UNITED STATES DEPARTMENT OF ENERGY
ENERGY EFFICIENCY AND RENEWABLE ENERGY
ENERGY CONSERVATION PROGRAM
NOTICE OF PROPOSED RULEMAKING (NOPR)
PUBLIC MEETING
WEDNESDAY, MARCH 24, 2010

The Public Meeting convened in Room 8E-089 in the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C., at 9:00 a.m., Douglas Brookman, Facilitator, presiding.

PRESENT

DOUGLAS BROOKMAN, Facilitator
BRUCE ALKIRE, Carpenter Co.
TIM BALLO, Earthjustice
GOPAL BANDYOPADHYAY, Ph.D., Pacific Northwest National Laboratory
GARRY L. BRANNON, TAFCO
AMY CHIANG, Honeywell
STEVE COMBS, International Cold Storage
ELLIS CRAIG, Craig Industries
STEVE DUNLAP, Dunlap Consulting Services
TIM DYE, Schott Gemtron
DARYL ERBS, Manitowoc
ERIC H. FITZ, Navigant Consulting
ALBERT FRYDLAND, TAFCO
CLAIRE GAGNE, Navigant Consulting
DAVID GRIFE, Arctic Industries, Inc.
LINDA M. HESS, Dow Chemical Company
MILEN KIRILOV, Carpenter Co.
SHAUN LAMPEL, United States Department of Justice
REBECCA LEGETT, Navigant Consulting
KURT LEIBEL, Dow Chemical Company
HARMON S. LEWIS, American Panel
JIM Y. K. LING, Honeywell

PRESENT: (continued)
ARISTOTLE MARANTAN, Ph.D., Navigant Consulting
JOANNA MAUER, Appliance Standards Awareness Project
RAY McGOWAN, National Fenestration Rating Council
JON McHUGH, McHugh Energy Consultants
KIMBERLY MILLER, Honeywell
FRED L. MINELLI, Kysor Panel Systems
BRETT A. MITCHELL, Kason Industries, Inc.
KENNY OWEN, Master-Bilt
RONALD E. PARK, Bayer MaterialScience LLC
GRAHAM B. PARKER, Pacific Northwest National Laboratory
MICHAEL PERRODIN, Hill Phoenix
JIM PERRY, Thermal Rite
WILLIAM J. RAMSEY, Owens Corning Science and Technology, LLC
LOREN RASMUSSON, Nor-Lake
DEVIN RAUSS, Southern California Edison
DOUGLAS E. READ, ASHRAE
IRA RICHTER, Heatcraft
HARVEY SACHS, American Council for an Energy Efficient Economy
MICHAEL J. SIEVERS, BASF Polyurethane Foam Enterprises, LLC
JEFF VAN SLOUN, Owens Corning Foam Insulation, LLC
JOHN A. STOCKS, Hill Phoenix
BILL STOMPF, Bally Refrigerated Boxes, Inc.
LEE THAMES, Thermo-Kool
JAKE VANDEVORT, American Chemistry Council
COLLIN WEBER, Navigant Consulting
SARAH WIDDER, Pacific Northwest National Laboratory
MICHAEL VENABLE, Hill Phoenix

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1 P R O C E E D I N G S

2 9:02 A.M.

3 MR. BROOKMAN: Let's start. Please

4 take your seats and let's get started.

5 Good morning, everybody. Welcome.

6 My name is Doug Brookman. I'll be

7 facilitating today's meeting. We're fortunate

8 this morning to have John Cymbalsky from the

9 Department of Energy. He wishes to make

10 welcoming remarks.

11 MR. CYMBALSKY: Thanks, Doug. Is

12 this on? This is my fourth week on the job,

13 so I want to say I know it's going to be a

14 contentious meeting. Don't throw anything at

15 me. Yell and everything, that's great.

16 Another thing we request that if

17 you have lots of comments, the written

18 comments are ones that we would generally like

19 over oral statements. Sometimes it's harder

20 to read the transcript. So if you have

21 something important, please submit it in

22 written form and if you do get tired of

yelling at us, it's going to be 70 degrees today. The cherry blossoms are starting to come out. Feel free to walk out and enjoy the day. So with that, have a good meeting.

MR. BROOKMAN: It's our tradition to provide an opportunity for each person to introduce him or herself, so let's start with that. I'm going to start on this side of the room and go around. If you would say your name and organizational affiliation to make these microphones work, you need to push the little button, the little push button, and you can see a little green LED light on there.

Not everybody will be recorded in this, however, since everybody did register, the Department will provide a list of all the attendees here today. That will be made available later on this afternoon. So your name and organizational affiliation and we'll go.

MR. SIEVERS: Michael Sievers with BASF Polyurethane Foam Enterprises LLC.

1 MR. MITCHELL: Brett Mitchell with
2 Kason Industries.
3 MR. LEWIS: Harmon Lewis with
4 American Panel Corporation.
5 MR. CRAIG: Ellis Craig with Craig
6 Industries, Inc.
7 MR. GRIFE: David Grife with Arctic
8 Industries.
9 MR. KIRILOV: Milen Kirilov with
10 Carpenter Chemical Company.
11 MR. VANDEVORT: Jake Vandevort,
12 Center for the Polyurethanes Industry,
13 American Chemistry Council.
14 MR. DUNLAP: Steven Dunlap, HH
15 Technologies representing specialty doors
16 manufacturers.
17 MS. FABIAN: Barb Fabian, Owens
18 Corning.
19 MR. LAMPEL: Shaun Lampel,
20 Department of Justice, Anti-Trust Division.
21 MR. DYE: Tim Dye, Schott Gemtron,
22 commercial glass doors.

1 MR. THAMES: Lee Thames with
2 Thermo-Kool.
3 MR. RICHTER: Ira Richter,
4 Heatcraft Worldwide Refrigeration.
5 MR. McHUGH: Jon McHugh on behalf
6 of Southern California Edison and the
7 California Statewide Codes and Standards
8 Program.
9 MR. LEIBEL: Kurt Keibel, the Dow
10 Chemical Company, Formulated Systems Division.
11 MR. AMRANE: Karim Amrane, Air-
12 conditioning, Heating, and Refrigeration
13 Institute.
14 MR. SACHS: Harvey Sachs, American
15 Council for an Energy-Efficient Economy.
16 MR. RASMUSSON: Loren Rasmusson
17 with Nor-Lake, Incorporated.
18 MR. COMBS: Steve Combs,
19 International Cold Storage.
20 MR. PERRY: Jim Perry, Thermal
21 Rite.
22 MR. KRUPA: Mike Krupa, BASF

Corporation.

MR. KIDO: Michael Kido, Department of Energy, Office of the General Counsel.

MR. CYMBALSKY: John Cymbalsky, DOE, Appliance Standards.

MR. LLENZA: Charles Llenza, Project Manager, Department of Energy.

MS. LEGETT: Rebecca Legett, Navigant Consulting.

MR. MARANTAN: Aris Marantan, Navigant Consulting.

MR. WEBER: Collin Weber, Navigant Consulting.

MS. GAGNE: Claire Gagne, Navigant Consulting.

MR. FITZ: Eric Fitz, Navigant Consulting.

MS. WIDDER: Sarah Widder, Pacific Northwest National Laboratory.

MS. HESS: Linda Hess, the Dow Chemical Company.

(Participants from the gallery

identify themselves)

MR. BROOKMAN: Thank you. Did everybody get a chance? Okay.

So glad you could make it here this morning. My name is Doug Brookman from Public Solutions in Baltimore. I'm going to run through the agenda briefly and then we're going to proceed with the program.

I think all of you have a copy of the agenda. You also received, as you registered, a PowerPoint presentation packet, as well as the Federal Register notice. A general comment about the way we have done this in the past and what has tended to work well is as you look at this packet with the PowerPoint slides in it, you will see that there's a lot of content in it. And the way it's structured is so that three or four or some number of slides can be presented as a block of content. And then there's a request for comment. And the presenters think it's generally better for them to get the bulk of

1 that included as one chunk before we seek all
2 of your comments. And there's plenty of
3 opportunity for you to do that.
4 So if you can observe that
5 generally as a form, it will make this go
6 easier today, and I think it will also make
7 the transcript more understandable as the
8 Department reviews these materials.
9 So all of you have a copy of this
10 agenda. I hope immediately following this
11 agenda review, we're going to have a
12 rulemaking overview by Charles Llenza.
13 Following that, there's an opportunity for
14 anybody that wishes to do so to make brief
15 opening remarks, key issues, key concerns that
16 you'd like to raise here at the outside.
17 Following that, we're going to have a
18 presentation followed by your opportunity for
19 comment on the test procedures approach.
20 We'll take a break mid-morning and following
21 that proposed envelope test procedure, the
22 description of that that's once again embedded

in these slides.

We'll take lunch today around about 12:30 or so. Everybody is on their own for lunch. We'll give more specific instructions for that, as we approach -- as we break for lunch.

Immediately following lunch, continuing the proposed envelope test procedure presentation, your opportunity for comment. We'll take a break mid-afternoon, 3:15 or so, and then you can see the proposed refrigeration system test procedure and discussion of small business impacts.

Finally, at the end of the day today, whether that's at 4:45 or whether it's at 5:30, there's yet another opportunity for anybody that wishes to do so to comment. So if you don't get a chance to say what you came here to say today, there is that opportunity at the end of the day.

Is everybody with me? Okay.

I would ask for your consideration

for what I think over the span of these years we have observed these norms. Please speak one at a time. Please say your name for the record. You don't need to say your organizational affiliation every time, just your name, so we have a sense of who is speaking.

I am going to be queuing people as best as I can by name to speak. I also wish to encourage follow-on comments. Sometimes the exchange, the back and forth is very useful to the Department as they're trying to sort through these issues.

Please keep the focus here. If you would, please, turn your cell phones on silent mode. If you need to have a sidebar conversation with the person next to you, if it's going to last more than about ten seconds, you can take it out of the room. Microphones work pretty well, but you need to turn them on. They're better than they used to be.

1 And then finally, if you could try
2 your best to be concise. There's a lot to be
3 said, I'm certain. This is a crowded
4 proceeding today and we want to make sure we
5 give everybody a change to say what they came
6 here to say.
7 Questions or comments about any of
8 that?
9 MR. LEWIS: If we submitted written
10 statement to Charles Llenza, is that part of
11 the record or does that have to come up at
12 this right here?
13 MR. LLENZA: Yes, it's part of the
14 record.
15 MR. BROOKMAN: The answer is yes,
16 it's part of the record. And of course, the
17 Department encourages, as John indicated at
18 the outset, your complete and documented
19 supported written comments, that will be very
20 helpful to the Department as they figure out
21 how to proceed.
22 Okay? So then final questions here

1 before we launch into the content? I see
2 none. Let's hear from Charles Llenza.
3 MR. LLENZA: Well, welcome to the
4 meeting on walk-in coolers, walk-in freezers.
5 Today, we're presenting what the Department
6 has come up in terms of our concept for test
7 procedures.
8 As you are probably aware, the
9 Department of Energy is conducting this
10 rulemaking as required by law, EISA 2007. We
11 have several steps here to accomplish. One,
12 prescribed standards where enacted by
13 Congress, January 1, 2009, we have a test
14 procedure we're currently working on and this
15 is what the meeting is about today. Once this
16 is published as a final rule there will be 30
17 daysbefore the test procedure final rule test
18 procedure becomes effective.
19 We are also currently working on an
20 energy conservation standard which is not due
21 to be published until January 1, 2012.
22 As you can see, these are the two

1 processes that we're working on. The one for
2 the test procedure which is today's meeting,
3 again,and then we are in the preliminary
4 analysis in terms of milestones for the
5 standard. Right now, we can't talk much about
6 the standard, but we are currently working on
7 our preliminary analysis for the standard.
8 As you can see, the major milestonehere has been that we
9 published a NOPR on January 1, 2010. Please note that the comment period
10 closes on the 31st of March. DOE will review and consider all the comments
11 that are submitted and they will also be put in the
12 record.
13
14
15
16 DOE is holding this public meeting
17 to present DOE's proposed test procedures, to
18 clarify any questions about DOE's proposed
19 approach, to seek your comment and
20 participation in this process, and describe
21 the next steps for the rulemaking.
22 And as you can see, today we have a
23 series of issues that we want to present to
24 this group. We'll go into background and
25 approach, Basic Model, proposed test procedure

envelope, refrigeration test procedure, and the small impacts on business.

DOE welcomes your comments, data and information concerning this proposed test procedure for walk-in coolers and freezers. So we're here really to listen to you, as part of the industry, for you to tell us what we need to get right in our test procedure. And with that, I'll give it back to Doug.

MR. BROOKMAN: Thank you. And you see an illustration of the comment box that provides a structured opportunity for your comment.

So now is an opportunity for anybody who wants to to make an opening remark, brief opening remarks, key issues that matter to you. And perhaps some of you contacted the Department in advance. Did they?

MR. LLENZA: Yes.

MR. BROOKMAN: I think so. So we'll just take it here. At the outset,

1 please, and you are, Claus?
2 MR. CRAIG: Ellis Craig with Craig
3 Industries and I'd like to read a statement
4 into the record.
5 MR. BROOKMAN: Is it a lengthy
6 statement?
7 MR. CRAIG: It will take about five
8 minutes. Or do you want me to cover points?
9 MR. BROOKMAN: If you could cover
10 the points and then submit your written
11 statement, that would be helpful, because
12 we're trying to keep this brief.
13 MR. CRAIG: Okay, I will. First of
14 all, we're considered by DOE a small company.
15 Evidently, it's 750 people or less working for
16 your company and I don't know if there's too
17 many in here that are making walk-ins that
18 have over 750 making it. So most of us are
19 small businesses, considering that.
20 We're concerned about the effect,
21 not only is it going to happen to us, but to
22 other companies that operate out of their

1 garage or whatever, that are making walk-ins
2 now. It will probably put this -- these new
3 regulations will probably put a lot of small
4 businesses out of business. And it's a big
5 concern for us that the cost of this testing
6 can be up to $1 million by the time you test
7 all the refrigeration equipment, that you
8 actually manufactured at this present date and
9 the fact that it will probably limit the
10 amount of walk-in refrigeration systems that
11 are offered because if you test one unit, then
12 you can't offer another because it costs
13 another $5,000 to test it. So it's going to
14 limit that and require a lot of problems.
15 We're also concerned about walk-in
16 definition. Technically speaking, in the
17 definition that the law has right now, a walk-
18 in is any storage room that is at, above, or
19 below 32 degrees or in other words any
20 temperature that has a refrigeration system on
21 that is 3,000 square foot or smaller.
22 Well, technically, this room here

1 could be a walk-in cooler if it had a
2 refrigeration system on it, no matter what
3 temperature you hold it at. So the definition
4 of a walk-in is very vague and very apt to be
5 interpreted by the -- as a matter of fact,
6 there are systems out there right now that you
7 could buy on the market that will make an air
8 conditioner operate at 32 degrees or cool a
9 walk-in cooler. Technically, if you put that
10 air conditioner on a walk-in cooler it now
11 could not be a walk-in cooler any more. It's
12 now a cooled room. So the definition leaves
13 itself wide open. It needs to be defined
14 something like 45 degrees or below, or
15 something. It has to have a temperature
16 element into it or you're just wide open for
17 misinterpretation.
18 I also think we need some
19 definition on mechanical, scientific, and
20 research. It's left to our interpretation.
21 Would a mortuary box that holds cadavers,
22 would that be considered scientific or medical

1 or what does that have to be under these
2 regulations or not. We don't have any
3 clarification in any of the regulations we've
4 got right now.
5 In the law, it states that
6 structural members are not required to meet
7 the R-32 and the R-25 R values, but if we're
8 going to this new process of testing that
9 we've got on the agenda today, this formula
10 that we come up to will end up have to predict
11 the R value or the load requirements of that
12 walk-in structure. And if we have structural
13 members in it that reduce that R-value,
14 they'll have to be taking into consideration
15 and in the law it doesn't say they do. So
16 there has to be testing on like wood members
17 that are into it or steel members or hard-
18 nosed members that are in it and have a
19 separate R-value test done on those so that
20 they can figure it into the formula so that
21 you can come up with an accurate definition of
22 what that product is going to be. Right now,

there's nothing in there to do that.

A lot of manufacturers put electrical boxes and conduit inside the panels which by the new law states that the walls need to be R-32 or R-25 unless they're structural. Since electrical and conduit are not structural, then they'd have to be surface-mounted and I think that hasn't been addressed and I think we need a ruling on that because by the law the way it's stated right now, it says that they can't be inside the panel and be compliant.

Remote refrigeration, part of our business is selling packages that have a condensing unit, a coil, an expansion valve, and a box of parts. We don't touch it. We bring it in, we put it into a package and we send it out with a walk-in cooler. The refrigeration guy in the field assembles all of this, puts it together, puts it on the walk-in and now we're responsible for testing each one of those units. So if we change an

1 expansion valve to another expansion valve,
2 now we have to have a $5,000 test. If we
3 change the timer on that system to another
4 timer because it's a cheaper, less expensive,
5 more competitive timer, we can't switch it
6 because it costs $5,000 to change it.
7 Not only that, we're held
8 accountable, according to the definition as
9 the manufacturer now. It used to be the
10 refrigeration contractor in the field was also
11 held accountable, but the new definition now
12 puts the manufacturer, the person who
13 manufactured the product, which is us, so now
14 we're going to either eliminate all of that
15 business so we can't send these parts out to
16 the end-user. Or now the refrigeration guy in
17 the field is going to have to take on the name
18 as a manufacturer.
19 Another thing is we're required to
20 do this testing, but a wholesaler is not
21 required to do this testing. So we send a
22 walk-in out without refrigeration right now, a

1 wholesaler can give him these parts and he can
2 install it on that system and it would
3 technically be noncompliant, because it's
4 going on a new walk-in, but there is no
5 testing done on it. So that defeats the rule.
6 We recommend that if we're going to
7 be accountable for that refrigeration and
8 we're going to pay the testing on it, then all
9 walk-ins need to be sold with refrigeration
10 from the manufacturer. That would assure that
11 when that system goes out into the field, the
12 whole package is done and tested by us and we
13 know the performance level of that product.
14 As it is right now, we're wasting our time if
15 we're just working on parts of this thing.
16 The cost of testing is pretty
17 prohibitive. I talked about that before, but
18 I want to reassure the fact is that just like
19 these -- I was just telling you, we had in
20 your document 50 refrigeration systems. We
21 probably sell a thousand different variations
22 of refrigeration systems right now. So taking

1 what you're going to do, you're going to limit
2 it down to just a few refrigeration systems.
3 They're going to cost a lot more money because
4 once you're locked into them, you're locked
5 into them for life. There's no competition in
6 the industry anymore because no one can change
7 that. Large companies who make their own
8 system and stuff are going to be a lot more
9 competitive than small companies who can't
10 afford the systems that they're putting in.
11 So a lot of the guys are going to get out of
12 the refrigeration business or buy them from
13 large companies that the large companies will
14 put those and do all the testing and give you
15 a limited amount of units.
16 The net effect of this is walk-in
17 coolers and freezers are going to cost a lot
18 more money in the industry, to restaurants,
19 convenient stores. They haven't even got a
20 clue or they'd be here today to know how much
21 these product lines are going to go up and
22 it's all because our extra costs are going to

be passed down and they're going to be limited on their options. Right now, they're not, but they're going to be limited on what they can buy.

Last, if we're going to have manufacturers, if the manufacturer is us and an installer in the field is not a manufacturer, then we either believe that he becomes a manufacturer in this definition, or we would be required to sell the installation or be at least contracting the installation with a certified contractor in the field to put this system together so that when it's in place, we can verify as the manufacturer that it meets these requirements. Otherwise, if one guy puts the install in, another guy sells refrigeration over here and we're selling just the walk-in box, there's no way that's going to be controlled.

And that's pretty much it.

MR. BROOKMAN: Thank you, Ellis. So the Department really appreciates -- how

many of you are new to these proceedings? Quite a number of you. Much more than normal, I would say.

The Department really appreciates the specificity of your comments and so if you have suggested definitions or suggested recommendations along these lines, in writing to them, thank you, that would be very helpful.

MR. CRAIG: Yes, we'll do that.

MR. BROOKMAN: Who would like to go next? And I appreciate you summarizing.

Your name, please?

MR. DUNLAP: Steve Dunlap with HH Technologies. I just wanted to follow up on the last comments about the definition of walk-in coolers. I'd like to submit that the current definition as was stated is unclear and it could be misconstrued.

I have clients that have cold storage facilities that are well beyond 3,000 square feet. If this definition is changed --

1 I have clients that have air conditioned
2 warehouses, and walk-in coolers and freezers
3 within air conditioned facilities, well above
4 3,000 square feet. Their interpretation of
5 the definition is that the air conditioning is
6 acting as a refrigerator. So as you approach
7 the facility, it's a walk-in cooler. So where
8 there's a definition, this was done by
9 Congress, it seems to me I'm not sure what
10 authority DOE has in regards to defining
11 further the interpretation of the walk-in
12 cooler.
13 However, if they do, I would submit
14 that the current practice of the current
15 legislation which specifies R-values for walk-
16 in coolers defines that without having
17 performance parameters is backwards
18 engineering you might say. Without the
19 performance parameters, we have applications
20 where our doors are much more efficient than a
21 heavy sliding door, heavy R-value door. And
22 what happens with that definition where

1 Congress is told the industry, regardless of
2 the application, if it fits within the walk-in
3 cooler, that the door has to be an R-28, an R-
4 32. The problem with that is in our
5 application, eight hours out of the day we
6 have forklifts that traverse back and forth
7 and we have some clients that have people that
8 just don't shut the doors and there's enough
9 traffic that the R-value has little to no
10 value. In fact, the biggest load and I've
11 stated this in the past meeting, the biggest
12 load on that refrigerator is infiltration.
13 And the door itself, if you have a tight,
14 automatic door that closes automatically, that
15 prevents infiltration, one of the most energy-
16 efficient ways to maintain the freezer and the
17 cooler.
18 So I would submit if we start to
19 redefine the walk-in cooler and if DOE has the
20 authority to redefine it, i.e., put instead of
21 above which is how it's defined now, well,
22 above could be anything, just like what was

1 stated.
2 And in that regards then I feel like the R-
3 value on doors which by the way is a new
4 requirement. Even in 2005, California
5 excluded doors and they also excluded floors
6 and coolers. So these are new requirements on
7 the industry.
8 And without specificity on the
9 application of the freezer, whether it's a
10 retail application or a warehouse with a lot
11 of traffic, conceivably if the DOE defines a
12 cooler and puts that above temperature limit,
13 then I've got customers in cold storage where
14 the specific use of that entire building is
15 strictly for moving product in and out.
16 Now we have a requirement on that
17 door where forklifts are going in and out and
18 they have freezers. They have different
19 compartments within cold storage. They may
20 have a small freezer that's under 3,000 square
21 feet. So there's a lot. And respectfully,
22 this legislation is a mess.

1 MR. BROOKMAN: So I hope maybe
2 you've got some empathy for the position the
3 Department is in here.
4 MR. DUNLAP: Absolutely.
5 MR. BROOKMAN: If you could make
6 your specific definitional suggestions, that
7 would be very helpful.
8 Who else? Who would like to go
9 next? Yes, please. Your name, please?
10 MR. COMBS: Steve Combs. As we go
11 forward with this and my comments are going to
12 be much more brief than the others, as we go
13 forward with this, the National Sanitation
14 Foundation has requirements laid out, has
15 definitions for the envelope and the operating
16 parameters of walk-in coolers and freezers.
17 So just to kind of put it out there for
18 consideration to keep from getting the issues
19 confused, I think it would be useful to confer
20 with those standards as we go forward, so that
21 we don't end up with a bunch of different
22 standards that we're all trying to get to the

1 same point and using different pieces of
2 paper.
3 MR. BROOKMAN: Thank you. I
4 appreciate that. You, sir? No. Yes.
5 MR. THAMES: I'm Lee Thames. I
6 would like to reiterate what Ellis had
7 mentioned too about just the fact that a lot
8 of the walk-in cooler manufacturers here I'm
9 sure are engineered to order where we don't
10 really have a standard walk-in. So just that
11 fact, probably 85 percent of our walk-ins are
12 engineered to order and very rare are there
13 repeats unless it's a chain account or
14 something like that.
15 MR. BROOKMAN: Okay, thank you.
16 Yes, please?
17 MS. FABIAN: Barb Fabian. I would
18 just like to state that the test method that
19 we have proposed here is ASTM C1303 for the
20 insulations is going to be impossible to
21 conduct for these products to meet the
22 requirements of EISA, the 32, 28, and 25,

1 because of a thickness limitation and other
2 criteria. So I'll document that more fully in
3 my comments.
4 MR. BROOKMAN: Thank you. Yes,
5 please.
6 MR. LEWIS: Harmon Lewis with
7 American Panel. I won't do the five minutes
8 of my statement, just that the testing on the
9 insulation for the walk-in cold rooms, if that
10 is done without the metal skins that are on
11 the panel, it's totally non-real world. We
12 produced foam-placed walk-in coolers for over
13 20 years and we've had no long-term R-value
14 degradation at all. We've not had to replace
15 refrigeration at the five-year point when
16 supposedly our R-values are going to drop from
17 32 down to 6 which would mean your
18 refrigeration would have to run 37 hours per
19 day where it had been running 18 hours. So
20 this proposal just is not real world.
21 MR. BROOKMAN: The Department would
22 love to see your data.

1 MR. LEWIS: I've already submitted
2 it.
3 MR. BROOKMAN: Thank you. That's
4 very helpful to them. Appreciate that. Okay.
5 Yes, Jon. Jon, say your name again?
6 MR. McHUGH: Sure. This is Jon
7 McHugh on behalf of the California Statewide
8 Codes and Standards Program. The Codes and
9 Standards Program is supported by Southern
10 California Edison, Pacific Gas & Electric
11 Company, and San Diego Gas & Electric, so all
12 three of the California investor-owned
13 utilities.
14 Next slide, please.
15 So this proceeding is very
16 important to us as refrigeration, as large a
17 load as cooling.
18 Next slide, please.
19 This proceeding is to help develop
20 the test methods for the performance-based
21 standards for EISA. And the purpose of these
22 performance standards are to achieve the

maximum improvement and energy efficiency of walk-ins. And the efficiency that is gained is a function of not just the stringency of those standards, but how enforceable those standards are. And so I'm going to be talking quite a bit today about that issue.

Next slide, please.

So this is a description of the market structure. This was developed for our Title 20 appliance standards and it describes the interconnections of the industry.

Could you click the button please?

And what we see is that of what the current thinking about a single unitary standard around a refrigeration system that is specifically designed for a particular walk-in is something that actually corresponds to a small fraction of the overall market. The market is actually very competitive. You have a lot of mechanical contractors and consultants for the various end-users that purchase components across different

1 manufacturers. It makes for a very efficient
2 industry. It forces innovation in the
3 industry in that various components are
4 competing against each other for not only
5 their efficiency, but also their cost.
6 Next slide, please.
7 So a desirable outcome of this rule
8 is something that first off is enforced at the
9 manufacturer level because there's dozens of
10 manufacturers where there's thousands of
11 contractors. So it's not very realistic to
12 think that we're going to designate each of
13 these contractors as quote unquote
14 manufacturers.
15 It's also very important that the
16 benefits of the current market which is very
17 competitive that this does not end up as a
18 restraint of trade kind of situation where
19 only vertically integrated businesses are able
20 to produce product and that the cost of
21 entering into the market is reasonable. So we
22 don't want to throw out the competitiveness of

1 the industry to obtain energy efficiency and I
2 don't think that's necessary.
3 And also related to competitiveness
4 is that we have accurate performance
5 information. Many of the people in this room
6 probably know about quote unquote
7 commercialized ratings which are essentially
8 inaccurate ratings. What we would like to see
9 if third-party certified ratings that give the
10 true performance information about these
11 products.
12 Next slide, please.
13 In terms of supporting a
14 performance approach to walk-ins, we're
15 recommending that DOE consider a components
16 performance method which is essentially that's
17 enforced at the manufacturer's level,
18 something that could be enforced at the level
19 of the catalog and that designers can put
20 together complying components to sell a
21 complying walk-in.
22 We don't want to end up in the

1 situation that I've got this really
2 inefficient whatever, coil, box, etcetera, but
3 I was going to match it with this really
4 efficient other component and therefore that's
5 why I'm able to sell something that's
6 inefficient and have that in my catalog for
7 walk-ins.
8 We do believe that a performance
9 base is important so we want to be technology
10 neutral so currently the EISA standard talks
11 about triple-glazed windows. We think it
12 makes lots of sense in terms of U-factor,
13 whether it's a low-E coating or different
14 gases, we don't care how the particular glass
15 door is able to achieve its efficiency, just
16 that it's on a performance basis. We think
17 that competition is actually enhanced if we
18 have third party certified ratings and that we
19 maintain the competitive market.
20 So the standard can impact not only
21 the new walk-ins, but potentially with a
22 component performance method it can also

impact the larger market of repaired and replaced walk-ins.

Next slide, please.

So we should also make use of the preexisting standards. We don't need to reinvent the wheel. And so there's -- and in particular, when we look at the infiltration issues, I think that it makes a lot of sense to look at the cheaper blower door tests and we make use of the ratings that already exist for different components, such as the National Fenestration Rating Council rating of infiltration and U-factor of doors.

Next slide, please.

We looked at this concept of specific efficiency which is the thermal capacity of evaporators and condensers divided by the actual fan power, not the brake horsepower of the motor, not the name plate of the motor, but the actual input watts to that motor as it's pushing air through the given pressure drop of a particular coil.

Next slide, please.

And I congratulate AHRI in developing standard 1250 that they've addressed I think some historical errors in how condensers have been rated, so I commend them for that.

Next slide, please.

But I think that in the AHRI 1250 standard, I think there needs to be more work on defrost controls and it captures all the essential failure modes or at least poorly-performing modes of defrost controls.

Next slide, please.

And in terms of some of the studies that we've done for the State of California, the two single largest measures in terms of the 80-20 rule in terms of energy savings from walk-ins has to do with variable speed evaporator fans and floating head pressure controls. And so any new standard or any new test method needs to accurately capture the benefit of those two measures.

1 Next slide, please.
2 So finally, we'd like to see that
3 these test methods reflect the market and are
4 enforceable in the market, so I'm hoping that
5 today, there's a lot of information sharing
6 that helps understand how products are truly
7 sold and it's not just talking with the
8 manufacturers, but also the end-users, so the
9 various end-users are described earlier and
10 some of the consultants that are assisting
11 those end-users.
12 Also, I think it's very important
13 that DOE describe how the walk-in regulations
14 are going to be enforced and once you do that
15 I think that that will impact both the test
16 methods and also the final wording of the
17 regulation.
18 As I mentioned earlier, variable
19 speed fans and floating head controls are two
20 critical efficiency measures and we also want
21 to make sure that this new performance
22 standard doesn't result in backsliding in the

1 standards, so thoughts about how to actually
2 maintain the efficiencies that are currently
3 gained in EISR are lost in this new
4 performance standard.
5 Thank you very much.
6 MR. BROOKMAN: Other comments here
7 at the outset? We're going to get into
8 considerable detail here in a little bit.
9 Ira, please turn on the microphone
10 and say your name for the record.
11 MR. RICHTER: Ira Richter from
12 Heatcraft.
13 I'd just like to echo Lee's
14 comments about the variability of our product.
15 To serve our market, it's a very highly-
16 variable product with lots of features and
17 lots of options and one of our concerns is how
18 we're going to test each one of these options.
19 We may have a condensing unit with
20 six different options on it. Are we going to
21 be required to test the unit with each of
22 these options and all of the permutations?

1 What do we do about customer-specified
2 equipment where he tells us exactly how he
3 builds the product? Are we going to be
4 required to test that as well?
5 And then finally, what are we going
6 to do about experimentation? We do an awful
7 lot of work with our customers to promote new
8 technologies such as CO2. Is this regulation
9 going to still allow us to do that kind of
10 work?
11 MR. BROOKMAN: Thank you, is it
12 Jake?
13 MR. VANDEVORT: Jake Vandevort.
14 I'm representing the Center for the
15 Polyurethanes Industry today. Thank you for
16 the opportunity to present these comments.
17 I'm just going to -- we submitted
18 full written comments to the Department of
19 Energy earlier and I'm just going to address
20 some of our key points today very briefly.
21 Initially, I just want to say that
22 we support the use of mean test temperatures

at 20 degrees Fahrenheit for freezers and 55 degrees Fahrenheit for coolers to calculate R-value. Since the thermal conductivity of foam will change with temperature and it's not the same for all foams, the use of these mean test temperatures is more indicative of actual usage conditions, so we support that.

Next, I'd also like to address briefly the definition given of a Basic Model and we do support the definition of Basic Model as well as the factors that would require additional testing of products as a different Basic Model. However, even though we support that definition, we feel that there are some other factors that DOE should consider including in the list and among those are the use of a different type of insulating foam or different types or amounts of blowing agents in the insulating foam which can result in different performance characteristics, including the R-value of the envelope in energy consumption. So we recommend that the

1 language be specified to include those
2 specifically among the list of factors.
3 Our primary concern as has been
4 mentioned earlier is with the use of --
5 proposed use of ASTM C-1303 to determine long-
6 term R-value which is inappropriate for foam
7 in place or bun stock faced with impermeable
8 materials such as metal skins. The scope of
9 ASTM C-1303 covers a procedure for predicting
10 a long-term thermal resistance of unfaced or
11 permeably faced rigid gas-filled closed-cell
12 foam insulation by reducing the specimen
13 thickness to accelerate aging under controlled
14 laboratory conditions.
15 And we strongly urge DOE to not use
16 this test method to measure long-term R-value
17 and instead propose test methods such as ASTM
18 C-1363, a modified C-518 or perhaps the use of
19 a calculation method based on initial K-factor
20 be considered in the development of a test
21 method. So thank you.
22 MR. BROOKMAN: Thank you. Other

comments here at the outset, to launch into considerable detail in the following slides?

Okay, so then let's proceed. Rebecca, thanks for advancing those slides earlier.

Then let's move to the materials. All of you have a copy of this packet. You will see what's up on the screen is also here in front of you.

We're going to hear from Rebecca Legett.

MS. LEGETT: Thank you, Doug. As he said, I'm Rebecca Legett. I'm going to discuss background and approach to the test procedures.

First, an overview. EPCA specifies -- EPCA, as amended by EISA 2007, specifies which equipment is covered by the test procedure. And this is the statutory definition that you see here. And some of the previous comments that we just heard suggested modifications or clarifications to that

definition and we will take those comments into consideration.

The table just summarizes the statutory definition and I'm sure you're all familiar with that, so I'll move on.

During the framework meeting, we got a lot of feedback on the issue of how to test walk-in coolers and freezers. Originally, DOE was considering one single test procedure for an entire assembled walk-in. However, we received a great deal of feedback from interested parties stating that this was not the right approach. So DOE reconsidered its approach upon consideration.

Therefore, today, we are proposing in this test procedure to develop separate test procedures for the envelope and refrigeration system.

I'll briefly go through the justification for our decision, summarizing feedback that we received during the framework from interested parties.

First, we learned that there are two components, two general components of a walk-in cooler or walk-in freezer. And these are often considered different pieces of equipment. You have the envelope in which the refrigerated items are stored. And you also have the refrigeration system that chills the space inside the envelope.

Feedback from interested parties during the standards framework public meeting and through the framework process indicated that a single test procedure that covered these both as assembled was not a viable approach for DOE to use, for these reasons: burden; the fact that often these two components are manufactured by separate manufacturers; that under a single test, the assembler or installer could be required to demonstrate compliance which is not DOE's typical approach. DOE typically holds the manufacturer responsible. Furthermore, it could be difficult to enforce testing

1 requirements if the walk-in is assembled in
2 the field.
3 Here's an outline of the proposed
4 test procedure as separated into envelope and
5 refrigeration equipment. Even though DOE is
6 proposing that these two are tested
7 separately, DOE attempted to formulate these
8 test procedures such that the energy use of a
9 walk-in as a whole would be captured.
10 And we'll get into the multiple
11 details of both of these test procedures later
12 in the presentation. This is a high-level
13 overview.
14 As I said, one key justification
15 for the separate tests was that the two
16 separate components are often manufactured by
17 separate parties. So it follows that it makes
18 -- DOE thought that it made sense to hold the
19 envelope manufacturer responsible for testing
20 the envelope and the refrigeration system
21 manufacturer responsible for testing the
22 refrigeration system.

