

Minutes
Photometrics Working Group
Saturday, 19 March 2005
Fairmont Royal York Hotel
Toronto, ON, Canada

Presiding chairman: Jerry Gorrell; Theatre Safety Programs; P; U

Recording secretary: Karl G. Ruling; ESTA

Members attending: Thomas Tyler; Altman Stage Lighting; A; MP
Ed Hyatt; Boston Illumination Group, Inc.; O; CP (arrived at 13:16)
Jim McHugh; Humboldt State University; P; U
Ken Vannice; Colortran (Leviton Manufacturing Co., Inc.); P; MP
Nic Bowker; PLASA; P; G (joined at this meeting)
Michael Lay; Strand Lighting (Strand Lighting Ltd.); P; MP

Visitor: Matthew Immel, Humboldt State University

1 Opening Remarks

Jerry Gorrell called the meeting to order at 13:00. He welcomed all to the Fairmont Royal York Hotel and Canada.

2 Attendance and membership

2.1 Introductions of those present and taking attendance

A blue sign-in sheet was circulated while those present introduced themselves.

2.2 Determination of quorum

Gorrell noted that five voting members were present (before Bowker joined), which was more than enough for a quorum.

2.3 Recognition of alternate voting members

Jerry Gorrell recognized Tom Tyler as the voting member for Altman Stage Lighting.

2.4 Requirements for membership

Gorrell reminded the assembly that membership is open to all who are affected by the work of the group, but voting members are required to vote on letter ballots and to attend meetings. If a voting member and his alternate both miss three meetings in a row, they are moved to observer status. This will be done at the end of the third meeting missed.

2.5 Processing of new membership requests

Nic Bowker of PLASA applied as a principal in the general interest category. He explained that his name uses "bow" pronounced like the "bow" of a ship, and not as the "bow" on a wrapped gift.

Ken Vannice moved that Nic Bowker's application be accepted. The motion was seconded, and then approved with a unanimous show of hands.

The full consensus body of the working group, including those not present during this meeting, was:

Name	Company	Representing	Voting status	Interest cat.
John T. Ryan	Altman Stage Lighting	Altman Stage Lighting	P	MP
Thomas Tyler	Altman Stage Lighting	Altman Stage Lighting	A	MP
Rick Loudenburg	Barbizon Light (Denver)	Barbizon Companies	P	DR
Jim McHugh	Humboldt State University/IES	Humboldt State University	P	U
Ken Vannice	Colortran	Leviton Manufacturing	P	MP

Name	Company	Representing	Voting status	Interest cat.
		Co., Inc.		
Bill Klages	New Klages Inc.	New Klages Inc.	P	U
Nic Bowker	PLASA	PLASA	P	G
Michael Lay	Strand Lighting	Strand Lighting Ltd.	P	MP
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	P	U
		Total votes	8	
		Votes by interest category	3	MP
			0	CP
			1	DR
			3	U
			1	G

3 Approval of the minutes from the previous meeting

Tom Tyler moved that the draft minutes be approved without amendment. The motion was seconded. The motion was approved with a unanimous show of hands.

4 Call for patents

The following was read aloud to the assembly by Jerry Gorrell:

"ESTA intends not to publish any standard that contains protected intellectual property, unless that information can be licensed by anyone for a reasonable fee. ESTA uses a process of open patent and copyright disclosures to implement its intent. ESTA does not conduct patent or copyright searches and does not warrant that its standards contain no protected intellectual property.

"In keeping with the open disclosures policy, I ask if anyone present wishes to notify this working group of the existence of a patent or copyright or other intellectual property that might protect material in a standard being developed by this working group. You need not be the holder of the patent or copyright to notify this working group of its existence."

No issues were brought to the attention of the assembly by anyone present.

and Anti-Trust Statement

The following was read aloud to the assembly by Jerry Gorrell:

"The ESTA Board of Directors, the Technical Standards Committee, and the leadership of this working group will reject or nullify any actions that unlawfully restrain trade. Anyone who feels that such an action is being or has been taken is requested to bring that matter to the attention of the chair immediately. Anyone who feels that actions in restraint of trade have been taken and not properly annulled is requested to notify the TSC chair or ESTA president immediately.

"ESTA legal counsel has informed us that violations of the anti-trust laws can have serious consequences. Individuals engaged in certain unlawful conduct can be found criminally liable. An individual convicted of a criminal violation of the Sherman Act may be fined as much as \$1,000,000 and imprisoned for up to ten years. An easy to read pamphlet describing restraint of trade issues is available from the Technical Standards Manager."

