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LIGHT the official NEWSLETTER

of the **indian society of lighting engineers**

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FROM THE PRESIDENT'S DESK

Lii2008 has come and gone and as expected it was an outstanding event. With some120 exhibitors from 17 countries and over 7000 business visitors the exhibition was indeed the most successful to date. The collaboration with the Expomedia group helped increase the international participation in the show. This collaboration has now been extended and ISLE will be a partner in the Lighting South Asia exhibition being organized by Expomedia in Mumbai in February 2009. As always, we will need the active support of our members to ensure the success of the event.

The conference at Lii2008 was also outstanding. With a faculty of 22 outstanding experts, it was indeed a unique opportunity for all of us in India involved in lighting. I am somewhat surprised and disappointed by the inadequate response by our members. While I understand that everyone is busy, participation in conferences such as these provides a unique opportunity to update ourselves on the technology and practice in our fields.

I am happy to note the continued interest of the next generation in lighting as is reflected in the numbers of new student members in our ranks. The Education Committee (see report on page 6) has streamlined the process for giving scholarships and is working out programmmes to sustain the interest of students in lighting. We are grateful to the lighting companies for their continued support to the scholarship scheme.

The Governing Body is examining the possibilities to extend the reach of ISLE activities. We are in conversation with the Bureau of Energy Efficiency to see how we can jointly promote good lighting practice. One possibility is the establishment of a Lighting Competence Centre. We are also examining the possibility of a publishing programme to spread the message of good lighting.

Lumilux Range of Lamps comes with Tri Band Advantage.

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I am happy to inform you that with the active involvement of ISLE the National Lighting Code is now ready and we hope to see it in print very shortly.

I am available to all members for help and suggestions in improving the working of our Society.

A. D. Kulkarni
President
dradk@hotmail.com

EDITORIAL

This issue gives a comprehensive coverage of both the Lii2008 Exhibition and Conference. It will help those of you who were not there you will get some idea of the event.

On request from a number of people we are reproducing Lou Bedocs' excellent article on the Design Parameters for Lighting Engineer Designing for Interior Space, a subject of interest to most of our members. This was published in the 2008 edition of the Directory of the Lighting Industry released at Lii2008.

In every issue we give information on forthcoming lighting events in different parts of the world. However, the attendance at international conferences by ISLE members is negligible. The next Lux Pacifica conference is being held in Khabarovsk, Russia from April 23 to 25. We have a year to go and I do hope that several of our members will make a note in their calendars and be present there. The abstract for papers is due on 1st September this year and I really do hope that there will be a good representation of the technical lighting expertise from india at the conference. India is very much in world economic focus and this is no different for lighting. We are fortunate that we have a large number of both lighing experts as well as lighting enthusiasts and therefore we want more exposure at international lighting events.

We present a report from the Education Committee headed by Dr. Saswati Mazumdar outlining the plans to streamline the scholarship process and to spread lighting education. In the next issue we will carry information of the projects done by the students that have been awarded scholarships. You will notice that the scholarship plans cover all the aspects of ISLE intentions in this respect.

Karnataka State Centre is planning another conference and exhibition, Vision 2010 in November this year. They will need the help and support of our membership to make the event successful and meaningful.

As always, we have an interesting Webwatch section of news from around the world compiled from the information sent to us by Anool Mahidharia.

H.S. Mamak
Editor

ISLE ACTIVITY

Lii 2008
LIGHT INDIA INTERNATIONAL
February 22-25, 2008

Exhibition

With Lii2008 we have seen yet another successful ISLE international event. The collaboration with an international exhibition group, Expomedia worked well and we had the many new international companies.

The Exhibition had 7341 registered business visitors. This figure does not include the company representatives who also accounted for large numbers who visited stalls and were an important group of interested customers and opinion leaders.

Though the number is not higher than the last time, the feedback from Exhibitors is that the composition reflected a much higher number of professionals. A summary of the business visitor registration data is given below.

Business Visitor Registration Data

Data for 7341 business visitors was recorded at the registration counters set up for Lii2008.

Indian Visitors: 7199
Foreign Visitors: 142

Remarks:

- The change that was noticed was that the application wise interest was predominant - 21.48% for lamps for instance as against over 100% interest in application oriented segments - Office Lighting, Retail Lighting, Residential Lighting, Stage -Studio Lighting, Architectural Lighting etc.
- The interest in accessories has increased showing awareness of electronics and controllers
- LEDs continue to hold strong interest with visitors
- Non - conventional Energy interest has also increased.

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Mumbai 400 093

Business Interest

(Note: Since these are multiple choice, the total number for selection will be more than the total number of Visitors)

Particulars	Numbers	% Age
Accessories	1214	16.54
Components	1116	15.20
Residential Lighting	1688	22.99
Lamps	1577	21.48
Non Conventional Energy	680	9.26
Raw Materials	616	8.39
Stage & Studio Lighting	635	8.65
Architectural Lighting	1183	16.11
Decorative Lighting	1279	17.42
Industrial Lighting	1301	17.72
Leds	1588	21.63
Office Lighting	1220	16.62
Retail Lighting	931	12.68

Visitor Profile

Particulars	Numbers	% Age
Airport Authorities	90	1.41
Consumer	1500	23.43
Entrepreneur	1200	18.75
Investor	267	4.17
Railways	123	1.92
Trade Delegation	153	2.39
Armed Forces	62	0.97
Diplomat	42	0.66
Govt Utility(PWD/ Electricity/Etc)	525	8.20
Policy Maker	89	1.39
Supplier/Trader/ Manufacturer/Dealer	2350	36.71

(Note: The profile of 940 business visitors not indicated.)

Market Research Study

A market research group was hired to study and report on various aspects of Lii2008. The main conclusions of their findings are given below.

1. From the data it can be inferred that the Exhibition was successful with all categories - professionals, decision makers as well as the general public.
2. The concept of increased business hours and reduced hours for the general public was much appreciated.
3. Visitors remarked that the exhibition satisfied their interest and curiosity on products and trends. The exhibitors expressed satisfaction with the flow of business contacts and the visit of competitors to their stall.
4. The foreign visitors were satisfied with their participation since in most cases, it met their primary objective of brand introduction and distributor/dealer identification.
5. It was interesting to note that even though this was the sixth exhibition by ISLE, the majority of visitors came for the first time. This shows the changing dynamics of customers and the industry.
6. New products commanded the maximum attention and Multinational Corporations got the highest rating for the best designed exhibit.
7. There was also a substantial interest in Foreign participants and their offerings. This indicates growing interest in New technologies / Products.
8. LED's generated maximum interest followed by CFL indicating the priority being given to Energy saving solutions in lighting.
9. On the organization side, the perception broadly was that the exhibition was well coordinated but there were minor criticisms of parking facilities, the air conditioning and support infrastructure. This needs to be addressed in future.
10. The study was limited only to the Exhibition and does not have any feedback on Lighting conference which formed a part of the event.
11. Business Visitors, amongst whom the suppliers in particular, felt more International companies should participate in the exhibition.

Conference

The Conference was excellent with a very eminent faculty covering a wide range of subjects. The choice of format with 6 focused application oriented workshops worked very well. The 20 lead speakers representing expertise in a large variety of fields covered the selected subjects very comprehensively. In addition there were two outstanding invited papers, the opening keynote paper by Prof. Wout van Bommel, immediate Past President of CIE and the closing Invited Paper by Prof. Hao Luoxi from Tongji University, Shanghai.

Though we missed the presence of Mr. Ted Ferreira and Mr. Chip Israel (both of whom have been presenters at earlier ISLE conferences) they sent very capable and senior colleagues, Hilary Wainer and Varma Namburi who made excellent presentations in their place.

The session of Presented Papers on February 24 featured a number of interesting projects that reflected simple and effective lighting solutions. This session also gave some of student co-authors the opportunity to present a paper.

The only disappointment was that more people did not take advantage of this unique opportunity to interact with such a large number of leading international experts at one forum. The proceedings are under preparation and will be published shortly.

	INAUGURAL SESSION
22nd February 2008	
09.00	Keynote paper by Prof. Wout van Bommel
	WORKSHOPS
22nd February 2008	
11.00-13.30	**Energy Saving (Sustainability)** Warren Julian (Australia) Martine Knoop (Netherlands) Lou Bedocs (UK)
14.30-17.00	**Outdoor (City Beautification Street Lighting, Monument Lighting)** Reg Wilson (Australia) Vincent Laganier (France) AGK Menon (India)
23rd February 2008	
10.00-12.30	**Infrastructure Lighting (Highways, Airports, Railways)** Richard Taylor (Germany) Paul J. Rutte (Netherlands) Sudeshna Mukhopadhyay (India)
14.30-17.00	**Retail and Hospitality** Jan Ejhed (Sweden) Varma Namburi (USA) Krishnesh Mehta (India)
25thFebruary 2008	
10.00-12.30	**LEDs** Richard Sng (Hong Kong) Franz Otten (Netherlands) Hilary Wainer (USA)
14.30-17.00	**Electronics and Controls** Arthur Felder (Malaysia) Ulrich Mathis (Austria) Jas Clare (UK)
	CLOSING SESSION
25thFebruary 2008	
17.00	Invited paper by Prof. Hao Luoxi
	SPECIAL OPEN SESSION
24th February 2008	
10.00-12.30	Presented papers

Directory

The Directory of the Lighting Industry in India once again is a much sought after publication and continues to provide those interested in Lighting with a comprehensive picture of the industry as well as an insight into a wide range of key issues through the expert articles that it contains. Copies are still available for sale and can be acquired from the ISLE Secretariat in Delhi. Members should acquire copies of this useful and interesting publication for their own use as well as for their contacts with an interest in lighting.

Table of Contents

Dear Mr Mamak,

I am writing to congratulate ISLE on another excellent Light India International. It was amazing to see the changes since the last LII in 2005, especially with regard to the trade show. The sophistication and the quality of the products on display, especially from local manufacturers, had increased enormously. The size and quality of the stands had also increased showing a greater emphasis on getting a message across, rather than simply displaying a collection of products.

The seminars were also excellent and ISLE obviously put a lot of thought into attracting speakers with relevant messages. It was disappointing that more didn't take advantage of the wealth of information presented in the seminars.

The cultural events are always a highlight of LIIs, especially for the foreign visitos and this year's maintained the high standard of the past.

I understand that this year's event trialled a possible future arrangement where ISLE was in partnership with a professional exhibition organiser. From my viewpoint, that trial was a success. Having said that, what makes ISLE events special in the world of exhibitions is the experienced ISLE team that comes up with the basic themes for each LII and which liaises with all the players who contribute to the success of these events. I extend my congratulations to that team and to the ISLE for staging these events, showcasing lighting in India, to India and the world.

I'm looking forward to next year's, which I believe will see a move from Delhi to Mumbai.

Again, my congratulations,

Warren Julian,
Chair, Lux Pacifica

Education and Training Committee

The Director of the Education and Training Committee called a meeting at Kolkata on April 18, 2008. The following members were present:

Dr. Saswati Mazumdar, Director

Mr. P.K.Majumdar, Hon Gen Secy.ISLE

Mr. R.B.Putatunda	Member
Dr. Biswanath Roy	"
Mr. Rajat Roy	"
Mr. Onkar Mitra	"
Mr. Sisir Ganguly	"
Mr.Prakash Kumar Chatterjee	"
Mr.Bipin Dattani	"

Disbursement of Scholarships to Students

Based on decisions of the 4th GB meeting and the ISLE Annual Report of 2006-2007 and the feedback received from the selected students the following decisions were taken for the 2006-2007 Scholarships.

