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LIGHT the official NEWSLETTER

of the **indian society of lighting engineers**

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FROM THE PRESIDENT'S DESK

The awarding of the Nobel Peace Prize to the IPCC has far reaching consequences for the lighting fraternity.

For at least two decades the lighting fraternity (and this most certainly includes ISLE) has been trying to engage the attention of the policy makers to promote the adoption of the new energy efficient lighting technologies with only a limited degree of real success till recently.

With the widespread attention being drawn to the issue of global warming currently, it is a good time for us to spread the message of good lighting practice as we will find a receptive audience. After all, lighting does continue to be one of the least energy efficient practices in the home.

A very good opportunity will be provided by the upcoming Lii2008. I would like to appeal to all members to spread the word about this event to all potential conference attendees as well as exhibition visitors. This will provide a platform to launch smaller programmes at the level of the State and Local Centres. And I am glad to see that there are already plans for such activities at some of our Centres.

And talking about Lii2008, you will find that the halls have already filled up and that we are creating Annexe space for the international companies. A large number of European companies are in touch with us and I feel that we will have an even more exciting display than we did three years ago. For those of you who have yet to decide on participation, I would advise you to book space immediately as this is not an opportunity that any serious player in the industry (big or small) should miss. This is after all the only international lighting show in South Asia.

A word now about the Directory that we publish at every international event. This publication has established itself as the definitive document on the Indian lighting scene and has a long shelf life of 3 years. We still get orders every month for the 2005 edition. The success of

Lumilux Range of Lamps comes with Tri Band Advantage.

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a new development from OSRAM.
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Others are fluorescent tubelights.

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this depends in some measure on the interest of our members and so I would appeal to you to please ensure that those of your contacts that should form part of this do so.

ISLE has been involved actively in the formulation of the National Lighting Code which I am happy to inform you is now in the final stages of editing and there is a strong likelihood that it could be published by BIS in time for its presentation at LII 2008. I want to thank all our members who have contributed to this great effort and we all look forward at long last to a scientific code for Indian lighting practice.

As I said in my column last time I would like to encourage members to help us improve and upgrade ISLE. And though I gave my email address I have not heard from anyone yet. I give it below again and do hope to get suggestions and feedback from you.

dradk@hotmail.com

A.D. Kulkarni
President

EDITORIAL

Well, I find that even after having signed off in my column in the last issue, for an interim period I will continue till I can hand over to the new editor. Already we have new members on the Editorial Board and they will surely help the newsletter to improve.

This issue brings you an update on Lii2008 and as the President has said it is shaping up very successfully and the exhibition will be more exciting than our previous ones. You will also see that the new conference format has drawn a very positive response from our expert speakers. The flexible attendance options should make it easier to attend the sessions of interest and hopefully this will translate into larger numbers of ISLE members at the conference. It gives us a sense of pride and confidence that the Bureau of Energy Efficiency is giving its full support to the conference and has agreed to be a session co-sponsor.

The opening of the Jaipur Local Centre is in keeping with the recent trend we have seen where ISLE is moving outwards from the major metropolitan centres. This is a very positive move as ISLE activities get more localised and lighting issues get a wider platform for discussion. This will be a very important complement to the already well established national level and international activity of the Society.

There have been elections in some State Centres and the new office bearers will be announced shortly. This is likely lead to new initiatives and greater activity levels at the centres.

You will find updates on the post Beijing outlook of the different CIE Divisions as well as articles from the new CIE President and Vice President. Four new CIE publications have become available and with the special discount for ISLE members we can look forward to a wider readership for these.

Coupled with the new findings in the field of light and health, is also the increase in longevity as a worldwide phenomenon and this has led logically to an enquiry into the special lighting needs of the elderly. You will find a paper on this subject by Ken Sagawa that was delivered as an invited paper at the CIE Session in Beijing on this subject and is reproduced with permission.

The first announcement for the next Lux Pacifica conference is out and since we have a long notice, I do hope that there will be a substantial participation from India this time. The last conference in Australia had a very limited Indian presence. It is significant that the next Lux Pacifica is being held in Russia. The country is well known for its scientific developments and in the recent year the Russian economy is also moving in the same direction as China and India. In fact the Russia-China-India combination could be a world beater even in lighting.

Also in this issue, you will find some of the award winning projects from this year's IALD Lightng Design Awards. This year the Radiance Award has gone to Mr. Kauro Mende who many of you will remember from Lii2005 where he delivered one of the Lighting Masterclass lectures. We will bring you the other projects in future issues.

And finally, it is encouraging to see the growth in membership as reflected in the long list of new members published at the end of this issue. Of particular interest is the large numbers of students that are getting attracted to the discipline of lighting which is a good sign for the future.

H.S. Mamak
Editor

NEW MAILING ADDRESS

We have moved back to :

Indian Society of Lighting Engineers
A-274, 1st floor, Defence Colony
New Delhi 110 024
Tel: 46562981, 46562982
Fax: 46528477
E-mail: isledel@vsnl.com, www.isleind.org

Registered Office: C/o Philips Electronics India Ltd.
Technopolis Knowledge Park, Mahakali Caves Road, Chakala, Andheri (E)
Mumbai 400 093

ISLE ACTIVITY

LIGHT INDIA INTERNATIONAL
February 22-25, 2008

Conference

In recent years the format of the ISLE International Conference has been evolving and become somewhat modified. In 2005 there were 6 Masterclass Lectures and 4 Workshops. Since then the feedback received has been strongly in favour of application oriented workshops.

The conference will therefore cover the following areas:

- Energy Conservation (Sustainability)
- Outdoor Lighting (City Beautification, Street Lighting and Monument Lighting)
- Infrastructure Lighting (Airports, Highways, Railways etc.)
- Retail and Hospitality Lighting
- LEDs
- Electronics and Controls

So far the following speakers have agreed to be lead presenters at the workshops.

Dr. Warren Julian *Dean University of Sydney*

Mr. Reg Wilson *President, International Darksky Association*

Mr. Chip Israel *Principal, Lighting Design Alliance, USA*

Mr. A.G.K. Menon *Architect and Urban Planner and Director, TVB School of Habitat Studies*

Mr. Jan Ejhed *President, Professional Lighting Designers Association*

Mr. Lou Bedocs *UK*

Mr. Richard Taylor *Germany*

Ms. Martine Knoop *Netherlands*

Mr. Vincent Laganier *France*

Mr. Frans Otten *Netherlands*

Mr. Richard Sng *Hong Kong*

Call for Papers

To give delegates access to a wider range of papers there will also be presented and poster papers at Lii2008.

Prospective authors are invited to send extended abstracts in 500 words in English of their proposed papers by email to isledel@vsnl.com or on CD to ISLE, A 274 Defence Colony New Delhi 110 024 before November 30, 2007.

Authors will be notified of the acceptance of their papers by December 20, 2007 and full papers will need to be submitted by January 20, 2008. Details of paper submission will be communicated together with the notice of acceptance. Acceptance of papers is subject to at least one of the authors attending the conference to present the paper (this stipulation applies to poster papers as well). All accepted papers will be published.

Registration Fee

Full Conference	Rs. 7,000
ISLE Members	Rs. 6,000
Per session	Rs. 2,000
ISLE Members	Rs. 1,800

(Note: The ISLE member rate is only applicable to those members whose dues are fully paid up as on 31.3.07)

Exhibition

As expected the exhibition has filled up. With only a few stalls left, latecomers are going to be disappointed.

On the international front after the holiday season in Europe, things are beginning to materialise. Companies from Italy, the Czech Republic and Portugal are already in place and several more are under negotiation. The Chinese companies have also begun to finalise their stalls. It does look like there will be a large international presence at Lii2008.

Directory

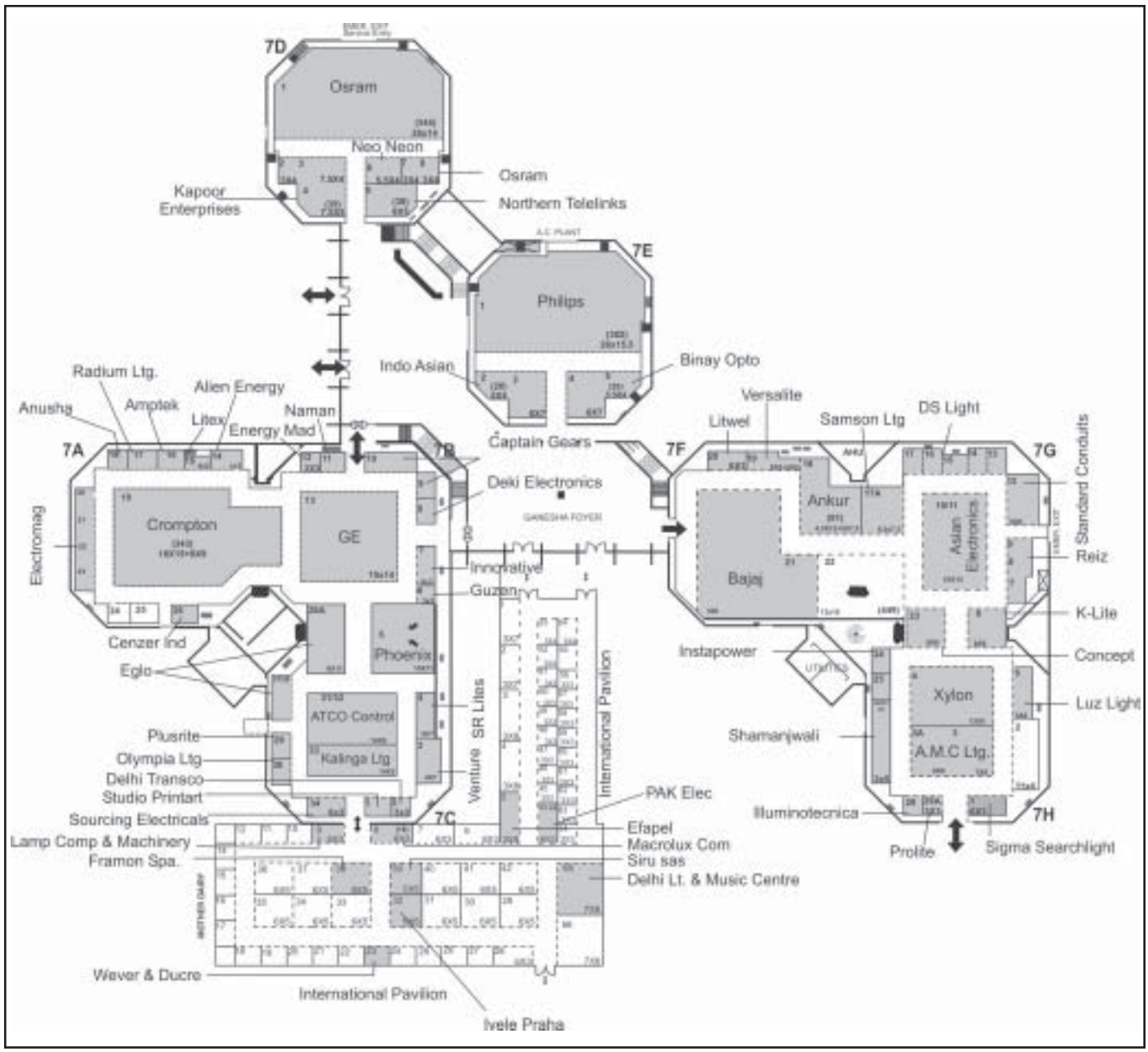
The sixth edition of the Directory of the Lighting Industry will be published and released at Lii2008.

