



LIGHT

the official

NEWSLETTER

of the **indian society of lighting engineers**

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MESSAGE FROM THE TREASURER

We Need a Common Definition of Time

It is a great privilege and honor for me to be invited to write a message in the ISLE Light Newsletter, on the eve of Light India International 2005 scheduled at Delhi in the second week of September of this year. The Indian Society of Lighting Engineers (ISLE) is organizing this international event under the strong leadership of Mr. H.S.Mamak and Mr. S.Venkataramani, the two lighting stalwarts. The first one is the father and grandfather of the Society and the second one is the Society's present president and my mentor.

At the formulation of Lii 2005 I had discussions with both of these stalwarts along with the Hon. General Secretary and Mr. Ramani clearly explained that at the present moment Indian industries had overcome a dull period and the market was looking very good. If we can help our industries they could enhance their prospects in the global market. This will be the unique contribution of Lii 2005. However, I have tried to look at this event from a teacher's viewpoint.

The efforts of the Lii 2005 Organizing Committee and staff members will gather industries, policy makers, academicians, designers, doctors, scientists and many other knowledgeable personalities in the field of lighting, architecture, medicine, education etc. Participants will have opportunities to interact with them not only to develop knowledge but also generate wide band connectivity which will certainly evolve communications at the international level to highlight the label "country of origin: India" or "made in India".

My experiences have indicated that in our country there is limited or even no connectivity between the industries and the educational institutions. This is because both the educational institutions and industries differ essentially in their definition of time. Academic

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institutions are concerned with the discovery of truth, finding of causes and with the ultimate goal of publishing a paper in a reputed journal. As a result time is dilated to them. On the other hand, industries seek readymade solutions for quick return on investment. Thus, there is contraction of time to them. These two conflicting requirements never match. For a perfect match a common definition of time and aim is required.

During the national independence movement some engineering and technical institutions were built up with support from the landed gentry to develop students to contribute to development with the expectation that independence was round the corner. The vision was "Students will serve their motherland, mother institutions".

This resulted in the creation of a substantial body of human resources. They helped build good industries, employed many people, presented many products and provided remarkable services to the nation. What we observed was that industries and academic institutions became complementary to each other. In general, one is producing the products and other is using the products to stabilize the socio-economic cycle of the country. Thus, for total development there is always a need for a complementary relationship between the producer and user for making a perfect match between the demand and supply.

It is my dream that ISLE's mega event Lii 2005 will play a catalytic role in developing a common definition of time.

In the pre-independence era the interactions between the industries and academic institutions were driven by the spirit of nationalism. The interaction became stronger from the 50's to 70's. However, from 80's onward a slackening was observed. The situation took another dimension in the 90's when the pressure to compete at the global market led to greater reliance on automated systems. These systems reduced involvement of manpower and at the same time brought transparencies in the systems controlled by machines. Such parameters created imbalances in the total system. To participate in the global market industries require consciousness regarding the quality of products, prices and after sale service. These require involvement from the intellectual community to make the products and services competitive in the global market. This is a key challenge for modern industries irrespective of the country of origin.

As the Director of the Education and Training Committee of ISLE I would like to use this note to highlight the challenges that are confronting us. We are entering an era where there is substantial need for market development and commercial restructuring of our industries in which

Research, Technology and Demonstration are needed for achieving good products with maximum yield, efficient after sale service, all at a minimum price. To achieve this we certainly need to have a common definition of time.

We now have the future of the lighting industry in our hands: by creating markets to accelerate the new lighting products and systems for low energy consumption and even to energize them with renewable sources. Quality mass production may drive us further down in the price index curve rapidly bringing competition in all the market segments showing that better illumination can be achieved with lower power consumption. This will call for new lighting devices, luminaires, and control systems. Many such devices have already entered the market. With the net energy and cost saving we could even surpass our goal.

Things can - and will - happen if we want them to!

The forthcoming Lii 2005 may help us to reach our programs to the remote rural areas to provide "Green Lighting". It is very unfortunate that globally more than two billion people still lack appropriate lighting, an essential component for health and education. I personally believe that the Lii 2005 will illuminate the solution to those problems for the betterment of mankind and will be a pathfinder for a common program for security, equity and sustainability of this planet.

Biswajit Ghosh
Director
Education & Training Committee

EDITORIAL

This has been a busy and productive year for lighting. I was at the CIE Midterm Meeting in Leon in May followed by an excellent International Congress on Lighting, Lux Pacifica is taking place at the end of July and Light India International is now round the corner.

In this issue you will find a brief report from me on the highlights of the CIE Midterm Meeting. There are also detailed reports of some of the office holders of the Board of Administration. Reports from the Division Directors describing the detailed working of the technical committees will appear in subsequent newsletters.

The International Lighting Congress in Leon had some excellent papers including an outstanding session on LEDs. There was one excellent paper from India on architectural lighting in India by Sudeshna Mukhopadhyay. Since she was unable to make it to the conference due to some visa problems, I had the privilege of delivering this paper. It is carried on page 24 of this issue.

From the Lii2005 programme you can see that our own conference is certainly shaping up to be the best that we have had so far. I am therefore surprised and disappointed to find that for a conference that is our own we have had so few registrations from our Members. Please register immediately and we will make available the ISLE concessional fee even now. Please keep in mind that the hall capacity is only 586 and once this number is reached then there is no way we will be able to take any further registrations even if they are from ISLE members.

This could be an appropriate time to thank some of the Members that have worked hard to help the success of our events. First and foremost a very big thank you to our President, Mr. Venkataramani who has done the most to help. Then it is Mr. Bipin Dattani from Calcutta, Mr. M.S.N. Swamy from Karnataka, Mr. P.K. Barjatia and Mr. Nandish Shah from Mumbai State Centre, and Mr. Nagarajan from the Delhi State Centre. We still have some more days before us and we hope that other members, particularly those in the GB will come forward with help.

We still have some 600 square metres at the exhibition for sale. Please use your contacts to help fill up this remaining space. There is still a little time to send in advertisements and entries for the Directory. Let us make full use of this time to enhance the effectiveness of this publication by making it as comprehensive and representative as possible.

H.S. Mamak
Editor

ISLE ACTIVITIES



Conference

PROGRAMME AT A GLANCE

September 12

09.30-11.00	Inaugural Session Chief Guest-Hon'ble Minister for Power
11.00-11.30	Tea/Coffee
11.30-13.30	Philips Masterclass (Howard Brandston)
13.30-14.30	Lunch
14.30-16.30	GE Masterclass (George C Brainard)
16.30-17.00	Tea/Coffee
18.30-20.30	Cultural Programme and High Tea

September 13

09.00-11.00	Workshops- City Beautification and Transportation Lighting
11.00-11.30	Tea/Coffee

11.30-13.30	Masterclass (Kaoru Mende)
13.30-14.30	Lunch
14.30-16.30	Osram Masterclass (Gert Hof)
16.30-17.00	Tea/Coffee
September 14	
09.00-11.00	Workshop on LEDs
11.00-11.30	Tea/Coffee
11.30-13.30	Bajaj Masterclass (Dave Halliday)
13.30-14.30	Lunch
14.30-16.30	TVS Masterclass (Behr Champana Gagneron)
16.30-17.00	Tea/Coffee
17.00-18.00	Valedictory Session
20.00	Farewell theme dinner

You will see from the programme above that as always the Ministry of Power is giving the importance and support to our conference. The Hon'ble Minister of Power has agreed to inaugurate the conference and the Secretary of Ministry of Power, Mr. R. V. Shahi will also be at the conference. Of course, we have the six outstanding Masterclass speakers.

The **Philips Masterclass Lecture** will be delivered by Mr. Howard Brandston and will cover '*Design*' - *Bringing the Humanities to Lighting Design*.

The **GE Masterclass Lecture** by Dr. George C. Brainard will be on *The Power of Light: Biological, Behavioural and Therapeutic Effects in Humans*.

The **Masterclass Lecture** by Mr. Kaoru Mende will cover *Architectural Lighting Design in Asia*.

The title of the **Osram Masterclass Lecture** by Mr. Gert Hof is *A Light Journey to the Heavens: The Architecture and Aesthetics of Light*.

Dr. Dave Irvine Halliday will deliver the **Bajaj Masterclass Lecture** on *India Can Lead the World into Solid State Lighting - Does it Have the Will?*

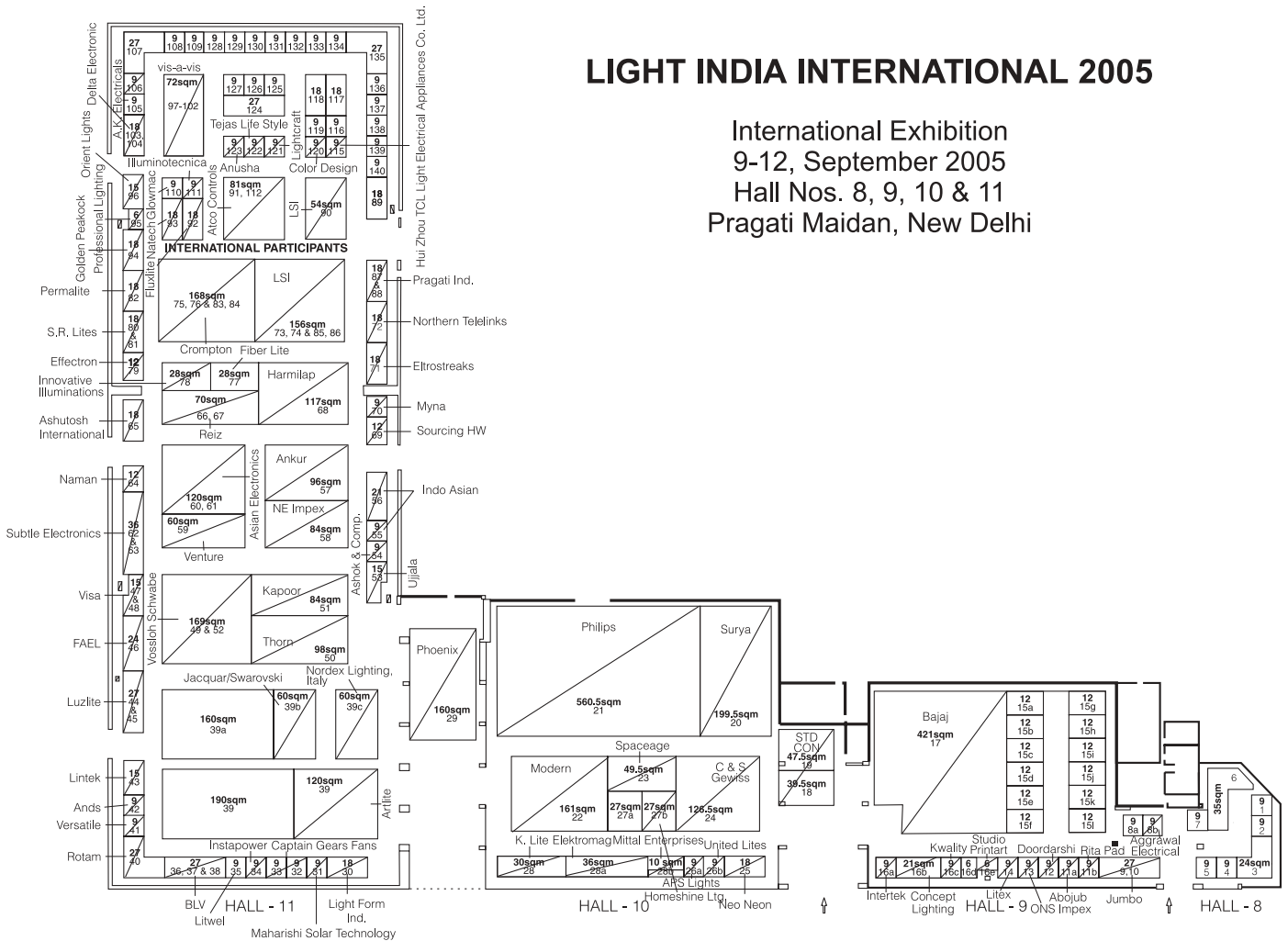
The **TVS Masterclass Lecture** by Mr. Behr Champana Gagneron will cover the *Management of Projects*.

In addition, the conference has three workshops, two on September 13 and one on September 14.

City Beautification - an approach to the lighting of Delhi for the 2010 Commonwealth Games. This workshop will cover different aspects of the lighting issues involved in City Beautification with special emphasis on the lighting of monuments. It will analyse the negative and positive impacts of such projects - light pollution, energy consumption, heritage protection, security, traffic, tourism, cultural activities etc. We are very fortunate to have three outstanding speakers who initiate and led this workshop. Ms. Dorien van der Weele is the head of LiDAC International at Philips in Eindhoven, Ted Ferreira is from the City Design Group in the US and the third person

LIGHT INDIA INTERNATIONAL 2005

International Exhibition
9-12, September 2005
Hall Nos. 8, 9, 10 & 11
Pragati Maidan, New Delhi



List of Exhibitors

- | | | | |
|---------------------------|--------------------------|----------------------------|-----------------------|
| Abojub | Effectron Luminex | Light Craft | Pragati Industries |
| Aggrawal Electrical | Elektromag Devices | Light Form | Professional Lighting |
| Ands Trading | Eltrostreaks | Linear Technologies | Reiz Electrocontrols |
| Ankur | Fael Luce | Litex | Rita Pad Printing |
| Anusha Technovision | Fiberlite | Litwel | Rotam |
| Aps Lights | Fluxlite | Luzlite | S.R.Lites |
| Artlite | Golden Peacock | Maharishi Solar Technology | Sourcing Hardware |
| Ashok Kr. & Comp. | Homeshine Lighting | Mittal Enterprises | Spaceage Switchgears |
| Ashutosh International | Hui Zhou | Modern Stage Service | Standard Conduits |
| Asian Electronics | Illuminotecnica | Myna Electronics | Studio Printart |
| Atco Controls | Indo Asian Fusegear | N.E. Impex | Subtle |
| Bajaj Electricals | Innovative Illuminations | Naman Ent. | Surya Roshni |
| Blv | Instapower | Natech | Tejas Life Style |
| C & S Gewiss | Intertek | Neo Neon Lighting | Thorn Lighting |
| Captain Gears And Fans | Jaquar | Nordex | Ujjala |
| Color Design | Jumbo | Northern Tele Links | United Lights |
| Concept Lighting Solution | Kapoor Ent. | Ons Impex | Venture Lighting |
| Converge Transprint | Kiran Lighting | Orient Lights | Versatile |
| Crompton Greaves | K-Lite | Permalite | Visa Electronics |
| Delta Electronics | Kwality Electricals | Philips | Vis-À-Vis |
| Doordarshi | L.S.I. | Phoenix Lamps | Vossloh Schwabe |

leading this workshop will be the Masterclass speaker Mr. Behr Champana Gagneron.