1 So the purpose of this provision is
2 to reflect the structure of the market and
3 assign the appropriate testing
4 responsibilities. We realize that you may
5 have multiple comments on this so we'll ask
6 for those in the next slide.
7 MR. BROOKMAN: We'll receive
8 comment on this broad overview to the
9 Department's general approach.
10 Yes, Ellis.
11 MR. CRAIG: Ellis Craig. You
12 mentioned that the envelope manufacturer would
13 test the envelope and the refrigeration
14 manufacturer would test the refrigeration
15 equipment. That may or may not be a different
16 party.
17 MS. LEGETT: Okay.
18 MR. CRAIG: A lot of manufacturers
19 of walk-ins manufacture refrigeration
20 equipment by buying the parts, assembling them
21 and putting them together. So there's a lot
22 of crossover there. And I just want to make

1 sure that it doesn't sound like there's two
2 unique individuals that do completely
3 different things. They don't. Sometimes
4 there's a cross, sometimes we buy it from
5 somebody else. Sometimes we sell a walk-in
6 without refrigeration and they buy it from
7 somebody else. So it's important to know
8 that.
9 MS. LEGETT: Thank you for the
10 clarification.
11 MR. BROOKMAN: Yes, please.
12 Harmon.
13 MR. LEWIS: Harmon Lewis. Yes, the
14 big issue here is that as has been mentioned
15 before, most of the walk-in cooler and freezer
16 manufacturers, we're like a custom cabinet
17 shop. Every order is different. We're not
18 Sears or Whirlpool or whoever making five or
19 ten refrigerators or freezer models. We sell
20 thousands of walk-ins each year and no two are
21 alike except for a chain account. And those
22 aren't even all that much alike.

1 So the testing is going to be
2 crazy. We sell over 200 different condensing
3 units. Each condensing unit can have as many
4 as seven different evaporator selections with
5 it. And this is to provide energy efficient
6 walk-ins. If we've got to cut that down and
7 start trying to pick a small number, this
8 isn't going to be a competitive marketplace.
9 It's going to be a disaster.
10 MR. BROOKMAN: Okay, thank you.
11 Jon?
12 MR. McHUGH: Jon McHugh. I'd like
13 to hear a little bit more information about
14 how the envelope -- who is the envelope
15 manufacturer. So as an example, it might be
16 someone who might have a contractor who buys
17 the panels from one manufacturer and also
18 purchases the glass doors from somebody else
19 and potentially purchases the actual walk-in
20 door from a third party.
21 Who is the manufacturer in that
22 case?

1 MR. BROOKMAN: Ellis, do you want
2 to respond to that?
3 MR. CRAIG: Ellis Craig. The only
4 comment -- I agree with him 100 percent. I
5 don't see how this -- the only way this is
6 going to work is if the manufacturer is
7 responsible for the whole system. He buys the
8 doors. He buys the refrigeration. He builds
9 the walk-in. He supplies it. Then he can
10 control all of these things. If he does it
11 just piecemeal, you're not going to have the
12 effect in the industry that you think you're
13 going to have because I guarantee you, I'm
14 selling walk-ins today that refrigeration
15 systems are being put on, doors are being put
16 on. They are probably noncompliant and I am
17 going to responsible for it, but I have no say
18 so in it.
19 MR. BROOKMAN: And that is a
20 reflection of the current state of the
21 industry that you've got multiple players
22 putting these pieces together in a walk-in

1 unit.

2 MR. CRAIG: Absolutely.

3 MR. BROOKMAN: Okay.

4 MR. DUNLAP: Steve Dunlap, just a

5 follow up on that comment. You also don't

6 know the applications or the operations many

7 times. And again, this comes back to if it's

8 a retail application, industrial retail

9 supermarket. So many of the manufacturers

10 really don't know the application or which

11 would be the best optimized, which technology

12 would be the best optimized for energy

13 efficiency.

14 MR. BROOKMAN: Thank you.

15 Additional comments on this overview? We're

16 about to get into significant details.

17 Jon?

18 MR. McHUGH: I'd just like to hear

19 if there was some thought put to various

20 components requiring -- if you look at the

21 current EISA standard there are essential

22 prescriptive requirements right now and it's

1 R-value for the envelope. It's triple glazed
2 glass doors, etcetera. And so I'd be
3 interested in hearing about is there any
4 reason why manufacturers of for instance
5 insulation panels can't be required to meet a
6 particular U-factor and the door manufacturer
7 is required to meet certain infiltration U-
8 factor requirements?
9 MR. BROOKMAN: Yes, Ellis.
10 MR. CRAIG: The law was written in
11 a prescriptive way and the way I understand
12 it, we can't change the law here, so evidently
13 those things are not negotiable. Yes, we can
14 meet those things, but as you look at those
15 regulations, they're technically we could
16 manufacture a walk-in today with an R-32 wall,
17 sell it to a customer and a week from now it
18 has no R-value at all. All the gas is gone.
19 It falls apart and that's a legal product to
20 sell in this industry today.
21 So obviously, the prescriptive law
22 doesn't have the intent of what the law makers

wanted when they implemented it. They should have left that to a meeting like this to help devise standards and prescriptive. An initial R-value means nothing as far as what may or may not happen in the field to a product. So saying today what something is has no effect on how its ten-year lifecycle is going to be or the amount of energy it's going to require over a ten-year period.

So the way the system is today is really a waste of time, the way it is written. Now hopefully, we can fix some of those things here and make it better, but I'd like to see us get completely away from the prescriptive nature of the law and deal with it on more of a performance-based testing system which we don't have.

MR. BROOKMAN: Thank you. Barb?

MS. FABIAN: Yes.

MR. BROOKMAN: Please turn on the microphone, Barb.

MS. FABIAN: The way the EISA

standard is written right now it is not for the R-value of the wall panel. It is just for the insulation. And depending on how the panel is constructed if there are wood pieces or metal membranes in there, you're going to have a lot of thermal shorts and that's going to affect the R-value or the U-value of the whole assembly, not just the R-value of the insulation. So there's two different things that we're looking at here, insulation versus a panel.

MR. BROOKMAN: Jon?

MR. McHUGH: Just a clarifying comment. What I'm suggesting is that we go from a prescriptive requirement that had things like R-value. We go to a performance standard that looks at long-term U-factor for those opaque components, but also look at requirements for the various components and then as long as each of those components are complying, then the walk-in is complying. It allows people to compete on their particular

1 component whether it's doors or it's opaque
2 sections, whether it's coils, etcetera. And
3 by putting all the components are complying,
4 you have a complying walk-in. It brings it up
5 to the level of the manufacturer.
6 I'd be interested in hearing from
7 DOE counsel if there's any reason in the EISA
8 standard whether that is achievable or not.
9 MR. BROOKMAN: Michael Kido.
10 MR. KIDO: I guess my first
11 question is where would be the specific
12 authority just to set up particular standards
13 for the individual components? As the statute
14 is set up right now, we have the authority to
15 regulate equipment as a whole. So in this
16 context, Congress has given us the ability to
17 set up performance standards for the walk-in
18 coolers and the walk-in freezers. We could
19 certainly look at the possibility of setting
20 certain requirements with respect to
21 individual components, but as I said before,
22 the way that it's set out it's based on the

1 specifically-stated equipment, in this case
2 the walk-in cooler and freezer.
3 MR. McHUGH: Just a little follow-
4 on. Currently, what you're looking at
5 currently is taking the requirements for walk-
6 ins and breaking in half one for the
7 refrigeration side, one for the box side.
8 We're just saying take that out to its logical
9 extension at the level of what products are
10 sold for the walk-ins.
11 MR. BROOKMAN: Like I said, we'll
12 certainly look at it. Thank you.
13 Yes, please.
14 MR. COMBS: One thing that we
15 should -- Steve Combs. One thing that we
16 should consider as we go forward with this is
17 that in order to create, to prevent creation
18 of inadvertent loopholes, there needs to be
19 some type of a qualification as to whether or
20 not it's a commercial enterprise, a private
21 enterprise, or a government use or something
22 of that nature because too often those are

left by the way and as we get into the legislation and we start reading it, we find that there are some quote unquote loopholes in there for people to kind of slip under the door with. And we don't want to inadvertently create those as we go forward here. So just a point to keep in mind.

MR. BROOKMAN: Okay, thank you.

MS. LEGETT: Doug, can you clarify when you said whether it's a private enterprise or a government, whether -- are you talking about the manufacturer or the end-user?

MR. COMBS: The end-user.

MS. LEGETT: Thank you.

MR. DUNLAP: Steve Dunlap. Just to follow up again on your comment. A lot of the loopholes are out there because of the operations. This isn't only energy, but it's the form, function, and fit. And that's why those are out there. It goes back to the end-use. And the problem with the legislation is

it blankets it. It covers every aspect. And it doesn't address all the specialty customized applications today.

MR. BROOKMAN: Okay. I think we're going to move on now. A little more detail.

MS. LEGETT: Okay, thanks, Doug.

In keeping with DOE's proposed approach of dividing the walk-in into its two components, the envelope and the refrigeration, DOE then needed to come up with definitions for each component to ensure that all parts of a walk-in fell into one of these two components, these individual parts that we've been talking about.

So here is our definition that we are considering for the envelope. Here in the -- so, if you can see how the two parts of the definition. We have examples of each part.

There are the parts that separate the interior environment from the external environment such as panels, doors, etcetera. Second, is all energy-consuming components

1 that are not part of the refrigeration system.
2 This includes lighting, etcetera. These
3 examples are not exhaustive. We realize that
4 there could be many more examples of these.
5 So we invite comment on this
6 definition.
7 MR. BROOKMAN: Definition of
8 envelope. Ellis, you're next.
9 MR. CRAIG: I just want to bring up
10 the fact that this doesn't deal with it, but
11 it needs to include, as I mentioned earlier in
12 our statement structural members that are
13 involved with the walk-in. And I don't see
14 that in anything I've seen in writing from the
15 DOE yet, but now that we're going to have this
16 formula that's going to calculate this R-
17 value, I'm hoping that we're going to know
18 that a two by four is less R-value than a
19 insulated panel so you can't calculate it all
20 on insulated panels. You have to calculate it
21 on the composite.
22 MS. LEGETT: Thank you for your

comment. We would appreciate if it looks like we've missed anything on this, like I said, it's not exhaustive, but if you just want to clarify, please feel free to do so.

MR. BROOKMAN: Please say your name for the record.

MR. MINELLI: Fred Minelli. I would just like to address the envelope issue that the Panel should include glass doors, electrical, lighting. Typically, our market, we sell the panel. Very seldom sell the glass doors. Very seldom sell the lighting. Almost never sell the refrigeration. So I think those items should be separate and to Jon's discussion about component testing, these are all items manufactured and designed by someone with U-values and electrical output values so that they should be separated from the box. They should be components and component testing.

And to address Mr. Craig's issues in panel assembly, if we do component testing

1 we can test a section of panels, 8 by 8, 10 by
2 10, 10 by 20, whatever that DOE considers
3 effective. But you can test the finished
4 panel with any framing, any reinforcing, any
5 conduit, any method that you want to have in
6 that product. And these are all typical
7 testing methods -- the testing method for the
8 entire envelope can only be done at the final
9 end-user's jobsite. No manufacturer is
10 capable of setting up an entire unit,
11 specifically freezers without floors because
12 you're going to have condensation in freezing
13 and other serious problems.
14 So the component approach I think
15 is by far the best approach for this process
16 and the envelope should be separated into
17 components.
18 MR. BROOKMAN: Thank you. Jim?
19 MR. PERRY: Jim Perry with Thermal
20 Rite. I was going to say that the comments
21 about the structural members and the comments
22 about the complexity of our products and how

1 we custom engineer products would make it very
2 prohibitive to test every typical
3 configuration or configuration that could be
4 made of that.
5 MR. BROOKMAN: Can you suggest some
6 other way to do this?
7 MR. PERRY: I would echo Mr.
8 Minelli's comments that we separate and test
9 panels as a whole.
10 MR. BROOKMAN: Okay. Charles
11 Llenza.
12 MR. LLENZA: Charles Llenza,
13 Department of Energy.
14 I kind of feel the concern here,
15 but when you assemble this on-site, what's
16 going to guarantee me that the actual walk-in
17 freezer is going to perform to some standard,
18 that we're not going to have -- who is going
19 to be responsible for putting this together
20 right? I mean if it's not put together right,
21 no matter how efficient your components are,
22 how am I going to guarantee that I'm going to

1 get the most out of the performance of the
2 components if the assembly part of it is not -
3 -
4 MR. BROOKMAN: The actual assembled
5 unit performs?
6 MR. LLENZA: Yes, so that this is
7 kind of like do I have two different levels of
8 standards so you have to have the component
9 level that guarantees some minimum standard?
10 And then I have to have some kind of assembly
11 standard where once assembled, there has to be
12 a performance-based level that we have to
13 reach? I mean it's complicated, but I just
14 don't -- I would like people to express their
15 opinions about this.
16 MR. BROOKMAN: Let's hear from the
17 manufacturers first for a little bit and then
18 we'll go -- is it Tim?
19 MR. MINELLI: I agree. It is
20 extremely complicated. But this is the only
21 time you're going to have the entire assembly
22 in position in a functioning role is at the

1 jobsite.
2 And some things that were discussed in
3 warehouse meetings is to have the general
4 contractor do the certification. DOE is
5 considering certification by manufacturers,
6 but I believe the manufacturers do not
7 typically have the entire assembly.
8 So a general contractor in the end-
9 use can certify the walk-in. You have to
10 create some system by way to get this
11 certification done so why not the guy that
12 touches it last, the general contractor.
13 MR. BROOKMAN: Please say your name
14 again?
15 MR. MINELLI: Fred Minelli.
16 MR. BROOKMAN: Tim, you're next.
17 MR. DYE: Tim Dye with Schott
18 Gemtron. We are a glass door manufacturer.
19 So we have most, if not all of these people,
20 manufacturers, walk-in coolers, freezer
21 companies as customers. And to require the
22 panel manufacturers to test all of the glass

1 doors just in our product line alone, we offer
2 14 different variations. That's just the
3 door.
4 Then there are roughly 16 different
5 sizes of each variation. So to require a
6 panel manufacturer to test all of these
7 components and put that burden on them would
8 be overbearing to say the least. That's just
9 my product line. There are other glass door
10 manufacturers. There's roughly about five of
11 us here in North America. So -- and I agree
12 also with the statement on the installation.
13 If you install panels incorrectly and you
14 install glass doors incorrectly, if you forget
15 to torque the door to close, you've lost all
16 of your value. And today, that relies on the
17 installer. But as far as I'm aware of,
18 there's no criteria for all of that
19 checkpoint. It's a checkoff list. The
20 glass doors, the refrigeration system in my
21 opinion, I feel need to be completely separate
22 than the panel manufacturers.

1 MS. LEGETT: A follow-up question.
2 So as a door manufacturer then you would
3 consider yourself responsible for testing?
4 MR. DYE: Absolutely.
5 MS. LEGETT: Do you do that now?
6 MR. DYE: Yes, we do.
7 MS. LEGETT: Thank you.
8 MR. BROOKMAN: I saw Harvey, and
9 also John. Harvey Sachs. If you can get
10 close to that microphone.
11 MR. SACHS: Harvey Sachs, ACEEE.
12 I'd like to just follow up to Mr. Llenza's
13 question about how we would assure that a
14 component was assembled, the unit was
15 assembled properly in the field. And as a
16 thought experiment, it seems to me that we can
17 go a long way relatively simply if the panels
18 are tested appropriately. If there are
19 prescriptive requirements that make it hard to
20 put them together wrong, and it's harder to
21 put them together wrong than correctly, and if
22 we have an infiltration test whether that's

done by tracer gas or blower door, that handles much of the problem. Any egregious thermal bypasses will show up as condensation on the interior and manufacturers have strong incentives to avoid that.

So I think there is potentially a path, although I'm certainly not in a position to recommend it now.

(Laughter.)

MR. BROOKMAN: Thank you.

MR. SACHS: I just don't know enough.

MR. BROOKMAN: Jon McHugh.

MR. McHUGH: Jon McHugh. So in terms of testing, the U-factor is not the only thing that could be tested for the panel. So you could have an assembly and you also test the infiltration per linear foot of perimeter of that panel. And then putting -- so that if you met both the infiltration requirements on the connection system and the U-factor, long-term U-factor, then you would capture most of

1 that.

2 The other question that again I'd

3 like to hear from counsel is whether or not

4 building codes would be federally pre-empted

5 from requiring blower door tests on site

6 assembled walk-ins.

7 MR. BROOKMAN: Michael Kido.

8 MR. KIDO: We'll have to look into

9 that. Are you talking about -- my

10 understanding is that most building codes are

11 actually at the state and local level. I'll

12 have to look into that.

13 MR. McHUGH: Thank you.

14 MR. BROOKMAN: Ellis, first.

15 MR. CRAIG: I'm really concerned

16 about this installation what this is kind of

17 going to because testing in the field is going

18 to be very, very problematic. That probably

19 is going to be very hard to do.

20 MR. BROOKMAN: A blower door

21 wouldn't work.

22 MR. CRAIG: We're not going to go -

1 - I can't see how we could -- we sell
2 thousands of walk-ins. You're talking about
3 thousands of tests on each application out
4 there. That's not going to be a feasible way
5 of doing things.
6 Another thing is to say that we
7 manufacture -- we manufacture panels within
8 two-thousandths of an inch. I don't know how
9 it can get any better than that. So what
10 happens is -- in two-thousandths of an inch,
11 you can still install that walk-in wrong. And
12 you can make a mess out there and you can have
13 condensation and you can have all these things
14 and they live with it.
15 MR. BROOKMAN: What about the idea
16 that the manufacturing -- the assembly system
17 makes it easier to assemble it right than
18 wrong.
19 MR. CRAIG: Well, it does. They're
20 already to that extent, but there's a certain
21 amount of flexibility in the system that lends
22 itself to - -I don't know how to explain it.

1 If you install the walk-in right
2 and the floor is not level, you will see gaps
3 underneath the floor. If you square it toward
4 the floor, you'll see gaps in the panel. So I
5 mean this is kind of what happens.
6 What bothers me more if you're
7 going to assure that it's out in the field,
8 somebody has to take responsibility for that
9 field installation. As it is right now,
10 you've kind of got the manufacturer taking the
11 responsibility for it which is us, but you're
12 not -- I mean we don't have any way of
13 controlling that installation in the field.
14 Now if we were controlling the
15 installation and we were selling the
16 installation with our product, then we could
17 go to the contractors that are doing it,
18 entering into contractual agreements with them
19 that if something is wrong and it's not
20 appropriately installed, they've got to go out
21 and fix it.
22 The problem is right now we've got

1 to go out and fix it. I've got to hire
2 somebody and that guy says I'm not going out
3 there anymore. Now we've got to hire somebody
4 else to go out there and fix it. It is
5 manufactured right, but installed incorrectly.
6 And that happens to all of us in this room,
7 believe me.
8 MR. BROOKMAN: Charles has very
9 clearly stated what the Department's interest
10 here is which is to assure that as installed
11 the performance is --
12 MR. CRAIG: As it is right now,
13 that ain't going to happen.
14 MR. LEWIS: In the real world and
15 I've been 32 years now in the walk-in cooler
16 and freezer industry, if the walk-in is
17 installed wrong, the condensation and coolers
18 and the ice formation and freezers is very
19 obvious to what let's call even the most
20 casual observer and that's going to start
21 floating up from the end-user to the food
22 service equipment dealer from which he bought

1 the walk-in who is going to call us and we
2 will be involved in the fix of the process
3 already. So it just happens already that
4 people know when it's installed wrong.
5 I look above the clock up there and
6 see the dropped ceiling doesn't fit. If this
7 is a walk-in cooler or freezer, there would be
8 water running down the wall or it would be ice
9 formation. So there's a very knowing and
10 easily discernible feature there or factor
11 when it doesn't get done right.
12 So typically, those are corrected.
13 A lot of times we don't hear about them, but
14 I've been out in the field on many trips to
15 take care of major accounts where it was
16 installed wrong, but it is corrected because
17 otherwise it does not perform correctly.
18 MR. BROOKMAN: The Department is
19 looking for some assurance that this is going
20 to happen.
21 MR. LEWIS: How do you know
22 somebody is going to use their seatbelt?

MR. BROOKMAN: You next, please. Your name?

MR. MINELLI: Fred Minelli. This is a very large issue. The installation is where the problems occur. If you're going to have a leaky joint, it's going to be due to installation. And NSF is going through this same situation right now trying to find a way to control that and I think the discussion to have certification at the end-user site by the GC will settle everything right there with the installers present. If they can run the tests on the box, they can find the leaks before you get ice in the joints. They can find it and take care of it then. That's the spot to control the energy usage.

If I build a test box in my factory or third-party agency somewhere, it will be installed perfectly.

MR. BROOKMAN: Does the GC, does that person typically do some kind of post-installation test now?

1 MR. MINELLI: No.
2 MR. BROOKMAN: It doesn't happen.
3 MR. MINELLI: No. Neither do the
4 manufacturers, ours, no testing.
5 MR. BROOKMAN: John Cymbalsky.
6 MR. CYMBALSKY: John Cymbalsky,
7 DOE. I think we're getting into the same spot
8 where we are with building codes in a sense
9 because a local building code is component
10 driven, windows, R-values in the ceiling, the
11 walls, etcetera.
12 But in a stick-built house, you
13 know, you're dealing with the quality of your
14 labor. And I think that's the issue that's
15 being brought up here. So I don't have a good
16 feeling about the code enforcement in
17 buildings and so this is even more narrow I
18 think.
19 MR. BROOKMAN: Okay. Any
20 additional thoughts, please. Your name again,
21 Fred?
22 MR. MINELLI: Fred Minelli. It is

a component of construction and the permitting process. GCs have to go through this process, not on walk-ins, but they go through this process on other parts of the building. We're talking about new construction. The process already exists. If DOE defines the certification method which you're attempting to do now, but only have the manufacturers do the certification, there's no difference in having the GC do the certification and it's a much better application in that this is the finished product. It has the doors that I probably didn't build or have anything to do with that has the glass doors installed. It has the refrigeration installed. It has the insulated concrete slab. So it's a fully functional system.

Here is where you're going to lose energy if it's not done correctly there. That's where it should be checked.

MR. BROOKMAN: In a little bit, we're going to move on. An additional comment

here. Please say your name.

MR. FITZ: My name is Eric Fitz. I just wanted to follow up on some of these comments. So if the Department of Energy allowed manufacturers to certify installers, would the manufacturers think that's a good idea. Is that a --

MR. MINELLI: Fred Minelli again. Installation, too, is not controlled by us. Many of our customers have their own installation crews. They're national corporations. They build all over the country. We supply panels. They buy glass doors. They buy lighting. They buy sliding doors. They buy the refrigeration. They do their own install.

It's very, very seldom -- Mr. Craig is talking about someone doing the entire package. It's very, very seldom that a manufacturer would do the entire package.

MR. BROOKMAN: There's no certification regimen or requirement or

anything like that for GCs now.

MR. MINELLI: None that I know of.

MR. BROOKMAN: Okay. I want to get back into the slides here briefly. Final comment.

MR. LEWIS: Just a quick -- when we do installer certification trainings in American Panel for installers all over the country because a number of consultants do write in their specification that it has to be installed by a factory certified installer or have a factory representative on site which would be cost prohibitive. And again, coming back to one of your first slides and one from California talks about more cost competitive situation. And everything we're doing here that adds cost, the walk-in manufacturer can't absorb it. None of us drove up here today in Rolls Royces.

Whatever we have to spend, we've got to charge. So the end-user is going to have to pay more. So you're going to pay more

for your stakes. You're going to pay more for anything you go for.

MR. BROOKMAN: Yes, is it David?

MR. GRIFE: David from Arctic Industries. I have to agree with him. I think we're constantly losing touch with significant amounts of money and a burden being put on to this marketplace. The customization we've talked about, but I can't stress it enough. There are so many people who are a part of this puzzle, the consultant respect, the customer respect. The customers who don't even tell us what it's for, that we do not know, where we cannot even influence energy efficiency because we don't even know what the application is going to be.

There are so many different areas, and then we finally have this walk-in that is installed perfectly, that is built perfectly and then we have a gentleman who walks in with a hose and just washes down all the walls and all the floors and he's in the kitchen, so you

1 know what he loves in the kitchen. It's
2 ammonia. He takes ammonia and he rubs it on
3 all the gaskets. It eats away the gaskets.
4 These things are what's happening in the
5 practical world. We need to look beyond that.
6 We need to remember that we're
7 energy efficient, but we need to understand
8 what is happening in this marketplace and it
9 is incredibly complex. And I wish I had that
10 answer. I do not. But I think we need to
11 remember the burden on small businesses that
12 are trying to help their customers every
13 single day.
14 MR. BROOKMAN: That's helpful. The
15 Department is going to have to do something
16 here. That's the bottom line, right? So your
17 best thoughts on how this could be done to
18 satisfy the needs of industry and the needs of
19 Federal Government to achieve energy
20 efficiency would be helpful.
21 Now we're going to return to the
22 slides.

1 MS. LEGETT: Yes, so that was
2 envelope and now I'm going to discuss briefly
3 the definition of refrigeration system.
4 This is the definition that was
5 proposed in the published NOPR and you all
6 have this in front of you so I'm not going to
7 read it. I'll just move on to the next slide.
8 Mention that DOE is interested in
9 comment or feedback regarding this proposed
10 definition. Additionally, DOE is considering
11 a couple of minor revisions, clarifications,
12 to this definition.
13 First, clarifying the term
14 integrated single package refrigeration unit
15 within the definition. Second, instead of the
16 term central rack system using the term
17 multiplex condensing system. This is just to
18 clarify that the term refers to a condensing
19 system that serves, that may serve multiple
20 units in a store or a supermarket, walk-ins,
21 reach-ins. In this case, the condensing
22 system would not be covered, this multiplex

system because it does not just serve the one walk-in. So instead, the unit cooler of the walk-in would be covered.

In our research, after the NOPR was published, we learned that multiplex condensing system is a more widely-used term. So this is the revised definition. We asked for comments on both the original definition and DOE's minor modifications.

MR. BROOKMAN: Leave the definition up.

MS. LEGETT: Absolutely.

MR. BROOKMAN: Ellis?

MR. CRAIG: Ellis Craig. I have a real problem because every time we have a definition, then you need to define another word in the definition to understand what you're talking about. It says it creates a refrigerated environment.

This room here is a refrigerated environment technically, so I mean what does it mean? If you're defining a refrigeration

1 system, something that keeps a refrigerated
2 environment, is that a certain temperature
3 range? Is it -- if it's not, then I don't
4 understand what a refrigerated environment is
5 if you don't define it.
6 MR. BROOKMAN: Be specific.
7 MS. LEGETT: What would you say --
8 MR. CRAIG: I would say you pick a
9 temperature that's below 45 degrees or below
10 40. I'm not picky on it, but you need a
11 temperature that we can hang our hats on to
12 say if that's room is going to be 45 or below,
13 we have two product lines in our manufacturing
14 plant. We have Enviro-Buildings which we do
15 clean rooms, quality control rooms,
16 communications shelters and all these other
17 kind of items and we defined it in our
18 company. If it's over -- I think we defined
19 it if it's over 45 degrees, it's an Enviro-
20 Building. If it's under 45, it's a walk-in
21 cooler.
22 But without -- you know, without

that definition, now you've opened it up that every room that's refrigerated, that means this room could be considered refrigerated if it's 90 degrees outside and it's cooler in here. That's my problem with it.

MS. LEGETT: Thank you. Briefly, you suggested 45. Does anyone disagree with that?

MR. BROOKMAN: Jon, go ahead.

MR. McHUGH: So just in terms of harmonization with other standards, I believe that Title 24, California's Building Energy standards used below 55 degrees as what is considered not space conditioning.

MS. LEGETT: Thank you.

MR. BROOKMAN: Fred.

MR. MINELLI: Fred Minelli. NSF defined -- we're talking about food storage rooms. NSF defines 41 degrees as the maximum high temperature for food storage. So we should tie the codes together and use 41 degrees and below as refrigerated space; 32

1 degrees and below as freezers.
2 MS. LEGETT: Thank you.
3 MR. BROOKMAN: Ellis.
4 MR. CRAIG: I have a problem with
5 55 degrees because wine coolers are held at 55
6 degrees, so you can say well I'm selling you a
7 55 degree wine cooler, but they might rate it
8 at 45, 43, so it's right on that -- I don't
9 like it to be right close to something at such
10 a big amount of product being sold out there
11 to hold at a certain temperature.
12 I'd rather have it not be
13 refrigerated. So the 41 is a good idea with
14 NSF at least.
15 MR. BROOKMAN: Okay, thank you.
16 Yes.
17 MR. COMBS: Yes, I echo Fred's
18 remarks as far as NSF goes and what we also
19 have to keep in mind is that much of this is
20 going to be based on the intended application.
21 Because we have no control over what the
22 customer does with that thermostat when it

1 gets in the field.

2 MR. BROOKMAN: Yes.

3 MR. DUNLAP: Just as a follow-up

4 all of the definitions on even the square

5 footage, less than -- over 3,000 square feet.

6 Again, there's a lot of -- what does that

7 comprise? Is that just a space out there

8 where you have a cooler that's less than 3,000

9 square feet?

10 I have warehouses that are well

11 beyond 3,000 square feet that are air

12 conditioned and they're air conditioned mainly

13 for the coolers. So I can say that's my first

14 stage of cooling for the walk-in cooler. And

15 in fact, that's what is there. The

16 definition, Webster's definition of

17 refrigerated is that it's for preservation.

18 It does not give a temperature.

19 So again, we're back into defining

20 just like the gentleman's comments. Once

21 there's a definition, just like the

22 legislation where they put in this definition

of a walk-in cooler and the fact that they arbitrarily put in R-values on components going back to the end-use that make absolutely no sense: R-values on doors, R-values on ceilings, R-values on freezer floors, without defining performance.

And the other comment before was that this meeting should have been done before the legislation. I think we're all beginning to agree that's the way it should have been done. These various applications have not been identified. And going back, if indeed we start to define and I don't have a problem with the 41 degrees or 45 degrees, as long as there's a definition for that above temperature, but again now you have introduced a definition now that many of areas, because of the end-use, the doors don't make much sense the way they're being -- the freezer and the coolers are being applied because they're wide doors.

I wish they had just cut out, just

1 left this at -- what is it, three foot nine
2 inches where you had the automatic door
3 closers. Once you opened it up beyond that,
4 now the application is high traffic. And now
5 the whole situation changes and from an energy
6 efficiency standpoint, again, that's what the
7 purpose of this is. Our value for the door
8 means -- means absolutely nothing unless the
9 door is closed. If the door is not closed,
10 our value means very little.
11 When we get into the effectiveness
12 of air curtains or strip curtains, there's
13 very little information as far as standards on
14 those types of devices. I've never seen a
15 specification on strip curtain for overlap.
16 We all know that strip curtains are deformed.
17 Why doesn't an employee shut a door when he
18 goes in and out of a freezer? Because he has
19 strip curtains.
20 MS. LEGETT: He does. Quick
21 process note. I'm hearing some discussion of
22 different components and that's great. We

1 welcome comments, but I want to emphasize that
2 we will touch on each of these as we go
3 through the details of the test procedure.
4 This is really just a high-level
5 overview. I'd like to emphasize that right
6 now we're requesting comments on some specific
7 things.
8 MR. BROOKMAN: Thank you. I
9 appreciate that. Ira?
10 MR. RICHTER: I'd like a
11 clarification on mixed use condensing units
12 that could serve walk-ins and display cases at
13 the same time.
14 MS. LEGETT: Right.
15 MR. RICHTER: How would these be
16 treated?
17 MR. BROOKMAN: Does that fit here
18 or could we do it later?
19 MS. LEGETT: This does. It fits
20 part of the definition. You're talking about
21 these multiplex systems that were --
22 MR. RICHTER: It doesn't have to be

multiplex.

MS. LEGETT: Okay. Can you give another example of that kind of system?

MR. RICHTER: Well, multiplex is a good example and it goes to show where it serves walk-ins and display cases.

MS. LEGETT: Okay.

MR. RICHTER: But we also are starting to see in convenience stores where you have a walk-in cooler and maybe two display cases on the same condensing unit.

MS. LEGETT: So what would the correct technical term be for that? Are you suggesting that we use a different term in this definition?

MR. RICHTER: My real question is it going to be covered in this or is it going to be excluded?

MS. LEGETT: As proposed, DOE is intending to only regulate the parts of the refrigeration system that serve that individual walk-in being regulated.

MR. RICHTER: Then we should have an exemption for refrigeration equipment that serves other loads other than walk-ins.

MS. LEGETT: Thank you.

MR. BROOKMAN: Harvey Sachs.

MR. SACHS: Harvey Sachs, ACEEE. I was certainly not involved in drafting the legislation, but certainly know some of the people who were thinking about this and I want to address one point that Mr. Dunlap has raised.

The goal of this was to address walk-ins that are produced in reasonable numbers, not drive-ins. So that the 3,000 square foot line was an effort, I believe, to differentiate between the production facility, warehouse-type facility and the storage type facility. I could be wrong. But it leads me to one other thought which is a little indirect, but we have seen in some cases in the past where consensus is reached that the Congress has been open to suggestions on

technical corrections. And I hope that everyone is in parallel thinking about that level of suggestions not only to the Department, but to all the participants that might help achieve energy efficiency.

One final note while I'm up at the 30,000 foot level is I think there's an understanding that some changes to increase energy efficiency will increase purchase price and the hope that the present value of the energy savings will be greater than the cost at purchase. In other words, this will be a transfer to the manufacturers in the distribution chain from the energy consumption side. That would be a general hope and somewhat of a constraint.

Thank you.

MR. BROOKMAN: I'm looking ahead. There's a lot more to cover here. So final comments on this definition before we move on.

MS. LEGETT: Thank you. Now I'm going to turn it over to my colleague, Claire,

1 who is going to discuss the concept of Basic
2 Model.
3 Thank you.
4 MS. GAGNE: As Rebecca mentioned,
5 I'll be covering some parts of the Basic Model
6 which I think will be of interest to many of
7 you because it is on point with some of the
8 discussion that we've already heard today.
9 The following slides will describe
10 the definition of the Basic Model as proposed
11 in the NOPR, as well as several examples of
12 how this would apply to the equipment for
13 walk-in coolers and freezers.
14 In essence, the Basic Model is
15 DOE's response to the customization issue in
16 the marketplace. The purpose of the Basic
17 Model is to reduce the testing burden on
18 manufacturers. And the -- I'd say the main
19 point of it is that it is a grouping system
20 for walk-in equipment that essentially allows
21 certain calculations to be made within a
22 particular group or family of equipment.

I will talk specifically about how this applies to the envelope. Rebecca will return to discuss how this might apply to the refrigeration systems.

In the Basic Model that has been proposed, the basic idea is that certain parameters can be calculated or tested and then used in a calculation. It is a rating method. I will provide more detail on how this works in the next slide, but the essential idea is that manufacturers would be required to test at least one unit of one Basic Model to determine the energy consumption and then scale certain pieces within that Basic Model. Or if in some cases the adjustment is simply a calculation such as square footage of the envelope where nothing else changes, then there is an additional approach that I can describe that will take this idea of rating and apply it to many different potential model types that the manufacture may make.

This slide describes the rationale, underlying rationale for the Basic Model which is the Daily Energy Consumption Coefficient. It is a scaling factor that would allow for the calculation of energy consumption in some components.

The DECC parameters that are listed here are not exhaustive. However, I will run through a quick example before moving on to more in-depth examples.

In the case of a glass display door, if you had a walk-in with say five of the same display doors and then you had a different walk-in made that used 10 or 15, it would simply allow you take the calculation or the test and the outcome of the test and scale those results for a larger size model with the identical doors.

The basic idea is that it's a linear expression and that's why it can be scaled in this way.

Before we get into some examples of

how this would apply, I'd also like to turn our focus to the issue of the alternative efficiency determination methods or AEDMS. This was something that DOE proposed in the Standards Frameworks Document and it's essentially also a calculation methodology. However, the AEDMs would have allowed manufacturers to use their own software and the DECC as proposed is something developed by DOE in order to be more uniform.

The feedback that was received by DOE that was Standards Framework Public Meeting was significant in that it objected to this idea of using the AEDMs because they would be developed by individual manufacturers as opposed to something that was something uniform.

This was seen as something that could be expensive and time-consuming. It may also have been unfair and it would have potentially provided inconsistent information.

As a result, DOE elected to go down

the route of developing its own calculation methodology that as proposed would apply to all manufacturers.

So with that I'll turn to some examples as to how this might play out. Again, this is not an exhaustive list, but it is meant to give an indication of how the DECCs and therefore the Basic Model could be used in practice by manufacturers.

First, I'll discuss the temperature application. At the basic sense, the difference between a cooler or a freezer can be viewed as a fundamental difference, at least from an energy consumption perspective, of how a walk-in cooler or freezer uses energy. So in this example, if the manufacturer were to make an identical envelope structure with the same doors and the same gasketing, etcetera, but the temperature that the walk-in was going to operating in is different, they would constitute different Basic Models.

In the case of electrical load, this is something that can be calculated no matter what. So if the same cooler or freezer had different types of lighting or different anti-sweat heaters or one had an anti-sweat heater and the other different, this is something that would simply be a calculation.

In this example, the boxes look identical. However, we've indicated that one is made from a certain type of foam and the other is made from another type of foam. This is a trigger parameter for a Basic Model. It doesn't matter what the operating temperature is or what the components are. Essentially, if it's a different foam type, it's automatically a different Basic Model.