Though two students of BESU (Bengal Engg. & Science University), four students of MIT (Manipal Institute of Technology) and four students of Jadavpur University were in the preliminary selection for the Scholarship, five of them were rejected as they did not perform their projects on any Illumination topic. The selected candidates are:

Mr. Sachin Sinha (M.Tech , MIT - Rs. 20,000)

Ms. Prattusha Kar (ME, JU - Rs. 20,000)

Ms. Sucheta Mondal (ME, JU - Rs. 20,000)

Mr. Sagnik Mazumdar ((BE, JU - Rs. 15,000)

Mr. Akashdeep Banerjee ((BE, JU - Rs. 15,000)

Scholarships for 2007 - 2008

In response to the letter of Director-GB Education 18 students applied for the scholarships through their Professors, three from MIT UG course, two from Calcutta University UG course, four from JU UG course, three from JU PG-1 course, six from PG-2 course.

Interviews will be arranged by experts of the state centre members before 6th May 2008 so that the selected names of the awardees would be placed in the next GB meeting to be held on 9th May, 2008. The selection criteria will be based on Lighting related Projects and will be evaluated on

i) the project job they are doing

ii) the quality of work and their innovativeness

iii) the knowledge on Illumination Engineering.

The expert committee should send the panel of the scholarship holders to the Director-GB Education & Secretary GB by 7th May 2008.

The names of the Calcutta experts are

a) Mr. Kanishka Sen

b) Mr. B. Joardar

c) Mr. Soumen Bhowmik

d) Mr. Onkar Mitra (Convener- Scholarship Interview Committee)

It was agreed that for Manipal Mr. Kagalwala (or Mr. Bhavani Prasad) will be requested to conduct the interviews with some other ISLE experts of South India.

Faculty members of the institute concerned will not be eligible to take part in the final scrutiny and interview of the students.

It was unanimously agreed that ISLE certificates should be given to the awardees with some amount of prize money.

It was also agreed that it was already late in finalizing procedure to select the right candidate for 2007-08 and this type of selection procedure is definitely improved compared to the past years and the outgoing students should be awarded before leaving their institutions by this procedure. The amount of prize money will be decided by ISLE GB for this current year.

Scholarship for 2008 - 2009 onwards

In order to streamline the process for the future scholarships, the following guidelines of the rules and regulations for monitoring procedure was discussed

- The scholarships should be named as 'X' company scholarships, 'X' being the donor. This should be published in the ISLE newsletter.
- As bio-data of all students will be available, ISLE and the donor companies will be able to keep contacts with the awardees.
- To encourage knowledge on Illumination Engineering, it was decided to select three best student projects on Illumination Engineering and any student may apply even if he or she is getting scholarships from anywhere else in the country. The reward to the recipients should be so that students get interested and the proposed values were;

  1st Prize - 15K, 2nd Prize - 12K and 3rd Prize - 10K, with the certificates from ISLE. The abstract of their project should be published in the newsletter.
- It has been observed that approximately 50% of the students studying post graduate Illumination Enggineering do not get any financial assistance. Due to financial reasons 50% of these students give up studies and join any non-lighting job and India as a country loses future Illumination Engineers. The University and Industry should have a clear objective

of producing Illumination Engineers in respect of both Quality and Quantity and should try to help these students. The selected students should get Rs.20K yearly and ISLE should select not more than 10 such students per year.

- To achieve these objectives the following are recommended.
  a) Within 15th of January each year the student should send their bio-data with the brief report of the lighting project done in 1st semester of UG 4th year or PG 1st year or PG 2nd year, through their HOD's or Professors of their department.
  b) From end of January to 10th of February, one expert committee comprising three members will conduct the interview of all the students and amongst them one member will be nominated from Education Committee and two members from respective State Centre.
  c) Results must be announced before March every year.
  d) The award ceremony should be conducted in any technical programme of State Centre.
- All these points should be discussed in ISLE GB and also in ELCOMA meetings to arrive at a conclusion. If necessary any member can be nominated to explain these points in ELCOMA meetings.

Planning of Energy Conservation Awareness Programme in Educational Institutions

It was resolved that PowerPoint presentations on the above mentioned subject and Quiz Contest programmes should be conducted by November 2008 with the help of State Committees. Posters and Leaflet distribution may be done in parallel.

The Kolkata State Centre agreed to conduct this type of activity to be headed by Mr. S.K.Ganguly.

Short Term Lighting Courses

It was decided that one short term lighting course should be conducted each year before the end of December. The course syllabus must be circulated before July of each year. It was agreed to form a lighting education syllabus sub-committee to be headed by Dr. B. Roy.

MUMBAI STATE CENTRE

Lighting programs held in February

On the eve of LII 2008 two prominent personalities in the field of lighting Prof.Warren Julian, Dean (Faculty of Architecture),University of Sydney and Mr.Reg Wilson, Head (Asia-Pacific Office) International Dark-Sky Association visited Mumbai and shared their rich experience with members of ISLE and others.

On **16th Feb. 2008** ISLE MSC organized a half day programme at Rachna Sansad for architectural students and members. Mr. Stan Alvares Co-ordinator of the Program Sub-Committee of the State Centre welcomed the audience which included ISLE members and students of the Academy of Architecture, Rachna Sansad. Mr. A. Auddy, Hon.Treasurer introduced Mr. Amrith Prabhu, Manager, Osram Opto Semiconductors who gave a presentation on 'LED Technology - Powering Innovative Lighting Applications - Now and the Future'. Giving a brief history of LED's he showed various ways in which LED lighting can be integrated smoothly with architecture giving attractive and energy efficient solutions. The students found it very interesting and there was a lot of interaction.

Prof. S.H. Wandrekar, Chairman, Rachana Sansad then addressed the audience and welcomed the concept of this program. Mr. Anil Valia, a Founder Member of ISLE introduced Prof. Warren Julian who gave a presentation on 'Architectural Lighting'. Prof. Julian highlighted the human aspect of architectural lighting and illustrated the relevance of good lighting which could be artificial or natural, but which ultimately brings out the detailed features of the architecture and landscape to the viewer.

After the presentations, mementoes were presented to both speakers by Prof. P.P. Amberkar, Jt. Hon. Secretary, Rachana Sansad and Ar. Rohini Mani, Member ISLE GB. In his Vote of Thanks, Mr. Alvares thanked the speakers for their interesting presentation as well as Prof. Amberkar and Prof. Arvind Adarkar, Joint Director, Academy of Architecture for their support and assistance in organising the program.

On **19th Feb.2008** Mr. Reg Wilson gave a presentation on 'Light Pollution and Trespass and the Integrity of the Indian Night Skies' at the Hall of Culture in the Nehru Centre. This program was sponsored by Crompton Greaves, Lighting Division. Mr. Piyush Pandey, Director, Nehru Planetarium, Mumbai welcomed the audience consisting of ISLE members as well as astronomers and environmentalists who are concerned with the effects of light pollution. He highlighted the relevance of this program by sharing his experience of observing a beautiful clear starlit sky when driving outside Mumbai; a scene which he misses here.

Mr. K. Naveen, Hon.Secretary, ISLE-MSC introduced Mr.Reg Wilson to the audience and also presented the good wishes of the Chief Guest, Mr.Manoj Verma, President ELCOMA and Vice President- Lighting,Crompton Greaves who was not able to attend the function.

Mr. Reg Wilson then explained the causes and effects of light pollution and how they can be tackled. He stated that reducing light pollution did not mean less or poor lighting as commonly interpreted, but rather usage of lamps with suitable luminaires which focus on optimum illumination of the required area thus cutting unwanted reflection into the sky. He also showed how security issues can be addressed by proper lighting methods while reducing light pollution. The above methods not only retain the desired features of the illuminated area but also give the benefit of energy efficiency.

At the end of the presentation a memento and floral token was presented to Mr Reg Wilson by Ar. Rohini Mani and Mr. K. Naveen. Together with Mr. Rajendra Gupta, Committee Member, ISLE MSC they also presented floral tokens to Mr. Piyush Pandey and Mr. Suresh Satam of Nehru Planetarium. Mr. Alvares then proposed a Vote of Thanks to Mr. Reg Wilson as well as Crompton Greaves for sponsoring the program. He also thanked Nehru Planetarium for their assistance in organising the program. The evening ended with high tea for all present.

PUNE LOCAL STATE CENTRE

International Conference on City Beautification through Lighting

February 18, 2008, Pune

"You walk down the city roads in the evening and wonder why it's all dark and gloomy, despite all the streetlights being on. Nothing wrong with your eyesight. It's just that streetlights in the city are maintained poorly, are damaged and many need replacement." That was the unanimous opinion of Prof.(Dr.) Warren Julian, Dean, Faculty of Architecture, Design and Planning - University of Sydney, and Mr. Reg Wilson of International Darksky Association, both from Australia. They were in Pune as part of a City Beautification Program taken up as a Social Responsibility Project by the MIT Lighting Research Academy, Pune.

Dr.Sunil Karad, Executive Director, MITLRA welcomed the guests and Dr.Prakash Barjatia, Director- MITLRA, Pune gave background of the Conference. Inaugurating the Conference as the Chief Guest, Mr.Rajesh Kochhar, Chief Executive - C&I Business of Wipro Lighting mentioned that lighting has to be part of the larger master plan for the city. As Pune grows, the need for a master plan becomes imperative.

The Conference was organized by the MIT Lighting Research Academy, Pune in association with Indian Society of Lighting Engineers, Mumbai State Centre on February18, 2008 at the MIT Campus, Pune. The conference was also addressed by Dr. Avinash Kulkarni, President, ISLE, Mr. S. Chakraborty, Sr. General Manager, Bajaj Electricals, Mr.Krishnesh Mehta, National Institute of Design, Ahmedabad and Mr. Makarand Sainis, General Manager- Technology, C&I,Wipro Lighting. This conference was attended by the lighting professionals, government officials, students and citizens.

National Seminar on Architecture and Lighting

February 19, 2008, Pune

"There is a need for more interaction between architects, electrical engineers, interior designers with lighting engineers so as to bring awareness about energy efficient lighting, and optimum utilization of this scarce source of energy i.e. electricity". These were the words of

Mr. P.C. Barjatia introducing the speakers

Shri Shrikant Nivasarkar, President, Federation of International Interior Architects / Designers(IFI) while inaugurating the National Seminar on February 19, 2008 at the MIT Campus in Pune as Chief Guest. The Seminar was organized by MIT Lighting Research Academy, Pune in association with the Mumbai State Centre of the Indian Society of Lighting Engineers, Pune Centre of the Indian Institute of Architecture (IIA), Promoters & Builders Association of Pune (PBAP), and Maharashtra Energy Dev.

Agency (MEDA). During his Keynote address, Prof. (Dr.) Warren Julian, Director of Lighting Studies, Professor in Architectural and Design Science, Dean, University of Sydney, Australia emphasized the need of lighting education and awareness amongst not only architects, but also users so as to minimize the pollution due to wasteful lighting.