The second workshop (also on September 13 and running in parallel) will be on the problems encountered in transportation lighting with special reference to the issues in railway lighting. This will cover a wide range of topics, the relevance of which will extend well beyond the railways and other transportation systems - carriage lighting, outdoor lighting for marshalling yards, platform lighting, tunnel lighting etc. This workshop will be led by Mr. Axel Stockmar from LCI Germany who will cover platform lighting, exterior lighting and the implications of CIE Standard S015 on future railway lighting design. Another speaker will be Mr. Jari Tabell from Teknoware, Finland who will speak on coach lighting and emergency lighting. The third initiator for this workshop is in the process of finalisation and will speak on tunnel lighting.

The third workshop is on LEDs. With the rapid pace of development in the field of solid state lighting, LEDs are an obvious choice of subject for a workshop. It is becoming increasingly clear that when we speak of LEDs as "the light source of the future", that future is not really all that far off and for all of those involved in lighting it will be essential to understand this new technology.

The Masterclass lectures will be held at the FICCI Auditorium on Tansen Marg while the workshops will take place at the FICCI Federation House next door.

For those of you who have attended the earlier conferences you know that ISLE events are **NOT "all work and no play"**! As always there will be a Welcome Reception which will consist this year of a high tea followed by a dance programme by the internationally known troupe from Nrityagram in Karnataka. Osram is sponsoring this event. Also as in the past, there will be a gala farewell theme dinner on the closing evening. We will keep the details of this secret so that you get a pleasant surprise. Philips India and Bajaj Electricals are sponsoring this event.

Exhibition

The Hon'ble Minister for Commerce and Industry, Mr. Kamal Nath has kindly consented to inaugurate the exhibition and The Hon'ble Minister for Power, Mr. P.M. Sayeed has consented to be the Chief Guest. The inauguration will take place in the conference hall above Hall 8.

To attract more visitors to the exhibition there will be some special events at Pragati Maidan. In Hall 8 there will be a laser and light show as well as dance performances. In the evening hours on the lake in front of the exhibition halls a water curtain will be created for the projection of a spectacular laser show.

The fair will be open to business visitors from 10 am to 2 pm and to general visitors from 2 pm to 8 pm on September 9, 10 and 12. On September 11 which is a Sunday, the fair will be open to all from 10 am to 8 pm.

Directory

Since 1991 the Lighting Directory has been an invaluable source of information on the Indian lighting scenario, as well as a peep into the world of lighting.

The Indian lighting industry has moved from a local activity for local industry to an outward looking ambitious phase where the aspirations for exports and the success it has achieved have resulted in confidence levels hitherto unknown in Indian lighting. The Directory has therefore attempted to meet this need for information and data on world trends.

The need for information on quality standards and requirements to enable exports has found a place in the Directory.

Over the last two years we have noticed that Market Research Organisations in India and abroad as well as foreign companies have shown increasing interest in purchasing the Directory. The Lighting Directory has become a reference publication reflecting not only data on the industry but also the trends and aspirations of the lighting fraternity.

The Directory attempts in this 5th edition to project the place for high-end lighting projects and lighting designs. The need for specialized lighting in Malls, 4 and 5 Star Hotels, Airports, Heritage Monuments etc. are being increasingly realised. There is also a need for awareness of the place of lighting controls for the savings in power consumption that they can effect.

International buyers have now put India on their tour circuits and the International lighting companies are keen to know about Manufacturers, Markets, Channels of distribution, etc. The Lighting Directory can meet this requirement.

Full Page (black & white)	Rs. 25000
Full Page (colour)	Rs. 35000
Listing (rate per 2 column cm)	Rs. 2500

Please rush your entries and advertisements to the Secretariat immediately to avoid dssappointment.

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Mr. Mamak Reports on the CIE Midterm Meeting May 12-17, 2005, Leon, Spain

Below I give some highlights of the CIE Midterm Meeting at Leon in Spain. Detailed reports from CIE office holders are published under the CIE Activity column.

CIE Board of Administration Meeting, 13th May 2005

President's Report

- i) The president identified the following stakeholder groups in CIE:-

External

Industry and Consultants
Science and Quality Assessment
Government and International Bodies
Professional and Technical Societies
Media

Internal

National Committees
Board/Staff
Div./Technical Committees

- ii) CIE has some 40 National Committees (country members), its technical work is organized in seven technical divisions, which together have about 135 Technical Committees for detailed expert work. The Technical Committees bring in knowledge and know-how of more than 1,000 top experts from all over the world. As a result CIE has more than 120 up to date Standards, Guides and Technical Reports available covering all fields of light, lighting and image technology.
- iii) To avoid duplication on standards CIE works closely with ISO and CEN. In order to strengthen this function a V.P. Standards will be appointed on the new Board.
- iv) To give recognition the Board decided to give three Awards - for outstanding contributions in Fundamental Research, in Applied Illuminating Engineering, and in Organisation/Administration.
- v) CIE wants NCs to get more supportive members for which a financial incentive will be offered to NCs. 200 Euros for Supportive Members, 400 Euros for Silver Supportive Member and 800 Euros for Gold Supportive Members.

Vice-President (Technical) Report

- i) CIE continues with CIE publications, new or revised standards and new CIE congress/symposium publications. There were three symposia so far and three more planned.
- ii) Old TCs that have completed their task were dissolved and new TCs created to undertake new tasks.
- iii) There was a need for greater participation by developing countries, and also to attract and retain young researchers to CIE.

- iv) The revision of the international lighting vocabulary has been addressed. The final edition will be published shortly.
- v) Commendable work has been achieved in cross communication over the divisional websites. A request is made to solicit more active participation in TCs by qualified individuals.

Vice President (Publications) Report

- i) CIE has finalised a web shop, which will enable the purchase of all publications on-line via the Internet. CIE members will need to contact their National Committees to get the required membership code in order to enjoy the special reduced price.
- ii) Techstreet will handle all net sales from 1st May 2005, but NCs can continue to also order their requirements directly from the Central Bureau of CIE.
- iii) Techstreet also handle other technical publications, viz. IESNA, ANSI, IEEE, ASTM, etc.

Treasurer's Report

- i) CIE financial results have once again been positive. The main contributing factor for this was the successful workshop that was organized on Health and Lighting. CIE had a surplus of 42,000 Euros.
- ii) Argentina, Yugoslavia and Iceland have been expelled due to non-payment of dues, while Bulgaria and Slovenia have paid its back dues and will continue to remain members.
- iii) In view of the profits it was decided not to increase the CIE dues for the year 2006.
- iv) Budget increases have been made on two heads- CIE Central Bureau due to increased work load, and secondly on a provision for "Marketing" of 25,000 Euros.
- v) Publications sale is expected to increase due to the webshop.

Education Report

- I) Membership drive is necessary especially to enroll Developing Countries.
- II) 52 members shared information on lighting courses and education. The highest interest is in professional and university lighting courses.
- III) The European Union is willing to support educational programmes. Financial help will be offered to participants from Developing Countries.

CIE General Assembly

14th May 2005

- 27 National Committee Representatives attended as against 35 NCs.
- CIE has decided to in future announce a list of "Recommended Journals". *Lighting and Research* was accepted as the first and this will be reported in the

next CIE News. The Publications Committee together with the Divisional Directors will decide on journals for recommendation in the future and particular attention was drawn to excellent Russian and Japanese Magazines.

- The General Assembly accepted the Board's recommendation of increasing the Board strength by one, and fully endorsed the names suggested for the new Board 2007-2011.
- Mr. S. Venkataramani, President ISLE, was elected as Vice-President in the next Board. He will replace Mr. H.S. Mamak who has served the full term of eight years.
- The General Assembly welcomed the decision to offer Awards very selectively.
- The General Assembly wanted dialogue to be opened between CIE and IESNA for a closer relationship.

From 12-17 May, the CIE Board of Administration, its different subcommittees, the CIE General Assembly as well as CIE Divisions 1, 2, 4, 5 and several TCs met in León, Spain.

Officers elected for the next quadrennium (2007-2011)

<i>President-Elect 2005-2007 and President 2007-2011:</i>	Franz Hengstberger South Africa
<i>Past-President:</i>	Wout van Bommel The Netherlands
<i>Vice-President Technical:</i>	János Schanda Hungary
<i>Vice-President Publications:</i>	Teresa Goodman Great Britain
<i>Vice-President Standards:</i>	Michael Seidl Germany
<i>Vice-President Marketing:</i>	Todd Newman USA
<i>Vice-President:</i>	Lily Chang Wai Ling China
<i>Vice-President:</i>	S.Venkataramani India
<i>Vice-President:</i>	Gennady Shakhparunyants Russian Federation
<i>Vice-President:</i>	Marc Fontoynt France
<i>Secretary:</i>	Ken Sagawa Japan
<i>Treasurer:</i>	Peter Gradl Austria

Beijing Session 2007

Dates - 4th - 11th July, 2007
 Slogan - Light and the sustainability of environment
 Special concessional delegate fees for senior citizens and those from Developing Countries.

CALCUTTA STATE CENTRE

Course on Photovoltaic Systems

May 30 – June 11, Calcutta

ISLE Calcutta State Centre supported a two week programme on Operation and Maintenance of Photovoltaic Systems for the personnel of Bihar Renewable Energy Development Agency of the Government of Bihar. This programme was organised by the School of Energy Studies at Jadavpur University and sponsored by BREDA.

The programme was inaugurated on May 30 in the presence of Mr. D.C. Mishra, Deputy Director BREDA, Prof. B. Ghosh, Director, School of Energy Studies, Jadavpur University, Mr. H. Mukherjee, Hon. General Secretary, ISLE and Mr. R. Roy, GB Member, ISLE.

The Course was designed to be comprehensive and interesting and tailor made to suit the need of the participants. In plant training in the manufacturing process was provided by M/s Debotronics. A video presentation on products was given by Asian Electronics at the Valedictory Session. All participants were awarded course completion certificates jointly signed by the Registrar, Jadavpur University, the Director, School for Energy Studies and the Hon. General Secretary, ISLE.



L to R Messrs. R. Roy, B. Ghosh, D.C. Mishra and H. Mukherjee

Curtain Raiser for Lii2005

June 10, 2005, Calcutta

A special programme was organised for ISLE Calcutta State Centre members to give them an update into the forthcoming Lii2005 at the School of Energy Studies at Jadavpur University.

Mr. H. Mukherjee, Hon. General Secretary of ISLE made a presentation on the events scheduled for September in Delhi. He gave details of the six Masterclass speakers and their work in the field of lighting, architecture, design, environment etc. His presentation generated a lot of enthusiasm. Hopefully this will translate into delegate registrations.

Following the presentation, Prof. A.K. Datta, Director, Membership Committee made a technical presentation on LEDs. The thought provoking lecture generated great interest in the subject.

MUMBAI STATE CENTRE

Meeting at Ahmedabad

May 21, 2005

For some time now with the encouragement of the Chairman, Mumbai State Centre, Mr. P.C. Barjatia, ISLE Member Mr. Nandish Shah has been working to try and enroll members and start a Local Centre of ISLE at Ahmedabad.

On Saturday, May 21 a very good beginning was made and a meeting of interested persons held. Although the number of people present in the meeting was only 14 (much less than expected) almost everyone showed their full support.

Mr. Nandish Shah started the meeting with a welcome address and briefly talked about role of lighting and the areas of interest to various categories of people (architects, interior designers, electrical consultants, lighting engineers, clients and lighting suppliers - companies, dealers etc). He then made a presentation on the objectives of ISLE, outlining the different activities carried out by ISLE, the Society's affiliations with international organisations, the conferences, seminars and exhibitions held so far as well as plans for the future - specifically, the setting up of the Ahmedabad Local Centre.

He also made a presentation on Lii2005 sent to him by the Conference Secretariat in Delhi. He distributed the latest issue of the Light Newsletter as well as the brochures for the Conference, Exhibition and Directory.

After the presentation, those present had a good interaction about the action plan and all of them decided the first goal was to first enroll at least 25 members to start a Local Centre. The target date for achieving this was set as May 31. Mr. Shah distributed 40 ISLE membership application forms among the participants so everyone could use their contacts to bring in interested members.

INDORE LOCAL CENTRE

Lecture on Lighting Controls

May 14, 2005, Indore

Indore Local Centre organized a technical lecture on Lighting Controls on May 14.



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Mr. Dileep Dharkar, Chairman of the Indore Local Centre welcomed the participants and introduced the speakers. Mr. Dharkar gave a special welcome to some of the prominent Architects and Engineers present.



Mr. Narayan Krishna

Mr. Dharkar informed the audience that M/s. Arya Filaments had handed over a cheque of Rs.21,000 to become an Institutional Life Member of ISLE, thus becoming the first and only institutional member from Indore Local Centre. Mr. Dharkar said that credit for this membership went to Mr. P.C. Barjatia. Mr. Surendra Agrawal, Managing Director of Arya Filaments was invited to the dais and was felicitated.

Mr. P.C.Barjatia, Chairman, Mumbai State Centre made the first presentation of the evening giving a comprehensive picture of the objectives and activities of ISLE.

This was followed by a presentation by Mr. Kiran Ganguli of the Conference Secretariat on the Lii2005 Conference and Exhibition in September. He highlighted the fact that such an opportunity to interact with six world lighting masters on one platform would not come again in the near future, so full advantage should be taken by participating in both events as well as the Directory.

Mr. Narayan Krishna of Thorn Lighting made a technical presentation on Lighting Controls. He emphasized the importance of using lighting controls and pointed out that existing systems need not always be completely replaced to get the benefits. The lecture was very well received and followed by an animated discussion. The lecture was followed by dinner.