This publication has proved its usefulness over the last 16 years and continues to be in demand. We are still getting orders for the 2005 edition from both Indian and international sources!

As in the past, the Directory will continue to provide comprehensive information on Lighting in India as well as editorial inputs on international developments and future directions in this field.

EU Light India

In our previous issues the EU Light India project has been covered comprehensively The Indian delegation that went as part of the exchange programme is seen at Milan below and Warsaw on page 6.



FLOOR PLAN Lii2008

List of Exhibitors

A.M.C Lighting (China)
Alien Energy
Amptek
Ankur
Anusha
Asian Electronics
ATCO Controls
Bajaj
Binay Opto
Captain Gears
Cenzer Ind
Concept Lighting
Crompton Greaves
DS Light
Deki Electronics
Delhi Light & Music Centre
Delhi Transco
Efapel (Portugal)
Eglo
Electromag
Energy Mad (New Zealand)
Framon Spa. (Italy)
GE
Guzen
Illuminotecnica (Italy)
Indo Asian
Innovative
Instapower
Ivele Praha (Czech Rep.)
K-Lite
Kalinga Lighting
Kapoor Enterprises
Lamp Comp & Machinery
Litex
Litwel
Luz Light
Macrolux Com (Italy)
Naman Enterprises
Neo Neon
Northern Telelinks
Olympia Lighting
Osram
PAK Elec (China)
Phoenix
Plusrite
Prolite
Radium Lighting
Reiz Electronics
SR Lites
Samson Lighting
Shamanjwali
Sigma Searchlight
Siru sas (Italy)
Sourcing Electricals
Standard Conduits
Studio Printart
Venture Lighting
Versalitel
Wever & Ducre (Belgium)
Xylon

ISLE delegaton at Warsaw

CALCUTTA STATE CENTRE

CSC Programmes

The Calcutta State Centre organised the following programmes in the last quarter.

August 17, 2007

A technical lecture on Modern Trends in Lighting by Mr. Raja Mukherjee, DGM – Business Development & Design Application at GE India was held at the Bhawanipur Gujarati Education Society in Kolkata.

September 6, 2007

A special meeting was organized by the Calcutta State Centre for Mr. H.S. Mamak, Director, Conference and Exhibition Committee to make a presentation on the forthcoming Lii2008 Exhibition and Conference in February next year.

Election

The process for the election of the new State Centre Committee for the session 2007-09 has been completed. The following candidates have been declared elected.

Mr. Bipin Dattani

Mr. Prakash K Chatterjee

Mr. Alok K Basu

Mr. Dipak K Pal

Mr. Soumen Basu

Mr. Nikhilesh De

Mr. Prasanta Chowdhury

The new committee will take over and elect the office helders at the next Annual General Meeting scheduled for October.

DELHI STATE CENTRE

Inauguration of the Jaipur Local Centre

August 3, 2007, Jaipur

The most recent centre of ISLE, the Jaipur Local Centre was inaugurated at Jaipur on August 3.

Mr. R.S. Saxena, Chairman of the Jaipur Local Centre

Present at the opening ceremony were the following Governing Body members; Mr. N. Nagarajan, Chairman Delhi State Centre, Mr. Gulshan Aghi, Vice President, ISLE and Mr. H.S. Mamak, Past President of ISLE. Mr. R.G. Gupta, CMD, JVVNL was the Chief Guest and Mr. M.M. Bharadwaj, MD, REIL presided over the function.

The following office bearers were nominated by the members from Rajasthan to run the centre:

Mr. R.S. Saxena, Chairman

Mr. A.K. Jain, Secretary

Mr. Sandeep Dakshini, Treasurer

Mr. R.S. Saxena welcomed the guests. Mr. Gulshan Aghi gave a presentation on the major achievements and activities of ISLE. Mr. H.S. Mamak gave suggestions about how the ISLE platform could be used by concerned engineers, government departments and other relevant agencies in controlling wastage of power, light pollution and in tackling other issues like lowering the running cost of illumination. He also gave details about the the forthcoming International Exhibition and Conference, Lii2008 being organised in Delhi in February next year

Mr. M.M. Bharadwaj explained the importance of solar energy as an alternative means for providing electric power and lighting to far flung rural areas where grid electricity is not a viable option. He urged ISLE to work in tandem with government departments to provide education and training in the use of such systems.

Mr. Gulshan Aghi

Mr. R.G. Gupta, the Chief Guest, urged ISLE to work as an interface between industry and power distribution companies to devise methods to lower individual lighting loads without burdening the consumer with heavy initial

capital expenditure. He also encouraged the members of the Society to start programmes and conduct workshops on lowering the ever growing lighting load without compromising the level of illumination required. Further, he felt the need for providing education on non conventional sources of power generation in small villages.

Mr. A.K. Jain, Secretary of the new centre promised to implement the suggestions made and gave an indication of programmes planned for the future.

The proceedings were compered by the Treasurer, Mr. Sandeep Dakshini.

MUMBAI STATE CENTRE

Elections

The process for the election of the new State Centre Committee has been completed and the following candidates have been declared elected.

Veerkumar S. Doshi
Rajendra Gupta
Prakash C. Barjatia
Aamalendu Auddy
K. Naveen
Pulin Tolia
Prakash Mavinkurve

The new Committee will take over at the next Annual General Meeting at the end of October.

Future Programmes

Mumbai State Centre has decided to hold a workshop on Photometry- Evaluation of Light and Light Sources.

PUNE LOCAL CENTRE

Meet for Lighting Professionals
August 19, 2007, Pune

Thirty lighting professionals attended a meet organised jointly by the Pune Local Centre and MIT Lighting Research Academy.

On this occasion Dr. Avinash Kulkarni was felicitated on his election as President of ISLE. Dr. Kulkarni gave a lecture on the Journey from Mercury to Metal Halide.

The Pune Local Centre also decided to organise an interactive session on CFLs as well as sector specific programmes for architects, interior designers, electrical contractors etc.

The Centre also has plans for organising a National Workshop on Automotive Lighting jointly with CIRT and MIT LRA in Pune.

KARNATAKA STATE CENTRE

Annual General Meeting
October 2, 2007, Bangalore

The Annual General meeting of the Karnataka State Centre was held on October 2, 2007.

The Chairman of the State Centre, Mr. Sanjay Jadhav welcomed the members and informed them of the efforts made by the Secretary and other Committee Members to further the objectives of ISLE. While appreciating the successful completion of the EU Light India Project, he stressed the need to enhance participation by members in all the Society's activities.

The Secretary, Mr. M.S.N. Swamy presented the Annual Report of the State Centre. He highlighted the decision of the Centre to spread lighting awareness among future decision makers by organising programmes at educational institutions as well as institutions like BSNL. He also gave details of the recently concluded EU Light India project in collaboration with the European Union.

The Treasurer, Mr. Kagalwala Presented the audited Statement of Accounts for the year 2006-07 which were passed unanimously after detailed deliberation. Members expressed their appreciation of the fact that there were funds available for conducting future programmes.

Mr. Swamy then presented the budget for the year 2007-08 and informed members of the plan to conduct Vision 2009, an International Conference and Exhibition in September/October 2008. Members approved the budget and supported the idea of the planned event.

The secretary then proposed the vote of thanks and invited the members to participate in the family get together with games organised by Mr. Riaz Kagalwala and followed by lunch.

The Annual General Meeting in progress

The CIE - Approaching Its Centenary and Still Going Strong

Message from the incoming president

It will be an exciting challenge for me to serve as CIE President for the quadrennium 2007 - 2011. This is the last full quadrennium before the CIE Centenary in 2013 and the organization is approaching this significant date full of confidence and energy. I accept the honour of serving this premier international lighting organisation not only humbly for myself but also for my country and my continent, South Africa and Africa respectively, for which it is the first time to be bestowed with this honour and responsibility.

The challenges are many in every country and on every continent. This is even more so in the developing world, which has nevertheless made impressive progress in many areas over the past decade. Countries like China and India, with together more than a third of the planet's population, finally seem to be on the verge of breaking out of the poverty of the past and making their mark as serious global players economically, technologically and politically. It is thus fitting and in line with this trend that the 1995 quadrennial session of the CIE was held in India and the 2007 session is being held in China.

The CIE as an organization has undergone considerable renewal and reform over the past few decades, starting with the transformation of its technical infrastructure in 1983 from numerous permanent Technical Committees to seven Divisions composed of Technical Committees with clearly defined terms of reference and a limited period of existence. This was followed by further changes, which saw an increased emphasis being placed on the CIE becoming a recognized international standards organization in light and lighting, instead of only publishing technical reports and guides, while other organizations converted or incorporated this intellectual property into their standards.

CIE membership was expanded from consisting of National Committees and individual members to include such new membership categories as Associate National Committees and Supportive Members. The list price of CIE publications was halved and the pricing and sale of CIE publications was harmonized worldwide. These steps allowed the introduction of a web shop, leading to a significant increase in the number of publications sold, particularly to non-members. With prices for members being half the price for non-members, a strong additional incentive was created for interested parties to become members of their National Committees.

As a consequence of all these structural reforms, the CIE is today in a healthy financial position, allowing it to operate a professional secretariat with full-time technical staff in Vienna and even starting to reduce the burden of annual subscriptions on National Committees. The total CIE subscriptions (in Euro) have been held constant every year since 2001 and it is proposed to reduce them by 3% in 2008 and a further 3% in 2009. A portion of the proceeds from publication sales, both by National Committees and via the web shop, and part of the membership fees from Supportive Members are credited directly to National Committees and these credits can now be subtracted from the annual dues. Another portion of the proceeds from publication sales goes to the CIE Central Bureau to cover the costs of producing the publications.

Retiring members of the CIE Board of Administration (l to r) David Sliney, Jean Bastie, Pentii Hautala, Sharon McFadden, Hari Mamak and Warren Julian

With the position of the CIE V(λ) function entrenched as an international standard, it is gratifying to note that this function and the definition of the candela by the International Committee of Weights and Measures (CIPM), an organ of the Metre Convention, are today the cornerstones of practical physical photometry worldwide. This fact was recognized and formalized for the first time by the signing of a Memorandum of Understanding between the CIPM and the CIE in May 2007. In this document the two parties agree to cooperate and to consult each other if either party should contemplate any change in these two pillars of physical photometry.

It will be my goal for the quadrennium 2007 -2011 to continue with these structural improvements in the organization, so that the technical output by our many experts and contributors can be optimized and the financial pressures on National Committees can be reduced even further. These measures will require significant investment in the IT infrastructure at the Central Bureau to facilitate the work of the Technical Committees and Divisions, thereby also improving the marketing and the image of the CIE. Technical challenges will need similar focus and attention by the Divisions and strategic guidance by the Board. They include such issues as energy efficient lighting, lighting and vision under mesopic conditions, lighting for the elderly, lighting and health, the effective luminous intensity of flashing lights, the increasing use of LEDs for lighting purposes and many other topics.

I look forward to seeing many of you again at the Beijing Session and to working towards these goals with my colleagues in the Board under the guidance of the General Assembly.