The Seminar was addressed by Mr. S.Chakraborty, Sr.General Manager, Bajaj Electricals, Mumbai; Mr.Krishnesh Mehta, National Institute of Design, Ahmedabad; Mr.PAS Ramakrishna, Marketing Manager and Mr.Shailesh K. Tokekar, Business Manager - Retail, both of C&I, Wipro Lighting. It was attended by architects, interior designers, lighting consultants, academicians and students. Expressing his sincere thanks to all agencies who supported the program and all participants, Dr. Prakash Barjatia, Director, MITLRA expressed the intention of the institution to conduct many more such programs.

KARNATAKA STATE CENTRE

Vision 2010

November 21-23, 2008, Bangalore

After the success of Vision 2006 and the EU Light India project, the Karnataka State Centre is planning its next event, Vision 2010 in November this year.

With the increasing outlay on infrastructure development, urban renewal, sporting events and health care, there have been requests from industry, government departments and professional institutions in Karnataka to conduct another lighting event to showcase the latest developments in the field of lighting.

Vision 2010 will be a three day exhibition and conference at Hotel Grand Ashok in Bangalore on November 21, 22 & 23, 2008.

For further information on registration and space booking, please contact:

Mr. M.S.N. Swamy
Email:swamy43@gmail.com
Ph: 080 23441952/09341231755

CIE ACTIVITY

CIE, ISO and IEC Cooperation in International Standardization

While the CIE has for decades been a scientific organization that issued fundamental publications on light and lighting it has only 20 years ago been accepted that the CIE also needs to be present on the global marketplace for standards on light and lighting. Ongoing standardization efforts from technical committees of the International Organization for Standardization - ISO (www.iso.org) and the International Electrotechnical Commission - IEC (www.iec.ch) concerning light and lighting made it very clear that there is competition and that the CIE had to raise its voice as the true international center of competence in this field.

The response to this challenge was not only the publication of the first dozen or so of CIE standards but also – in order to avoid duplication of work – the establishment of a memorandum of understanding between CIE, ISO and IEC. ISO and IEC agreed to recognize the CIE as a competent body for submitting its approved standards to ISO and/or IEC for direct endorsement and issue as ISO/CIE-, IEC/CIE- or ISO/IEC/CIE-standards ("double- or triplelogo"- standards).

- ISO 8995-1:2002(E)/CIE S 008/E:2001 "Lighting of Work Places - Part 1: Indoor" or

- IEC 62471/CIE S 009/E:2006 "Photobiological Safety of Lamps and Lamp Systems"

are examples of such successful cooperation between the CIE and its partner organizations.

Standards from ISO and IEC are not only recognized worldwide, they are also the basis for national or regional standards. However, every country or region is absolutely free to adopt an ISO- or IEC-Standard for national or regional use en bloc, in part or not at all. Even ISO- and IEC-Members are free in their decision, regardless whether they have previously voted in favor of the particular standard in question or not.

Europe has taken a different approach: it has decided on a policy to, whenever acceptable, adopt International Standards from ISO and IEC unchanged as European Standards - mandatory to be published as National Standards in all the presently 30 member states of the regional standardization body (CEN/CENELEC).

CIE-Standards - like ISO- and IEC-Standards - reflect the worldwide state of the art in their specific field, however (similar to the ISO/IEC-procedures) every country or region is absolutely free to adopt a CIE-Standard for national or regional use en bloc, in part or not at all. Even countries that are represented in the CIE through CIE National Committees (NCs) are free in their decision, regardless whether these NCs have previously voted in favour of the particular CIE-Standard in question or not.

Naturally it is in the CIE's interest and in the interest of the Divisions and Committees that have worked out CIE-Standards to see these standards being actively used in the CIE member countries and beyond. The decision to

enter into cooperation with ISO and IEC was a step in the direction to give CIE work results an even wider use while an unchanged national or regional takeover of many CIE standards in many countries or regions must certainly remain on top of the CIE's standardization policy.

This was the background to establish another cooperation, this time with a regional partner, the European standardization body CEN. With its policy to adopt ISO-Standards unchanged as regional standards the adoption of a CIE-ISO-Standard as a European Standard would be equivalent to the adoption of a CIE-Standard as a National Standard in 30 European countries - certainly a regional breakthrough for the CIE in its work to supply the world with the latest and up-to-date knowledge on light and lighting.

Besides, with 20 of those 30 countries being represented in the CIE through National Committees – 53% of all CIE NCs - such a regional breakthrough would certainly have a special value for the CIE community and could lead the way to similar adoptions in other regions of the world.

The first CIE-Standard to be adopted as a regional standard will most probably be CIE S 009 after IEC agreed to adopt CIE S 009 as IEC/CIE-double-logo-standard (IEC 62471/CIE S 009/E:2006). This has now been published as Draft European Standard prEN 62471:2006 and is on its way to (partially) supersede the previous European Standard EN 60825-1:1994 and to become a National Standard in 30 European countries.

Another project with such a regional adoption in mind was CIE S 015 on the lighting of exterior work places. It passed the voting within CIE and was put out to parallel voting in ISO as Final Draft International Standard FDIS ISO 8995-2/CIE S015 and in CEN as Draft European Standard prEN ISO 8995-2.

It passed on the European level but it failed in the ISO voting - only 7 (!) out of presently 104 ISO members voted on FDIS ISO 8995-2/CIE S015 and two of those gave a negative vote due to disagreement to certain technical details. Thus - with more than 25 % of the ISO-Members taking part in the voting disapproving - CIE S 015 was stopped from becoming an ISO-Standard.

The overwhelming majority of ISO-Members did not vote at all on this FDIS. How could this happen? It could hardly have been the subject; the lighting of outdoor workplaces is certainly of great importance and guidance on this matter definitely required. There must be another reason: to get an explanation it is necessary to take a deeper look into how the national participation in ISO is

organized: Each ISOMember body must indicate, with regard to each technical committee (TC), if it intends to participate actively in the work, with an obligation to vote on all questions formally submitted for voting (P-members) or to follow the work as an observer (O-members).

Usually ISO-members have defined national mirror-bodies to most or all TCs of ISO where they are P-members and it is up to these mirror-bodies to define the national standpoint whenever a vote on an ISO/CIE-FDIS is required. But – as far as light and lighting is concerned – there are no TCs in ISO, there are no P-members and there are no mirror bodies.

So whenever a vote on an ISO/CIE-FDIS is required the first reaction from an ISO-Member could be: There is no P-membership – so we don't take part in the voting. And even if well experienced people realize that this is a different kind of voting there are no established national mirror bodies and it becomes necessary to individually find the relevant national experts for advice.

Is this acceptable to the CIE and to all the experts that invested their work-time and travel-money? What can we do to have more success in the future, what must be changed?

- CIE-NCs should establish contacts to their national ISO and IEC-Members and should make themselves known as the national authority on light and lighting to be consulted whenever a voting on an ISO/CIE or IEC/CIE standard is going on.
- ISO and IEC should add to each voting-sheet concerning an ISO/CIE or IEC/CIE draft standard a covering letter explaining that the draft standard put out for voting has been worked out by the CIE and that there are CIENCs in 37 countries ready to give assistance in defining the national vote.
- CIE-NCs should regularly be updated about ISO/CIE or IEC/CIE standards put out for vote. - CIE-NCs should inform their national ISO- or IEC-Member about their position from the previous internal CIE-voting on ISO/CIE or IEC/CIE standards put out for vote to secure that both votes comply with each other.

All national ISO- and IEC-Members can easily be found on the ISO- and IEC-websites:

http://www.iso.org/iso/en/aboutiso/isomembers/MemberList.MemberSummary?MEMBERCODE=10

http://www.iec.ch/cgi-in/procgi.pl/www/iecwww.p?wwwlang=e&wwwprog=membrs3.p

Michael Seidl
Vice-President Standards
CIE

New CIE Supportive Members

We are pleased to announce that
Sensing Instruments Co. Ltd., China,
3M Deutschland GmbH, Germany
and
ICE, Instituto Costarricense de Electricidad, Costa Rica
joined CIE as Supportive Members.

Supportive members benefit from the right to use the CIE Supportive member logo on their letterhead and in their publications so as to show that they are fully up to date with the latest information on world wide lighting trends, research and standards, and, depending upon membership category, the internal or external exploitation right of CIE publications.

Supportive Members of the CIE also provide additional support that helps CIE to carry out its work.

Supportive Membership is open to companies and organisations working on an international or regional scale, having an interest in light and lighting and wishing to support the work of the CIE. Such organisations may include equipment manufacturing companies, commercial organisations, consultants and lighting designers, local government and government departments, educational organisations, etc.

The level of support is classified by the amount of annual membership fees and benefits received.

- Supportive Member : • 500
- Silver Supportive Member : • 3000
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More information on this membership scheme can be obtained from the CIE Central Bureau (ciecb@cie.co.at).

CIE PUBLICATIONS

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CIE 178:2007

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A separate directory includes the photos of the Session.

The Proceedings are readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this CD-ROM is EUR 90,— (Members of the national CIE organisations get 50% discount).

TECHNICAL PAPER

Design Parameters for Lighting Engineer Designing for Interior Space

Lou Bedocs

Introduction

Buildings are designed to accommodate many activities in different interior spaces. The successful interior space design requires that the designer takes into consideration all the requirements and constraints. Good lighting is an essential part of the interior space design and without this, human activity will be seriously impaired and valuable energy will be wasted. Good lighting ensures that people can see to carry out their various tasks safely, efficiently and in comfort. It is important to recognise that this lighting not only illuminates the tasks but can also contribute to the quality of the visual environment and the wellbeing of the occupants. In this section, the roles of the main lighting design parameters are discussed and some general guidance on requirements are given.

Lighting Objectives

Clear specification of the lighting objectives are essential to ensure that the right conditions are created for the occupants, the intended use of the space and image to be projected. The key lighting objectives are:

1, safety and health 2. performance 3. comfort and appearance

Safety and health

The interior lighting should enable the occupants to see well to work and move about in safety. The lighting

must not create conditions that harms people's health and wellbeing. It must avoid emitting harmful radiations, be free of flicker and must not dazzle.

Performance

There is wide variety of visual tasks that has to be performed efficiently in an interior space. To have the right lighting criteria and solution these tasks need to be analysed in terms of size, contrast, position, duration, colour, complexity and age of the observer. Help on this can be found in lighting standards such as the CIE S 008:2001 standard on "Lighting of Indoor Work Places".

Comfort and appearance

The way in which the space is illuminated will affect the environment and character of the space and appearance of objects within. This lighting sets the tone or mood of the space and gives it atmosphere, prestige and stimulation for the occupants. The balance between lighting for appearance and performance may change according to the purpose of the interior. In some interior spaces, such as public places, waiting rooms, shops and banks the appearance will be more important than performance. These lighting objectives are rather subjective and cannot be expressed in measurable terms, but must form part of the design objectives. This needs a holistic or integrated approach to lighting design.

Design considerations – a holistic approach to lighting design.