No issues were brought to the attention of the assembly by anyone present.

5 Approval of agenda

Ken Vannice moved that the draft agenda be accepted as written. The motion was seconded. The motion was approved by a unanimous show of hands.

6 Old Business — Discussion of comments and appeals on BSR E1.25 lamp calibration comment resolution

Karl G. Ruling had written the working group a letter, dated Thursday, 24 February 2005, that incorporated an appeal from Regine Krämer regarding the resolutions to her comments in the second public review and some comments from Heidi Hyldahl of Martin Professional about the difficulty of measuring HID lamp power during photometric testing. This letter (appended to these minutes) stimulated the following discussion and actions.

There was a discussion of issues related to test lamp calibration. It was decided that test lamp calibration is not required if a large sampling is tested and a statistical analysis is done on the collected data. However, if one or two instruments are to be tested and some statement is to be made about the performance an end-user can expect, lamp calibration would be necessary, but the calibration conditions would have to match the conditions used by the lamp manufacturer. This would resolve the objections of Regine Krämer. If some statement is to be made about optical efficiency, the lamp would have to be calibrated under the luminaire operating conditions. This is very difficult to do.

Section 4 was rewritten to address the lamp calibration issue. Section 5 was rewritten to specify simply controlling the input voltage to the luminaire or luminaire-ballast combination, thus removing the requirement to measure discharge lamp wattage under operating conditions. This would resolve the problems identified by Heidi Hylดาห์. Section 6, Electrical, was removed because its topic was reasonably well covered by section 5. Section 7 was renumbered as 6 and the test equipment described was clarified to be the measurement test equipment.

One remaining question was what is a reasonable tolerance on the input voltage to the system. This was left at 0.5% during the meeting, but this might be impractical or unreasonably expensive. It was decided that the use of uninterruptible power supplies would probably be a cost-effective solution for providing a stable voltage for most people, so the tolerance should be set at what is available with reasonably priced UPSs.

Action item: Ken Vannice will research the output tolerance of uninterruptible power supplies.

The draft document that was created in the meeting has "r6" in the document number. This was an unapproved draft, and will have to be reviewed in light of any additional comments that are submitted as part of the third public review of BSR E1.25.

7 New business

None.

8 Other business

None.

9 Schedule for future meetings

It was announced that the next meeting will be at the Dallas/Ft. Worth Airport Marriott South in Ft. Worth, on the July 30 afternoon.

10 Changes to observer status

Principals (and alternates) who have missed the last two meetings: None

11 Adjournment

Jim McHugh moved that the meeting adjourn. The motion was seconded. The motion was approved with a unanimous voice vote. Jerry Gorrell declared the meeting adjourned at 14:11.

