

U.S. DEPARTMENT OF ENERGY
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TEST PROCEDURES FOR HIGH-INTENSITY
DISCHARGE (HID) LAMPS

+ + + + +
PUBLIC MEETING

+ + + + +
THURSDAY
JANUARY 19, 2012
+ + + + +

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)

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

2 9:02 a.m.

3 DR. KAARSBERG: Good morning.

4 Welcome to the first Lighting Standards
5 Meeting of 2012. I hope you're having a good
6 year so far. As I think a lot of you know,
7 I'm Tina Kaarsberg. I'm the project manager
8 for Lighting Standards and I'm also going to
9 try to be a bit of an emcee today. And I'd
10 like to give a special hello to the Web
11 participants.

12 (Telephonic interference.)

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

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

1 Department of Energy's public meeting on Test
2 Procedures for High Intensity Discharge Lamps.

3 Today is Thursday, January 19th, 2012. It's
4 our tradition to start with introductions
5 around the room, so start over here. Say your
6 name and organizational affiliation and you
7 can get used to turning these mics on and off.

8 Make sure the little green button is
9 illuminated.

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

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

14 MR. BOESENBERG: Alex Boesenberg,
15 NEMA.

16 MR. HOWLEY: Joe Howley, GE
17 Lighting.

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

20 MS. ANDERSON: Susan Anderson,
21 Osram Sylvania.

22 MR. COOK: Keith Cook, Philips

1 Electronics.

2 (Off-microphone comments)

3 MR. BROOKMAN: Thank you, Brenda.

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

6 MS. KOHL: Betsy Kohl, DOE General
7 Counsel.

8 MR. BROOKMAN: Okay, I guess
9 that's all for this morning. Thanks again for
10 those of you here, an early start on the day.

11 All of you received a packet of information
12 when you came in the door, as well as an
13 agenda. I'm going to run through this very,
14 very briefly.

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

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

1 context.

2 Immediately following that, we're
3 going to talk about the proposed HID test
4 procedures, the definitions and test methods.

5 We'll take a break midmorning or so, around
6 about 11:15.

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

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

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

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

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

16 DR. KAARSBERG: One more process
17 item. Some of you may have noticed that the
18 Federal Register notice says we're going until
19 2:00 p.m., but the agenda here has us stopping
20 at 12:30. That was just our best judgment,
21 once we actually went through everything we
22 needed to talk about, that's when we do think

1 it will end. However, we have flexibility.

2 If you want to say more, we can go until 2:00.

3 If you want to say less, we can end earlier.

4 But I just wanted to note that for the
5 record.

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

13 Okay, let's see what's next.

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

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

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

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

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

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

20 (Off-microphone comments.)

21 MR. MYER: I defer to Simone.

22 DR. KAARSBERG: Okay, Simone's

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

5 (Off microphone comments.)

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

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

15 MR. BROOKMAN: Okay, thank you.

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

1 from Pacific Northwest National Lab.

2 [applause]

3 MR. MYER: Wow, tragically
4 everything from this point on is going to be
5 anticlimactic. Wow. Hopefully when we sync
6 this up for a podcast it can be like the old
7 60s Batman, pow. Thank you, Tina. So the
8 purpose of test procedures and today's NOPR
9 public meeting: One, we'll review the statute
10 and DOE's actions related to high intensity
11 discharge lamps.

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

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

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

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

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

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

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

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

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

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

1 to retest everything.

2 MALE PARTICIPANT: With concern to
3 lumen maintenance.

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

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

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

1 to two years sometimes.

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

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

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

22 But, I spoke briefly with Tina

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

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

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

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

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

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

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

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

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

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

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

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

10 In early December, the Federal
11 Register published this notice of proposed
12 test procedure. That started a 75-day comment
13 period and that 75-day comment period ends
14 11:59 Eastern on Tuesday, February 28th.

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

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

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

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

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

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

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

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

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

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

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

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

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

7 The International Commission on
8 Illumination, or CIE standards referenced in
9 these test procedures, are shown here, CIE
10 13.3 and CIE 15. These standards will be
11 incorporated by reference into the Code of
12 Federal Regulations.