To create a good lighting solution needs integrated design considerations based on the holistic approach to lighting design. In this approach the entirety of the lighting objectives and the means to lighting solutions are considered as a whole. This means addressing all the lighting design parameters and balancing the requirements and constraints to yield the best possible solution. This can be made easier by considering the structured approach given by the Lighting Design Framework. The framework contains six main elements that influence lighting design, although a particular situation may require additional considerations. The individual elements may not carry equal weight, but they all need to be considered separately and combined with one other, for the best or most successful design solution. The framework can be used for daylight, electric light, or as is more usual, a combination of the two, to help develop a conceptual lighting design. The six elements are lighting, visual function, visual amenity, architectural integration, energy efficiency, installation maintenance and costs. Each element has several parameters that the designer must consider and these are detailed in this section.

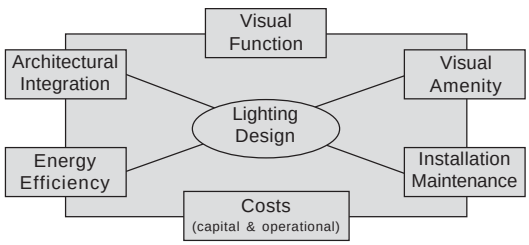


Figure 1. Lighting Design Framework

Lighting for Visual function - activity and task

The primary aim of the lighting installation is to provide sufficient and suitable light to illuminate the visual tasks and create a comfortable visual environment. In this, main parameters to consider are – task and surround area illuminance, uniformity, glare, modelling, colour and emergency lighting. The lighting criteria for design for most of these parameters can be found in the lighting application standards such as CIE S 008 and

CIE S 020 publications. An example of the schedule from CIE S 008 for office interiors is shown in table 1 below.

Table 1 *Example of Lighting requirements for Areas, Tasks and Activities*

Interior, activity	task area Em lux	surround area Em lux	UGRL	Ra	Remarks
Circulation area, corridors	100		28	40	at floor level
Stairs, escalators	150		25	40	
Cloakroom, toilets	200		25	80	
Cafeteria, canteen pantries	200		22	80	
Telex, post room, switchboard	500	300	19	80	
Reception desk	300	200	22	80	
Archives, store room	200		25	80	
Conference, meeting rooms	500	300	19	80	use lighting controls
Filing, copying, etc	300	200	19	80	
Writing, reading, word processing	500	300	19	80	DSE lighting solutions
CAD work stations	500	300	19	80	DSE lighting solutions
Technical drawing	750	500	19	80	

Note 1, In continuously occupied areas the background illuminance should be not less than 200 lux.

Note 2, The uniformity of illuminance of Task > 0.7 and immediate surround and background > 0.5

Illuminance

Illuminance is the amount of light falling on a surface and is measured in Lux.

The necessary illuminance for tasks, immediate surround area and background are given in the schedule of CIE S008:200; and for emergency lighting it is given in

CIE S 020:2007. The illuminance should be increased or decreased by one step if the task details (size and/or contrast) are unusually difficult or easy to see. Also if the most onerous visual tasks are to be carried out by the poor sighted or those aged over 50 years, the designer can justify increased illuminance. To avoid dynamic adaptation problems the immediate area (0.5 m wide band) surrounding the task area should be illuminated to two-thirds of the task illuminance. Where the interior space is continuously occupied, background or room illuminance of 200 lux should be provided. The illuminance may be provided by electric or daylight. But in most places used after dark the electric light alone should meet the criteria. The light levels are based on "Maintained illuminance" that is the average illuminance below which the value should not fall in the life of the installation. Maintained illuminance takes into account the depreciation of lamps and surfaces, the planned cleaning and service schedule in the life of the installation.

Illuminance uniformity

This is the ratio of the minimum to average illuminance over the relevant area. Some variation in illuminance is desirable to provide interest but should avoid excessive variations that can cause adaptation problems, poor shadows and loss of comfort. This ratio should be not less than 0.7 over the task area and not less than 0.5 over the surround areas.

Glare

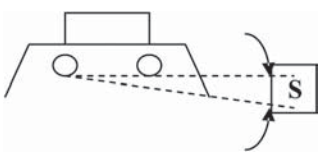
Excessively bright areas produced by the light source or reflections in the view, in an interior, can impair visual performance (disability glare) or over a period of time cause visual discomfort (discomfort glare).

Disability glare

Disability glare or dazzle by very a bright source such as the sun or bare lamp can cause instant impairment of vision. This can be minimised by shielding the light source from direct view. For interior lighting the recommended shielding angles (cut off) of lamps of different luminance are shown in table 2.

Table 2 *Minimum shielding angles at specified lamp luminances*

Lamp luminance (kcd x m²)	Minimum shielding angle S
20 to < 50	15°
50 to < 500	20°
〈 500	30°



Reflected glare

This we experience when bright sources are reflected by the task or surfaces in the field of view and stops us seeing the task or reduces the contrast by veil effect. Computer display screens are good examples of surfaces that are prone to produce reflected glare. Laws such as the Display Screen Equipment (DSE) Regulation puts a legal obligation on the lighting designer to control the luminance of the luminaire in the zone 65º to 90º below 1500 cd/m². Printed or pencil written text on glossy paper can suffer from veiling reflections that can severely reduce contrast rendition. Veiling reflection from the lighting can be minimised by providing more sideways lighting and using wide (batwing) distribution luminaires overhead.

Discomfort glare

Discomfort glare from luminaires in a lighting scheme can cause headaches, eyestrain and fatigue over a period of time. It can be minimised by reducing the luminance of the luminaires in the zone 60º to 90º and by increasing the background brightness. Discomfort glare is measured by the CIE UGR system and the limiting values range from 13 to 28 in steps of 3. Each type of interior or activity is assigned a limit that if not exceeded will yield a comfortable lighting installation. The limit, for example in sedentary work places like an office, is 19 but in other places, such as restaurants and shops, values of 22 to 25 are accepted. (See table 1) The UGR system makes use of pre-calculated tables of UGR values produced by the manufacturer of the luminaire. The data is based on a set of standard conditions that needs to be corrected for the actual installation parameters.

Modelling and Directional light

People and almost everything else in an interior are 3 dimensional and need to be illuminated all around. For good modelling there is a need for preferential light to come from one direction. This directional 'flow of light', as produced by daylight through side windows or asymmetric and batwing distributions of electric light, can create pleasant high lights and shadows to model objects, texture and people. The strong directional sidelight can provide high vertical illuminance relative to the background horizontal illuminance, can create dramatic shadows, high lights features on displays and reveal shape and form of objects and people.

Colour

Colour is our perception of light of different wavelengths. Our visual performance, satisfaction and comfort require the stimulus of colour rendering and appearance. Colour rendering and colour appearance are properties of the lamps and are important elements in lighting design.

Colour rendering

Colour can improve visual acuity and enhance the visual clarity of our perception of tasks and environment, and improve comfort. The light emitted by the lamp has

Continued on page 25

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Ulrich Mathis
Electronic control gear for Fluorescent lamps

Jas Clare

Closing Session

Invited Paper

Prof. Hao Luoxi
The Ecological Light Environment Design of West Lake Hangzhou City

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Sandipa Mukherji

Energy conservation strategies for lighting system in BSNL, Telecom Buildings.
V.P. Gupta

Simulation based analysis of daylight linked lighting control system.
Sujoy Pal, Biswanath Roy, Subhasis Neogi

Energy Effective Redesign of Lighting System at Fuel Handling Plant of a Thermal Power Generating Station
Susnata Bhowmick, Sandipa Mukherjee, Sukanta Bhowmik, Shyamal Mondal, Biswanath Roy

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Rajat S.Mandal, Asit Sur, Susanta Bhaumik, Saswati Mazumdar, Chetan Chetansankhla, Ajay Mittal

Power factor and harmonic analysis of self ballasted compact fluorescent lamps.
Saswati Mazumdar, Aniruddha Mukherjee, Rajat S Mandal, A K Sur

Easy-to-use road lighting design tools.
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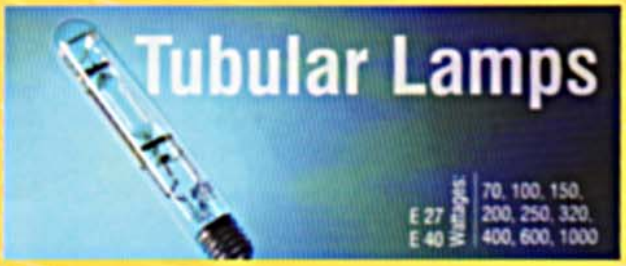

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Continued from page 14

to contain the required wavelength in the right proportionate amounts to render colours in tasks. The ability of the lamp to reveal colours is measured by colour rendition. The colour rendering performance of a light source is defined by the general CIE Colour Rendering Index (Ra) system. The best lamp (tungsten halogen) has Ra of 100. Most fluorescent lamps rated over Ra 60. But for good lighting of continuously (over 2 hours) used interior space, lamps with at least Ra 80 should be used. For detection of safety colours lamps with Ra > 40 should be used.

Colour appearance

Colour appearance refers to the apparent colour of the emitted light in terms of its warmth or coolness and is described by its Correlated Colour Temperature (CCT). In interior lighting the CCT values usually range between 3000K to 4000K. When electric lighting is used to complement daylight the use of lamps of 4000K are recommended. Lamps with good colour rendering are available in a number of different colour appearances.

Emergency lighting

Emergency escape lighting is required in buildings where people are on the premises during darkness. This light is provided, in the event the supply to the normal lighting has failed, to assist in the safe evacuation of the building. The system consists of illuminated direction and exit signs and illuminated escape route and areas. The lighting is provided on the floor typically in the range 0.5 lux to 1 lux. The luminous requirements are set out in CIE S 020: 2007 publication "Emergency lighting of work places".

Lighting for Visual amenity

In interiors it is not sufficient to provide good task lighting without considering the overall appearance of the space or "lighting aesthetics". People prefer an interior to be visually attractive and lighting can play a big part in this. An attractively lit interior will give people greater sense of wellbeing and they likely to perform better through greater visual satisfaction and stimulation. This approach may also contribute to a healthier environment, which could mean less absenteeism. Research studies show that people prefer a space to appear visually interesting and visually light particularly in the normal field of view that is defined as a horizontal band approximately 40º high and centred at normal eye height. See figure 2.

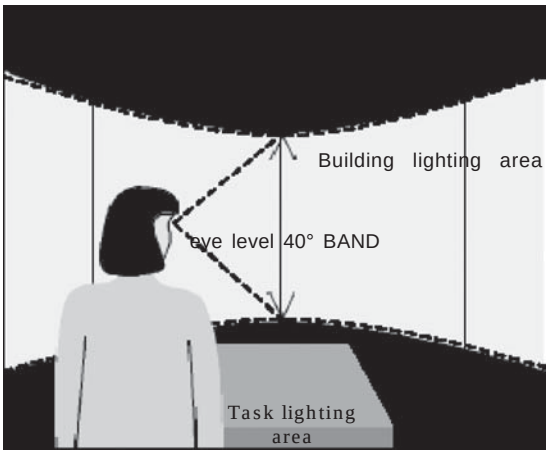

Figure 2. Normal field of view in indoors.

The lighting in the interior will therefore, need to be appropriate for the purpose of the application. In lighting for amenity, considerations should be given to provide visual interest, visual lightness, surface colours and reflectance, illuminance ratios and the elimination of flicker.