In this example, the appearance of the walk-in coolers is very different, although they look to be made out of the same materials and in fact, in this example, they are.

They also are operating at the same

temperature and use the same assembly system. And so in this case, DOE would propose for the Basic Model that these could simply be rated differently, but that a test would only need to be done on one of them and then those results would be scaled.

The way that the results would be scaled is somewhat of a simple calculation. The main point that I'd like to bring your attention to is this very last line. The DECC is just a calculation. It's a calculation of the energy load divided by the exterior surface area. The energy load, of course, is the issue at stake here from a testing perspective. But once tested, it can be applied through the DECC model.

So to take this last bullet here of 12.815 watt hours per day per square foot, in this example because the materials and temperature and assembly system and all trigger parameters are identical to the previous walk-in, simply the DECC would be

applied with the exterior surface area of this new walk-in model. And then the energy load would be calculated from there, so a new test would not be required.

So with that, I'd like to open up the discussion to this basic mode for the envelope as well as the embedded idea of the daily energy consumption coefficient.

MR. BROOKMAN: Yes, David?

MR. GRIFE: So, when I quote a customer, I am going to have to calculate in his quote this new energy load. And if it doesn't meet the standard, I will tell him he can't buy it. Then he will call me up and say, "Excuse me? This is what I asked for. This is what I want. I will just go to another manufacturer."

So I am not really sure what you mean by that. You know, is that where you want it, some load basis on a quote of what they can buy?

MS. GAGNE: The issue of the load

is something we will get into in more detail later, but it factors into the way that we look at the test procedure. The issue here is whether the basic model, as a grouping system in order to sensibly reduce the testing burden, is a good idea.

MR. BROOKMAN: Ellis?

MR. CRAIG: Ellis Craig. Yes, I have no problem with the testing model idea, that basic model. I like it because it does save costs without just trying to test 20 different types of walk-ins or whatever.

One thing I have a little problem is it seems like you are leaving it up to us what model we want to test. I don't see any definitions in here about what size walk-in or anything. So in other words, if you assume that the infiltration losses are larger on the joints, therefore you would test walk-ins with big panels because they would have less joints per square foot on the panels. So you could, I know that if I were doing it, I would say

1 well let's see, how am I going to make this
2 the best? Well, I will design a walk-in that
3 is going to perform the best with my
4 construction and I will get that basic number
5 and apply it.
6 Another manufacturer may say well I
7 think this will work and, therefore, he tested
8 according to his most optimal performing unit.
9 I think the DOE needs to come out and say an
10 eight by ten or whatever. There has got to be
11 a basic test that we are all testing the same
12 size walk-in unit or we are all going to get
13 different results. Not because they are
14 different in construction. It is just that
15 there are going to be different results
16 because of different size walk-ins.
17 We need to have a basic -- a model
18 that says this basic model will be an eight by
19 ten with one door, or one expansion or one
20 pressure relief on it, or not a pressure
21 relief on it. We have to have something so we
22 are testing the same thing. Otherwise, this

1 won't work.
2 MS. GAGNE: I understand your
3 comment. Just to clarify one thing, the
4 energy load would be a unit that could be
5 scaled.
6 MR. CRAIG: No, I understand that.
7 MS. GAGNE: Okay.
8 MR. CRAIG: But the one unit we
9 test needs to be the same in all
10 manufacturers. That is what I am saying.
11 MR. BROOKMAN: Let's hear over
12 here.
13 MR. FITZ: This is Eric Fitz.
14 Ellis, I just want to follow-up. Do you have
15 a specific recommendation for a size? You
16 threw out some numbers but is there something
17 specific that you think is a good idea?
18 MR. CRAIG: Probably the number one
19 walk-in sold as a standard unit for a cooler
20 is an eight by ten and a standard on a freezer
21 would be a six by eight. Now, does that mean
22 all of us are going to have that same

standard? If somebody does only mainly grocery stores, that wouldn't work. But in the food service industry, those are the two number one sizes that are sold.

So if you want to pick something that would be more applicable to the industry, in most walk-ins that are sold, it would be a six by eight freezer and an eight by ten walk-in cooler, seven foot six tall, something like that. And I think your guys here would probably agree with me.

MR. FITZ: Does anybody else have a recommendation for a particular size that is tested?

MR. BROOKMAN: This gentleman is in the queue. Do you want to speak on this or do you want to wait a minute?

MR. ERBS: I will wait a minute.

MR. BROOKMAN: Fred, you are next.

MR. MINELLI: Fred Minelli. I think this is another one of the concerns that leads us to component testing. Because as Mr.

1 Craig says, what is typical in food service is
2 not typical in supermarkets, is not typical in
3 big box clubs. There is no typical box or
4 model group.
5 The component test the DOE
6 specifies this high by this length, something
7 or two, maybe one to cover the eight foot tall
8 walls and one for the 16 and 18 foot tall
9 walls that we build.
10 MR. BROOKMAN: Ellis, I have to
11 think that the Department constructed it this
12 way to reduce the burden on the manufacturers
13 so that whatever unit that you had that was a
14 basic unit that you were going to do a lot,
15 that that would be the thing that you could
16 then test and scale.
17 MR. CRAIG: But again, like I am
18 telling you, if I am going to make a test
19 unit, I guarantee you I will make a test unit
20 that is going to give me the most favorable
21 results, whether I build that all the time or
22 not because that is the one that I am going to

be accountable for. Do you understand what I mean?

MR. BROOKMAN: I do.

MR. CRAIG: The basic nature of a business, unless you specify it, I am going to get with my engineers and we are going to figure out the best way to make this test unit so we get the highest, the lowest energy use out of that unit I can, if you don't specify.

MR. BROOKMAN: Charles Llenza.

MR. LLENZA: Yes, I kind of agree with what he is saying. If we baseline the unit that everybody has to test, then the scalability up or down from that unit is more uniform for everybody. So it sort of levels the playing field, as opposed to what Mr. Ellis is saying when somebody can pick a size.

MR. BROOKMAN: So there are two sides of this. You are next.

MR. ERBS: Daryl Erbs and I am just going to throw a few more logs on that fire.

I think the physics of walk-in

modes, the way I understand them would say that it is not a simple scaling exercise. That because people could change the number of doors that they have on a walk-in, they could add view ports, they could do other things, that it is an over-simplification to think that you can take the base model energy use and multiply it by a surface area and get an accurate representation of a different size walk-in.

So I think that really pushes the argument back to look at it at a basic component level. Because if you are just looking at conduction loads through a panel, that does scale.

If you are looking at infiltration effects of doors, then there is at least mathematical equations that could be used to deal with how those change. Infiltration is also a function of the relative size of the door opening to the box volume, not necessarily surface area.

So I think it is a noble attempt but I don't think it is really going to capture reality. We are not going to do a good job of representing what really happens and maybe we are better off going to a more simplistic approach where we just try to make sure that the individual components address some level of performance.

MR. BROOKMAN: Okay, thank you. Let me go to this gentleman here.

MR. PERRY: Jim. Jim Perry.

MR. BROOKMAN: Jim.

MR. PERRY: I have a couple questions about these slides the young lady showed.

On the first slide, if we are bound by EISA to have certain R-value requirements, how we achieve those R-value requirements, I don't understand why that would make that different basic model.

And then on the second slide, if we -- I think we need to get some scientific data

or talk to the engineers about is it truly a linear relationship between the size of the walk-ins that allows you to make a scaling.

MR. BROOKMAN: I don't know whether Claire or Aris here --

MS. GAGNE: I would like to seek clarification on your first point about R-value.

MR. PERRY: Okay. Yes. If we are bound to a certain R-value by the law, then why does the method of achieving that R-value constitute it being a different model?

MS. GAGNE: Aris, perhaps you have some thoughts on that?

MR. MARANTAN: Sure. Let me just make sure I understand your question. You are talking about the different of insulation for the same basic cooler, for example. If you have two coolers that look pretty identical, except for the change in insulation type, why would it matter?

MR. PERRY: Yes.

MR. MARANTAN: Well we don't know the -- so long as they both comply with the prescriptive requirements in the EISA legislation, you know, they pass that test. But then to comply with the performance standard in the energy conservation standards rulemaking that DOE is going to be developing, we need to know how much they exceed the performance standard. And so they may have different ratings, even though they both comply with the EISA regulation, they may have one, one maybe even better than the other.

So we would like to quantify that and that is what the test here tries to do.

MR. PERRY: That would also come out as part of the value that you assigned to that particular configuration.

MR. MARANTAN: Yes.

MR. PERRY: Not necessarily making it a different basic model. It is a basic model with a better performance rating.

MR. BROOKMAN: If it is different

insulation, it would be a different basic model, yes. That is what they said. That was how they were specifying -- that would be a trigger, as they specified in the slide. Correct?

Follow on, Barb.

MS. FABIAN: Yes, Barb Fabian. The only reason, as the last gentleman said was that it would be a different model is in application. If you are meeting the initial basic R-value for that insulation, then only over time will you know if one is doing better or worse. And at this point in time, as I understand it, we are not going to consider anything related to moisture infiltration, which is the biggest key of deterioration of the R-value. So you just eliminated the two differences there.

MR. MARANTAN: Well, I would like to just mention that as Rebecca indicated, there is two different tests, I guess, needed for a difference in insulation.

1 And one other thing I would like to
2 point out is that in the performance standard
3 the DOE is considering, is developing
4 currently, manufacturers of let's say one type
5 of insulation, if it performs better than
6 another type of insulation, well then they
7 have that ability to improve the overall
8 performance, just focusing in on insulation,
9 if they choose to, or they have the ability to
10 improve other components, if they want to
11 choose a different type of insulation.
12 And so we want to capture all of
13 that and this is part of that calculation to
14 determine overall performance for the standard
15 itself.
16 MR. BROOKMAN: I had several people
17 in the queue. I am going to let this
18 gentleman go first and then to Harmon and then
19 Ellis. Your name, please?
20 MR. McGOWAN: Sure. I am Ray
21 McGowan. I am from the National Fenestration
22 Rating Council and I have heard several

comments today that make me think that this situation is similar to what windows had faced. I mean, you can make a window in many different combinations and we wanted to provide a simulation and a testing method and only test a small subset of the windows to prove performance.

So one of my thoughts is, is there a way to simulate the performance of a walk-in cooler, based on a variety of inputs and then you could test a subset of them or a base model, which is exactly what windows does. Is that something that has been considered or exists? I mean, I know there is building simulation software, certainly, that could almost do what a walk-in cooler does. It could almost simulate it, I am guessing. But I just am curious if the industry has ever considered that or DOE considered that. Because you are talking about equation where you scale the size of a cooler away from a baseline. That is kind of like a window.

1 MR. BROOKMAN: Aris first.
2 MR. MARANTAN: Yes, we explored
3 that option during the framework public
4 meeting and we asked that very question. It
5 was related to the idea of the AEDMs, the
6 alternative energy or efficiency determination
7 method. And you know, just like the slide
8 indicated, there were problems using that
9 approach. We didn't hear from stakeholders or
10 interested parties that there was one
11 consistent way that everyone was using. Some
12 manufacturers indicated that they have their
13 own proprietary software that they were
14 willing to offer up but not everybody was
15 using a consistent one.
16 MR. BROOKMAN: Are you on this same
17 point?
18 MR. ERBS: Yes.
19 MR. BROOKMAN: Follow on.
20 MR. ERBS: I just wanted to mention
21 that --
22 MR. BROOKMAN: Say your name again,

please.

MR. ERBS: Daryl Erbs.

MR. BROOKMAN: Thank you.

MR. ERBS: There is some research that is being funded by ARDI, which is an arm of AHRI, that is trying to look at that issue, to look into more detailed modeling methods, not necessarily to define that as the way for manufacturers but to help validate some of these more simplified approaches.

You know, unfortunately, that research is just starting and so it is going to be a matter of probably six, eight months before we have any results. I just wanted to make sure people were aware that we are trying to learn more about how to properly do that.

MR. BROOKMAN: Thank you, Daryl. Harmon and then Ellis.

MR. LEWIS: When you sell walk-in coolers, if you sell refrigeration with those, you have to know the heat load of the walk-in and that is a computational item using ASHRAE

standards and perhaps Heatcraft or other manufacturers of refrigeration have programs that they have done or the individual walk-in manufacturers. But you have got your transmission heat load through the wall, your air infiltration, your product load, if it is not a holding application, and then your miscellaneous loads, your lighting and your fans. These are all unknown numbers. The biggest unknown is the air infiltration but ASHRAE has standards for that and you tend to adopt one.

We have done this for over 25 years with a computer program on every walk-in we sell. We know the heat load and we tell the customer because if they don't buy the refrigeration from us, they have got to know how to size that. So these are known computations and I have not done, you know, looked at the different numbers for the different sizes. So they may not be scalable linearly, but these are mathematical numbers

that work. And if you sell somebody the wrong refrigeration, you are replacing it. And we don't do that. We don't have that problem.

So there is science that already exists on this that determine the heat load on the walk-in and how much time the refrigeration is going to run.

MR. BROOKMAN: So apparently the Department didn't hear this in the first meeting. Ellis, go ahead.

MR. CRAIG: Okay. Ellis Craig. Just first of all, Harmon is correct in the fact that there is, we use it all the time, we wrote our own software off of other software and ASHRAE and everybody kind of develops one, one way or the other.

The problem is that that software doesn't actually take in the unique manufacturing uniqueness of each manufacturer. In other words, I am sure if you use the Heatcraft sizing program and I use the Heatcraft sizing program, we are going to plug

in figures on that and come up with the same answer but our products are not the same. And in performance, which means actual performance out there, they won't perform exactly the same. So, the new program is to get more defined in the actual construction of the product, so that it gives a more accurate number than the existing programs that are out there right now.

And as far as I am concerned about this basic unit, the only time that really becomes applicable really is on the infiltration test. So we will build an eight by ten. We do the infiltration test, everybody does the same thing.

The R-value of the insulation is a separate test and that is just multiplied times the square footage. And if you add in loads such as wood and not high R-value items that are in the structure, it is pretty simple to calculate what that box theoretically is going to have a heat load at. And that is

1 what this attempt was. The only thing I said
2 was if you are going to do this infiltration
3 test, let's do it on the same size walk-in.
4 That's all I am asking. And as far as the
5 basic model, I don't care what size you pick
6 as a basic model, other than that test. That
7 test is what is really going to set it.
8 MR. MARANTAN: Just one more
9 follow-on to Daryl's comment earlier. You
10 stated your position about, you know, using
11 the concept of performance metrics for
12 individual components. And I think that stems
13 from Jon's earlier proposal.
14 I would like to hear if there are
15 any component manufacturers in the room who
16 are also in agreement with that proposal or
17 otherwise, I know that there are some
18 manufacturers of components of the envelope
19 side, maybe even the refrigeration side, if
20 that seems to be a preferred method.
21 MR. DUNLAP: Steve Dunlap. Again,
22 representing HH Technologies, there are

1 standards for infiltration testing on doors.
2 They have been submitted to the DOE in the
3 past. Unfortunately, I can't recollect the
4 exact standard. But we will provide you with
5 that information. And I support the component
6 testing, as opposed to the envelope, just
7 because of the all the reasons that we talked
8 about.
9 MR. BROOKMAN: Yes, please.
10 MR. RASMUSSON: Loren Rasmusson. I
11 agree with what Daryl was saying earlier about
12 the component testing. For example on the two
13 walk-ins that you showed up there with the
14 smaller unit and then you go to the larger
15 one, many customers may want a door on the far
16 back end so they can enter from another point.
17 And in some cases, that other door may have a
18 ramp on it, which would change your
19 infiltration on that particular door, compared
20 to the one that you have shown there. And
21 another door might be a floorless, not
22 necessarily in this walk-in. So each door

1 would have a different infiltration rate.
2 MR. BROOKMAN: I think all of you
3 have made the point well about the complexity
4 of this. So then the question would be for
5 the department how they should address it.
6 And your best thinking on that will help them.
7 Because the complexity is what you are going
8 to have to live with. And the Department,
9 barring some act by Congress, is going to have
10 to do something about this.
11 MR. BROOKMAN: Charles Llenza.
12 MR. LLENZA: Charles Llenza,
13 Department of Energy.
14 So what we are hearing is that we
15 proposed an envelope testing method and of
16 course the refrigeration is separate, which is
17 more component oriented.
18 So the question now becomes we like
19 to hear sort of a round robin from everybody
20 here, are you telling the Department that you
21 are favoring more component testing at this
22 point and that we should abandon the envelope

testing methodology in terms of trying to set the testing procedures for this.

MR. BROOKMAN: Ellis, first.

MR. CRAIG: I have no problem with the basic model test. Obviously, we are adding components. It is really a hybrid we are talking about here because when you add glass doors, this basic model is just now multiplied up. You have added the load of the glass doors on. And obviously if you add another door to that big long walk-in, you would have to add that into the load. So that is kind of a component edition.

But once you get the basic model without all these options, with one door, one walk-in, with or without any pressure relief, that is a basic model. So that testing I have no problem with. And that makes sense to test one model.

Then if you have a door with a ramp, that is a different load that comes in. And then if you have glass doors, that is a

1 different load that comes in. If you have an
2 expansion valve, that is a different load. So
3 that is kind of a hybrid test. This process
4 is really a hybrid process. It is not just,
5 this unit, whether you put glass doors on or
6 not, it is the same number. It is not that.
7 The way I understand it, you have to add all
8 these extra loads in. Right? So if you are,
9 we are doing both right now, according to this
10 basic model test that you are doing.
11 MR. BROOKMAN: Brett did you want
12 in? Use the microphone.
13 MR. MITCHELL: Brett Mitchell with
14 Kason. The basic model test makes a lot of
15 sense to keep the testing cost down. But it
16 needs to have provisions at the component
17 level because for just future innovation.
18 If someone was to develop some new
19 widget, to put a panel together or a new
20 gasket, you wouldn't want have the burden of a
21 manufacturer having to retest the basic model
22 again because the intent of the change was to

1 improve energy efficiency.
2 MR. BROOKMAN: So if you had that
3 configuration, then the manufacturer could
4 pick and choose, based on his or her needs.
5 Right?
6 MR. MITCHELL: Right. As long as
7 the component manufacturer, that new component
8 is certified to exceed the performance of the
9 old component.
10 MR. BROOKMAN: Let's hear from
11 Fred.
12 MR. MINELLI: Fred Minelli. I just
13 want to reiterate that I back the component
14 testing because of the variables in our
15 industry, in the product, in the glass doors,
16 in the sliding doors, roll-up doors,
17 horizontal slide doors. There are so many
18 variables that testing a box is not a
19 solution. The solution is component testing.
20 MR. BROOKMAN: Yes, let's hear from
21 this gentleman, please.
22 MR. McGOWAN: Well this Ray McGowan

again from National Fenestration Rating Council.

All the comments I am hearing, it is so similar to a building. I serve on the ASHRAE 90.1 Envelope subcommittee. And one of my thoughts is, could you do both?

Component testing, I think you might find that onerous. I don't know but I know your opinion is that you prefer component. But performance testing might be simpler and allow more freedom of design as well. And I don't know, maybe a compromise could be both.

I know in ASHRAE 90.1 you have both. You can submit your components in your building per prescriptive methods and then you can also do building simulation, which allows greater freedom of design on the building. And a walk-in cooler is almost like a little building from what I am hearing.

So it is just a thought. If there could be two paths. I mean in 90.1 there are

1 two paths for a building. Could there be two
2 paths for a walk-in cooler? Just a thought.
3 MR. BROOKMAN: Thank you. Tim?
4 MR. DYE: Tim Dye. As a major
5 component provider, the glass doors, we are
6 kind of going back and forth with the word
7 door very generically. There is glass doors
8 and then there is entry doors and then there
9 is glass entry doors. And then there are all
10 kinds of other things, drive-in doors. We
11 don't want to go there.
12 But where he has been specifically
13 talking about doors are the drive-through
14 doors or the major traffic doors, where we
15 manufacture, 98 percent of what we do is we
16 manufacture display doors. And where a walk-
17 in panel manufacturer can go in and do their
18 testing, and I am not going to even try to
19 pretend to go there because they know their
20 business much better than I do, but as a
21 component supplier in a glass door business,
22 in their testing, if they have a net opening

where we go in and put frames and doors and shelving and things like that in, if they calculate in, there is going to be a filtration of air because of the frame going into the walk-in if it is not sealed properly. That needs to be done.

But as far as the independent component testing, as far as glass doors are concerned, I believe that that needs to be burdened back to the glass door manufacturer because we know glass doors. They know walk-in coolers and panels. And the refrigeration people know commercial refrigeration. That is what we do and we have been doing for a very long time.

When you start putting all of these things together, you are not talking about thousands of products, you are talking about millions, all the different configurations.

MR. BROOKMAN: We will let Ellis follow on, then I am coming to you. Yes, Rebecca?

1 MS. LEGETT: How would you provide
2 that rating? Would it be a label? Would you
3 just communicate it to the walk-in
4 manufacturer? Would it be in your catalogue?
5 How would that work?
6 MR. DYE: Well, yes. All of the
7 above. And the reason being is that it is not
8 just a simple glass door. You know, these
9 people in there that manufacture panels will
10 not, you know, our industry says well a panel
11 is a panel is a panel. Well it is not. Well
12 a glass door is in the same situation.
13 You have two-pane low-E gas filled
14 doors. You have three-pane, non-low-E. Then
15 you have two-pane heated. Then you have
16 three-pane heated. And then you have a one-
17 inch glass pack and a one and a quarter inch
18 glass pack. There is all different types of
19 configurations here. And then you have a
20 customer that, you know, a Wal-Mart comes to
21 you and says I want this. And guess what?
22 Most of the time you do it, as long as it is

1 within the ethical part of business. Okay?
2 But what I am getting at is those
3 energy labels or those energy ratings are
4 already there. We know what the U-values are
5 of the glass. There is calculations that we
6 use every day to test these.
7 Now you start talking about how a
8 door seals to the frame. What is the
9 tolerance of the gasket ceiling to the seal
10 plate? They can't, you know, there is no way
11 that they can understand how to do that
12 because they don't do it every day.
13 MR. BROOKMAN: Eric, go ahead.
14 MR. FITZ: This is Eric Fitz. Are
15 you suggesting that the Department of Energy,
16 if possible, redefine or interpret the
17 manufacturer to put the burden on the
18 component manufacturer, such as yourself, for
19 testing?
20 MR. DYE: No one ever wants burden
21 put on them. Okay? But by saying that, I
22 don't want the success of my product being

determined by a panel manufacturer. Okay? We have to govern ourselves from an energy standpoint. We take energy extremely serious. Very seriously. And all of our new products, if it is not energy-driven, we don't even look at it, period.

So yes, that burden should be back on the component supplier. There may be other component suppliers in here that totally disagree but glass doors are extremely complex. That is why there are only five of us that do it.

MR. BROOKMAN: Do you do some form of certification or whatever now?

MR. DYE: Yes. I mean, we have to meet the California code.

MR. BROOKMAN: Let's hear from this gentleman here.

MR. STOMPF: Bill Stompf, Bally Refrigerated Boxes.

I agree with my competitors here that the basic model testing certainly is not

1 applicable to our industry. We manufacture a
2 multitude of models, probably tens of
3 thousands of various models. And we like to
4 say that we are a panel producer. When you
5 put the panel components with the door
6 components with the system components, you
7 have various degrees of walk-in coolers and
8 freezers. They are not catalogue items. They
9 are not models. They are components of panels
10 that should be tested on a panel integrity.
11 And we all make different variations on the
12 insulation and that is how the component
13 testing, I feel, should be conducted.
14 The infiltration is a good test.
15 However, then we are again relying in the
16 ability of the installer. Our industry today,
17 it has become a very cost-competitive market
18 out there and we sell through a dealer who
19 sells to an end user. So we are at the tail-
20 end of the process and really don't control
21 the installation procedures.
22 MR. BROOKMAN: Yes. So if the

burden is on the component manufacturer to meet a certain level of performance, then how does the Department of Energy receive some assurance that when all these pieces are put together it is going to actually perform as a system as a whole?

Ellis.

MR. CRAIG: Presently, we have been doing this for years. We go to these guys and we say, hey we are going to put some doors on here and we are going to size this refrigeration system. What is the load? They tell us the load. We put it in the system and it tells us how much refrigeration system to put on it.

It is not something new. This is being done all the time. All of these are loads we have to take into consideration.

MR. BROOKMAN: When you are asking about that additional door and their load, are they telling you about the infiltration rate or anything like that?

1 MR. CRAIG: They are telling us the
2 BTU load of that door, which includes what
3 would be their infiltration load, which would
4 be radiation of heat through the glass,
5 whether it is triple pane, what kind of gas it
6 has got in it. They have done that testing.
7 I sure don't want to, as a manufacturer of
8 walk-ins, go out here and start testing glass
9 doors.
10 MR. BROOKMAN: Are you saying the
11 Department shouldn't have to worry about this?
12 MR. CRAIG: I am saying that they
13 are already giving us a number. Now if you
14 want to go and --
15 MR. BROOKMAN: No, we want to be
16 clear. Because the Department, if you think
17 that is the case, they want to hear that.
18 MR. GRIFE: Well you can talk about
19 the application. I mean, I know when we size,
20 we size on two openings per hour. Are you
21 sure they are opening two times an hour?
22 Maybe they are opening four. This is what we

size them based upon what is common knowledge of the industry and what its market says.

And the customer, through that consultive nature of selling, which we try to do, will tell us no, I need a greater load. I have had a customer call me and say my refrigeration is not getting cold. We end up discussing and find out he is putting hot soup in the walk-in. Well if you are putting hot soup in 50 gallon buckets, you have a problem there.

So we work on the basis of what we know, based upon what they tell us, and then we work to help make it efficient for them, based upon what their needs are.

MR. BROOKMAN: Yes, Jim?

MR. PERRY: Yes, Jim Perry. It has been suggested that there is thousands, millions of configurations. I would say there is an infinite number of configurations and situations that occur in our industry.

I would say that the gentleman that

proposed a hybrid test where we have an envelope test of a base model that everybody is required to make this exact same configuration have control of the installation of that to come up with a relative number for the envelope that you could compare one manufacturer of panels to the next manufacturer of panels and then let the component manufacturers do the testing of their components.

MR. BROOKMAN: Okay, let's hear from Jon.

MR. McHUGH: So this actually goes back to a comment I thought Aris had mentioned earlier which is that you would have someone who has a panel that is providing too much U-factor and therefore then you could use other components.

I think that in terms of DOE being assured that they actual have adequate performance, if you set these performance standards so that for instance someone's

panel, they all have to meet at least some minimum level of efficiency. So low U-factor and the same thing for all the manufacturers of windows.

And of course, they are going to be competing and having products that exceed the federal standards, because I am not assuming that we are going to pick the absolute highest performing of any of these components, so that it takes care of the issues of the millions of permutations of these components.

As long as each of those components are exceeding that minimum performance standard, then it is a relatively straight-forward process of compliance. These things in our catalogue are allowed to be used in walk-ins. These other things aren't because they don't perform as well.

So anyway, I think that is what other people are talking about when they say a hybrid performance model.

MR. BROOKMAN: And so you assume

that at the point of assembly that the purchaser of the walk-in has an incentive to get that done right and the general contractor that puts it together also is incented to get it done right. And so the Department then has some assurance with those components that you know will be performing.

MR. McHUGH: I will give you an example that occurs right now in the building trade. So for instance, in compliance with the National Electrical Code, an electrician pretty much has to put in UL certified equipment. And so the similar kinds of things can apply for walk-ins that all these things are DOE certified as being minimally compliant, all those things, you put them all together, you have got a complying walk-in.

MR. BROOKMAN: For the walk-in application. Tim and then back to Ellis.

MR. DYE: Tim Dye. Just a quick statement.

You asked a very specific question.

1 What assurances do the Department of Energy
2 have to where these things will be installed
3 properly.
4 MR. BROOKMAN: Yes.
5 MR. DYE: The manufacturer, the
6 only way that a manufacturer can give the
7 assurances for that is if they do the
8 installation themselves.
9 Now I am not talking about the
10 panel guy or the door guy or the shelving guy
11 or whoever it is. Okay? But you can have the
12 best parts of every, you know, take the best
13 panel, take the best glass door, take the best
14 walk-in entry door, or whatever you want to
15 do, and if it is not installed properly, it is
16 not energy efficient.
17 MR. BROOKMAN: Right. Ellis.
18 MR. CRAIG: I wanted to say the
19 exact same thing he is. If you are relying on
20 the contractor or the end user to be vested in
21 making sure it meets these requirements, that
22 will never happen. You have obviously come

1 out and said that they are now not
2 manufacturers. So they aren't even
3 accountable to the law. We are. They aren't.
4 They are not going to care. They are going to
5 buy the cheapest door they can get out here at
6 the lowest R-value they can. They are going
7 to buy the cheapest refrigeration system they
8 can and they are going to get the cheapest
9 walk-in they can and they are going to put,
10 not all of them, believe me there are good
11 people out there, too. But a lot of them will
12 do that.
13 I don't want to sound like
14 everybody here. But in this industry, you are
15 going to have that group that is not going to
16 care a think about anything we are doing here
17 today. And if you are relying on them to make
18 sure that your performance is being met, you
19 are just -- yes.
20 MR. BROOKMAN: Well that is on the
21 putting the pieces together part. But if all
22 the component parts meet some level of

1 performance, as Jon suggested and others, then
2 you have got a better shot at meeting the
3 Department's goal of energy efficiency.
4 MR. CRAIG: Except if the one part
5 is coming from me and another part is coming
6 from somebody else and another part is coming
7 from somebody else, the guy who is buying that
8 right now has no vested interest in it.
9 MR. BROOKMAN: He is just looking
10 for the lowest --
11 MR. CRAIG: Yes. He has no vested
12 interest to make sure of those things that I
13 would have to make sure.
14 Listen, if I buy doors down here, I
15 am going to buy doors that meet these
16 requirements for my walk-in because I am held
17 accountable. I have got to go out and replace
18 that walk-in if it is wrong. The guy who is
19 buying this isn't going to have to replace
20 anything. He is just going to get it and put
21 it in and if something is wrong, they are
22 going to say well you need to talk to that

manufacturer. They shouldn't be selling you that.

MR. BROOKMAN: Yes. So I want to make sure if anybody has got anything novel to say, something we haven't heard, now is the time to say it.

MR. FITZ: So I think this might address it. I have got a general question for a sort of hypothetical situation.

So if for example every supplier for the walk-in manufacturers, if those suppliers, these component manufacturers had some kind of third-party voluntary program that they participated in that actually rated their components, would manufacturers consider this a viable option to then take that rating from this third-party organization, take that value and use it for a calculation for the entire system to then rate the walk-in itself?

MR. BROOKMAN: I guess Ellis, you are first.

MR. CRAIG: Yes, we would love it.

However, you just added a lot of cost. The product just keeps adding costs and adding costs and adding costs. Because now he is going to charge me more because he has to have all this outside certified testing now and he is going to mark his product up and sell it to me. And I am going to mark it up. And it goes through about three people. You just added a lot of cost to the product.

MR. BROOKMAN: And some of the other appliance manufacturers, they test the model and they scale, they do something so that they diminish their testing burden.

MR. CRAIG: Right.

MR. BROOKMAN: So there ought to be some way to manage it so that there is some benefit, in addition to the energy savings.

MR. CRAIG: I agree. The only thing said is you do some of your testing inside. Right?

MR. DYE: We do 100 percent of our testing.

1 MR. CRAIG: Okay. You said third-
2 party, which is different than inside. You
3 know, now you are talking he has to go out and
4 spend thousands of dollars in testing.
5 MR. BROOKMAN: If he is doing it on
6 his own, then you have got some confidence in
7 your own internal testing. Right?
8 MR. DYE: Absolutely.
9 MR. BROOKMAN: Okay, Tim. Thank
10 you.
11 MR. DYE: And keep in mind, there
12 is third-party. It is what is known as UL,
13 NSF, EnergyStar. But there are products that
14 we have to manufacture that is going to
15 perform in a high humidity situations that
16 will never be EnergyStar.
17 MR. BROOKMAN: Okay.
18 MR. DYE: Never.
19 MR. BROOKMAN: Jon you -- Well, let
20 me hear from one more manufacturer and then I
21 am coming back to you, Jon. Please, Steve.
22 MR. COMBS: Okay, Steve Combs. The

1 third-party certification, that is something
2 that happens to just about every manufacturer
3 now has some sort or some form of third-party
4 certification, UL, NSF, PFS or any of those.
5 Our company manufactures two
6 product lines, one of them being a factory-
7 assembled, what we call a one-piece walk-in.
8 So the distinction that I am interested in
9 hearing there or if there is going to be a
10 distinction is will the level of compliance be
11 based on how much of that certification can be
12 done before that product goes into the field,
13 versus how much certification will have to be
14 done onsite when that product is assembled.
15 Now I have a vested interest in
16 both because we do both product lines.
17 MR. BROOKMAN: Got you. Okay, I
18 understand. Jon?
19 MR. McHUGH: So something to think
20 about in terms of enforcement is that if you
21 have a standard that places minimum
22 requirements on the components, that is a

standard that is enforced at the level of the manufacturer's catalogue.

In terms of people buying stuff, let's say a refrigeration product that actually doesn't have the DOE W or something in the catalogue and they use some non-complying component, the reasonable place to enforce that is actually probably at the level of 90.1. DOE is actively involved in 90.1 in the IECC.

Those building codes just like the UL requirement for the electrician, that actually gets enforced in terms of the building codes. But in terms of your appliance standard, setting the standard here in terms of those component efficiencies, that is the legal standard for what is sold.

And then in terms of what happens in the field, I think, is enforced at the building level.

MR. BROOKMAN: Okay. Eric, do you have an additional question or comment?

MR. FITZ: I think it has sufficiently been covered.

MR. BROOKMAN: All set?

MR. FITZ: I think we can probably move on. Yes.

MR. BROOKMAN: Anything novel? Because we are about to move on.

MR. RICHTER: Yes, I agree with the earlier comment. I don't think it is mandatory to have third-party testing. A lot of us have our own test labs and we can provide sufficient data.

What I would like to suggest is that the DOE provide a uniform calculation method, a consistent method that can take all of these components and provide the energy cost to the end user so that he can mix and match. Say, I want to have a really good door but not as good an R-value because it might be cheaper.

MR. BROOKMAN: Got you.

MR. FITZ: Okay. And I think that

needs to come from the government and it needs to be consistent so that none of us can manipulate it to our favor.

MR. BROOKMAN: Got you. We have heard from others at the table surrounding the potential for gaming and finding ways to diminish that.

Your name please?

MS. MAUER: Joanna Mauer. I just had a question about the market. And in terms of market shares, if anyone has a sense for what portion of the market is the case where contractors are ordering components from different manufacturers, as opposed to the case where all the components of an envelope are shipped by one manufacturer. If anyone has a sense for that.

MR. BROOKMAN: There are many different segments in this market. Yes? Ellis, can you speculate on that?

MR. CRAIG: Ellis Craig. In a community store business, it is not unusual to

1 sell the walk-in and they buy the glass doors
2 direct by a contractor -- buy the glass doors
3 direct, and then the refrigeration from
4 another person.
5 So percentage wise, you can see in
6 some markets 60 to 70 percent of it -- no 40
7 percent of it, probably higher than that,
8 probably 50 percent of it, we don't supply all
9 the parts.
10 MR. BROOKMAN: Daryl?
11 MR. ERBS: Yes, Daryl Erbs. I
12 guess I would agree. From our, I guess,
13 experience, it depends on both the end-use
14 segments. So retail has a very different
15 model from food service.
16 And then within food service, it
17 becomes customer dependent. Some customers
18 will do, they call it buy-outs but they will
19 basically say I just want the shell. I just
20 want the panels from you. Other customers
21 want an entire finished kit that gets
22 installed. But I would say that it is

1 probably more than half the time, you know,
2 from our perspective that it is just part of
3 the box that we supply.
4 MR. BROOKMAN: I want to return to
5 Claire. Close out this segment.
6 MS. GAGNE: Thank you everyone for
7 your comments. We appreciate the rich
8 discussion of this issue. It is clearly an
9 important item of concern and consideration
10 for the Department of Energy.
11 I would like to reiterate that the
12 comment period is open for an additional seven
13 days following this meeting. So please, if
14 you feel that your comments have not been
15 sufficiently covered in the oral portion of
16 today, that you are welcome to submit written
17 comments that the Department will take under
18 consideration, as it does with everything else
19 that has been covered today and has been
20 submitted prior to today.
21 MR. BROOKMAN: Let's take a break
22 right now. Before anybody moves, especially

1 those of you who are not familiar with the
2 building, there are restrooms on both ends of
3 this hall and they stack all the way up and
4 down, if you need to find another one.
5 You have got to wear your badge
6 inside the building. If you don't someone
7 will escort you around.
8 There is a coffee shop on the
9 ground floor just about straight on down. So
10 take the elevator down. But you have got to
11 go quickly. We are going to break for 15
12 minutes and probably we won't break for lunch
13 until say 12:30 or so. So if you need a
14 banana, get yourself some sustenance.
15 We will resume, it is now 11:23, we
16 will resume at 11:40 right here in this room.
17 Thanks for a good start on the day.
18 We made good progress this morning. 11:40 we
19 will resume.
20 (Whereupon, the foregoing proceeding went off
21 the record at 11:24 a.m. and went
22 back on the record at 11:40 a.m.)