Photometric Working Group Membership and Contact Information as of 2005-05-04

Name	Company	Representing	Voting status	Int. cat.
Andre Broucke	ADB - TTV Technologies	ADB-TTV Group	O	MP
John T. Ryan	Altman Stage Lighting	Altman Stage Lighting	P	MP
John Luk	Altman Stage Lighting	Altman Stage Lighting	O	MP
Thomas Tyler	Altman Stage Lighting	Altman Stage Lighting	A	MP
Rick Loudenburg	Barbizon Light (Denver)	Barbizon Companies	P	DR
Lee J. Bloch	Blue Sky Design, Ltd.	Blue Sky Design, Ltd.	O	U
Ed Hyatt	Boston Illumination Group, Inc.	Boston Illumination Group	O	CP
Bill Ellis	Candela Controls, Inc.	Candela Controls, Inc.	O	U
Francesco Romagnoli	Clay Paky S.P.A.	Clay Paky S.P.A.	O	MP
David Bertenshaw	David Bertenshaw	David Bertenshaw	O	G
A C Hickox	Domingo Gonzalez Associates	Domingo Gonzalez Associates	O	U
Gregg Esakoff	ETC West	Electronic Theatre Controls, Inc.	O	MP
Mitch Hefter	Entertainment Technology	Genlyte Group LLC	O	G
Dawn K. Crosby	Vari-Lite	Genlyte Group LLC	O	MP
Jim McHugh	Humboldt State University/IES	Humboldt State University	P	U
Robert Mokry	I C Lighting	I C Lighting	O	G
Jim Grosh	Jim Grosh Associates	Jim Grosh Associates	O	G
Ken Vannice	Colortran	Leviton Manufacturing Co., Inc.	P	MP
Afsan Quazi	Lighting & Electronics, Inc.	Lighting & Electronics, Inc.	O	G
Ashley Rice	Lighting & Electronics, Inc.	Lighting & Electronics, Inc.	O	G
Hiroshi Kita	Marumo Electric Co., Ltd.	Marumo Electric Co., Ltd.	O	MP
Mike Wood	Mike Wood Consulting LLC	Mike Wood Consulting LLC	O	G
Tom Pincu	Moodie, Pincu & Associates, Inc.	Moodie, Pincu & Associates, Inc.	O	MP
Bill Klages	New Klages Inc.	New Klages Inc.	P	U
Tim Hansen	Oasis Stage Werks	Oasis Stage Werks	O	U
Nic Bowker	PLASA	PLASA	P	G
James Eade	PLASA	PLASA	O	G
Ron Rykowski	Radiant Imaging, Inc.	Radiant Imaging, Inc.	O	G
David Jenkins	Radiant Imaging, Inc.	Radiant Imaging, Inc.	O	G
Robert Mumm	Robert Mumm	Robert Mumm	O	G
Andrew Nichols	Selecon	Selecon NZ Ltd.	O	MP
Robert Barbagallo	Solotech Inc.	Solotech Inc.	O	DR
Joseph M. Good, III	Spectrum Professional Services	Spectrum Professional Services	O	G
Michael Lay	Strand Lighting	Strand Lighting Ltd.	P	MP
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	P	U
Larry Lieberman	Vision Quest Lighting	Vision Quest Lighting	O	CP
Eckart Steffens	SOUNDLIGHT	VPLT	O	G

Key to codes:

- P principal voting member
- A alternate voting member
- I individual voting member
- O observer, non-voting
- MP mass-market producer interest category
- CP custom-market producer interest category
- DR dealer or rental company interest category
- U user interest category
- G general-interest interest category

Thursday, 24 February 2005

Dear Photometrics Working Group member:

I thought we would have nothing to talk about at the next meeting, since E1.25 will be in public review. However, I have a request from Regine Krämer of Arri to Mike Garl, our new TSP chairman, asking that we reconsider one of our last resolutions, which deals with calibrating the lamp. I have also had an email conversation with Heidi Hyldahl of Martin, which suggests that calibrating a lamp and holding the power to an HID lamp steady is really a bear, almost impossible. So, I suggest that the working group revisit the issue of lamp calibration.

It seems to me there are two reasons why one would want to calibrate a lamp.

1. One is to figure out the efficiency of a luminaire. For this, the raw lumens coming off the lamp as it is used in a luminaire is needed. That means the operating position in the lamp must be used, because that affects arc lamps, and the power delivered to the lamp, but also the temperature must be the same. That is a real problem. It's very hot in a luminaire, but, worse than that, the cooling on a lamp such as the MSR1200sa is really tricky. You have to concentrate the cooling air on the pinches while leaving the capsule hot. Add to that Heidi Hyldahl's note that measuring and maintaining the power to the lamp within the 0.5 percent specification we have with a square-wave ballast is extremely difficult. She can't measure the power with that accuracy with any kind of a power meter of reasonable cost.

Heidi asked one of their engineers about the costs and accuracies of power meters, and this is his opinion about the measurement accuracy of the power analyzers:

This is not an easy question because not many suppliers of power analyzers give much information on real life conditions. On magnetic ballast it is relatively easy to measure the power, but when it comes to electronic ballasts it gets tricky. Electronic ballast has a square wave output in the range from 100Hz up to several kHz (and more in the future). Tolerances for measurements at this high frequencies and on square signals is normally not specified for "low cost" (<1k\$) equipment, however my guess is that $\pm 2-5\%$ is realistic. If you pay in the range of 10k\$ you will properly get a tolerance of $\pm 1\%$ or maybe down to $\pm 0,5\%$.

An other very important issue is that the output power of a ballast will change over time. Even in a controlled environment the power can easily change $\pm 1\%$ during a 1h measuring period.

I think that it is realistic to keep the power within $\pm 2.5\%$ during a measurement, it might take some effort and it might be necessary to do some compensation during measurement to cope with ballasts variations.

So, luminaire operating condition measurements are difficult and expensive.