Visual interest

To create visual interest it is necessary for the light (luminance) pattern to have some variation. This is to create areas of light and shade that people find attractive and stimulating. A very uniform light pattern, like the light from overcast sky, is seen as dull and unappealing. However, too much illuminance diversity can be equally unacceptable or be even uncomfortable, particularly if the change in illuminance is rapid. Hard shadows should be avoided particularly in the work area. Introducing daylight can also provide natural dynamic changes in light levels and directions but of course, this can also be mimicked by controllable electric light.

Visual lightness

To create a feeling of visual lightness it will be necessary to direct light on to room surfaces particularly on those surfaces, that are prominent in the normal field of view. Often these will be the walls, but the ceiling may also be included, especially in large rooms. Where workstations are employed using vertical partitions, some light on the partitions will be beneficial. Without which the room can appear gloomy and under lit.

Room surface reflectance

Room surface reflectance is the ability of the surface to reflect light that falls on it. The colour appearance of a surface is a function of the surface itself and the type of light source. It is rare that a lighting designer is allowed to select the room surface finishes. But when the opportunity arises the designer should select the hue or colour, its light or darkness and chroma or saturation. Subdued colours are often chosen where restful or dignified atmosphere is required, whilst strong colours and high contrast are normally used to create lively and exciting effects. The recommended reflectance values are shown in table 3 together with the preferred range of illuminance ratios. These values not only provide for balanced appearance but also helps to generate inter reflected light making the scheme more energy efficient.

Table 3 *Range of useful surface reflectances and illuminance ratios*

Room surface	Reflectance range	Relative Illuminance
Ceiling	0.6 to 0.9	0.3 to 0.9
Walls	0.3 to 0.8	0.5 to 0.6
Work plane	0.2 to 0.6	1.0
Floor	0.1 to 0.5	—

Illuminance ratios

Illuminance ratio (or relative illuminance) is the relative distribution of light onto major surfaces. The combination of reflectance and illuminance on the surfaces provides the luminance pattern. Luminance is the measure of our perception of brightness of the lit surfaces. Luminance balance is highly desirable in interiors but this does not mean that it has to be uniform. In fact we need the opposite as lack of difference provides no visual relief and the room will appear monotonous and boring. Visual interest and lightness is created by illuminance variation. Such light patterns will produce areas of light and shade that people find attractive and stimulating. The differences should not exceed 5:1 as it may produce harsh shadows. The recommended illuminance ratios are given in table 3. They will produce acceptable conditions in most situations but one should understand the impact on the room appearance created by the relative brightness of the room surfaces. For example bright walls make a room appear large and spacious whilst dark walls make it appear small and cramped.

Flicker

Flicker is our awareness of any short duration variation in illuminance or luminance. Light source flicker, from discharge lamps operating on the normal 50Hz mains supply, can be annoying and uncomfortable to some office occupants and in extreme cases can cause headaches. This potential problem can be avoided by operating the lamps at high frequency, usually at around 30kHz.

Lighting and Architectural Integration

The most successful lighting installations are those where the lighting solutions, both daylight and electric light, form an integrated part of the overall design of the building. In terms of the electric lighting this means the appearance of the visible lighting equipment and the way they are installed into the building. It is important that the luminaires are not seen as an after thought by people, but form an integral part of the architecture. However, when choosing luminaires the lighting performance should not be compromised for the sake of their appearance, but the style needs to integrate with the interior architecture. Effective and efficient integration of the equipment into the building interior can best be achieved in close cooperation between the design team members. The issues to be considered are; shape and form of the building, colour and surface finish of the major surfaces, architectural style, hierarchy of spaces and areas, daylight entry, suspended ceiling, air conditioning, and other services. Ceiling recessed luminaires help to preserve a clear, uncluttered ceiling, whereas suspended luminaires can form a notional ceiling plane. Ceiling suspended luminaires can also provide direct light up and down and can be included in coffers, or barrel vaults or other architectural features. The lighting designer and architect will need to pay particular attention to the detailing of the fixing during installation. It is also important to note that some luminaires can handle the return air of the air-conditioning system and can be integrated into the suspended ceiling to form a return air plenum. Similarly the luminaires maybe integrated with surface mounted chilled beams where they not only handle the return air but may also provide up/down light output.

Lighting and Energy Efficiency

The effective use of energy is an important aspect of lighting design not only from consideration of the cost of energy used but also the impact it makes on the environment through conservation of fuel and reduction of emissions responsible for climate change. The Kyoto climate change agreement has introduced constraints and these are transposed into national laws. The regulations limit the use of inefficient products and encourage the use of controls. There is no excuse for waste of energy in lighting, particularly when energy savings give cost savings. However, energy considerations should not compromise the quantity and quality of the required lighting solutions. There are several decision points that the lighting designer should consider during the scheme design to reduce potential energy usage –

- Selection of the most efficient of the suitable light sources
- Selection of luminaires with high luminaire maintenance factor
- Selection of luminaire with high utilisation factor
- Selection of a lighting system that restricts high surround illuminance to task area
- Use of occupancy detectors to automatically switch off the lights in unoccupied spaces
- Use of controls to take advantage and use the available daylight
- Selection of service schedule that minimises energy consumption.
- Selection of maintenance link controls
- Selection of dimmable electronic ballasted circuits
- Selection of intelligent luminaires

Power Targets and Lighting Controls

Table 3 indicates the installed lighting power density requirements for task illuminances. The schemes to satisfy

these may be based on general or localised or local lighting solutions.

Table 3 *Lighting power target*

Lamp type	linear fluorescent	compact fluorescent	metal halide
Task illuminance	Initial power density W/m²		
300	7	8	11
500	11	14	18
750	17	21	27

Lighting Installation Maintenance

The illuminance of an interior lighting system reduces as soon as it is installed and switched on to operate. Typical illuminance variation with time and servicing is illustrated in figure 3. There are four parameters and reasons for this 1, reduction of lamp lumen output with burning hours, 2, failure of lamps with burning hours, 3, dirt on luminaire optics, 4, dirt on room surfaces. The parameters permit the designer to calculate the Maintenance Factor for the installation.

Maintenance Factor

Maintenance Factor (MF) is the ratio of the maintained illuminance to initial illuminance and is given by MF = LLMF x LSF x LMF x RSMF

Where,

LLMF is the Lamp Lumen Maintenance Factor, LSF is the Lamp Survival Factor, LMF is the Luminaire Maintenance Factor and RSMF is the Room Surface Maintenance Factor. Ideally the MF should be designed to be > 0.7.

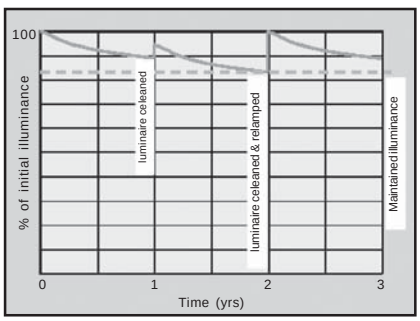

Figure 3. Typical illuminance variation with time and periodic servicing.

The lighting installations need to be kept in prime working conditions otherwise efficiency of both equipment and people will suffer and the quality of the lit environment will deteriorate rapidly. As part of the interior lighting design the designer has to prepare the maintenance schedule taking into consideration the characteristics of the chosen solutions in particular the lamp life and lumen depreciation, luminaire maintenance class, cleanliness of the environment, servicing intervals and access to the installation.

The act of servicing is by replacing failed lamps, rectifying equipment faults, and cleaning lamps, luminaires and room surfaces. Lamp replacement may be done by individual replacement of failed lamps (spot replacement) or in bulk at a suitable burning interval (group replacement). The choice largely depends on convenience and labour costs. The CIE 97.2 publication gives much advice and examples on maintenance matters.

Today consideration must also be given to the end of life disposal of the lamps and luminaires. There are Regulations in place that (WEEE and RoHS) require separate collection of end of life lamps and luminaires for recycling or for special treatment if they contain some hazardous substances.

Lighting Costs

The capital cost of a lighting installation needs to be balanced against the operational costs. If only capital costs are considered then what at first sight appears to be a low cost installation, may turn out to be expensive if the operating costs are excessive through high energy or maintenance costs. Therefore it is important to take a life cycle costing approach. It is particularly important if the people paying for the installation differ from those paying for the operational costs.

Capital costs

These include the installation design, the equipment – lamps, luminaires, controls, the wiring and installation of the equipment, any required builders work as well as testing and commissioning of the installation. It should be noted that a typical service life of a lighting installation is in excess of 20 years and can justify a payback period of up to 5 years. The payback period is the time when the combined capital and running costs of a lighting scheme is predicted to become less than an alternative scheme for the same installation. Figure 4 illustrates graphically

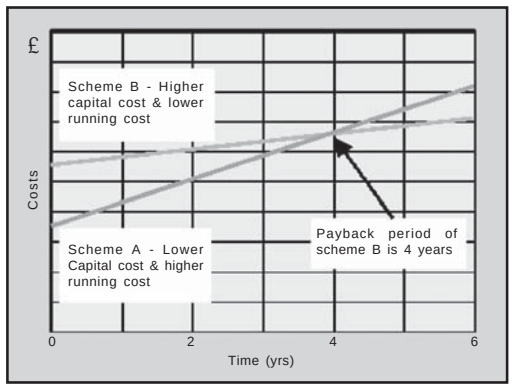

Figure 4 Payback period of lighting scheme

that scheme A has a lower capital cost than scheme B but the operational costs of scheme B are lower and will reach the payback point in four years.

Operational Costs

These include the cost of energy, maintenance, repair, replacement and disposal. It is important to recognise that the cost of an electric lighting installation is a small percentage of the total building costs. Typically as an example, office building, it can amount to about 4%. However, the electricity cost for lighting can be as much as 50% of the total cost of electricity.

In lighting economics the capital cost of the installation has to be balanced with the running or operational cost.

Future Considerations

Without question the most pressing issue for the world is harnessing sustainability. In this endeavour certainly many new factors and considerations will come into focus. The environmental challenges of crowded cities, expanding urban areas, depletion of raw materials, high toxic wastes, unwanted gas emission and excessive end of life waste are all making an impact on lighting practice. Also we have changing human factors impacting on work patterns and life styles such as the 24 hour society, increased leisure time, ageing population, increased variety of tasks and working hours, stricter health and safety rules and greater environmental awareness. These all need handling but may put pressure that could harm our lighting practice. A new approach is needed that can embrace all the drivers, yield good quality lighting and contribute to a safe and sustainable environment. The PEC, that is Performance, Efficiency and Comfort, a new design philosophy brings all these together. By using PEC, this dynamic design tool in which Performance is to achieve visual satisfaction and meet targets, Efficiency is to ensure energy efficiency, minimise harmful emissions, create sustainable and practical solutions and Comfort is to fulfil the human desires of aesthetics, ergonomics, satisfaction and stimulation, quality lighting can be provided. In PEC the already established quantitative and qualitative criteria are harnessed whilst embracing the green issues with human factors. This new concept is gaining the designer's interest.

Lou Bedocs
C ENG MIET FCIBSE FSLL
Lighting Applications Director, Thorn Lighting, UK

OTHER NEWS

Lighting Research Academy Inaugurated at MIT Pune

On August 9, the Lighting Research Academy was inaugurated at MIT in Pune. The Institute is offering a post graduate programme in Lighting Technology Management.