1 MR. BROOKMAN: Okay, let's resume.
2 Please take your seats. Okay, let's start
3 back up.
4 We are going to resume where we
5 left off with the slides, which I believe is
6 35 and Rebecca is back at the podium.
7 MS. LEGETT: Yes. Following my
8 colleague Claire's discussion --
9 MR. BROOKMAN: Oh, I need to make
10 an announcement.
11 MS. LEGETT: Okay.
12 MR. BROOKMAN: The Department likes
13 to collect business cards so that it can make
14 a copy of them and distribute the attendee
15 list to everybody that is participating here
16 today.
17 Apparently two or three individuals
18 did not have a business card and did not hand
19 them off when you registered. If you can see
20 Brenda if you didn't have one, so she can at
21 least get your contact information and if you
22 would do that either now or as we go to lunch

so that information will be complete.

Okay, now Rebecca.

MS. LEGETT: Thanks Doug. I am now going to discuss the basic model concept as it applies to refrigeration systems. And we have realized that there are some of the same issues with refrigeration systems as there are with envelopes. So I am going to briefly discuss our proposed approach and then ask for comment. So bear with me for the next few slides.

We are considering applying the basic model concept to refrigeration systems as well. They may be customizable. There may be different design characteristics within a set of refrigeration systems that could change the energy consumption either by a lot or by a very little or not at all.

So the purpose of using a basic model would be to reduce the testing burden on manufacturers, similar to envelope, allow them to group similar models of refrigeration

1 systems into a basic model.
2 There is one key difference between
3 the approach for refrigeration and the
4 approach for envelope. In this context, we
5 are not accounting for a calculation
6 methodology as there was for envelope.
7 So in this context, basic model
8 means that for all the units that a
9 manufacturer determined fell into one basic
10 model, the manufacturer would test at least
11 one unit in the basic model, get a rating for
12 energy consumption, and then apply that rating
13 to other units in the basic model.
14 And as I said, we will seek comment
15 on this proposal in just a few minutes.
16 There was one approach that we
17 described in the NOPR that we are considering.
18 We are also considering another approach and
19 here are the options that we are considering.
20 And I want to note, these options are options
21 for DOE. It is not that we are going to have
22 these three option and manufacturers get to

pick one. I want to clarify that for the final rule, we would have one of these or a different one, if we have one based on the discussion and then that would be the one that would be uniform across manufacturers.

DOE is really trying to strike a balance between not imposing an undue burden on manfacturers and also ensuring an accurate rating. The first option you see here is the basic model approach proposed in the NOPR. Units in one basic model may differ slightly in energy consumption but not significantly. One complication is that it may be difficult to determine what constitutes a significant difference.

So you have a refrigeration system and you have the same refrigeration system but it has a different valve. Does that cause a significant difference in energy consumption? That is what we are trying to find out.

To address this ambiguity, there is a second option that DOE may take. And that

is to group several models into a basic model. Units in the basic model must not differ in energy consumption but they could have cosmetic changes that do not affect energy consumption.

The final option is the default option. In the absence of a provision for basic model for refrigeration, manufacturers would have to test one of every model of refrigeration system. And then the next three slides are details on these three options but I am going to go through them very quickly, reiterating what I said before about those three options.

This is option one and here is the original definition in the published NOPR. Here is option two, a revised definition where refrigeration systems in a basic model could not have any design changes that affect energy consumption. And here is option three, which is the absence of a basic model provision.

And here are our comments. We

1 realize that given the previous discussion on
2 envelopes that some of you may think that the
3 same approach that we took for envelope,
4 considering the individual components could be
5 applied to refrigeration system basic model
6 and we will take comments on that as well.
7 MR. BROOKMAN: Yes, Harmon?
8 MR. LEWIS: Within the walk-in
9 industry, a lot of us, or most of us do sell
10 refrigeration. We sell it with like 74
11 percent of the cold rooms that we sell. With
12 those, we are going to buy a condensing unit
13 that is rated at a certain capacity of BTUs,
14 it has a certain energy draw per hour of
15 operation. We make that in with the
16 evaporator coil, mounted inside the walk-in
17 that is rated at a certain rating. It has a
18 certain draw. And you know what the energy
19 consumption will be on that and you have to
20 size it an 18 hour a day run time and freezers
21 with electric defrosters. We do it at 16
22 hours in coolers because of the air defrost.

So the science is sitting there for what that will draw. But we sell over 200 condensing units, each one with seven different evaporators that can go with it. So you can't test every one of these and be in business.

But again, I think you go back to the component tree. Copeland and Tecumseh, Bohn, Heatcraft, and Russell, all the other major manufacturers rate their own systems. And we have been doing that for the 30 years that I have been around. And people have got to be reputable or they don't stay in business. So, the math is already there to tell us what it is on ever system.

MR. BROOKMAN: Daryl.

MR. ERBS: Daryl Erbs. And just to, I guess, continue on that point. My interpretation of basic model on refrigeration is a unit cooler can be considered a basic model. It is not the combination of the unit cooler and the condensing unit, that each one

of them could be considered a basic model. And so it is not necessary to test all of the mix-matched combinations between unit coolers and condensing units but in fact just within those basic models for those individual parts to the system, which I think help simplify.

And then the other comment is the definition which says any change that would have any effect on performance, I would say it is impractical. In fact, you know, we can build two identical refrigeration units using exactly the same components and they won't have exactly the same performance because there are tolerances in the individual parts that go into them. DOE recognizes this already in other performance standards. And that there is a tolerance allowed to the manufacturer.

MS. LEGETT: Can you specify what the tolerance is?

MR. ERBS: It is typically five percent. And so that allows for those

1 manufacturing tolerance variations that would
2 affect the performance of any basic model,
3 even if the components don't change. If a
4 manufacturer were to put different options
5 into a basic model that are small enough that
6 they don't drive the performance outside of
7 that normal statistical distribution of
8 performance, then we don't feel that we should
9 have to test it just because it has got a
10 filter dryer in or it has a different type of
11 service valve or some other component that
12 materially doesn't affect performance.
13 MS. LEGETT: Thank you. Would
14 anyone else like to either back up or disagree
15 with the five percent tolerance or propose a
16 different one?
17 MR. BROOKMAN: Ellis?
18 MR. CRAIG: Well, I like his idea
19 that you know, I am sure it won't cover 100
20 percent and I am sure that it won't be exact.
21 But the more exact we get on this, the more
22 money gets involved.

1 If we do what Harmon said, we don't
2 have to do testing because the testing is all
3 done. They don't, Russell, Bohn don't have to
4 go in and do all their testing because their
5 testing is done. So we can take those things,
6 we can run it through a little formula
7 calculator that says we are designing this
8 system. We pulled this coil, we pulled this
9 evaporator, we put this expansion valve with
10 it. Right? It is not going to be as exact as
11 if we put the unit altogether and spend $5,000
12 testing it but it will be a lot better than us
13 putting 70 percent of the small businesses out
14 of business here, at least out of the
15 refrigeration business that we are going to do
16 if we start testing every model or even test
17 basic models at $5,000 a whack.
18 MR. BROOKMAN: Okay, thank you.
19 Ira?
20 MR. RICHTER: Yes, I will comment
21 on the five percent. That is pretty typical.
22 MR. BROOKMAN: Microphone.

MR. RICHTER: I'm sorry. I think the five percent is pretty typical in America. I think Europe is a little higher. I think it is eight percent in Europe.

From our standpoint, I like the idea of the basic model. The idea that every time we add a filter or a dryer, we have to retest is just unrealistic. And even if we did, the ratings would be so complicated because you would have so many permutations that the end user couldn't understand it.

I think what would be beneficial would be perhaps like a two-tier system where the DOE would define what a basic model is so that we are not comparing apples to oranges. An example would be a condensing unit, something like a suction filter will have a very minimal effect on capacity. But I think it is important that everybody has that in their basic unit, so the end user can have a valid comparison.

And then on top of that, you give

us the ability to promote those things that are unique to our company that help energy. So if we want to have the basic unit and then a premium unit, we can have a rating for both.

MS. LEGETT: Thank you. So I am hearing a refrigeration system, a basic model should have certain components that are common to all manufacturers who are doing this test?

MR. RICHTER: Well, I think to make a valid comparison from an end user, yes, you need to have some sort of consistency.

MS. LEGETT: Okay and perhaps maybe not list all those out right now. But if you could provide either a list or some diagram or some indication of what you believe those common components should be, that would be very helpful.

MR. BROOKMAN: And you would expect that there would be those common elements typically and that would be the basis upon which there would be the testing.

Yes, Charles Llenza.

1 MR. LLENZA: This is Charles
2 Llenza, Department of Energy.
3 In terms of the field testing, we
4 are talking basically is there more than just
5 an infiltration test? Is that pretty much it?
6 MR. CRAIG: You're talking -- you
7 are going back. Right?
8 MR. LLENZA: Yes, I am going back.
9 It is assembled. Say you are doing --
10 MR. CRAIG: The only one test that
11 we have in here that we have to do is we have
12 the infiltration test.
13 MR. LLENZA: Right.
14 MR. CRAIG: Other than that, it is
15 the R-value of the insulation right now.
16 MR. LLENZA: So but what I am just
17 saying, if we went to this component level
18 certification site and we go and say okay,
19 what we really think is if this is assembled
20 correctly, you could come up with an
21 infiltration test that then basically
22 certifies it. It is assembled, based on what

1 infiltration numbers you get or whatever.
2 Would that be sufficient to maybe certify it
3 on the field that it is put together right?
4 Is that basically the basic issue?
5 I mean, if you have all these
6 efficient components, is the infiltration test
7 sort of critical at that point?
8 MR. CRAIG: Well, on a
9 refrigeration system, it is not involved with
10 infiltration. It is a completely different
11 closed system. I mean, it is closed. It is
12 not going to have any of that load on it.
13 What its load is going to be is its efficiency
14 of taking the heat and taking it out of the
15 walk-in.
16 And what we are saying is, that
17 coil comes on and says it will operate at this
18 BTU. The condensing comes on and says it will
19 operate at this BTU, meaning how much BTU and
20 at what efficiency. And operating at that, I
21 think the design in Heatcraft may be able to
22 help me on that. But I think they are talking

about they run it at about 90 percent efficiency or something like that. Isn't that what you guys are coming up with?

MR. LLENZA: I'm sorry?

MR. CRAIG: Ninety percent efficiency. If you are running a compressor -- In other words, if you run at 100 percent, you can get 100 percent of the BUT per watt. Nothing is running at 100 percent but they know how much percentage off that is.

So pretty much if you have a BTU rating out there, they can give you a pretty close estimate at how much power it is using because they know the efficiency it runs at. We could use those numbers and tell you pretty close how much BTU we are going to get per watt out of that refrigeration system that we put together, which simplifies all this testing thing. It has already been tested once. We are going to turn around, put it all together and test it again.

MR. BROOKMAN: Harvey Sachs.

MR. SACHS: Harvey Sachs. Thank you. I want to comment on two areas on the refrigeration side now. The first would be to thank AHRI for the hard work in developing the 1250, which is a tremendous start toward addressing some of these issues. But at the same time, it is a start in that it addresses load, rather than energy. We do not yet have part load parameters and we would expect much of this equipment to be operating under part load most of its duty cycle, particularly for units that are not doing a whole lot of pull down.

The second point I want to make is quite independent from that is we would be supportive of the base model approach but we think the base model has to be defined and because I am not a specialist in the area, I have got to use the metaphors that work for me.

Base model ought to include those components which have a reasonable probability

that it will be fitted and could impact the energy used by, for example, increasing suction pressure. These would be things like filter dryers that impose a pressure drop, service valve changes using the most restrictive service valves, in terms of they are cutting the flow as we build that basic model, so the manufacturers have some incentive -- Well, I'm not sure that is the right way.

We need to do it so there is an incentive to include the proper equipment and to drive toward greater efficiency. And I am not sure how to balance that but Karim will instruct me.

MR. BROOKMAN: Karim.

MR. AMRANE: Karim Amrane, AHRI. I think DOE has already definitions for basic model groups for other products. Residential central air, for example, is a product for which there is a different issue. And it is a broad definition which has been fine. It has

worked very well. So I am not sure. I think the original definition that you had is probably appropriate for basic model groups. It is broad enough and we don't want to be specific as to what should be in the basic model groups, as far as design requirements.

So I would urge DOE not to go too much to details in defining its basic model groups.

MR. BROOKMAN: Thank you. Daryl.

MR. ERBS: Yes, I just wanted to comment. Harry or Harvey indicated that 1250 doesn't consider part load. In fact it does. It will deal with compressor unloading. It will deal with fan speed changes. It will deal with everything that I think is currently identified as potential technology done at a basic level.

So I think we have covered pretty thoroughly the question of part load and how that affects efficiency.

MR. BROOKMAN: Thank you. Jon.

MR. McHUGH: I would actually like to congratulate AHRI on 1250. And what is interesting is, you know, I have heard a couple of times that we have these fantastic models and great ratings. You know, it is just a little bit of math and we really understand things well.

Prior to the development of 1250, we actually had a fairly large error associated with the rating of compressors and condensers with the assumption of a 65 return gas temperature. And as a manufacturer, you probably realize that that is pretty far off from the return gas temperature. That can lead to capacity overestimates of 30 percent.

So you know, the current state of the art is not state of the art. We are getting there. So you know, in general, because there is life safety, you know, at risk, the system are oversized, which is appropriate. You know, to make sure that we don't damage product and risk health.

1 If you look at the issue of the 16
2 hour runtime when you actually monitor many of
3 these systems, the run time is actually around
4 40 percent. So, you know, which is reasonable
5 that it would oversized. And of course the
6 issues about part load are important. And I
7 commend the committee for trying to address
8 the issues with part load.
9 I am concerned about the concept of
10 having a rating that is not verified, that is
11 not third-party. I think it creates a great
12 incentive for innovation, that we have real
13 numbers that are verified. There are what we
14 call commercialized ratings now. And actually
15 kind of luckily because of the errors
16 associated with the 65 degree return gas
17 temperature, the coil ratings are likely also
18 commercialized and probably close, you know,
19 that there are some offsetting errors.
20 So it wouldn't be a good idea to
21 fix one side and not the other. And I think
22 the third party ratings are very important.

1 MR. BROOKMAN: Thank you. Ellis.
2 MR. CRAIG: I don't agree. I mean,
3 I agree with you 100 percent. And that new
4 test program, and I was on the committee
5 partially, you know, but the concern that I
6 have is I think we ought to take the results
7 of what you found out and apply it to improve
8 the exist system that we are doing without
9 amplifying all the cost and testing that is
10 going to add to our product line.
11 What it is going to do, it is going
12 to put anybody that is a small manufacturer
13 out of business on the refrigeration side of
14 it. You will then have to order his
15 refrigeration from somebody else who is large
16 enough to pay this added expense.
17 I would like to see it so that we
18 could take your improvements or your things
19 you found out and apply them to our existing
20 systems and make it simple to come up with
21 fairly close recommendations or fairly close
22 accurate, within plus or minus five percent or

1 whatever it is, that represents real life.
2 Obviously, the walk-in has to
3 represent real life when we do these
4 calculations over here. We should do the same
5 thing with refrigeration. But the test that
6 we have developed is costly for us to send it
7 out as a third-party to do. It is basically
8 when you consider all of the variables that
9 our customers are asking for and now we are
10 going to have to tell them no we can't do that
11 because I can't afford to swing $5,000 to test
12 that product. Whereas, with this basic system
13 improved on the things you found out, we can
14 calculate it. I am saying yes, we can do that
15 but here is how much it is going to cost. If
16 we do that it won't meet EISA or we can push
17 toward that.
18 And as I understand it, the more
19 efficient the refrigeration system is, the
20 less efficient the walk-in has to be to meet
21 the standards that you are going to require
22 somewhere down the line. It does. It may

take the maximum but today you have said that you are probably not going to pick the maximum standards all the way around. You are going to pick a standard. You are going to pick a standard that has some flexibility.

Obviously, I may want to go to a better walk-in R-value and you can balance the system out and you can pick and choose how to provide the best acceptable walk-in to that customer for the dollar he is going to be spending. Because he doesn't, honestly I am going to be honest with you, unless you are a chain, he doesn't care about these things. He just cares how much he is paying. That is what he is worried about. How much does it cost me to buy this walk-in?

MR. BROOKMAN: Charles Llenza.

MR. LLENZA: Charles Llenza, Department of Energy. Just a preview on the standards and how we set those.

What we will come out is with a max, what we call a max tech standard, which

is all the bells and whistles, no matter what the cost is. Then we start looking on ways to scale it down until we find a point where it is technologically feasible and economically justified. So basically, we don't pick the max tech but we usually scale it down to, and we will stop at a point where we weigh in the factors of the small businesses and the cost of the industry, etcetera, etcetera.

MR. BROOKMAN: As you are considering different product classes.

MR. LLENZA: Right, as we break it down into different classes.

MR. BROOKMAN: Okay. You are next.

MS. MAUER: Joanna Mauer. Just two quick questions about the refrigeration systems.

The first, is it generally true that refrigeration systems are sold as a complete system or is it often the case that contractors are purchasing, for example, the condenser and evaporator units separately?

1 And in that latter, case, who would be the
2 responsible party for testing and
3 certification?
4 MR. BROOKMAN: Ellis.
5 MR. CRAIG: That is a great point
6 because that is a question I have.
7 Right now, we sell packages, I
8 guess you could say, that include a condensing
9 unit, a compressor, an expansion valve, a
10 timer, whatever, and we send that out. My
11 understanding is that business is going to
12 stop immediately, unless we put that all
13 together and test it under the regs you have
14 got right here right now and verify that it is
15 going to perform to a certain thing and then
16 we can sell it.
17 The problem is --
18 MR. BROOKMAN: You have to ship it
19 as a complete unit.
20 MR. CRAIG: Well, we would ship it
21 in boxes. We wouldn't have to assemble it,
22 from what I understand but we would have to

1 ship it in a way that if they assemble it
2 under the correct procedure by a licensed
3 refrigeration person, that it would perform
4 the way when I assembled it in my plant, that
5 is kind of like the walk-in. You know, we are
6 saying the walk-in performs this way. The guy
7 in the field has to put it together and it has
8 to perform the same way.
9 But refrigeration guys out in the
10 field will not buy the product from me if I
11 add that extra cost on. They will just go
12 down to the wholesaler and buy the system in
13 parts, put it together themselves and sell it.
14 And no one is going to buy refrigeration from
15 us because if they can go down, refrigeration
16 contractors especially will go down and buy it
17 from a wholesaler. And the wholesaler is not
18 required to test this unit assembled. He is
19 selling parts.
20 So, it puts us at a tremendous
21 economic disadvantage here that we have
22 regulations affecting us that our competitors

technically don't. And your end result is going to be you are going to have product out in a field that doesn't meet EISA requirements.

MR. BROOKMAN: Jon.

MR. McHUGH: So I think the proposed, well one of the things I have been proposing here is that you wouldn't actually have to put each of those pieces together, that you get each of those pieces to be tested so each individual component complies. Then you wouldn't have the added expense of every permutation of condenser coil and compressor. You would test those separately and each part of those passed and then the overall system would pass.

Does that satisfy your concern about cost?

MR. CRAIG: That satisfies my concern about us not having to test every system. That is wonderful. That is the way I would like to see it go. And I am sure most

manufacturers and your walk-in guys would agree with that.

The problem I have is the only way that would work is if the wholesalers are brought into this so that when they sell their systems, they have to have the same information and requirements as I do. Otherwise, this system is not going to work.

It is happening right now. We are selling walk-ins that they are going down to the wholesaler and buying non-EISA compliant fan motors on equipment and they are bringing them in and putting them in all day long because they are $300 cheaper.

MR. McHUGH: Right. So ideally, where the situation would be is that the distributor would be selling. You know, they would have their catalogue and it would say EISA compliant or whatever. You know, walk-in compliant compressors. And then at that point, the contractor, by purchasing something that is not labeled as EISA compliant is

1 breaking the law.
2 MR. CRAIG: Except that under the
3 definition we have as a manufacturer right
4 now, he is not included. So he has no
5 requirements.
6 MR. BROOKMAN: Charles Llenza.
7 MR. LLENZA: Yes, my understand is
8 if, and maybe just even correct me here, is
9 that if I am selling a component like a motor
10 for a new walk-in cooler as of January 1, 2010
11 here, they are not supposed to be selling
12 anything other than what is prescribed.
13 MR. CRAIG: That is true. But in
14 reality you are worrying about is this really
15 going to happen out here in the field. It is
16 not happening out in the field.
17 MR. LLENZA: Well if we find out, I
18 mean, what we will end up doing is we will
19 investigate and we will send somebody.
20 I mean we have a very active
21 enforcement group here now and they are just
22 waiting to hear from --

1 MR. CRAIG: Who do they want to
2 hear from?
3 MR. LLENZA: Because the prescribed
4 requirements are part of what now has become
5 mandated. So --
6 MR. LEWIS: The wholesaler
7 distribution chain is so diverse and spread
8 that they won't get caught?
9 MR. CRAIG: You do realize that the
10 wholesaler is going to say ‘‘he didn't tell me
11 this was going on a new walk-in.’’ The
12 refrigeration guy is going to say ‘‘I didn't
13 know it had to go on a new walk-in.’’ Or he is
14 going to say I told him it was going on a new
15 walk-in. And no one is going to know that
16 unless we report him because the end user is
17 not going to report him because he wants to
18 buy a $300 cheaper refrigeration system.
19 So I know it sounds good on paper
20 but in reality, this will never work.
21 MR. BROOKMAN: Steve.
22 MR. COMBS: One of the things, one

of the issues that is inherent to this overall issue is the fact that geographic differences from one side of the country to the other. If within this standard, if the standard is set, not only does this standard have to include the definition of a basic model system, but it also needs to include a standard set of parameters against which these basic models will be tested.

So, if we say they have got to be tested like most condensing unit manufacturers 95 degrees ambient and whatever the suction temperature is, whether it be a cooler or a freezer, what is to say that these components, individually, will all be certified, meet the requirements. But yet when I send one out to southern Texas or southern California, and it is at 120 degree ambient, now I have gone into an application where this system may or may not be compliant anymore as far as the overall energy consumption at the end of the day on this entire assembled unit.

1 MR. GRIFE: There is also how many
2 times you send it out there where you don't
3 know where it is going.
4 MR. BROOKMAN: Yes, David. Thank
5 you. Keep going.
6 MR. GRIFE: I said to a dealer in
7 New York, many of us who quote dealers at the
8 very beginning do not even know who the end
9 user is. The dealer wants to make sure you do
10 not know, for whatever reason. We have been
11 fighting hard on our back end under warranty
12 saying we need to know the end user because if
13 an issue comes up, we don't know who the end
14 user is. So when they call and they say open
15 the door and let me know the serial number and
16 I will see if I sold it to somebody that was
17 my dealer. So somebody could buy in New York
18 and it ends up in Texas; buys it in Texas,
19 ends up in Alaska. Especially now because
20 dealers are selling all over and now we even
21 talked about the internet, what is happening
22 with that.

1 So it is just making it harder and
2 harder and more cumbersome.
3 MR. BROOKMAN: Steve.
4 MR. COMBS: So again, this just
5 reiterates the nonlinearity of this basic
6 model concept.
7 I mean there is nothing wrong with
8 the basic model testing concept but the
9 application of it and the provisions for
10 scaling it need to be in there. They need to
11 be specific and they need to be practical.
12 MR. BROOKMAN: And if they are
13 specific, is it possible, given the
14 variability?
15 MR. COMBS: That is the burning
16 question.
17 MR. BROOKMAN: Karim.
18 MR. AMRANE: Karim Amrane, AHRI. I
19 guess this issue of temperature location is
20 true for any other product regulated by DOE.
21 I mean, what you do, you test it at standard
22 rating condition. That is all you can do.

1 I mean it is true for anything
2 else.
3 MR. BROOKMAN: Okay, thanks Karim.
4 Okay.
5 MR. BROOKMAN: Yes, Harmon?
6 MR. LEWIS: Real quick on there.
7 ASHRAE also has numbers where you can factor
8 down performance of the condensing unit based
9 on the ambient and it will have a great
10 effect.
11 Again, hopefully this modeling is
12 that the condensing unit manufacturer like a
13 Copeland or Tecumseh, or if it is Heatcraft,
14 Bohn, or Russell, that is making the whole
15 condensing unit, they need to be the certifier
16 of their capacities, not International Cold
17 Storage or American Panel and Arctic and Craig
18 and everybody else. Because they are going to
19 sell it to all of us. It is all going to work
20 the same way because it has its same capacity.
21 The same way with all the evaporator coils.
22 That manufacturer needs to do the testing and

1 certification because when he sells it to us,
2 it is going to work the same in every walk-in
3 at its capacity.
4 MS. LEGETT: Doug, I want to follow
5 up with that and -- sorry. Rebecca.
6 I want to follow up with that and
7 ask if there are component manufacturers in
8 the room, either the manufacturers themselves
9 or representatives of those manufacturers who
10 would like to comment on that and either
11 support or not.
12 MR. BROOKMAN: Karim?
13 MR. AMRANE: Support what?
14 MS. LEGETT: Support what Harmon
15 just said, that the component manufacturers
16 should be responsible for this testing and
17 rating and not the manufacturers of the walk-
18 ins.
19 MR. AMRANE: I agree. I think it
20 makes sense for the manufacturers to be in
21 control.
22 MR. BROOKMAN: Thanks Karim.

1 MS. LEGETT: Thank you.
2 MR. BROOKMAN: Aris.
3 MR. MARANTAN: Just to clarify on
4 that exact point, I think what I am hearing is
5 that the manufacturers of components of
6 refrigerations would be responsible for rating
7 their equipment. Is that what you are
8 agreeing to? The components themselves,
9 piece-wise, meaning the unit coolers, the
10 condensing units separately.
11 MR. BROOKMAN: I wouldn't
12 characterize this as agreement yet but we are
13 getting comment. Karim, is that what you
14 meant?
15 MR. AMRANE: Again, I mean if you
16 look at the standard 1250, we are rating a
17 combination of indoor and outdoor units. So
18 again, to the extent that we have extended it,
19 we will rate the combination. And we could do
20 it like we were doing it for residential
21 central air, where you have the OEMs that make
22 both and they are responsible for the combined

rating and you have the third-parties that make just the indoor unit and they rate with a condensing unit and they are responsible for that rating as well.

So again, it depends on who is selling what. But it should be the responsibility of, I think the combined. I think the combined rating, that is what DOE is interested in, is the condensing unit coupled with the indoor coil that has to be somehow regulated.

MR. MARANTAN: Is there any plans to have some kind of directory similar to residential central air conditioning?

MR. AMRANE: We are in the process here. Again, we started with the standard. Again, it is going to depend on the manufacturers and what they want to do in the future. But that is a possibility. I am not saying that is going to happen.

MR. BROOKMAN: Daryl.

MR. ERBS: Yes, Daryl Erbs. Just,

1 I mean I think we are getting a little bit
2 ahead in that we are now starting to talk
3 about the performance standard and the
4 enforcement regulations. What we have created
5 so far is a way to test that allows the
6 individual unit cooler and condensing unit to
7 be tested individually and the performance of
8 any match of those two parts to be calculated
9 fairly easily.
10 And then it is a question of how do
11 you need to get to the point of before someone
12 sells a unit cooler with a condensing unit,
13 some way of knowing whether it conforms to
14 some minimum efficiency level. And I think
15 that goes into the performance rulemaking,
16 which if I heard earlier today has to be done
17 by 2012.
18 We have a way of testing that will
19 support any combination of directories or who
20 is responsible. I don't know that that needs
21 to be defined to agree on how we test.
22 MR. BROOKMAN: Harvey Sachs.

1 MR. SACHS: Harvey Sachs. Like
2 Daryl, I am a little concerned that we may get
3 ahead of ourselves. In particular, I am not
4 hearing a consensus on the term component
5 because I am hearing that as meaning
6 condensing unit and unit cooler from some of
7 the AHRI members. I am hearing Mr. McHugh
8 refer to this as the level of an expansion
9 valve and a compressor.
10 And I am not trying to say one is
11 right and one is wrong but I think when we get
12 into thinking about a performance measure at
13 the end of the day, it is pretty important to
14 understand what we mean by component because
15 that will determine what we mean by
16 performance measure for the refrigeration
17 side.
18 MR. BROOKMAN: Ellis.
19 MR. CRAIG: My concern, and we are
20 hearing, and I am a little confused and maybe
21 other people are too, but I came into this
22 meeting with the assumption that under these

new regulations we put a whole system together and we tested it. It had to meet a certain standard somewhere down the road that is going to be established.

We are expressing the fact that we don't, as walk-in manufacturers, don't want to go out and build a whole bunch of units and test them because it is quite expensive. You are talking about $250,000 for us when we, at least I would like to do is like you said, be able to have the suppliers of products to us tell us their performance characteristics, have a module that I put those characteristics in and it tells me the performance of the system. Now I don't have an expense.

MR. BROOKMAN: You would like to do a calculation.

MR. CRAIG: Yes, I calculate that thing.

MR. BROOKMAN: Yes.

MR. CRAIG: And now I can have, I can run ten different coils. I can run all

1 these different options without having to --
2 You know, my customers now out there can say
3 oh, I would like to have this. Okay, I need a
4 low profile coil or a low velocity coil
5 because it is going to a floral application.
6 Now I have to spend another $5,000 to make a
7 system, under the way this is proposing.
8 I would rather just go over, get it
9 from Heatcraft, plug it into my formula, it
10 pops out and says this is the efficiency level
11 and is that acceptable or not.
12 MR. BROOKMAN: Okay.
13 Clarification?
14 MR. CRAIG: I am hearing two
15 different things but I don't like this system.
16 I like that system.
17 MR. BROOKMAN: Yes, so I think we
18 have heard that comment now several times.
19 That is good.
20 Harvey do you want to follow on?
21 MR. SACHS: This is Harvey Sachs
22 again. Just a clarification, Ellis. I am

still not quite sure. Am I hearing you say you would like to have Heatcraft or Emerson or the other refrigeration suppliers tell you that this is a specification for a system that complies with the refrigeration requirements of EISA?

MR. CRAIG: No.

MR. SACHS: No. Okay, that is not. So they would take the responsibility for a low velocity coil versus a high velocity coil and things like that. That is not what you want.

MR. CRAIG: What I am saying is, the way I understood your question was you were saying do I want Heatcraft to take responsibility for the whole system.

MR. SACHS: No, sir. That is not what I said.

MR. CRAIG: Okay, I misunderstood you.

MR. SACHS: Harvey Sachs. What I am asking is it seems to me that the DOE's

1 proposal on the table is to ask Craig
2 Industries to be responsible for the
3 performance of the envelope walk-in --
4 MR. CRAIG: Right.
5 MR. SACHS: -- and to ask Heatcraft
6 to be responsible for the performance of the
7 refrigeration system. You tell them what you
8 want in terms of the parameters and it is
9 their responsibility.
10 MR. CRAIG: The problem with that
11 right now, we may buy a condensing unit from
12 Heatcraft and we might buy a coil from
13 Russell. Okay? We don't have to buy all of
14 our product from the same manufacturer.
15 MR. SACHS: Harvey Sachs. Now in
16 the analogous case that Karim has pointed out
17 of the residential air conditioner, that coil
18 manufacturer, Russell in this case, would have
19 the responsibility of certifying that when
20 combined with Heatcraft's condensing unit, it
21 does comply.
22 MR. CRAIG: That is not what we are

1 asking. We are asking them to give us the
2 performance parameters of that coil.
3 Heatcraft gives us the performance
4 characteristics of the condensing unit. And
5 we with a module that we plug these numbers
6 into, come up with the efficiency rating of
7 that combination.
8 We take the responsibility that it
9 either meets or doesn't, according to the
10 information that they are giving us. That is
11 what I am saying.
12 MR. SACHS: I think I understand
13 now. So you are basically -- again Harvey
14 Sachs -- asking to become responsibility as
15 the integrators and that includes a basic
16 refrigeration engineering responsibility.
17 MR. CRAIG: Well, assuming that
18 this module that we plug all this into is
19 approved by the DOE, which we would all have
20 to use the same one again, like we do on the
21 walk-ins, that it says if the performance of
22 the coil is this, the performance of the

compressor is this, the performance of the expansion valve and the different things we add on of the basic unit, of the basic options we are going to put here a list of options, it will perform according to this, then we would take on that responsibility. But they wouldn't say well I can't be responsible for my condensing unit working with Russell's coil because they won't do that.

MR. SACHS: Again Harvey Sachs. I appreciate this and I think it is getting toward one of our concerns at ACEEE.

Let's assume that all this happens but now Warren at Emerson has this new super duper new cycloceramic injector that replaces a whole bunch of other stuff and gives higher efficiency. How does he document that if we have a component-based specification and he is not using those components?

MR. BROOKMAN: Well the thing is, as I understand, this is not a lock down, we reached this efficiency on your standards that

1 you are coming out with and they will change
2 as we go and new technologies come out and
3 efficiency levels go up, I am sure you will be
4 modifying those.
5 So if a new technology came along
6 that increases 20 percent, all the DOE has to
7 do is modify their part of it, requiring --
8 Go ahead.
9 MR. LLENZA: Well, this is Charles
10 Llenza, Department of Energy.
11 We actually provide you paths to
12 get to that level. And usually we provide
13 examples but we do not predetermine what
14 particular pieces or components you have to
15 use to get to that level.
16 So if something new comes on the
17 market which helps you save energy and you can
18 then mix it with other components, it is the
19 total effect of the mixture of the components
20 that we are concerned about, not necessarily
21 the technology. So we don't really have to do
22 anything as long as you are not reaching the

1 ceiling that we set.

2 MR. CRAIG: Ellis Craig. I think

3 what you are worried about is what is the

4 incentive for us to add this new item if it

5 costs $10 more, if the items we are presently

6 using meet your requirements over here.

7 And the only thing I can say to

8 that is if it is very costly, nothing is going

9 to happen in our industry to make it more

10 efficient, unless it comes from outside,

11 either by an end user, which usually unless

12 you are a chain account, end users are not

13 going to be worrying about their energy bills.

14 Otherwise, this would be a moot point here or

15 might be really pushing it and it isn't.

16 So it will have to come from

17 without to have a pressure on what is capable

18 of being done in the industry. But we will

19 definitely, using this item, if we can save

20 money over there, we may be able to do

21 something different over here that we couldn't

22 do before. So it opens that up but it will

still use the same energy footprint.

So there is no incentive in it to improve it. But even if we use the test that you have, there is no incentive for us to go beyond what this requirement is over here. Even if they come out with new items and your test works great, there is no incentive to do it.

MR. BROOKMAN: Let's hear from Daryl.

MR. ERBS: Yes, I just wanted to try to clarify once again that you know, what is in the proposed rulemaking is to adopt an AHRI standard. That standard doesn't define who is accountable for representing the performance of a mix-matched system.

It could be that a refrigeration equipment manufacturer such as Heatcraft would want to do that but it is not necessarily that they are the only people that can do that. But there are tests that are defined for the unit cooler that provide data that is

1 sufficient when combined with anyone's
2 condensing unit, which as long as it is tested
3 appropriately, it has the data that the two of
4 them could be matched together and what is
5 important is that the individual manufacturers
6 of each of those halves of the system have
7 accurate representation of their equipment
8 performance.
9 And if they do it accurately and
10 there is some accountability at that level,
11 then when you put them together whether it be
12 Ellis industries or Heatcraft that is going to
13 rate the matched system, you will get an
14 answer that represents how that system will
15 perform. And that allows the flexibility that
16 I think this industry needs to allow different
17 companies to offer combinations that may come
18 from a combination of suppliers.
19 So I really think we have a way to
20 handle it. And then it is just a question of
21 how do you enforce it. That is always one of
22 the big questions. But again, I think that is

1 beyond the scope of today's meeting. So I
2 think we have it covered.
3 MR. BROOKMAN: Jon first and then
4 to Steve.
5 MR. McHUGH: So just a
6 clarification. My understanding is is that
7 AHRI 1250 only allows mix-match for fixed
8 output condensing units. So, you would
9 actually have to test the entire system if you
10 changed any of the components of any systems
11 that are variable speed, two speed, et cetera.
12 So that kind of goes back to Ellis' comments
13 about the cost.
14 So even though I appreciate the
15 rigor that is involved in this complete
16 approach, I think it is desirable from an
17 enforcement point of view to look at setting
18 standards for these major components.
19 And in addition that there is
20 probably so that you can apply these across
21 multiple system configurations, that there
22 also be particular requirements around for

instance if I do insert something like a headmaster valve, then all of a sudden I am not getting the floating head benefits.