The evening was compered by Ar. Shreya Bhargava. The programme was attended by 124 participants from the field of Architecture, Interior Design, Consultants, Industry and Government Departments including the Municipal Corporation, Indore Development Authority and other institutions.

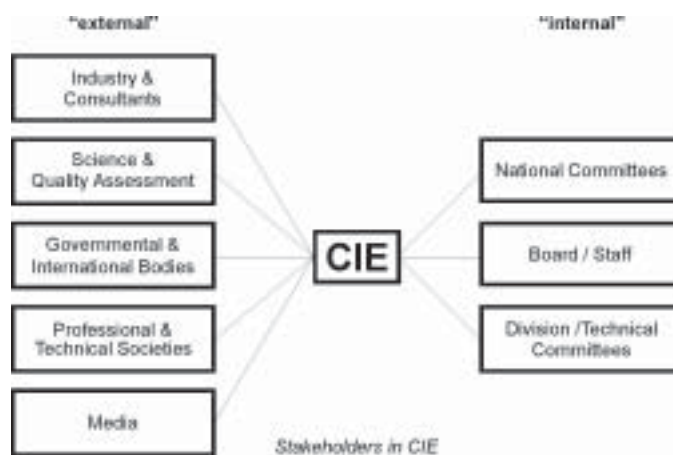


Mr. Akhilesh Jain felicitating Mr. Surendra Agrawal of Arya Filaments

CIE ACTIVITY

President's Report for the General Assembly Meeting in Leon, May 2005

At the Session in San Diego in 2003 I talked about the importance of the different stakeholder groups in CIE. They can be divided in, on the one hand "internal stakeholders" National Committees, Board & Staff and the Division and Technical Committee (TC) expert volunteers, and on the other hand into: "external stakeholders" like industry and consultants, universities and quality assessment institutes, governmental and international bodies, professional and technical societies and the media (press).



The "internal" part

Today, CIE has some 40 National Committees ("country members"). Its technical work is organised in 7 technical Divisions, which together have about 135 Technical Committees for the detailed technical expert work. The Technical Committees together join the knowledge and know-how of more than 1000 top-expert volunteers from all over the world. As a result, CIE has more than 120 up to date Standards, Guides and Technical Reports available covering all fields of light, lighting and image technology.

In San Diego I concentrated on the fact that expert volunteers become more rare and have less time to spend. I stated that CIE should therefore learn to focus more and be more sure about the importance and urgency of new planned work. CIE has to become more realistic with time frames set for the work. This all means that, if not enough volunteers on a certain subject are available to do the work, the TC is better disbanded or not created. On the other hand once a working program with deadlines has been accepted a stringent control is what one should expect. I have noted that this message indeed has made Divisions more critical about their work program and about creating new TC's. And, luckily, this has nevertheless not

led to a reduction in our CIE Publications. So, probably our volunteer base has been “used” more efficiently. This is also important because the “outside” world expects announced publications to indeed be available at the time announced. This will in continuity further improve the image of CIE as the world recognized authority in the field of light, lighting and image technology.

We have seen in the recent past inefficient duplication of work in CIE, ISO and CEN although our agreements with ISO and CEN are aimed at avoiding duplication of work and especially also at avoiding conflicting standards and recommendations. In order to improve here, and to subsequently safeguard the way of working in this respect, the present Board has proposed to have in the new Board (2007-2011) a specific Vice-President “Standards”.

Of course all these measures have to be supplemented with actions to get new, young expert volunteers. For me it was surprising to find out in many discussions after my presentations about CIE, that many young people active in lighting think that you need to have something like a “lifetime of experience” in order to be able to work as an expert volunteer in CIE. Without generalizing it is thus important to point out that we need to have a balance between experienced and young, innovative and alternative thinking minds. To underline this the Board has decided to ask all organizers of CIE Symposia and Workshops to consider to organize a competition for young contributors (“best young contributor’s award”).

Especially for young people it is also important to point out to them the rewards for them and their employers like:

- becoming part of a network with early information about trends, research programs, research results, directions of standardization and about “who is who”
- influence in the contents of world standards and recommendations
- world wide recognition via his/her CIE Publication.

In San Diego, we already discussed the fact that an important reward for the active volunteers and for their employers is that the Standards, Publications and Guides they have prepared, are being read, studied, referred to or in other words: are used by many readers and users all over the world. An important step in this respect was already the reduction of the publication prices in 2002 to 50%. Another very important step is the implementation of an on-line Webshop next month April. Most CIE publications will, from next month onwards, be directly available from the Internet as downloadable PDF or, if wanted, also as hard copy. The system registers from which country the purchase originates so that the relevant NC can and will be credited for the NC part of the Publication price. We may expect therefore not only a wider

spread of our publications (and image) but also a better income for NC’s from publications. Since non-NC members have to pay double the publication price we hope to have created an extra argument for buyers of CIE publications to join “their” NC as a member.

To honor and recognize outstanding contributions of CIE volunteers the CIE Board will from the 2007 Beijing Session onwards have the possibility to award maximum 3 Distinguished Services Awards per quadrennium: The “Judd Award” for exceptional outstanding contribution in Fundamental Research, the “Waldram Award” for exceptional outstanding contribution in Applied Illuminating Engineering and the “de Boer Award” for exceptional outstanding contribution in organisation/administration. With all attention for volunteers, we must and will of course not forget that the NCs of CIE are controlling the affairs of CIE and provide the legitimation for the CIE work results as true international state of the art. We are therefore anxious to note that we have difficulties to further interest new countries to form a National Committee and join CIE. It is worrying that we have in both Africa and South America only one country that has an NC (South Africa and Brazil respectively). With mutual regret we had to conclude that we could for example not keep Argentina as a National Committee the reason being a pure financial one caused by the difficult economic situation in Argentina. We understand that for some other NCs it is not always easy to get the required funding. Sometimes this has to do with the way in which an NC is organized and its position relative to other institutions in its country. In order to have the chance to learn and hopefully benefit from each other’s experience we have arranged for a workshop as part of the General Assembly meeting in Leon to exchange ideas on organization type and method of financing NCs. CIE has not raised the total sum of dues for NCs since the budget of 2001. In order to be able to continue to do so alternative ways to get CIE financed, partly also from external sources, need to be put into place.

The “external” part

The supportive membership system introduced in 1999 has made it possible for companies (industry, consultants) and international institutions to join the CIE organisation. The system was seen as a step in getting financial support independent of publication sales and others than from NC fees. As this new system did not immediately work out as a success we have asked the NCs in San Diego in 2003 for support in our endeavours to get a first base of supportive members. We proposed that at the next (2004) Board meeting 5 serious contact addresses should be available from each NC. Although the 2003 GA meeting reacted positively on this proposal and we now have a small supportive membership base, we learn from the limited

number of NC reactions that we need to make the supportive membership financially more interesting for NCs.

The Board in its 2004 meeting therefore decided that NCs will receive from the CIE Central Bureau the following financial credits for Supportive Members in their country:

200 Eur/year for each Supportive Member (total membership fee: 500 Eur)

400 Eur/year for each Silver Supportive Member (total membership fee 3000 Eur)

800 Eur/year for each Gold Supportive Member (total membership fee 8000 Eur)

Because only NC members may, in addition to their NC-membership, become CIE Supportive Members there is now a considerable financial profit for the NC. We hope that with this change we can reckon on the active support of NCs to increase the number of CIE supportive members. The benefits for the supportive member itself have been discussed in detail at earlier occasions and are described in the "image brochure" of CIE that is available from the Central Bureau.

CIE's Board together with the able support of the Central Bureau staff will try to guide CIE through the coming challenging period. But that alone will not be enough: CIE needs the support of all the active volunteers both in NCs and in Divisions and TCs that together form the basis of CIE.

I thank very much all volunteers who have put so much work in CIE.

Wout van Bommel
CIE President

Report by Vice-President (Technical)

The CIE has had an active start to the current quadrennium of technical activities that resulted in new CIE publications, new or revised Standards and new CIE Congress/Symposium publications.

There have been three symposia so far in the quadrennium; with three planned.

Divisional activity resulted in publications as noted above and as detailed in the Divisional reports. As a result TCs that completed their tasks were dissolved. New work has resulted in the creation of new TCs at about the same rate as the dissolution of old ones.

The Divisional Directors had proposed changes to the Session format used in San Diego, to permit a greater number of presented papers and to introduce formal poster presentations at the posters. This was accepted by the Board and implemented for the Session. And was successful.

Concerns raised regarding CIE Technical work include: the need for greater participation from developing countries; the need to attract and retain young researchers to the CIE (the Board addressed this issue and after a long discussion on a proposal for a VP for this purpose, decided against it, however, nomination for a VP has been made by the French NC and has been circulated for the GA meeting); succession planning for the administration of the CIE Divisions.

The concern regarding the slowness of the revision of the International Lighting Vocabulary (which commenced seventeen years ago, upon the publication of the last edition) has been addressed by the Board and General Assembly meetings in San Diego and considerable progress has been made. It is hoped to finalise this at a meeting during the Leon congress.

I would like to thank the CIE Central Bureau for its hard work in support of the CIE Technical work, the Divisional Directors, the TC Chairs and the hundreds of people who form the TCs.

Without their work and the support of their employers, the CIE would not be able to achieve its goals.

Finally, I would like to thank the new Divisional Directors Sharon McFadden, Nigel Pollard and Anne Webb for their leadership and success in filling the shoes of three previous long-term directors.

Warren Julian
V.P. Technical

Report by the Vice President

Among the CIE activities which cover a large number of fields related to light and lighting, embracing such fundamental subjects as vision, photometry, colorimetry, photobiology, and application subjects covering all usage of light, the measurement of optical radiation and related topics have a special place because, the results of the research in this field are expected to be used not only by the CIE community but worldwide. In this specific field the expertise of CIE, based on a large number of research works in the past as well as in the present, is well recognised since some publications are taken for the authority in their field. During the past two years, the updating of the International Lighting Vocabulary have been a major activity of all the divisions and, at present time, the work is near completion. The CIE standard S 010/E:2004, "Photometry – the CIE system of physical photometry" has been issued. In this standard the definitive values of $V(\lambda)$ and $V'(\lambda)$ are given. I would remind you that the $V(\lambda)$ curve has been adopted, by the CIE, as a provisional curve in 1924 and since that time, though it has been endorsed by some other international

organisations, it had not been formally published up to now. In 2004 another important publication in the field of metrology has been also reissued, it is the publication 15 : 2004 "Colorimetry". To increase the audience of these works it is important of having them recognised by the CIPM, the organisation in charge of metrology at the world level.

As I told you in my report in San Diego, there exists a very close connection between the CIPM and the CIE through the Consultative Committees of the CIPM. The CIE is a full member of the Consultative Committee for Units (CCU), and have also strong connection with the Consultative Committee for Photometry and Radiometry (CCPR).

At the last CCPR meeting, from the 17th to 19th of June 2003, in Sèvres, I gave a written and an oral report on the CIE activities. This report was a good opportunity to explain how the CIE is organised and it works, and to give an overview on the research activities, in progress at present time within the CIE technical committees, directly or indirectly connected with CCPR activities. About 35 technical committees belonging to division 1, 2 and 6 have working programmes dealing with subjects which could be considered as relevant to CCPR activity. In the field of photometry these subjects are mainly on luminous efficiency functions, supplementary system of photometry or on the measurement of light emitted by LEDs and flashing lights. For photobiology these subjects are in connection with action spectra for various photobiological interactions and the measurement of UV radiation in connection with safety or medical treatments. There are also subjects dealing with instrument characterisation, colorimetry, optical properties of materials, detectors and uncertainty determination or vocabulary matters. At this meeting of the CCPR, I gave also a report on the units used by the CIE for measurements in the field of photobiology in order to obtain the support of this Committee for having them introduced in the new issue of the "SI brochure" in preparation by the CCU.

The main task of the CCU is the development of the "Système International d'Unités" (SI) and the preparation of successive editions of the SI Brochure which is giving the rule for implementing practically the SI for all measurable quantities. The CCU met on the 13th and the 14th of May 2004 and I attended this meeting as the CIE representative. The major subject discussed during this meeting was the draft proposal of the next edition of the SI Brochure which is expected to be published soon. For that meeting, on the behalf the CIE, with the support of the CCPR, I prepared, with the assistance of some CIE colleagues, a draft chapter on the units for photobiological quantities for addition to the SI brochure and a note for supporting this chapter. After discussion, the member of the CCU not only have accepted the proposal for

introducing photobiological units in the SI brochure but have decided to extend this chapter to some others quantities and units related to biology. The title of this new chapter is "Units for quantities that describe biological effects". It contains four paragraphs, on : "units for photobiological and photochemical quantities", "Units used in acoustics", "Units used in radiation therapy and radiation protection" and "WHO International Units". The proposal for this new chapter has been approved by the CIPM at its meeting of October 2004, in Sèvres. The publishing of the SI brochure is expected at the end of this year or the beginning of next year.

The formal participation of the CIE in the work of the CCU is useful for both organisations because they have different and complementary views and activities in the field of metrology. The CCU is dealing with all the units and the right use of them according to the rule of the SI. The CIE is involved in the theoretical and practical aspect of measurement of very specific quantities in the field of optical radiation. For similar reasons the collaboration between the CIE and the CCPR is also very fruitful for both organisations. It could be useful for promoting the research works related to metrology, carried out by the technical committees of the CIE, to strengthen and enlarge the existing links between the CIE and the various committees of the "Convention du mètre".

Jean Bastie
Vice President

Vice-President (Publications)

This report lists the publications produced since the 2003 Session in San Diego and the sales of these publications. CIE publications include Technical Reports and Standards, Proceedings, the CIE Collections, the CIE News and CD ROMS. Also constituting a form of publication are the CIE website and the websites of the CIE Divisions.

Another subject addressed in this report is the change in the CIE publications sales system initiated by the decisions at the 2003 General Assembly and the latest news on the imminent opening of the new CIE web shop.