The Chief Guest was Mr. Manoj Verma, Vice President, Crompton Greaves and President, ELCOMA.

Training Programme
December 10-14, 2007, Pune

The MIT Lighting Research Academy in association with MIT College of Engineering organised a five day training programme on Light Sources - Control and Applications. The Programme was approved by the Indian Society for Technical Education (ISTE), sponsored by the All India Council for Technical Education (AICTE) and supported by ISLE.

The programme covered the following subjects: Measurement of Light, Vision and Colour, Lamps and Luminaires, Lighting Controls and Ballasts, Biological Effects of Light and Solid State Lighting. The programme attracted 70 participants from different parts of the country comprising professionals, academicians, faculty members and students.

Dr. Avinash Kulkarni, President ISLE complimented MIT for this initiative that was coordinated by Mr. Prakash Barjatia, Director MIT LRA and Chairman ISLE Mumbai State Centre.

FORTHCOMING EVENTS

National Workshop On Street Lighting
June 2008

During their presentations at the International Conference on City Beautification through Lighting at Pune in February this year, Dr.Warren Julian and Mr.Wilson Reg spoke about the poor quality of Street Lighting in the major cities of India. To address the issue, ISLE has decided to conduct a series of Workshops throughout the country.

To start with, the subject event is planned at Pune in the last week of June,2008. All those are interested in the event may please contact:

Dr.Prakash Barjatia
Mobile - 09370144389 E-mail : jainpcb@hotmail.com

CGIV 2008 The 4th European Conference on Color in Graphics, Imaging and Vision
June 9-13, 2008, Terrasa, Barcelona, Spain

CGIV2008 will cover a wide range of topics related to colour and visual information, while MCS

(www.multispectral.org) will review the current state of the art and address major challenges and future directions in multispectral colour science. The singletrack structure of the conference will encompass technical areas that strike a balance between academia and industry. CGIV2008 builds on the success of three previous conferences; MCS has been organized since 1999, mainly incorporated into larger international conferences, to their mutual benefit, as in CGIV2004/MCS'04.

The conferences will provide an excellent forum for research scientists and engineers from all over the world to discuss new ideas, present results, exchange research, and establish possible future collaborations in a forum emphasizing high-quality content and presentations. Newcomers will discover the scope of exciting colour related research areas and be able to discuss ideas with world renowned experts.

We are currently soliciting high-quality submissions from researchers working in a broad range of colour related fields from industry, academia, and national and international standards communities.

Conference topics include

- Colour Science;
- Computational Colour;
- Colour in Computer Graphics;
- Colour Reproduction;
- Colour Vision/Psychophysics;
- Colour Image Quality;
- Colour Image Processing;
- Multispectral Colour Science.

CGIV2008 will include oral paper presentations, poster sessions, exciting tutorials, and an industry exhibit. As in years past, submissions will be subject to a rigorous peer review. Technical Chairs for each specific area will lead a group of technical experts who will conduct the reviewing.

The conference committee also welcomes suggestions for tutorial presentations.

For further information, please contact:
Changjun Li
c.li@leeds.ac.uk or
Francisco Martinez Verdu
verdu@ua.es

National Seminar on Automotive Lighting

July 2008

A 2-Day Seminar is scheduled to be held at the Central Institute of Road Transport (CIRT) Bhosari, Pune in the last week of July, 2008. It will be arranged by Pune Local Centre of Indian Society of Lighting Engineers (ISLE). Co-organisers of the event are Central Institute of Road Transport, Pune ; MIT Lighting Research Academy, Pune and TUV Rheinland (India) Pvt.Ltd., Pune.

Papers are invited on the following topics -

1. Fundamentals of Light
2. Design of Automotive Lighting Devices
3. Design of Signaling Devices
4. CMVR & Automotive Lighting
5. Testing & Evaluation
6. Homologation
7. Equipments for Testing & Calibration
8. Future Trends in Automotive Lighting

For detailed information contact:
Dr.Prakash Barjatia
Mobile - 09370144389 E-mail:jainpcb@hotmail.com

International Symposium on Road Surface Photometric Characteristics: Measurements Systems and Results

July 9 to 10, 2008, Torino, Italy

This symposium is being organised by the CIE Division 4 "Lighting and Signalling for Transport" in collaboration with INRIM (Istituto Nazionale di Ricerca Metrologica) and CERTU (Centre d'études sur les réseaux, les transports, l'urbanisme et les constructions publiques).

The symposium will be a great opportunity to discuss the importance of road surface photometric characteristics in nowadays lighting engineering and to evaluate the state of the art and future trends of instrumentation for its characterisation.

Everyone interested on road surface characteristics or characterization should attend the meeting: lighting engineers and designers, researchers on materials characterisation, road and lighting plant managers, road authorities, ...

The need to increase the photometric performances of road lighting systems considering environmental and energetic aspects has become a matter of primary importance in many countries: road lighting represents a large amount of the electricity consumption of a country.

Moreover, the importance of considering correct photometric data, of luminaires as well as of road surfaces, has also become an international focus.

To save energy while visual performances increase requires a detailed physical modelling of the lighted environment and of the human vision properties: in this

process the photometric characteristics of the road surface play a key role.

The main goals workshop are:

- to provide a detailed and update description of the existing measurement systems and their acquisition methodologies
- to face the new research on measurement methodologies and systems
- to discuss about relevant measurement problems
- to give to researchers and lighting engineers the possibility to compare different technical solutions both for in situ and in laboratory characterisations
- to gather the recent data of current materials and evaluate their impact on the road lighting performances
- to help lighting designers on the evaluation of road surface characteristics and on their importance in the plant design

The outcome of the workshop could be utilized for future works in Division 4, especially, for CIE reportships R4-30 "Measuring systems for in-situ road characteristics" and R4-32 "Reflection properties of road surfaces"

For further information see:

http://www.inrim.it/CIE2008road

Light and Music

August 18-23, 2008, Stavanger, Sweden

The "Light and Music" workshop and conference is a Stavanger 2008 project, organised by Stavanger Concert Hall and PLDA, in cooperation with The Stavanger University and Lyskultur. It provides an opportunity to work with the world's leading lighting designers in Stavanger, European Capital of Culture 2008.

Workshop and Conference with the world's leading lighting designers in The Workshop is intended for students and trade people that work with or are associated with lighting and lighting design. Each of the designers has selected a location in Stavanger in advance and has accepted the assignment to create exciting lighting with the help of the participants. The assignment will be full of creative challenges and developing work. Besides the competence improving part, the workshop is also a significant international meeting place for lighting designers, students, and trade people. The results are marketed and exhibited to trade representatives, the general public and the media.

For further information contact:

lritter@via-internet.com
www.lightandmusic.com

Solaris 2008 4th International Conference on Solar Radiation and Daylighting.

December 4-5, 2008, Hong kong

The Registration fee is USD$160 including conference dinner, technical visit and proceedings. Updated information available on the website.

For further information:

http://bccw.cityu.edu.hk/solaris2008_testing
Solaris.2008@cityu.edu.hk

Lux Pacifica 2009

April 23-25, 2009, Khabarovsk, Russia

Light without borders!

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 we invite different countries to participate in it.

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

Location

Khabarovsk is one of the largest cities of Russian Far East. In 2008 Khabarovsk will celebrate its 150-year anniversary.

Subjects of the Conference:

- Fundamental of lighting and daylighting
- Vision and colour
- Energy Efficiency
- Outdoor and Indoor Lighting

- Light and Health
- Light and Architecture,
- Lighting Design
- Lighting Fixtures Sources of Light and Control Systems
- LEDs and their application
- Irradiation Systems
- Light Measurements
- Standards of Lighting
- Optical devices, sensors and displays
- Radiometric or optical properties of materials

Abstracts

Prospective contributors are invited to submit abstracts. The short abstract should be submitted as Word doc file 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 by e-mail: luxpacifica2009@yandex.ru.

The dead line of abstracts submission is the 1st of September 2008. Authors will be informed on the decision of the Board of LUX PACIFICA by November 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

WEBWATCH

Human Perception Studied to Double LED Brightness

A research group at Ehime University developed a pulse drive control method to make LEDs look twice as bright by leveraging the properties of how people perceive brightness.

When a short-cycle pulse voltage with a frequency of approximately 60Hz is applied to an LED at a duty ratio of about 5%, the LED looks about twice brighter to human eyes than that driven by a direct voltage, the research group said.

Based on an evaluation test using subjects, the group reported that a blue LED looks 1.5-1.9 times brighter while green and red LEDs look 2.0-2.2 and 1.0-1.3 times brighter, respectively.

With this method, the brightness of LED with a luminance efficiency of 100lm/W can be simulated by using a 50lm/W LED,

There are two principles, the Broca-Sulzer effect and the Talbot-Plateau effect, involved in how human eyes perceive brightness. The Broca-Sulzer effect refers to a phenomenon in which light looks several times brighter to the eye than it actually is when exposed to a spark of light, such as a camera flash.

In addition, the Talbot-Plateau effect is a principle where human eyes repeatedly see flashes and sense the average brightness of the repeated lights. Thus far, it has been believed that, due to the Talbot-Plateau effect, the brightness perceived by human eyes would not change even if an LED is pulse driven.

The Talbot-Plateau effect is a principle found in the days when fluorescent mercury lamps and other light sources driven by a power supply with a longer voltage cycle of about several hundred milliseconds were used.

Thus, the group decided to drive the LEDs using a power supply with a shorter voltage cycle of about several hundred microseconds. As a result, the group discovered that, when a pulse voltage with a frequency of approximately 60Hz is applied at a duty ratio of about 5%, the impact by the Broca-Sulzer effect becomes greater than that of the Talbot-Plateau effect so that the light emitted from the LED looks brighter to human eyes.

Link:

http://techon.nikkeibp.co.jp/english/NEWS_EN/20080407/150114/
http://www.jst.go.jp/EN/

2008 DOE SSL R&D Workshop Report Posted

The U.S. Department of Energy has published the summary report from the 2008 DOE Solid-State Lighting (SSL) R&D Workshop, held January 29-31 in Atlanta, Georgia. A PDF copy of the report may be downloaded from the DOE SSL website at:

Link

http://www.netl.doe.gov/ssl.
http://www.netl.doe.gov/ssl/PDFs/workshop_report08.pdf

NEMA Paper Addresses Failure Modes for Self-Ballasted CFLs

The National Electrical Manufacturers Association (NEMA) has published a white paper addressing concerns that self-ballasted compact fluorescent lamps (SBCFLs) may present a possible safety hazard when they reach their “end of useful life.”

The paper is entitled "LSD 40-2008 Failure Modes for Self-Ballasted Compact Fluorescent Lamps - A NEMA Update," and it was prepared by the NEMA Lighting Systems Division.

NEMA estimates that in 2006 more than 180 million SBCFLs were sold in the U.S., many of them to residential consumers. The vast majority of compact fluorescent lamps pose no safety concerns even though third-party safety agencies, such as UL, CSA, and ESA, have reported complaints from consumers regarding failure modes of SBCFLs.

According to Pamela Horner, NEMA Lamp Section chair, LSD 40 addresses these concerns and explains in simplified terms why SBCFLs have different failure modes from normal incandescent lamps; how existing product standards meet safety requirements; and what the industry, standards development organizations, and third-party safety agencies have done and are doing to minimize any potential safety risk from SBCFLs.