Franz Hengstberger
President CIE

CIE Adresses the Issue of Energy Conservation

The issue of energy conservation in lighting was present in most debates during our Quadrennial Session held in Beijing in July 2007. It was brought to the General Assembly by the Finnish National Committee, and its concern was largely shared by the delegates which approved the following resolution:

Energy Conservation Requires Smart Lighting

A worldwide consensus is evolving to reduce electrical energy consumption because of concerns about global climate change. Recognizing that lighting consumes substantial energy, the International Commission on Illumination (the CIE) which held its XXVIth Session in Beijing, China 4-11 July (about 800 delegates from 42 countries), called for a worldwide effort to reduce energy consumed for lighting. This is possible through intelligent use of new technology and a scientific understanding of the varied human needs for different types of lighting in different settings. A more efficient use of daylight augmented with the use of more efficient lamps and the latest lighting technology now enable us to save energy without sacrificing good lighting.

Exciting new scientific findings in medical science reveal that light plays important roles in maintaining optimum regulation of biological rhythms and hormones

on a daily basis. However, the improper choice of lamps or luminaires (fixtures) and poor lighting design and/ or lighting installation maintenance, can actually have negative consequences for health and also for traffic safety, personal security, worker performance and well being. To avoid this risk, the CIE has prepared a range of lighting standards and technical guidelines for the intelligent, scientifically based use of both daylight and artificial lighting.

For example, the use of high-pressure mercury lamps for roadway lighting remains widespread in many countries, but these can be replaced by alternatives that can provide better lighting at half the energy consumptions.

Also, modern electronic control systems enable us to adapt light level and timing of artificial lighting to minimize energy consumption depending upon levels of available daylight and occupancy in buildings and traffic volumes on roadways.

Consumers now have available energy-saver lamp technologies such as compact fluorescent and solid-state (LED) lamps that can often replace less efficient incandescent lamps.

However, manufacturers of such lamps should continue to aim to offer good colour quality and supply products, which - by taking into account the new knowledge of spectrum and health - do not produce negative effects upon health and well being. Manufacturers should also offer energy saver lamps that are readily dimmable.

Architects should further strive to design buildings which optimize daylight entrance into buildings and to follow the latest lighting standards.

All of this is particularly important because lighting consumes between 5% and 15% of the electricity produced in industrialized countries and up to 86% in developing countries, or about 19% of electricity used in the world. As a consequence, CO2 emissions currently related to the production of electricity for lighting account for 1,775 billion tonnes per year.

Good lighting brings safety, security and a better quality of life to all but needs to be related to the supply of the correct amount of light and with good colour rendering, with the minimal use of resources.

Energy performance is an aspect of lighting installations which does not only concern countries where electric lighting consumption is increasing rapidly due to economic growth, but also developed countries which are establishing new energy regulations. Lighting is a field requiring electricity where new energy efficient lighting can easily use less than half of the energy required by some more conventional lighting installations. This high potential has been identified by political bodies, thus creating a historical opportunity to renovate lighting installations on a large scale, and to motivate the development of an energy-efficient response to lighting requirements.

Trying to take all perspectives into account CIE experts have also identified the possible risk of degrading lighting quality, if the energy efficient approach is applied with a poor understanding of lighting requirements regarding vision, colour rendering, health, security and maintenance.

At CIE, we think it is crucial that we address the energy issue, since CIE is the most competent and recognized international body to identify opportunities in the field of lighting and to exchange the views of international experts. We consider CIE to be legitimate to take a strong stand on climatic change and thus energy conservation.

The guiding principle of the CIE activities is that it provides the "agora" where a profound debate can take place between representatives from various fields: specialists in photometry and optics, lighting engineers, neuro- and medical scientists, psychologists are as well involved as experts of the lighting industry and services.

In addressing the energy issue, it is fundamental that we have to understand all the possible impacts of using alternative low-energy techniques to satisfy the lighting requirements.

Up to now, the issue of energy conservation is not a topic which has motivated - per se - a specific Technical Committee or publication by the CIE. It is however widely addressed through the evolution of recommendations, the work with energy-efficient light sources or on daylighting techniques.

For instance, innovative and alternative light sources need to be characterized in order to supply an adequate light spectrum to meet our visual (this is largely covered by CIE Division 1 activities) as well as our health requirements (CIE Division 6). Professionals have to be provided with standard procedures to describe equipment (CIE Division 2) so that the various performances of the solutions can be compared worldwide.

Last but not least, recommendations are established to reach the most efficient lighting installations: for indoor lighting by CIE Division 3, for road lighting by Division 4 and for other outdoor applications by Division 5.

CIE realizes a historical opportunity to develop new high performance lighting schemes: sources, luminaries designs, controls with improved maintenance, durability and cost.

CIE considers it to be imperative to put this potential on the agenda of political representatives in charge of energy policy and calls on the National Committees, to contribute actively to this goal.

Prof. Marc Fontoynont
Vice-President

New CIE Officers after the Beijing Session

The new CIE Board of Administration for the term 2007-2011 (taking office after the Beijing Session) will be composed as follows:

President:	Franz Hengstberger, South Africa
Past President:	Wout van Bommel, The Netherlands
Vice-President Publications:	Teresa Goodman, UK
Vice-President Technical:	Janos Schanda, Hungary
Vice-President Standards:	Michael SeidI, Germany
Vice-President Marketing:	Todd Newman, USA
Vice-President:	Lily Chang Wai Ling, China
Vice-President	S. Venkataramani, India
Vice-President:	Gennady Shakhparunyants, Russian Fed.
Vice-President:	Marc Fontoynont, France
Secretary:	Ken Sagawa, Japan
Treasurer:	Johann Schleritzko, South Africa
Division Directors:	
Division 1 Director:	Ronnier Luo, UK
Division 2 Director:	Yoshihiro Ohno, USA
Division 3 Director:	Jan Ejhed, Sweden
Division 4 Director:	Ad de Visser, The Netherlands
Division 5 Director:	Nigel Pollard, UK
Division 6 Director:	Ann Webb, UK
Division 8 Director:	Sabine Susstrunk, Switzerland

Activity Reports
Division 1 - Vision and Colour

New Division Officers:

Division Director: Ronnier Luo, UK
Associate Director (Colour): Ellen Carter, US
Associate Director (Vision): Miyoshi Ayama, JP
Division Secretary: Michael Pointer, UK
Division Editor: John Setchell, US

The following new TCs were established in Beijing:

TC 1-70: Metameric Samples for Indoor Daylight Evaluation

Chair: Balazs Kranicz, HU

Terms of Reference: To investigate the derivation of a set of metameric samples to enable the evaluation of indoor daylight simulators.

TC 1-71: Tristimulus Integration
Chair: Changjun Li. CN

Terms of Reference: To investigate methods for computing weighting tables for the calculation of tristimulus values from abridged data.

TC 1-72: Measurement of Appearance Network, MApNet

Chair: Michael Pointer, UK

Terms of Reference:

1. To establish a network of those interested in the measurement of visual appearance.
2. The network shall be under the direction and guidance of a group of at least four Technical Leaders each responsible for a particular aspect of the subject.
3. Each Technical Leader shall provide substantial periodic reports in a form that might be published.
4. A second Expert Symposium on Appearance shall be organized at an appropriate time within the next 4 years.
5. A database of relevant published work shall be maintained.
6. Consideration shall be given to the establishment of separate Technical Committees when appropriate

The following new reporterships were established:

R1-41: Adaptation Transforms (Boris Oicherman, IL)

R1-42: Extensions of CIECAM02 (Changjun Li, CN)

R1-43: Standard Deviate Observer (Boris Oicherman, IL)

R1-44: Limits of Normal Colour Vision (Sharon McFadden, CA)

R1-45: Luminous Efficiency Functions (Yasuhisa Nakano, JP)

Change in Terms of Reference:

TC 1-56: Improved Colour Matching Functions
Chair: Michael Brill, US

New Terms of Reference: A revision of the ToR of the TC has been approved such that the TC will now concentrate on the testing of Grassman's Laws and the transformability of primaries.

The following TCs and Reporterships have been disbanded:

TC 1-30: Luminous Efficiency Functions.

TC 1 -62: Colour Rendering of White Light Sources.

TC 1-65: Visual Appearance Measurement.

Division 2 - Physical Measurement of Light and Radiation

New Division Officers:

Division Director: Yoshihiro Ohno, USA
Associate Director: Georg Sauter/DE
Associate Director: Norbert Johnson, US
Associate Director: Guy Vandermeersch, BE
Division Secretary: Armin Sperling, DE
Division Editor: Jim Gardner, AU

The following new TC was established in Beijing:

TC 2-62; Imaging-Photometer-Based Near-Field Goniophotometry
Chair: Walter Steudtner, DE

Terms of Reference: To prepare a ClE recommendation on the methods for characterization and calibration of imaging-photometer-based near-field goniophotometers and for determination and conversion of photometric data of lamps and luminaries for both near-field and far-field applications.

The following new reporterships were established:

R2-38: Measurement of Spectral Properties of Photometers and Colorimeters (Jiangen Pan, CN)

R2-39: Display Measurement Standard - Liaison with ICDM (Ken Vassie, UK)

Change in Terms of Reference:

TC2-51: Calibration of Multi-Channel Spectrometers
Chair: Richard Austin, US

New Terms of Reference: To produce a technical report for the calibration of detector array spectroradiometers primarily for the determination of colorimetric and photometric quantities, including performance characteristics, calibration methods and guidance in the application of methods for the determination of uncertainty.

The following TCs and Reporterships have been disbanded:

TC 2-42: Colorimetric Measurements for Visual Displays

R2-28: Evaluation of Colorimeter Spectral Responsivity

R2-37: Industrial Lighting Requirements for a D65 Illuminant

Division 3 - Interior Environment and Lighting Design

New Division Officers:

Division Director: Jan Ejhed, SE
Associate Director: Dominique Dumortier, FR
Associate Director: Yoshiki Nakamura, JP
Division Secretary: Jennifer Veitch, CA
Division Editor: Peter Thorns, US

The following new TCs were established in Beijing:

TC 3-43: Determination of Discomfort Glare
Chair: Lou Bedocs, UK

Terms of Reference: To add an annex called UGR verification to the standards ISO 8995-1:2002/CIE S008:2001. Update publication CIE 117:1995 to replace 0,25:1 SHR tabular procedure with 1:2 SHR standard conditions.

TC 3-45: Luminance Based Design Approach
Chair: Yoshiki Nakamura, JP

Terms of Reference: To determine suitable design factors and criteria for luminance based design, and to produce suitable tools to allow luminance based design to be performed and validated.

This will involve a detailed literature search in the area of luminance based design and an examination of the tools for a luminance based design that have been developed or are currently available. The validity of the tools will be undertaken and compared to standard data.

TC 3-46: Research Roadmap for Healthful Interior Lighting Applications
Chair: Jennifer Veitch, CA

Terms of Reference: The TC will review relevant CIE publications and the more recent scientific literature to identify the information that is needed before such lighting application may take place. The output will be a technical report which will describe a research roadmap intended to stimulate fundamental research into questions relevant to lighting applications. This technical committee follows from the publication of CIE 158:2004 and the two CIE expert symposia on light and lighting and health in 2004 and 2006.