1. New publications produced

The new publications produced since the San Diego meeting are listed below

Publ. No.	Title
15:2004 (3rd edition)	Colorimetry
88:2004 (2nd edition)	Guide for the Lighting of Road Tunnels and Underpasses
153:2003	Report on an Intercomparison of Measurements of the Luminous Flux of High-Pressure Sodium Lamps

155:2003	Ultraviolet Air Disinfection
156:2004	Guidelines for the Evaluation of Gamut Mapping Algorithms
157:2004	Control of Damage to Museum Objects by Optical Radiation
158:2004	Ocular Lighting Effects on Human Physiology and Behaviour
159:2004	A Colour Appearance Model for Colour Management Systems: CIECAM02
160:2004	A Review of Chromatic Adaptation Transforms
161:2004	Lighting Design Methods for Obstructed Interiors
162:2004	Chromatic Adaptation Under Mixed Illumination Condition When Comparing Softcopy and Hardcopy Images
163:2004	The Effects of Fluorescence in the Characterization of Imaging Media
164:2005	Hollow Light Guide Technology and Applications
165:2005	CIE 10 Degree Photopic Photometric Observer

The following new CIE Standards and Draft Standards became available:

Standard No.	Title
<i>CIE S 010/E:2004</i>	Photometry - The CIE System of Physical Photometry
<i>ISO 15469:2004(E)/ CIE S 011/E:2003</i>	Spatial Distribution of Daylight - CIE Standard General Sky
<i>CIE S 012/E:2004</i>	Standard Method of Assessing the Spectral Quality of Daylight Simulators for Visual Appraisal and Measurement of Colour
<i>CIE S 013/E:2003</i>	International Standard Global Solar UV Index
<i>CIE Draft Standard DS 014-1.2/E:2004</i>	Colorimetry - Part 1: CIE Standard Colorimetric Observers
<i>CIE Draft Standard DS 014-2.2/E:2004</i>	Colorimetry - Part 2: CIE Standard Illuminants
<i>CIE Draft Standard DS 019.2/E:2005</i>	Photocarcinogenesis Action Spectrum (Non-Melanoma Skin Cancers)

Proceedings and material from CIE Congresses, workshops and symposia resulted in the publications listed below:

Publ. No.	Title
<i>CIE 152:2003</i>	Proceedings of the CIE Session San Diego

<i>CIE x026:2005</i>	Proceedings of the CIE Symposium 04 on LED Light Sources: Physical Measurement and Visual and Photobiological Assessment, 7-8 June 2004, Tokyo/Japan
<i>CIE x027:2004</i>	Proceedings of the CIE Symposium '04 on Light and Health, 30 Sep.- 2 Oct. 2004, Vienna, Austria

3. New CIE webshop

CIE is currently in the final stages of establishing its new web shop. Publications can soon be bought on-line via the internet (either as pdf files or paper copies). The web shop will be accessible to purchasers via a link from the CIE home page. Apart from the radically reduced prices of CIE Publications since 2002 (-50 % for National Committee members, while non members pay double the members' price), CIE members and purchasers in general will soon also have the benefit of a fast and convenient web shop. In order to get the publications at the reduced members' price, members will have to contact their NC to get the required membership code. CIE Board members believe that easy access to and widespread use of CIE publications is one of the best ways for the organization to remain relevant to the international lighting community.

Because of the importance of understanding the process, which led to the new CIE approach to publication sales, the following summary from the September 2004 CIE newsletter is hereby reproduced:

At the 2003 CIE General Assembly meeting in San Diego, the Vice-President (Publications) presented an analysis of CIE publication sales and proposed the following actions:

1. Introduction of a uniform system of publications pricing for sales to members and non-members by all National Committees (NCs) and the CIE Central Bureau (CIE CB).
2. The parallel sale of publications by the CIE CB and by NCs, thus effectively ending the bilateral sales arrangements between 18 NCs and the CIE CB.
3. Implementation of a system of crediting NCs with the profit from sales through the CIE CB.
4. The eventual creation of a web-based CIE shop for the sale of both paper and electronic versions of the CIE publications.

Incorporating the inputs received at the CIE General Assembly meeting in San Diego, the CIE Board subsequently approved these proposals with effect from 1 January 2004. The CIE publication sales policy since that date now is:

- NCs can purchase CIE Publications from the CIE CB (for their own purposes or for re-sale) at 65% of the official CIE list price.

- The price at which CIE publications are sold to NC members worldwide is equal to the official CIE list price.
- Persons or organisations who are not NC members pay twice the official CIE list price for CIE Publications.
- Publication sales can be made either through the CIE CB or the NCs, in each case at exactly the same price [as indicated under a) and b) above]. Profit from CIE CB sales (difference between price to buyer and CIE CB price to NC) is credited to NCs as if they had made the sale themselves. NC credits earned through CIE CB sales can be offset against dues, used for publications purchases from the CIE CB or the balance can be transferred once a year, at the discretion of the NC.

The implementation of actions 1 - 3 since January 2004 has put the CIE now into a position, where it can start to proceed with the next stage in this evolution, namely the establishment of a web shop (action 4 above).

Proposals from various companies around the world were gathered in time for the September 2004 CIE Board meeting. Most of the offers involved an initial payment for establishing the web shop and monthly or yearly amounts for hosting and maintenance. An exception to this was an offer received from a company named Techstreet (<http://www.techstreet.com/>), which offered the creation, hosting and maintenance of the web shop to the CIE free of charge in return for a commission on the publication sales. After due consideration of all the offers and of all the information available on the bidders, the CIE Board decided that the model offered by Techstreet seemed to be the best solution. It relieved the CIE of the problems of hardware and software maintenance and upgrades, which would have meant regular expenditure as well as time and additional skills from the staff at the Central Bureau. It also did not require any initial capital investment, gave access to powerful marketing channels and even held the promise of additional income from the sale of third-party publications. The Vice-President (Publications) was instructed to conclude the negotiations with Techstreet within certain parameters set by the Board and he and the CIE Treasurer were assigned as signatories of the agreement once a satisfactory solution had been achieved.

The negotiations for the CIE web shop were concluded between the parties in December 2004 and the CIE Board agreed to the proposed contract in January 2005. It was signed by the authorized representatives in February 2005 and is now being implemented. The web shop will be operational in the

course of May 2005. It is hoped that it can already be demonstrated to and used by the delegates at the CIE Midterm Meeting in May 2005 in Spain.

It should be mentioned that the price of CIE publications to CIE members and non-members through the CIE web shop will be unchanged in spite of the commission payable on each sale to Techstreet. In order to achieve this, the amount per sale received by the Central Bureau (CB) and the National Committees (NCs) will be reduced proportionally. As with the previous price cut announced by the CIE Board, there is good reason to believe that this reduction in CB and NC income per sale of a CIE publication will eventually be compensated for and perhaps even exceeded through an increased sales volume via the online web shop. Apart from the radically reduced prices (-50%) of individual CIE Publications since 2002, CIE members and purchasers in general will now also have the benefit of a fast and convenient web shop. The CIE Board members believe that easy access to and widespread use of CIE publications is one of the best ways for the organization to remain relevant to the international lighting community.

The web shop will be accessible via a link (clicking on a shop icon) from the CIE home page. The same link and icon will be offered to all CIE NCs for use on their own NC web sites. With the implementation of the agreement, CIE publications will also be available for ordering from the Techstreet website and the websites of other organizations, whose web shops are provided by Techstreet. The latter include ASTM, ANSI, IEEE, IESNA and many others.

4. CIE websites

The address of the main CIE website is <http://www.cie.co.at/>

The Division websites can be found at

Division 1- <http://www.bio.im.hiroshima-cu.ac.jp/~cie1/>

Division 2- <http://cie2.nist.gov/>

Division 3- <http://ciediv3.entpe.fr/>

Division 4- <http://www.ee.tut.fi/tel/cie4/>

Division 5- <http://www.cie.co.at/div5/index.html>

Division 6- <http://physics.nist.gov/Divisions/Div844/CIE/CIE6/index.html>

Division 8- <http://www.colour.org/>

There have been continuing discussions at the Publications Board about the look and feel as well as the content of the Divisional websites, without taking away their unique identities.

This matter was, however, regarded as less of a priority than the creation of the web shop and the subject will be re-visited again once the web shop is operational.

Acknowledgements

I wish to acknowledge with gratitude the many efforts of Study Groups, Technical Committees and Divisions in producing the technical output of the CIE, the long hours Division Editors spend on scrutinizing the submitted texts, the final editing, production and marketing of the publications by the Central Bureau and the guidance provided by the members of the Publications Board.

Franz Hengstberger
V.P. Publications

Report on the Education Mailing List

The List has 52 members, collects and disseminates information submitted by the participants in six subject areas:

1. General education for 6-18 years old
2. Vocational schools, training for different professions
3. Technical high schools and colleges
4. Professional lighting courses at universities and technical colleges
5. Univ.courses in electr., architect., computer, chemical, physical dep.
6. Professional lighting courses for lighting designers/engineers

The highest interest is in professional and university lighting courses.

A subject that has been recently brought to the attention of the mailing List is the following:

To establish an International Masters Course in Light and Lighting: The European Union is willing to support programmes, where a few universities establish joint Programmes, with ample mobility for both the students and the teachers. Students from developing countries could get special support for joining such a programme. As European universities are at present changing their system from a five years study to a BS and MS system, probably a few years are needed, before such joint programmes can be set up.

At present the Members of the EDU Mailing list have been asked to submit information on courses they have that could be used as a basis of such a programme. Replies are coming in and get distributed to the other members of the list.

Vision and Lighting in Mesopic Conditions

Ever since the CIE defined the photopic spectral luminous efficiency curve, $V(\lambda)$, in 1924, researchers have

been grappling with the difficult question of how to deal with the fact that the performance of the human eye changes depending on the level of illumination to which it is exposed. The photopic curve applies only at "high" light levels (daylight, lit interiors etc.), where the rods are less active and cones dominate our vision, and colour discrimination and the ability to resolve detail in the visual field are both good. At "low" levels (e.g. moonlight), only the rods are active, visual acuity is poor, and it is not possible to distinguish colours; in this condition, the scotopic spectral luminous efficiency curve, $V'(\lambda)$, applies. The intermediate region, the so-called mesopic, has proved an intractable problem so far. Here the eye's sensitivity changes rapidly depending on the characteristics (level and spectral distribution) of the lighting used, shifting towards the blue as the level decreases. No agreed system of photometry presently exists for this mesopic region.

Of course this raises the question, "Is there a need for measurements of lighting in the mesopic?" The answer is a definite "Yes!" The reason is that a number of safety critical applications, such as night time driving, fall in the mesopic region. Under the current system of photometry, lamps which emit a large proportion of their power around the peak of the $V(\lambda)$ curve (such as high pressure sodium lamps) are rated as having a high luminous efficacy and are thus the lamp of choice in many situations. Under mesopic conditions, however, a lamp with a higher blue content (e.g. metal halide) will have a greater visual effectiveness and may therefore be a better choice. The difficulty is that without an agreed system for mesopic photometry, it is not possible to make meaningful comparisons between one lamp type and another, with the result that the optimum lamps are generally not specified.

A major limitation in research to date has been the fact that there are 2 key response channels in the human visual system. One, the luminance channel, is achromatic and additive; the other, the chromatic channel, provides colour information and is non-additive. The relative contribution from each channel depends on the light level and the task being undertaken. Flicker photometry, for example, is dominated by the luminance channel and is the basis for the $V(\lambda)$ function. Heterochromatic brightness matching, on the other hand, is dominated by the chromatic channel and is not well-described by $V(\lambda)$. As a result, researchers have developed many different models by which to describe the performance of the eye in the mesopic, the characteristics of which have varied significantly depending on the experimental conditions under which they were developed.

Recently, research has shifted towards a new approach to this problem. Instead of trying to describe the detailed performance of the eye under a given set of conditions, the emphasis has been on developing a system which can be readily implemented in practice, but which may not



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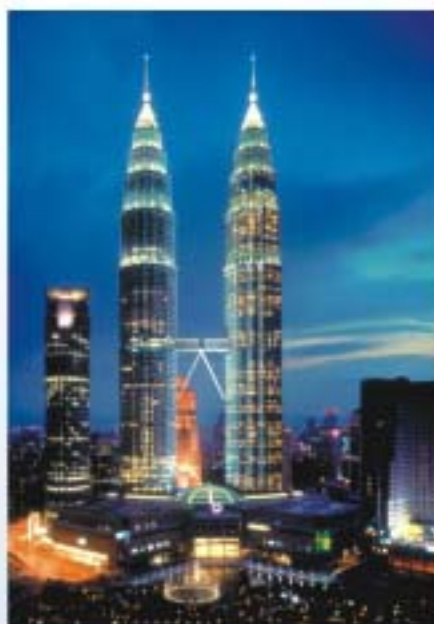
Howard Brandston

Has more than 40 years experience in lighting design, engineering and electronics, designing illumination for more than 2500 commercial, institutional, residential and government projects. Honoured as an initial inductee of the Lighting Design Hall of Fame, he has received the International Lighting Designers Lifetime Achievement Award, AIA Institute Honors Award for his contribution to architecture and the IESNA medal. He has been inducted in the Interior Design Hall of Fame, the only lighting designer to be awarded this honour.

Teaches at LRC. He is also a light sculptor and his work is displayed in several museums.

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George C. Brainard

Is a Professor of Neurology and a Professor of Biochemistry and Molecular Pharmacology at Jefferson Medical College, Thomas Jefferson University in Philadelphia. Dr. Brainard is the Director of Jefferson's Light Research Program. Over the past twenty years, his academic work has been concerned with the effects of light on biological and behavioural responses of animals and humans.

Dr. Brainard has actively worked with industry and different branches of the government on lighting education and standards.

His current work concerns the regulation of the human circadian system by the wavelength, intensity and timing of light. Results from these studies are being applied to the development of new lighting products and architectural designs. In addition, he is currently supported by the National Space Biomedical Research Institute of NASA to develop lighting applications for the Space Shuttle, International Space Station and future exploration-class space environments.

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Gert Hof

He doesn't like to be called a "light designer". He could be called a pyroartist or lighting architect. "I approach every light show as if it were one of Shakespeare's play", says Gert Hof. His works include the lighting of the Acropolis to the music of Mikis Theodorakis, dedication of the millennium monument in Beijing, Berlin Millennium celebrations, the 1000th Anniversary of Budapest and the Anniversary Lights at the Red Square in Moscow. Hof told Mike Oldfield who wrote the music for the Berlin show that he needed "monumental music because I will be shooting a week's worth of Berlin's electricity consumption into the sky on one of your chords".

www.mega-events.net



Acropolis

...at *Li* 2005



Kaoru Mende

Was attracted to architectural lighting and has been involved in such superb projects as Tower of Winds, Chapel on the Water, Frankfurt Opera House, Tokyo Design Center, Shinjuku Takashimaya, Tokyo International Forum, JR Kyoto station and Sendai Mediatheque.