So, there are probably some specific prescriptive requirements in addition to the ability to combine these components and to maintain the competitive market. Thanks.

MR. BROOKMAN: Okay. And so AHRI does that in 1250.

MR. McHUGH: Does not.

MR. BROOKMAN: Doesn't. Okay.

MR. McHUGH: Does not.

MR. BROOKMAN: Okay. Steve.

MR. DUNLAP: Go ahead Daryl, you go first.

MR. ERBS: So I guess two things. One is if you took a condensing unit that didn't have a headmaster and you put a headmaster in, not the manufacturer, but someone out in the field, I would view that as being something that the manufacturer of that condensing unit would view as inappropriate,

voids the warranty.

So you can't stop people from doing that but that is really to me to be an unusual circumstance.

If the manufacturer makes two condensing units, one with the headmaster and one without, those are different basic models and they would have to be tested because that does affect the performance.

The comment on we can't deal with mix matching a variable speed condensing unit to anyone's unit cooler is absolutely correct. I would expect that there will be future revisions to the AHRI standard as is required. Today, I don't think there is anyone who would be comfortable, besides the fact that there really aren't any variable speed condensing units on the market, but just ignoring that, you know, there is a lot more complexity in matching up a variable speed unit to someone else's unit cooler.

And if there is enough demand for

that, I am sure that can be accommodated but today --

MR. BROOKMAN: I don't think we need to go any further into the weeds. Steve, go ahead.

MR. DUNLAP: Well, he just took all my --

MR. BROOKMAN: He has prompted you to go there? Go ahead.

MR. DUNLAP: Yes that is exactly what I was going to say is that when you start to mix match, a designer, he doesn't know what the pressure drops are on the end or side. And there is requirements.

You may have a capacity number -- and this is for DOE. If you have never designed a refrigeration system, what you have got to understand is when you take X manufacturer and you have got a compressor manufacturer, you have to look at that indoor side. And now you have got a different velocity. It goes back into the variable

speed drives, the different flow rates. And you just don't have that kind of information. And most of the box manufacturers, I would suspect that they would not take a variable speed compressor and use someone else's indoor coil.

MR. BROOKMAN: Got you. Okay. So a final comment or two. I am going to ask Rebecca if she has anything -- Harmon and then Rebecca if she has got anything final. You go ahead.

MR. LEWIS: Yes, just one quick thing. As I understand thermodynamics and the compressor guys and the evaporator guys, we have got two curves. And now that we have got computers, computer does it all but the old days, you did your curve, you did your curve and that is where it balanced out.

It is the same science, even when the computer picks it. So if you put the wrong evaporator coil with a condenser unit that has got too much or too little capacity,

1 it doesn't work right.
2 So the real world proves this stuff
3 out. So the stuff isn't going to be out there
4 that won't work because if it doesn't work, it
5 has got to be replaced.
6 MR. BROOKMAN: Rebecca anything
7 further? Any questions?
8 MS. LEGETT: Thank you all for your
9 comments and please feel free to submit more
10 in writing, if you would like.
11 MR. BROOKMAN: So we are not as far
12 along as we perhaps should be but we will make
13 it up after lunch. I am going to suggest that
14 we break for lunch. It is now 12:30.
15 A bunch of us all together will go
16 to the big cafeteria, which means you take the
17 elevators. Wear your badge inside the
18 building. You might need an ID to get back
19 in. This room will be locked, so you can
20 leave your stuff.
21 Go down to the ground floor and
22 walk maybe 100 yards, 75 yards at least to the

other side of the auditorium and then go up the escalators. We can all go together so no one will get lost.

We will resume, it takes just about an hour to go there and eat and come back. So we will literally resume at 1:30 in this room.

Questions and comments before we break? Yes.

MR. VANDEVORT: If we wanted to drop off written comments, where should we place those?

MR. BROOKMAN: Hand them to Charles Llenza.

For those of you who haven't signed in or given your contact information to Brenda Edwards who is seated out front, please do so. We need to have a record of who is here.

We have made good progress today. We will make more progress after lunch. We will resume at 1:30.

(Whereupon, at 12:32 a lunch recess was taken.)

AFTERNOON SESSION

(1:34 p.m.)

MR. BROOKMAN: Let me just say we covered a lot of ground this morning, and I think it was a very productive conversation. I appreciate everybody being so forthcoming and direct in their comments.

As we go into the afternoon, I think there may be an opportunity for us to retread that same ground. Let's not do that. Let's make sure that we go with new information. What we have done this morning is on the record, and also the department will enjoy seeing your detailed written remarks.

So let's then go to Claire.

MS. GAGNE: Welcome back, everyone.

Just a procedural note. I will be introducing this topic and then handing it over to my colleague Eric. So don't be surprised when we change hands with this.

I'm going to start talking about the proposed test procedure for the envelope

1 side of the equipment under consideration
2 today for walk-in coolers and freezers.
3 Just a very basic slide is an
4 introduction. It seeks to sort of talk about
5 the components that may go into the energy
6 load calculations when we talk about energy
7 load for the walk-in coolers or freezers.
8 Most of you are familiar with this equipment.
9 So I don't need to get into detail, but just
10 to give you a sense of how the differences may
11 play out even between these two pieces of
12 equipment, clearly, they are both walk-in
13 coolers or freezers, but they may have very
14 different components at the individual level.
15 So the test procedure at its
16 30,000-foot perspective seeks to establish
17 energy load, and it's the fundamental value
18 that would go into a performance standard for
19 envelopes from the DOE perspective.
20 So how could this be determined?
21 Well, DOE at present looks at it as a
22 combination of conduction load, infiltration

load, and then something that we'll talk about as electricity. When we say that we really mean to say both the electrical load as well as the electrical heat load. So just a distinction.

Each of these three can be broken down at the component level, which we've done here, at least provided some indication of how some of the components may fit in. Clearly there are the components that fit in as well. This is just representative but not exhaustive.

And from a testing perspective, there are specific tests that are associated with certain pieces of the equipment or certain components. However, there are also calculations that may be embedded into either these tests or into other pieces of the energy load. From this level we're just presenting it as performance tests that are part of the test procedure, but that's to imply that there are also calculations. This can be seen with

the electrical devices that are over here on the right or, I guess, your left -- your right.

Not all of these components that will factor into the energy load necessarily have performance tests, and this is just an example of that.

So with that I'm going to provide an example of how one of these components might contribute to the overall energy load of the walk-in. It is not necessarily a straightforward process. That is to say it is not necessarily a one-to-one ratio of one component contributes to precisely one type of load.

In the example of a glass door, clearly there is an infiltration load associated with the glass door. There may also be a heater wire attached to the glass door. So there is both a conduction load in the glass door, in addition to the infiltration, as well as if there's a heater

1 wire attached to the glass door an electrical
2 load and an electrical heat load.
3 So it's not a straightforward issue
4 that we're dealing with here. I would expect
5 it's not new information for most of you, but
6 just as a way to start off the discussion, we
7 wanted to present this so that we're clear
8 about the level of complexity that we are
9 talking about when we discuss the test
10 procedure and the tests that are proposed by
11 DOE as part of this test procedure.
12 So with that, I'd like to kick off
13 the first discussion item. It has to do with
14 the normalization factor that DOE proposes to
15 be used. In the framework public meeting, we
16 got feedback and also understand that there
17 are several options for normalizing the energy
18 use that may include footprint, surface area,
19 and volume. And DOE has proposed in the NOPR
20 that the normalization factor be surface area
21 corrected by a ratio of glass to non-glass.
22 This is the calculation as proposed

in the NOPR, and with that I'll open it up to comment.

MR. BROOKMAN: Yes, please. Say your name.

MR. McGOWAN: I'm Ray McGowan from the National Fenestration Rating Council.

I'd like to make a comment. You keep speaking of conduction on the glass. With windows about half of the loss is radiated, you know. So there's significant loss, and I don't know if you're capturing that or not, but if these walk-in coolers have significant glass surface, you'll have to account for that.

Are there plans to account for that in the calculations at all?

MR. FITZ: This is Eric Fitz.

We'll actually address that specifically later on in the slides.

MR. McGOWAN: Okay. Thank you.

MR. BROOKMAN: Thank you, Eric. That's good.

1 So then from the manufacturer's
2 perspective, perhaps there's a place to start.
3 Comments on this normalization factor equation
4 or maybe beyond the equation?
5 MS. GAGNE: The approach in
6 general.
7 MR. BROOKMAN: Yes. Harmon, yes.
8 MR. LEWIS: Right. Harmon Lewis.
9 Have you run these numbers to see
10 what the effect is? In other words, we've
11 got, you know, factors up there. If you've
12 got 100 square feet of glass and 400 square
13 feet of non-glass, what are you trying to
14 achieve?
15 MS. GAGNE: Eric, perhaps you can
16 speak to that.
17 MR. FITZ: So that exercise is
18 really part of the standards development, that
19 standards rulemaking process, and of course,
20 the Department of Energy will run through that
21 and understand what those values will be for
22 specific product classes, but that's part of

1 the separate rulemaking process.
2 MR. BROOKMAN: You haven't done it
3 yet.
4 MR. FITZ: Exactly.
5 MR. BROOKMAN: Okay. Ellis.
6 MR. CRAIG: I have a simple thing.
7 I have a question. This normalization factor,
8 I think what you were saying is what are you
9 doing. What are you trying to accomplish
10 here?
11 MR. BROOKMAN: Eric.
12 MR. FITZ: This is Eric Fitz.
13 It really stems from the framework
14 meeting where there was a lot of discussion
15 about using some type of metric to normalize
16 the energy consumption just to make it easier
17 for other calculations related to the standard
18 itself.
19 MR. CRAIG: Yeah, but how does that
20 relate to non-glass and glass?
21 MR. FITZ: So since glass --
22 there's a heat load associated with glass

compared to the heat load associated with an insulated wall is significantly different. I think the Department of Energy will get into this in detail in the standards process, but there might be a good reason to make a distinction and sort of correct for the amount of glass on a walk-in.

For example, if a walk-in was made entirely of glass -- and I think you'll recognize that, you know, nobody does that today -- but just to account for the possibility, you know, a loophole in the test procedure that would allow a manufacturer to do something such as that to avoid complying with the test procedure as intended by the Department of Energy.

MR. CRAIG: Okay. So this normalization effect -- this is Ellis Craig -- normalization factor will limit the ability of a walk-in manufacturer to put too much glass compared to the insulated panel?

MR. FITZ: No. It's just a way to

reflect the amount of glass that's actually there. It's sort of a clarifying metric.

MS. GAGNE: I would agree with Eric. It's an attempt to use surface area and better reflect the composition of that surface area.

MR. CRAIG: Well, technically at the present time we calculate a walk-in and we figure the square footage of the walk-in that has insulated panel and the square footage of a walk-in that has glass. Is this any different than what we're doing?

MR. FITZ: I think this is a long discussion, and I think if you have specific comments on how it should be done, then --

MR. CRAIG: I won't hold you up. Never mind.

MR. FITZ: -- we'll welcome those. Thank you.

MR. BROOKMAN: Looking at the glass door manufacturers, does this make sense to you?

MR. DYE: As long -- Tim Dye -- as long as this is an attempt just to understand how much panel there is and how much glass there is, I would agree with that. If it goes beyond that, I think there is some major concerns.

And just so we understand, glass is not glass. There are heated -- okay.

MS. GAGNE: Perhaps just a follow-up question. Can you elaborate on what you mean by "goes beyond"? That's a fairly vague term.

MR. DYE: There again, you know, he made a comment that no one makes a walk-in out of all glass. That is true. However, if you go to a Sam's Club, they take a walk-in cooler or freezer and all three sides are loaded with glass, and then you have a huge drive-in door, not a walk-in door, but the panels are -- someone will have to help me here. What are they, 16, 18 feet?

PARTICIPANT: Sixteen or 18 feet.

1 MR. DYE: Sixteen, 18 feet.
2 PARTICIPANT: Twenty.
3 MR. DYE: So every thought process,
4 you know, we need to be careful how we limit
5 things because we have some very innovative
6 customers.
7 MR. BROOKMAN: Got you. Okay.
8 Thank you.
9 So additional? Jon, please.
10 MR. McHUGH: So this all becomes
11 moot, I expect, if you actually went to a
12 component performance approach; is that
13 correct? This is only if you're still trying
14 to hit this overall kilowatt hours per cubic
15 meter or something like that; is that correct?
16 MS. GAGNE: I'd rather not
17 speculate.
18 (Laughter.)
19 MR. McHUGH: Okay.
20 MR. BROOKMAN: No, I think we've
21 revealed it's a complicated question here,
22 right?

1 MR. McHUGH: Could you describe
2 what Q tot EER means?
3 MS. GAGNE: So the heat load -- oh.
4 MR. FITZ: This is Eric Fitz.
5 I think to go into it into detail
6 you should review the test procedure itself,
7 but it's essentially a total sum of the heat
8 load associated with the -- in this case the
9 non-glass components.
10 MR. BROOKMAN: Thank you.
11 Additional comments on this stream?
12 Because I'm going to move us along here.
13 Okay. Yes, Harmon.
14 MR. LEWIS: Just one real quick
15 one. At least at our company when we're
16 measuring heat loads we're talking kilowatt
17 hours per day or BTUs. Excuse me. BTUs per
18 hour. Eric, how are we going to transfer that
19 to kilowatts? That's based on your
20 refrigeration.
21 Just the heat loads, when we
22 calculate them, they're always in the BTUs.

How are you going to the kilowatts? Just based on the efficiency of the refrigeration system?

MR. FITZ: This is Eric Fitz.

We'll actually get to that specifically in later slides, but that's a good question.

MR. BROOKMAN: Go ahead.

MR. McGOWAN: This is Ray McGowan from NFRC again.

This equation would discount better glass, correct? If you did better glass in the walk-in cooler, it would sort of take it out, wouldn't count it correctly. Is that true?

MS. GAGNE: There is an additional provision for accounting for the type of glass that's used, the U factor specifically, not within this equation. But later we'll get to it later on.

MR. McGOWAN: Okay.

MR. BROOKMAN: Hold onto the

1 question, and speaking of later on -- yes.
2 Aris.
3 MR. MARANTAN: Aris Marantan.
4 Maybe I can attempt to explain the
5 normalization metric concept. Basically if we
6 look at other refrigeration equipment, we use
7 the idea of normalization. Maybe I'll refer
8 to a display case, for example. The standard
9 that DOE established for display cases
10 recently is in terms of kilowatt hour
11 consumption maximum per day per unit volume or
12 display area, and we're trying to do something
13 similar here.
14 So if you have a larger size walk-
15 in or you have a smaller size walk-in, you
16 will normalize that specific kilowatt hour
17 consumption limit based on your size. So here
18 what we're trying to do is, you know, in the
19 energy conservation standards proceeding, DOE
20 will establish a limit of energy consumption,
21 but the idea with this normalization metric is
22 that that standard is just scaled to your

size, and since we're going down the road of picking a surface area metric, instead of volume, instead of square footage, the surface area obviously has different components, the glass and the non-glass. So we're just trying to account for that.

MR. BROOKMAN: Okay. Tim.

MR. DYE: Just real quick. Tim Dye.

I think that's a very good statement. When you do that consideration though, when you go from cases to walk-in coolers, please understand it's two totally separate functions because cases are made to display immediate product. Walk-in coolers display immediate and cool down. So there's some specific things you needed to look at there.

MS. GAGNE: We understand that comment.

MR. BROOKMAN: Thank you. Thank you. That's helpful. Keep going.

MS. GAGNE: I'm going to turn this over to Eric.

MR. FITZ: Okay. So before we get into the details of the envelope test procedure, I just wanted to take a moment to point out once again that this process is for the test procedures associated with the energy conservation standards. None of this is immediately associated with EISA or EPCA compliance. That's a separate issue, and we're really focusing on test procedures associated with this standards process. So I hope that will help clarify some of the questions that might come up.

So starting off, we're going to discuss the conduction, the components and calculations associated with the conduction load on the envelope itself.

And as you're all aware and as specified in EISA, the typical way to measure the resistance to heat flow in any material is the use of R value. So as the R value goes

1 up, the resistance to heat flow goes up. So
2 effectively, a product with a higher R value
3 is more efficient, and you're all familiar
4 with this concept.
5 And this sort of gets back to
6 earlier comments. The calculation method is
7 very simple. If you have the R value and you
8 have a known surface area, a known thickness
9 of the material that's at a certain R value,
10 you also have a known temperature difference
11 across that specific material or panel, for
12 example, and you can very easily calculate the
13 heat load associated with it.
14 So this is just illustrating that
15 you can immediately find the BTUs per hour for
16 a walk-in panel, for example.
17 During the framework meeting last
18 year, there were a number of interested
19 parties that commented that while R value is
20 the standard way for quantifying the
21 performance of a material related to heat
22 conduction, that there are a number of

mechanisms that might exist that over time cause the R value of these materials to drop.

And two of them that were discussed at the framework meeting were diffusion of gases -- this is both air and blowing agents associated with foam in particular -- and also the possibility of moisture infiltration into the insulating materials that could also reduce the R value.

So first we're going to talk about this issue of diffusion. This is more to build a general understanding of the concept of diffusion, how we recognize that this is an issue that many interested parties have differing opinions on. So I'm going to just sort of get through the conceptual idea of it, but then we'll have an opportunity to comment on it itself.

So starting off with the walk-in panel, as you dig down you can see that the foam itself actually contains individual cells, and generally in the walk-in cooler

1 market manufacturers use foam that contains
2 closed cells that are intended to trap a
3 blowing agent. And this blowing agent has a
4 very high resistance to heat flow, and this is
5 where the material itself gets a lot of its
6 performance.
7 So digging further down all the way
8 into an individual closed cell of foam
9 material, there are two mechanisms that occur
10 over time that may cause a drop in R value.
11 So the first mechanism is actually air from
12 outside of the material diffusing into the
13 cells. This reduces the concentration of
14 blowing agent in the cell itself, which
15 reduces the R value, and then a secondary
16 mechanism which happens at a later time, the
17 blowing agent itself begins to diffuse outward
18 into the open environment.
19 So both of these mechanisms reduce
20 the concentration of blowing agent and,
21 therefore, reduced the R value.
22 So again, just illustrating

1 immediately after manufacture, as designed the
2 closed cells have a certain concentration of
3 blowing agent within them. At some time later
4 air begins to propagate into the cells
5 reducing the concentration, and then the final
6 mechanism is the blowing agent itself
7 diffusing out.
8 MR. LEWIS: Harmon Lewis with
9 American Panel.
10 I'm asking, where does this blowing
11 agent go? If these panels are camlocked
12 together, it's not going out into the whole
13 environment. It's a trapped system. It's a
14 closed system. There's nowhere for it to go.
15 MR. FITZ: So I think that's a
16 great comment. There's another couple of
17 slides where we deal with that specific issue,
18 and I think we'll probably talk about that at
19 length, but so just hold that until then.
20 So based on this concept and
21 direction from stakeholder input at the
22 framework meeting, DOE reviewed a number of

1 available test procedures that are used to
2 account for this aging, this diffusion of air
3 and blowing agents that may reduce the R value
4 of foam.
5 In its research, DOE proposed the
6 use of ASTM C1303-08. That was what was
7 published in the NOPR, and just a very high
8 level overview of how this works, and again,
9 there are details in the NOPR itself. The
10 idea is you slice a full thickness sample.
11 You allow time to pass so by slicing it it
12 accelerates the process at which this
13 diffusion can occur, and then at some later
14 point you then measure the R value.
15 So really this is a test procedure
16 that is conditioning the foam before you
17 measure the R value. And the key benefit is
18 that instead of predicting or using R value
19 right after manufacture, it actually is
20 representative of the 15-year life.
21 It's also widely recognized in the
22 building industry that this is an issue of

1 aging of materials. In addition, Canada has
2 used a similar thin slicing method since 2001
3 for all of its foam insulating products.
4 And with that I will take comment
5 on C1303.
6 MR. BROOKMAN: Harmon.
7 MR. LEWIS: Just a quick one.
8 Harmon Lewis.
9 I think that's like taking the
10 bumper off your cars before you do the impact
11 test on the bumper.
12 (Laughter.)
13 MR. LEWIS: That urethane, okay --
14 not to be facetious, but the urethane that's
15 encapsulated between the metal skins of the
16 panel and camlocked together within NSF
17 approved gaskets, and these panels are all UL
18 tested also; it's trapped in there. You're
19 not getting this long-term degradation that's
20 postulated here.
21 That would be R value total
22 collapse, if you want to call it, or total

1 deterioration. All of us that are building
2 these walk-in panels have thousands and
3 thousands of walk-ins out there that are over
4 five years old where this is supposedly all,
5 you know, going down to R value of six, and
6 we're not seeing this from our customers.
7 If that were true, like I said
8 earlier this morning, our refrigeration should
9 be running 37 hours a day to keep up, and last
10 time I looked there weren't that many hours in
11 the day. So you know, we're trying to fix
12 something that isn't broken.
13 I know we need to measure it, but
14 you can't postulate that slicing something
15 that thin to accelerate the testing. That
16 isn't what happens out in the real world. And
17 we can give you addresses of walk-ins that
18 have been out there for 15 years, and maybe we
19 need to go test that foam.
20 MR. BROOKMAN: Ellis.
21 MR. CRAIG: Ellis Craig.
22 The thing that I know that outside

1 of us, the building industry recognizes this
2 happens even with foil-faced insulations that
3 are put together and caulked and laid over
4 with vinyl, and the roofing industry and
5 several other industries have already worked
6 with that, but as far as experience that we've
7 seen, just not necessarily with our walk-ins,
8 but with walk-ins that we've taken down and
9 put new walk-ins up -- and most of you guys in
10 here make walk-ins. You know this is the
11 truth -- when you take them down, they're full
12 of water.
13 Now, if we had that --
14 (Simultaneous conversation from the
15 floor.)
16 MR. CRAIG: Well, we've taken down
17 several walk-ins. We even have documented
18 testing that we've submitted in here where the
19 walk-ins not of our manufacture were taken
20 down, and there's ice and water in them. And
21 that doesn't mean every manufacturer is
22 manufacturing the same product, is going to

1 react the same way, but to say that they're
2 impermeable doesn't, as far as what we've seen
3 in the field, what we've seen in the field and
4 what we've seen in the testing that has been
5 done by people who provide insulations to us,
6 it seems like there is a permeability involved
7 with them that has to be taken into
8 consideration.
9 MR. BROOKMAN: Is that after a 15-
10 year life, for example?
11 MR. CRAIG: A 15-year life is
12 probably -- there are walk-ins out there that
13 are 15 years old, and there's walk-ins out
14 there that get changed out after three or four
15 years just because they change their facility,
16 they expand or whatever. But a 15-year life
17 cycle on a walk-in is not an unusual thing
18 because we have a ten-year warranty.
19 MR. BROOKMAN: Right.
20 MR. MINELLI: Fred Minelli.
21 I think the insinuation that walk-
22 ins that are a few years old or ten years old,

1 that you take them apart and they're full of
2 water and ice is purely unsupported. I don't
3 know where that information comes from.
4 Those panels were probably damaged
5 where the joints have been separated and metal
6 skin has pulled loose. Plenty of things that
7 can happen in the field that would allow
8 moisture and ice in the joints, but the
9 typical insulated installed walk-in will not
10 produce that situation.
11 MR. BROOKMAN: Do you agree with
12 Harmon's comment?
13 MR. MINELLI: Absolutely.
14 MR. BROOKMAN: Okay.
15 MR. MINELLI: I would also like to
16 add that the Canadian standards you reference,
17 and there was another body, PMR or somebody
18 that allowed 1303. Those tests are done on
19 unencapsulated foam. They're done on spray
20 foam, bunstock foam, not insulated panels for
21 walk-in coolers that are poured inside of
22 metal facers.

1 MR. BROOKMAN: Eric.
2 MR. FITZ: I think that's a great
3 comment. Just from a process standpoint, on
4 the water issues, we're going to talk about
5 those in later slides, and there will be a
6 specific period to talk about that, but right
7 now we really want to focus on this issue of
8 do you have recommendations for other test
9 procedures related to this issue that might be
10 helpful or there is a specific problem with
11 1303 in, you know, predicting R value.
12 And in addition to this water
13 issue, there's a whole other piece where we
14 will have specific discussion about whether or
15 not the metal skins can actually prevent this
16 diffusion to occur at all.
17 So right now it's really about this
18 test procedure as proposed by the Department
19 of Energy rather than the issue of skins and
20 water.
21 MR. BROOKMAN: I'll let him finish,
22 Jim, and then I'll come back to you.

1 Fred.
2 MR. MINELLI: Fred Minelli.
3 Yes, we do believe that 1303 is not
4 an applicable test for this type of product.
5 It may be applicable for a different product,
6 but not this one. If you shred the foam, you
7 have no R value. You have no cell structure
8 holding blowing agent. So we do not believe
9 it is correct at all, and I would like to hear
10 from the urethane manufacturers.
11 MR. BROOKMAN: Is there anything
12 else you'd recommend in this case?
13 MR. MINELLI: I think the C518 is
14 completely applicable. We've been discussing
15 this for more than a year, and I think an
16 applicable standard would be to go out in the
17 field and find a 15 year old panel and cut it
18 and do the C518 and see what the R value is.
19 Because this is purely conjecture. There is
20 no proof in the statement that a C1303 will
21 give you an accurate aged R value.
22 MR. BROOKMAN: Jim. Thanks for

being patient.

MR. PERRY: Jim Perry.

Just a couple of things. We would also like to urge the DOE to not think that thin slice testing is the best option for conditioning foams. We would agree using the C518 test on aged panels of known age would be a more real world and accurate test method.

And also we've taken apart several walk-ins in our history, and they're not full of water.

MR. BROOKMAN: Okay. Thank you.

MR. FITZ: Can I respond to that specific comment?

MR. BROOKMAN: Go ahead. Yes.

MR. FITZ: So do you have a recommendation for how long the Department of Energy should age a panel before using 518?

MR. PERRY: I think to get an accurate representation of how they behave in the field you might want to do it at two years, four, years, six years, eight years and

1 see how that degradation goes.
2 We have several people from the
3 urethane industry here that could probably
4 speak more learnedly about that for us.
5 MR. BROOKMAN: Yes. Well, let's --
6 can we go there, Barbara? And then I'll
7 return to you. It is -- I didn't get your
8 name.
9 MR. KIRILOV: Milen Kirilov from
10 Carpenter.
11 I actually agree with Harmon and
12 Jim and also the panel manufacturers here that
13 our internal data also show that there is no
14 significant degradation in the R values of
15 enclosed panels.
16 And just to propose an idea for how
17 long we can age these panels, if you look at
18 the aging theory, it's pretty well understood
19 most of the aging occurs within the first six
20 to 12 months of manufacture. So maybe a year
21 is probably a good period to test panels with
22 C518.

1 MR. BROOKMAN: Okay. Thank you.
2 Barb.
3 MS. FABIAN: Yes, Barb Fabian.
4 A couple of comments. The first
5 one is on one of your slides, Eric, where you
6 said that the diffusion of the gases occurs
7 within two to three years, that's incorrect.
8 The primary stage of aging where the air is
9 coming in occurs early on, but the diffusion
10 of the blowing agent within the cells occurs
11 over 70 years. I mean, it's a very long
12 asymptotic relationship there.
13 So the blowing agent stays in
14 there, but the air infiltration dilutes it and
15 causes the loss of R value early on.
16 I agree that 1303 isn't the correct
17 methodology to use for this. One, it's very
18 burdensome to conduct. I have two papers out
19 on this. I am the co-chairman of ASTM C1303,
20 have done a lot of work on this. There's only
21 two laboratories, one in the U.S. and one in
22 Canada, who can conduct this. It can only be

1 done on 12 inch by 12 inch specimens, and when
2 you're getting thicknesses greater than four
3 inch, you must go to a heat flow meter that's
4 at least 24 by 24. You cannot thin slice a
5 specimen that big to get the thickness
6 tolerance required.
7 Another aspect of that is --
8 MR. BROOKMAN: Before you move on,
9 what would you recommend the department do?
10 MS. FABIAN: I think we're going to
11 have to look at full thickness aging at some
12 point in time, use C518 for the heat flow
13 meters and then we have to agree on where we
14 feel that that point in time would be.
15 MR. BROOKMAN: Charles Llenza.
16 MR. LLENZA: Yes. Can you get a
17 hold of your paper so we can take a look at
18 that?
19 MS. FABIAN: Yes. I've already
20 submitted them at the last stakeholders
21 meeting.
22 MR. LLENZA: Okay, great. Thank

1 you.

2 MR. BROOKMAN: Thanks for that.

3 Thanks.

4 And by the way, you weren't

5 finished. Keep going.

6 MS. FABIAN: Yes. The new test

7 temperatures looking at 55 degree mean

8 temperature and 20 degree mean temperatures,

9 we've never looked at thin slicing other than

10 a few research instances at Oak Ridge National

11 Lab where we've looked at those temperatures.

12 So the industry really doesn't know how the

13 materials are going to perform at those

14 temperatures.

15 What else did I say in here?

16 It's very expensive to do.

17 A couple of the restrictions. One,

18 it's only applicable to materials that have

19 the intent to retain the blowing agent. So if

20 you utilize an EPS material which does not

21 retain the blowing agent, this conditioning

22 procedure is not applicable for that.

1 And it's also not applicable
2 currently for materials that have permeably
3 faced products.
4 MR. BROOKMAN: Okay. Thank you.
5 MS. LEGETT: A quick question. You
6 mentioned you would need to think about or
7 come up with a good time period. Can you
8 please do that and recommend that at least
9 before the end of the comment period?
10 Thank you.
11 MR. BROOKMAN: Yes. Let me see.
12 Mike.
13 MR. KRUPA: Yeah, Mike Krupa from
14 BSF Corporation.
15 I want to explain a little bit on
16 the blowing agent and why it works and why it
17 takes so long to diffuse through the cells.
18 The blowing agents are such large molecules
19 that it takes a lot of pressure for that
20 molecule to actually diffuse through, and
21 after it does, then it's replaced by nitrogen
22 and oxygen from the air.

1 And we found that these diffusion
2 rates are extremely slow, and they can take
3 years to go through.
4 I also agree with the gentleman
5 from Carpenter that most of the diffusion can
6 take effect in the first year, and after that
7 it's very, very slow. It plateaus out for a
8 very long time.
9 Our industry standard is 518.
10 We've been using that for, you know, 30 years
11 or more, and we would like to see panels from
12 the field that have been in service, tested
13 against a standard or a known condition and
14 try to use that rather than a thin slicing
15 method where you're trying to prematurely
16 break the cells in order to test K factor.
17 MR. FITZ: I guess I can respond to
18 both of your comments and also what Barb had
19 stated.
20 So when we said on the previous
21 slide that it was two to three years, that
22 really should have been clarified with the

1 term "majority of the aging." So we agree and
2 DOE understands that the aging actually occurs
3 over, you know, asymptotically over, you know,
4 100 years, but the vast majority, say, maybe a
5 range of 70 to 90 percent occurs in the first
6 two to three years.
7 And then the comment about, you
8 know, how long you should wait before you use
9 518, so if you were to assemble a panel and
10 let it sit somewhere for, say, ten or 15
11 years, I guess I'll respond to that with a
12 question. In terms of burden on the
13 manufacturer, if they want to use a different
14 type of foam, some kind of new technology
15 comes out, that would mean that the
16 manufacturer before they can switch to that
17 would have to wait 15 years before there's new
18 data available.
19 And I just wanted to point that
20 out, and I would like to hear some discussion
21 on that idea.
22 MR. BROOKMAN: Yes, Kurt.

1 MR. LEIBEL: Kurt Leibel, Dow
2 Chemical Company.
3 I think to answer your question, I
4 think what this is is establishing a baseline
5 for polyurethane foam mainly in testing may be
6 a year to two years to three years, and once
7 that's established, the data will be there as
8 it is probably in papers right now that even
9 if you come out with new foam that you won't
10 have to go through this again.
11 So it is more establishing, you
12 know, the credibility of the data there.
13 MR. FITZ: Can you point to
14 specific papers that have data on --
15 MR. LEIBEL: Yes. I'd refer back
16 to the comments that the industry submitted
17 through the CPI. That has some papers, and I
18 think to the individual companies we'll be
19 submitting separate comments also.
20 MR. BROOKMAN: CPI is?
21 MR. LEIBEL: American Chemistry
22 Council, the Center for Polyurethanes

Industry.

MR. BROOKMAN: Thank you. Okay. thank you.

I'm eager for us to keep moving if it's possible. So are we ready to go now? Additional comments before we move on?

MR. CRAIG: I just want to make one comment.

MR. BROOKMAN: One quick one, yeah.

MR. CRAIG: This is Ellis Craig.

I don't want everybody to think in this room that there's only one type of insulation that we're talking about. The two prevalent ones right now are probably extruded polystyrene and foamed-in-place polyurethane. There are other insulations out there that this test wouldn't work on, too, but I just didn't want it to sound like that was the only product out there.

MR. BROOKMAN: Right. Okay. What we're discussing applies to both of those.

MR. CRAIG: Yeah.

1 MR. BROOKMAN: Okay.
2 MR. FITZ: And also, that reminds
3 me to comment. Barb Fabian had mentioned
4 about EPS foam. DOE recognizes that 1303 does
5 not apply to foams that don't use some type of
6 blowing agent. So EPS, for example, which
7 only uses air or CO.
2
8 Great. So now we're going to move
9 on to the water absorption issue. Just to
10 summarize, as was stated in the published
11 NOPR, at this point DOE is proposing not to
12 account for this issue. This is mainly due to
13 limited industry accepted methodology and test
14 procedures that the Department of Energy could
15 point to to actually account for both the
16 water absorption and then its impact on R
17 value.
18 And in addition, the body of
19 research that is out there, which is
20 significant, has been focused primarily on the
21 building industry. And it is important to
22 note that in the case of walk-in coolers and

1 freezers, unlike buildings, the inside
2 temperature of the walk-in is always lower
3 than the external temperature. So there is
4 always an inward pressure that is driving
5 moisture into the envelope itself. So that
6 makes for some unique issues.
7 So we'd like to take comment on
8 this particular topic.
9 MR. BROOKMAN: Ellis.
10 MR. CRAIG: Like I said on record,
11 again, that we believe that moisture is an
12 element involved with this from what we've
13 seen in the field and in the testing we've
14 done and products we've taken apart, and I
15 think by not putting any kind of testing in
16 there, it will probably give us faulty results
17 as far as what we come up with and say that
18 product is doing in the field.
19 MR. BROOKMAN: How faulty?
20 MR. CRAIG: Well, from what we've
21 seen is -- and Barb can probably testify to
22 this a little bit better than I -- she did the

1 testing and I'd like to transfer the question
2 to her, but we did a case study where we went
3 out and took unknowns; we just had a customer
4 that we were replacing all of the boxes that
5 were out there with newer boxes, and we were
6 going to each site and taking the panels
7 apart, cutting them into square, sending them
8 off for testing; put them in plastic, weighing
9 them when they got there, drying them out and
10 weighing them again.
11 She has that information and she
12 can tell you better specifics on it than I
13 can.
14 MS. FABIAN: Barb Fabian.
15 All of the data was shared at the
16 last stakeholder meeting. I provided the case
17 studies that we generated from that.
18 We know moisture decreases the R
19 value, and there are several calculations that
20 were generated by the U.S. Army Corps of
21 Engineers for various insulation types that
22 can show you how much the R value decreases

with X percentage of moisture. So that's available out there.

Another approach may be to look at materials that have lower water vapor permeance rates as per ASTM E96, and you look at those. You know, that is a way to approach using a lower water vapor permeance rate material.

(Participant speaking from unmiked location.)

MS. FABIAN: Well, you've got other things going on, too.

MR. BROOKMAN: That's established in the record.

MS. FABIAN: Excuse me.

MR. BROOKMAN: The department has it.

MS. FABIAN: Yes.

MR. BROOKMAN: That will be good. That's what they need.

I'm just looking. The summary of the water issue, you can see what the

department's approach is here. Any thoughts, additional comments on their approach?

Yes, please, Mike.

MR. KRUPA: I may be oversimplifying this a little bit, but I look at walk-in coolers very much as I look at refrigeration, you know, refrigerators that you might have in your house.

Currently we use polyurethane foams in refrigeration because of the great energy performance that we get out of it, and I don't believe that there has been any issues with water inside of the foams in a normal refrigerator.

MR. BROOKMAN: Okay. Thank you.

I'll take a final comment on this. We need to keep moving or we won't get through it. Okay, yes, please.

MR. THAMES: I was just concerned about where you might have found this walk-in. Like was it under real un-normal circumstances, possibly like in the path of

1 Hurricane Katrina, you know?
2 (Laughter.)
3 MR. THAMES: So.
4 MR. BROOKMAN: Thank you, Lee.
5 Maybe you could have that conversation off
6 line. Okay?
7 MR. FITZ: But I think to that
8 point, the Department of Energy, it would be
9 great if you could submit specific data, you
10 know, supporting either that water is a major
11 issue and particularly on the impact of R
12 value or not. So please do so.
13 MR. BROOKMAN: Let's keep going.
14 Harmon.
15 MR. LEWIS: Real quickly, not to
16 regress, but if we take apart ten or 20 walk-
17 ins, each one of the major manufacturers are
18 selling a couple thousand every year. I've
19 got 40,000 walk-ins out there, and water may
20 attack them, but I'm not getting complaints,
21 and I'm getting repeat customers.
22 MR. BROOKMAN: -- skin or something

1 like that.