The following new reporterships were established:

R3-28: The CIE Method for the Calculation of UF (Lou Bedocs. UK)

R3-29: The Lighting Requirements for Night-Shift Workers (Martina Knoop-Velds, NL)

Division 4 - Lighting and Signalling for Transport

New Division Officers:

Division Director: Ad de Visser, NL
Division Secretary: Hans Huijben, NL
Division Editor: Doug Simpson, UK

The following new TC was established in Beijing:

TC 4-47: Application of LEDs in Transport Signalling and Lighting
Chair: Stephen Jenkins, US

Terms of Reference: To review the application of LEDs in transport lighting and signalling in as far as they affect the visual performance of the users of the transport system. To prepare a Technical Report which includes the findings of the review and recommendations for the visual characteristics of LED signals and lighting.

TC4-48: White light on road lighting
(Chair: Stephan Voelker, DE)

Terms of Reference: Phase 1) To define and study the effects of white light under mesopic conditions in road lighting, evaluating energy saving and safety.

The following new reporterships were established:

R4-31: Inventory D4 Publications on Possible Energy Efficiency Improvement Review (Hans Huijben, NL)

R4-32: Reflection Properties of Road Surfaces (Cyril Chain, FR)

R4-33: Review of CIE 72-1987 "Guide to the properties and uses of retroreflectors at night" (Norbert Johnson, US)

R4-34: Retro-Reflective and other Passive Devices as Energy Savers (Norbert Johnson, US)

The following TCs and Reporterships have been disbanded:

TC 4-38: Roadsigns

R4-22: Use of LEDs in Visual Signalling

R4-24 Definition of an Eye Sensitivity Function in the Mesopic Region to be Used for the Calculation of Road Lighting Levels

R4-27: Control of Tunnel Lighting

R4-29: Collection of Research Programs

Division 5 - Exterior and Other Lighting Applications

New Division Officers:

Division Director: Nigel Pollard, UK
Division Secretary: Thomas Lemons, US
Division Editor: Mary Crawford, US

The following new TC was established in Beijing:

TC 5-24: Guide for Architectural and Decorative Lighting
Chair: Mujgan Serefhanoglu-Sozen, TR

Terms of Reference: To review CIE 94:1993 and produce a new guide that reflects both the technical and aesthetic values required for architectural and decorative lighting taking into account both the efficient use of energy and the effect that lighting has on the environment.

Change in Terms of Reference:

TC 5-21: Masterplanning Urban Lighting
Chair: Mujgan Serefhanoglu-Sozen, TR

New Terms of Reference: To prepare a Guide to Masterplanning Urban Lighting. The Guide shall be used whenever designing new or renewed creative lighting for master planning urban lighting. The Guide includes an integrated approach which takes into consideration functional lighting, floodlighting, decorative lighting and considers functional, aesthetic and emotional aspects of lighting design.

The following new reportership was established:

R5-17 Lighting and Health in Outdoor Areas (B. Weis, DE)

Division 6 - Photobiology and Photochemistry

New Division Officers:

Division Director: Ann Webb, UK
Associate Director: Kohtaro Kohmoto, JP
Division Secretary: vacant
Division Editor: John O'Hagan, UK

The following new TCs were established in Beijing:

TC 6-62: Action Spectra and Dosimetric Quantities for Circadian and Related Neurobiological Effects
Chair: H. Cooper, FR

Terms of Reference: To evaluate currently available biological research data relating to action spectra for human neuroendocrine effects, alerting effects and chronobiological effects with the aim of providing guidance to the lighting community for assessing the impact of different spectral distributions of lighting upon non-visual effects in humans. The historical studies of chronobiology will be briefly mentioned to provide a historical perspective. The eventual aim will be to provide a recommended standard action spectrum (or spectra) for melatonin suppression and for assessing the health impact of light. Dosimetric quantities related to biologically effective radiance and irradiance will also be developed.

TC 6-63. Photobiological Strategies for Adjusting Circadian Phase to Minimize the Impact of Shift Work and Jet Lag

Chair: S. Lockley, USA

Terms of Reference: To evaluate currently available biological research data relating to chronobiological effects and neuroendocrine effects, to include alerting effects with the aim to develop strategies for countering the effects of shift work and jet lag, as well as other sleep-wake disorders. The report shall provide guidance to the lighting community for assessing the impact of different light sequencing and spectral distributions of lighting for the environments where this can be used for humans. The historical studies of chronobiology will be briefly mentioned to provide a historical perspective.

The following new reportership was established:

R6-40: A Survey of Action Spectra in the Scientific Literature: 19XX-200X (Alois Schmalweisser, AT)

Division 8 - Image Technology

New Division Officers:

Division Director: Sabine Susstrunk, CH
Division Secretary: Nathan Moroney, US
Division Editor: Ann McCarthy, US

The following new TCs were established in Beijing:

TC8-11: CIECAM02 Mathematics
Chair: Changjun Li, CN

Terms of Reference: To investigate the improvements of the CIECAM02 model to avoid mathematical inconsistencies.

TC 8-12: Video Compression Assessment
Chair: Christine Fernandez-Maloigne, FR

Terms of Reference: To establish and report on the display and viewing conditions and materials for video compression quality evaluation in different applications including, but not limited to, web, mobile phones, HDTV, home cinema and digital cinema.

The following TCs and Reporterships have been disbanded:

TC 8-01: Colour Appearance Model for Colour Management Applications

TC 8-03: Gamut Mapping

TC 8-04: Adaptation under Mixed Illumination Conditions

TC 8-05: Communication of Colour Information

TC 8-06: Imaging Technology Terminology

R8-01: Grading of Colour Measurement Equipment

R8-02: Fluorescence

R8-03: Potential Interaction between CIE and I EC TA2

R8-04: Effects of Fluorescence in Characterization of Imaging Media

R8-06: Results of CIECAM02

CIE PUBLICATIONS

Photobiological Safety of Lamps and Lamp Systems (bilingual edition)

IEC 62471/CIE S 009/E:2006

Lamps were developed and produced in large quantities and became commonplace in an era when industry-wide safety standards were not the norm. The evaluation and control of optical radiation hazards from lamps and lamp systems is a far more complicated subject than similar tasks for a single-wavelength laser system. The required radiometric measurements are quite involved, for they do not deal with the simple optics of a point source, but rather with an extended source that may or may not be altered by diffusers or projection optics. Also the wavelength distribution of the lamp may be altered by ancillary optical elements, diffusers, lenses, and the like, as well as variations in operating conditions.

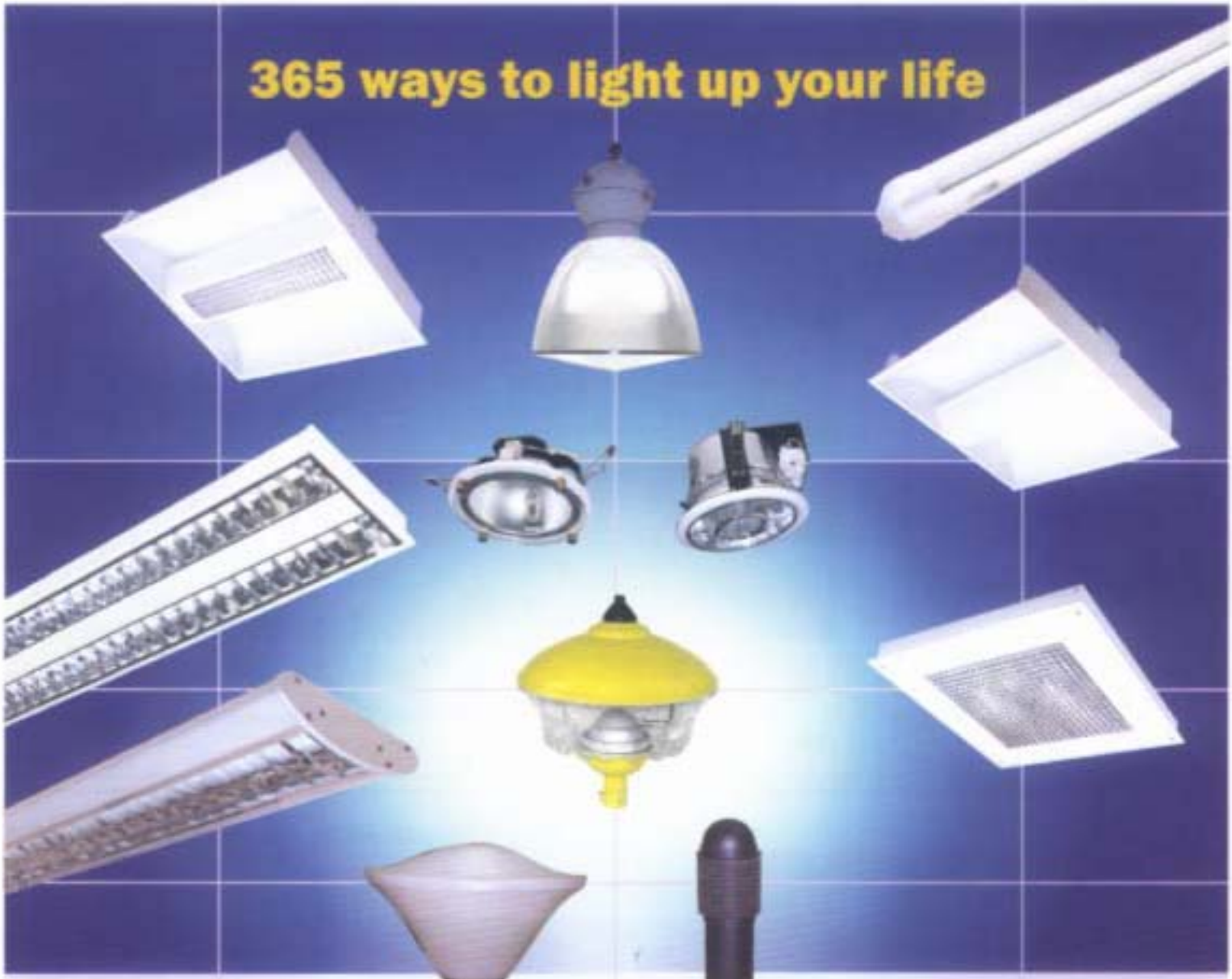
To evaluate a broad-band optical source, such as an arc lamp, an incandescent lamp, a fluorescent lamp, an array of lamps or a lamp system, it is first necessary to determine the spectral distribution of optical radiation emitted from the source at the point or points of nearest human access. This accessible emission spectral distribution of interest for a lighting system may differ from that actually being emitted by the lamp alone due to the filtration by any optical elements (e.g., projection optics) in the light path. Secondly, the size, or projected size, of the source must be characterized in the retinal hazard spectral region. Thirdly, it may be necessary to determine the variation of irradiance and effective radiance with distance. The performance of the necessary measurements is normally not an easy task without sophisticated instruments. Thus it was decided to include reference measurement techniques for lamps and lamp systems in this standard. The measurement techniques along with the described risk group classification scheme will provide common ground for both lamp manufacturers and users to define the specific photobiological hazards of any given lamp and/or lamp system.

Finally, there are well known optical radiation hazards associated with some lamps and lamp systems. The purpose of this standard is to provide a standardized technique for evaluation of potential radiation hazards that may be associated with various lamps and lamp systems.

This Standard has been approved by CIE and by IEC as a Dual IEC/CIE Logo Standard. It may be obtained via the website of the Central Bureau of the CIE (www.cie.co.at).

