U.S. DEPARTMENT OF ENERGY

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TEST PROCEDURES FOR HIGH-INTENSITY DISCHARGE (HID) LAMPS

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PUBLIC MEETING

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THURSDAY
JANUARY 19, 2012

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The Meeting convened in Room 8E-089, 1000 Independence Avenue SW, Washington, District of Columbia, at 9:00 a.m., Doug Brookman, Facilitator, presiding.

PRESENT
DOUG BROOKMAN, Facilitator, Pacific Solutions, Inc.
TINA KAARSBERG, Ph.D., Department of Energy
ELIZABETH 'BETSY' KOHL, Department of Energy

ALSO PRESENT
CARL ABRAMSON, Ushio America, Inc. (via telephone)
ERIC ANDERSEN, Pacific Northwest National Laboratory (via telephone)
SUSAN ANDERSON, Osram Sylvania
ALEX BOESENBERG, Nation Electrical Manufacturers Association
SUSAN CALLAHAN, Osram Sylvania (via telephone)
ALSO PRESENT(Cont'd)

KEITH COOK, Philips Electronics
RONALD DAUBACH, Osram Sylvania (via telephone)
BRENDA EDWARDS, Department of Energy
DAVID ELLIS, Intertek (via telephone)
BILL HITCHCOCK, Philips Lighting
(via telephone)
MARGE HOLDSWORTH, QSSI (via telephone)
JOE HOWLEY, General Electric
BECKY KEUBLER, ALP Lighting Components
(via telephone)
RUI LI, Lumentra, Inc. (via telephone)
ROBERT LINGARD, Pacific Northwest National
Laboratory (via telephone)
JOANNA MAUER, Appliance Standards Awareness
Project
MICHAEL McGARAGHAN, California Investor-Owned
Utilities
SCOTT MORRIS, Pacific Northwest National
Laboratory (via telephone)
MICHAEL MYER, Pacific Northwest National
Laboratory
REBECCA RAINER, Cooper Lighting
(via telephone)
HEIDI STEWARD, Pacific Northwest National
Laboratory
SIMONE SYDNOR, Energetics
LINDSAY STEELE, Pacific Northwest National
Laboratory
MATTHEW WALKER, Navigant
MERRY WALKER, Navigant
LINDA WILSON, New York State Office of the
Attorney General (via telephone)
DAVID WOODWARD, Philips Lighting
(via telephone)
MATTHEW SWINK, Department of Justice
(via telephone)
JAMES WANG, Simkar (via telephone)

C-O-N-T-E-N-T-S

C-O-N-T-E-N-T-S

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

9:02 a.m.

DR. KAARSBERG: Good morning. Welcome to the first Lighting Standards Meeting of 2012. I hope you're having a good year so far. As I think a lot of you know, I'm Tina Kaarsberg. I'm the project manager for Lighting Standards and I'm also going to try to be a bit of an emcee today. And I'd like to give a special hello to the Web participants.

(Telephonic interference.)

DR. KAARSBERG: Welcome to the wonderful world of HID lamp Test Procedures. The thrills, the chills, the excitement, the drama. Okay, everyone, I guess, as per usual, I'm going to turn it over to Doug to go through the rules and regulations, I mean, just the process. And the agenda, so take it away, Doug.

MR. BROOKMAN: Thank you. Good morning, everyone. This is the U.S.

Department of Energy's public meeting on Test Procedures for High Intensity Discharge Lamps. Today is Thursday, January 19th, 2012. It's our tradition to start with introductions around the room, so start over here. Say your name and organizational affiliation and you can get used to turning these mics on and off. Make sure the little green button is illuminated.

MR. STEELE: Lindsey Steele, Pacific Northwest National Laboratory.

MS. STEWARD: Heidi Stewart, Pacific Northwest National Lab.

MR. BOESENBERG: Alex Boesenberg, NEMA.

MR. HOWLEY: Joe Howley, GE Lighting.

MS. MAUER: Joanna Mauer, Appliance Standards Awareness Project.

MS. ANDERSON: Susan Anderson, Osram Sylvania.

MR. COOK: Keith Cook, Philips

Electronics.

(Off-microphone comments)

MR. BROOKMAN: Thank you, Brenda.

MR. MYER: Michael Myer, Pacific Northwest National Laboratory.

MS. KOHL: Betsy Kohl, DOE General Counsel.

MR. BROOKMAN: Okay, I guess that's all for this morning. Thanks again for those of you here, an early start on the day. All of you received a packet of information when you came in the door, as well as an agenda. I'm going to run through this very, very briefly.

Immediately following this agenda review, there's an opportunity for brief opening statements. Anybody that wishes to raise any issues here at the outset, there's an opportunity here to do so.

Following that we'll have a presentation followed by the opportunity for question, answer and comment on statute and

context.

Immediately following that, we're going to talk about the proposed HID test procedures, the definitions and test methods. We'll take a break midmorning or so, around about 11:15.

Following the break, yet more presentation materials on the proposed HID test procedures, laboratory accreditation program, test measurements and calculations. And around about noon or so, after that discussion on presentation segment is concluded, there's an opportunity yet again for closing remarks, any other issues that you would like to raise at this point in this public meeting.

So that's the plan for today. Questions and comments about the schedule or about this? Anything that's not covered that should be covered? We're good? Okay.

I'd ask for your consideration. I've jotted up what I think are common

courtesies. Please speak one at a time. Please say your name for the record each time you speak. I'm going to be queuing individuals by name as best I can to speak. I will also wish to encourage follow-on comments, I find that might be useful, the back and forth, for the Department. Please say your name when you speak.

Please keep the focus here, turn your cell phones on silent mode and limit your sidebar conversations. We've already gotten used to hitting the little on/off button on the microphone, so please speak into the record, there'll be a complete transcript of this meeting.

DR. KAARSBERG: One more process item. Some of you may have noticed that the Federal Register notice says we're going until 2:00 p.m., but the agenda here has us stopping at 12:30. That was just our best judgment, once we actually went through everything we needed to talk about, that's when we do think

it will end. However, we have flexibility. If you want to say more, we can go until 2:00. If you want to say less, we can end earlier. But I just wanted to note that for the record.

And the other item is that we will, in order to accommodate some of the West Coast folks who were not able to get logged in at 6:00 in the morning, for whatever reason, we will be posting audio files as well as the transcript on the website. And we'll also try to make them as user-friendly as we can.

Okay, let's see what's next.

MR. BROOKMAN: And we should probably also say we have folks joining us via the web.

DR. KAARSBERG: Right, yes I was mentioning that.

MR. BROOKMAN: And thanks for those on the web if you'd please keep your phones on mute, I think we've solved the echo problem for now.

DR. KAARSBERG: Yes, and we're going to -- So, Simone, how many web people do we have right now? Sixteen, okay. So what ' we're going to do is stop of at the end of ' every segment in the agenda, so for us, the ' first segment would be like 9:45, we're going ' to ask for web comments as well. '

What's going to happen there is, ' if there are just a handful of web comments, we will read them aloud and they will get into the transcript. If it turns that there are more than we can accommodate in the time, which has happened in the past, the procedure will be to have the ones that aren't read aloud, to have them be appended to the transcript as if they had been spoken, but they'll be at the end. That's the best we could do.

Oh, yes, is there any reason we couldn't show them who's on?

(Off-microphone comments.)

MR. MYER: I defer to Simone.

DR. KAARSBERG: Okay, Simone's

going to read the Web participants names aloud. I think we have more on the web than in person, or it's very close anyway. Okay, so, Simone, do you have a microphone now?

(Off microphone comments.)

MR. BROOKMAN: Why don't you just read the names of those who are on there?

MS. SYDNOR: So on the webinar we have Becky Keubler, Carl Abramson, David Ellis, David Woodward, Eric Andersen, James Wang, Linda Wilson, Marge Holdsworth, Matthew Swink, Rebecca Rainer, Robert Lingard, Ronald Daubach, Rui Li, Scott Morris, Susan Callahan, and William Hitchcock.

MR. BROOKMAN: Okay, thank you.

DR. KAARSBERG: Thank you. Now we're finally getting to the meat of the test procedures. We're going to review, present and seek comments. And without further ado, I would like to introduce the master of metal halide, the sultan of sodium and the maestro of mercury, our own hero of HID, Mr. Mike Myer

from Pacific Northwest National Lab.

[applause]

MR. MYER: Wow, tragically everything from this point on is going to be anticlimactic. Wow. Hopefully when we sync this up for a podcast it can be like the old 60s Batman, pow. Thank you, Tina. So the purpose of test procedures and today's NOPR public meeting: One, we'll review the statute and DOE's actions related to high intensity discharge lamps.

We're also going to present the proposed test procedure and ultimately it's for comment from both people in the room and the many others who are listening online and via the web. And at this time, we'll do opening remarks from around the room and then we'll wait and then do brief opening remarks from the web, as that works.

MR. BROOKMAN: If that works. I saw Alex at the outset wanted to make a comment.

MR. BOESENBERG: This is Alex Boesenberg of NEMA and on behalf of the manufacturers, I wanted to list a couple of -- six very brief summary topics that we have gathered so far as we're crafting our public comments, just some thoughts to keep in mind.

As always, we'll submit this in writing. And some of these topics will be commented on by some of the industry experts as we get to those subjects through the course of today's discussion.

One thing we want to point out is there's an inconsistency in the NOPR right now regarding the use of the terms measured and rated, they're sometimes interchanged. A measured value is very different from the rated value and we will include some suggestions as to how that could be clarified.

We note frequent mention of HID ballasts in the document right now and want to reaffirm that it's not a ballast standard, so in most cases ballasts are not the appropriate

topic. How a lamp performs will be measured based solely on the lamp.

We noted some interchangeability, or some confusion, we think, in the use of lumen maintenance and life rating. The terms L40 and L70 appear in the NOPR. The L categories, if you will, are related to solid state lighting, L70 being one of the more common terms, and that is regarded when an LED has lost 70 percent of its original, 30 percent of its original flux, thank you.

Anyway, the point we wanted to clarify is that for HID we talk about 40 percent of life for metal halide and 50 percent of life for high pressure sodium and mercury vapor lamps.

In most of the testing that has been done to date, the bulk of the data that manufacturers have on hand is about that 40 percent rated life. We want to stick to that figure as often as able, because that means we can use all our historic data and don't have

to retest everything.