2 MR. LEWIS: The impervious skin.

3 So, you know, real world, a few of something

4 fail, but that doesn't mean that, you know, my

5 40,000 and your 40,000 and your 40,000 have

6 gone bad. So it's statistical.

7 MR. BROOKMAN: Steve and then to

8 Harvey.

9 MR. COMBS: Yeah, just real

10 quickly, I mean, what you're talking about

11 here is installation issues, sealing issues,

12 putting the panels together because how else

13 can -- water can't penetrate the metal.

14 MR. BROOKMAN: Thank you. Harvey,

15 you're next.

16 MR. SACHS: Harvey Sachs.

17 Just expressing the hope that with

18 the new emphasis on standards at DOE it will

19 be possible to do a simple thermal decay test

20 over 24 hours or even 12 hours in a bunch of

21 walk-ins around the country. This would get

22 us to the sense of whether we've had

substantial thermal decay on products that have been in use for a number of years across different manufacturers.

MR. BROOKMAN: Okay. Thank you.

One more. Ellis.

MR. CRAIG: One thing that I think sounds funny. One minute we're talking about infiltration losses inside a walk-in, like air can get in and get out of these walk-ins that are locked together and so sealed tight that air can't get out of the panels. It doesn't make sense that we're worrying about infiltration losses that's coming from the inside of the walk-in to the outside or from the outside inside the walk-in, and then say that the panels are all sealed up so that there's no way air can get into them or get out of them.

That doesn't make sense. Then we can do away the infiltration loss because if there's no sealing -- if they're sealed 100 percent, then we don't have to worry about

1 either one of these issues.
2 Do you see what I'm getting at?
3 MR. BROOKMAN: I guess I do.
4 PARTICIPANT: I think there's a
5 conceptual failure there.
6 MR. MINELLI: Insulated panels that
7 you build walk-in coolers and freezers out of
8 them are covered with impermeable facers. The
9 doors have wiper gaskets, what's know as in
10 the industry, the wiper gaskets are flexible
11 and allow air pressure from the negative
12 pressure inside or positive pressure through
13 the cycle; let the air in and out.
14 This is also on freezers. You have
15 to have a pressure relief port because the
16 pressure, negative and positive, is so great
17 that in some instances without a pressure
18 relief port you couldn't open the door.
19 So there's systems designed to
20 allow air in and out, and it's not through the
21 panel.
22 MR. BROOKMAN: Barb, and then

1 Harvey.

2 MS. FABIAN: Just real quickly,

3 there had been some studies done in the past

4 by Dr. Glicksman at MIT where he looked at

5 metal scans on insulation, and he did a dye

6 study where he looked at the diffusion of the

7 blowing agent, and it can even under metal

8 skins. It does migrate to the surface, and it

9 can permeate out even underneath an air

10 impermeable surface.

11 MR. BROOKMAN: Okay. Harvey.

12 MR. SACHS: Harvey Sachs.

13 It seems to me that I could well

14 have an assembly of completely gas impermeable

15 panels which aren't tied down real well. Now,

16 there is the possibility of installation

17 errors leading to substantial infiltration

18 that's totally independent from the integrity

19 of the camlocked panels themselves.

20 So these diffusion issues are to me

21 at least conceptually independent from

22 infiltration across the envelope.

1 MR. BROOKMAN: I'm a little
2 concerned that we're covering this in such
3 depth we won't get to everything. Okay? So
4 please submit your written comments and let's
5 keep moving on.
6 MR. FITZ: So we've already been
7 talking about the specific issue of whether or
8 not impermeable skins are actually impermeable
9 or whether they are permeable skins. So we'll
10 just -- this is a summary of the comments that
11 were made in the framework meeting. There are
12 a number of people as we've just discussed now
13 that suggest that the metal skins or
14 particularly the panels themselves are
15 impermeable, and then there's also been people
16 that have pointed out that they are not
17 impermeable due to, for example, like at the
18 panel joints there is not a continuous wrap of
19 metal material. So that at the joints
20 themselves there may be just foam or some
21 other material.
22 In addition, in the field as

1 somebody has pointed out, there are issues
2 where an end user may puncture the walls and
3 specifically breach the metal skin.
4 So if there are any additional
5 comments on this issue, please.
6 MR. BROOKMAN: You see the comment
7 box there. DOE invites the submission of test
8 results regarding the impact of impermeable
9 skins on long-term R values, specifically peer
10 reviewed published data pertaining to efficacy
11 of skins in preventing and delaying R value
12 decline.
13 Any additional comments on that?
14 (No response.)
15 MR. BROOKMAN: Okay.
16 MR. FITZ: All right. So in
17 continuing the discussion of conduction
18 related heat load, the floor is another area
19 that a substantial amount of conduction,
20 particularly in floorless coolers. So DOE is
21 proposing a correction to the equations that
22 were published in the NOPR on how to calculate

the heat transfer through floorless coolers.

This was in response both to DOE's own research and, in addition, since the NOPR was published, a number of people have commented on this through formal written comment that was submitted to the Federal Register.

So through subsequent simulations DOE has developed these two equations that we're going to correct the original equation, which I'll show you on the next slide. So specifically for walk-ins that have a footprint of less than 750 square feet, this first equation will be used, and for walk-ins that are greater than 750 square feet, this second equation will be used.

Specifically, the first equation shown here is what was originally published in the NOPR, and DOE is proposing this correction specifically for the calculation with floorless coolers, to use this Q correction factor.

1 And we'll take comment on this, on
2 this issue.
3 MR. BROOKMAN: Well, are you able
4 to track this equation? Do we need to --
5 (Laughter.)
6 MR. BROOKMAN: Seriously. Does it
7 need to be explained a little bit?
8 Harmon.
9 MR. LEWIS: Have you computed it?
10 Are those two equations equal at 750 square
11 feet? Is it totally disjointed?
12 MR. FITZ: So that's why it's a
13 less than or equal to. So there's a
14 continuous --
15 MR. LEWIS: Right, but is each one
16 at 750 an equal value?
17 MR. FITZ: Yes.
18 MR. LEWIS: Okay.
19 MR. FITZ: Yes.
20 MR. BROOKMAN: That sounds good.
21 Additional thoughts and comments on these
22 equations?

I think the Department just laid out rather well what they're trying to do here. Did they succeed is the question.

Yes, Jim.

MR. PERRY: Jim Perry.

Just for our records, what are there? What thermodynamic principle are these calculations based upon?

MR. FITZ: So these equations were developed from doing finite element modeling, which is a very detailed type of computer simulation that captures all of the heat transfer through the floor. In this case a concrete floor was what the Department of Energy had proposed in the NOPR. That was what was used for the baseline calculations.

So because the unique nature of not having an insulated floor, without getting into too much detail on the physics, it essentially because it's attached to the earth, there's a much different nonlinear heat flow characteristic that wasn't initially

1 captured in the published NOPR equations, and
2 this correction deals with that sort of
3 nonlinearity and complexity.
4 As you can see, the first equation
5 here is an exponential to correct for that.
6 MR. BROOKMAN: Final comments on
7 these equations?
8 (No response.)
9 MR. BROOKMAN: Okay.
10 MR. FITZ: So in addition, as
11 published in the NOPR, it has been made clear
12 both through stakeholder comments and through
13 manufacturer submitted information that in
14 many cases a walk-in manufacturer, even if
15 it's a freezer, they do not provide the floor.
16 It is not shipped to the customer, and instead
17 a third party may install an insulated
18 separately from the walk-in manufacturer.
19 So in this particular case for the
20 purposes of calculating the heat transfer for
21 a freezer, DOE is proposing the use of R-28,
22 which reflects the EISA minimum R value for

calculating the overall envelope heat transfer.

And if there are any comments on this.

MR. BROOKMAN: The department also appreciates affirmation if you think they're gotten it right.

Harmon.

MR. LEWIS: Yeah, you got it right.

MR. BROOKMAN: Okay, and other thoughts?

(Laughter.)

MR. BROOKMAN: Other thoughts or contrary thoughts, Daryl.

MR. ERBS: Yeah, Daryl Erbs.

I want to make sure I understand. Are you allowing specification of the R value for a freezer floor if, in fact, it's being included with the box?

MR. FITZ: If it is included?

MR. ERBS: Yeah.

MR. FITZ: Actually it's the next

slides.

MR. ERBS: Oh, okay.

MR. FITZ: There’s a -- yes. So you got credit for using a much better floor.

MR. BROOKMAN: So then final comments on Slide 66, the one you have up there now before we move on?

There's little tiny -- on the bottom left-hand corner there are about maybe four points. Yours were the only ones colored that way, Harvey.

(Laughter.)

MR. BROOKMAN: Keep going.

MR. FITZ: So, to the separate points, we just talked about floorless coolers. We talked about specifically the case when a manufacturer is shipping a freezer but a third party has provided the floor. It was in this final case where regardless if it's a cooler or freezer, that the walk-in manufacturer ships a floor with the walk-in, and in this specific case, DOE had proposed

1 the use of a single assumption about the floor
2 that's beneath the insulated floor that's
3 provided by the walk-in cooler. DOE had
4 proposed the value of 55 degrees and at this
5 point is proposing a correction of 60 degrees
6 for freezers and 65 degrees for coolers. This
7 correction came out of a similar simulation
8 that was done in the case of floorless
9 coolers, and we believe that this will make
10 the overall calculations more accurate, but
11 still using the original equation that was
12 described in the NOPR.
13 MR. BROOKMAN: This is a revision.
14 Comments on this? Ellis.
15 MR. CRAIG: Ellis Craig.
16 It's still at 55. What's the R
17 value supposed to be rated at 55, at this new
18 temperature then?
19 MR. FITZ: So again, this is --
20 MR. CRAIG: The same R value, but
21 you're raising the temperature?
22 MR. FITZ: Let me go to the slide.

1 This is related to the assumption about the
2 temperature T1 in this very simple calculation
3 of heat transfer. So it's underneath the
4 insulated floor, the actual surface of the
5 subfloor, the concrete, it's an assumption
6 about that temperature.
7 MR. CRAIG: So you're saying that
8 the floor is warmer than the -- never mind.
9 That's all right. It's no big deal. Go on.
10 MR. GRIFE: No, I'm sorry. David
11 Grife.
12 If you could expand that, because
13 you're saying the outside wall has an ambient
14 of 90 while the floor has --
15 MR. FITZ: Right, but in this case,
16 exactly, the floor --
17 MR. GRIFE: Therefore, that leads
18 to what is the R value then of the floor. It
19 sounds like it's going to have a lower R value
20 than a wall panel. That's what you're saying.
21 MR. FITZ: So there are two
22 separate issues. One is at what temperature

do you test the R value of foam using ASTM 518, and the separate thing is then what temperature do you use for calculating the heat transfer across any material of a given R value.

So in the case of calculating the heat transfer, DOE is making assumptions about the T1 in this particular equation and the T2 in the case of the floor is the internal temperature of the walk-in. So 35 degrees, for example, for a cooler or minus ten degrees for a freezer.

MR. BROOKMAN: Barb.

MS. FABIAN: Yeah, Eric. So are you suggesting that then you'd have three different mean test temperatures, the 55, 25, and then 60? Or I'm confused.

MR. FITZ: Sorry. So, again, this is not related to the test procedure for measuring the R value. This is simply the assumption that is required to make the calculation of how much heat flows through a

1 material.

2 MR. BROOKMAN: Ask your questions

3 now. Jon? Oh, sorry. This gentleman. Say

4 your name, please.

5 MR. OWEN: Kenny Owen with Master-

6 Bilt.

7 The equation appears that it might

8 be good for a walk-in where the concrete floor

9 is like on a second floor building, where you

10 have ambient temperature underneath. Our

11 experience is most boxes are going to be put

12 on top of concrete which is right on top of

13 the ground. Ground temperature is usually in

14 the, you know, high 50 degree temperatures.

15 So if the cooler is 35 degrees, 40

16 degrees, the ground is 55. How can you use a

17 60 or 65 degree temperature? It seems to be

18 okay for some instances, but coolers sitting

19 on the ground, I think you would have a lot

20 lower temperature.

21 MR. FITZ: So, again, just to

22 remind you this is specifically for the case

as long as the walk-in cooler has an insulated floor and then to your point about there's a lot of variability exactly where a walk-in cooler is installed. It would be impossible for the Department of Energy to account for all of the different sites. So, instead of doing that, the Department is just specifying specific assumptions and this will be uniform across all the manufacturers to rate their products.

So the Department agrees that it doesn't exactly reflect the true, installed walk-in. It's just a uniform measure that makes it fair for comparison of products.

MR. BROOKMAN: Fred.

MR. MINELLI: Fred Minelli. I agree with the uniform -- with it being more uniform. But, as Kenny stated, most of us in the business use 55 or 60 degrees as the ground ambient. So it should be more consistent with a realistic number of 55 degrees. I mean I don't understand the

1 process of moving it up to 60 or 65. Is it to
2 build an insurance in calculating the loads or
3 what's the purpose of it not being what it
4 really is?
5 MR. FITZ: I think that's a great
6 comment and the Department will take that into
7 consideration.
8 MR. BROOKMAN: Thanks Fred. Okay.
9 Yes, Jon. Thank you, Jon.
10 MR. McHUGH: So I'm again trying to
11 think back to where this ultimately goes. And
12 it goes back to an earlier comment about wall
13 insulation. Is it the intent of the
14 Department to replace the current prescriptive
15 requirements with these performance
16 requirements or these are in addition to the
17 existing prescriptive requirements that are in
18 EISA?
19 MR. BROOKMAN: Charles Llenza.
20 MR. LLENZA: This is in addition to
21 what's in EISA. This would be components to a
22 performance requirement for the envelope, for

1 example. And you need to know what the
2 insulation value is of the floor in order --
3 If you're doing the whole concept of the
4 envelope, then that's put into some equation
5 to come up with a generalized performance
6 standard for the envelope.
7 MR. McHUGH: So this can't be used
8 to reduce the insulation level of the floor.
9 Is that correct?
10 MR. LLENZA: No.
11 MR. FITZ: The EISA, the standards
12 cannot supersede -- and correct me. They
13 cannot supersede EISA. That's a requirement
14 by law and a secondary as this rulemaking is
15 about. It's the Department of Energy dealing
16 with these new standards.
17 MR. McHUGH: Okay. Thanks. That's
18 a good clarification. Thank you.
19 MR. BROOKMAN: Jon, thank you.
20 Yes. Claire.
21 MS. GAGNE: This is Claire. And to
22 add to that, it's really just an issue here of

1 trying to create a level playing field with
2 the calculation that's used. So the feedback
3 that we're really looking for is are those
4 numbers correct and, if not, then what is?
5 MR. BROOKMAN: Yes, and we've heard
6 already. Is there any reason the Department
7 couldn't go to 55 rather than -- Yes.
8 MR. FITZ: It's a somewhat
9 complicated issue and, as I said, the
10 Department will take into consideration and --
11 MR. BROOKMAN: Okay. So then final
12 comments on this comment box before we move
13 on. We're going.
14 MR. FITZ: So we've had a lot of
15 discussion already about glass doors. So
16 we're now going to get into that in detail.
17 As we've discussed, the performance
18 of a glass door is really more complex than
19 simply the glass itself. There's actually a
20 number of subsystems that are included. You
21 have multiple panes. You could have low
22 emissivity coatings. You may or may not use

1 some type of inert gas fill. There are a
2 number of parameters that go into actually
3 calculating the heat transfer associated with
4 a glass door.
5 So, to deal with this specific
6 issue, DOE has proposed as described in the
7 NOPR that for the purposes of calculating the
8 heat transfer related to glass doors if the
9 component manufacturer of the glass door
10 participates in some type of third party
11 rating system such as NFRC, then the walk-in
12 manufacturing can simply use that label, that
13 performance metric or the U-factor, and use
14 that for their calculations of the heat
15 transfer associated with the glass.
16 If not, DOE is proposing the use of
17 a calculation method. This is a publicly
18 available, free software called Window 5.2.
19 This was developed over a number of years by
20 Lawrence Berkeley National Labs. It's well
21 respected. It's used by the National
22 Fenestration Rating Council, NFRC, and we

1 think it provides a way for accurately
2 measuring the performance of glass doors while
3 reducing the burden on manufacturers because
4 it's a calculation method.
5 One thing that's very important to
6 point out that because it's a piece of
7 software that manufacturers would be using
8 it's critical that in the process they fully
9 document the exact inputs that are used so
10 that the Department of Energy, other
11 interested parties, etc., can later ensure
12 that the same calculations, that the same
13 performance, is actually represented by the
14 manufacturer. And we'd like to take comment
15 on this issue.
16 MR. BROOKMAN: Tim.
17 MR. DYE: This is Tim Dye. Again,
18 this speaks back to the walk-in cooler
19 manufacturer being held responsible for these
20 numbers and, although we have very capable
21 people in this room, the complexity of glass
22 doors to fill in a Window 5.2 the variations

are so different just from my company versus my competitors because we don't do things the same way. One person may use a low-E of an 80 or one uses a 60 and there's no way that these manufacturers would have that information readily available.

I'll go back to speak that this should be the burden of the glass door manufacturer on that component.

MR. BROOKMAN: Okay. Thank you. Please.

MR. McGOWAN: This is Ray McGowan from the NFRC. And this is an interesting situation. At NFRC we rate doors for buildings and we could perhaps rate these glass doors for walk-in refrigerators. We'd have to see drawings and understand what typical sizes that you would make for these different coolers.

The way the NFRC system works is we've been talking a lot today about you don't want to rate every single window. Well, NFRC

1 knows that as well. And so what we do is you
2 simulate everything, but you only rate a
3 standard size.
4 So perhaps this industry could do
5 the same thing. You could either adopt the
6 size that we have which is about 35 X 80 or
7 you could propose a new size to NFRC to rate
8 and then we could put it into our documents.
9 And you guys could rate the performance of the
10 windows.
11 So I would encourage the industry
12 to make contact with me and I would be glad to
13 talk with someone later. And perhaps we could
14 take a look at some drawings or consider the
15 sizes of the doors that you make and see if it
16 will fit into the NFRC system. Because as is
17 the only thing you can rate with the Window
18 5.2 software is the door sizes that are loaded
19 in there right now which is just 35 X 80 and
20 there's also a double which would be 70 X 80.
21 MR. BROOKMAN: NFRC doesn't rate
22 these now.

1 MR. McGOWAN: Well, we're not
2 certain -- It depends on the standard size
3 they select. If they happen to select the
4 standard size we have, perhaps we could. But
5 if they select a standard size that we don't
6 have, then we can't rate it. The software
7 will not do it really.
8 MR. BROOKMAN: Ellis.
9 MR. CRAIG: I like the idea that
10 the glass door guys calculate this out and
11 give it to us which is not hard for them to
12 do. You know they'll have the whole listing.
13 Then that's one manufacturer doing it instead
14 of all of us trying to do it.
15 MR. BROOKMAN: Yes, right.
16 Tim.
17 MR. DYE: Tim Dye. And again this
18 5.2, he's exactly right. The size that he
19 mentions is less than one percent of my total
20 sales.
21 MR. BROOKMAN: Yes.
22 MR. DYE: A typical door size for

1 you pick what industry you want for the
2 convenience stores, 30 X 75. For the
3 supermarkets, it's 30 X 63. Now you start
4 talking about nonheated, heated, low temp. I
5 mean it's --
6 MR. BROOKMAN: Go ahead, Steve.
7 MR. DUNLAP: Steve Dunlap again.
8 Thanks, Tim. I appreciate that. I think
9 everybody just heard his comment. Walk-in
10 cooler doors, single entry, less than three
11 feet or 3.5 feet. Mr. Kido is going to look
12 at the definition of a walk-in cooler. If
13 we're changing the definition, then walk-in
14 and I think Harvey mentioned this, too, these
15 applications are drive-in. They're heavy
16 traffic. We're going to look at walk-in, what
17 is a walk-in cooler, and the definition
18 changes different than what was Congress's
19 intent, legal definition.
20 Then we look at 3'9" or whatever
21 the magic number is and anything that's wider
22 than that doesn't have an R-value requirement.

It's plain and simple. Because I've already submitted that information to Mr. Llenza. And we show that the R-value depending on openings. As we all know, R-value is zero when the door is open. And one of the largest loads on the walk-in cooler or freezer is infiltration especially from an energy perspective, not just the design of the equipment, but the energy perspective.

So now once you get that door and he doesn't even have a model for our door. So I think it's a unique application. It's outside the intent that Congress had.

MR. BROOKMAN: Thank you.

Rob, follow on.

MR. McGOWAN: Yes. I just wanted to add that if you're using the Windows 5.2 software that's a full product rating. Frame and glass effects are included. Okay. So the output is you have to be careful with it. In the industry, we're aware particularly at the commercial level that they're just using the

1 glass portion and reporting center of glass at
2 times. And that's going to overstate U-
3 factor.
4 So if you don't use a standard size
5 door in the NFRC system and generate the
6 output with that and you take sort of a short
7 step and just use the IG that's going to be
8 misleading. So I just caution you guys if you
9 want to pursue the energy rating of a door you
10 should work with us and we should get a
11 standard size in there.
12 So you get a full rating with the
13 frame effects, let's call it. I assume you're
14 using metal aluminum doors, something like
15 that, perhaps vinyl. And we can account for
16 that accurately or else it's not going to be -
17 - The competition will be unfair and that's
18 why NFRC exists to make sure you can compete
19 fairly.
20 MR. BROOKMAN: Pardon me. David.
21 MR. GRIFE: Yes. To Mr. Kido, I'd
22 like you to look into that. I'd love to hear

1 the ruling on that or the interpretation or
2 how it is. It's an important comment.
3 MR. KIDO: I anticipate that we'll
4 address that either through the preanalysis
5 document. If not there, then definitely in
6 the notice of proposed rulemaking that affects
7 the standards.
8 MR. BROOKMAN: Let's let this
9 gentleman follow on.
10 MR. PARK: Hi. Ron Park. You'll
11 find I think with the NFRC you run into the
12 same issue as you have when we talked with the
13 contractors field installing walk-in coolers
14 in that the test that they do many of those
15 doors have windows that are installed by
16 construction companies, door companies that
17 are not the actual manufacturers.
18 I think in this instance for this
19 industry you're in a better position to have
20 the manufacturers because all the windows from
21 what I understand are factory installed. So I
22 think it takes out that variability.

1 MR. BROOKMAN: Thank you.
2 Harvey.
3 MR. SACHS: Thank you. Harvey
4 Sachs. With all due respect to my friend, Mr.
5 Dunlap, I did not recommend that anything with
6 a door wider than three foot, nine inches be
7 exempted from this proceeding.
8 (Laughter.)
9 MR. BROOKMAN: You just want to
10 clarify that for the record.
11 MR. SACHS: I did try to suggest
12 that a drive-in facility is different from a
13 walk-in cooler.
14 MR. BROOKMAN: Okay. Thanks for
15 that clarification.
16 Ellis.
17 MR. CRAIG: And that's what I was
18 going to ask. All we have to do is build
19 bigger doors and we don't have to worry about
20 all this.
21 (Laughter.)
22 MR. BROOKMAN: Not on my watch.

1 The door people are great with that proposal.
2 They're fine with that.
3 Please go ahead.
4 MR. McGOWAN: Just a little
5 addition. We do have a garage door rating,
6 too, that's 118 inches X 80 inches. So we
7 could accommodate something like that.
8 MR. BROOKMAN: Okay. But they'd
9 need to make -- If they didn't make that door,
10 they'd need to custom make it so that it could
11 fit for the parameters and your software.
12 MR. McGOWAN: Well, the way the
13 NFRC system works is again we have the
14 simulation program can do a variety of options
15 on a product and you have to build a standard
16 size and model the standard size. Okay. And
17 the rating goes on the standard size.
18 MR. BROOKMAN: Right.
19 MR. McGOWAN: You can go forward
20 with different sizes, but you still get the
21 same rating. It's not an actual rating. It's
22 a rating based on a standard size. So there's

a difference.

MR. BROOKMAN: Final comments. Tim and then Steve.

MR. DYE: Okay. I understand his comment, but the size that he's stating is not a standard size for this industry.

MR. BROOKMAN: Yes. I'm with you. Steve, yes.

MR. DUNLAP: Yes. Just to respond to the other two comments about the doors. The people that I represent today the implication of the legislation is to install R-28 doors. These technologies, they're fast acting doors. They're lightweight curtains or doors or panels and they don't meet the R-28. And it's just a challenge. And the problem is that now we have to go in, add doors that offer very little value, economic value or justification, especially when the doors are hardly used. So from a small business, small manufacturing perspective, it's a challenge. It's a burden. And there's no value added.

In fact, if we go with the manual doors simply because we can meet the R-28 values, then you have a door that uses more energy. Because in operation and in practice, we can talk about the engineering and conduction and infiltration losses, but it's people that use those doors. And the more they go, the less they show.

MR. BROOKMAN: Okay.

MR. DUNLAP: And that's the reality. I'm not trying to -- I'm being very respectful. But it is a burden on a small manufacturer to change their technology. There's no opportunity for emerging technologies that resolve some of the issues in the field in these applications. That's my comment.

MR. BROOKMAN: Thank you.

Okay. Then we're moving on.

MR. FITZ: So like the issue of a manufacturer shipping a walk-in without a floor there are also cases where a

1 manufacturer may ship a walk-in without the
2 glass doors installed. So DOE proposed in the
3 NOPR to use a methodology that simply
4 specifies the EPCA limits, the EISA limits,
5 for the case of when a manufacturer does not
6 ship the glass doors with the walk-in cooler
7 or freezer.
8 DOE used the Window 5.2 program to
9 estimate the U-factor associated with the EPCA
10 described doors. And you can see the values
11 here: 0.43 for coolers and 0.3 for freezers.
12 And then in the case where a
13 manufacturer does ship the glass doors with
14 the walk-in, DOE is proposing that the
15 manufacturer either use, for example, if there
16 is an NFRC rating then they can simply specify
17 that label or use the value from that label.
18 Or they will use the Window 5.2 program to
19 calculate the performance metric.
20 We will take comment on this issue.
21 MR. BROOKMAN: Ellis.
22 MR. CRAIG: Ellis Craig. Are you

saying that if we don't ship the doors then we're going to use the highest number?

MR. FITZ: So technically, yes, for U-factor is the highest number.

MR. CRAIG: So the results are the guy calls me and wants to buy a walk-in. If he buys the doors from me and I can give him a lower number, it will be more efficient for me to sell -- He will have a higher efficiency walk-in than he will if he orders one without it and gets one on his own. Because what we're really telling him and we're designing our refrigeration and everything around is that higher R-value which may or may not be true.

MR. FITZ: So I think in terms of your advice to a specific end user, that's separate from how you would comply with the test procedure.

MR. CRAIG: But I might comply if I sell him the glass door but not comply if I don't.

MR. FITZ: You would be as proposed if you are shipping the walk-in without the glass doors.

MR. CRAIG: That would mean I would be compliant. Could possibly not be compliant. But if I sold him the glass doors since that number's lower then I could be compliant.

MR. CRAIG: I think we're kind of mixing -- So the idea is that having this sort of differentiation between the walk-in shipped with doors and without it gives manufacturers who have control over what doors are being shipped. They get credit for that energy savings. And if they don't there's no mechanism or possibly might not be a mechanism for compliance.

MR. CRAIG: But that doesn't seem -- It seems like we shouldn't be accountable for them not buying the door from us and what you're doing you're putting a burden on us to try to sell every door we can because if we

1 don't it could hurt us in the long run.
2 MR. FITZ: Do you have a suggestion
3 of what the Department of Energy could use in
4 place?
5 MR. CRAIG: Yes. Make it so that
6 if they're going to put glass doors in they
7 have to buy them from the walk-in
8 manufacturer.
9 (Laughter.)
10 It solves it right there. No
11 questions asked. Right?
12 MR. BROOKMAN: Harmon, do you wish
13 to comment?
14 MR. LEWIS: Well, just real world,
15 if we can ask that customer whose glass doors
16 are you putting in and that customer has a
17 rating, it would seem to make sense. We could
18 use that rating material with a known glass
19 door manufacturer. Because if they buy it
20 from us, we know the value. If they buy it
21 directly, it's the same company. The results
22 of the formulas ought to be the same amount.

1 MR. BROOKMAN: We're going back to
2 the component approach, right?
3 MR. DYE: Yes. Tim Dye again. The
4 reality of this is that if a walk-in cooler
5 company does not ship the doors or buy the
6 doors and resell, they know whose doors are
7 going in because they have to cut the neck of
8 their opening. Right, guys? Okay. You may
9 not know what style of door, whether it's
10 heated or unheated. But they know whose door
11 whether it be mine or my competitors.
12 Hopefully mine, everybody.
13 But what I'm getting at is they
14 know because not all of the door companies
15 have the same what we call ‘‘net cooler
16 opening’’ for the doors. Mine may be an inch
17 different than my largest competitor. Or
18 another guy may be a little shorter. So they
19 have that information.
20 But to sit here and say that
21 they're going to be penalized and have to use
22 the -- what was it the lowest number? Or the

highest number? That's --

MR. BROOKMAN: What would you recommend the Department do in this case? I don't want to put words in your mouth. What would you recommend the Department do in this case?

MR. DYE: What we're all here to do is to have an energy efficient product for our customers, right, and to save energy. But we all have to understand that it's not just these two numbers. Okay. That's what we have to understand here.

So we're penalizing by using the least R-factor or U-factor when in fact we have a product that we're introducing here very shortly. You can do ten doors with less than six 60 watt lightbulbs.

MR. FITZ: So the issue of lighting and infiltration and we're going to talk about that in just a little bit.

MR. DYE: Yes.

MR. BROOKMAN: Let's hear from

Aris.

Go ahead.

MR. MARANTAN: Aris Marantan. Let me see if I can try and clarify that, the point about the highest or the lowest. I think the slide we're looking at here, slide 72, is simply telling us that when a manufacturer ships a walk-in and the door is unknown we just want to allow you to calculate the performance of the walk-in by assuming a value for the doors itself. And that is the -- What you see here, the two numbers are simply the U-factors of the EISA compliant doors specified in EISA. It's a default value.

So if you want to use -- If you know the value of a better door, you can use that if you're going to include the door. But this is only for the case where you're not including the door itself.

MR. BROOKMAN: Okay.

MR. MARANTAN: So it's not the best

door. It's just the EISA minimally compliant door, U-value equivalent.

MR. BROOKMAN: Ira.

MR. RICHTER: Would it be an easier solution just to change the wording from "without" to "unknown"? And that seems like that would solve the problem.

MR. BROOKMAN: Okay. Thanks for that specific --

MR. DYE: And one other comment.

MR. FITZ: We'll consider that.

MR. DYE: The panel manufacturers also I would assume -- You're asking the question because you're trying to base the refrigeration load. You're asking if it's a heated door or nonheated door or a freezer door. Right? So in reality you know who the door company is and you know kind of the type of the door, whether it's two-pane heated or it's two-pane nonheated or two pane heated, two-pane nonheated, three pane heated. Right? So it's not like it's just something way out

there that they don't know. And I like his comment to where "without" to "unknown."

MR. BROOKMAN: Okay. Please.

MR. McGOWAN: This is Ray again. I just wanted to ask again if there's someone I could discuss the rating of the doors with. Is there an industry association here that perhaps I could talk to or a manufacturer that might be interested in just exploring the potential for a rating on a door? I'd be glad to exchange cards or something like that. So anybody? Because I have to get going pretty soon. Sorry. And I know we're going to end this conversation soon.

MR. BROOKMAN: Yes. There's one right there. Thank you.

MR. McGOWAN: Thank you.

MR. BROOKMAN: Okay. Jon.

MR. McHUGH: So one thing I'd actually like to hear from the manufacturers of glass doors is do they have a recommendation relative to NFRC rating or

1 another rating. Is there a particular rating
2 that they support for the rating of their
3 doors? I don't think that question's been
4 asked. It's just been the description of
5 we're thinking about the NFRC. But I didn't
6 hear "No, we'd actually prefer to rate
7 according to some other ASTM method." I think
8 that would be useful.
9 MR. BROOKMAN: Okay.
10 MR. DYE: Tim Dye. The ratings of
11 doors are highly subjective to the performance
12 that they have to withhold. For example, I
13 can sell a two-pane nonheated gas-filled door
14 at a 75 degree room, 35 degree cooler and we
15 have one that's completely energy free that
16 will protect you up to 74 percent relative
17 humidity. Okay. Huge. It's huge.
18 However, that door works very good
19 in Milwaukee or in Minnesota. But you go put
20 it in New Orleans and the store owner that
21 keeps his door open. His entry door to the
22 store, he keeps it open. And he doesn't turn

his air conditioning on and you're going to have water all over the floor. All right. So therefore that condition we have to sell -- We would sell an energy-free door if we know those conditions

Stating back to what we all said earlier, we don't know where these things are going a lot of times. Okay. I can sell one to any panel manufacturer in here, ship it to their location and it could end up in any 120 volt country.

MR. BROOKMAN: Okay.

MR. DYE: So the ratings that we have would have to be based on models. It's not just here's a rating for a door. Because if you take my door and you take my other competitors' doors, the same model that we compare to each other is going to have two different ratings.

MR. BROOKMAN: David, go ahead.

MR. GRIFE: Just in addition. Just please don't assume that we always know

either. We're dealing with the dealer. Especially if you're doing a large range for a convenient store, you may not be doing refrigeration because they're doing a rack system. So now you have the walk-in. You don't know the door. And you may not even know the refrigeration.

MR. DYE: But I would -- To digress just a little bit, I would love to see some type of rating like that because it quite honestly would give me a competitive edge. Okay. But the situation that we have is a glass door is not a glass door is not a glass door. There are different environments that we have to play in.

MR. BROOKMAN: And I noticed you handed your card to the gentleman from NFRC. Okay.

So, Jon, go ahead.

MR. McHUGH: And I just wanted to clarify that this rating is not just the U-factor and infiltration of the door, but

potentially it's condensation resistance or some kind of metric like that for these humid climates or related to coatings and things like that around condensation.

MR. DYE: Condensation is probably the biggest concern when it comes to glass doors in the retail environment.

MR. McGOWAN: This is Ray McGowan from NFRC. Yes, in the window industry, they recognize the same thing with the various conditions, various climates. So therefore we standardize on a large set of assumptions for conditions, you know, indoor/outdoor temperature, wind speed, humidity, a variety of things. So you know perhaps we could work with the industry as well here.

And additionally I heard condensation. The Window 5.2 software has a condensation resistance rating that it outputs as well. So perhaps I could help the industry if you choose to pursue some sort of rating.

MR. BROOKMAN: Okay.

1 MR. FITZ: Just to clarify. Tim,
2 when you were referring to energy-free doors,
3 you were talking about doors without anti-
4 sweat, heater wire.
5 MR. DYE: When I speak of energy-
6 free door, the door component itself, the
7 glass and/or door rail have no electricity to
8 it whatsoever.
9 MR. FITZ: Okay. Thank you.
10 MR. DYE: And soon to be a frame
11 with no energy. So it's huge.
12 MR. BROOKMAN: So let's move on to
13 the next slides.
14 MR. FITZ: We've talked already
15 about infiltration. We'll dig into this in
16 detail. Specifically, steady-state
17 infiltration, this is infiltration that is not
18 related to the opening of doors which we've
19 also discussed. Specifically, this is air
20 that might go into or out of the walk-in
21 through panels, through the panel-to-panel
22 interface, through the bi-directional pressure

1 relief valves that we've also discussed
2 earlier and possibly through the door
3 threshold itself.
4 In the NOPR, DOE has proposed the
5 use of a gas tracer method to calculate this
6 steady state infiltration. Now I'm just going
7 to do a very quick overview of how this test
8 works. First, you inject a tracer gas into
9 the walk-in itself. You then measure that gas
10 concentration. You let time pass. And then
11 you remeasure the concentration. Based on
12 this change in concentration, you can directly
13 calculate the air infiltration.
14 So DOE would like to take comment
15 on the use of the gas tracer method for
16 measuring steady state infiltration.
17 MR. BROOKMAN: Ellis.
18 MR. CRAIG: This would be on our
19 basic unit then if we do this one test on the
20 basic unit and then we come up with this
21 number. Correct?
22 MR. BROOKMAN: Charles Llenza.