Continued on page 23

365 ways to light up your life



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2007 IALD lighting design Awards

Chino Cultural Complex

Chino, Nagano, Japan

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Lighting Designers
Kaoru Mende, IALD
Ryuichi Sawada, Hirohito Totsune, Aki Hayakawa
Lighting Planners Associates Inc.

Architects
Nobuaki Furuya, Sachiko Yagi

The Chino Cultural Complex is the world's first facility to integrate a complex of culture that includes a library, concert hall and gallery, along with an existing train station. As such, it was a closely watched project by the community and architectural world.

While simply waiting for a train, passengers have contact with cultural experiences and, therefore, functional lighting, typical of a train station was unacceptable. This building required a lighting design with a sense of affluence and the lure to communicate all it has to offer. Mr. Mende wanted to turn this building into a light fixture itself with super ambient light, detailed lighting changes, and dynamic color-temperature contrast from the morning hours until night.

As intended by the architectural design, the interior lighting invokes a strong, inviting presence at dusk. After, careful consideration of day and night lighting conditions, Lighting Planners Associates worked to fulfill spatial lighting functions while also demanding a dynamic reversal of day and night.

During the design phase, the lighting design intention required many special needs, including an insistence on featuring light, not the fixture. The center of this facility is one continuous space forming the library, studio and lobby. To free this space of any ceiling mounted fixtures, Lighting Planners Associates used the top of the air conditioning units, bathrooms, and entrance overhangs for mounting. Gradual change in the ceiling height made it necessary to adjust light fixtures, distribution and wattage in accordance.

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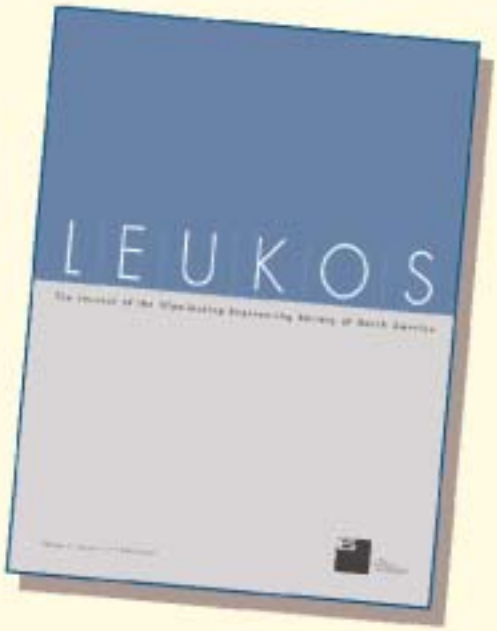

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2007 IALD lighting design Awards

Manufactum

Munich, Germany

© Andreas J. Focke

Lighting Designers
Gerd Pfarré, IALD, DWB
Katja Moebs
pfarré lighting design

Architects
Peter Kulka

Interior Architects
Landau + Kindelbacher

Manufactum, which means made-by-hand, offers an abundance of products such as household goods, tools, textiles and toys - all of exceptional, quality. The products are manufactured with great skill according to traditional methods, and they are made from traditional materials. The challenge was to create a custom-tailored lighting scheme for the new 1000 square meter store in a Munich 1A-location in a building that is the former residence of a 15th century emperor.

Large-scale, custom-designed lighting objects have been designed to balance with the great diversity of the product range to illuminate the spaces and goods perfectly and to enhance the shopping experience.

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MAKHIJA 3364

2007 IALD lighting design Awards

ERHA Clinic Kelapa Gading

Jakarta, Indonesia

Lighting Designer
Abdi Ahsan

Architect
Heru Mudito

Interior
Joke Roos Interior

Artwork
George Timorason

In this project, the lighting designer is responding to transparent architecture, and the lighting design objective is to create a glowing building without disturbing guests looking outside. This led to challenges: the designer could not use floodlights and the designed interior lighting had to look as though it was part of the exterior appearance. Together with the architect, Mr. Ahsan created a "band of lights" integrated into an architecturally function element. Light points are not visible from the outside, thereby creating a more pleasant, glowing exterior appearance.

As to interior lighting, one of the objectives was to create a comfortable and pleasant ambiance that would make waiting guests as comfortable as possible before consultation sessions.Integrated lighting and ceiling details were developed to create this phenomenon.

Manchester235
Manchester, England U.K.

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Lighting Designers
Sanjit Bahra, Senior Designer
Graham Rollins, Lighting Designer
Lighting Design International

Architects
Burrows Cave International

Interior Designer
Nicholas Hollinshead Interiors

Manchester235 is a luxury gaming casino including classic and electronic gaming facilities, three bars, two restaurants and a live music and comedy venue. The Casino is spread across two floors of the Grade II listed Victorian Great Northern Warehouse building, and with its combination of contemporary design and varied leisure experiences, is designed to appeal to new gaming markets as well as more traditional casino customers.

While technically challenging, designers used the building's Grade II listing to its advantage, as it helped shape some of the scheme's most interesting aspects. The design intent was to be sympathetic and respectful to the grand Victorian features without creating an oppressively industrial feel.

Planning restrictions meant that the original iron columns throughout could not be clad.

Instead they were embellished and highlighted in line with the design's luxury ethos. Columns on the first floor are encapsulated in acrylic. They are up and downlit by color-changing LED's with the colour range restricted to complementary blues, reds and purples. Columns on the ground floor are uplit by low-heat halogens to harmonize with the space's warmer color palette and create drama by picking out the rivets and texture.

Ultimately, the lighting scheme had to use a consistent design language throughout, yet provide different solutions for each of the club's areas and personalities, creating the appropriate atmosphere and level of intimacy for each space.

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Continued from page 14

The price of this publication is EUR 72,— (Members of the CIE National Committees get 50% discount).

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Colorimetry - Part 4: CIE 1976 L*a*b* Colour Spaces

CIE Standard S 014-4/E:2007

The three-dimensional colour space produced by plotting CIE tristimulus values (X,Y,Z) in rectangular coordinates is not visually uniform, nor is the (x,y,Y) space nor the two-dimensional CIE (x,y) chromaticity diagram. Equal distances in these spaces do not represent equally perceptible differences between colour stimuli. For this reason, in 1976, the CIE introduced and recommended two new spaces (known as CIELAB and CIELUV) whose coordinates are non-linear functions of X, Y and Z. The recommendation was put forward in an attempt to unify the then very diverse practice in uniform colour spaces and associated colour difference formulae. Both these more-nearly uniform colour spaces have become well accepted and widely used. Numerical values representing approximately the magnitude of colour differences can be described by simple Euclidean distances in the spaces or by more sophisticated formulae that improve the correlation with the perceived size of differences.

The purpose of this CIE Standard is to define procedures for calculating the coordinates of the CIE 1976 L*a*b* (CIELAB) colour space and the Euclidean colour difference values based on these coordinates. The standard does not cover more sophisticated colour difference formulae based on CIELAB, such as the CMC formula, the CIE94 formula, the DIN99 formula, and the CIEDE2000 formula nor does it cover the alternative uniform colour space, CIELUV.

This standard has been approved by CIE National Committees. It may be obtained via the website of the Central Bureau of the CIE (www.cie.co.at).

Price of this standard: EUR 38,— (Members of CIE National Committees get 50% discount).

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Photocarcinogenesis Action Spectrum (Non-Melanoma Skin Cancers)

ISO 28077:2006(E) / CIE S 019/E:2006

Solar ultraviolet radiation is recognized as a major cause of non-melanoma skin cancer in man. Skin cancer occurs most frequently in the most heavily exposed areas and correlates with degree of outdoor exposure. Describing the relationship of exposure (dose) to risk (skin cancer) requires the availability of a biological hazard function or action spectrum for photocarcinogenesis. This standard proposes the adoption of an action spectrum (weighting function) derived from experimental laboratory data and modified to estimate the non-melanoma tumor response in human skin. The experimental data are sufficient for estimating effectiveness down to about 250 nm, but experimental data are not sufficient for specifying effectiveness above 400 nm.

This standard has been approved by CIE and by ISO. It may be obtained via the website of the CIE Central Bureau (www.cie.co.at).

The price of this publication is EUR 38,— (Members of the CIE National Committees get 50% discount).

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Proceedings of the 2nd CIE Expert Symposium on Measurement Uncertainty

12-13 June 2006, Braunschweig, Germany
CIE x029:2006

In 2001 CIE has organized its first symposium on the evaluation of uncertainty in measurements. This follow-up conference held at the Physikalisch-Technische Bundesanstalt (PTB) Braunschweig, Germany summarized the latest results and trends in this topic, particularly the evaluation of uncertainties associated to values of photometric and radiometric quantities and developments related to methods for the assessment of uncertainties of quantities which are derived from spectral measurements.

The symposium was split into two main parts: tutorial and workshop. The tutorial covered fundamentals for uncertainty evaluation, modelling of measurements i.e. modules and measurement equations, combinations of modules, uncertainties of calculated quantities resulting from spectral measurements, uncertainty calculations in key comparisons and measurement uncertainty evaluation based on the propagation of distributions using Monte-Carlo simulation. The 1993 ISO publication “Guide to the expression of uncertainties in measurement” (GUM) is devoted to mainly linear models, the advantage of the Monte-Carlo method is that non-linear models and models with more than one output quantity can be handled. A separate lecture introduced the work of CIE TC 2-43 Determination of measurement uncertainties in photometry.

A great part of the contributed papers dealt with the analysis of spectral measurements. Ways to determine the correlation between the different spectral responsivities together with the calculation of the photometric responsivity were presented. The linear model and the Monte-Carlo simulation was compared and the additional possibilities, like the determination of the correlation

matrix, of the Monte- Carlo simulation was analysed. Two papers addressed the question of the uncertainty of the average LED intensity. Further papers were read on industrial applications, scale realization, monochromator bandwidth correction, etc.

The proceedings contain either the full papers or the slides of the presentations, both that of the tutorial and the workshop.

The publication consists of 254 pages with 156 figures and 46 tables. A CD-ROM with all papers in a searchable form is included. CIE x029:2006 is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 128,— (Members of the CIE National Committees get 50% discount).

TECHNICAL PAPER

Vision of the Elderly and visually impaired - For Accessible Design in Light and Lighting -

Ken Sagawa

Abstract

Accessible design, a concept to address the needs of people with special requirements such as older people and people with disabilities, is introduced for consideration of lighting for the elderly and visually impaired. To implement the concept of accessible design in light and lighting field fundamental data on human vision of the elderly and visually impaired are necessary to correctly address their needs. In this paper, some basic visual functions such as spectral luminous efficiency function, span of categorical colours, visual acuity, and useful field of view, are shown as a function of age together with its implication to designing visual signs and lighting. Data on low vision are also presented with regards to contrast sensitivity function and span of categorical colours.

Key words: the elderly, the visually impaired, low vision, accessible design, luminous efficiency function, categorical colour, visual acuity, useful field of view, contrast sensitivity.

1. Introduction

When we design products or environments it should be kept in our mind that people with a large variety of human abilities are concerned with the benefit of them. Lighting design, especially for public space, should consider this wide range of population that have a large variety of visual abilities. Accessible design is a concept to take into accounts the needs of those people with special requirements so that a wider range of users can use or enjoy products and environments. This concept has been developed in ISO and widely spread into international standard organizations. Examples of the design will be introduced here with regard to lighting for elderly and disabled people. Some technical guidance on the bases of visual properties of older persons and person with visually impaired will also be presented.