MALE PARTICIPANT: With concern to lumen maintenance.

MR. BOESENBERG: Yes, as relates to lumen maintenance. Another point we wanted to bring up, or wanted to raise for your awareness, is that a lot of HID lamp testing, since it's not been heavily regulated in the past, that testing has been done at factories post-production.

And a lot of these factories, or at least enough of them to concern us, are NVLAP certified. NVLAP being the typical certification that DOE allows something to be tested, if we do testing in-house. So that is a consideration regarding testing and the capabilities and timing and cost.

We're concerned about delaying of product to market if a full 40 percent life test becomes required, because this is a very long-lived light source. And so if we test 40 percent that's quite a long time, could be up

to two years sometimes.

So we'll hope that there will be options for beginning testing, doing some initial values and then completing later. And if, you know, settling out. We do that in many other programs, whether it's DOE or EnergyStar.

And, lastly, we do believe that tests for correlated color, temperature and CRI are appropriate but we want to point out that variation of color within HID lamps can be quite significant due to manufacturing variation, and also in the lamp types and their orientation during operation.

We don't think that lamp color, whether CRI or CCT, should be a factor in determining product classes for energy efficiency testing. We do agree with the possibility of its use as far as delineating classes, particularly if those will be used to set exempted categories.

But, I spoke briefly with Tina

before we started and one of the points we'll make and reiterate throughout the discussion as it comes up is that the variation of the products and production, production variation more accurately, in HID lamp is quite large. And when you're talking about something that goes way up high on a pole or up in a highly elevated ceiling, variation from one product to another is not nearly as noticeable.

We have a much tighter band of tolerance or production variation on consumer products because they're usually right next to each other in the fixtures there and when there's a lot of difference, you'd notice it.

HID is not really in that category, so we talk more about ranges of performance than a single-point curve. And some of my experts will talk about that later on. And that's all I have, thank you.

MR. BROOKMAN: Okay. Other comments, opening remarks, here at the outset? No one else in the room? Did I understand

you, are you thinking that if they want to comment online, they can do so vocally?

MS. SYDNOR: They can, but we need them, if they are not speaking, to mute their phones because we are still getting a lot of feedback.

MR. BROOKMAN: Okay, so once again, I'd request from here at Forrestal, if you're not -- please mute your phones because we're still getting feedback on the line here in the broadcast over the room.

But let me ask at this point, anybody who's joined us via the web, would you like to make opening remarks at this point? I heard somebody, please speak up. Okay, good.

So thanks to all of you for muting your phones, that's working better now. Then let's proceed with the slides. Michael.

MR. MYER: Yes, regarding the comments I think it is important to just point out it is a lamp test procedure and at periods/times, ballasts do need to come up for

just different reasons. But I think those will be apparent in the test procedure.

From time to time we'll see yellow boxes at the bottom of slides. They are issue boxes, they are a request for comment. They do correlate to the NOPR itself in terms of numbering and text. So at times we'll stop and pause and ask for comment about the material that was just presented.

In early December, the Federal Register published this notice of proposed test procedure. That started a 75-day comment period and that 75-day comment period ends 11:59 Eastern on Tuesday, February 28th.

From here I will just briefly touch on statute and context. And then I will turn over the proposed HID lamp test procedures to my colleagues, Lindsay Steele and Heidi Steward.

Briefly the regulatory history started out in 1975 with EPCA itself, Energy Policy Conservation Act. That actually just

started the whole program itself, creating the authority for test procedures and energy conservation standards.

A little bit after that, the Department of Energy was directed to a determination for HID lamps. The final determination was published July 1 of 2010, that did determine that test procedures and energy conservation standards were technically feasible, economically justified and would result in significant energy savings.

That final determination then started the next process of the test procedure, which is where we are today with the proposed test procedure, bringing us to our process and our schedule.

We are currently in the NOPR phase, shown by the green arrow to the left, and we are moving into the final rule stage. As I mentioned, the key dates here, the notice was published December 15th, as I said before. That starts a 75-day comment period which

ends on February 28th. And a projected final rule to establish test procedure will be January 1, 2013.

At this time I'm going to turn over the presentation to Lindsay Steele, who will discuss standards and other related aspects of the test procedures.

MR. STEELE: Good morning. Here we're going to discuss the industry standards for HID lamps that were used to develop these test procedures.

DOE reviewed current industry standards, best practices and technological developments and concluded that the existing industry test procedures provide all elements required to measure the required parameters and calculate the efficacy of HID lamps. The next several slides will list the relevant industry standards.

Part of the photometric lamp characteristic measurements requires determination of color rendering index and

correlated color temperature, CRI and CCT respectively, of an HID lamp's output.

I should mention DOE is considering color metrics to delineate to the equipment classes in the HID lamp energy conservation standard.

The International Commission on Illumination, or CIE standards referenced in these test procedures, are shown here, CIE 13.3 and CIE 15. These standards will be incorporated by reference into the Code of Federal Regulations.

The HID lamp electrical characteristics are contained in the combined American National Standards Institute, or ANSI Standard, C78.389. And the ANSI Standards here contain details on the equipment requirements, on lamp aging, warm-up, stabilization and the electrical characterization measurements themselves.

In the case of an HID directional lamp, which will be defined in a few moments

and discussed shortly, is basically a lamp that produces a beam. And that standard referencing directional lamps is ANSI C78.379. And again, we're proposing to incorporate these by reference in the Code of Federal Regulations.

The last two standards needed for these test procedures are from the Illuminating Engineering Society of North America, or the IES. The HID test procedures require measurement of HID lamp lumen maintenance. LM-47 contains the methods and measurement details to determine lumen maintenance.

As far as HID lamp output and color measurements, those are described in the IES Standard LM-51, and the references therein. And again, we will be incorporating these by reference in the Code of Federal Regulations.

Finally, for this portion of the presentation, a quick mention about standby

mode and off mode energy usage. DOE regulates HID lamps as commercial and industrial equipment and they do not require measurement of either standby or off mode energy usage, unlike counterparts or products that are considered consumer or residential which do consider standby and off mode energy usage if it's feasible to do the measurements.

HID lamps do not operate in either standby or off mode. Their primary function being to produce light. Therefore, DOE is proposing not to measure either standby or off mode energy usage in these test procedures.

At this point, I'll hand over the podium to Heidi Steward.

MR. BROOKMAN: Questions or comments so far? I see none. Okay.

MS. STEWARD: Okay, let's go on to the actual proposed test procedures. We'll start with definitions.

We looked at the definitions within EPCA and determined six of them were

relevant to HID lamp test procedures as written. This is just housekeeping. We're moving them from a subsection to a parent section. We propose to adopt these with no changes.

Within 10 CFR 430, we found four definitions that are useful to this test procedure. We propose to copy them from the Consumer Code to Commercial Code.

The only change we propose is to lamp wattage. We are trying to make it more generic. The current version reference is in IES standards to define the aging period. We propose to broaden this to allow other relevant industry standards to be used as necessary.

We did determine that six additional definitions were needed to create a full test procedure so we will talk about these more in the next few slides.

For more appropriate characterization of HID lamps, DOE proposes to

distinguish directional lamps by distribution rather than [lamp] shape, which also allows the possibility of future lamps having different shapes or forms.

We reviewed definitions for directional lamps with optical characteristics similar to those of HID directional lamps, for example incandescent reflector lamps, and found that definitions for reflector lamps typically focus on the construction of the lamp and not the direction in which the light leaves the lamp.

Existing HID lamps that would be considered directional are offered in various bulb shapes. For example, R40, R111, Part 20, Part 38. Future lamps may take different non-conforming shapes and forms while providing similar light output delivery. Therefore, the proposed DOE definition is based on the directional delivery of light output and not the construction of the lamp.

The proposed definition is based

on the EU definition, which was adopted as the standard by EnergyStar. So the proposed definition for directional lamp is, directional lamp means a lamp emitting at least 80 percent light output within a solid angle of pi steradians corresponding to a cone with and angle of 120 percent.

In other rulemakings, NEMA commented that efficacy doesn't work as a realistic measure of directional lamps. So we distinguish directional lamps with a lamp's light distribution or beam angle.

So the proposed definition for beam angle is, beam angle means the beam angle, or angles, as measured according to the requirements of ANSI C78.379, including complex beam angles as described in ANSI C78.379, Appendix A.

There are three types of lamps covered under this HID lamp test procedure, metal halide and mercury vapor lamps have already been defined. We needed to add a

definition for high-pressure sodium lamp, so here it is.

NEMA recommended we propose this based on ANSI C82.9, which is thus, high pressure sodium lamp means a high intensity discharge lamp in which the major portion of the light is produced by radiation from sodium vapor operating at a partial pressure of about 6,670 pascals, approximately 0.066 atmospheres or 50 torr or greater.

DOE notes that EPCA defines lamp efficacy to mean the lumen output of a lamp divided by its wattage, expressed in lumens per watt. This proposed definition interprets the EPCA definition for the rulemaking. We are using rated luminous flux because this calculation is being used for a statistical sample rather than an individual lamp.

Yes, there's a question.

MR. BROOKMAN: Yes, Susan, please.

MS. ANDERSON: There may be a point but I'll wait until you finish all the

definitions.

MS. STEWARD: Thank you. One subset of HID lamps are the self-ballasted lamps. They can be used as replacements for other lamps in existing fixtures with no external ballasts.

For example, a metal halide PAR lamp might be used as a direct replacement for a halogen lamp used in a retail space.

The proposed definition for self-ballasted lamp for HID lamps is, self-ballasted lamp means a lamp unit that incorporates all elements that are necessary for the starting and stable operation of the lamp in a permanent enclosure and does not include any replaceable or interchangeable parts.

A basic model defines a class of lamps that are similar in design and specification to the extent that their performance can be determined by a representative sample. This definition is

global and used for most basic models, not just for lamps.

The proposed definition for basic model is, basic model, with respect to HID lamps, means all units of a given type of covered equipment or class thereof, manufactured by one manufacturer, having the same primary energy source and which have essentially identical electrical, physical and functional or hydraulic characteristics that affect energy consumption, energy efficiency, water consumption or water efficiency and are rated to operate at given lamp type and wattage.

Again, this is a more global definition, thus the hydraulics and water portions. So our opening Issue 1a, DOE invites comment.

MR. BROOKMAN: Susan, you're first, but please use the microphone.