The awards he has received include the IES (Illuminating Engineering Society) International Lighting Design Award of 1989, Award of Distinction for "Chapel on the Water", and many Awards of Excellence, '97 IALD (International Association for Lighting Designers) Award of Excellence for "Tokyo International Forum", '96 Japan Culture Design Award and '97 Mainichi Design Award and many others.

He has been teaching lighting design at Musashino Art University, Tokyo University, Tokyo University of Art and others.

www.lighting.co.jp

MASTERCLASS



Tokyo International Forum



Behr Champana Gagneron

Vice President and Principal of TVS International, Behr Champana Gagneron is a talented design architect and has won many international design competitions. Mr. Champana Gagneron is a recognized specialist in the areas of master planning and site analysis, architectural design, programming, construction documents and administration.

He was one of four national experts selected for a special design think-tank on energy efficient and sustainable environments by the world-renowned Rocky Mountain Institute in Colorado. He was also later involved in 1994 in the Regional Urban Design Action Team for the planning of the 1996 Olympics. As a lead strategic visionary of TVS International he is presently gaining a reputation as a futuristic planner in 'tomorrow's world' being created in Dubai and the Middle East.

TVS MASTERCLASS



BAJAJ MASTERCLASS

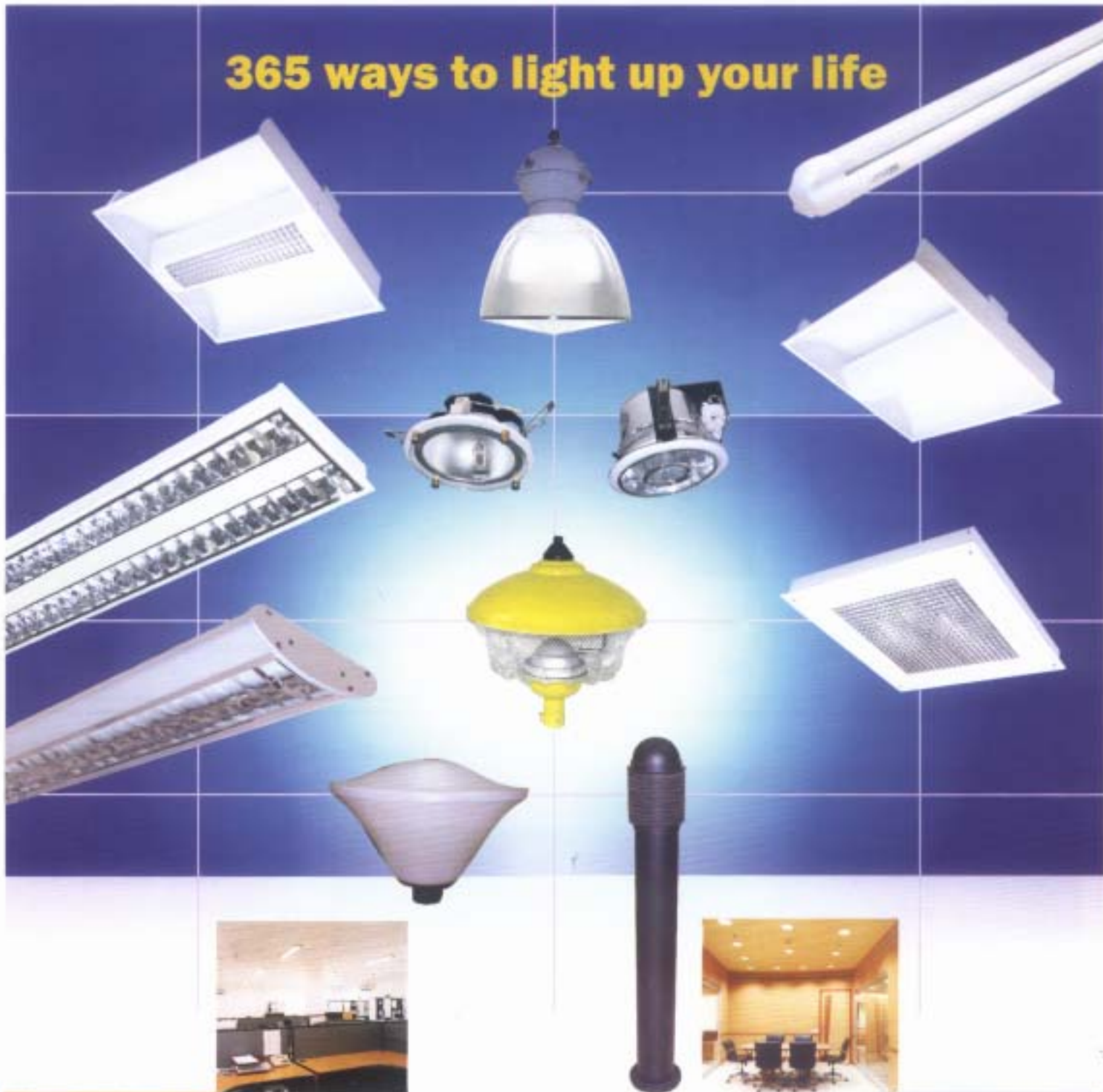


Dave Irvine Halliday

Dave Halliday is the Founder Director of the Light Up The World Foundation, an international humanitarian organization affiliated with the University of Calgary dedicated to illuminating the lives of the world's poor. It is the first humanitarian organization to utilise solid-state lighting technologies to bring affordable, safe, healthy, efficient, and environmentally responsible lighting to people currently without access to proper lighting. Dr. Halliday laid the foundation for the development of LUTW into a global lighting initiative.

www.lightuptheworld.org

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provide a precise description of visual performance. This places two important constraints on the model:

- It must be additive
- It must tend to $V(\lambda)$ at the upper end of the mesopic region and to $V'(\lambda)$ at the lower end

The results of this research were presented at the recent CIE Expert Symposium, "Vision and Lighting in Mesopic Conditions 2005". At the discussion session following the symposium, a clear distinction was drawn between the two approaches to mesopic photometry and it was proposed that 2 systems should be developed. The first, the so-called "practical" or "luminance" system, should focus on an additive system to provide a bridge between the $V(\lambda)$ and $V'(\lambda)$ curves and would be used for specification of lighting installations etc. Although this system would not provide a precise prediction of the performance of any particular visual task, in this respect it would be no worse than the present photometric system in the photopic. The second, the so-called "brightness system", should incorporate the influence of the chromatic channel and would link with work on brightness matching in the photopic region.

The work presented at the symposium, and elsewhere, is now sufficiently advanced to form a basis for the practical system. The model takes the form $x V(\lambda) + (1-x) V'(\lambda)$, with x being a function of the level of illumination. It was agreed during the discussion that those involved in the development of the practical system should, over the next year, refine the model based on existing experimental data, with the aim of having a trial system ready by June 2006 for field-testing by the road lighting and road safety industries in particular. This work will be carried out under the auspices of TC 1-58. In parallel, work will continue in TC 1-37 and TC 1-46 to develop a system for brightness evaluations.

It is truly encouraging that, after more than 7 decades of research, we are now close to establishing a practical system for mesopic photometry. The potential implications for road safety and improved energy efficiency alone make this a major breakthrough for the CIE. We would encourage everyone with an interest in lighting to watch for further developments over the next year or so, and to become active in the work of the relevant TCs in order to take this forward as quickly as possible.

Teresa Goodman, Director, CIE Division 2
János Schanda, Secretary of the CIE

Information from CIE Supportive Member: Instrument Systems

High Power LEDs - Measurement Solutions for Solid State Lighting

The semiconductor light of LEDs has long been deployed in many areas of daily life. Examples include

applications such as backlighting for displays and panel graphics on mobile phones and instrument clusters in cars. The new High Power LEDs now on the market enable LED light to be used for applications in traditional illumination as well.

This is good news, but High Power LEDs also present new challenges for optical metrology. Test and measurement systems for individual LEDs have been technically refined with highly developed and fast spectroradiometers, but when it comes to lighting applications, it is necessary to deploy systems from conventional photometry such as goniophotometers and large integrating spheres. These test systems generally use photometer measurement heads that are not accurate enough for LED spectra. One solution is to combine modern spectroradiometer technology with the systems of classical photometry. Instrument Systems, based in Munich, has addressed this problem and launched appropriate measuring systems.

High Power also means High Temperature

Today, modern spectroradiometers are able to record accurately all the optical parameters of LEDs, such as luminous intensity, luminous flux, chromaticity and spatial radiation pattern. However, the new High Power LEDs with luminous flux values in excess of 100 lumens require proper thermal management. Some of these LEDs cannot be operated without heat dissipation. Their optical properties are also significantly influenced by temperature. The light output, for example, can degrade by some 10 percent if the temperature increases by 40 K, and the colour temperature of white LEDs changes to the point where it is clearly visible to the human eye. It is therefore necessary to consider the thermal behavior of LEDs adequately during optical analysis.

To this end, Instrument Systems has developed special test adapters for High Power LEDs. They combine with integrated passive or active cooling to create stable temperature conditions and permit measurement of the temperature at the LED slug.

From the single LED to the LED module

Despite the impressive light power, a single LED is far from adequate for applications such as headlights in cars or interior illumination. Entire clusters and modules of LEDs are required for these applications. This is why the analysis of photometric parameters for modules is becoming increasingly important alongside the measurement of single LEDs. A goniophotometer can be used to analyze the spatial radiation pattern of an LED module. Using a spectroradiometer as a detector allows the distribution curve for luminous intensity and colour to be determined. A feature that is particularly important

for white LEDs since there can be major changes in colour coordinates for different viewing angles. This is because there is a lower proportion of the broadband phosphor radiation present in the lateral radiation of the LED by comparison with the primary radiation of the blue LED chip.

LED luminous flux measurement using integrating spheres

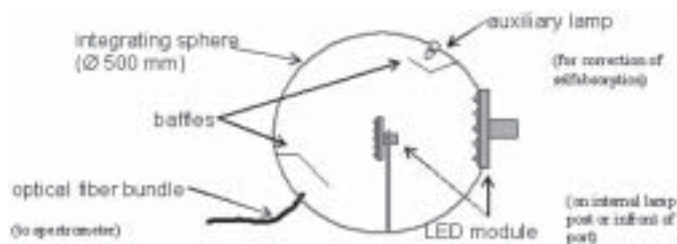


Figure 1: cross-section of an integrating sphere for measuring LED modules

Integrating spheres are used to determine the luminous flux (total flux of light emitted). These comprise a hollow sphere, the interior of which is coated with a material that is an almost perfect diffuse reflector. This ensures that the total flux of light is integrated. The quality of the measurements is largely dependent on the homogeneity of the reflection properties within the sphere. It is important to keep sources of errors such as openings and adapters in the sphere to a minimum. The self-absorption of the test specimen is a key factor during analysis of LED modules and should be taken into account when measurements are taken.

There is a trend toward larger integrating spheres in order to minimize the defect area as a proportion of the interior area of the sphere. Whereas sphere diameters of 75 mm to 150 mm were adequate for conventional single LEDs, diameters of 250 to 500 mm are now recommended for High Power LEDs and LED clusters.

Instrument Systems GmbH
www.instrumentsystems.de

CIE PUBLICATIONS

Cognitive Colour

CIE 166:2005

This report surveys cognitive aspects of colour in terms of behavioural, neuropsychological, and neurophysiological data. Colour is usually defined as a colour stimulus or as perceived colour. In this report the concept of cognitive colour has been discussed in relation to colour categorization, colour coding, colour naming,

the Stroop effect, spatial organization of coloured visual objects, visual search, and colour memory.

The results show that there are aspects of colour that the CIE definitions of psychophysical and perceived colour do not cover, although it gives notes to some of them. These phenomena could be referred to as “cognitive colour” and they point to the need for a new formal definition of colour in the CIE terminology.

Cognitive colour is very important in certain specific tasks. A common property of these tasks is the importance of the economy of cognition of the human brain. It means that perceived colours are represented and stored in a compressed form i.e. as “cognitive colours”. This accelerates complex tasks like visual attention, visual search, figural organization, figural segregation, etc. For these tasks, colour appearance models alone, including the calculations recommended for assessing colour appearance and colour differences, may be limited for predicting how an observer will behave in these complex tasks. We must define cognitive colours by the boundaries of a continuous perceived colour set, or by a “representative item” of this set, and assign a name to the cognitive colour.

The final report from the CIE Reportership “Cognitive Aspects of Colour” was published with the title “Cognitive Color” in *Color Research and Application*, 29(1), pp. 7-19, 2004 and has been reprinted with the kind permission of John Wiley and Sons, Inc.

The report consists of 24 pages with 14 coloured figures.

Recommended Practice for Tabulating Spectral Data for use in Colour Computations

CIE 167:2005

This technical report describes several difficulties resulting from incompatibility of tables of spectral data used for computations, such as colour computations, with automatic digital computers, and provides guidance in tabulating spectral data to facilitate such applications. The recommended practices, with regard to spectral ranges, spectral intervals, etc., are based on the experience of members of the committee, who were experts in the field of colour measurement and computation.

The report is written in English, with a short summary in French and German. It consists of 21 pages with 3 figures and 12 tables.

Lighting of Outdoor Work Places

CIE Standard S 015/E:2005

To enable people to perform visual tasks efficiently and accurately, especially during the night, adequate and

appropriate lighting has to be provided. The degree of visibility and comfort required in a wide range of outdoor work places is governed by the type and duration of activity.

This standard specifies requirements for lighting of tasks in most outdoor work places and their associated areas in terms of quantity and quality of illumination. In addition recommendations are given for good lighting practice. All usual visual tasks are considered.

After the definitions of terms, the standard gives detailed information on lighting design criteria. Fifteen tables specify the lighting requirements for various areas, tasks and activities, and a short chapter recommends verification procedures. Following a bibliography, an extensive index of areas, tasks and activities facilitates consultation of the tables of the standard.

A further CIE Standard giving the specific requirements for safety and security in outdoor work places is to follow as CIE S 016/E:2005 shortly.