"SBCFLs are quickly being adopted by homeowners since they only require one fourth to one third of the operating power consumed by a standard incandescent lamp, last six to ten times as long under typical conditions, and significantly reduce greenhouse gas emissions produced by utility power plants," Horner said, in a statement released by NEMA.

The intrinsic benefits of replacing an incandescent lamp with a SBCFL are significant for the home owner, the utility, the national and local energy supply, and the environment. Remember that in the early days of incandescent lighting, consumers also had to become accustomed to the different characteristics presented by a new source of illumination in contrast to candles, oil lamps, and gas mantels."

"LSD 40-2008 Failure Modes for Self-Ballasted Compact Fluorescent Lamps - A NEMA Update" may be downloaded at no charge by visiting NEMA's website.

Link:

http://www.nema.org/stds/LSD40.cfm

IALD Weighs In on 'Banning the Incandescent Bulb'

We've heard from many interest groups on "banning the bulb." The latest one to register its sentiments is the International Association of Lighting Designers (IALD), which recently released a position statement on the subject.

Here's how this organization views the challenge ahead:

From Australia to California and across Europe, there are proposals to ban the incandescent lamp. Recently enacted energy legislation in the United States will phase out certain types of incandescent lamps.

While the IALD strongly supports the development and use of technologies, methods and appropriate regulation to minimize the energy use of lighting systems, we believe that "incandescent bans" must be carefully conceived or they are likely to be ineffective.

Where established and enforced, existing energy codes have already effectively banned inefficient incandescent lamps from new commercial installations.

- There is presently no lighting technology that can replace certain types and uses of incandescent lamps. There are still drawbacks such as poor color, bad dimming performance, and high cost, that make replacement technologies ineffective replacements for incandescent in some applications.
  A grace period is needed to allow the development of light sources that can replace incandescent in all applications.
- Energy-efficient replacement light sources must be adapted to suit the existing electrical infrastructure. Those with simple and clear-cut applications must be made available as soon as proven, but there will be cases in which an efficient source is not ready for a particular use.
  When products cannot achieve appropriate goals, continuance of incandescent technology specific to those situations should be permitted.
- The complete environmental impact and life-cycle carbon footprint of each replacement technology must be understood.
  Incandescent lamps should not be banned until their replacements are proven to be an overall environmental improvement.
- Replacement lamps must be cost-effective. Because replacement light sources are often more expensive than incandescent sources, conversion cost is a concern. Subsidies may be needed to help low-income consumers.
- Phasing-out of inefficient light sources is one step in reducing lighting energy use. The most efficient electric light source is the one that is turned off.
  Effective use of daylight and aggressive use of lighting control technologies will be needed to significantly reduce lighting energy use.
- The IALD supports all efforts to reduce electric lighting's negative environmental impacts through careful design, daylighting integration, lighting controls and more efficient sources.

We urge consideration of the full ramifications of proposed regulations, and possibly the continued use of

some unique types of incandescent lamps until truly better alternatives are available.

Through our design choices and expertise, IALD Lighting Designers have an opportunity and an obligation to make a great contribution to energy use reduction and global CO2 goals.

We are fully prepared to offer our technical and design expertise to help reduce the negative environmental impact of lighting while producing quality lighting solutions for effective working and living.

Link :

http://www.iald.org/media/index.asp

LRC Evaluates Integrated Classroom Lighting System

The Lighting Research Center (LRC) at Rensselaer Polytechnic Institute has released a new publication detailing a new, systems-based approach to lighting school classrooms that improves the lighting while saving energy.

Field Test DELTA Snapshots: Classroom Lighting summarizes the LRC's findings from its evaluation of a demonstration project conducted by Finelite, Inc., which installed its Integrated Classroom Lighting System (ICLS) in 28 classrooms at seven different schools (K-12 and university level) in New York State.

The New York State Energy Research and Development Authority (NYSERDA) sponsored the project. The LRC assessed how teachers used the lighting system to benefit the learning environment.

LRC researchers interviewed teachers, distributed student preference surveys, and analyzed the results of electronic data loggers connected to the system in order to map usage patterns and energy use. Teachers agreed that they preferred the ICLS over existing lighting systems.

On the energy side of the equation, the new system delivered significant energy savings compared to current national codes. The results demonstrated that the system is effective at saving energy while increasing teacher and student acceptance of the new lighting system.

Study Findings

- Teachers rated the ICLS favorably, particularly at the K-12 level.
- Electricians characterized ICLS as "easy to install."
- The ICLS reduced energy consumption reduced by 52% from current national energy code levels and 58% from New York State energy standards for schools.

DELTA Publication

The LRC publication, Field Test DELTA: Classroom Lighting is available at no charge online :

http://www.lrc.rpi.edu/programs/delta/publications/publicationsDetails.asp?id=918&cat=17

Advanced Energy Design Guides: Now Free Downloads

Lighting professionals can now download three Advanced Energy Design Guides, at no cost, from the IESNA website.

These in-depth guides cover:

- Small Retail Buildings
- Small Office Buildings
- K-12 School Buildings

The Advanced Energy Design Guide series provides a sensible approach to easily achieve advanced levels of energy savings without having to resort to detailed calculations or analysis.

The four-color guides offer contractors and designers the tools needed for achieving a 30% energy savings compared to buildings that meet the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1-1999.

Recommendations are offered for practical products and off-the-shelf technology.

The energy savings target of 30% is the first step in the process toward achieving a net-zero energy building, which is defined as a building that, on an annual basis, draws from outside resources equal or less energy than it provides using on-site renewable energy sources.

In an effort to promote building energy efficiency, ASHRAE and its partners have made these guides available for download (PDF) at no charge.

Link :

http://www.iesna.org/bookstore/AEDG.cfm

Forbes Calls It: 'LED Illumination Revolution'

The surge of interest in LEDs caught the interest of Forbes.com, which recently ran an article entitled, The LED Illumination Revolution.

"Though the word 'revolution' has been devalued by overuse, the LED is only the third revolution in illumination technology since the dawn of fire," writes Mark P. Mills.

A physicist, Mills is a co-founding partner of Digital Power Capital, an energy tech venture fund.

His analysis of the revolution, its players, trends and prospects, can be read here.

Link :

http://www.forbes.com/finance/2008/02/27/incandescent-led-cfl-pf-guru_in_mm_0227energy_inl.html

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RPI Student Develops First 'Polarized LED'

A Rensselaer Polytechnic Institute (RPI) student has developed a new type of LED that could allow for its widespread use as light sources for liquid crystal displays (LCDs) on everything from televisions and computers to cell phones and cameras. It also has potential for street lights.

Martin Schubert, a doctoral student in electrical, computer, and systems engineering, has developed the first polarized LED, an innovation that could vastly improve LCD screens, conserve energy, and usher in the next generation of ultra-efficient LEDs, according to RPI.

This new light-emitting diode advances current LED technology in its ability to better control the direction and polarization of the light being emitted.

With better control over the light, more light reaches its desired location because less energy is wasted producing scattered light. This makes the polarized LED perfectly suited as a backlighting unit for any kind of LCD, according to Schubert.

Its focused light will produce images on the display that are more colorful, vibrant, and lifelike, with no motion artifacts.

The invention could advance the effort to combine the power and environmental soundness of LEDs with the beauty and clarity of LCDs.

His innovation also could be used for street lighting, high-contrast imaging, sensing, and free-space optics, he said.

http://www.lrc.rpi.edu/resources/newsroom/index.asp
http://www.lrc.rpi.edu/researchAreas/leds.asp

New SSL Technology Fact Sheets Tout Advantages of LEDs

Looking for a way to educate clients, or yourself, about the benefit of LEDs? The U.S. Department of Energy (DOE) recently released two new technology fact sheets on solid-state lighting (SSL) topics.

"Using LEDs to Their Best Advantage" explores some of the unique attributes of LEDs, and looks at applications where these attributes offer distinct advantages. Among the qualities listed in the fact sheet are these:

- Directional light emission - Directing light where it is needed
- Size advantage - Can be very compact and low profile
- Breakage resistance - No breakable glass or filaments
- Cold temperature operation - Performance improves in the cold
- Instant on - Requires no "warm-up" time
- Rapid cycling capability - Lifetime not affected by frequent switching
- Controllability - Compatible with electronic controls to change light levels and color characteristics
- No infrared or ultraviolet emissions - LEDs intended for lighting do not emit IF or UV radiation

To learn more, read the entire document here.

http://www.netl.doe.gov/ssl/PDFs/LEDAdvantage.pdf

"Dimming LEDs," another fact sheet, gives an overview of dimming technology and examines the prospects for dimming LEDs in residential applications. It can be downloaded here.

http://www.netl.doe.gov/ssl/PDFs/DimmingLEDs.pdf

The DOE SSL technology fact sheet series provides current information on important technical issues and topics of interest related to solid-state lighting. Recently updated fact sheets include "Energy Efficiency of White LEDs" and "Luminaire Efficacy."

For more information, or to download these and other DOE SSL technology fact sheets, check out the publications page.

http://www.netl.doe.gov/ssl/publications/publications-factsheets.htm

New Publication Provides Energy Efficiency Guidance for Schools

A full 16 percent of schools districts' controllable costs is spent on energy.

A new publication written specifically for K-12 school buildings will aid design teams in constructing energy-smart schools using off-the-shelf technology that can cut energy use 30 percent or more annually.

The Advanced Energy Design Guide for K-12 School Buildings, published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, instructs architects, engineers and others on building design teams how to use best design practices to create energy-saving buildings.

Written in partnership with the American Institute of Architects, the Illuminating Engineering Society of North America, the U.S. Green Building Council and the U.S. Department of Energy, the book is available for free in electronic form at www.ashrae.org/freeaedg

The cost of the print version of Advanced Energy Design Guide for K-12 School Buildings, is $59 ($47 members).

To download the free electronic version, please visit

www.ashrae.org/freeaed

Cooper Lighting Announces 2008 Class Schedule For The Source

The Source, the industry's leading lighting education facility, has released the 2008 calendar of classes for the lighting and design community. Located at Cooper Lighting's headquarters in Peachtree City, Georgia, the 35,000 sq. ft. state-of-the-art facility is considered to be one the lighting industry's most complete, offering a wide variety of seminars designed to broaden the understanding of lighting and its applications. The Source has been servicing the lighting industry for over sixteen years and to date, 93,000 lighting and interior designers, architects, utilities, facility managers, retail planners, electrical contractors, energy saving companies, engineers, distributors, builders, landscape architects, university students and end-users have benefited from The Source experience.

Members of many professional organizations are required to earn some form of continuing education units or credits to demonstrate currency of knowledge and skills and to maintain their professional standing. The Source supports this nationally recognized measurement of accomplishment by providing seminars and workshops, which are pre-certified educational opportunities to obtain such recognition.

For currently scheduled seminars and workshops, visit the Cooper Lighting website :

http://www.cooperlighting.com/content/source/source_overview.cfm

Cree, Inc. recently announced the results of an independent survey on the adoption, deployment and benefits of LED lighting.

The survey, taken at the recent 2007 Hong Kong International Lighting Fair, validates strong global growth for LED lighting applications, confirms awareness of the energy-efficiency benefits of LEDs and indicates that the adoption trend should continue through the end of the decade.