MS. ANDERSON: What we want to start with is looking at lamp efficacy. And

what we're concerned about is when it talking about rounding the value to the nearest tenth, because of the wide variation in measurement you can get in HID lamps, you're lucky to round to the nearest 100. You know, so it's just not practical to round HID lamps to such a small unit of measure.

MR. COOK: There's an implied accuracy that's not achievable.

MS. ANDERSON: That just doesn't exist.

MR. BROOKMAN: Okay, thanks, Keith.

MS. ANDERSON: And the other thing is that the appropriate definition for lamp efficacy as far as the industry is concerned is in IES RP-16, and we would refer you to that. And them LM-51 being the standard that describes how you measure it.

MR. BROOKMAN: Okay. Keith.

MR. COOK: Keith Cook, Philips Electronics. Concerning your basic model,

NEMA doesn't understand why that's being put into a test standard. That should be part of a lamp specification, not a test standard. So it needs to be dealt with, I think, separately from this particular activity.

MS. STEWARD: Thank you.

MR. BROOKMAN: And, Susan.

MS. ANDERSON: We would also, industry would like to work with the DOE in determining those basic models, too, to have some input on that.

MR. BROOKMAN: Okay. Joe, please go ahead.

MR. HOWLEY: Just one other comment that we have talked about in industry is that we really don't see the need to have hydraulic or water consumption in the definition of HID basic model. We think that probably could be removed or it could be confusing.

MR. BROOKMAN: Okay, thank you.

MR. COOK: It's dangerous.

MR. BROOKMAN: Has the Department not determined what the basic models are yet?

MR. MYER: I'm going to step out here, Michael Myer, Pacific Northwest Laboratory. The definition with the hydraulic, this is a standard definition used for a lot of the terms for -- in the certification, in 429. It works for a lot of the technologies regardless of what it is. It's kind of generic.

Also there's some, I don't want to use the word ambiguity, but there's some leeway in the manufacturers to determine their own basic model rather than saying it's a 100 to 200 lumens type of metric. It allows the flexibility of determination of the basic model. That's why it's a broad definition.

MR. COOK: Regardless, I guess we're still confused as to why we even bring that up in a test standard though.

MR. MYER: You need to know what, you're testing a basic model to --

MR. COOK: No, you're testing a lamp regardless of the model.

MR. MYER: I'm suggesting here that you could use a 100 watt metal halide and a 150 watt metal halide and they could be characterized the same or you could separate them out.

MR. COOK: But the testing itself would be the same.

MS. ANDERSON: See, we just think basic model should be part of the lamp standard rulemaking, not the test and measurement rulemaking.

MR. MYER: All right, we'll take that under advisement and review.

MR. BROOKMAN: Okay. Good, thank you. Joe.

MR. HOWLEY: Just another comment on lumen maintenance. Alex mentioned this in his opening comments. That just a continued concern about lumen maintenance being suggested at 70 percent of lamp life versus 40

percent of lamp life for metal halide and 50 percent of lamp life for mercury vapor and high-pressure sodium lamps.

That is the industry-standard way that we've measured lumen maintenance for 50 years and that's what all our modeling and our values are based on today. Also some concerns about the use of rated values and measured values in the definition as well were raised within the group. So we'll provide some further written comments on that.

MR. BROOKMAN: Okay, thank you. Susan, please go ahead.

MS. ANDERSON: Yes, one other thing about lumen maintenance and what I would refer you to. Say for example, my company's literature if you look at how we publish lumen maintenance information for metal halide lamps, in particular, it varies over a range. I mean it's not like fluorescent or incandescent or halogen where we can come up with a specific defined --

MR. BROOKMAN: Susan, I'm sorry, you need to get closer to the microphone. Thank you.

MS. ANDERSON: Okay. There's so much variation in the lamps when we publish our lumen maintenance curves we actually show its region that the maintenance is going to be within this region. It's not a single line of data.

MR. BROOKMAN: So as Alex said at the outset that's a standard characteristic of these products?

MS. ANDERSON: These are discharge lamps, yes. It's something that has to be taken into consideration when setting standards for these lamps.

MR. BROOKMAN: Okay, thank you. Michael.

MR. MYER: Michael Myer, Pacific Northwest National Laboratory. I just want to followup on the comment about the industry standard. That's not published anywhere, we

did do some research, am I incorrect on that, that there's no actual ANSI or document that says 40 percent for HPS, 50 percent. And the reason I'm following up for this is that there's a statement about changing it now would invalidate some manufacturers' data. Characterizing the term, I think, accurately.

My concern is, do all manufacturers use this value as of now, or is it just kind of an industry, we all do it but, you know, as I said, is there a document out there that says that's what everyone does and therefore all people do that?

MR. BROOKMAN: Susan.

MS. ANDERSON: You might want to direct that question to Dr. Ron Daubach who is on the line, or Susan Callahan that's on the line. Ron Daubach is head of our test and measurement group. And Susan is one of our engineers for HID.

MR. BROOKMAN: So, Dr. Ron Daubach, are you on the line? Can you talk to

us?

MALE PARTICIPANT: Or Susan.

MR. BROOKMAN: Or Susan.

MS. ANDERSON: Or Susan Callahan. The question -- Ron, are you on there?

DR. DAUBACH: Hello, can you hear me?

MR. BROOKMAN: Now we can hear you, yes.

DR. DAUBACH: Yes, I heard the question but there's no consensus standard that states that these lights test definitions of 40 percent or lumen maintenance definitions.

MS. ANDERSON: We did all agree with the NEMA companies coming together to prepare for this that all of us use that same, that's what we use so that's what all of our historic data is based on. Measured at 40 percent of rated life for metal halide, 50 percent of rated life for mercury and high-pressure sodium.

MR. BROOKMAN: So is that an established policy at NEMA?

MR. HOWLEY: Well, it is, what the industry does, if you look in our catalogues and you look at where ever we list lumen maintenance data, we all list it based on the same techniques. Forty percent for metal halide and 50 percent for high-pressure sodium and mercury vapor lamps.

MR. BROOKMAN: So irrespective of whether it's an established procedure or policy in NEMA, all of you use it and it can be traced in your product literature?

MR. HOWLEY: Right, it's how we have developed those numbers over the past 50 years and everybody uses the same life points when they publish that data.

MR. BROOKMAN: Michael.

MR. MYER: Well, I had a question related to a possible future energy conservation standard. If they're, I don't want to say competitive, or equal technology,

is there an issue in rating one at 50 percent and one at 40 percent of rated life rather than not rating them point at the same point in life? Also then you have apples to [ten-apples comparison when you're starting to do your lumen values over time.

MS. ANDERSON: If you look at the applications of the consensus today, it's not an issue, because mercury and high-pressure sodium are typically used outdoors. And in most cases high-pressure sodium has replaced mercury.

By the time you get indoors where metal halide is typically used, it's used in, say, applications where at one time fluorescent was used or fluorescent has now replaced metal halide. Those are both traditionally measured at 40 percent of rated life.

So if you look at the applications and where they're actually used and the other sources that are used in those same

applications, then they're measured at comparable periods in the life timeline of the lamp.

MR. HOWLEY: Right, I would agree with that, Susan. High-pressure sodium --

MR. BROOKMAN: Joe Howley.

MR. HOWLEY: Yes. High pressure sodium replaced mercury vapor over the past 50 years and that's why the data points were similar, the lumen maintenance values were similar, because generally customers were looking at those two products and the lumen maintenance of those two products.

When metal halide was developed it often was competing against fluorescent for high color rendering index type of applications, which is why that became rated at 40 percent to be equivalent to the 40 percent life ratings on fluorescent at the time.

So that's why these values have been developed over the past four or five

decades the way they have. That's the kind of historical basis. But more importantly that's what all our data is tested on and all of our ratings are based on, are those values.

So industry certainly would not want to change this approach after all these decades. We'd want to maintain the same approach.

MR. BROOKMAN: Michael, do you have any additional questions? Or DOE any additional questions? No? Not at this time.

MR. MYER: Actually, I hope with written comments, Michael Myer, Pacific Northwest National Laboratory, that cannot be expressed mathematically the spend of lumen maintenance tolerance is what you're describing, Susan?

MS. ANDERSON: We can certainly show you data that we have that shows that range.

MR. MYER: Thank you.

MS. ANDERSON: And, as I said,

it's public information in our literature.

MR. BROOKMAN: Okay, thank you, Susan. Alex.

MR. BOESENBERG: One other point not related to this. I think we're finished with that discussion. A point we wanted to raise in at least two of the definitions, and anywhere else in the rule it might appear.

I'll speak right now to the definition of lamp electrical power input. It defines total electrical power input to the lamp including both arc and cathode power where appropriate at the reference condition in units of watts.

We want to point out that HID lamps have electrodes, they do not have cathodes. So there is no separation between arc power and total lamp power for these products. I think cathode is a carryover from some other technology. Fluorescent technology. So sort of a partial recognition of that and when you say "as appropriate" we

want to point out it's never appropriate.

MR. BROOKMAN: Okay, thank you. That was a useful discussion. Any additional comments on definitions before we move on? And thanks again, for those of you that are joining us via the web, for keeping your telephones on mute. That's now working pretty well here in the room. I'm going to go back to Heidi.

MS. STEWARD: Thank you. This is just a housekeeping definition. Alex, I know you're going to love it. This is a ballast efficiency definition. We are proposing to standardize this definition across the technologies, we are not proposing to measure ballast efficiency for this. We are just amending this definition to harmonize it.

Our proposed modified definition is, "Ballast efficiency' means, in the case of a high-intensity discharge fixture, the efficiency of a lamp and ballast combination, expressed as a percentage, and calculated in

accordance with the following formula, Efficiency = Lamp electrical power input divided by ballast power input."

We have another issue box, so we invite comment on the proposed amendment. That ends the interpretive dance portion. And I will be handing off to Mr. Lindsay Steele for the test methods.

MR. STEELE: Okay, the next several slides we're going to talk about test methods for measuring energy efficiency of HID lamps. Here we're going to talk about the test conditions, equipment specifications and measurement requirements for HID lamps in these test procedures.

This will establish a standard measurement practice, minimize potential errors and obtain consistent and reproducible test measurement results.

As mentioned previously in comments a ballast is required to operate an HID lamp, especially for stable operation.