This standard has been prepared by a joint Technical Committee of the CIE Division 5 and CEN/TC 169 "Light and lighting" and approved by CIE National Committees. It may be obtained from the CIE National Committees or from the website of the Central Bureau of the CIE (www.cie.co.at). French and German versions are under preparation.

Lighting of Outdoor Work Places - Lighting Requirements for Safety and Security CIE Standard S 016/E:2005

To enable people to perform visual tasks efficiently and accurately, especially during the night, adequate and appropriate lighting has to be provided. The degree of visibility and comfort required in a wide range of outdoor work places is governed by the type and duration of activity.

This standard specifies the lighting requirements that will contribute to the visual needs for safety and security within outdoor work places.

This standard has been prepared by CIE Division 5 and should be read in conjunction with CIE S 015/E:2005 "Lighting of Outdoor Work Places". It has been approved by CIE National Committees. French and German versions are under preparation.

Photocarcinogenesis Action Spectrum (Non-Melanoma Skin Cancers) CIE Draft Standard DS 019.2/E:2005

Solar ultraviolet radiation is recognized as a major cause of non-melanoma skin cancer in man. Skin cancer occurs most frequently in the most heavily exposed areas and correlates with degree of outdoor exposure. Describing

the relationship of exposure (dose) to risk (skin cancer) requires the availability of a biological hazard function or *action spectrum* for photocarcinogenesis. This standard proposes the adoption of an action spectrum (weighting function) derived from experimental laboratory data and modified to estimate the non-melanoma tumor response in human skin. The experimental data are sufficient for estimating effectiveness down to about 250 nm, but experimental data are not sufficient for specifying effectiveness above 400 nm.

The draft standard has been sent to CIE National Committees for comments and sales to interested parties. It is still subject to changes and may not yet be referred to as a CIE Standard. When approved by the CIE National Committees, it will be published as a CIE Standard and later on eventually as a joint standard with ISO.

FORTHCOMING EVENTS

2nd CIE Expert Symposium on Measurement Uncertainty: Methods and models for analysis of uncertainties in optical radiation measurement June, 12 - 13 2006, Braunschweig, Germany

This symposium will be held in conjunction with the CIE Division 2 Meeting (14-17 June).

The goals of the symposium are to:

- provide guidance on techniques for the evaluation of uncertainties associated to values of photometric and radiometric quantities;
- present the latest developments relating to methods for assessment of uncertainties for values of quantities which are derived from spectral measurements;
- provide a forum for discussion of related effects such as correlation of data.

The meeting will be split into 2 parts; the first part (12 June) will include tutorial presentations with Invited Papers, while the second part (13 June) will be a Workshop with Contributed Papers.

The Tutorial Sessions will cover fundamentals for uncertainty evaluation, particularly for photometry and radiometry:

- Fundamentals of uncertainty analysis, including evaluation of standard uncertainty for both repeated measurements and other knowledge, degrees of freedom and expanded uncertainty;
- Modelling of measurements especially the development of measurement equations under the consideration of correlations and their use in uncertainty evaluation;
- Introduction to the work of CIE TC 2-43.

The Workshop Sessions will cover recent work related to uncertainty evaluation for optical radiation measurements.

A Call for Papers will be published shortly (check the Symposium website www.ptb.de/en/org/4/41/412/cie/cie.htm or contact CIE2006@PTB.de).

ISCC/CIE Expert Symposium 75 Years of the CIE Standard Colorimetric Observer

In 2006, both the CIE Standard Colorimetric Observer and the Inter-Society Color Council (ISCC) will observe their 75th Anniversaries. To celebrate the occasion, the ISCC and the Canadian National Committee of the CIE are hosting an Expert Symposium on the Standard Colorimetric Observer, May 16-17, 2006 at the National Research Council in Ottawa, Canada. The Symposium will anchor a week of events starting with the Annual Meeting of the ISCC and ending with meetings of CIE Division 1, "Vision and Colour."

The Standard Colorimetric Observer is ubiquitous when it comes to measuring, specifying and designing products that involve light and colour. Its use is so pervasive in everyday life that the Symposium will appeal to a wide range of professionals, from those who are responsible for colour and colour appearance to those who are research and development specialists in the area—just about anyone with an interest in colorimetry and colour measurement.

The goals of the Symposium are to recall the many advances that have been made since the introduction of the Standard Colorimetric Observer, to understand the current state of colorimetry and colour appearance, and to provide guidance on directions for future work. Specific topics will include:

- Standard Colorimetric Observer – past, present, and future
- Colour matching functions
- Colour appearance
- Temporal and spatial issues in colorimetry
- Colour differences and tolerances
- Colour management
- Instruments and standards

For more information, visit the Symposium website at <http://www.jubilee2006.org>.

2nd CIE Expert Symposium on Light and Health September 2006, Ottawa, Canada

The Symposium will be organized jointly by CIE Divisions 3 and 6, and will take place in Ottawa, Canada, in September 2006. Details are being clarified. Please check the CIE website (www.cie.co.at) for further news.

TECHNICAL PAPER

Experiencing Architectural Lighting in India

Sudeshna Mukhopadhyay

Introduction

With their intricate embellishments and exquisite architecture, Indian monuments represent one of the most prominent facets of the multi-faceted India. An architectural feat in itself, each monument is a strikingly splendid specimen of incredible artistry, shrouded in a sense of mystery, intrigue and romance. Be it the marvel in white marble of the spellbinding Taj Mahal; or the red stone splendour of the imposing Red Fort; or the magnificence of temple art in Southern Part of India, therein is evident the master craftsmanship and elegance, that brings to the fore the grandeur of a bygone era.

Lighting of such architectural Masterpieces, throws open various challenges to a designer. It is important not to disturb the daytime appearance of the Monuments and their surroundings and yet create a Lighting effect, which captivates nighttime viewers. More importantly, such lit up monuments are symbols of civic pride, and need to be handled with great sensitivity.

Indian architecture – Historical Background

India's history and culture is ancient and dynamic, spanning back to the beginning of human civilization. Beginning with a mysterious culture along the Indus River and in farming communities in the southern lands of India, the history of India is punctuated by constant integration with migrating peoples and with the diverse cultures that surround India. Placed in the centre of Asia, history in India is a crossroads of cultures from China to Europe. In India so many civilizations have flourished, it is logical that they would influence the country's architectural style. The most unique part about Indian architecture is the wide variance that it carries with it.

The Indian Architectural horizon can broadly be divided into

- Prehistoric
- Ancient
- Medieval
- Mughal
- Colonial
- Modern

The History of India begins with the birth of the Indus Valley Civilization in such sites as Mohenjo-Daro, Harappa, and Lothal, and the coming of the Aryans. The most prominent evidence of Prehistoric Architecture belongs to Harappa culture, remnants of which can be seen in Rajasthan and Gujarat. However such sites have not been lit and are still treated as "Study locations".

It is, from the **Ancient Era** (also known as the Golden Era) that architecture assumed its splendor when religious practices flourished and temples became the world's storehouse of knowledge and culture. The ancient temples were more than mere places of worship. The wondrous beauty of the monuments built in great empires of Ashoka, Maurayas, Guptas in North, Chalukayas, Cholas, and Pallavas in South, Pals and Sens in East still holds all in awe. Ancient Architecture is manifested mostly in Temples, with distinctive styles in the Northern and Southern part of India and in Buddhist Stupas mostly built during Ashoka's dynasty. Almost all Indian art has been religious, and almost all forms of artistic tradition have been deeply conservative.

The *Nagara* or Northern Style, which developed in the fifth century, is characterized by a beehive shaped tower called a *shikhara*, made up of layer upon layer of architectural elements.



From the seventh century the *Dravida* or Southern style has a pyramid shaped tower consisting, progressively of smaller storeys of small pavilions, a narrow throat, and a dome on the top also called a shikhara. The shikhara of the temples in South India tend to be made up of distinct

horizontal levels that diminish to form a rough pyramid. Each level is decorated with miniature temple rooftops. This stands on a square base. In the south elaborate gateways called *gopurams* led the devotees into the superstructures and are the most striking feature of the South Indian temple.



The **Medieval period** was an era of chivalry and feudalism. Varied in architectural style, the medieval temples provide a peek into the conglomerate society that was shaping in India. The architecture of these temples has a blend of many foreign countries from central Asia. The *Rajput* rulers in the North were prolific builders who left behind a legacy of some have the most imposing and magnificent forts and palaces in the world. Cities, towns and villages of Rajasthan - all had their forts and protective ramparts. It was customary to build the palace within the fort, outside which lay the city, enclosed within a rampart. In the west, the *Marathas* profusely built Forts and Caves, to protect them from invasion. Today they

stand silently, but these forts and palaces have not only been witness to changing times, they have also shaped them. Sikhs in Punjab and Hyder Ali and Tipu Sultan in Mysore were fragmented rulers in various parts of India. During this period the Mughals invaded India and built the great Mughal Empire, especially in the Northern Part.



Under the Mughals, India was the heart of a great Islamic empire and a prolific center of Islamic culture and learning. The Mughals provided the setting for a brilliant court and a vigorous cultural life. The Mughals lived and reigned in

India from 1526 to 1858 AD. This dynasty produced the finest and most elegant arts and architecture in the history of Muslim dynasties. The Mughal state was well aware of the declamatory power of architecture and used it as a means of self representation and an instrument of royalty. This era gifted to India very timeless monuments- palaces, mausoleums and forts including Taj Mahal, which attract travelers the world over.



The **Colonial Era**, beside the aura of sophistication of the west, brought with it the traditional European architectural styles. The British were much more concerned with the comfort aspect than with intricate designs, That's why most the monuments built by them usually carry a simple and sober look, when compared to the rest.



However, there were marvels also. The India Gate, Victoria Memorial in Calcutta, Churches of Old Goa, Rashtrapati Bhavan in Delhi, various museums all over India bear testament to the contribution of the British Raj in simplifying architecture.

Some examples of **Modern Indian Architecture** with their sheer beauty and architectural excellence stand out quite proudly and prominently along with the sophistication of the British or intricacies of Mughal architecture. They have a novelty that was somewhat missing in the previous eras.

Prominent examples are Bahai Temple in Delhi, Birla and Mahalaxmi Temple Temple in Delhi and Calcutta.



The Lighting Saga... Down the Memory lane

Needless to mention, not all Heritage Monuments are lit up during the night! Most of these monuments are now the property of Archeological Survey of India and the Tourism Department or the Public Works Department usually handle lighting projects.

However, Architectural Monument lighting in India is not new. Progressively over the past 35 years, various monuments have been lighted and even re-lighted. The tradition of lighting up monuments was initiated in the Northern part of India, logically for commercial reasons as Rajasthan and Delhi attracted more International visitors. In the last ten years, many of the Southern monuments are also being lighted up.

Lighting concepts and design attitudes underwent quite a change in the last 35 years. This, of course, is obvious with changes in Lamp and Luminaire Technology. Interestingly in India, Monument Lighting is quite representative of the dominant Technology of the period!

Lighting up of such monuments pose immense challenge to any Lighting Designer. Basically the location of luminaires is the main stumbling block, as fixing any luminaire on the surface of the building is considered sacrilege.

The bigger challenge lies post installation, as it is during maintenance that the aiming of the luminaires and subsequently lighting effects get disturbed!

Also there needs to be more planned renewal of Lighting. There is indeed a positive trend in India to expedite this. Since Tourism is the fastest growing Industry, Lighting is well leveraged to create more attractions.

1970 - 1980

Halogen and Incandescent was the most preferred Light Source for architectural Lighting in this period. Although, in the latter part of the decade some use of High Pressure Sodium vapor lamps are seen. Northern Indian Monuments use a lot of red sandstone or *Dholpur* stone, both warm in texture, and it was but natural to use such Light sources. Limited choice of optics available

in the Indian market then led to some compromises, although they were quite rich in visual composition and set the trend for Architectural Lighting in India. Popularity of such installations in those years, paved the way for future lighting projects.

Here are a few examples

Hawa Mahal- Jaipur



Built in 1799, by Maharaja Sawai Pratap Singh the 'Hawa Mahal', Palace of the Winds, is one of the major landmarks of Jaipur. It is an integral part of the City Palace, an extension of the Zenana (women's chambers)

standing away from the main complex. This five storey building of unusual architecture is a stunning example of Rajput artistry made of red and pink sand stone, beautifully outlined with white borders and motifs painted with quick lime. The monument with a spectacular view of Jaipur city with road avenues, intersections and colourful crowds in the market, was originally conceived with the aim of enabling ladies of the royal household to watch everyday life and royal processions in the city without being seen by others.



Albert Hall Museum



Just outside the walled city is the sprawling Ram Niwas Garden. The Majestic Albert Hall Museum occupies pride place situated as it is in the middle of the garden. Designed by Sir Swinton Jacob

it was opened in 1887 as a public museum. It contains a fine collection of sculptures, paintings, decorative art objects, natural history specimens, Egyptian history specimens, an Egyptian mummy and a celebrated Persian Garden Carpet.

1980-1990

This era saw interesting changes in Lightscape. Use of New Light sources like Metal Halides became popular in the later part. But more importantly, designers laid greater stress on the concept of luminous compositions by using different Light sources.





Lodi Tomb

About 3km to the west of Humayun's tomb and adjoining the India International Centre are the Lodhi Gardens. In these well-kept gardens are the tombs of Sayyid and Lodi rulers. Mohammed Shah's

tomb (1450) was a prototype for the later Mughal-style tomb of Humayun, a design that would eventually develop into the Taj Mahal. This monument was "floodlit" with High pressure Sodium Vapour Lamps in the early 80s.

Victoria Memorial

On the death of Queen Victoria in January 1901, Lord Curzon, who was then Viceroy of India, placed before the public the question of setting up a fitting memorial to the Queen. He suggested that the most suitable memorial would be a "stately", spacious, monumental and grand building surrounded by an exquisite garden. The princes and people of India responded generously to his appeal for funds and the total cost of construction of this monument amounting to one crore, five lakhs of rupees, was entirely derived from their voluntary subscriptions.

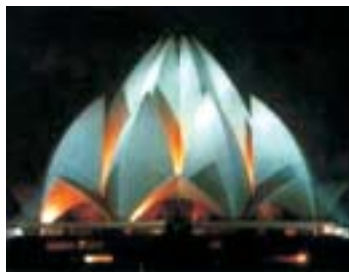


This impressive colonial structure was lit up in 1988 and won lot of acclaim in India and Internationally.