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

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

1 and discussed shortly, is basically a lamp
2 that produces a beam. And that standard
3 referencing directional lamps is ANSI C78.379.

4 And again, we're proposing to incorporate
5 these by reference in the Code of Federal
6 Regulations.

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

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

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

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

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

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

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

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

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

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

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

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

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

21 For more appropriate
22 characterization of HID lamps, DOE proposes to

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

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

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

22 The proposed definition is based

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

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

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

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

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

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

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

19 Yes, there's a question.

20 MR. BROOKMAN: Yes, Susan, please.

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

1 definitions.

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

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

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

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

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

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

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

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

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

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

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

10 MS. ANDERSON: That just doesn't
11 exist.

12 MR. BROOKMAN: Okay, thanks,
13 Keith.

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

20 MR. BROOKMAN: Okay. Keith.

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

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

6 MS. STEWARD: Thank you.

7 MR. BROOKMAN: And, Susan.

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

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

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

21 MR. BROOKMAN: Okay, thank you.

22 MR. COOK: It's dangerous.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14 MS. ANDERSON: Yes, one other
15 thing about lumen maintenance and what I would
16 refer you to. Say for example, my company's
17 literature if you look at how we publish lumen
18 maintenance information for metal halide
19 lamps, in particular, it varies over a range.

20 I mean it's not like fluorescent or
21 incandescent or halogen where we can come up
22 with a specific defined --

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

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

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

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

17 MR. BROOKMAN: Okay, thank you.
18 Michael.

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

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

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

14 MR. BROOKMAN: Susan.

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

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

1 us?

2 MALE PARTICIPANT: Or Susan.

3 MR. BROOKMAN: Or Susan.

4 MS. ANDERSON: Or Susan Callahan.

5 The question -- Ron, are you on there?

6 DR. DAUBACH: Hello, can you hear
7 me?

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

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

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

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

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

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

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

18 MR. BROOKMAN: Michael.

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

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

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

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

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

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

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

6 MR. BROOKMAN: Joe Howley.

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

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

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

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

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

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

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

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

21 MR. MYER: Thank you.

22 MS. ANDERSON: And, as I said,

1 it's public information in our literature.

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

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

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

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

1 want to point out it's never appropriate.

2 MR. BROOKMAN: Okay, thank you.

3 That was a useful discussion. Any additional
4 comments on definitions before we move on?

5 And thanks again, for those of you that are
6 joining us via the web, for keeping your
7 telephones on mute. That's now working pretty
8 well here in the room. I'm going to go back
9 to Heidi.

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

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

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

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

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

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

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

1 And this was borne out in the metal halide
2 lamp ballast test procedure of 2010. And in
3 that test procedure an ambient temperature of
4 25C was required as well as an air speed of
5 less than a half a meter per second.

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

13 MR. BROOKMAN: Susan.

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

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

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

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

12 MR. BROOKMAN: Okay. Tina.

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

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

20 MR. BROOKMAN: Susan.

21 MS. CALLAHAN: Yes.

22 MS. ANDERSON: Susan is involved

1 in writing the new standards for the higher
2 wattage lamps.

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

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

7 MR. BROOKMAN: Okay.

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

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

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

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

22 MR. MYER: Susan Callahan, can you

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

3 MS. CALLAHAN: Excuse me?

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

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

9 MR. MYER: If we could double-
10 check.

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

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

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

1 this section, Lindsay?

2 MR. STEELE: No, nothing.

3 MR. BROOKMAN: Yes, please, your
4 name.

5 MR. MCGARAGHAN: Hi, Doug. My
6 apologies, I missed the introductions earlier.

7 This is Mike McGaraghan here on behalf of
8 California Investor-Owned Utilities, PG&E,
9 SCE, and separate utilities.

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

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

1 change?