2. Accessible design; What is it ?

Accessible design is to design products, environments, and services so as to make them accessible to all people. The term “accessible” means here in other words “be able to use”, “easy to use”, “friendly”, etc. There are not a small number of users who want to use products or enjoy environments but they can not do so due to their physical handicaps. Accessible design is to design things that can be used by or are friendly to all people including people with special requirements. In the field of light and lighting the term “all people” includes people with visual impairments such as low vision, or partially sighted, and older people as well.

For example, when we become older our accommodative power of eye lens loses its power to focus at near sight and this brings us difficulty in reading small letters at short viewing distance such as in the case of reading newspapers. In instructions of electric appliances or pill bottles, we sometimes find the information for safety use written in small letters, and this may cause a misuse or an accident. To rectify this type of inconvenience, it is required to design letters in an appropriate size or to design lighting so that letters are legible to older people and people with visual impairments as well. This is called accessible design.

There is another approach to solve the problem by wearing glasses, and this type of care makes also one big technological field called “Assistive Technology”. The difference between assistive technology and accessible design can be briefly described as follows: The assistive technology is a design to increase human ability concerning with the best fitting of devices to the individuals, while accessible design is a design in products that can be used by many people with a focus on the best fitting to majority of users taking account of distribution of users’ abilities.

Figure 1 shows the basic concept of accessible design that shows the increase of users by taking account of needs of older people and people with disabilities. This concept of accessible design was developed in ISO to draw attention of standard developers to accessibility in order to meet the needs of consumers. In 2001 ISO published guidelines called ISO/IEC Guide 71, which is a clear message not only to ISO community but to other international standard organizations to take account of

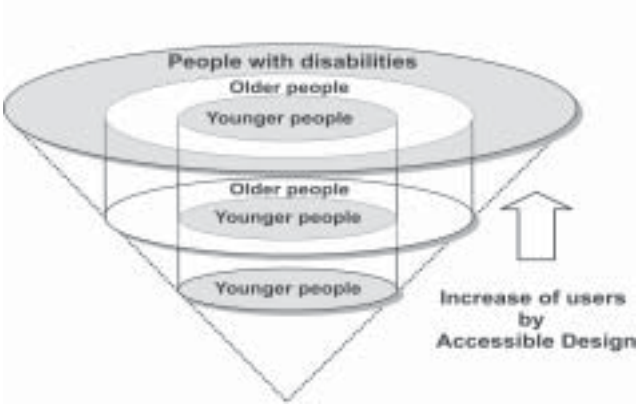

Figure 1. A concept of accessible design to increase users

the needs of older people and people with disabilities [1]. The CIE, as one of the international standards developing organizations, should be responsible for implementing and promoting this concept in the field of light and lighting. In the following sections, some basics for accessible design in light and lighting fields will be presented.

3. Basics for Accessible Design in Light and Lighting

3.1 Age-related relative luminance

Human visual sensitivity to the spectra is called spectral luminous efficiency (SLE). This is one of the fundamental functions of our visual system. Due to the yellowing of the eye lens with aging, the SLE changes with age, which makes visual appearance of older people different from that of the younger.

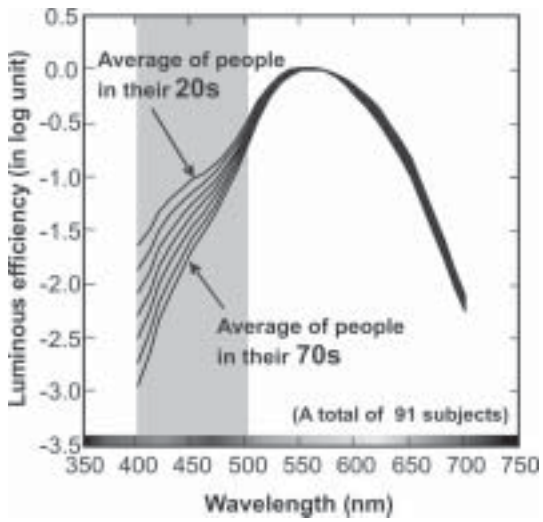

Figure 2. Luminous efficiency functions for different age groups from those in their teens to those in their 70s measured by flicker photometry [2].

Figure 2 shows the data of SLE taken from a total of 91 people with different age [2]. The data are classified into 7 decades from 10 years old up to 80 years old. It is clear from these data that luminous efficiency of light to the shortwave stimuli gradually decreases with age. This means a light colored purple or blue looks darker to older people. Care for accessibility of visual signs should be taken when we use bluish colours so as that those signs are clearly visible to older people.

By using the luminous efficiency data shown in Figure 2, a technical guideline can be given for the evaluation of brightness of visual signs. In equation (1), a quantity denoted as age-related relative luminance, $L_{(a)}$, is introduced to evaluate the brightness of any colored light that appears to a person at any age;

$$L_{(a)} = \int L_{e,\lambda} V_{(a)}(\lambda) d\lambda \qquad (1)$$

where $L_{e,\lambda}$ means spectral radiance and $V_{(a)}(\lambda)$ is luminous efficiency of age *a* (in decade) as shown in Figure 2. Maximum efficacy K_m is omitted here to avoid the confusion with the currently defined CIE luminance *L*. With this newly defined quantity, $L_{(a)}$, we can evaluate apparent brightness of colours for a person at any age.

Figure 3 shows how to apply the age-related relative luminance to evaluate the visual contrast of a sign. Given spectral radiance of the background (dark-brown) and of a sign (blue) of an example as shown in the top of Figure 3, the age-related relative luminance is calculable, and the contrast of the sign relative to the background can be obtained. For a younger person in age in their 20s, for example, the visual contrast is calculated to be 0.34 as shown in the figure which indicates the sign is clearly visible, while the same calculation using the efficiency curve of 70s, turns out that the contrast is 0.06 which is quite low meaning the sign is very difficult to see for a person in their 70s. As shown with this example, visibility

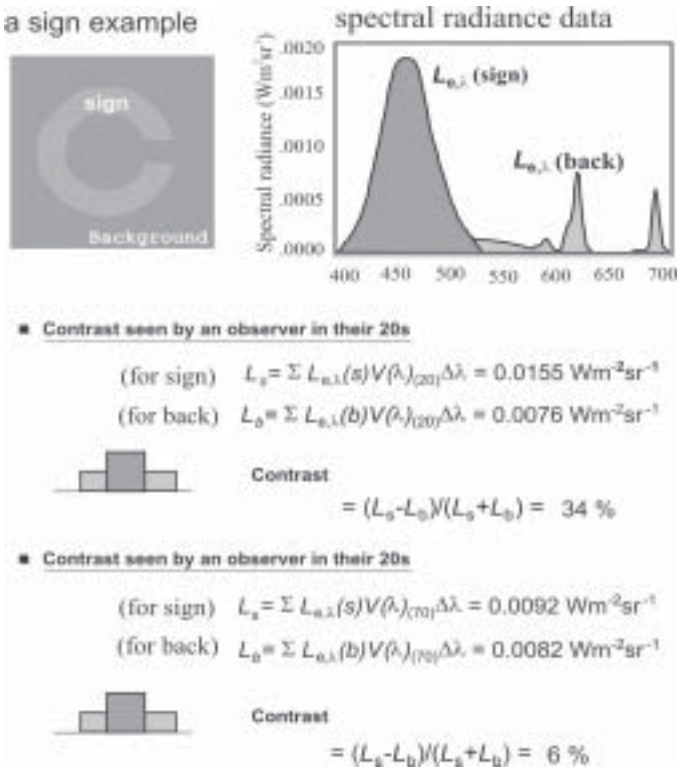

Figure 3. *An example of how to calculate the age-related relative luminance and how to apply them to the evaluation of visibility of a sign.*

of the same sign generates a large difference between a younger and an older person. Care should be taken when blue signs are used. Age-related luminance will be applied applied in evaluating and designing visual signs to increase accessibility.

Efficient lighting also should take into account the efficiency loss of blue light for older people. White or blue LED light sources for lighting, for example, contain much more radiant power in the short-wave region than ordinary light sources. Those LED light sources are efficient for younger people but not so much for older people. Effective intensity of such blue-rich light sources should be evaluated and used appropriately in lighting.

3.2 Colour Identification

Colour is used widely in our daily life and identification of colours and creation of distinct colour combinations are vitally important. In case of using several colours, in particular, the choice of colours is a rather troublesome problem. One of the clear and easy ways to create distinct colour combination is the use of concept of color category. According to the theory of categorical colour perception, which is now widely accepted in colour science, colour is perceived as a group of similar colours and different categories are easy to discriminate [3, 4]. As our colour appearance changes with age, we have to consider also the effect of age-related change of colour perception for the distinct colour combination.

Figure 4 shows examples of the areas of colour category expressed in Munsell colour space and how to use them in the choice of colours for a subway network. The left-side figure gives the data for areas of 5 fundamental colors, such as orange, yellow-green, blue-green, purple-blue, red-purple. The boundaries shown by solid lines indicate the data for older people and the dotted lines for younger people. The boundaries were determined experimentally by using a criterion of subjective similarity of colours judged by 50 older subjects and 50 younger subjects [5]. One of the most interesting points with these data is that area of each colour shown here, and also for other fundamental colours not shown here, is smaller for older

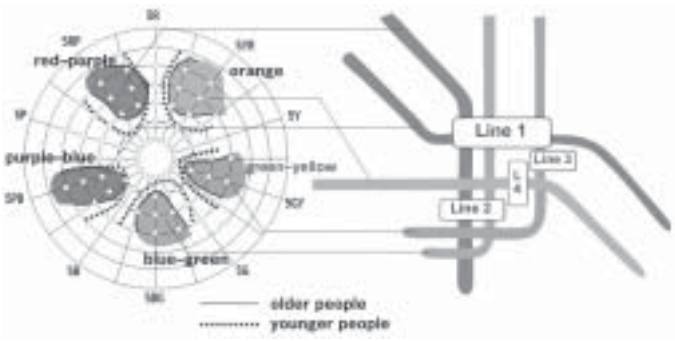

Figure 4. Examples of colour category (the left figure) and their application to coloring of lines of subway network (the right figure).

people than that for younger people. This can be considered due to the saturation reduction caused by scattered light in the eye of older persons.

The right side of the Figure 4 is an example how to use the data of color category. The five lines of a subway network are required to be clearly distinct by coloring. The way to do so is easy. One has to pick up colours from each of the different areas of colour categories as shown in the left figure. Then the distinct colour combination will be accomplished. For older persons the area defined by solid lines should be used, and dotted lines for younger people.

The advantage of this method is that the designer does not need to consider a certain exact colour when selecting colours but only to choose one of the categories and then any colour in the category. Selecting any colour from a category is very easy, and a colour combination of those selected colours can assure high distinctiveness of the combination. Of course, there is no limit for the number of colours chosen unless the areas of color categories do not overlap with each other.

As noted before, the smaller area of fundamental colours for older people might be due to the effect of scattering light in the eye that reduces the purity or saturation of colours. It should be noted that care is taken to avoid glare also for distinct colour combination. It is also noted that colour appearance is largely changed in dark (mesopic) condition. The data for spans of categorical colours are also defined for dark (mesopic) condition [5].