And this was borne out in the metal halide lamp ballast test procedure of 2010. And in that test procedure an ambient temperature of 25C was required as well as an air speed of less than a half a meter per second.

These are typical laboratory conditions. They are quantified and reproducible. And this brings us to Issues 2 and 3 where we're requesting comment on the ambient temperature and the air speed requirements as pulled from the metal halide lamp ballast test procedure.

MR. BROOKMAN: Susan.

MS. ANDERSON: While this is appropriate for ballast it is not appropriate for HID lamps. The majority of the HID lamps are actually a lamp within an envelope. So they're totally enclosed. It's the arc tube that's the lamp and then the envelope seals it in. So air speed is not an issue whatsoever.

Where we do have double ended lamps where it is the bare arc tube, those are

tested inside enclosed fixtures, because that is the only way they can be used, because there are safety issues with those lamps. And right now we have standards for up to the 400 watt double-ended lamps for those enclosures.

And the industry is in the process now, already in the process, of defining standards for those enclosures for the higher wattage double-ended lamps. So in no case whatsoever is air speed an issued when you're testing HID lamps.

MR. BROOKMAN: Okay. Tina.

DR. KAARSBERG: Does the established procedure in the enclosures have any temperature requirements? Or any requirements that are related to temperature?

MS. ANDERSON: I'm not enough of a technical expert to answer that but Susan Callahan from our company is on the line.

MR. BROOKMAN: Susan.

MS. CALLAHAN: Yes.

MS. ANDERSON: Susan is involved

in writing the new standards for the higher wattage lamps.

MR. BROOKMAN: Susan, did you hear the question?

MS. CALLAHAN: Yes, I did. There is no temperature requirement index.

MR. BROOKMAN: Okay.

MR. HOWLEY: HID lamps are not affected by temperature to any great extent, unlike fluorescent lamps, which there's a huge temperature impact in operating a fluorescent lamp. There really is no meaningful impact in operating HID due to temperature range, the normal temperature range.

MR. BROOKMAN: The normal temperature range. Yes, Michael, go ahead.

MR. MYER: I believe the temperature stated in LM-51, the temperature range is --

MS. ANDERSON: I would ask you address that to Susan Callahan.

MR. MYER: Susan Callahan, can you

confirm that there is a temperature range specified in LM-51?

MS. CALLAHAN: Excuse me?

MR. MYER: Susan Anderson asked if you could confirm the temperature range, if there is one listed, in LM-51.

MS. CALLAHAN: I don't believe there is.

MR. MYER: If we could double-check.

MR. BROOKMAN: Okay, so if you could address that in your written comments that would be helpful. Thank you, Susan. Let me ask those who are joining us online to re-mute your telephones, if you would please. I have comments on this section. Lindsay, are there issues that you want to raise at this point?

MS. ANDERSON: The air speed is also an issue with us.

MR. BROOKMAN: Right. Yes, okay. Got that. Anything else you want to raise in

this section, Lindsay?

MR. STEELE: No, nothing.

MR. BROOKMAN: Yes, please, your name.

MR. MCGARAGHAN: Hi, Doug. My apologies, I missed the introductions earlier. This is Mike McGaraghan here on behalf of California Investor-Owned Utilities, PG&E, SCE, and separate utilities.

And I just had a quick question on this. My understanding is that you're incorporating ANSI C78.389 by reference and then these two bullets here, ambient temperature 25 plus or minus five. And then airspeeds are listed. My read of 389 just said "draft-free."

So I guess the question is are you amending 389? And this will apply to, I'm sure, a lot of slides today. Are you incorporating by reference and making amendments to 389? And if so can you identify as you go through the slides where it's a

change?

MR. BROOKMAN: Michael.

MR. MYER: This is Michael Myer. I can address the draft-free comment. Actually Keith Cook, many years ago, for those in the room that may not know the story here, the term draft-free was something we did in the metal halide lamp ballast test procedure because the air speed, my understanding, was related to the stability. And it is ambiguous, it says draft-free.

And in the final rule for Metal Halide Lamp Ballast Test Procedure we did a thorough review of multiple different documents. IES LM documents, ANSI documents. Not just lamps, but also fixtures and there's a variety of different answers. Some gave speeds, some of them had different speeds.

The term still is draft-free. Keith, about two or three years ago at that public meeting, Keith said in the old days they did a tissue test. Meaning a piece of

Kleenex, if it didn't move, that was their definition of draft-free. That opened up a whole new can of worms.

So we actually finalized on the IEC definition of 0.5 meters per second squared in that test procedure. Again, this is, best way I would describe, is a harmonization issue, because they used draft-free and the question was raised at that public meeting, what is draft-free. We then published a final rule that set it at that speed. So we were just continuing, again, that draft-free issue into this rule.

MR. BROOKMAN: Okay, thanks for the explanation. Yes, Mike?

MR. MCGARAGHAN: Great, thank you. So the only follow-on there is just as you go if you could try to point out if there are places where you're adopting verbatim these ANSI standards versus places where there might be amendments to what's actually in the standards. You may not always catch it but if

you are aware of those that would be helpful. Thanks.

MR. BROOKMAN: Additional comments in this section, because we're about to move on.

DR. DAUBACH: Can you hear me?

MR. BROOKMAN: Yes, please say your name.

DR. DAUBACH: Hello?

MR. BROOKMAN: Say your name.

DR. DAUBACH: Hi, this is Ron Daubach, Osram Sylvania. I think I missed a little part of this and I heard some mention of LM-51 having a ambient temperature requirement. But that's qualified by saying that it's primarily because of measurement instrumentation and not due to lamp operation. So I didn't know whether that was pointed out.

MR. MYER: Although HID lamps may not be affected by temperature is there a value in setting the temperature for a

correlation relative photometry or lamp ballast factor.

Some of the other light loss factors you need to correlate later on. You know, this 25 degrees is a pretty de facto standard for most light sources. Is there a problem with setting it? This gentleman just said that it's a testing equipment issue.

MR. BROOKMAN: Do you have an answer for that, Ron?

DR. DAUBACH: Yes, there's a mic here and I hear myself so I'm sorry. No, I don't have a problem with the 25 plus/minus five. I just didn't hear all of the question that led up to that.

MR. BROOKMAN: So I thought that previously Susan said that temperature range was not a part of the LM, is that correct, Keith?

MS. ANDERSON: No, my comments were about airspeed. Let me clarify that, about airspeed.

MR. BROOKMAN: Airspeed, okay. So Michael, repeat your question so that Ron can hear it again. Ron, here we go.

MR. COOK: He answered it I think and I understand what's going on. Ron makes a good point and the fact that really, again, the lamp is not affected by it but the test setup is affected by it. And as Joe pointed out ballasts are very affected by the temperature.

And so we may want to go back and review the temperature requirements again, because from a test setup standpoint if you will be effecting the results of the lamp due to the ballast itself changing then we may want to hold that temperature a little bit more precisely. So we will include something in our written comments on that.

MR. MYER: Thank you.

MR. BROOKMAN: Okay, that made sense.

MR. STEELE: Moving on. Now we're

going to discuss the electric and photometric measurements of the HID lamps. As mentioned previously the electric characteristics are based on the ANSI standards and the photometric measurements are from the IES standards with also reference to CIE standards for the color parameters.

Again, we'll remind you DOE is considering colorimetric to delineate the equipment classes in the HID lamp energy conservation standard and also point out here that we have luminous intensity as a photometric measurement and that is for directional lamps to determine beam angle from the light output distribution.

Okay, we'll move on.

MR. MYER: Actually, this is Michael Myer. Going back to an earlier comment about color temperature and ranges. There is no chromaticity standard for HID lamps, like there are for fluorescents and SL.

Can NEMA, when they provide

written comments, provide what some of those tolerances or ranges should be for color temperature for the different, you know, plus or minus what for a 4,000K lamp, because based on some of the earlier comments.

MR. HOWLEY: We can discuss that, Michael. We haven't yet but we can discuss it.

MR. BROOKMAN: Keith, please.

MR. COOK: Keith Cook from Philips. Wouldn't that be part of the lamp standard though and not part of the test standard?

MR. MYER: I would think that would go both ways. You need to know whatever tolerance you were testing to, I mean yes at some value would be the standard, but when you have to test to a tolerance. That's all I was asking.

MR. COOK: You may have to specify the accuracy of the test setup, like is typically done for NVLAP approvals. But you

wouldn't necessarily be looking at it for a particular lamp.

MR. BROOKMAN: Yes, Joanna Mauer.

MS. MAUER: Could DOE describe a little bit about the rationale for potentially using color characteristics for establishing equipment classes?

MR. BROOKMAN: Michael.

MR. MYER: Well, the rationale is… it's still being explored. The Energy Conservation Standard is still in development. If you look at the European Union's they're definitely different, they have an HID standard and at certain color temperatures there are different efficacy requirements. For example, somewhere in the mid-5,000 range. I don't remember if it's 5,000 or 5,500 kelvin. There's definitely a trade-off at some point that you might have to change something.

We also in HID determination heard comments from NEMA, and others about,

essentially high pressure sodium if efficient but it has poor color rendering, low color rendering, aspects in the 20s depending on a standard HPS lamp. And it may not be a viable trade-off for certain other technologies.

And so an equipment class might effected that way. We have heard opening comments from NEMA where they didn't discourage equipment classes but said maybe exclusions. So it's those type of aspects we're still looking at.

MR. BROOKMAN: Tina.

DR. KAARSBERG: Yes, this Tina Kaarsberg. I think it has to do with consumer utility and the trade-offs because.This is probably more important in some types of lamps than in the HID. But we're still exploring to what extent in those markets it might it be important for customer utility, what are the trade-offs, because if the customer utility requires a certain type of color temperature then what are efficiency

trade-offs. Even though the markets and applications are perhaps less sensitive in this one, weare still exploring that.

MR. BROOKMAN: Okay.

MR. STEELE: Moving along now with the measurements of HID lamps. We're looking at power supply characteristics. The test procedures require specific power supply specifications to obtain consistent reproducible measurements. An HID lamp output can vary with a little bit of variation in the supply voltage. Obviously depending on the technology under test.

So given the importance of the supply voltage we're going to take some precautions to minimize other contributions that can affect the lamp voltage and current. And this is quite a busy slide, but we list a few things here that are from the standards that address this.