2 MR. BROOKMAN: Michael.

3 MR. MYER: This is Michael Myer.

4 I can address the draft-free comment.
5 Actually Keith Cook, many years ago, for those
6 in the room that may not know the story here,
7 the term draft-free was something we did in
8 the metal halide lamp ballast test procedure
9 because the air speed, my understanding, was
10 related to the stability. And it is
11 ambiguous, it says draft-free.

12 And in the final rule for Metal
13 Halide Lamp Ballast Test Procedure we did a
14 thorough review of multiple different
15 documents. IES LM documents, ANSI documents.

16 Not just lamps, but also fixtures and there's
17 a variety of different answers. Some gave
18 speeds, some of them had different speeds.

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

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

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

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

16 MR. MCGARAGHAN: Great, thank you.

17 So the only follow-on there is just as you go
18 if you could try to point out if there are
19 places where you're adopting verbatim these
20 ANSI standards versus places where there might
21 be amendments to what's actually in the
22 standards. You may not always catch it but if

1 you are aware of those that would be helpful.

2 Thanks.

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

6 DR. DAUBACH: Can you hear me?

7 MR. BROOKMAN: Yes, please say
8 your name.

9 DR. DAUBACH: Hello?

10 MR. BROOKMAN: Say your name.

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

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

1 correlation relative photometry or lamp
2 ballast factor.

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

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

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

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

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

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

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

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

19 MR. MYER: Thank you.

20 MR. BROOKMAN: Okay, that made
21 sense.

22 MR. STEELE: Moving on. Now we're

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

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

16 Okay, we'll move on.

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

22 Can NEMA, when they provide

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

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

9 MR. BROOKMAN: Keith, please.

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

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

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

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

3 MR. BROOKMAN: Yes, Joanna Mauer.

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

8 MR. BROOKMAN: Michael.

9 MR. MYER: Well, the rationale is..
10 it's still being explored. The Energy
11 Conservation Standard is still in development.

12 If you look at the European Union's they're
13 definitely different, they have an HID
14 standard and at certain color temperatures
15 there are different efficacy requirements.
16 For example, somewhere in the mid-5,000 range.
17 I don't remember if it's 5,000 or 5,500
18 kelvin. There's definitely a trade-off at
19 some point that you might have to change
20 something.

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

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

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

12 MR. BROOKMAN: Tina.

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

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

5 MR. BROOKMAN: Okay.

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

15 So given the importance of the
16 supply voltage we're going to take some
17 precautions to minimize other contributions
18 that can affect the lamp voltage and current.

19 And this is quite a busy slide, but we list a
20 few things here that are from the standards
21 that address this.

22 In particular we've got the

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

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

14 MR. BROOKMAN: No comments on
15 power supply characteristics.

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

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

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

1 MR. BROOKMAN: Okay, keep going.

2 MR. STEELE: Okay, sorry.

3 Reference ballast is required to operate the
4 lamp per manufacturer's specifications. We
5 don't want you to overdrive and damage the
6 lamps or underdrive them and skew the test
7 results.

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

17 MR. BROOKMAN: Joe Howley.

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

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

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

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

17 MR. MYER: So you would do like M-
18 47, you know, I'm must throwing --

19 MS. ANDERSON: Yes.

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

1 comments related to reference ballast
2 requirements?

3 MR. STEELE: Thank you.

4 MR. BROOKMAN: Mike, yes.

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

9 MR. BROOKMAN: Susan.

10 MS. ANDERSON: That would actually
11 be something that would be done through ANSI.

12 And NEMA would work through ANSI to set up
13 standards. And that's still an evolving
14 portion of our industry, if you would have it.

15 So that's all very new.

16 MR. MCGARAGHAN: Okay.

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

21 MS. ANDERSON: Susan Callahan?

22 MS. CALLAHAN: There's another

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

6 MS. ANDERSON: Did everyone hear
7 that?

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

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

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

18 MR. MCGARAGHAN: And so, Mike
19 McGaraghan again. I guess a question for DOE.

20 Are you prepared to wait for an ANSI standard
21 to finalize this test procedure, or what's
22 your strategy to address lamps that can only

1 be operated on electronic ballasts in the
2 meantime?