3.3 Visual acuity, lighting level and legible font size

Letters are widely used in the “Information and Communication” age and design for legible font size is also very important. This is particularly true for older people and people with low vision whose visual acuity is much lower that that of normal younger people. In our daily life, there are so many signs which contain too small fonts that are hard for them to read. Appropriate font size and font type, and lighting as well, should be designed for older and people with low vision. There seems to be no systematic method, however, and accessible design for legible font size is needed.

The principle factor to determine the legible font size is visual acuity. If the acuity is good, small font size is enough to read, and if the acuity is worse, the size should be larger. Therefore, the visual acuity is most critically influencing factor on legible font size. The actual problem is that the visual acuity changes in our daily condition such as luminance level, viewing distance as well as age of the observer.

Figures 5 (a) and 5(b) are the data of visual acuity for a total of 111 people who are classified into 7 decades of age [6]. Figure 5(a) is for the effect of viewing distance

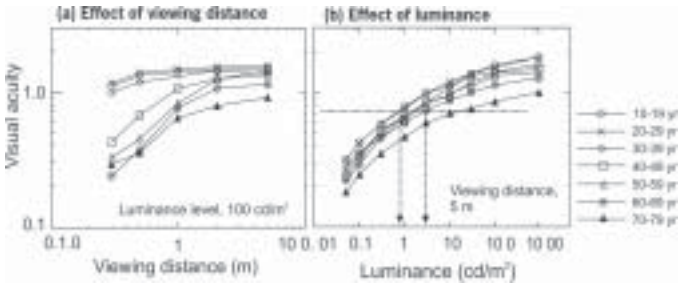

Figure 5. Visual acuity for different age groups as a function of; (a) viewing distance and (b) luminance level.

and Figure 5(b) the effect of luminance both having 7 curves that correspond to each of the 7 age groups. The effect of viewing distance (Figure 5(a)) shows a clear reduction of visual acuity at near distance (less than about 1m) for people older than 40 years old while the acuity remains rather constant for younger people. The font should be larger, therefore, for older persons when they see letters at near distance. As for the effect of luminance, all the 7 curves in Figure 5(b) show the same trend along with the luminance and no aging effect in the effect of luminance though the level of acuity is different among age groups.

It is possible from the Figure 5(b) to estimate how much light is required for older people to keep the visual acuity equivalent to younger people. This estimation can be done by drawing a horizontal line of constant visual acuity and find a cross point to each of the acuity vs luminance curves of younger or older people. As already shown in Figure 5(b), given a level of about 0.8 of visual acuity, the luminance level to ensure this acuity is 0.8 cd/m^2 for younger people (in their age of 20s) and about 3 cd/m^2 for older people (in their age of 60s). This means that about 4 times as much light is required for older people to keep the same acuity level as that of younger people.

This ratio is different among luminance levels, i.e., photopic or mesopic. Rough estimation, though not shown in Figure 5, tells us that at photopic vision above a few cd/m^2, about 10 times of luminance is required for people in their 60s than that for people in their 20s. But at very low mesopic vision the ratio becomes about twice. Although the ratio is different among levels, it can be generally said that more light is needed for older people at any level to maintain the visual acuity equivalent to younger people.

In order to find a quantitative relationship between visual acuity and a legible font size, an experiment on legibility of Japanese letters including numerals was carried out under several different viewing conditions for a total of 47 younger and 46 older people [6]. From those data the following equation was successfully derived by introducing a new factor called a size factor, S, which was defined as D/V where D means the viewing distance expressed in meter (m) and V is visual acuity defined by the Landolt-Ring.

$$P = aS + b \qquad (2)$$

Where P means the minimum legible font size (with 80% correct reading), and a, b are parameters depending on the kind of characters, which was tabulated already as Table 1.

Table 1. Parameters a *and* b *used in equation (2)*

Kind of letters		*a*	*b*
Plain	Japanese Hiragana Arabic numerals	8.2	2.6
	Chinese with 5-10 strokes	9.6	2.8
	Chinese with 11-15 strokes	9.6	3.6
Gothic	Japanese Hiragana Arabic numerals	6.4	3.0
	Chinese with 5-10 strokes	8.1	3.4
	Chinese with 11-15 strokes	8.6	4.1

For example, given a person of 70 years old who reads Arabic numerals of plain type at 50 cm under the 100 cd/m^2 level, the following calculation can be applied. The visual acuity of the person at this viewing condition can be obtained as 0.4 by referring the data in Figures 5(a) and 5(b). This gives us a size factor S (=D/V) of 1.25. From equation (2) and Table 1, the legible font size for this viewing condition is calculated as follows:

P = 8.2 x 1.25 + 2.6 = 12.9 (point)

If this calculation is applied to the gothic type font, the minimum size is calculated to be 11.0 point which is smaller than the plain meaning that the gothic type is easier to read than the plain one.

3.5 Useful field of view

Our visual field is so wide that in a physiological sense we can see almost 180 degree of visual angle in front of us. However, the effective visual field where we can obtain useful information, is smaller than the physiologically perceptible field, depending on visual task, such as discrimination of colours or reading letters. This field size, called useful field of view (UFOV), shows an age-related change in the size of it, and this age effect should be considered when we design visual signs or signals, such as traffic signs that should be clearly seen by older people.

Figure 6(a) and Figure 6(b) show data of the useful field of view for a total of 50 younger and 50 older people [7]. The data were taken for a task of detecting an achromatic stimulus on a large uniform gray background with different contrast as a variable. In Figure 6(a) the

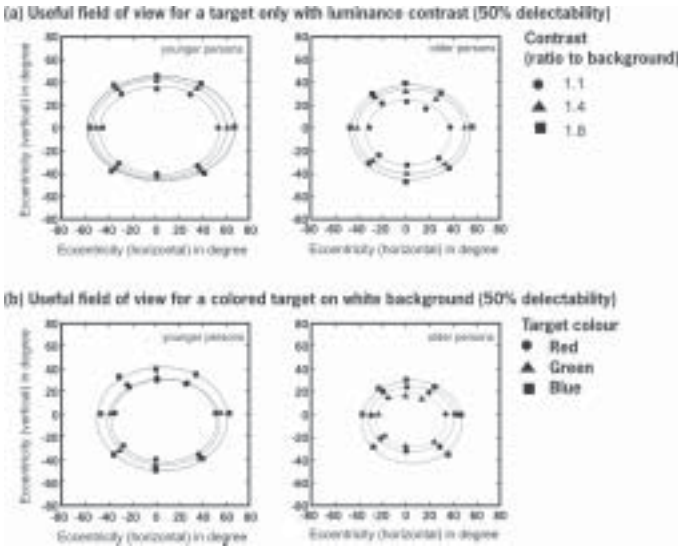

Figure 6. Useful field of view for; (a) an achromatic and (b) a chromatic target

data are shown for three different contrasts, 1.1, 1.4, and 1.8. As the contrast increases, the field of view becomes larger which means that higher contrast stimuli can be detected easier in far peripheral field. The same trend is true for older people but the size of UFOV is smaller compared to the one obtained for younger people.

Figure 6(b) is the same data but taken for detecting a coloured target against the grey background of the same luminance. Again, the size of UFOV for detecting any colour becomes smaller for older people than for the younger. Among the colours, the blue stimulus is easier to be detected in periphery than the red and green stimuli of the same luminance.

Similar data were taken also for the mesopic condition and the size of UFOV was found to be smaller than that taken in photopic level. This indicates that the lighting level is one of the affecting factors on the size of UFOV and care should be taken for road lighting, for example, so that visual signs should be visible to older drivers.

3.6 Low vision

There are not a small number of people who have impaired vision due to pathological disorders in the visual pathway, such as cataract, macular degeneration, glaucoma, etc. Visibility of those people cannot be improved simply by wearing glasses. Care in designing visual signs and lighting design have to be taken to make their visual environment more visible and safe. For this consideration, visual property of low vision and their requirements for better lighting are necessary. CIE already published a technical report to summarize the knowledge of low vision [8], but much more data on various visual functions of low vision are still required.

Figure 7 shows the contrast sensitivity function (CSF) of low vision together with the data of older people and of younger people for comparison, all being measured by contrast detection threshold [9,10]. It is noted all these three curves are averaged function and individual data are rather widely spread. This is exactly true for the data for low vision. The individual data of low vision were distributed from near the normal younger sensitivity level to a much lower level. The function drawn in a thick solid line in Figure 7 is an averaged function to show merely the middle range of sensitivity of people with low vision. The decrease in sensitivity is more prominent at higher frequency region and consequently the peak of the CSF of low vision shifts to lower frequency region, namely at around 0.3 cycle per degree.

By using the CSF curve shown in Figure 7, it is possible to estimate a visible range of low vision in terms of spatial frequency. For example, given a contrast of 10%, the frequency range of about 0.1 to 10 cpd can be seen for older or younger people, but only a narrow range approximately from above 0.1 to up to about 0.6 can be seen for people with low vision. This implies that fine details in visual signs should be avoided in designing the visual signs or to raise lighting level to improve spatial sensitivity function.

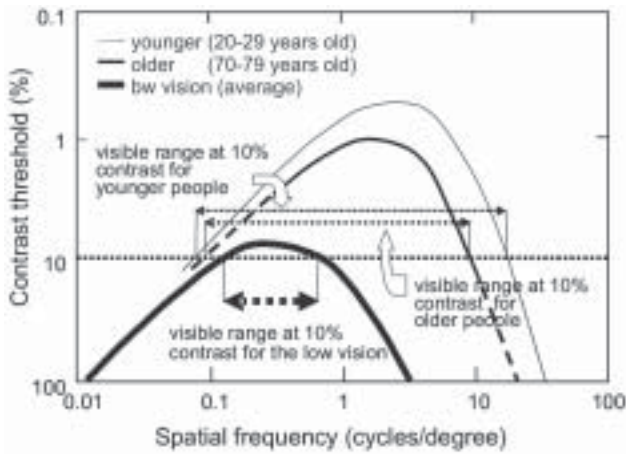

Figure 7. Contrast sensitivity function of low vision in comparison with that of older people and of younger people.

Colour is also an important factor for visual signs for low vision, and colour vision data of low vision are vitally important in designing signs and lighting for them. However, those basic data are apparently lacking in the literature.

Figure 8 shows the data taken for colour category of low vision [11]. The data were obtained from 22 people with low vision to show the distribution of colours judged similar to some fundamental colours. In Figure 8 only one example for red (5R4/14) colour is shown. The height of the bars vertical to the Munsell Value 5 plane shows the frequency of the "similar to red" responses. It is shown in this figure the area judged red by low vision is very widely spread. Some people with low vision saw even the greenish colours as similar to red, indicating very low

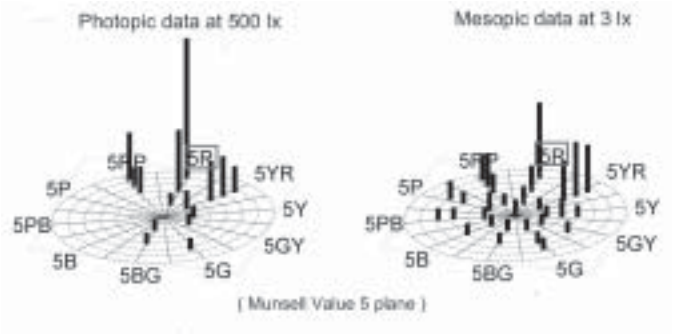

Figure 8. Distribution of colours judged similar to red (5R4/14) by people with low vision

distinctiveness of colour appearance. This is more pronounced in mesopic condition (the right side) in which the colours judged red are expanding almost whole of the V5 plane of Munsell colour space. This low distinctiveness of colour at mesopic condition is characterized as one of the specific features of low vision.