In particular we've got the

voltage supply wave shape being sinusoidal. The harmonic content of the supply voltage. And also the actual voltage regulation itself. The last two bullets here on power source impedance and the kVA rating is the ensure that the power supply used is capable of providing the appropriate power to the ballast.

This brings us to Issue 4. We're inviting comments on the proposal to waveshape, voltage regulation, and power source impedance requirements from ANSI C78.389 in part and LM-51.

MR. BROOKMAN: No comments on power supply characteristics.

MR. STEELE: Another precaution to ensure consistent reproducible measurement or reduce errors in the test results --

MR. BROOKMAN: Hey, Lindsay, hang on. Comments?

MS. ANDERSON: My comments will be about the next one.

MR. BROOKMAN: Okay, keep going.

MR. STEELE: Okay, sorry. Reference ballast is required to operate the lamp per manufacturer's specifications. We don't want you to overdrive and damage the lamps or underdrive them and skew the test results.

You can also use a power supply versus a specification ballast. Again, the goal here is to obtain valid, reproducible test measurement results. And that brings us to Issue Number 5. DOE invites comments on the proposal for reference ballast requirements and the appropriateness of adopting requirements as recommended in ANSI C78.389.

MR. BROOKMAN: Joe Howley.

MR. HOWLEY: Yes, NEMA did discuss this issue. Our comments are just to point out that there, reference ballasts are not, of course, required for self-ballasted lamps. They are self-contained.

And also that at this time lamps designed for operation only on electronic ballasts do not have a reference ballast. The industry has not created a reference ballast for electronic operation only lamps. This could create some issues going forward in that area.

MR. MYER: This is Michael Myer. Just if it's designated, it says it clearly in the catalogue, electronic ballasts only and it would have a different ballast catalogue code so it's easily distinguishable?

MS. ANDERSON: I mean, in our catalogue what we do is to list the ANSI reference for the ballast that operates that lamp, if one exists.

MR. MYER: So you would do like M-47, you know, I'm must throwing --

MS. ANDERSON: Yes.

MR. BROOKMAN: So that exchange there between Susan and Michael, back and forth. So thank you, both of you. Other

comments related to reference ballast requirements?

MR. STEELE: Thank you.

MR. BROOKMAN: Mike, yes.

MR. MCGARAGHAN: So is NEMA planning to propose reference ballast characteristics that operate only on electric ballasts, electronic ballasts?

MR. BROOKMAN: Susan.

MS. ANDERSON: That would actually be something that would be done through ANSI. And NEMA would work through ANSI to set up standards. And that's still an evolving portion of our industry, if you would have it. So that's all very new.

MR. MCGARAGHAN: Okay.

MR. BROOKMAN: Susan, does that indicate that that is something that is underway or you're considering getting underway? Or what is the status?

MS. ANDERSON: Susan Callahan?

MS. CALLAHAN: There's another

company working on the test methods for electronic ballasts. And it is my understanding that the lamp manufacturers are also working on what could be considered electric ballasts for the market place.

MS. ANDERSON: Did everyone hear that?

MR. BROOKMAN: I think that came through clear enough. Okay, thank you, Susan.

MR. MCGARAGHAN: So when she says we, she's referring to the committee?

MS. ANDERSON: Usually the way ANSI standards for lighting evolve is that the NEMA companies come together and come up with standards and present them to ANSI. And then ANSI typically adopts them. They become formal through ANSI.

MR. MCGARAGHAN: And so, Mike McGaraghan again. I guess a question for DOE. Are you prepared to wait for an ANSI standard to finalize this test procedure, or what's your strategy to address lamps that can only

be operated on electronic ballasts in the meantime?

MR. BROOKMAN: Michael Myer.

MR. MYER: Michael Myer. I think we'd research it more. Offhand I would guess that electronic only would be a very small percentage of the current market because they would not be backward compatible since the vast majority of the market is magnetic right now. And then it also could be something that, depending on other characteristics, they would have other factors that would probably be before it. But we'll do more research and address it in the final.

MR. BROOKMAN: Okay.

DR. KAARSBERG: This is one of those things, like many of these things, where the test procedure and the standard need to be in sync with each other. And we'll see how it goes in terms of the way we look at market shares and volume of shipments and those sorts of things> That's part of the standard

practice.

MR. BROOKMAN: Thank you, Tina. Now, Joe.

MR. HOWLEY: Just a comment that you may also look at this as an exempted category since there are a very limited number and they tend to be very high efficiency, if there's no standards for them. Just a possibility.

MR. BROOKMAN: So written comments on that front I think would be useful.

MR. MCGARAGHAN: Another question. Mike McGaraghan, on the issue NEMA raised about self-ballasted lamps. Again, it goes back to the question I asked earlier, what's the DOE strategy for incorporating changes to ANSI 389 in the federal test procedure? Because that C78.389 doesn't mention a procedure for self-ballasted lamps, that I'm aware of.

So I think if you're going to move forward with a test procedure that would cover

them you would have to make a change to it. Is that correct?

MR. MYER: Michael Myer, Pacific Northwest National Lab. I think we would, well first we would review it compared to self-ballasted CFLs to see how they're treating it. Obviously you couldn't have a reference ballast because you can't remove the ballast out of the bits.

Again, self-ballasted HID lamps are also a very small market segment and we might have to address it differently. But research will be the starting point of, at least, with other technologies that are self-ballasted and then how it's applicable or not applicable to this technology. And we'll address it and I will.

MR. MCGARAGHAN: Another question on ballasts. Lamps that are designed to operate on probe-start and pulse-start ballasts. I guess this is perhaps a question for manufacturers. Does the current test

procedure give you enough guidance on how to measure that lamp?

MR. BROOKMAN: Susan, please.

MS. ANDERSON: We haven't discussed this, but if the reference ballast is pulse-start ballast, you know, if that's what the technology is. If that's the defined reference ballast I would think the measurements would be taken on the referenced ballast.

MR. MYER: Michael Myer, are you asking about the lamps that have a dual start mechanism that can be either probe or pulse, essentially like Philips AllStart Lamp, what is the reference ballast there?

MR. MCGARAGHAN: Yes.

MR. MYER: And is that answer you're saying, Susan?

MS. ANDERSON: Yes, I would think that would be the logical thing. If the reference ballast goes back to being in the probe start technology, rather, that's where

you would go. Whatever the technology is of the reference ballast, because most of those lamps are made, there are lamps that are made to retrofit into probe start applications. That's the primary one.

MR. MCGARAGHAN: Okay, so I don't have an opinion at this point one way or another how it should be. I just wanted to make sure that the standard, as it's written, does have enough clarity and it sounds like at least Osram's got an opinion on how they would interpret it. If that's not how DOE intended it to be interpreted then my comment would be to address that in further detail.

MR. BROOKMAN: So would NEMA intend to address this point in its written comments? Keith.

MR. COOK: Yes, Keith Cook. Yes, we can address that. I think what we're finding is this is a very complex subject. We've got the self-ballasted, we have the AllStart type lamps. We have the HID, we have

probe start. It almost ends up being a specific test for each different type of lamp, which I don't think we're wanting to get into. But I'm not sure how we're going to address but we will add some comments to this.

MR. BROOKMAN: Okay, thank you. Mike McGaraghan.

MR. MCGARAGHAN: Mike McGaraghan. One final question on ballasts. In the reference in the ANSI standard, I think it's C85, I don't have it in front of me. But the one that has all the reference ballast characteristics in it.

I notice there are different reference ballast characteristics based on lamp orientation, whether it's vertical, base-up or horizontal. It seemed odd to me but I wanted to bring it up and if that is industry standard and that makes sense to the manufacturers then I won't push it.

MS. ANDERSON: Now there are lamps that are only designed for base-up operation.

Some that are only base-down or some that can be in either of those orientations. And then there are lamps that are exclusively designed for horizontal operation, plus or minus 15 degrees of the horizontal.

MR. MYER: And each of those is deserving of different reference ballast operating characteristics?

MS. ANDERSON: No.

MR. COOK: No.

MS. ANDERSON: Susan Callahan, can you comment on that?

MS. CALLAHAN: I'm looking at the ANSI standard for metal halide lamps and I'm not seeing different reference ballast characteristics depending on orientation in this document.

MR. BROOKMAN: I see Heidi shaking her head. Do you want to comment for the record, Heidi? No. Okay. Susan, go ahead.

MS. ANDERSON: No, I mean when you're actually doing the testing of the lamp

it would be tested in its designed position.

MR. COOK: The lamp is designed for a wattage, it doesn't know what the orientation is.

MS. ANDERSON: -- to the lamp not the ballast.

MS. CALLAHAN: Okay, there are different ranges for lamp voltage and current depending on the orientation of the lamp. But they would be tested using the same reference ballast characteristics. So once installed characteristics don't change.

MR. MCGARAGHAN: Great, I'll follow up perhaps with you, Susan, offline and if I can just send you this table and you can help me understand.

MS. CALLAHAN: Okay, thank you.

MR. BROOKMAN: Okay, final comments on this?

MR. HITCHCOCK: This is Bill Hitchcock from Philips with a question.

MR. BROOKMAN: We hear you, keep

going. Yes.

MR. HITCHCOCK: I think there may be some confusion here. I do not believe that C78.389 carries the characteristic for the reference ballast. It's C78.43, the lamp standard, that defines the characteristics. And therefore, you've only got characteristics for reference ballast on lamps that are standardized.

MR. MCGARAGHAN: Can you say the number there again, C78.43?

MR. HITCHCOCK: C78.43.

MR. MCGARAGHAN: I was actually referencing C82.5, so maybe I was in the wrong place to start with.

MR. HITCHCOCK: I believe C82.5 has the characteristic, the rules for how to determine a reference ballast. But I do not believe it lists the actual values for the specific lamps.

MR. BROOKMAN: Okay, thank you. Any other questions or comments related to

reference balance ballast issues?

MR. STEELE: Continuing on with our quest to minimize test measurement result error, one potential source of error is not using correct measurement equipment. So here we're showing some of the instrumentation requirements pulled from ANSI C78.389 for the electrical measurements. And LM-51 for the photometry.

We're dealing with AC here, hence there's a possible frequency range and harmonics therein, so therefore there is a frequency range accuracy requirement in any of the measurement equipment there.

Any measurement equipment that is put in circuit during the test measurement should not affect the lamp operation. That being it should not disturb the lamp's characteristic voltage and current.

Moving on to light output and color measurement, we're requiring a V-lambda spectral response and photometer that is with

any photometric measurement we scale to a human visual response.