Well-balanced usage of Metal Halide lamps, Sodium Vapour, High-pressure mercury, halogen and incandescent PAR, made this installation a landmark, which is still appreciated by one and all.

Bahai Temple

Shaped like a half opened Lotus flower, this temple is made of marble, cement, dolomite and sand. It is open to all faiths and is an ideal place for meditation and



obtaining peace and tranquillity. The lotus flower signifies purity and peace, a representation of the Manifestation of God, to the people of India. This ancient symbol has been given a modern and contemporary form in the structure of the Bahai House of Worship. Metal Halide, Halogen and Sodium Vapour lamps have been used in this installation.

1990 - 2000 & beyond

In this period a distinctive design style evolved. New generation miniature light sources like Dichroic, Compact

Metal Halides were introduced in the Indian Market and these opened up new opportunities and consequently design ideas. From the traditional way of only general floodlighting, local lighting to accentuate articulate design details were successfully implemented. This was possible, as light-fitting sizes became smaller and it was much easier to conceal light fittings, without compromising daytime views.

Mahalaxmi Temple, Kolkata



An impressive Hindu temple built in the Modern era by noted Indian Industrialist family, the Goenkas is a place of religious worship and architectural marvel. There

is however a strong Influence of Ancient Northern architecture, with the Cithara. This temple is flood lit with Metal Halide Lamps and accents with Dichroic, Ceramic Discharge Metal halide lamps at closer vicinity.

Churchgate Station, Mumbai

This is a colonial structure and now houses the main Railway Station building in the Western city of Mumbai. Lit with combination of Metal Halide lamps, Incandescent, Dichroics and High-pressure Sodium Vapour lamps create interesting contrasts.



Maharaja Coochbehar Palace

This impressive Palace in eastern part of India judiciously combines general and local lighting. The Minarets at the Terrace levels are good example of Accent lighting



India Gate



At the centre of New Delhi stands the 42m high India Gate, an "Arc-de-Triomphe" like Archway in the middle of a crossroad. Almost similar to its French counterpart war memorial, it commemorates the 70,000 Indian soldiers who lost their lives fighting for the British Army during the First World War and bears the names of more than 13,516 British and Indian soldiers killed in the Northwestern Frontier in the Afghan war of 1919.

Another memorial, Amar Jawan Jyoti was added much later, after India got its independence. It is in the form of a flame that burns day and night under the arch to remind the nation of soldiers who laid down their lives in the Indo-Pakistan War of December 1971. The entire arch stands on a low base of red Bharatpur stone.

This monument was relit with different lighting effect in 1999 using High pressure sodium vapour lamps, mercury vapour, Halogen and linear fluorescent lamps

Lighting in the new millennium

Technology dominates!

Fibre Optics, Miniature Ceramic Discharge Lamps, LEDs fascinate the Lighting Designers. New Lighting Concepts are being tried out. It is, however, important to respect the history of the Monument, which is being lighted up.

Anandpur Sahib Gurdwara

Anandpur Sahib - the holy City of Bliss - is one of the most important sacred places of the Sikhs and is closely linked with their religious traditions and history. It is located on the lower spurs of the Himalayas surrounded by picturesque natural scenery, with the river Satluj forming a shimmering blue border on the south west. So far as the historical significance of Anandpur Sahib is concerned, it is second only to Amritsar, the city of Golden Temple.



This structure is interestingly lit with general floodlighting with Metal Halides and Fibre Optics for the domes.

Ajanta & Ellora Caves

These constitute one of the most beautiful expressions of the art of the Indian Middle Ages, and are designated as a UNESCO World Heritage Site. They are noteworthy, as three major Indian religions have laid joint claim to the caves peacefully since they were created. These breathtaking caves are definitely worth visiting for their remarkable reliefs, sculptures and architecture.



The Buddhist caves of Ajanta are situated 100km northeast of Ellora. These magnificent caves containing carvings that depict the life of Buddha have also been designated as a UNESCO World Heritage Site. They date

from around 200 B.C. and their carvings and sculptures are considered to be the beginning of classical Indian art.

The Lighting of these caves has two distinct parts. The Paintings have been lit with Fibre Optics, and the Stone carvings outside the painting gallery are lit with conventional lighting (dichroics, with additional glass filter)

Landscapes & Gardens

Gardens were a dominant feature in the Mughal Architecture. However these have not yet being lit in a planned manner



The world famous **Vrindavan Gardens** on the terrace of the Krishna Raja Sagar Dam, near the Mysore City, across the river Cauvery is a meticulously planned garden.

It was built in 1932 during the rule of Krishnaraja Wodeyar IV, who was a great lover of gardens and parks. The then Dewan or Prime Minister of the Maharaja, Sir Mirza Ismail, designed the enchanting garden.

This garden was lit in mid 80s with Bollards using Incandescent lamps. This also has a spectacular Musical Fountain, which remains the focal attraction point.

More recently some of the lavish gardens of **Ramoji Film City**, the only comprehensive Film City in India, with acres of Theme Gardens have been lit up. Professional designers, landscapists and architects have worked on this vast 2000-Acre complex to ensure that moviemakers can shoot in a picturesque Indian village or recreate a street in Switzerland! Filmmakers can choreograph a song and dance in any of the gardens and later change the appearance of the Gardens/Fountains, Streets, buildings etc, to give a totally different Locale impression! All are lit to a colourful lighting scheme!

The **Mughal Gardens** is reminiscent of the colourful History of the Mughals who ruled India in the pre British days. Mughal Architecture is typified with Minarets, fine Filigree work. Colours especially, Green and Red are used in abundance. The lighting scheme is coordinated with the changing fountain lights. There is provision of Sequenced light switching, which is generally used for Film background. All building structures are made of Fibre Glass and no luminaires can be mounted /fixed on to them in the filigreed sidewalls are lit with 12V 50W, Green and Red Dichroic Lamps. The Sloping Terraced Gardens are lit with Fluorescent Lamps in Weatherproof



Luminaires. Low Height Bollards shaped like a small pants line the pathway.



Drive now to the **Dream Valley**, with a 15 m Structure - Gateway as a backdrop. Pools of coloured shrubs are a great attraction to children. There is a “real” stream here which shimmers under light Walk across to the Japanese Gardens with Pagoda at its centre and light stream with various pebbles. No coloured Lights are used here and using dichroic lamps and Ceramic Discharge Metal Halide Lamps has created accents. A “make believe” stream has been created with light with even a bridge over it.

Glimpses of Son-et-Lumière Projects

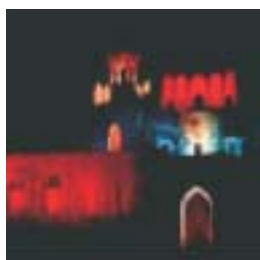
The Lighting Journey would not be complete, without the mention of various son-et-lumière projects, which have been implemented from way back in 1970’s and still continues to be a major spectacle in the Tourism map.



The hot seat of power of the sub-continent, the symbol of control, the **Red Fort** locally known as **Lal Qila** built of red Sandstone was built by the Mughal Emperor Shah Jahan.

India’s history is also closely linked with this fort. It was from its ramparts that the first Prime Minister of India, Pandit Jawharlal Nehru, announced to the nation that India was free from colonial rule. The light and sound show held in the evenings bring to life the important events which have marked the history of India.

Close to Red Fort is the historic **Purana Qila** or Old Fort, which has stood witness to Delhi’s rejuvenation, periods of anarchy, and the rise and fall of empires, is the venue for the spectacular sound and light show which brings alive the history of the capital.



Golconda Fort was built on a hill in 1143 AD and was strengthened and enlarged between 14th and 17th centuries. It has a chequered history with all the trappings of intrigue and murders. It has palaces, mosques, a hilltop pavilion and magnificent tombs. The fort is famous for its acoustics and ingenious water supply and drainage system.

The glorious past of Golconda Fort is narrated effectively with matchless sound and lighting effects. The unique sound and light show of unmatched quality and excellence at the Golconda Fort, Hyderabad



takes you back in time, when Golconda was full of life, glory and grandeur. It continues to draw large groups of tourists everyday and is rated as one of the *best son-et-lumières* shows in the country.

A Living Heritage of heroism: The Gwalior Fort Son-et-Lumière- For many decades now, the Fort of Gwalior has slumbered in silence, broken now and then by the patter of curious feet and awed tones. A multitude of reigning dynasties, of the great Rajput clans of the Pratiharas, Kacchwahas and Tomars have left indelible etchings of their rule in this city of palaces, temples and monuments. Come sundown, the deserted Fort is once again left with only memories for company. But now it comes alive every night. Well remembered incidents, and well-loved voices once more echo through its lonely corridors and its dark and sad facade now glows with the colours of life. Red-gold, blue-green lights illuminate every nook and cranny of the superbly tiled ‘Man Mandir’. The Sound and Light show at the Man Mandir Palace of Gwalior Fort gives you a glimpse into its glorious past.



There are many more monuments which have been lit or under active consideration now It will be beyond the scope of this article to include all. Quite a few Lighting installations are in progress in many places in India, with experimentation in use of colours. Today LEDs is an emerging technology area and is bound to find applications in creating a new dimension in Architectural Lighting.

References

- Philips Lighting Archives
- Historical Reference from various Internet Sites of India Tourism

Acknowledgements & Disclaimer

- Photographs of Lighting Installations shown here are from Philips Lighting India
- Archives, and have been designed by the Philips Lighting Design team thru the years. *By no means, all such installations are representative of author’s work.*
- Various Monuments are under active consideration of Lighting Renewal and some projects are under

progress. The Renewed Lighting effect may substantially differ from what is shown here.

- The Fibre Optics Lighting in Ajanta Caves, referred in the article, is not a Philips Installation.

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Son-et-Lumière Show at Sankaradeva Kalakshetra in Guwahati

Lalit Mehta

Introduction

One stormy evening in France, a man saw a castle stand out against the dark sky as it was lit by a flash of lightning and in those seconds he saw the castle come to life, transformed from mere cold stone into a glowing entity. And out of this magical revelation grew the modern *son-et-lumière* (sound and light in French) concept where the drama of historical sites and events are recreated through sound and light at a variety of locations across the world.

The installation of a sound and light spectacle is obviously a complicated business, requiring the services of specialists across several disciplines. For nearly 40 to 45 minutes or so the humdrum present will be forgotten under the spell of the past.

The basic ingredients of *son-et-lumière* are just Sound and Light. No live actors take part; just their recorded voices are heard. The audio and the visual effects are skillfully combined, so that it gives a spectacular impression to the audience.

The presentation of a sound and light spectacle involves the use of techniques similar to those of filmmaking. A considerable amount of time is spent on perfecting a script in which glimpses of the historical background of the monument are incorporated in a dramatic way. The sound including mono, stereo effects, traveling effects are inter woven with the lighting to render lifelike special effects like flow of water, fire, moving train, war, thunder and lightning etc.

Carefully sited outdoor speakers and lighting units convey all the audio and visual effects to the audience. This is normally blended into the surroundings so as to be inconspicuous during the daytime. The camouflaging of the lighting units, junction boxes, sound columns etc is done to suit the surroundings.

The light and sound source is centrally connected to a control unit, which is automatic. It is comprised of computer based control equipment, solid-state multi track recorder, amplifiers and dimmers to control lighting circuits and speakers.

Organization for Installation of Sound and Light Spectacle

The installation of sound and light spectacle requires services of several specialists.

The Script Writer: writes the story with sequences of events which are intended to be conveyed to the public by the son-et-lumiere show. He has to study the history of monuments and has to bring about the story spanning 200 to 300 years in 40 to 45 minutes with the most important events in an interesting manner to the public. This is usually done through a narrator with dramatic sequences and music interspersed in the narrative.

The Art Director: co-ordinates with the script writer, recordist in studio, technical wing of sound and light spectacle and the client.

The artistic impression of the entire spectacle is his responsibility. The Art Director is generally a person experienced in television, film, or drama production. He also liaises with the technical and execution team for the installation of the spectacle.

On finalization of script, for which he is also responsible, he selects the narrator and other voices for dialogues. He also selects the music director and sound effects, drama portions, music songs etc that are recorded on different tracks of recorder in a professional studio. The art director decides the location of speakers in consultation with the technical team based on the events happening at different parts of monument, as per the script. The mixing of the sound recording in the professional studio is also carried out by the art director during which the technical team is present.

The final programming of the show is carried out at site to synchronize the sound and light effects to perfect the results as visualized by the Art Director.



The Technical Team: The technical team decides the location of control room and spectators gallery in consultation with the Art Director. The control room location is selected in such a way that the cable lengths for lighting circuits and sound speakers are minimized so that maintenance is easy. The spectators gallery is located in such a manner that most of the monument is visible to all the audience.

The lighting layout drawing with the details of lighting circuits and control room equipment layout drawing are prepared by the technical team. The additional lighting effects are incorporated by the team in consultation with the art director. The outdoor installation of luminaires, sound columns, junction boxes laying of cables etc and indoor installation of control room equipment such as amplifier rack, dimmer rack hard disc recorder, computer, voltage stabilizer etc is carried out by the technical team.

Role of the Client

The Client has to co-ordinate with the Art Director, technical team and approving authorities for civil construction at site, joint site visits, booking of studio, and programming of show etc. The approval of script of the show is obtained by the client from the appropriate authority.

Project Details

Recently commissioned was the son-et-lumière project at Sankaradeva Kalakshetra in Assam titled "Assam Through the Ages" for the Assam Tourism Development Corporation. It was a great challenge to put up such a show at Kalakshetra, since there was no monument, no building or fort, nothing except a hillock with trees and bushes. "Assam through ages" has been designed to give an insight into the history and rich culture of Assam.

The script encompasses the mythology and history of ancient Kamrupa, dwelling on the tale of king Bhagadatta, the advent of first Ahom king Sukafa. Sankaradeva and formation of greater Assamese society through the neo-vaishnavite movement, the end of the Ahom reign, British rule and the freedom struggle.

It was not possible to have a son-et-lumière show by lighting the bushes, trees and the hillock. The entire team agreed and the client constructed replicas of Rang Ghar, Kamakhya Gate at the starting point of the Mhela Uzuwa path, fort wall of the Agni Ghar in Tezpur, a Chang Ghar, a hut with a man and a woman wearing traditional Assamese attire, the Naam Ghar, Ashoka Chakra and a lion, symbolizing the British age in India, on picturesque sites inside the Sankaradeva Kalakshetra.