4. Summary

To implement the concept of accessible design into the light and lighting fields, some basic visual functions were shown as a function of age and visual impairments. In this paper only some of fundamental items can be addressed and there are many more important items to be considered for accessible design in the field of application of lighting, such as glare. CIE should investigate such items for the application of accessible design in the field of light and lighting. A guideline of accessible design is now being developed in the working group of CIE BA. In the near future it will be published with a better collection of knowledge of vision of older people and people with disabilities and of methods for application to lighting for them.

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Author:
Ken Sagawa
National Institute of Advanced Industrial Science and Technology
1-1-1, Higashi, Tsukuba, Ibaraki 305-8566, Japan
e-mail sagawa-k@aist.go.jp

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FORTHCOMING EVENTS

Lux Pacifica 2009

April 23 - 25, 2009, Khabarovsk, Russia

Lux Pacifica is the organization established in the late 1980s which unites the Illuminating Engineering Societies of the Pacific Basin Region. The member lighting societies are: Illuminating Engineering Society of Australia & New Zealand, Illuminating Engineering Society of North America, Illuminating Engineering Institute of Japan, China Illuminating Engineering Society, Indian Society of Lighting Engineers, The Illuminating Engineering Society of Russia, The Illumination Engineering Society of South Africa and The Illuminating Engineering Society of Thailand. The Chairman of Lux Pacifica is Dr Warren Julian, IESANZ.

The first Lux Pacifica conference was held in Shanghai (China) in 1989. That was very successful, with Thailand offering to host the second Lux Pacifica in 1993. Then followed, Nagoya (Japan) in 1997, New Delhi (India) in 2002 (rather than 2001) and The Illuminating Engineering Society of Australia and New Zealand hosted this important regional conference in 2005.

Lux Pacifica 2009 will be organized by the Illuminating Engineering Society of Russia. It is an open conference and different countries are invited to participate in it.

The national lighting conference will be held in conjunction with Lux Pacifica in April 22-23, 2009.

Subjects of the Conference

- Energy Efficiency
- Outdoor and Indoor Lighting

- Light and Health
- Light and Architecture, Lighting Design
- Lighting Fixtures
- Semiconductor and Traditional Sources of Light, and Control Systems
- Irradiation Systems
- Light Measurements
- Standards of Lighting

Abstracts

Prospective contributors are invited to submit papers. The extended abstract should be submitted in English with a minimum of 500 and a maximum of 1000 words and has the following information of the author: name, last name, address, the name of the organization, e-mail. Contributions can be submitted electronically. The submissions must arrive at the Organizing Committee by September 1, 2008

For further information contact:

Russian Lighting Research Institute
106, Prospect Mira,
129626, Moscow
Russia
Tel.: 007 495 687 63 11
Fax: 007 495 687 62 90
E-mail: vnisi@bk.ru

Lux Europa 2009

September 9-11, 2009, Istanbul, Turkey

Lux Europa is the association of National Lighting Societies of at present 18 European countries. One of its main tasks is to spread the lighting knowledge by holding conferences every four years. Lux Europa 2009 will be organized by the Turkish National Committee on Illumination.

Subjects of the conference:

- Energy efficiency
- Lighting quality
- Light for people at work
- Health and lighting
- Lighting in architecture
- Lighting and darkness
- Lighting in the cities
- Adaptive lighting
- Standards for lighting

Call for Papers: until 30 September 2008.

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Turkish National Committee on Illumination
Istanbul Teknik Oniversitesi
Enerji Enstitusd, Ayazaga Yerleskesi
34469 Maslak, Istanbul, Turkey
Tel.:+90 212 285 60 50
Fax:+90 212 285 60 51
e-mail: luxeuropa2009@itu.edu.tr
www.luxeuropa2009.org.tr

WEBWATCH

LRC Publishes Report on LED Encapsulants

The Lighting Research Center (LRC) recently published a study designed to aid in the selection of a suitable encapsulant to maximize light extraction in high-power LEDs, based on findings about the impact of temperature and phosphor concentration on the refractive index.

Specifically, the study explored the refractive indices of commercially available encapsulant materials used for LEDs, and how those indices change as a function of temperature and the amount of YAG:Ce phosphor mixed within the encapsulant.

You can read The Impact of Temperature and Phosphor Concentration on the Refractive Index of LED Encapsulants here.

Link :

http://www.lrc.rpi.edu/programs/solidstate/cr_impact.asp

LEDs to Light the Way on GW Bridge, in Holland Tunnel

The New York Port Authority Board of Commissioners recently authorized the installation of LEDs, replacing fluorescent lighting in the Holland Tunnel and mercury vapor lamps for the necklace lighting on the George Washington Bridge.

The LED lighting, which distributes light more efficiently and requires less energy, has a life expectancy of 15 years - compared to 1.4 years for the existing tunnel lighting.

More than 1,700 LED fixtures will replace 4,000 existing fixtures in the tunnel and will produce annual energy and maintenance savings of $340,000.

An annual carbon dioxide emissions reduction of approximately 3 million pounds is expected with the use of the new system, according to the port authority.

The necklace lighting for the George Washington Bridge is currently lit by 156 mercury vapor fixtures and will be replaced with 156 LED fixtures.

The LEDs will have a life expectancy of 12 years, compared to one year for the existing lighting. The use of LED lighting on the bridge necklace will produce annual energy and maintenance savings of $49,000.

An annual carbon dioxide emissions reduction of approximately 260,000 pounds is expected with the use of the new system.

The Holland Tunnel and George Washington Bridge projects are scheduled to be completed in 2008.

You Can Make a Difference

You're concerned about human impact on global climate patterns and you sometimes wonder what you can do about it, although you doubt that your voice alone will make much difference, if any. You're also expert in a branch of electricity or electronics and have some good ideas about how to improve things in a way that diminishes human impact on the climate. There's a place for you where you can express your views within a community of like-minded people who want to make a difference. Together, your combined voices could help to bring about change. That place is called watt**watt**.com. Although it was created by the IEC to generate discussion about electrical energy efficiency, it is not the IEC's website. It is something new and independent. The community is known as wattwatters. Each wattwatter helps to determine the content of the website by sharing ideas, by asking and answering questions, by pointing out interesting resources found on the web, by generating discussion or debate, and so forth. With a big enough community and, eventually, enough agreement on what needs to be done and practical ways to do it, the collective voice will be heard because, there's an interesting twist here, the IEC is reading all the contributions. So watt**watt** is not just another online community. With the IEC behind it, you have the power to make things happen. The watt**watt** community is free and it's for everybody: you don't need to be an expert in electrotechnology, although expertise is always welcome because it gives solid foundation to opinions and ideas. All you really need is to be convinced about the need for change. Log in today and start to make a difference.

http://www.watt**watt**.com

Secrets of the Sun

In September 2007, sculptor Peter Erskine visited five cities around the United States lecturing on his solar spectrum environmental artwork called Secrets of the Sun, which uses the sun as its subject, medium, and energy source. Originally installed in the ancient Roman Forum, this interactive light sculpture draws upon the visible light spectrum to stimulate a deep emotional and physical response. Laser-cut prisms were positioned around the Roman Forum to direct light into its interior spaces, breaking it down into the visible spectrum. Mirrors directed the colored light around the rooms of the Forum, highlighting different architectural details and surfaces as the light moved and changed throughout the day. Visitors, clothed in white jumpsuits, became part of the canvas. Presented by the International Association of Lighting Designers (IALD), Erskine's presentation also discussed solar spectrum art installations in the central station of Milan, the new LAPD Headquarters, and a shade garden in the California desert.

For images see this link:

http://www.archlighting.com/industry-news.asp?sectionID=1312&articleID=587386

Anool Mahidharia

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S-273	Mr. Ujjal Jyoti S 1, Shatrunjay Society Dattanagar Road Pune 411 046	Student	Mumbai
S-274	Mr. Nishant Kumar Flt 306, Bld 1B, Swapnpoorty H Society Pradhkaran Nigdi Pune	Student	Mumbai
S-275	Mr. Shiv Kumar Flat No J4, Durga Apt. Chaitvaban, Bibewadi Pune 411 037	Student	Mumbai
S-276	Mr. Varun Rathore A-6/7, Shriram Gardens Katraj Pune 411 046	Student	Mumbai
S-277	Ms Shivika Sinha Ladies Hostel Katraj, Dhankawadi Pune 411 043	Student	Mumbai
S-278	Mr. Dinesh Kumar Garg A-6/7, Shriram Gardens Katraj Pune 411 046	Student	Mumbai
S-279	Mr. Ankit Garg A-6/7, Shriram Gardens Katraj Pune 411 046	Student	Mumbai
S-280	Mr. Arpit Agarwal C-15 Classic Garden Pune 411 043	Student	Mumbai
S-281	Ms. Rupali 24 Patang Plaza Apt. Dhankawadi Pune 411 043	Student	Mumbai
S-282	Mr. Ishan jain S. No 33/7 Patang Nagar, Ambegaon Pune 411 046	Student	Mumbai
S-283	Mr. Prakash Kandala HN-17, Hrishikesh Housing Soc. Katraj Pune 411 046	Student	Mumbai
S-284	Mr. Vivekanand Plot 27, Balkrishna Society Chaitanyanagar Pune 411 043	Student	Mumbai
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S-287	Mr. Anumeha Gupta Room 8, Sharallal Deb Hostel Katraj Pune 411 043	Student	Mumbai
S-288	Mr. Akshay Chandna C 2 Building, Flat No 5 Manik Mall. Katraj Pune 411 043	Student	Mumbai
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S-292	Mr. Prashant Balasaheb Jagdale OMKAR, 34/2 Dattanagar Ambegaon Pune 411 046	Student	Mumbai
S-293	Mr. Mitin Balasaheb Jagtap Sutar Galli, Kavate Mahankap Sangli 516 505	Student	Mumbai
S-294	Mr. Sourabh Tyagi North India Shiv Sankar Hostel Dhankawadi Pune 411 043	Student	Mumbai
S-295	Ms. Sandhya Sachan Room 116, Sarhad Girls Hostel Pune 411 046	Student	Mumbai
S-296	Mr. Asim Kumar Ramdayale Nagar Lane No 3 Muzaffarpur Bihar 842 002	Student	Mumbai

Transfer of grade

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F(L)-0577	Mr. Satyabrata Chaudhuri J-2/19 DLF - II, GF Gurgaon 122 002	Fellow (Life) from M-0890	Delhi
M(L)-1301	Mr. Prasanta Chowdhury 215/1 Rishi Bankim Chandra Road Mahendra Colony Kolkata 700 028	Member (Life) from A(L)-0540	Calcutta
A-909	Ms Sutapa Das 57-1-2 P. M. Sur Garden Lane Kolkata 700 085	Associate from S-0163	Calcutta

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