Key survey findings include:(

- Nearly three-quarters (72 percent) of respondents have witnessed a growth rate in excess of 20 percent for LED lighting applications in their businesses over the past six months.
- Almost two-thirds of respondents (63 percent) believe LED lighting will comprise more than 50 percent of their sales or installations by 2009.
- Future growth in the LED lighting market is expected to come from a mix of applications - with street/parking (20 percent), residential indoor (17 percent), retail/display (17 percent) and office (15 percent) cited as the leading opportunities.

Survey respondents represent top decision-makers at lighting manufacturers who attended the 2007 Hong Kong International Lighting Fair -the largest lighting show in Asia and the second largest in the world.

Nearly half the respondents to this survey were from outside of Asia, reflecting the surveys global reach.

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

Members admitted on 9th January, 2008

M. No.	Name & Addresses	Grade	Centre
S.0298	Md. Sohrab Ansari C/o R.B. Nagarkatte House No. 2/94, Shivgorakhshya Society Rambagh Colony Paud Road, Kothrud Pune	Student	Mumbai
S.0299	Mr.Shraddha Jhariya Near Cumines College Lane No.4, Karvenagar Pune	Student	Mumbai
S.0300	Mr.Swapnil Ashok Meshram Military Boy's Hostel Near Nai Savrakshan Dal, Pravati Pune 411 009	Student	Mumbai
S.0301	Mr. Soni Jain 703, B-6 Atul Nagar, Warje Pune 411 052	Student	Mumbai
S.0302	Mr. Rahul Nigam Suvarna Apartment D Block Flat No.303, Bavdhan Pune	Student	Mumbai
S.0303	Mr. Prakash Haidasji Nakhale MIT - SOT Kothrud Pune 411 038	Student	Mumbai
S.0304	Mr. Varsha Yadav MIT - SOT Kothrud Pune 411 038	Student	Mumbai
S.0305	Mr. Ruchi Chandrakar MIT -SOT Kothrud Pune 411 038	Student	Mumbai
S.0306	Mr. Siddhartha Mitra 4567 B5/6 Vasant Kunj New Delhi	Student	Mumbai

Members admitted on 24th February, 2008

	Name & Addresses	Grade	Centre
I-0130	M/s. VLM India Pvt. Ltd. B-215 & 216, Somdatt Chamber-1,5 Bhikaji Cama Place New Delhi 110 017	Institutional	Delhi
IM-0130	Mr. Rohit Kapoor M/s. VLM India Pvt. Ltd. B-215 & 216, Somdatt Chamber-1,5 Bhikaji Cama Place New Delhi 110 017	Institutional Representative	Delhi
F-0608	Mr. Rajgopal Kannan No. C.11 Shanti Apartments Old No. 23, New No. 36 Mahalashmi Street, T. Nagar Chennai 600 017	Fellow	Chennai
F-0609	Mr. Livinder Singh Decon Lighting Pvt. Ltd. 5 - Lok Nayak Bhawan Khan Market New Delhi 110 003	Fellow	Delhi
F-0610	Mr. Biswajit Chatterjee C-14 AAI (IAD) Residential Colony NSCBI Airport Kolkata 700 052	Fellow	Kolkata
F(L)-0611	Mr. Debrata Chaudhuri Studio Printart Gopalpur House R. Gopalpur Kolkata 700 136	Fellow	Kolkata
F(L)-0612	Mr. Mohan Kumar Datta F 35/3 Karunamoyee Estate Salt Lake Kolkata 700 091	Fellow	Kolkata
M(L)-1349	Mr. Kishore Chandra Mahapatra 233/3, A.J.C.Bose Road Opp:Gorky Sadan Kolkata 700 020.	Member	Kolkata
M(L)-1350	Mr. Krishan Kumar Jhunjhunwala Jhunkam Lighting Systems Pvt. Ltd. Virwani Industrial Estate Off. Western Express Highway Goregaon (East) Mumbai 400 063	Member	Mumbai
M(L)-1351	Mr. Rahul Jhunjhunwala A/404, Mansarovar Suchidham Film City Road, Malad (E) Mumbai 400 097	Member	Mumbai
M-1352	Mr. Dinesh Sharma VLM India B 215, 216 Somdatt Chamber-1, 5 Bhikaji Cama Place New Delhi 110 066	Member	Delhi
M-1353	Mr. Sharath Alva Underwriters Laboratories (India) Pvt. Ltd. 1st Floor, Titanium, #135 Airport Road Kodihalli Bangalore 560 017	Member	Karnataka
M(L)-1354	Mr. Saket Ravindra Yeolekar 'Radhey' 23 Varshanand Society Anand Nagar, Hingne (Kd) Sinhagad Road Pune 411 051	Member	Mumbai
M(L)-1355	Mr. Mandar Dnyaneshwar Bankhele Flat No.6 Charudatta Chambers Sarang Society, Sahakar Nagar Pune 411 009	Member	Mumbai
A(L)-936	Mr. S.K. Barkatul Islam 3-Sunyat Sen Street, First Floor P.O. Bowbazar Kolkata 700 012	Associate	Kolkata
A(L)-937	Mr. Satyajit Bose Control Switchgear Contractors Ltd. Development House, 4th floor 24 Park Street Kolkata 700 016	Associate	Kolkata
A(L)-938	Mr.Sunil Bansal Utkarsh Tubes & Pipes Ltd. 23A N.S. Road Flat 6C Belmont Appt. Kolkata 700 027	Associate	Kolkata
A(L)-939	Mr.Aditya Vikram Mohanka Techno Electric Corporation 36 Ezra Street Kolkata 700 001	Associate	Kolkata
A(L)-940	Mrs. Ellora Chatterjee Aarshi 233/3 A.J.C. Bose Road Kolkata 700 020	Associate	Kolkata

Members Admitted on 24.3.08

F(L)-0613	Mr. Satinder Jeet Singh Superintending Engineer 11th Elect./Mech. Circle PWD 48 Shastri Nagar Dehra Dun	Fellow	Delhi
F-0614	Mr. T.M. Ilamathi No. C.11 Shanti Apartments Old No. 23, New No. 36 Mahalashmi Street, T. Nagar Chennai 600 017	Fellow	Chennai

M-1356	Mr. Pandari Chandrasekar Techniq Design Group 5-3-419 1st Floor Secunderabad (AP) 500 003	Member	Chennai
M(L)-1357	Mr. Vibhavari Kumar #348 Amar Jyoti Layout Domlur Bangalore 560 071	Member	Karnataka
M-1358	Mr. Ritesh Shah Red Lightings 14 Rizvi Chambers, Ground Floor Hill Road, Bandra (West) Mumbai 400 050	Member	Mumbai
A(L)-941	Mr. Nitika Kapoor CES India Pvt. Ltd. 57 Manjusha Nehru Place New Delhi 110 019	Associate	Delhi
A-0942	Mr. Puneet Agarwal Shri Ganga Traders 12 1st Floor Shakumbhari Complex `Durga Kund Road Varanasi (UP)	Associate	Delhi
M(L)-1359	Mr. Sandeep Sareen Sunny Electricals 79-80, Canal Colony Feroz Gandhi Market Extn. Ludhiana	Member	Delhi
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S-0308	Mr. Tanmoy Nag Sabuj Sarani, P.O. Nabapally P.S. Barasat 24 Parganas (N) West Bengal 700 126	Student	Calcutta
S-0309	Mr. Avijit Dey Chanmaridanga Abinahs Sarani P.O. + Distt. Bankura West Bengal 722 101	Student	Calcutta
S-0310	Mr. Subhamoy Saha 10/76A Bijoygarh P.O. Regent Estate Kolkata 700 092	Student	Calcutta
S-0311	Mr. Arijit Mondal c/o G. B. Mondal Kabirajpara P.O. Bishnupur, Distt. Bankura West Bengal 722 122	Student	Calcutta
S-0312	Mr. Amit Kumar Das Music Centre Kola, Kolaghat Purba Midnapur West Bengal 721 134	Student	Calcutta
S-0313	Ms. Sujata Ghorai Vill. & P.O. Mahammadpur P.S. Bhagwanpur, Distt. Purba Medinipur West Bengal	Student	Calcutta
S-0314	Mr. Dipayan Nath P-8 Prince Golam Md. Shah Road Golf Gardens Flat No.202 Kolkat 700 095	Student	Calcutta
S-0315	Mr. Sirshendu Pal c/o Dilip Kumar pal Govt. Qtr. No. 5, Block A, Type V Police Lines Asansol 713 304	Student	Calcutta
S-0316	Mr. Animesh Bhattacharya Purba Ukil Para (Near Sonali Sangha) P.O. Baruipur, Distt. 24 Parganas(S) West Bengal 700 144	Student	Calcutta
S-0317	Ms Ritu Rani Maity c/o Basanta Kr. De F/11 Saratpally, P.O. Midnapur Distt. West Midnapur West Bengal 721 101	Student	Calcutta
S-0318	Mr. Chirantan Kumar 130/2 Shibnarayan Road P.O. Uttarpara, Distt. Hooghly West Bengal 712 258	Student	Calcutta
S-0319	Mr. Pritam Mukherjee 141/A Netaji Subhas Road P.O. Uttarpara, Distt. Hooghly West Bengal 712 258	Student	Calcutta
S-0320	Mr.Ashim Kumar c/o S. K. Pal Opp. Petrol Pump P.O. Labpur, Distt. Birbhum West Bengal 731 303	Student	Calcutta
S-0321	Mr. Somsubhra Metia c/o Sri M.M. Metia Chandmaridanga, P.O. & Distt. Bankura West Bengal 722 101	Student	Calcutta
S-0322	Mr. Susanta Bhaumik c/o B.B. Jana 48 Manakitala main Road Kolkata 700 057	Student	Calcutta
S-0323	Mr. Parthasarathi Satvaya Vill. & P.O. Indpur, Distt. Bankura West Bengal	Student	Calcutta
S-0324	Mr. Provat Majumdar c/o Tapas som Vill. Sahidgarh, P.O. Maynaguri Distt. Jalpaiguri West Bengal 735 224	Student	Calcutta
S-0325	Mr. Tanumay Halder Saratpally, Ukilpara (East) P.O. Baruipur West Bengal 700 144	Student	Calcutta
S-0326	Mr. Subhankar Pramanick Birnagar Uttar Para P.O. Birnagar, Distt. Nadia West Bengal 741 127	Student	Calcutta
S-0327	Mr. C. Vikram H. No. 6-11-31 NWS Colony Shivrampally (NPA), R Nagar Distt. Hyderabad 500 052	Student	Chennai
S-0328	Ms. Rina Banerjee 27/M, JKM Road, New Park (Malir Bagan) Thakurpukur Kolkata 700 063	Student	Calcutta
S-0329	Ms. Debadyuti Banerjee 221 Mainadanga, Chinsurah (R.S.) Hooghly 712 102	Student	Calcutta
S-0330	Ms. Swetha Gayathri Pandari Techniq Design Group 5-3-419 1st Floor Secunderabad (AP) 500 003	Student	Karnataka

Errata

In Volume VIII No. I on page 26

F-0581 Madhusudan M. Panicker should read

F(L)-0581 Madhusudan M. Panicker

MAILING ADDRESS

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