The Sutradhar is the main Narrator relating the story of "Assam through Ages" and the mighty Brahmaputra river follows the journey from mythological times to the present day. The show is 40 minutes long.

The original script was written by the Late Dr. Bhabendranath Saikia and the Advisor for Lighting Design was Mr. Tapas Sen. The narration was by Mr. Victor Banerjee and the Programming and commissioning by Mr. P.V. Mavinkurve, Mr. S. Roy Chowdhury and Mr. Rajesh Ghosh Choudhury of Bajaj Electricals.

Control Room

The control room is located in the vicinity of the area where the show is held. This is the heart of son-et-lumière show since all the control equipment is installed and wired in this room. The control room is air conditioned and two double doors are provided so that the dust from outside does not enter.

The Main Power Receiving and Distribution Panel (MPRDP) is installed in the room and 415 V, 3 phase, 50 Hz uninterrupted power supply to this board is provided by the client. Various feeders of this board are connected to dimmer rack, amplifier rack, control room lighting etc. From this board cables are laid underground to various lighting circuits and outdoor sound speakers. The maximum electrical load at any particular instant is approximately 80 KW.

Son-et-lumière Control Equipment

The control software equipment is heart of Son-et-Lumière show. The control unit consists of solid state hard disc multi track recorder, computer based control equipment amplifiers, light dimmers and MPRDP to control lighting circuits and monitor speakers.

The system consists of an IBM PC compatible and controlled hardware – software blended integrated solution employing state-of-art technology in line with current global trends. The Controlling Software for the system is programmed for the different scenes of the show and then synchronised with the sound track through a sync encoder-decoder device. The sound from the Digital Multi-track Source or Playback Mechanism on the starting cue flows through the Power Amplifiers and Equalisers to the various installed sound projectors. The Main Electric Power received at the control-room is distributed through the MPRDP through a line conditioner to different solid state switching devices, which in turn control the various installed light sources according to the instructions of the control computer. The Control computer through its ISA Control Card Interphase and DMX Encoder-Decoder control the switching devices through DMX-512 Control Signals. Thus, finally all that is left for an operator to do for the every day running of the show is to Switch on the main power supply and the computer and start playing the sound source. All the other activities are automatically taken care of by the system including checking up the system and diagnostics of faults, if any.

Lighting System

Since the lighting variation/intensity is controlled through dimmers, incandescent lamps such as comptalux, GLS or halogen only were used. The front glass of the luminaires is suitably covered by colour filters to obtain colour effects. These luminaires are housed in a sheet steel enclosure and painted to suit surrounding area for mechanical protection and for aesthetics reason respectively. The luminaires in different enclosures are aimed in such a manner that the spill of light is minimized and to get the colour effect required. This installation was completed by the time the art director completed mixing of sound in the professional studio and programming was carried out by the technical team at site.

There are 102 lighting circuits with various combinations of floodlights with halogen lamps of 500/1000 W, comptalux lamps with 100/150 W, Par lamps of 300W distributed in dimmer channels. We have used 104 flood lights with halogen lamps and 80 flood lights with comptalux lamps. The floodlight batteries are camouflaged in suitably designed sheet steel housings so that daytime visitors to the Kalakshetra site hardly notice their presence. Depending on the scene being enacted, the lamps with different colours in the various light circuits are fed through dimmer units. The dimmer units themselves are controlled to deliver light outputs from 15 % to 100 % in the number of seconds as required the dialogue in the sequence. This ensures the smooth switching on and off of the lighting circuit with the start and end of dialogue.

Author

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NEWS ABOUT MEMBERS

Mr. Dilip Kumbhat at Lighting Expo



Mr. Dilip Kumbhat at his stall at the International Lighting Expo in New York in April 2005

Educational Activities of Mr. Anil Valia



Mr. Valia at Tianjin University

Mr. Anil Valia, founder member and Ex Vice President of ISLE is recognised internationally for his activities in the Educational field.

Mr. Valia was recently invited by IIR to conduct a four hours Workshop (Master Class) on Practical Aspects of Lighting during the CALM Conference and Exhibition in Beijing China from 1st - 3rd June 2005.

Mr. Valia was invited by Dr. Aiying Wang, Architecture School of Tianjin University, China on 3rd June 05 where he delivered a lecture on City Beautification with Lighting to the students of Interior Design where they have taken Illumination as an elective subject. Incidentally Dr. Aiying Wang is a colleague of Mr. Valia on the CIE Mailing List on Education.

Mr. Valia was also invited to deliver a lecture on LEDs Lighting during PALA International Conference 2005 at Singapore on 13th July 2005.

Members will recall that in 2002 Mr. Valia published *Designing with Light - A Lighting Handbook*. He also runs training courses that are accepted as part of continuing education programmes.

In 2003 Mr. Valia was invited by European Lighting Designers Association (ELDA) to present a paper on Lighting Education in Developing Countries during EuroLuce in Milan. His suggestion on need for Training the Teachers has taken up by ELDA on a priority basis. His paper on Lighting Education in Developing Countries was on the website of Lighting.com.

Mr. Valia's paper titled Certificate Course on Energy Management in Lighting (Proposed - Equivalent to 8 Credits) was accepted as a poster paper by Right Light 6 - The 6th International Conference On Energy Efficient Lighting, Group 1: Implementing Quality and Efficiency (Education Programmes), held in Shanghai from May 9 - 11, 2005. The full text of the paper is available on CD from RL6.

Baby powder to future light source

Zinc oxide in powder form is one of the important and well known ingredients of baby powder. In crystalline form it promises, according to David Look and his colleagues at Wright State University and Wright Patterson Air force Base, to be a future light source. It can, according to them, be a suitable material for LEDs. In fact it is a better material, in their opinion, than gallium nitride as it is less expensive and safer to handle.

But there are problems in using zinc oxide for LEDs. LEDs are basically p-n junction devices and require p-type and n-type of semiconductor materials. The technology for n-type of crystalline zinc oxide is well known, but not for p-type of zinc oxide. Researchers have to find a way of making p-type zinc oxide. David Look and his colleagues are actively working on this problem, and they believe that the obstacles can be overcome and that the fundamental advantages of zinc oxide will win out.

An additional development in this connection is that Prof. Masashi Kawasaki of Thohoku University made the first blue light emitting LED with low-cost zinc oxide in December 2004. Hopefully zinc oxide LEDs will be in the market soon.

Light Therapy in Heart Disease

Miravant Medical Technologies and Guidant Corp. in USA entered into a collaboration to develop a device for light and drug therapy for vulnerable plaque in the wall of an artery, a high risk condition for heart attack.

Light and drug therapy consists of injecting a drug into the blood stream and activating it by light of specific wavelength through a light-emitting catheter. The drug converts the light energy into chemical energy which induces the cells of the plaque into apoptosis, a natural process of cell death, and clears the artery.

Hopefully the collaboration between Miravant Medical Technologies and Guidant Corp.

will lead to a device for treatment of vulnerable plaque after the necessary clinical tests and regulatory procedures. This will be another example of the use of light in medical application.

V.D.P. Sastri

WEBWATCH

PIER Lighting Research Program

The California Energy Commission's PIER Lighting Research Program (LRP) is a two-year R&D program focused on developing and introducing new energy efficient lighting technologies into the marketplace.

The goal of the LRP is to create new lighting technologies and products that can save energy, reduce peak demand, and reduce air pollution for the citizens of California. The program includes 15 research and 3 market

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<p>Kaoru Mende lighting designer of the Tokyo International Forum, Tower of Winds Frankfurt Opera House</p>	<p>Gert Hof lighting spectaculars at Acropolis 1000th Anniversary- Budapest Millennium celebrations-Beijing</p>
<p>Dave Irvine Halliday a pioneer of rural lighting with solar powered LEDs</p>	<p>Behr Champana the futuristic planner for "tomorrow's world"</p>

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connection projects, and spans both the residential and commercial sectors, as well as outdoor lighting associated with buildings.

The LRP integrates activities with lighting product manufacturers, and has leveraged cofunding from these manufacturers. The manufacturers provide a great asset for the introduction of these products into the market, and further benefits will be realized because the program results are publicly available.

Read full story here: <http://www.archenergy.com/lrp/index.htm>

Elevator Study Demonstrates Possibilities with LEDs

Low-profile LED luminaires have proven to be a viable option for elevators in a study conducted by the Lighting Research Center.

They could effectively replace many of the incandescent downlights currently used in elevators throughout the U.S.

Researchers at the LRC discovered that LEDs offered a 45 percent energy efficiency over incandescents in an elevator on the Rensselaer Polytechnic Institute campus.

Full story here: <http://www.lighting.com/content.cfm?id=1384&sid=9&page=/>

Superluminescent LED allows early dental diagnosis

21 July 2005

Dentists using a new imaging technique that incorporates an InP-based superluminescent LED say that they can now detect tooth-related problems before they show up on an X-ray.

A medical imaging technique that uses an InP-based superluminescent LED (SLED) is being used by dentists to detect teeth in the early stages of disease.

Full story here: <http://compoundsemiconductor.net/articles/news/9/7/13/1?rss=2.0>

Light bulb that lasts more than a decade

The bulbs in lamps on the streets of Dutch town Ede will not have to be changed for 12 years, thanks to a new type of lighting technology.

The town has put up the first street lamps that use light-emitting diodes (LEDs), which last four times longer than normal street lighting.

With 50,000 light hours, LED lamps do not have to be changed for 12 years when lit for an average 11 to 12 hours a day.

Full story on CNN here: http://www.cnn.com/2005/TECH/07/18/spark.light.reut/index.html?section=cnn_latest

Lighting Research Center Begins Study on Fluorescent Dimming Systems

Two months ago, the Rensselaer Polytechnic Institute's Lighting Research Center (LRC) in Troy, NY, embarked on one of the largest independent studies of fluorescent dimming systems to date. Spanning over the next 3 to 5 years, the life test will investigate the performance of linear fluorescent lamps on dimming ballasts - totaling more than 850 dimming systems in all. The hope is to glean information and provide insight into design criteria for the compatibility and reliability of fluorescent dimming systems, which can be used by manufacturers to develop improved products for controlling lighting and electrical loads.

Read full story here: <http://www.buildings.com/Articles/detail.asp?ArticleID=2668>

and here: <http://www.lrc.rpi.edu/resources/news/enews/Jul05/general260.html>

Anool Mahidharia

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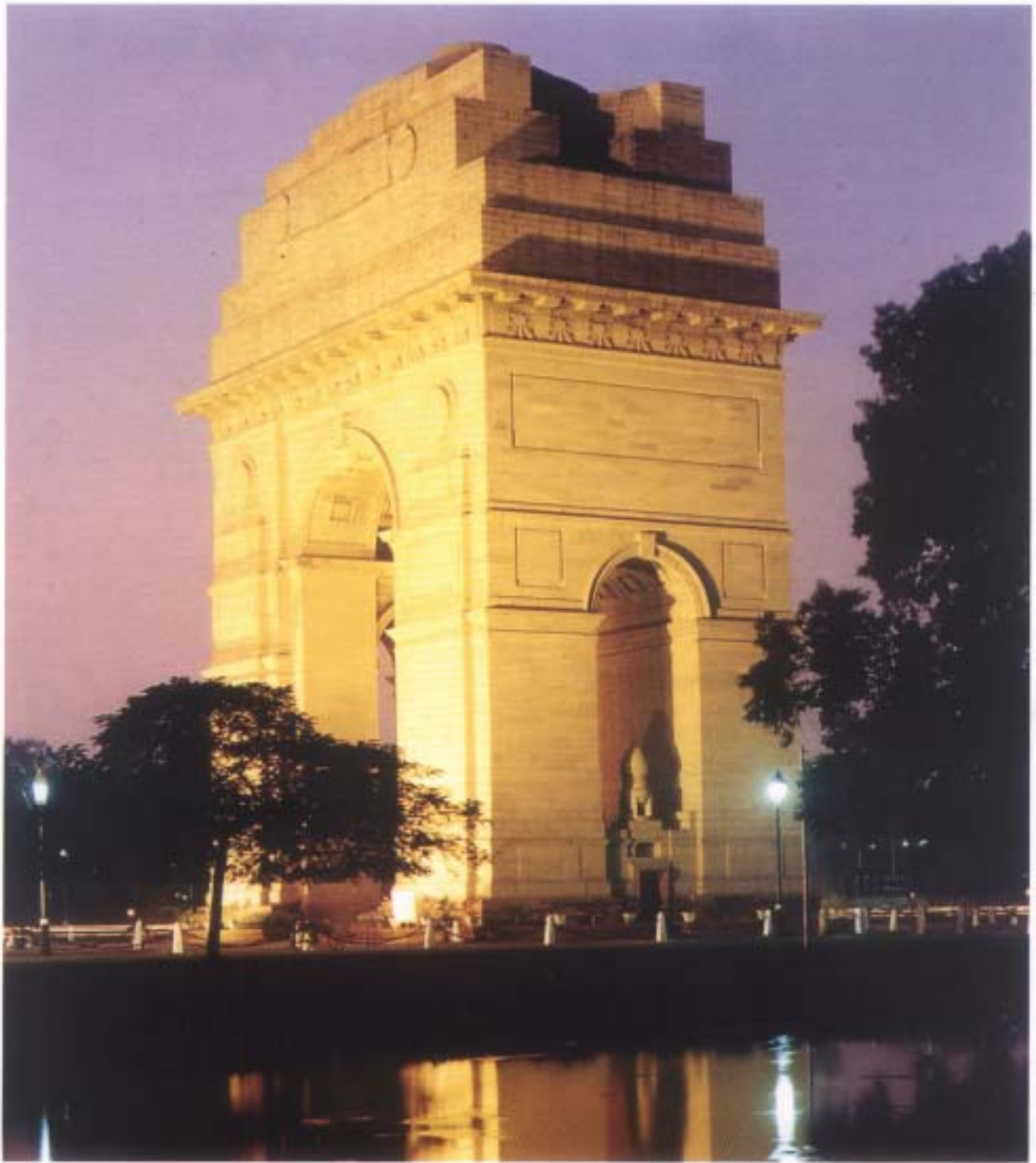


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