And for a chromaticity, CCT and CRI we also mention spectral radiometry, which is considered by industry a more precise method for determining those values.

So that brings us to Issue Number 6 on the proposed instrumentation specifications.

MR. BROOKMAN: Joe.

MR. HOWLEY: NEMA discussed this and had one comment. And that was that we believe more specificity can be provided on the integrating sphere diameter in terms of that last requirement, or comment. There are some recommendations in CIE and we'll provide more of that in our written comments.

MR. STEELE: Thank you for that.

MR. BROOKMAN: Other comments related to Issue Box 6, on proposed instrumentation specifications and appropriateness of ANSI C78.389 and LM-51?

Okay.

MR. STEELE: Now we're going to discuss the sampling method for these HID lamp test procedures. For each HID lamp basic model we're requiring that the lamp characteristics be representative of a manufacturer's production output.

So therefore we need a sampling plan to determine product process variability and DOE is proposing to adopt the sampling plan from another lighting equipment rule that's already in the Code of Federal Regulations in Section 429.27.

This is actually from the GSFL Rule and it is, sample test units are obtained via a random selection. Sample plan is over a 12-month period and we're requiring a minimum of 21 samples hopefully spread evenly over the 12-month period. I believe there is a minimum seven-month period available also if production does not run the full 12 months.

Then, with those sample test

group, you then go ahead and do the test procedures and determine the lamp characteristic measurements and take the mean of those measurements. This brings us to Issue Box Number 7, regarding the proposed sampling method.

MR. BROOKMAN: Alex.

MR. BOESENBERG: Alex Boesenberg of NEMA. You mentioned the GSFL Standard. We disagreed with the statistical measurement and the approach at that time, we will disagree with it again. And I will attempt to bring more information to bear at this time.

We disagree, we talk about inherent uncertainty but then misapply the statistical T test. So we will submit some more information to that, but the uncertainty brings with it a certain requirement that you allow a great degree of tolerance, or range of tolerance. And we'll comment to that.

But there's one other portion, besides just the statistical discussion

itself, is that in Europe they have a ten percent plus or minus in their reporting and testing requirement. And as such any manufacturer that sells to both markets would be disadvantaged if they were testing to a much tighter tolerance here in the U.S., because they'd have to potentially run two tests.

We'll provide greater explanation on that. It's very difficult for me to speak about statistics. But, again, we disagree with some of that approach.

MR. BROOKMAN: Alex, in addition to commenting on what is proposed, will NEMA propose an alternative?

MR. BOESENBERG: Yes, we will.

MR. BROOKMAN: Thank you. Tina.

DR. KAARSBERG: Alex, my understanding is that NEMA disagreed with the initial GSFL proposal, which had, I think, 20 samples. In the final version our intent anyway was to agree with NEMA on that.

So I'm just stating that if we don't agree with you in the final version it would be helpful if you could explain why as well I think that was October 4th when we had that meeting when you talked about it.

MR. BOESENBERG: Yes, I remember from that we talked about how 20 didn't make any difference statistically from 21 due to the requirement to get to 50 percent failure. But we'll bear that in mind and I'll get a greater explanation on that.

Also we will comment later on the 21 sample size and the 12-month sampling, because these are very long-lived lamps once you get to December and pull a lamp and begin testing it it's a long time before you have the results.

MR. BROOKMAN: Joe.

MR. HOWLEY: Yes, I'd just like to add, our statistical expert is not here. But the source of the concern really came out of the CCE rule versus the GSFL rule. And it had

to do with how the statistical test was being applied to lamp samples. Our statistical person believes that the T test is being very inappropriately applied. And he's going to provide some written comments on exactly how he feels that this is being misapplied.

But it has an effect when you have products that have fairly tight tolerances, like incandescent and fluorescent, but it has a much more severe effect of misinterpreting this if you're applying it to HID lamps, which need and have a much wider tolerance on things like lumens and lumen maintenance and issues like that.

So although we had a concern and it wasn't addressed with the CCE we don't feel in this particular case that we could afford to ignore it. We simply cannot have the statistical test and supply for these particular lamps because of the tolerances needed.

So we'll provide more written

comments. We'll have him provide them because he understands the statistical issues much better than we do.

MR. BROOKMAN: Okay. Whoever is coughing, if they could mute their phone that would greatly be appreciated for those of us in the room. Those of you that are joining us online please mute your phones. We're going to return to the slides and keep going.

MR. STEELE: Thank you for all the comments and pending input, we look forward to reviewing it. Now I would like to hand the podium over to Heidi Steward who's going to discuss the next issue.

MS. STEWARD: This is the musical portion. All right, aging is just turning a lamp on and letting it run for a specific period of time to prepare it for testing and use. Each lamp is aged only once. DOE proposes all HID lamps be aged 100 hours in the position it will be tested, base-up, base-down or horizontal.

After aging a lamp must be warmed up and measured to verify stabilization. Each of the three types of lamps is physically different and thus has different warm-up and stabilization criteria.

As you can see they range in warm-up time from 15 to 20 minutes for mercury vapor all the way to six hours for metal halide lamps. And stabilization criteria are generally three successive measurements of voltage and current across variable measurement intervals and changes of values depending on lamp type.

This is Issue 8. We invite comments and data on the applicability of the proposed 100 hour aging requirements and stabilization methods.

MR. BROOKMAN: No comments? Joe, what?

MR. HOWLEY: The only comment here was that NEMA agrees with using the ANSI C78.389.

MR. BROOKMAN: Thank you, that's useful. Okay, Heidi.

MS. STEWARD: Depending on where a lamp is aged or warmed up often it needs to be moved. So transfer and re-stabilization requirements are necessary. Again, lamps differ physically so they have different requirements.

The detailed lamp stabilization, re-stabilization and lamp transfer requirements for the various HID lamp types, metal halide, high pressure sodium and mercury vapor, are provided in C78.389. So our issue, DOE has proposed lamp cool down and re-stabilization methods for HID lamps and invites comments.

MR. BROOKMAN: Susan.

MS. ANDERSON: In practice, I mean once again, the NEMA companies have discussed this and we all do the same thing. We stabilize the lamps and then, without changing their orientation or removing power from them,

move them into the sphere and then make sure they're stabilized within the sphere. And it usually takes about 15 minutes within the sphere.

We check the measurements, if not stable we give them additional time. But we have a very specific procedure that we all agree that we use and we will give that to you in detail in our written comments.

There is no cool down time because we don't turn the lamps off before we put them in the sphere. We keep power, keep the lamps energized and move them into the sphere.

MS. STEWARD: Lamp orientation is the recommended burn position. Susan spoke briefly about it earlier. Generally you have base-up, base-down or horizontal. The orientation for aging and stabilization must be the same as that as for testing.

The physical changes can occur during aging and stabilization. If the lamp is turned before testing it can give you

completely different testing results than if the orientation were maintained.

So for consistency of measurement DOE has proposed the requirements of ANSI C78.389. Issue 10, we invite comments on this lamp orientation requirements.

MR. BROOKMAN: I see a few heads nodding from manufacturer representatives, so would you state that, Susan, for the record, please?

MS. ANDERSON: Yes, we agree.

MR. BROOKMAN: You agree with that, okay. Thank you.

MS. STEWARD: As we discussed briefly before, directional lamps require different measurements to calculate beam angle. Setup and measurement of directional lamps are proposed to be done following ANSI C78.379, which provides classification of beam patterns and technical guidance pertaining to directional lamp measurement and evaluation.

Issue 11, we invite comments on

proposed setup and measurements standard selection for directional lamps.

MR. BROOKMAN: Joe.

MR. HOWLEY: Again, in our industry discussions we were concerned how this may be applied and just note that measuring the beam performance of directional lamps increases the measurement variation if you're using zonal lumens to set efficiency limits.

So again, this would require a higher statistical variation tolerance on measurements if we head down that path. So far we haven't had any standard yet that deals with directional lamps in terms of taking into account the zonal lumens.

So we're approaching a new area here. I think it all has to be carefully thought out as we look at standards. Thank you.

MR. BROOKMAN: So is NEMA going to do some additional work on this, Alex?

MR. HOWLEY: I'll ask the members to discuss it. We're not sure yet how much we can provide other than just to say make it wide.

MR. BROOKMAN: Michael Myer.

MR. HOWLEY: Plus or minus 100 percent.

MR. MYER: Just to clarify. The comment is not in disagreement of the setup, it is only in the possible calculation or metrics derived from the setup, or from the --

MR. HOWLEY: That's right, we do agree with ANSI C78.379 being applied here, just how you apply it.

MR. MYER: Right, how it's applied and how tight the tolerance is held when you're talking about zonal lumens, which provides a lot of tolerance issues.

MR. BROOKMAN: Okay, so that was Alex followed by Joe. Thank you.

MR. MCGARAGHAN: Mike McGaraghan, California IOUs. I think I missed a chance to

comment two slides back on orientation. I just wanted to ask about lamps marked as universal. It looks like the proposal is to test base-up, which is I understand how it's always been done.

The question, I guess, for the group is if there's ever been discussion about the performance of universal lamps in other positions besides base-up and whether it should be measured or reported to the consumer if there's a big variation.

I understand that often base-up is the best performing position. So if some lamps that maybe their performance drops off a lot when you move to horizontal versus another lamp where the performance doesn't drop off much, is that an important thing to measure? Is there some strategy to capture that either in the test procedure or in the literature for these products?

MR. BROOKMAN: Susan.

MS. ANDERSON: If you go to our

literature, if it's a universal burning lamp, or operating lamp. Shouldn't say burning. We provide both the vertical and the horizontal lumens. But, I mean, the main application for these lamps are where they're used in things like floodlights where they're always tilted at an angle. So we do have to have some sort of a lamp that's tolerant of the multitude of many positions the lamps could be operated in.

You know, it's not like it's going, you know, the most common application is say a high bay fixture and it's base-up and traditionally people do try to design the luminaires based on base-up or base-down because for those lamps they're most efficient in vertical positions.

But, once again, there are some fixtures, like flood lights, where you have to aim them. So we have to have a lamp designed that's tolerant of that. But the most common application would be in the vertical position. And as far as we, as a manufacturer, go we do

publish both the vertical lumens and the horizontal lumens.

MR. MCGARAGHAN: And apart from publishing that in your literature would it be appropriate to actually measure both in the test procedure and consider standards in both positions?