3 MR. BROOKMAN: Michael Myer.

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

15 MR. BROOKMAN: Okay.

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

1 practice.

2 MR. BROOKMAN: Thank you, Tina.

3 Now, Joe.

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

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

12 MR. MCGARAGHAN: Another question.

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

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

1 them you would have to make a change to it.

2 Is that correct?

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

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

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

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

3 MR. BROOKMAN: Susan, please.

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

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

16 MR. MCGARAGHAN: Yes.

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

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

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

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

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

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

1 probe start. It almost ends up being a
2 specific test for each different type of lamp,
3 which I don't think we're wanting to get into.

4 But I'm not sure how we're going to address
5 but we will add some comments to this.

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

8 MR. MCGARAGHAN: Mike McGaraghan.

9 One final question on ballasts. In the
10 reference in the ANSI standard, I think it's
11 C85, I don't have it in front of me. But the
12 one that has all the reference ballast
13 characteristics in it.

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

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

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

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

9 MS. ANDERSON: No.

10 MR. COOK: No.

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

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

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

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

1 it would be tested in its designed position.

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

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

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

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

17 MS. CALLAHAN: Okay, thank you.

18 MR. BROOKMAN: Okay, final
19 comments on this?

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

22 MR. BROOKMAN: We hear you, keep

1 going. Yes.

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

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

12 MR. HITCHCOCK: C78.43.

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

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

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

1 reference balance ballast issues?

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

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

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

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

1 any photometric measurement we scale to a
2 human visual response.

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

7 So that brings us to Issue Number
8 6 on the proposed instrumentation
9 specifications.

10 MR. BROOKMAN: Joe.

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

18 MR. STEELE: Thank you for that.

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

1 Okay.

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

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

14 This is actually from the GSFL
15 Rule and it is, sample test units are obtained
16 via a random selection. Sample plan is over a
17 12-month period and we're requiring a minimum
18 of 21 samples hopefully spread evenly over the
19 12-month period. I believe there is a minimum
20 seven-month period available also if
21 production does not run the full 12 months.

22 Then, with those sample test

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

7 MR. BROOKMAN: Alex.

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

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

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

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

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

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

16 MR. BOESENBERG: Yes, we will.

17 MR. BROOKMAN: Thank you. Tina.

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

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

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

12 Also we will comment later on the
13 21 sample size and the 12-month sampling,
14 because these are very long-lived lamps once
15 you get to December and pull a lamp and begin
16 testing it it's a long time before you have
17 the results.

18 MR. BROOKMAN: Joe.

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

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

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

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

22 So we'll provide more written

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

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

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

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

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

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

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

18 MR. BROOKMAN: No comments? Joe,
19 what?

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

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

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

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

17 MR. BROOKMAN: Susan.

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

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

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

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

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

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

1 completely different testing results than if
2 the orientation were maintained.

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

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

11 MS. ANDERSON: Yes, we agree.

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

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

22 Issue 11, we invite comments on

1 proposed setup and measurements standard
2 selection for directional lamps.

3 MR. BROOKMAN: Joe.

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

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

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

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

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

5 MR. BROOKMAN: Michael Myer.

6 MR. HOWLEY: Plus or minus 100
7 percent.

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

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

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

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

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

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

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

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

21 MR. BROOKMAN: Susan.

22 MS. ANDERSON: If you go to our

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

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

17 But, once again, there are some
18 fixtures, like flood lights, where you have to
19 aim them. So we have to have a lamp designed
20 that's tolerant of that. But the most common
21 application would be in the vertical position.

22 And as far as we, as a manufacturer, go we do

1 publish both the vertical lumens and the
2 horizontal lumens.