1 Go ahead.
2 MR. FITZ: Conceptually, yes. This
3 is only applied to basic models.
4 MR. BROOKMAN: Okay. Thank you.
5 MR. FITZ: Under the definition of
6 Basic Model, yes.
7 MR. BROOKMAN: Okay. Thanks Eric.
8 Comment on this approach? Yes,
9 Harvey.
10 MR. SACHS: Harvey Sachs. First of
11 all, the tracer gas approach can be done as a
12 rather inexpensive test. The real question in
13 my own mind is whether that's to be done for
14 the unit as some manufacturers assemble it
15 before shipment or whether this is to be done
16 as an installed product/installed assembly
17 test.
18 MR. FITZ: As Ellis had alluded to,
19 this would be used for the basic model. The
20 idea is that the manufacturer possibly at its
21 own site, if it desired to do the test on its
22 own site, using some kind of third party that

1 would come into their facility would test a
2 basic unit and get a value for the steady
3 state infiltration. That's what was proposed
4 in the NOPR.
5 MR. SACHS: So the Department is --
6 Again Harvey Sachs. The Department assumes
7 that any field erected testing would be done
8 under the authority of the local jurisdiction
9 and not be a concern for -- Otherwise it would
10 be a concern for assemblies governed by this
11 rulemaking.
12 MR. KIDO: Can you repeat the
13 question? I didn't get the last part.
14 MR. BROOKMAN: Yes. Harvey,
15 please. I didn't either.
16 MR. SACHS: Okay. Harvey Sachs
17 again. My point is that I'm all in favor of
18 factory tests. On the other hand, I think
19 this morning's discussion established that
20 there are major sources of variability of
21 infiltration that relate to site assembly, as
22 for an example, the field joint between the

1 panels and the floor. And doing a tracer gas
2 decay on the basic model will not address the
3 creativity of the assemblers in the field in
4 developing auxiliary infiltration paths.
5 MR. BROOKMAN: Claire, do you want
6 to try that?
7 MS. GAGNE: This is Claire. I'd
8 just like to clarify that we're also
9 interested in understanding how people react
10 to this proposal in the context of what was
11 discussed earlier today, the potential of an
12 in-field assembly model for evaluating how
13 these perform.
14 MR. SACHS: If I might be permitted
15 one other comment. With the exception of the
16 question of the door itself, it's not clear to
17 me that the Department has a strong reason to
18 favor the tracer gas decay over a blower door
19 test and it might well be that either would be
20 acceptable at least for some classes of
21 equipment.
22 MR. BROOKMAN: Okay. This

gentleman first and then to Fred and back to Ellis. Please say your name.

MR. OWEN: Kenny Owen, Master-Bilt. I would propose that this method -- I don't disagree with the tracer gas method as a way to measure infiltration. But in reality the infiltration with the door shut, with the panel sealed properly, is negligible and we shouldn't even be arguing about it because it's such a smaller thing compared to the infiltration of even one door opening.

MR. BROOKMAN: Thank you.

Fred.

MR. MINELLI: Fred Minelli. I want to agree with what Harvey said. The real issue is energy savings and what happens in the field after the installers are finished with it. I agree with what Kenny said that this infiltration issue is pretty minute.

And I also want to reiterate that we talked about component testing this morning and we do sound attenuation testing. We do

1 water infiltration testing. Your infiltration
2 is no different than that. And that test
3 exists. It's something we could do easily.
4 It does not involve a huge cost of setting up
5 complete units with refrigeration, with glass
6 doors, with lighting.
7 It's a much simpler process to get
8 us where we need to be if we're not able to
9 get the installer in the field or the GC to do
10 the certification on a product. What we're
11 trying to do from a manufacturer's perspective
12 isn't going to give us that true energy
13 savings as a result of the installation in the
14 field.
15 MR. BROOKMAN: Ellis.
16 MR. CRAIG: I noticed the fact that
17 third party testing, if you do it in the
18 field, is each installation out there going to
19 get a third party individual to come in and
20 test the walk-in. I mean there's some
21 practicalities of this. I don't see how it
22 would be practical in any way to do a test

after it's up unless somebody said, "Hey, this thing doesn't work." Then you might get into testing.

But to do it on every unit, that would be very burdensome. In your document, it said it would be $1,000 to $5,000 to -- That's what it says in the document. And that would be pretty burdensome, especially if it's third party. It would be more than $1,000 if it's a third party coming in. Just traveling alone is going to be $1,000.

MR. LLENZA: Charles Llenza, the Department of Energy. I guess the only value of a third party test would be if we have component level standards. Right. And we go with that. But then we want to have an assurance of certain level of performance in the field as assembled and we considered that the infiltration factor would be one of maybe two, three factors we would want to test to make sure that the infiltration is either minimum or none.

1 And that would be a way of checking
2 that the envelope is tightly put together and
3 maybe that's sufficient to warrant to
4 certifying that particular. But that would be
5 a consideration. It's not finalized. So I'm
6 saying that.
7 MR. BROOKMAN: Yes. Harmon.
8 MR. LEWIS: Maybe you keep in
9 perspective that the average walk-in, say,
10 single coup or sales -- with refrigeration, an
11 8 X 10 maybe $8,000, $9,000 just grabbing it
12 off the head. You can't spend $1,000 or $2,000
13 or $5,000 measuring that little bit of air
14 infiltration for that poor restaurant owner
15 that the National Restaurant Association says
16 -- it's a mom and pop type restaurant -- 70
17 percent of them fail in the first year based
18 on money. And you can't add that burden on
19 them or no restaurants can survive after that
20 first year.
21 MR. BROOKMAN: Okay. Thank you.
22 MR. LEWIS: You have to keep that

in perspective.

MR. BROOKMAN: Right.

MR. MITCHELL: I would have to agree with what Kenny Owen stated earlier that the air infiltration would be probably a minimal contributor to the energy loss if you throw out the door opening. And so slide 74 makes a statement that exchange accounts for a large proportion of the energy use and that wouldn't be true unless you're talking about door opening.

MR. BROOKMAN: Okay. Everybody.

MR. FITZ: That was a good segue. We're now going to talk about door opening infiltration. Conceptually, air passes into and out of an open door. The cold denser air escapes on the bottom half of the opening. And the warm, less dense air exchanges through the top half. It mixes inside the walk-in and then this increases the load on the refrigeration system.

We've talked it about this morning.

1 There are a number of parameters that impact
2 the actual amount of air that is exchanged.
3 That includes the size of the door, the
4 specific air properties, you know, humidity,
5 temperature, how frequently the doors are
6 opened, how long they're opened for, etc.
7 So in order to account for the
8 variation that's in the marketplace as people
9 have commented, DOE is proposing the use of
10 ASHRAE described calculation methodology for
11 accounting for door opening infiltration. So
12 we'd like to take comment on the use of a
13 calculated method for accounting for
14 infiltration.
15 MR. BROOKMAN: Yes. Steve.
16 MR. DUNLAP: I agree with the DOE
17 on the calculated method because of all the
18 variability in the field. I think that's the
19 best was to go with the door openings,
20 duration, with the typical parameters and
21 we've got some comments on parameters of door
22 opening events and devices. I don't know if

we're yet on the testing effectiveness values.

MR. FITZ: We're talking about that, yes, the next slides.

MR. DUNLAP: That that would also -- That was suggested by the DOE for testing, testing of strip curtains, air curtains. My suggestion is that anything that performs consistently over time like an air curtain that would be a great thing to test.

A strip curtain is kind of low tech stuff. It doesn't perform consistently over time and I would propose that the DOE consider that as just a calculation or provide a degradation calculation over time as opposed to a test on a strip curtain.

MR. BROOKMAN: Thank you.

Please.

MR. OWEN: Kenny Owen, Master-Bilt. I agree. We've used this method using the ASHRAE numbers for infiltration for years in our load calculation programs. I think it's a great thing to do.

1 My question is how are you going to
2 account for the fact that a door opening in
3 Minneapolis in the wintertime with five
4 percent humidity versus a door opening in New
5 Orleans in July which is 85 percent humidity.
6 You've got a huge amount of difference in BTU
7 load going in that time. So something in our
8 calculation has to address that I think.
9 MR. FITZ: That's a great question.
10 There are details about just like the
11 assumption for the temperature of the
12 floorless coolers. There are numerous
13 assumptions that the Department of Energy has
14 proposed in a NOPR, for example, the specific
15 temperature which you can use for calculating
16 the door infiltration, specific humidity.
17 Also there are assumptions about the door
18 opening duration and the door opening
19 frequency and it's broken out by three
20 different door types, the passage doors,
21 display glass doors and then these large
22 freight doors that we've also been talking

about.

MR. OWEN: Kenny Owen again. When I build a box for New Orleans, I'm going to put a bigger refrigeration system on there because I know that load is going to be bigger. When I run through the standard calculations with standard assumptions, it's going to appear that that box has too much refrigeration and I'm going to be penalized.

How are we going to normalize that data and allow -- I might put a two-horse compressor on for Minneapolis, but I might put a 3.5 or so for New Orleans for the same exact box. And that would be appropriate for those applications.

I'm trying to use the same calculation to hit the same equation. If everything is normalized, I feel like I'm going to have a lot of trouble with that New Orleans trying to meet the energy numbers that we agreed to.

MR. FITZ: So the Department of

1 Energy for this test procedure is not
2 suggesting that the rating that is associated
3 with an envelope be used specifically for
4 helping an end user decide what size
5 refrigeration equipment they need. You're
6 welcome to do that, but it's really for
7 capturing the performance of the envelope
8 itself.
9 But if you're helping a customer
10 with specific regional variation in size of
11 refrigeration equipment, that's separate from
12 this issue.
13 MR. BROOKMAN: Tim.
14 MR. DYE: Tim Dye. I guess mine's
15 more of a question than a statement. But in
16 the ASHRAE defined equations, okay, if my
17 memory serves me correct, there's only one
18 definition of counting door openings. Is that
19 correct?
20 MR. FITZ: That's right.
21 MR. DYE: And I believe the
22 equation was based more for case business,

supermarket, frozen food cases, than it would be for this application. And I'm just wondering. That's one statement. Now I guess maybe a question.

But the second item would be is there needs to be a distinguishment between a glass display door and a service door because the service door obviously is not going to be opened as much as what a display door will.

MR. FITZ: That's right. And in the proposed method by the Department of Energy there are distinct assumptions for --

MR. DYE: Okay. I just wanted to be clear.

MR. BROOKMAN: Okay.

MS. LEGETT: Yes. And I'd like to add -- Sorry. Rebecca. If you have suggestions as to what assumptions we should use instead of the ones in ASHRAE please submit those.

MR. BROOKMAN: Thank you. Okay.

MR. FITZ: Finally, talking about

1 infiltration reduction devices. These include
2 strip curtains which we've already talked
3 about, air curtains and also these automated
4 curtain doors that we've discussed at some
5 length this morning as well. These are
6 devices that reduce the air infiltration when
7 the door is open.
8 So to measure the performance of
9 these devices if a manufacturer wants to
10 receive credit for shipping them with the
11 walk-in cooler or freezer, DOE is proposing
12 the use of the same gas tracer method. And
13 just to very quickly summarize how it works,
14 you install your infiltration reduction
15 device. As an example we're using strip
16 curtains. You perform the gas tracer test to
17 get a measurement for how much air exchange
18 occurs when the device is in place and then
19 you repeat the same test with the device
20 deactivated or removed. And then you can
21 calculate an effectiveness of this particular
22 device.

It's also important to note that in the NOPR there was a typo and it was missing this one minus term on the equation.

MR. BROOKMAN: David.

MR. GRIFE: David Grife. I'm just trying to get a handle on all this. Every single day I have people that quote any number of jobs. As most walk-in manufacturers know, we wished we got paid on quotes because we'd make a fortune as opposed to what actually comes through the door.

Am I having to write new software that every time I quote it's calculating everything from doors to air curtains to floors to panels to put together some type of number that now hits this DOE number?

I'm trying to understand in the real world how this is going to end up at the end for me and my business day in and day out when this happens to be an arena where other products get quoted at the point of sale. They pull out a catalog and they quote here.

1 They have to call us and we have to quote.
2 And I know we try to get 24 hours and I'm sure
3 most do 24 or 48. And they're demanding even
4 faster and faster.
5 And now I'm questioning what else
6 do I have to do when I send out a quote. Am I
7 getting new DOE numbers? How do you see this?
8 MR. FITZ: I think that's a great
9 comment. If you have specific issues with
10 burden that's placed on you or any other
11 manufacturers you should submit that as a
12 formal comment.
13 MR. LLENZA: Just a quick comment.
14 I know that at time here this looks like we're
15 going to be overburdening the industry with
16 all sorts of data points, etc. I think the
17 purpose at this point is we have to get as
18 much information on all these points as
19 possible and that the Department ends up
20 adopting everything is most unlikely. We'll
21 have to make some tradeoffs based on the
22 comments.

1 So your comments are well taken and
2 this is basically the function of these
3 meetings is to get the feedback from the
4 people out in the field and the people out in
5 the industry as to does this make any sense
6 and using these to give credits in terms
7 coming up with some kind of performance
8 standard for the entire system.
9 If it's not practical because of
10 some of the issues of how this would be
11 implemented, then these are the things we want
12 to hear here at the meeting. So don't be
13 frustrated yet. We're not there yet.
14 (Laughter.)
15 MR. BROOKMAN: Let's hear from
16 another manufacturer. Ellis.
17 MR. CRAIG: My question is I keep
18 hearing the manufacturer will get credited.
19 And credited sounds like we have this bank
20 account somewhere that there's money going in
21 and then we get to take it back out. That's
22 not what you're saying, is it? I mean you're

1 kind of saying something like --
2 MR. FITZ: I'm sorry. Yes. You're
3 right. I'm really just saying that the
4 manufacturer has some way of reflecting their
5 better, their more improved, products versus
6 another, someone in the marketplace.
7 MR. CRAIG: Okay. That's what I
8 wanted to understand.
9 MR. BROOKMAN: Jon.
10 MR. McHUGH: So speaking of
11 credited and money, I'm very supportive of
12 this and it does actually give the opportunity
13 for utility programs to provide incentives for
14 manufacturers that have products that are
15 better performing than what DOE will
16 ultimately provide as guidance on the minimum
17 efficiency. Then there's opportunities with
18 ratings to give incentives based on enhanced
19 efficiency.
20 And related to this test and I
21 think Mr. Dunlap should be interested in that
22 what I think also needs to happen is there's a

1 description about infiltration. But also the
2 timing of these doors, there needs to be some
3 description of the benefit of fast-acting
4 doors for reducing infiltration and
5 potentially that's actually a new market
6 opportunity for you in terms of that you
7 actually have a DOE recognized rating for the
8 benefits of those doors.
9 MR. BROOKMAN: Thank you.
10 Steve.
11 MR. DUNLAP: Thank you. Steve
12 Dunlap again.
13 They have parameters that if given
14 the right parameters will show the value of a
15 fast-acting door versus a manual door and we
16 have comments that we've prepared for you.
17 Presently the parameters are, in our opinion
18 and respectful to you, just dead wrong. So
19 we're going to come back with some parameters.
20 And just to give you an indication
21 in our application, a manual door could be
22 open for six hours. A fast-acting door an

hour and a half for the same application.

MR. FITZ: Okay. Moving on to all the electrical devices that are associated with the envelope. Because all electric devices already have specific codes and requirements that specify that they have a power requirement labeled on these components, DOE is proposing the use of the nameplate rating on everything from heater wires to lights. These are just examples. You can imagine the various electrical components that may be in a walk-in. To use that nameplate rating to then calculate the electricity consumption associated with them.

But it's important to note that while the nameplate is just an instantaneous power consumption, you obviously have to take into account how long this device is turned on throughout the day or throughout the year. So in order to account for that DOE is proposing the use of a number of assumptions based on whether or not these devices are controlled by

1 some mechanism that's shipped with the walk-
2 in.
3 For lights, for example, currently
4 as published in the NOPR, DOE is proposing the
5 use of this factor called percent time off.
6 So this is the idea of 25 percent of the day
7 if a light is not controlled by an auto shut-
8 off system of some type, then it's assumed
9 that the light will actually be on for 75
10 percent of the day. Or the inverse of that is
11 that it's actually just turned off 25 percent
12 of the day. And then you can see the
13 assumption associated with the lighting that
14 is connected to some type of control system.
15 So there are a series of
16 assumptions for the major components, lights,
17 anti-sweat heaters, possibly motors that are
18 associated with an air curtain, for example.
19 But then there's a blanket assumption in order
20 to capture all of the possible electrical
21 devices. If it doesn't fit within one of
22 these major components, DOE is proposing the

1 use of a percent time-off of zero. And if
2 these other devices are shown to be connected
3 and controlled in some way, then DOE is
4 proposing the use of 25 percent value.
5 We'd like to take comment on these
6 assumptions.
7 MR. BROOKMAN: Ellis.
8 MR. CRAIG: We have an anti-sweat
9 heater that really doesn't work unless it's
10 necessary meaning that the wire itself is self
11 regulating. Under that situation, would that
12 be considered -- it doesn't really cover it
13 under here -- a relative humidity which it
14 doesn't test relative humidity. It really
15 tests whether it's getting cold or not. Or if
16 it's getting cold, then it turns on. If it
17 isn't getting cold, it doesn't turn on.
18 MR. FITZ: Dew point.
19 MR. CRAIG: One foot could get warm
20 and the rest of it could stay cold. So it's
21 the most efficient use of a heater wire you
22 could do, but it's not able to be valued in

this formula.

So, under this formula, you're going to have to eliminate that. We'd have to go to a different heater wire which would be more energy because they're by the foot. In other words, when they're on -- And you've got them down here as 100 percent almost unless they're on a timer. So then you'd be burning it whether you need it or not.

We'd have to go to that kind of heater wire which is where we were to a heater wire now that doesn't do that. We need to have that so we can use that heater wire.

MR. FITZ: So I'm a little bit confused about it. Can you --

MR. LLENZA: Let me just clarify. It's a good suggestion. I don't think we thought about it.

MR. CRAIG: Okay.

MR. LLENZA: So I would just say submit your comments. Give us an estimate of --

MR. CRAIG: I've already done that.

MR. LLENZA: Yes. So that's what we need. And that will be an amendment to these assumptions.

MR. BROOKMAN: Thank you.

MR. FITZ: Any other comments?

Tim.

MR. DYE: Just a point of clarification. When you're saying "lights," it's a generic term. Is this overhead or display lights or both?

MR. FITZ: All lights.

MR. DYE: All lights. Okay. With the advent -- In just the last three or four years with the advent of LED lighting, you know without any motion sensors, we're able to pull out 90 percent of the energy costs now and it's cost prohibitive to put motion sensors because the motion sensor takes 12 years to pay for itself because you're taking out so much energy. Will that be addressed in any way or --?

1 MR. FITZ: Yes. As I described,
2 the nameplate rating of the LED bulbs. An LED
3 light or a strip light, for example, on the --
4 of a glass door, you know better what the
5 specific wattage is. Anyways, you use that
6 value to then calculate the energy
7 consumption.
8 MR. DYE: Okay.
9 MR. FITZ: So that's how you
10 differentiate between a fluorescent or an LED.
11 MR. DYE: Thank you.
12 MR. BROOKMAN: David, do you have a
13 comment?
14 MR. GRIFE: No, not really.
15 MR. BROOKMAN: Okay.
16 MR. FITZ: So then the final piece
17 because of these electrical devices that are
18 sited inside the walk-in and since they are
19 consuming electricity and actually generating
20 heat, as a couple of examples, lighting and
21 also the anti-sweat heater on glass doors, a
22 major portion of this heat or really 100

1 percent of it stays within the walk-in and
2 actually adds to the load that's put on the
3 refrigeration equipment.
4 In order to account for this extra
5 heat load, the Department is proposing the use
6 of a conversion factor or some way to take
7 this heat load and represent it in the form of
8 electricity consumption. This is normally
9 dealt with, this factor known as the Energy
10 Efficiency Ratio, and the Department is
11 proposing the use of EER of 12.4 for coolers
12 and 6.3 for freezers and this is coming
13 directly from AHRI 1250 that is associated
14 with the refrigeration equipment.
15 Basically, this makes for an easier
16 metric for rating a given piece of equipment.
17 And we would like to take comment on the use
18 of these conversion factors.
19 MR. BROOKMAN: Ira.
20 MR. RICHTER: Yes. Can you relate
21 that to indoor or outdoor perhaps condensing
22 temperatures what we're looking at there?

1 MR. FITZ: Like a number of other
2 assumptions that the DOE has made, we
3 recognize that in the field whether it's an
4 outdoor unit or sited indoors, whether it's in
5 Louisiana or in Alaska, there's lots of
6 variation. Instead of trying to capture all
7 the possible variation for the purposes of
8 rating the envelope, we're just using one
9 assumption for freezers and one assumption for
10 coolers again to create a level playing field
11 for rating the products.
12 MR. BROOKMAN: Okay. Any
13 additional comments on nominal energy
14 efficiency ratio?
15 Yes. Jon.
16 MR. McHUGH: Could you explain how
17 this rates to the use of AHRI 1250 since it's
18 also accounting for the energy consumption of
19 lights and those kinds of things?
20 MR. FITZ: For the purposes of
21 rating the envelope itself and the components
22 that --

MR. McHUGH: They're calculating EER that includes not just the compressor energy but also the fan energy.

MS. LEGETT: This is Rebecca. I think we're talking about different things here. When formulating some of the numbers for the 1250 I understand that a number of assumptions about the envelope were used given that a manufacturer for refrigeration may not know all the envelope parameters.

This is exactly the same situation from the other end. This is the manufacturer of an envelope who doesn't necessarily know what refrigeration system will go on the envelope. So to create a level playing field for everyone, we're using these values. That's all this is.

MR. BROOKMAN: Thank you that explanation.

Additional comments on this comment box?

(No verbal response.)

MR. FITZ: All right. Just again, this is a summary of all of the issues we just discussed related to the envelope. Now I'm going to pass it off to the refrigeration equipment discussion.

MR. BROOKMAN: I think we should take a break right now and let's see if we can do this in two minutes. I'm not even sure that the coffee shop is open at 3:30 p.m. I think so. A ten minute break. There are water fountains at both ends of the hall. Everybody can use the restroom.

And then we're doing pretty good in terms of the coverage here.

PARTICIPANT: (Off the microphone remark.)

MR. BROOKMAN: No, we'll be done. Yes, I think another -- Oh, less than an hour we'll be done. So we'll resume in ten minutes which would be 3:40 p.m. about. Okay. And we'll push this towards completion. Off the record.

(Whereupon, a short recess was taken.)

(Whereupon, the proceedings in the foregoing matter went off the record at 3:33 p.m. and went back on the record at 3:41 p.m.)

FACILITATOR BROOKMAN: We are on the home stretch here, folks. Let's resume.

We're moving into proposed test procedure refrigeration system. Hopefully, all of you have had a chance to get revived.

Let's take our seats. Let's begin as we --

PARTICIPANT: No.

PARTICIPANT: They're getting rebellious.

FACILITATOR BROOKMAN: We're doing well here, with the exception of one or two among us.

Okay. And, I apologize, we are going to hear from Gopal. Okay. Here we go. We're starting.

MR. BANDYOPADHYAY: Okay. This is

Gopal Bandyopadhyay from Pacific Northwest National Lab, and we are going to discuss just now the proposed test procedure for the refrigeration system.

So here, in fact, we will not go into too much of details, primarily because it has been developed by AHRI. And the other reason is that it has been there with you for a long time, so I guess there would be -- they have been studied in detail.

So what we will do just now is we will briefly, very briefly, describe the test methods, the test conditions, and explain the calculations which are involved, and, of course, we will actually also show finally how to -- what to do with it.

So this is the test procedure which DOE is proposing to adopt. This is AHRI 1250, which has been developed over I think about the course of six months in last year, and the AHRI actually has made this available in their website I think since September 2009, so which

is about a good six months ago. So it is really presumed that this will be -- really have been -- this will have been studied actually in some more detail.

So this is, again, test procedure which has been covered in this NOPR, and the important thing here is that this test procedure actually kind of measures the efficiency of the refrigeration system for the walk-in by defining a factor, efficiency factor, or annual walk-in energy factor, which is called -- which is -- actually we are calling it AWEF. And this AWEF also helps us compute the annual energy consumption for any walk-in system.

So in this we just familiarized ourselves with the basic subsystems of air refrigeration system. And what we have inside the box, inside the envelope, we have got fans and the coil. And this is also known as the unit cooler.

And outside the box we have got the

condensing unit, comprising of the compressor, and the condenser and -- the condenser fan. And there is an expansion valve which regulates the flow of the refrigerant in the loop.

So the -- I get to introduce this here, because there are -- there are separate provisions in AHRI 1250, which applies to the various subsystems.

And also, one more thing, I think I should let you know that the important and the key members who are actually instrumental in developing AHRI 1250, they are also present in this room. So I think -- I mean, it will be much easier for them even to address some questions or concerns that you might have.

So refrigeration systems for the walk-in -- walk-in coolers and freezers primarily comes in two different set of configurations. To the left we have the dedicated systems, and we have the multiplex systems to our right.

In the dedicated systems, the important thing is that the compressor and the condenser are meant for serving the unit cooler and meeting the refrigeration load of only one single box. So there is a one-to-one correspondence between the two.

And to the right we have got the multiplex system, where multiple compressors they actually stay in some kind of configuration in a rack, and there is a condenser which is outside. There may be bank of condensers which are outside. And they serve the -- the one box or maybe more boxes or display units also sometimes.

So what do you want to really -- there is a distinction between these two. I mean, as you can -- as you move on, we will see that there are some issues here. And so here again the dedicated systems, we are actually -- we are splitting into two different types.

One is we have got a packaged

system where the unit cooler and the condensing unit, they are attached to the structure of the envelope itself, and the other thing is a split system where the unit cooler is of course inside the box, and the condensing unit actually is often outside. It is exposed to the ambient outside.

So about the multiplex system, the important thing here is that in this test procedure this is not covered. So this test procedure doesn't address the issue of testing multiple systems, multiplex systems.

So in this test procedure, AHRI 1250, there are three types of systems which have actually been covered. One is the matched system, where actually the unit cooler paired with the condensing unit are tested together as a complete system.

So, and it also provides the testing for the unit cooler and the condensing unit separately, which are called it a mix-match system. I mean, there may be different

manufacturers or there may be the same manufacturer who are manufacturing both the unit cooler and the condensing unit, but there are separate tests which are done on these two subassemblies.

And, finally, we have the third items, the configurations which are covered here, which are really pertains to -- which pertains to the unit cooler paired with a multiplex system.

So this actually -- the mix-match system in particular is of great interest to people who have got a very wide variety of refrigeration systems, because this really allows you to reduce the number of tests. So there is a pathway for reducing the number of tests that you carry out by using this mix-match methodology of AHRI 1250.

I mean, to give you an example, suppose you have got three, let's say, unit coolers, which you pair with five different condensing units. What you can do actually

instead of testing, let's say, five into three -- 15 combinations -- you can really cut it down to only eight tests, five plus three, and then do the calculation to realize the results, the AWEF, when actually you pair a given unit cooler with a different condensing unit.

So this is a clear path forward to reduce the number of tests which is there in AHRI, and this is an excellent feature, which is actually -- it has been there also in central air conditioning for quite some time.

So the type of tests we have got I will just describe -- I mean, what kind of tests we are doing here. So first we take up the matched system. Matched system primarily in the AHRI 1250, we have the steady-state test, which really measures the on-cycle power consumption and the net refrigeration capacity.

How it is done, okay, I will just give you the outline on this, which is really

that you put the unit cooler in an environmental chamber where you keep the ambient conditions completely controlled. And the same way the condensing unit is also kept in an environmental chamber where the conditions are actually kept under control.

Then, in fact, you allow the system to run and reach a steady-state for about half an hour, and after that you measure some -- two parameters primarily, the refrigerant flow and also you figure out what is enthalpy difference across the coil.

So this gives you the gross refrigeration capacity. From there, you have to subtract the heat which is released by the evaporator fan, so that you get the net refrigeration capacity. So what you see here in the second box here, that has been really coming from there.

Then, we have the on-cycle power consumption, which means that you have to add up the power consumed by the condenser fan,

the compressor motor, and also the evaporator fan, which adds up in total for the refrigeration system, and you have the total on-cycle power consumption.

So this is the kind of -- the most key part of the test is really here. Then, we have got the off-cycle evaporator fan power test, which actually when the compressor goes off there is no load in the system, and that is the time you have to measure the power for the fan.

So this test -- the off-cycle evaporator fan power test has got the advantage, because if there is -- there are good controls, which is really cycling the fan or running the fan at a reduced speed, these tests actually get credit for that situation.

So these are the -- these two tests, first two tests, are essential. They are kind of the core tests, which are done for the -- both the cooler and the freezer, but the freezers there are two more tests -- the

1 defrost tests, which are done for the -- let's
2 say just to measure the defrost cycle, energy
3 input, how much electricity -- I mean,
4 kilowatt hour has gone into the test to --
5 over the entire defrost cycle, and you also
6 find out what is the duration of the defrost
7 cycle.
8 Then, there is optional defrost
9 test, again only for freezers, which measures
10 the time interval between the defrosts.
11 So then we move to the mix-and-
12 match system. As we explained, the mix-match
13 systems, the unit coolers and the condensing
14 units, they are tested separately. They are
15 not in the combined system.
16 So there, again, unit cooler -- we
17 have these -- the same way we have the
18 capacity test, we have off-cycle power test,
19 and the net refrigeration capacity is measured
20 again in the same way like we -- like I
21 explained earlier. And we have also the -- it
22 is common, nothing different. The only

1 difference is that now we are measuring the
2 refrigeration capacity at two different
3 suction temperatures.
4 Now, the reason that we are doing
5 this is because we need the cross-plot, which
6 really allows us to match this unit cooler
7 with any given -- any other condensing unit.
8 So this idea has come really from -- again,
9 from air conditioning experience.
10 Then, of course, from unit cooler
11 tests we must also do the condensing unit
12 test. That is the same way we do the on-cycle
13 test, and then on-cycle power consumption.
14 And here the difference is that because the --
15 we don't know what fan is -- will be actually
16 -- evaporator fan will go into the unit
17 cooler, so here we are measuring the gross
18 refrigeration capacity, but not the net
19 refrigeration capacity. So this is the
20 important difference.
21 Then, the last of those three
22 configurations, we have got the unit cooler

paired with the multiplex system, and there again we go through the same series of tests -- the capacity tests, the off-cycle fan power consumption test, then of course the energy inputs for the defrost cycles, and also the defrost -- the optional defrost test, where actually you measure the time interval between defrost.

So now we talk about just the conditions. Actually, these are very brief. After all, there is -- AHRI 1250 is a fairly long document, and it has got plenty of equations to keep you busy for weeks.

(Laughter.)

So -- anyway, so the conditions here I am just summarizing. Primarily, the conditions which are varied are the temperature inside the box, the temperature inside the box, which really means the entering air temperature in the box. So for coolers this is maintained at 35 degrees Fahrenheit, and for the freezers it is

1 maintained at minus 10.
2 And the second parameter we vary is
3 the condenser location -- indoors, outdoors.
4 Indoors you get the condenser at 90 degrees
5 Fahrenheit. For outdoor you vary at 35
6 degrees, which is kind of cold weather
7 conditions, maybe -- maybe Minneapolis in May.
8 (Laughter.)
9 And the 59-degree Fahrenheit, and
10 of course 95 is not good enough for some parts
11 of Texas.
12 Okay. So then the compressor types
13 also -- if it is a single capacity, fixed
14 capacity system, we do the testing only at one
15 condition. That is a single capacity. The
16 two capacity you must do at both capacities.
17 And of course, in variable capacity
18 compressors you have to do this test actually
19 at minimum and maximum and also an
20 intermediate.
21 So this gives you the idea about
22 the number of tests which are required for a

given situation. Like when you have, let's say, a variable capacity compressor, and you are trying to test that variable capacity compressor with a specific unit cooler, you have to really run this capacity test for nine different configurations, because there are three temperatures involved -- 35, 59, 95 -- for the outside ambient. And the capacity levels for the compressor are also three -- the minimum, maximum, and the intermediate.

So three into three is nine. So that is actually quite involved. But for single capacity systems, it is really only those three tests at three temperatures. That is all you've got to do.

Okay. So now I think we come to the crux of the -- this presentation. Actually, DOE examined AHRI 1250, and it believes that these methods are well suited for testing walk-in coolers and freezer refrigeration systems.

The reasons are this is really

1 based on the earlier experiences of AHRI 420,
2 520, and also ASHRAE 23, which have been there
3 for quite some time. So I think it is built
4 on experience.
5 And the second thing is that, of
6 course, that the conditions which are there,
7 the test conditions which are there are very
8 much applicable for the operating conditions
9 and the configurations of the walk-in coolers
10 and freezers. This is number 2. This is
11 number 3, that it is really industry
12 association standard. And, of course, it
13 really gives us the flexibility to give credit
14 for the energy-saving technologies.
15 So we come to the main issue here,
16 that whether this is an appropriate test
17 procedure for refrigeration systems used in
18 walk-ins. And DOE invites comment -- comments
19 on this issue.
20 FACILITATOR BROOKMAN: Comments on
21 the appropriateness of this test procedure?
22 Yes, Harvey Sachs.

MR. SACHS: Harvey Sachs. As I said this morning, I think AHRI 1250 is quite an accomplishment, and my compliments to all the chefs. Nonetheless, I am left with a number of second-order questions, which we may not be able to address this round. They may have to come later.

But you point out, Gopal, in your fourth bullet that it gives credit for energy savings technology, such as variable speed evaporator fans. What is not clear to me is an implementation issue that I offer as a specific example, and it may be wrong, is how I am going to handle the question of certifying that I am actually activating variable speed evaporator fan operation with variable speed condensing unit in the mix-and-match scenario.

The energy -- the general point is that the controls become increasingly important with advanced equipment, and it is not clear to me how the value of really good

controls will be propagated across all of these configuration classes.

MR. BANDYOPADHYAY: Okay. What I know and what I can foresee is that the control aspects for the evaporator fans is definitely taken into account when you do this off-cycle power test. But about the condenser fan, how really it will impact I am not too sure, but I will ask maybe Daryl, and others can -- who are from AHRI, they can address this.

FACILITATOR BROOKMAN: Daryl, thank you.

MR. ERBS: Daryl Erbs. I mean, Harvey raises I think a legitimate issue that I'm not sure we have the answer to. I mean, if it's how you make sure that the control is either supplied together with, let's say, the unit cooler, if it's a variable speed evaporator fan, you know, do you allow a third party control? I mean, it's not uncommon for people to take refrigeration systems that may

1 come from two manufacturers of the
2 refrigeration system and then purchase a third
3 party control and install that into the entire
4 system.
5 I'm not sure I have an answer for
6 how we -- how we incorporate that type of
7 integration when we are asking the
8 manufacturer of the unit cooler to, you know,
9 test his system and rate it.
10 FACILITATOR BROOKMAN: Rebecca.
11 MS. LEGETT: Yes. This is Rebecca.
12 I mean, we have that issue regardless. I
13 mean, that is really an enforcement issue as
14 to whether manufacturers are actually
15 providing what they say they are providing. I
16 mean, that's -- I see that as a separate
17 issue, and maybe Charlie can speak to that.
18 MR. LLENZA: Yes. This is Charlie
19 Llenza, Department of Energy. I think that --
20 we had a little bit of an off-bar discussion
21 about the enforcement and compliance issues,
22 that this rule -- that the general rule for

1 the walk-in cooler/freezer is going to
2 generate.
3 The test procedure part of this
4 does not necessarily clarify the enforcement
5 issues and necessarily who -- how the
6 compliance issues will be addressed.
7 We are in the middle of doing a
8 standards rule, and I think that as we go --
9 in the next month or so we are going to have a
10 pre-analysis meeting. This will probably be
11 something to be continued at that meeting, and
12 then continue through the process with the
13 standard, because this will be something that
14 will have to be resolved as we go through the
15 process of coming up with a standard.
16 The biggest concern here at this --
17 for the test procedure is getting the metrics
18 down for what everybody needs to test to,
19 regardless of who is going to enforce it or
20 who is responsible.
21 So while it is important that we
22 understand this for the future that is coming

very soon to us for the standard, it is not something, I don't think, we are going to resolve at this meeting.

FACILITATOR BROOKMAN: Let's hear from this gentleman back here. Yes. Your name, please, for the record.

MR. BEATON: Warren Beaton, Emerson. I think the air conditioning rating standard takes this problem into account by rating only the combination of the high and the low side together as one unit, whereas if it's a single-speed system it -- they have separate ratings for the -- you can have a rating for the condensing unit only, and then combine it with the evaporator.

So that means that you specify the controls and the high side and a low side together as one system to rate with a variable capacity compressor and variable speed fans.

FACILITATOR BROOKMAN: Thank you. Harvey Sachs.

MR. SACHS: Harvey Sachs. Thank

you, Warren. And this is perhaps more addressed to Daryl. Am I to infer, then, that I do not have a compliance path for mix-match with a variable speed compressor and a variable speed fan, or at least I don't have a way to assure that the controls are implemented, so that we will get the benefits?

MR. ERBS: Daryl. I think we can accommodate the case of a unit cooler, which has a variable speed fan, which may be able to do what it needs to do, irrespective of what condensing unit it is attached to.