2. The other reason to calibrate a lamp is so you can normalize the output measurements to what you would get with a hypothetical normal lamp. In telephone conversations I've had with him, Gregg Esakoff as emphasized the need to normalize, but we have so far said that normalization is a matter of reporting the data, not measuring it, so it is outside the scope of this standard. That said, if this standard requires test lamp calibration under luminaire operating conditions, you can't normalize the data because the nominal rating of the lamp is not derived under luminaire operating conditions.

If we require the lamp to be calibrated under the usual lamp calibration conditions, a person can then normalize the luminaire's performance, and we can push the specifics of lamp calibration off onto another standard we don't have to worry about. Probably those standards use standard magnetic ballasts for HID lamps, which makes measurement easier. However, then making any statements about luminaire efficiency are impossible. If you don't know how many lumens a lamp is producing inside the luminaire, you can't compare lumen input to lumen output to derive the efficiency.

The lamp's output inside the luminaire will be different than it is in an open-air testing condition. Heat is a serious complication that applies to all lamps, and not just HID. Take an Altman 360Q and point it at the

wall. Put a light meter in front of it and turn on the luminaire. The light meter jumps to some reading, and then keeps climbing as the luminaire warms up. Now, cover all the ventilation holes with foil. The light meter climbs some more as the lamp runs hotter. A bare lamp does not produce as much light as a lamp in a luminaire, and how much light comes out of the lamp in the luminaire depends on the internal temperature of the luminaire.

In conversations I've had with him (at least, as I remember the conversations), Mike Wood is of the opinion that lamp calibration and normalization is too fraught with problems. He's found that with HID lamps, the position of the lamp in the luminaire is so critical, that if you measured an instrument, took out the lamp, put it in again, and remeasured the instrument, the measurements would be significantly different, simply because the arc was not in exactly the same place. His solution at High End Systems was simply to take a lot of lamps and luminaires, test them all, and then report an average. The buyer of the equipment wants to know what he can expect from the average luminaire, and this is the most honest way to provide that information, according to Mike. With Mike's method, no statement can be made of luminaire efficiency, but probably most people don't care.

We could acknowledge the efficacy of Mike's way and simply dump the requirement for lamp calibration and refer people to other documents if they want to do that. The power regulation during luminaire testing would then be simply to control the input voltage and perhaps frequency. If you use a ballast rated for use on a 230 V, 50 Hz system, you test it on a 230 V, 50 Hz system, not 240 or 220 V or 60 Hz. Simple.

In some explanatory text (not mandatory text) in BSR E1.25 we could give some advice about what a person should do about the normalization/calibration issue. If someone is only testing one instrument or a few, normalization is the only way to extrapolate the data collected to make some sort of statement about what the average user might expect to get in the field from the average instrument. So, a person testing only few luminaires would need to either calibrate the lamp or buy a calibrated lamp. Ideally it would be calibrated per the method used by the lamp manufacturer in establishing the nominal output rating of the lamp. That could be an IESNA, DIN, CIE, or some other procedure. With Mike's method, many luminaires and lamps must be tested, and, to be quite honest, a confidence interval should be calculated and reported with any statement about what the mean readings were, but no lamp calibration would be needed.

I suspect we need to abandon the lamp calibration under luminaire conditions. This is only my opinion, and the working group may disagree. I am not a voting member. Lamp calibration under luminaire conditions is only useful for deriving honest efficiency statements, and I don't think anyone cares too much about that.

Following this letter are the email from Regine Krämer of Arri, the first message I received from Heidi Hyldahl of Martin, and the second message I received from her, which quotes my response to her first one. Also following is the Excel spreadsheet Heidi sent me showing the lamp power variation during a testing session.

I look forward to discussing this with you in Toronto. Fiat lux!

Best regards,



Karl G. Ruling
Technical Standards Manager

APPENDICES

To: "mikeg@jthomaseng.com" <mikeg@jthomaseng.com>
Cc: "kruling@esta.org" <kruling@esta.org>, "Melzner, Erwin" <emelzner@arri.de>
Subject: BSR 1.25
Date: Mon, 31 Jan 2005 09:22:22 +0100
Dear Mr. Garl,

from Mr. Ruling we received the resolutions to the comments concerning BSR 1.25.

There is one comment of us which was not accepted by the Working Group. I would like to resubmit this comment concerning the operation position of the lamp and explain, why.