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

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

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

12 MS. ANDERSON: We do measure it.

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

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

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

4 MR. BROOKMAN: Keith.

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

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

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

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

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

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

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

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

21 MR. BROOKMAN: Keith.

22 MR. COOK: Keith Cook with

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

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

10 MS. ANDERSON: Don't.

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

13 MS. STEWARD: Okay.

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

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

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

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

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

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

14 MR. COOK: Correct.

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

18 MR. COOK: Will do.

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

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

1 proposes that manufacturers' accredited
2 laboratories can also supply the test results.

3 That is still DOE's position?

4 MR. BROOKMAN: Michael Myer.

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

8 DR. DAUBACH: Okay.

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

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

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

22 MS. STEWARD: So we can move on to

1 test measurements and calculations with
2 Lindsay Steele.

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

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

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

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

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

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

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

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

19 MR. STEELE: I will do.

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

22 MR. HOWLEY: This comment is

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

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

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

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

1 Yes, NVLAB labs.

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

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

10 MR. BOESENBERG: Right, test the
11 same gear from one lab to the next. And they
12 --

13 (Off microphone comments.)

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

18 MR. BROOKMAN: Interesting.

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

1 but for the record we would like to raise the
2 concern that in terms of certification,
3 compliance and enforcement, since one day this
4 will all end up in that arena, because of the
5 lifetime of HID lamps, and I alluded to this
6 earlier, testing to the 40 or 50 percent rated
7 life-point, annual testing is not feasible,
8 due to the, first, the annual sampling itself.

9 And then the fact that these last so stinking
10 long. You can't do it every year.

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

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

1 tolerance in intensity at a given angle?

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

8 MR. BROOKMAN: Okay, Michael, yes.

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

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

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

17 MR. BROOKMAN: Joe Howley.

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

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

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

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

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

22 MR. BROOKMAN: Tina Kaarsberg.

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

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

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

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

4 MR. BROOKMAN: Mike McGaraghan.

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

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

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

1 classes.

2 I want to clarify, I guess, that
3 the test procedure rulemaking isn't going to
4 answer that question. That that decision
5 would be made later in the rulemaking itself.

6 And that, in the meantime, NEMA is okay with
7 the proposed test methods for measuring color.

8 Are both of those, I guess first a question
9 to DOE and then a follow-up to NEMA.

10 MR. BROOKMAN: Michael Myer.

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

16 MR. BROOKMAN: Yes, Alex.

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

20 MR. MCGARAGHAN: Thank you.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

20 MR. BROOKMAN: Thank you. Alex.

21 MR. BOESENBERG: Alex Boesenber,
22 NEMA. To amplify that, so that is very

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

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

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

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

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

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

15 MR. BROOKMAN: Thank you. Joe.

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

20 Thank you.

21 MR. BROOKMAN: Thank you.

22 Additional comments? Mike. Oh, I'm sorry,

1 Susan, please.

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

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

13 MR. BROOKMAN: Betsy.

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

16 DR. KAARSBERG: And a lot of your
17 comments overlap with the standard and there
18 will start to be opportunities for comment on
19 the standard as well.

20 MR. BROOKMAN: Mike.

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

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

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

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

12 MR. MCGARAGHAN: Okay.

13 MR. BROOKMAN: That was Susan.
14 Thank you.

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

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

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

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

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

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

22 MR. MCGARAGHAN: Okay. I guess I

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

4 MR. MYER: Continue to do
5 research.

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

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

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

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

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

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

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

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

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

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

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

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

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

22 MR. BROOKMAN: We didn't forget

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

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

6 (Off microphone comments.)

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

11 DR. DAUBACH: Hello, this is Ron
12 Daubach.

13 MR. BROOKMAN: Yes. Ron, go.

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

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

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

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

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

6 MR. BROOKMAN: Tina.

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

17 And then also we have to develop
18 the appropriate compliance guidance for that.

19 So I apologize for any confusion on that.
20 But that was just supposed to be an
21 illustration of how it might happen. I hope
22 that helps.

1 DR. DAUBACH: Thank you.

2 MR. BROOKMAN: Any additional
3 comments?

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

13 MR. BROOKMAN: Michael.

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

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

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

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my direction; further, that said transcript is a
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