MS. ANDERSON: That would add significant testing burden to us.

MR. MCGARAGHAN: But I thought you already reported that?

MS. ANDERSON: We do measure it.

MR. HOWLEY: In terms of standards, this is Joe again, we all think that would be appropriate as the most common position is the vertical position.

And in terms of testing and meeting these standards, which already can be quite onerous, it would add a very high level of testing concerns to try to measure out all these different angles that a few fixtures might operate in. So no we wouldn't agree to

having standards at all of these different operating positions. The primary operating position.

MR. BROOKMAN: Keith.

MR. COOK: Keith Cook with Philips. Even though we may do the testing today we don't do it necessarily through a NVLAP approved facility. And the implication here is that we are going to go to a NVLAP-approved facility which significantly will add cost.

And by having to do this on a third party, with a lot of the smaller manufacturers, you're significantly doubling the costs by asking them to do it in multiple orientations now. And there's a huge burden associated with that which we're concerned with.

MS. ANDERSON: And once again, the primary application is the vertical application. It's just these few applications where you see flood lights, where the angle

could be anything and you there's no way in the world you could begin to test for all those potential aiming angles.

MR. BROOKMAN: Okay, thank you, Susan. Heidi.

MS. STEWARD: Thank you. On to the aforementioned NVLAP. NVLAP is a National Voluntary Laboratory Accreditation Program. They accredit laboratories for many types of testing, not just luminaire testing or lamp testing.

The DOE proposes testing for HID lamps test procedure be done at independent test labs or manufacturer/importer testing labs that have been accredited by NVLAP or another organization recognized by NVLAP.

So on Issue 12 we request comment on the proposal to require NVLAP accredited or equivalent labs for testing, similar as DOE required in the GSFL test procedure.

MR. BROOKMAN: Keith.

MR. COOK: Keith Cook with

Philips. I've already alluded to this a little bit, but we're a little confused, first off, by the wording of this thing. First off, "by an accrediting organization recognized by NVLAP." NVLAP does not recognize any other accrediting bodies, they just don't do that.

MS. STEWARD: They do for other types of lighting. They do for solid-state lighting.

MS. ANDERSON: Don't.

MR. COOK: No, they don't. It's through NIST that you get the accreditation.

MS. STEWARD: Okay.

MR. MYER: We'll research that aspect, thank you for pointing that out.

MR. COOK: But even then, the other potential implication of this wording is going to certification bodies. And we had really cautioned DOE that that may be a mistake.

EPA has done that through the EnergyStar and that has not worked out

extremely well. It's led to a lot of chaos because of different interpretations of testing standards and testing setups and specifications.

And as a result it's caused a lot of delay of new product introductions and listings of new products on their websites. It has become a major fiasco. We'll include a lot of comments on this, but we do caution the DOE about going down this path.

MR. BROOKMAN: The principal comment relates to different or multiple certification bodies, correct?

MR. COOK: Correct.

MR. BROOKMAN: And so say what you'd like to see have happen with NVLAP in your comments, right?

MR. COOK: Will do.

MR. BROOKMAN: Okay. Other comments on Issue Box 12?

DR. DAUBACH: This is Ron Daubach Osram Sylvania. I believe that the DOE also

proposes that manufacturers' accredited laboratories can also supply the test results. That is still DOE's position?

MR. BROOKMAN: Michael Myer.

MR. MYER: At this time that is what is proposed, it would be an accredited laboratory.

DR. DAUBACH: Okay.

MR. BROOKMAN: Okay, Ron, thank you. All of you that are joining us online you're doing a great job of keeping those phones muted, thanks for doing that. Alex.

MR. BOESENBERG: This is Alex Boesenberg from NEMA. Specific to your question of whether or not additional or alternative requirements for testing labs should be considered, we suggest that we refrain from adding any additional requirements due to the cost.

MR. BROOKMAN: Other comments on Issue 12 before we move on? Okay.

MS. STEWARD: So we can move on to

test measurements and calculations with Lindsay Steele.

MR. STEELE: Almost there. This slide shows the logical progression of the proposed HID lamp test procedures. I have a nice start/finish arrow to kind of show you the direction that we're heading in here.

First off we start with an initial operation of 100 hours on the lamps burn, call that the lamp aging or sometimes referred to as seasoning. There is no exception to this rule, per the standard.

Then the next thing that would happen is the lamps would be stabilized before any kinds of measurements are done. And then when we move into the measurement phase of the procedures, taking the electrical and photometric characteristics.

Once you have established those measurements you would then repeat for each lamp in the sample test group, and then one would go ahead and calculate the lamp efficacy

and lumens per watts and take the mean values and generate a report with the group test results and statistics.

The characteristics that we would like to see in the report would be efficacy, CRI, CCT, lumen maintenance, obviously, and beam angle. Again we'll remind you that DOE is considering using the color values to delineate the equipment classes of the HID lamp in the energy conservation standards that are coming up.

Apologies for having to kind of switch slides here. But that brings us to Issue Box Number 13 where we're inviting comment on the suitability of the measurement and calculation procedures of HID lamps.

MR. BROOKMAN: Let's flip back to the previous slide.

MR. STEELE: I will do.

MR. BROOKMAN: Comments we know are on this slide, Slide 38. Joe.

MR. HOWLEY: This comment is

basically kind of summing up what we've been talking about today and this slide takes us through all the different testing and different outputs that we'd be looking at.

And, as we've mentioned this morning, concerns about tolerances, kind of, all the way through this process. Needing the proper tolerances on the lumen output. If we're adding a zonal lumen distribution, calculation tolerances within that area.

If we're measuring CCT or CRI, again we talked about tolerances there and appreciate that DOE is looking for what we might suggest in these areas in terms of tolerances.

And then finally, the labs themselves we've noticed even in doing round robin testing in labs there could be a tolerance of four percent or more just across the individual labs that may be trying to do compliance or certification testing. This would have to be taken into account as well.

Yes, NVLAB labs.

MR. BOESENBERG: That's not our number, NVLAP has tested effectiveness or repeatability among different labs and they give a four percent margin from one lab to the next.

MR. BROOKMAN: For the NVLAP-certified labs, within that identified group, four percent?

MR. BOESENBERG: Right, test the same gear from one lab to the next. And they --

(Off microphone comments.)

MS. ANDERSON: It's four percent or more. Four percent or more depending on the lamp technology. And HID lamps being the most variable.

MR. BROOKMAN: Interesting.

MR. BOESENBERG: It's my understanding that's for lamps, yes. And, if I may, this is Alex Boesenberg again. It's not specific to the test procedure standard,

but for the record we would like to raise the concern that in terms of certification, compliance and enforcement, since one day this will all end up in that arena, because of the lifetime of HID lamps, and I alluded to this earlier, testing to the 40 or 50 percent rated life-point, annual testing is not feasible, due to the, first, the annual sampling itself. And then the fact that these last so stinking long. You can't do it every year.

MR. MYER: Michael Myer. I just want to follow-up on the tolerance comment Joe had. I had two values there that I didn't hear and I just wanted to ask about those tolerances. Power, I assume, is there a lot of tolerance there? And you don't have to answer now, it can be in the comment. I just wanted to put that one out there.

And you've also used the term zonal lumens a couple of times and I just wanted to also interject it with intensity, candelas, again, is there a lot of assumed

tolerance in intensity at a given angle?

MR. HOWLEY: Yes, there can be because of the, just shape of the reflector or tolerances within the reflector. How well that's aimed within an HID arc source. There's tolerances within the center beam candlepower as well.

MR. BROOKMAN: Okay, Michael, yes.

MR. MYER: That addressed the question I was asking, thank you.

MR. BROOKMAN: Thank you. Okay. So, Joanna Mauer.

MS. MAUER: Just a quick question. Would lumens per watt be the metric for directional lamps as well as omnidirectional lamps?

MR. BROOKMAN: Joe Howley.

MR. HOWLEY: I'm just answering in that it has been so far, in the incandescent reflector lamps, we've had simply a lumen per watt metric on those. We have discussed whether or not it makes sense to look at the

directional nature of the center beam candlepower in these other rulemakings, but to date we haven't gone down that path. This is the first rule where we've actually proposed looking at this path.

So it's something that on one hand makes sense. On the other hand introduces a lot of tolerance concerns.

MR. MYER: Following up on Joe. This is Michael Myer. Again, no metrics have been proposed, just at some point after lumens you would need some aspect of intensity and that's all we're proposing to measure.

And these are actually following comments from NEMA from the high intensity discharge determination where they said look at something else. But it was not stated, as Joe has identified, there's some issues that have to be addressed before you could set a metric. But we are not proposing any metrics, just test the next logical thing.

MR. BROOKMAN: Tina Kaarsberg.

DR. KAARSBERG: I don't know if we have this data, but it would be interesting to just see the data on how many of the lamps are directional versus the fixtures. My understanding is that there are not that many directional lamps, so for a lamp standard it may not be an issue. But that most HID fixtures are directional fixtures. So any data you all could provide, or insights on how they're used would be very helpful to us.

MR. HOWLEY: That is a good comment. When you look at the whole world of HID lamps the fast majority of them are omnidirectional. There is just a very small subset of HID lamps that are actually in a reflector shape. So it also would be worth considering how much energy and time might be directed at directional HID lamps.

We know there's another rulemaking being proposed for reflector lamps, which is all directional, so that might make more sense to venture down this path versus an HID

rulemaking where such a small percentage of the lamps are indeed directional lamps. Thank you.

MR. BROOKMAN: Mike McGaraghan.

MR. MCGARAGHAN: Mike McGaraghan, California IOUs. We would definitely support any effort that goes into looking for a directional metric and agree with what Joe just said that the incandescent reflector lamp rulemaking might be the more appropriate place. But I also think that they probably could be the same metric used for both HID and incandescent reflector lamps. So maybe it's a kill two birds with one stone situation.

MR. BROOKMAN: Okay. So any additional comments on this sequence of test measurement and calculations that's shown on Slide 38? Mike.

MR. MCGARAGHAN: Mike again. I wanted to follow up on Alex's comment about color. Alex commented that NEMA doesn't support using color to establish product

classes.

I want to clarify, I guess, that the test procedure rulemaking isn't going to answer that question. That that decision would be made later in the rulemaking itself. And that, in the meantime, NEMA is okay with the proposed test methods for measuring color. Are both of those, I guess first a question to DOE and then a follow-up to NEMA.