Our proposal was adding the following sentence to item 4 - test lamp calibration: 4.1, and 4.2:
For lamp calibration the lamp shall be operated in the normal operating position according to the lamp manufacturer.

For luminaire testing of course the luminaire shall be operated in the normal operation position according to the luminaire manufacturer.

Reasons:

I try to translate the German Standard DIN 5032-4 (1999) - Measurement of Luminaires - :

6 Efficiency of a luminaire
6.2 Measurement Conditions

...

6.2.2 Measurement of the luminous flux of the lamp

The measurement of the luminous flux of the bare lamp has to be done under the following special conditions:

...

c) Operating Position of the Lamp according DIN 5032-2 resp. according to the manufacturer.

...

6.3.3 Measurement of the luminous flux of the luminaire

...

c) Measurement of the luminaire in operation position according to the manufacturer

* * * * *

German measurement laboratories (e.g. Osram, DIAL) take the LAMP-manufacturer for 6.2.2.c and the LUMINAIRE-manufacturer for 6.3.3.c.

The luminous flux of most lamps depends from the operation position. If the normal operation position of the lamp inside the luminaire is different to the normal operation position according to the lamp manufacturer this probably leads to more or less luminous flux of the lamp itself. A good luminaire should not operate the lamp in an operating position which is disadvantageous for the lamp - and if so, this should have an influence on the measured light output and efficiency of the luminaire because this would be a characteristic of the luminaire.

If BSR 1.25 uses the operation position according to the luminaire manufacturer also for lamp calibration this would lead to different results compared to the German Standard DIN 5032-4. It should be avoided to create a confusing situation with different measurement conditions between DIN and ESTA. Therefore I appeal to you to reconsider this comments, thanks.

With kind regards
Regine Krämer

ARRI Cine Technik
TLG - Lighting Basics / Advance Development
Pulvermühle
D - 83071 Stephanskirchen

APPENDICES

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rkraemer@arri.de
<http://www.arri.com>

Subject: BSR E1.25
Date: Wed, 16 Feb 2005 13:44:29 +0100
From: "Heidi M. Hyldahl" <heidi.hyldahl@martin.dk>
To: <kruling@esta.org>

Hello Karl,

I have been trying to make a Martin Professional A/S procedure which tries to fulfill the BSR E1.25 when photometric measurements are taken.

I have some questions about the BSR E1.25:

1. In 5.1 it says that: "Tests with incandescent lamps are to be preformed with the lamp operated at the luminaire manufacturer=B4s rated voltage for that lamp." and In 5.2: "Tests with a discharge lamp are to be preformed with the lamp operated at the lamp wattage specified by the luminaire manufacturer and with the luminaire manufacturer=B4s recommended power supply."

Martin Professional A/S does have some products with halogen lamps which do have a lower lamp voltage in the luminaire than the lamp supplier specifies. This is done in order to increase the lifetime of the lamp. In this case should the lamp then run at the lower voltage?

We do also have cases where the lamp runs at slightly different voltages depending on the chosen main power configuration (US EU or xx) as the same tapping is usually used to cover 220-240V. What voltage should we then chose?

How are the specified voltage for incandescent lamps and the specified wattage for discharge lamps defined? Martin Professional A/S does not have power meters which measures the voltage or wattage as an absolute number within 0.5 percent. Furthermore taking all variations from lamps, reflector, ballasts, transformers, lens coatings etc. into account the voltage and wattage differs from fixture to fixture, and most likely the variation is an order of magnitude higher than 0.5%. So to require a measurement accuracy on one or two fixtures with an accuracy of 0.5% does not make a lot of sense if the variation in the populations is unknown. Can you recommend a powermeter which measures the absolute power and voltage within 0.5 percent?

2. In 6 it says that: "Supply voltage for an incandescent lamp in testing is to be maintained at the lamp manufacturer's rated voltage within 0.5 percent during testing. The wattage of a discharge lamp used in testing shall be maintained within 0.5 percent of the wattage rated by the luminaire manufacturer during test."

Martin Professional A/S products do have power supplies which does not keep the voltage or wattage within 0.5 percent. I have measured if the wattage is within 0.5 percent on one of our products with discharge lamp. I have enclosed this measurement and it shows measurement of the wattage during time. The startup phase is also shown. After 15 minutes startup the wattage seams pretty stable, and the wattage is within +/- 0.44 percent, so this is great. But in order to make sure that the lamp wattage for all our products stays within 0.5 percent under the light measurement it would demand that we measure the lamp wattage during the light measurements which can take =BD-2 hour. Furthermore it is even harder to fulfill the demand when the lamp wattage is getting lower (down to 150 w).