So I think one of the more common scenarios that we have discussed is if the compressor is off, perhaps the evaporator fan could run at a lower speed and save energy during the compressor-off time, because you need to mix the air up in the box, but maybe it doesn't have to be at the full speed.

So I think that can be the -- when we start talking about variable speeds, condensing units, and unit coolers that go

with them, you know, to my earlier comments, I think that is something we have to tread a little bit cautiously, that we don't cover something with a standard that we don't need -- we don't completely understand how to do.

And I don't think there is an immediate need in the marketplace, but, you know, we will be continuing to look at the standard and try to address those issues.

FACILITATOR BROOKMAN: You can see the question here in the comment box. Additional comments? Yes, Jon.

MR. McHUGH: So first off, I think it is critical before DOE sets upon a final rule for the test method that they understand how it would be enforced, as you may find that you paint yourself into a corner by setting up rules for things that are unenforceable.

I talked earlier about the desirability of having component standards. And even though I -- you know, I worked with the AHRI team, and I think they have done a

lot of really good work here and made some great improvements, I am still a little concerned that, as I mentioned earlier, you know, having a tradeoff approach allows someone to say, "Well, my particular condensing unit, it may be marginal, but, hey, it actually passes if you use this really good, you know, indoor unit. And vice versa, I've got this marginal indoor unit, but, hey, it passes if I use a really good condensing unit."

And so it creates, I think, some confusion in the market in terms of saying, "Does this piece of equipment provide the desired efficiency?" Now I have, you know -- potentially, I am going to combine these two marginal units that I purchased from two different manufacturers, both of them saying, "Well, you know, when I put them together with this other thing, it did work."

So to me that is a really critical enforcement issue for this test method. Now,

potentially this method, all the hard work that went into it, can be used to define what is the minimum efficiency of the indoor unit, you know, potentially fixing -- fixing the condensing efficiency, you know, essentially like that is done with the rack type system test. So something to think about.

The other thing is is that --

FACILITATOR BROOKMAN: Pause there, Jon.

MR. McHUGH: Okay.

FACILITATOR BROOKMAN: Daryl wants to respond.

MR. ERBS: Yes. I just -- I guess to say that it is somehow not achieving the same end objective, because you use a lower efficiency half to the system, I don't think it matters in the end how -- you know, the objective will be to try and achieve some minimum efficiency for the system however -- and we want to give people as much flexibility to spur innovation, to come up with the lowest

1 net cost way of getting there, and so I don't
2 think there is anything wrong with that.
3 FACILITATOR BROOKMAN: Charles
4 Llenza.
5 MR. LLENZA: I think the issue
6 becomes -- is performance-based. So if we set
7 -- if we set standards for the components,
8 that's one thing. But then, because our
9 mandate is performance-based, we -- part of
10 the flexibility that we are supposed to be
11 providing here is multiple paths to achieve
12 the performance level, and sometimes the
13 tradeoff will be a mix and match of equipment
14 that is not at the highest level of efficiency
15 if it was taken individually.
16 FACILITATOR BROOKMAN: Karim.
17 MR. AMRANE: Right. And I would
18 like to stress this point exactly. This is a
19 performance standard. And we are doing the
20 same thing, for example, for residential
21 equipment today. You have condensing unit,
22 you are matching a coil with a condensing unit

-- system. Sorry, you are matching the coil with the condensing unit, and it is exactly -- we don't want to get into now trying to regulate every piece of the refrigeration system -- the condensers, the evaporators. That is not something that industry will be supportive of.

FACILITATOR BROOKMAN: Charles.

MR. LLENZA: Charles Llenza. In case, for example, the prescribed standards that Congress sent us, they had motors that were at a higher efficiency than the normal motors, and they were prescribed. So that would be a case where it is mandated, and we -- at that point, that is the minimum for us to accept.

FACILITATOR BROOKMAN: So, Jon, back to you.

MR. McHUGH: Yes. So, again, the -- what I heard earlier is that the -- that there are prescribed requirements in this standard. I think it is important to think

about how these -- how these components are going to be sold, so the standard has to reflect the market -- how the market actually works in terms of people obtaining components from different people.

The standard can be performance. It can be a component performance standard. It doesn't tell you exactly what FIN spacing and all of these sorts of things, so there is all sorts of flexibility for the manufacturers to exceed the standard. And remember that this is supposed to be a minimum efficiency standard, so that whatever standard that we ultimately end up with, these are going -- this is just going to be the minimum, and there will still be opportunities to exceed that minimum.

And so by having a rating for the various components you actually help incentivize innovation by improving the efficiency of each of those components. So I think there is some issues associated with

1 providing flexibility for improving each of
2 those components.
3 Now, the other thing related to
4 this standard has to do with the issue of
5 defrost. And I will send some written
6 comments about that, but I don't believe that
7 the defrost test, as it is currently written,
8 provides the desired protections against all
9 of the methods of poor performance with
10 defrost controls, or at least doesn't give
11 appropriate -- it gives credit for high-
12 performing systems, but it doesn't actually
13 identify low-performing systems, because you
14 only get the credit under the optional test.
15 FACILITATOR BROOKMAN: Okay. I am
16 going to pass out these evaluation forms now
17 as we are starting to lose a few people, and
18 we are nearing the end of the content that we
19 are covering. Please pay attention, but
20 before you leave fill out the evaluation
21 forms. The Department tries very hard to make
22 sure these meetings go as best they can.

1 So you can see the comment box.
2 Rebecca?
3 MS. LEGETT: Yes. Thank you for
4 that comment. And I know you made very
5 specific comments in your opening statements.
6 We appreciate specific ways in which DOE
7 should or can improve upon this test
8 procedure, if they do. So thank you.
9 FACILITATOR BROOKMAN: Thank you.
10 Thank you. Kenny.
11 MR. OWEN: This is Kenny Owen,
12 Master-Bilt. We believe that AHRI 1250 is an
13 appropriate standard. We think it is a great
14 thing. I will go back to some comments that
15 were made earlier, in that it can be a very
16 burdensome thing to a small company if we say
17 that every piece of equipment has to be tested
18 in all of these different ways.
19 So we recommended in our written
20 comments that something like a representative
21 sample, a few pieces, five percent, whatever
22 is appropriate, be tested third party, and the

1 rest of the equipment be tested by the
2 manufacturer or even through calculations, you
3 know, and confirmed third party like that.
4 FACILITATOR BROOKMAN: Thank you.
5 Karim.
6 MR. AMRANE: Yes. I would like to
7 add -- this is Karim Amrane, AHRI. We wrote
8 the standard because of the rulemaking
9 process. There was a deadline. We were
10 expecting DOE to come up with a final rule by
11 December, so we wrote the standard in, what,
12 three months? Four months? Very quick. I
13 mean, those guys did tremendous work, meeting
14 almost every week.
15 Several of you were on the phone
16 following this work, so it was an open
17 process. We tried to invite anybody who
18 wanted to be -- to participate in the
19 standard.
20 Now, standards are live documents.
21 They are going to be -- the standard is going
22 to be updated in the future, and we intend to

1 fix anything that needs to be fixed. So I am
2 -- again, we invite anybody to participate in
3 the process when there will be a -- when the
4 standard would be up for revision.
5 FACILITATOR BROOKMAN: I don't know
6 what you -- thank you, Karim.
7 Okay. So then let's -- final
8 comments on this point, because we are going
9 to move on. Yes.
10 MR. BANDYOPADHYAY: Okay. So I
11 think Collin Weber is going to explain to you
12 the calculation methodology.
13 FACILITATOR BROOKMAN: Yes.
14 MR. BANDYOPADHYAY: And also there
15 are some -- a couple of issues on this. So I
16 think I am -- Collin will now come here.
17 FACILITATOR BROOKMAN: Yes. Steve.
18 MR. COMBS: Steve Combs. Before we
19 move on, there is one editorial rewording
20 suggestion in here for this -- where you have
21 the summary of tests for the match system, the
22 mix-match.

1 FACILITATOR BROOKMAN: Can you
2 please give us the slide number?
3 MR. COMBS: Yes, it's slides 97,
4 98, and 99.
5 FACILITATOR BROOKMAN: Okay.
6 MR. COMBS: Where they talk about
7 mandatory defrost tests, and it is qualified
8 as freezer only. Suggest a rewording on that.
9 I am not quite sure what the rewording should
10 be, but to accommodate medium temperature or
11 cooler systems that have other than off-cycle
12 air defrost systems on them.
13 FACILITATOR BROOKMAN: Did you get
14 that?
15 MS. LEGETT: Thank you. And if you
16 -- and if you can think of an appropriate
17 rewording, or an appropriate methodology
18 before the end of the comment period, please
19 submit that in writing.
20 MR. COMBS: I will. Thanks.
21 FACILITATOR BROOKMAN: You've got
22 the content there, right? Because I think

that that's helpful.

Harvey, before we move on.

MR. SACHS: Mr. Chairman, I would like to ask unanimous consent for the adoption as deemed having been passed for slides 104 through 106 dealing with the -- 107 dealing with the energy use factor. Thank you.

(Laughter.)

FACILITATOR BROOKMAN: Thank you, Harvey. Okay. I'm having flashbacks here.

Okay. Let's proceed. Collin.

MR. WEBER: Thank you. Collin Weber. I am now going to discuss some calculations for the refrigeration system that are specific to the DOE test procedure.

After the test procedure -- after the data are gathered within 1250, the AWEF is then calculated as the output of the AHRI 1250 test procedure. It is calculated as a measure of the efficiency of the system. It is a ratio. And the general form is shown up here in the box.

It is the net heat removed from the walk-in, not including heat generated by refrigeration system components inside the envelope, such as fans running inside the envelope. And that is divided by the total energy consumption of the refrigeration system.

Then, the refrigeration system is analytically paired with a theoretical envelope. The purpose of this is to provide a level playing field for the test, some parity when comparing systems or when rating all systems. The 1250 test procedure calculates the energy the refrigeration system would use to project the heat load associated with this theoretical envelope.

The test procedure calculates the AWEF under assumed ambient conditions, and there are some assumptions here. In the left-most box there is data regarding these ambient conditions. For indoor units, the ambient temperature is assumed to be at 90 degrees

Fahrenheit. This is specified in AHRI 1250.

And for outdoor units the ambient temperature varies according to an assumed temperature profile in which temperatures are divided into bins, and a certain number of hours within each temperature bin are listed. This is also contained in 1250.

These ambient conditions affect the conduction load on the theoretical envelope, which contributes to the total heat load, which is then removed from the walk-in by the refrigeration system. And they also affect the energy consumption, therefore, of the condensing unit. Again, these assumed ambient conditions are taken to be consistent across all walk-in cooler/freezer refrigeration systems.

In DOE's test procedure, DOE adapted the AHRI test procedure to fulfill the statutory requirements laid out in EPCA for DOE.

Now, as I stated before, 1250

calculates AWEF of a refrigeration system, which is a measure of efficiency. The general form is show again here. The DOE test procedure, however, is mandated by EPCA to measure energy use. Therefore, in order to -- we essentially backed out annual energy use by swapping some of the terms.

So essentially in this case now we have annual energy use equals the net heat removed divided by the AWEF. We are using the output of 1250 and an intermediate variable from 1250 to determine the value that we are mandated by EPCA -- that DOE is mandated by EPCA to determine in this test procedure.

And this sort of flow diagram here just shows what is used. At the top we have four quantities that are either determined by or used in the evaluation of 1250P -- or, excuse me, 1250. And, for example, the net refrigeration capacity, coupled with the temperature profile data for outdoor units, is able to determine -- allows us to determine

the heat load at each ambient temperature.

And then, this, coupled with the hourly temperature profile data in the case of an outdoor unit, allows for the total heat load that must be removed annually by the refrigeration system to be determined. And then, this, coupled with the AWEF, allows for the result of the total annual energy use to be output.

And here specifically we can see the following equations that are set forth in the NOPR, where we just have that same ratio of net -- excuse me, of net heat removed over AWEF. And we can just see the differences for coolers and freezers and also for indoor, where it is just a single term, versus outdoor, where it is summed over the temperature bins, which vary across the temperature profile set forth in 1250.

At this time, DOE would welcome comments regarding this calculation methodology.

FACILITATOR BROOKMAN: Let's leave it on the equations slide.

MR. WEBER: Sure.

FACILITATOR BROOKMAN: If they wish to refer to that. Questions/comments on these equations, this methodology? Yes.

MR. LEWIS: Collin, on the -- any of those four formulas, do you actually plug in the AWEF value?

MR. WEBER: Yes, that's correct.

MR. LEWIS: Also, the -- when we size our refrigeration, we have to figure it on the worst ASHRAE temp for that particular city, which may be 105, 100, 110 even, and it isn't that all year, or even all month, but it is that enough of the time that that is what they show. And you can't be marginal. You can't have your cooler at 45 degrees for the month of July, etcetera.

So there is going to be some real-world penalty here that your refrigeration, you know, may be -- it could work 10 months a

1 year and be a horse and a half. It may have
2 to be a two or two and a quarter in the
3 summer.
4 MR. WEBER: Again, this test is
5 just to essentially provide a level playing
6 field, a measure of parity across testing of
7 different systems, not so much as to measure
8 the real-world performance of a specific unit
9 in a specific location.
10 FACILITATOR BROOKMAN: Well, thank
11 you, Harmon. Thank you.
12 Additional questions/comments on
13 the equations and the methodology? Please.
14 MS. MAUER: Joanna Mauer. Just a
15 quick clarification. So the NOPR proposes a
16 calculation of annual energy use for the
17 refrigeration system, and a separate
18 calculation of annual energy use for the
19 envelope, and the two aren't combined. Is
20 that correct?
21 MS. LEGETT: The test procedure --
22 yes to the first, no to the second. The test

procedure provides a calculation of energy use of the envelope and a calculation of the energy use of the refrigeration system.

FACILITATOR BROOKMAN: Okay. Yes, thank you. Steve.

MR. DUNLAP: Steve Dunlap. The calculation for the envelope, I know we are on the refrigeration side, but there is -- the AWEF is actually derived from the overall energy from the envelope, correct?

MR. WEBER: No. It's using a typical theoretical envelope that is laid out in the text of 1250.

MR. DUNLAP: Okay. So I wanted to be clear on that. So the refrigeration system is not combined at all with the envelope as far as the calculation and rating, correct?

MS. LEGETT: Correct.

MR. DUNLAP: Okay.

FACILITATOR BROOKMAN: Thank you. Charles Llenza.

MR. LLENZA: Just to clarify, back

at the framework when we were talking about methodology, we found it difficult to combine the cooling and the envelope, because we had no real metric to achieve. So we decided to come up with separate metrics to make it a little easier for the industry.

FACILITATOR BROOKMAN: Okay. Any additional comments on this equation, these equations, plural?

(No response.)

Okay.

MR. WEBER: Thank you. Finally, I would like to discuss briefly some issues of reporting requirements. DOE anticipates that manufacturers using this test procedure would measure and report both the AWEF and the annual energy consumption.

Now, it should be pointed out that DOE does not specify certification and reporting requirements in this test procedure. This is simply just that -- a test procedure, a tool for measuring system performance.

1 However, DOE will develop future
2 certification requirements in another
3 rulemaking that is yet to come. And DOE
4 expects, therefore, that this test procedure
5 will be used to measure compliance with a
6 future energy conservation standard.
7 However, either AWEF or energy
8 consumption, annual energy consumption, could
9 prove to be more useful in developing such an
10 energy conservation standard. Therefore, at
11 this time, DOE anticipates that manufacturers
12 could, therefore, measure and report both AWEF
13 and annual energy consumption. And DOE would
14 like to request comments on this approach.
15 FACILITATOR BROOKMAN: Rebecca.
16 MS. LEGETT: Just real quickly.
17 Over the course of this conversation, people
18 have suggested other things that could be
19 reported, other component-wise parameters. So
20 we will take those comments into
21 consideration. But if anyone has any new
22 ideas or agrees with that, please let me know.

1 FACILITATOR BROOKMAN: Daryl.
2 MR. ERBS: Yes. Daryl. I guess
3 from my perspective I think AWEF is perhaps a
4 more useful metric in that the load profile
5 that is used to come up with AWEF is somewhat
6 arbitrary. I mean, it is based on I think,
7 you know, general industry practices, but it
8 won't necessarily represent what any end user
9 would experience in terms of their energy
10 consumption, because of all the variability we
11 have discussed all day long.
12 So my only concern would be we
13 don't want someone to feel that this is an
14 accurate representation of how much energy
15 will be consumed. They will read their power
16 meter, and they will be going back to
17 manufacturers complaining that -- I don't know
18 how often that happens on refrigerators, but,
19 you know, and I know on the FTC tags there are
20 some disclaimers. But I think we would have
21 that kind of an issue.
22 FACILITATOR BROOKMAN: Okay. Thank

1 you. Harvey Sachs.
2 MR. WEBER: Thank you for that
3 comment.
4 FACILITATOR BROOKMAN: Yes, please.
5 Harvey Sachs.
6 MR. SACHS: Daryl, I think the --
7 this is Harvey Sachs. Daryl, I think the
8 question arises, is AWEF going to be a useful
9 number in the hypothetical case of big utility
10 incentives, for example, for differentiating
11 products for applications in a particular
12 climate zone or under specific loads, is it
13 going to be a useful engineering tool?
14 MR. ERBS: Yes. I think just like
15 -- and I know there has been some debate over
16 SEER and HSPF, and that is not the only metric
17 that utilities and other people care about.
18 But if you do know what your walk-in load is,
19 so if you had some basis for your walk-in
20 load, and we -- as I mentioned earlier, there
21 is some research going on to do some
22 sensitivity analysis around how accurate AWEF

is for different load profiles, so we will understand that better in the future.

But if you understood your load, then I think it would give you a reasonable way to come up with an estimate of what your true energy consumption would be, and for relative comparisons between higher and lower systems, right, so we want to promote an EnergyStar level or other higher energy efficient levels. It's -- I think it is a perfectly valid way to make those kind of comparisons.

FACILITATOR BROOKMAN: Thank you. Okay. Final comments on this? Because we are moving on. Jon.

MR. McHUGH: So back to reporting, what I think would be desirable is if the AWEF, for all fixed output systems, that mix-match was required for all of those systems, basically so that anybody who has a new indoor unit can apply their particular product to anybody else's outdoor unit. So I think that

1 would be beneficial.

2 FACILITATOR BROOKMAN: Okay. Thank

3 you. Final comments?

4 (No response.)

5 Okay. We are going to move next to

6 -- thank you, Collin. Move next to impacts on

7 small businesses.

8 MS. LEGETT: Thank you. I see that

9 we have about half an hour left, so I am going

10 to try to get through these last two content

11 slides in as little time as possible, give you

12 all a chance -- as much chance to speak.

13 There are going to be two issues

14 here. The first one is that DOE is required

15 by law in their proceeding to consider

16 impacts on small business manufacturers.

17 When DOE did their research on

18 small businesses in the walk-ins industry,

19 they used the NAICS code for the commercial

20 and industrial refrigeration manufacturing

21 industry of any business that is less than 750

22 employees is a small business.

1 We realize that not all of you may
2 agree with this. So we are aware that this
3 may not cover all manufacturers of walk-in
4 equipment. For instance, some envelope
5 manufacturers may not feel that they fall in
6 this category.
7 So DOE is essentially in this slide
8 requesting comment on the number of small
9 businesses that would be affected by this
10 proposed rule, how it is determined that they
11 are small businesses, and also how DOE could
12 figure out how many small businesses in the
13 industry there actually are.
14 Please comment.
15 FACILITATOR BROOKMAN: Yes, Harmon.
16 MR. LEWIS: Rebecca, I think here
17 you go on the inverse. I would like to know
18 who you found that was bigger than 750 and you
19 work inversely from there. I mean, in all
20 seriousness, I am not aware of any one of us
21 that are 750, unless perhaps maybe -- well,
22 put all of Manitowoc together on things that

aren't even to do with walk-in coolers and freezers. But I think we are all small business.

MS. LEGETT: Thank you.

MR. LEWIS: A hundred percent.

MR. LLENZA: Just a clarification. Charlie Llenza here from the Department. It is also including if you have a parent company. So if you are a subsidiary of a larger firm, then it includes everybody in that firm. So I don't -- I don't happen to know everybody's particular industry here, but --

MR. LEWIS: Right. But you have got a list, I would presume, of the people that you have found to be those 37, and the ones that are bigger? Is that something that could be e-mailed to us tomorrow?

MS. LEGETT: I am not sure if I am at liberty to do that. We would appreciate -- we would actually appreciate your feedback as to how many there are.

1 FACILITATOR BROOKMAN: Claire has a
2 comment.
3 MS. LEGETT: Claire.
4 MS. GAGNE: This is Claire. Well,
5 with regard to that issue, I don't think we
6 are at liberty to share any of that
7 information at this point, although in the
8 future it will be publicly available.
9 But I also wanted to add some
10 additional information to what Charlie said.
11 It is true that this is what the SBA
12 definition is, and that -- under that
13 definition the case of a walk-in manufacturer,
14 where the walk-in manufacturer may be owned by
15 a parent company, and, therefore, would be
16 considered something not as a small business,
17 we would actually be interested in a couple of
18 different things.
19 One would be an NAICS code that
20 would be more granular and provide more
21 information about the specific subsidiary
22 companies and/or any additional information

1 that those companies, and also other walk-in
2 companies, would be able to provide about the
3 number of employees that they have, any
4 insights into what we could actually use as
5 the small business definition.
6 And, in addition to that, we are
7 planning to get some information from --
8 potentially from the SBA itself, but any
9 information that you have or are willing to
10 share, or an opinion that you have even, about
11 what this definition should be or could be
12 would be very useful to us.
13 MS. LEGETT: Thank you.
14 FACILITATOR BROOKMAN: David.
15 MR. GRIFE: Besides, you know, the
16 definition of small business, you know, we
17 talked a few times about stakeholders. As a
18 small business, I also use other small
19 businesses where I purchase and are vendors of
20 mine that will be affected by this.
21 My dealers I sell to, many of them
22 are small businesses, and they sell to other

small businesses. This is not an area where there is a lot of large businesses' manufacturers selling to small businesses. Most of these people -- there are a lot of small businesses. I just want to make sure we look at that entire impact.

MS. LEGETT: Yes. A quick clarification. Right now we are only talking about small business manufacturers. Small business end users would be covered in the standards proceeding, impacts on that --

FACILITATOR BROOKMAN: How about vendors?

MS. LEGETT: As well. We are only talking about manufacturers here.

FACILITATOR BROOKMAN: And so that would be manufacturers of motors, manufacturers of condensers, everything.

MS. LEGETT: Right. Everyone we have talked about today.

MR. GRIFE: Could it be gaskets? Do you mean gaskets?

1 MS. LEGETT: Everyone we have
2 talked about today, if you have information.
3 MR. GRIFE: Okay.
4 FACILITATOR BROOKMAN: Yes, Steve.
5 MR. DUNLAP: One question. What
6 will you do with the information once you have
7 your database? Will you reach out to these
8 companies and indicate that there is, you
9 know, potential -- that there is a potential
10 impact on their business? Is that the intent
11 from the DOE?
12 FACILITATOR BROOKMAN: Aris.
13 MR. MARANTAN: There is two things.
14 Aris Marantan. The small business impacts in
15 this proceeding for the test procedure are
16 simply to identify the small businesses and
17 the impacts of these test procedures for the
18 SBA, for the Small Business Administration.
19 They will comment on the rule to
20 make sure that there are no differential
21 impacts between small manufacturers and large
22 manufacturers. So what they are guarding

1 against is anything that may affect a small
2 business differently than a large business.
3 So if they see that, if the analysis shows
4 that, then they will step into this proceeding
5 and weigh in on the process.
6 The second thing is that the small
7 business impacts analysis is also conducted in
8 the standards rulemaking. And this is
9 directly applicable to a lot of the comments
10 we have heard today -- you know, who is going
11 to go out of business, are small businesses
12 going to go out of business.
13 It is actually more important
14 there, because the standard that is set, they
15 will -- SBA will determine whether or not the
16 standards that are proposed in that proceeding
17 will also impact small businesses in a
18 differential way as well. And they will step
19 in if they see that that is the case.
20 MR. DUNLAP: So as a small
21 manufacturer, if we feel that the legislation
22 has an impact on our business, that it can

1 basically shut it down, then a small business
2 should contact the Small Business
3 Administration? Is that the best approach?
4 MR. MARANTAN: Yes. There is two
5 things here. The SBA will provide their
6 comments to our proceedings for the test
7 procedure and for the energy conservation
8 standard, because it is a rulemaking process.
9 MR. DUNLAP: Right.
10 MR. MARANTAN: Now, what you are
11 talking about specifically is the EISA
12 standards I believe.
13 MR. DUNLAP: Yes.
14 MR. MARANTAN: So DOE wouldn't be
15 involved with that. And to answer your
16 question, I think, yes, you would have to go
17 straight to SBA, or even directly to Congress.
18 MR. DUNLAP: A small business?
19 (Laughter.)
20 One lobbyist is all -- is more
21 money than we make.
22 (Laughter.)

1 FACILITATOR BROOKMAN: Okay. Thank
2 you.
3 MS. LEGETT: So what I'm -- sorry,
4 go ahead.
5 MR. LEWIS: Just one last question.
6 If you can't name names, if you identified 37
7 small businesses that are in the walk-ins, how
8 many have you identified that are in the
9 business that you don't classify as small
10 business?
11 And would that be included in the
12 report? In other words, I'm thinking it is
13 less than 10 percent. So what you are going
14 to do is going to impact 90 percent of the
15 companies. Is that something you typically
16 put in the report, or you just name the number
17 of small --
18 MS. LEGETT: We just name the
19 number -- or we have the number of small
20 businesses in the report.
21 MR. MARANTAN: Yes. Aris Marantan.
22 The energy conservation standard proceeding,

as Charlie mentioned earlier today, is in the pre-analysis phase. DOE is preparing that document now, and I think it will be published within the next few months. In fact, they will have another public meeting such as this within the next few months. Those documents will show exactly what we found in our analysis.

MR. LEWIS: Right. But it would name the number of small businesses impacted and the number that are not impacted.

MS. LEGETT: Yes.

MR. MARANTAN: I believe, yes, these documents will --

MS. LEGETT: Yes.

MR. MARANTAN: -- identify them.

MR. LLENZA: Charles Llenza, Department of Energy. And continue to clarify that through the NOPR stage. So we continue to review that. It then goes to the Department of Justice, and also it ends up going to the Small Business Administration for

1 review. So --
2 FACILITATOR BROOKMAN: Let me just
3 call your attention to the slide. There are
4 three databases, three data sources listed
5 there. Are there any additional ones that the
6 Department can consult?
7 MS. LEGETT: Also, I want to ask,
8 if you're a small business and you consider
9 yourself a small business for a certain
10 reason, can you please let us know why.
11 MR. GRIFE: There is also an
12 organization called NAFEM.
13 FACILITATOR BROOKMAN: David?
14 MR. GRIFE: Yes, I'm sorry. NAFEM
15 -- David Grife -- National Association of Food
16 Equipment Manufacturers. That is probably a
17 good database to look at.
18 MS. LEGETT: Great. Does NAFEM
19 identify which of the businesses are small
20 businesses?
21 MR. GRIFE: I don't know.
22 MS. LEGETT: Okay.

1 MR. GRIFE: But they at least will
2 identify all of the walk-in businesses that
3 are part of that, and they are the people you
4 probably want to speak to.
5 MS. LEGETT: Okay. Thanks.
6 FACILITATOR BROOKMAN: Tim.
7 MR. DYE: Tim Dye. I remember a
8 report that NAFEM sent out maybe a couple of
9 years ago that they said that over 90 percent
10 of their association membership was under a
11 $12 million business.
12 MS. LEGETT: Twelve million
13 dollars?
14 MR. DYE: In sales.
15 MS. LEGETT: And did they --
16 MR. DYE: So I can assure you that
17 wouldn't support --
18 MS. LEGETT: Okay.
19 MR. DYE: -- 750 people.
20 (Laughter.)
21 MS. LEGETT: Did they say that that
22 was their cutoff, or was that arbitrary?

1 MR. DYE: No. This was their
2 member association, and it is the National
3 Association of Food Equipment Manufacturers.
4 So these are only people who manufacture
5 equipment. And over 90 percent, I believe,
6 their sales were under $12 million.
7 FACILITATOR BROOKMAN: Okay, great.
8 Thank you.
9 MS. LEGETT: Okay. Thank you.
10 FACILITATOR BROOKMAN: Steve.
11 MR. COMBS: Yes, Steve Combs. Just
12 on the resources, the central contractor
13 registry with the government for those
14 manufacturers that are registered to do
15 business with the government has all of those
16 listings in there, and who is small business,
17 and so on.
18 FACILITATOR BROOKMAN: CCR.
19 MR. COMBS: CCR, yes.
20 MS. LEGETT: Great. Thank you.
21 That's helpful.
22 FACILITATOR BROOKMAN: Okay.

1 MS. LEGETT: Next slide, last
2 content slide. DOE identified potential
3 impacts and burden-reducing measures for small
4 manufacturers of walk-in equipment. The
5 impacts that DOE identified primarily were
6 associated with the cost of testing and the
7 length of time it takes to perform the test.
8 And DOE introduced several measures
9 that may reduce these burdens that we have
10 covered extensively I think in the rest of
11 today's meeting -- low-cost testing options,
12 for instance, CO2 as the tracer gas in the
13 tracer gas method, instead of a more expensive
14 gas, also the basic model concept, allowing
15 manufacturers to perform fewer tests.
16 These burdens and measures apply to
17 all manufacturers, but they may have a greater
18 impact on small businesses, and we would like
19 to hear about those differential impacts now.
20 FACILITATOR BROOKMAN: We've
21 already heard some comment on this already
22 today. Additional comments on the

differential impacts on small business as opposed to a large business?

MR. GRIFE: I said one thing to Charles, that there could be opportunities here that software could be developed and assisted by the Department of Energy through their great funding sources to assist us in calculating many of these points.

FACILITATOR BROOKMAN: Okay.

MR. GRIFE: Also could keep it on more of a level playing field.

FACILITATOR BROOKMAN: It may be something everybody could participate in.

MR. GRIFE: Correct.

FACILITATOR BROOKMAN: And share. Okay.

Okay. Additional comments on this final content box, impacts on small manufacturers? If you think of anything additional, the Department would really like to see that in writing.

MS. LEGETT: Yes.

1 FACILITATOR BROOKMAN: And this
2 would -- that would also be useful as they go
3 forward thinking about the standard-setting
4 process.
5 MS. LEGETT: Exactly.
6 FACILITATOR BROOKMAN: Yes.
7 Rebecca, is that it? I think that's it.
8 MS. LEGETT: That's it.
9 FACILITATOR BROOKMAN: So thanks,
10 Rebecca.
11 Yes, Charles.
12 MR. LLENZA: Just one final
13 comment. Charles Llenza, Department of
14 Energy. The comment period ends on the 31st
15 of this month, so send your comments in.
16 FACILITATOR BROOKMAN: We do want
17 to provide -- Karim, I will be right with you
18 -- an opportunity for anybody, as it reflects
19 in the agenda, to make final remarks at this
20 point. Any additional issues to be raised?
21 Karim?
22 MR. AMRANE: Karim Amrane, AHRI. I

1 guess I would like to follow up on the comment
2 period. You are giving us like one week from
3 today to file our comments. And given the
4 amount of information that was shared today, I
5 think I would like to request an extension, at
6 least a week extension.
7 I know it's difficult for DOE, but
8 I guess, I mean, there are so many -- so much
9 information was shared today that I think for
10 everybody's interest here we need more time to
11 respond to all of the questions that were
12 asked.
13 MR. LLENZA: Well, Karim, we will
14 take it under advisement. We have had the
15 comment period open for so long now, an
16 additional month almost because of the snow --
17 snow timeframe.
18 But let me say this. If we are not
19 able to extend it, because the problem with
20 the paperwork to do that is -- it's really a
21 pain, but we have the pre-analysis comment
22 period that will be coming up, too, and that

1 does not preclude anybody from sending
2 comments in about the test procedure in
3 relation to the standard.
4 So since this is all tied in, it
5 would -- you know, it would be in the best
6 interest of all parties to read the comments
7 and try to make the best use of the comment
8 period timeframes.
9 FACILITATOR BROOKMAN: Yes, that's
10 helpful. Harvey.
11 MR. SACHS: Charles, thank you very
12 much for that. But can we sort of wink and
13 agree that if comments come in on time they
14 might be edited in the week following?
15 (Laughter.)
16 MR. McHUGH: I don't think you can
17 make a public statement saying, "Yes, I can
18 wink and agree."
19 MR. LLENZA: I have talked to our
20 legal counsel.
21 (Laughter.)
22 And we could -- if there are

1 comments coming, if you send us a quick e-mail
2 or a letter or something that notifies that a
3 comment is coming, we will put a placeholder
4 in the docket for you guys. How about that?
5 MR. SACHS: Thank you very much.
6 FACILITATOR BROOKMAN: Thank you.
7 Jon.
8 MR. McHUGH: I would like to know
9 the approximate schedule of the remainder of
10 the proceeding, and in particular, you know,
11 the NOPR and the various other aspects of
12 this.
13 MR. LLENZA: Well, the pre-analysis
14 is in the process of being published within
15 the next several weeks, if not sooner. And at
16 this point, the test procedure final rule,
17 since we originally missed a deadline which
18 was January 1st, which has probably now worked
19 to everybody's advantage here, including the
20 Department's, there is not an urgency to put
21 it out, except we are looking to try to get
22 this wrapped up by August. That's what we're

1 thinking. I'm thinking here out loud.
2 And in terms of the schedule for --
3 the remaining schedule for the standard, we
4 have the pre-analysis coming out soon. We are
5 looking at the NOPR probably close to the end
6 of the year or early next year, and the final
7 rule of course by the end of 2011.
8 So we have plenty of time here,
9 but, I mean, time is not to waste. As you can
10 see, we've -- it has taken us a bit to get
11 through to where we're at, so -- and we have a
12 lot to do, too.
13 FACILITATOR BROOKMAN: Steve.
14 MR. DUNLAP: Charles, I noticed
15 that we talked a little bit about classes.
16 There was comments from the DOE that some of
17 the classes of freezers and walk-in coolers,
18 that there could be some expansion. Will that
19 occur in that timeframe, 2011?
20 MR. LLENZA: I think part of the
21 issue could be discussed at the pre-analysis,
22 because it is -- since that is a period where

1 we are starting to put out our -- what we are
2 finding on the actual walk-in cooler/walk-in
3 freezers. That would be a good time for -- to
4 do that. And it's premature right now, until
5 you see what we have, and then I think at that
6 point you can make full comments on that. So
7 --
8 FACILITATOR BROOKMAN: Yes, Jim.
9 MR. PERRY: Jim Perry. Charles,
10 will we be notified that the pre-analysis is
11 published?
12 MR. LLENZA: Oh, yes. What we do,
13 the Department -- what the Department does is
14 that we provide a courtesy e-mail telling you
15 to go to the website. And shortly after that
16 notification we -- as soon as we can -- it
17 takes us a day or so -- once it is issued,
18 once it is signed out of the Department, to
19 put up not necessarily the published document,
20 but the signed document up.
21 And then when -- and we send it to
22 the Federal Register. When the Federal

1 Register releases it in a publication, then we
2 put -- then we replace the signed document
3 with the Federal Register publication, and
4 that is your official notification. But
5 usually we don't wait.
6 And the other thing that -- for
7 this particular meeting, we will have more
8 than a month, a month and a half, buffer
9 between the release and the meeting. So there
10 will be ample time for notification to all
11 parties.
12 FACILITATOR BROOKMAN: As reflected
13 in the agenda, anybody that wishes to make
14 final remarks, raise any additional issues
15 before we close for the day? Yes, one more
16 thing. We are not quite there yet.
17 MR. LLENZA: Here's your contacts.
18 I just wanted to put that up there.
19 FACILITATOR BROOKMAN: Contact
20 information.
21 And, of course, the complete
22 transcript of this meeting will be available.

It will be posted on the EERE website in about a week or so. So you can dig through many pages of content there.

Final comments before we close for the day? And so for my part I would just say thanks to all of you. This I think was a very informative meeting, and I really appreciate the spirit of disclosure and sharing and the good humor and intelligence of the group. I will turn it back to Charles for closing remarks.

MR. LLENZA: The Department is very grateful for you guys attending, and I think I have heard a lot of good comments here. The team will make the best effort here to try to incorporate most of your comments, and to continue this process on getting the final rule for the test procedure out by the fall.

FACILITATOR BROOKMAN: Please fill out the evaluation form. The Department tries hard to make these meetings productive.

Safe travels.

1 (Whereupon, at 4:49 p.m., the
2 proceedings in the foregoing matter
3 were concluded.)
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CERTIFICATE

This is to certify that the foregoing transcript in the matter of: Notice of Proposed Rulemaking: Walk-in Coolers and Freezers

Before: Douglas Brookman

Date: March 24, 2010

Place: Washington, DC

represents the full and complete proceedings of the aforementioned matter, as reported and reduced to typewriting.

Benjamin Crane