MR. BROOKMAN: Michael Myer.

MR. MYER: Yes, all the test procedure does is just says test color quality and it doesn't set any requirements, doesn't delineate, it just says test and then you do something with it.

MR. BROOKMAN: Yes, Alex.

MR. BOESENBERG: And this is Alex Boesenberg. We have no argument with those ANSI standards, no.

MR. MCGARAGHAN: Thank you.

MR. BROOKMAN: So as I think that's the last issue box and this is the

final slide, substantive slide. So I'm turning it back then to Tina. Yes?

DR. KAARSBERG: Well, I have a request and if you want to comment as well that would be great.

MR. BROOKMAN: You should offer an opportunity for closing remarks.

DR. KAARSBERG: Right, right. But specifically on Mike McGaraghan's comment that it would be good if there were some kind of directional metric that it would be the same for incandescent reflector lamps and HID reflector lamps.

I'd just be curious if you all do have any comments on that, on his comment, I'd be interested in hearing your comments as well.

And in general, closing remarks. This is, I guess, where we ask everyone to kind of sum up, surmise what they're doing. I think on DOE's part we have some homework to do. A lot of your excellent questions we

couldn't answer because we haven't really gotten there yet in terms of other work we're doing on the standard and such.

But I really appreciate everyone's comments. And they will all be reflected in the next round of the test procedure. And I really strongly encourage you to submit comments by the 28th. And, at this point, I guess we're going to go around the room and see what people want to say to the proposed test procedures.

MR. BROOKMAN: Any final comments or additional comments here at the end? Keith.

MR. COOK: Keith Cook with Philips. One additional comment is we'd like maybe a closer look at the cost estimates that were put into this. The --

MR. BROOKMAN: Keith, you need to get closer to that microphone, thank you.

MR. COOK: The energy consumption for the life testing to determine 40 percent

and even the 70 percent maintenance, [we estimate] that actually will exceed $200 per individual lamp. And if you have 21 samples per year then that's going to be over $4,200 right there. We actually sent it out to find out what a third party would cost and they came back considerably higher than even that.

Also the references made regarding similarity between incandescent life testing and HID lamp life are way overstated.

And last, but not least, assuming the entire catalogue is incorporated as different basic models, we're seeing as many as 200 basic models then, per manufacturer. And that would require 23 million kilowatt hours of electricity annually to do the testing, which ends up being over $2.3 million. So we believe that these cost estimates need to be reviewed more closely.

MR. BROOKMAN: Thank you. Alex.

MR. BOESENBERG: Alex Boesenberg, NEMA. To amplify that, so that is very

pertinent both to the discussions of sample size and especially to the definition of a basic model, obviously.

And then one other comment I wanted to make to sort of sum up on the discussions we've had through the course of today's meeting about where a specific standard may not yet exist in terms of a procedure. And we've said more than once the general accepted industry practice is X, Y, Z.

I would like to point out, it's sort of moot, or it's common sense, but the more that we stick to the established procedures and tests, whether by a specific reference or by what we in the industry agree is the general accepted industry practice, the more we stick to that then easier it is to implement the future standard because we don't have to change what we've been doing.

In particular, as to my previous comment about testing to 40 and 50 percent of rated life, if one of the variables is

something that involves statistical sampling if we measure to points that we have already done in the past therefore we have that data already resident, the sooner and easier we can supply the answer to whatever that piece might be.

So sticking to the way we've done it and the procedures we already have and already, in a sense, paid for and set up the facilities for at the different companies or third party test labs means that we minimize the burden to the industry and you maximize the continued availability of product and you minimize time to market for new products.

MR. BROOKMAN: Thank you. Joe.

MR. HOWLEY: Just as chairman of the NEMA lamp section we appreciate the opportunity to provide our comments today and we'll follow up with written comments as well. Thank you.

MR. BROOKMAN: Thank you. Additional comments? Mike. Oh, I'm sorry,

Susan, please.

MS. ANDERSON: I actually have a question. Since there are so many open issues, when you look at the schedule there's not going to be an opportunity for another comment period beyond the one that is due February 28th.

Is it possible that there should be another publication of proposals based on the feedback that you get and the research that you do, and then have another opportunity for the interested parties to comment?

MR. BROOKMAN: Betsy.

MS. KOHL: We can take a look at that.

DR. KAARSBERG: And a lot of your comments overlap with the standard and there will startto be opportunities for comment on the standard as well.

MR. BROOKMAN: Mike.

MR. MCGARAGHAN: Mike McGaraghan, California IOUs. A few questions. First,

dimming lamps didn't come up at all today and that may be because it's more a factor of the ballast and not the lamp itself, maybe industry can confirm.

But the question here is are there any characteristics of lamps that are designed to operate on dimming systems that would impact the way they're tested or the way they perform?

MS. ANDERSON: We don't have lamps dedicated for dimming.

MR. MCGARAGHAN: Okay.

MR. BROOKMAN: That was Susan. Thank you.

MR. MCGARAGHAN: So you can put any lamp as long as it's designed to operate with a dimming ballast?

MS. ANDERSON: So long as the lamp and ballast are compatible.

MR. MCGARAGHAN: Okay. The other question I wanted to ask is, there had been a lot of discussion about measurement at 40

percent or 50 percent of rated life. If the implication now that DOE is considering a standard level at 40 percent or 50 percent of life?

MR. MYER: At this time there is no standard. Just what we, what the Department, would consider testing. There's already precedent for CFLs and testing lumen maintenance and I think most manufacturers and everyone agree that while a certain HID lamp might start off at economical value of 100 lumens per watt, over the course of the long life that Alex is referring of 24,000 hours it has not remained at that value. And we all know this and it's a fact of the technology and so that the efficacy is changed at some point and it would be helpful to get a sense of what that is. Maybe to set a standard, but at this point it's just testing.

MR. BROOKMAN: That was Michael Myer. Mike McGaraghan.

MR. MCGARAGHAN: Okay. I guess I

didn't follow, what else might you do with that information? If it doesn't end up as part of the standard.

MR. MYER: Continue to do research.

MR. MCGARAGHAN: Last question for me is if DOE can provide any insight as to this upcoming schedule for this rulemaking and specifically rulemaking stages is the plan is to start with a framework as is the usual practice, or because of all the research that went into the determination stage, any elements of the HID rulemaking might get skipped. And at what timeframe that will happen.

DR. KAARSBERG: We can't really comment on that. We are working, we're not not working on it. But we can't really comment on that right now.

MR. BROOKMAN: Thank you, Tina. Mike, okay? Okay. Additional comments here as we move towards closing? Michael Myer.

MR. MYER: I just had a follow-up note on from what Keith said. When you said the catalog 200 basic models, was SKU, product number, just so we could start looking at the cost implications.

MR. COOK: I was trying to look at logical groupings.

MR. MYER: Okay, I was just trying to get a sense of how you -- Thank you.

MS. ANDERSON: It was based on ten cents a kilowatt hour.

MR. BROOKMAN: Thanks, Susan. So any additional comments here? I think we've covered it at this point then. I'm going to hand out, the Department makes a photocopy of the business cards of attendees, I'll hand that out to pass around. And also the evaluation form.

And from my part I think we had a very constructive meeting. Thanks to all of you for being so knowledgeable and forthcoming. Back to Tina.

DR. KAARSBERG: And thank you for being you. Just one other thing, this is pretty much everything but don't forget to write. And up here on the screen is all the various numbers and websites and names. And don't forget Tuesday, February 28th, 2012, be there, aloha, or before. Before is nice as well.

And just one final note, some of you cc me when you send in your comments and I really appreciate that and it's great, but there's no need to because I do eventually get it. I mean get it pretty quickly. But you're welcome to do that if you wish.

MR. BROOKMAN: Simone reminds me that we wanted to provide the opportunity for those that are joining us on the web to make additional comments or summary comments, perhaps.

DR. KAARSBERG: How could we forget the web people?

MR. BROOKMAN: We didn't forget

them, they just weren't here in the room.

DR. KAARSBERG: Okay so I would like to invite the web participants to make any closing remarks that they would like to make. And, thank you.

(Off microphone comments.)

MR. BROOKMAN: So then final comments from those that are joining us via the web. Okay, so I'll just echo Tina's comments to say thank you for joining us --

DR. DAUBACH: Hello, this is Ron Daubach.

MR. BROOKMAN: Yes. Ron, go.

DR. DAUBACH: Yes, just a quick question. Will DOE be providing specifics on what data and how it will be reported?

MR. BROOKMAN: What data and how it will be reported?

DR. DAUBACH: Yes, the last slide indicated that group data was to be calculated. Is only the group data to be reported, for example, and which specific

parameters will be reported? Or is that part of the rulemaking?

DR. KAARSBERG: Oh, yes, the group data. It will be for entire test sample groups.

MR. BROOKMAN: Tina.

DR. KAARSBERG: Yes, this was an just an illustration of how this would work. This wasn't the exact requirement.It was to just give you an idea of the sequence. And this was just our best guess of how it might happen just to illustrate, you know, how the pieces all fit together. I mean, we can't tell you what exactly the group is and what you're testing and how you do the statistics until you have a standard.

And then also we have to develop the appropriate compliance guidance for that. So I apologize for any confusion on that. But that was just supposed to be an illustration of how it might happen. I hope that helps.

DR. DAUBACH: Thank you.

MR. BROOKMAN: Any additional comments?

MR. ELLIS: This is Dave Ellis at Intertek. I was concerned about the versions of LM-51 and LM-47. They are both more than ten years old. IES policy is to discontinue them, take them off the market. A new version of LM-47 is out and a new version of LM-51 will be out probably third quarter of this year. Will these be replaced in the final rule?

MR. BROOKMAN: Michael.

MR. MYER: We'll compare the two documents. And obviously if the IES rescinds a document because of its age we would like to be with the most current unless there's some major change that requires additional review.

MR. BROOKMAN: Thanks for the comment. Okay so then I think we've now completed the meeting. Thanks to all of you, safe travels. And we'll see you next time.

(Whereupon, the above-entitled matter was concluded at 11:04 a.m.)

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Test Procedures for High-Intensity Discharge (HID)Lamps

Before: US DOE

Date: 01-19-12

Place: Washington, DC

was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.

Neal R Gross

Court Reporter