Best regards,

Martin Professional A/S

APPENDICES

Heidi Hyldahl
Optical Engineer, M.Sc.

E-mail: heidi.hyldahl@martin.dk
Phone: + 45 87 40 00 00
Direct: + 45 72 15 02 71
Fax: + 45 87 40 00 10
<http://www.martin.dk/>

Subject: RE: BSR E1.25
Date: Thu, 17 Feb 2005 13:51:33 +0100
From: "Heidi M. Hyldahl" <heidi.hyldahl@martin.dk>
To: <kruling@esta.org>

Hi Karl,

I can tell you which setup we have chosen for calibrating the lamp. We have ordered special reference lamps from Osram and Philips. These lamps are measured at Osram and Philips in their integrating spheres and often the measurements are done with the same type of ballast as we use in our luminaires. We have not specified that the lumens measurements at Osram or Philips should be done with the ballast we use in our luminaires since they often use a reference ballast. In the case where Osram or Philips use a magnetic ballast, the wattage is adjusted to the nominal value of the lamp before the lumens output is measured. For the case where Osram or Philips uses an electronic ballast the nominal voltage (230V) is applied to the ballast before the lumens output is measured. We then know the total lumens at a given lamp wattage for this reference lamp. We then use the reference lamp in our luminaire when we take light measurements. We measure the lamp wattage in the fixture before we start the light measurements. Now we know at which wattage the light measurement was done. Afterwards we scale the measurements such that the lamp total lumens equal the nominal lumens specified from the lamp supplier.

An example: a 700W lamp is measured at the lamp supplier to give 60300 lumens at 700 W. The 700 W lamp is specified by the lamp supplier to give 59000 lumens. We use it in the light measurement at 675 W, then all the measurement values have to be scaled with the factor: $59000 / [(60300/700) * 675] = 1.0147$

The reference lamps are only used until 10 % of their total lifetime, then we order a new reference lamp from the lamp supplier.

For some time ago we had a lightning laboratory to measure our luminaries and they say they use the CIE 121-1996 as a guideline for their light measurements. The lightning laboratory measures/scans the bare lamp at first in their mirror goniophotometer. This measurement is done with the ballast used in the luminaire, and the main voltage is set to 230 V. Then the test lamp and ballast is mounted in the luminaire and they are mounted in the goniophotometer. Again the main voltage is set to 230 V and the goniophotometer checks that the candela value is constant +/- 1% in 3 minutes before a scan is performed.

It is not an easy task to make bare lamp measurement for us since it demands an integrating sphere or a goniophotometer, and it is very expensive equipment.

I had one of our Electronic Engineers to come with his opinion about the measurement accuracy of the power analyzers: "This is not an easy question

APPENDICES

because not many suppliers of power analyzers give much information on real life conditions. On magnetic ballast it is relatively easy to measure the power, but when it comes to electronic ballasts it gets tricky. Electronic ballast has a square wave output in the range from 100Hz up to several kHz (and more in the future). Tolerances for measurements at this high frequencies and on square signals is normally not specified for "low cost" (<1k\$) equipment, however my guess is that $\pm 2-5\%$ is realistic. If you pay in the range of 10k\$ you will properly get a tolerance of $\pm 1\%$ or maybe down to $\pm 0,5\%$.

An other very important issue is that the output power of a ballast will change over time. Even in a controlled environment the power can easily change $\pm 1\%$ during a 1h measuring period.

I think that it is realistic to keep the power within $\pm 2.5\%$ during a measurement, it might take some effort and it might be necessary to do some compensation during measurement to cope with ballasts variations."

Best regards,
Martin Professional A/S

Heidi Hyldahl
Optical Engineer, M.Sc.

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Phone: + 45 87 40 00 00
Direct: + 45 72 15 02 71
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-----Original Message-----

From: Karl G. Ruling [mailto:kruling@esta.org]
Sent: 16 February 2005 17:01
To: Heidi M. Hyldahl
Subject: Re: BSR E1.25

> 1. In 5.1 it says that: "Tests with incandescent lamps are to be
> preformed with the lamp operated at the luminaire manufacturer's rated
> voltage for that lamp." and In 5.2: "Tests with a discharge lamp are
> to be preformed with the lamp operated at the lamp wattage specified
> by the luminaire manufacturer and with the luminaire manufacturer's
> recommended power supply."

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> Martin Professional A/S does have some products with halogen lamps
> which do have a lower lamp voltage in the luminaire than the lamp
> supplier specifies. This is done in order to increase the lifetime of
> the lamp. In this case should the lamp then run at the lower voltage?

Yes. That's what the document now says. We have a comment from someone at Arri who points out that the standard operating procedure for calibrating lamps is to do it in the operating conditions specified by the lamp manufacturer, which is not necessarily the same as the conditions specified or created by the luminaire manufacturer.

Which of the two points of view -- lamp manufacturer conditions or luminaire manufacturer conditions -- is right for our purposes will depend on what the purpose is of the lamp calibration. We haven't explicitly decided that. If the purpose is to determine luminaire

APPENDICES

efficiency, then the lamp should be calibrated under its operating conditions in the luminaire. If the purpose is to allow one to normalize the luminaire's output readings to allow for the peculiarities of an individual lamp, then the lamp manufacturer's conditions should be used, since the published nominal output of a lamp will be based on the lamp manufacturer's testing procedures.

I suspect we will change the draft standard, either to remove lamp calibration entirely or to change it to testing under the lamp manufacturer's conditions. We have an odd split right now, because we have the power and operating position set to match the luminaire, but the temperature range is a generic specification for lamp testing that is much lower than what the temperature is in a luminaire.

Calibrating a lamp under the conditions in the luminaire would be difficult. Above all, we want this standard to be simple. It is proving very hard to be simple.

> We do also have cases where the lamp runs at slightly different
> voltages depending on the chosen main power configuration (US EU or
> xx) as the same tapping is usually used to cover 220-240V. What
> voltage should we then chose?

Pick one that seems to be the most common.

> How are the specified voltage for incandescent lamps and the specified
> wattage for discharge lamps defined? Martin Professional A/S does not
> have power meters which measures the voltage or wattage as an absolute
> number within 0.5 percent. Furthermore taking all variations from
> lamps, reflector, ballasts, transformers, lens coatings etc. into
> account the voltage and wattage differs from fixture to fixture, and
> most likely the variation is an order of magnitude higher than 0.5%.
> So to require a measurement accuracy on one or two fixtures with an
> accuracy of 0.5% does not make a lot of sense if the variation in the
> populations is unknown. Can you recommend a powermeter which measures
> the absolute power and voltage within 0.5 percent?

No. Can you tell me what the accuracy of your equipment is? The accuracy of the meters now specified was copied from other standards that were written by people who work for expensive testing labs. Our standard is supposed to be for people who don't work for expensive testing labs. What is a reasonable accuracy for your work and your budget?

>
>
>
>

> 2. In 6 it says that: "Supply voltage for an incandescent lamp in
> testing is to be maintained at the lamp manufacturer's rated voltage
> within 0.5 percent during testing. The wattage of a discharge lamp
> used in testing shall be maintained within 0.5 percent of the wattage
> rated by the luminaire manufacturer during test."

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>
>

> Martin Professional A/S products do have power supplies which does not
> keep the voltage or wattage within 0.5 percent. I have measured if the

APPENDICES

> wattage is within 0.5 percent on one of our products with discharge
> lamp. I have enclosed this measurement and it shows measurement of the
> wattage during time. The startup phase is also shown. After 15 minutes
> startup the wattage seems pretty stable, and the wattage is within +/-
> 0.44 percent, so this is great. But in order to make sure that the
> lamp wattage for all our products stays within 0.5 percent under the
> light measurement it would demand that we measure the lamp wattage
> during the light measurements which can take ½-2 hour. Furthermore it
> is even harder to fulfill the demand when the lamp wattage is getting
> lower (down to 150 w).
>
>
>

That's a problem. The document is still a draft and is in public review. We can change it. I will file your comments as something for us to consider when we review the document.

Your comments are extremely valuable. Thank you for trying to use our standards and pointing out where there are difficulties. Your comments are very good because they are not theoretical, but are based on practical experience.

Best regards,
Karl G. Ruling
Technical Standards Manager

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[The Excel spreadsheet Heidi Hyldahl enclosed with the above email is omitted from these appendices to the working group minutes to save space, but is available on request. When printed, it consumes 67 pages, 35 of which have data on them, the rest being blank sheets because of the way Excel prints spreadsheets that are larger than a standard piece of paper.]