



LIGHT

the official

NEWSLETTER

of the indian society of lighting engineers

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FROM THE PRESIDENT'S DESK

With the formal release of the National Lighting Code on January 27 in Delhi, we have a comprehensive document to guide users to good lighting practice. However, just having created this document is not enough. Our responsibility as a Society goes further. We need to be proactive in disseminating the knowledge in this document so that it actually translates into action for the public good.

To this end I am happy to inform you that BIS has plans to organise seminars on the subject at different locations in the country in the course of this year. ISLE will join hands with them to ensure the success of this initiative. As Dr. Mathur of BEE said at the NLC launch, we in India have a unique opportunity to ensure a sustainable future as 70% of the buildings that will be there in 2030 have yet to be built and these can incorporate the best practices available.

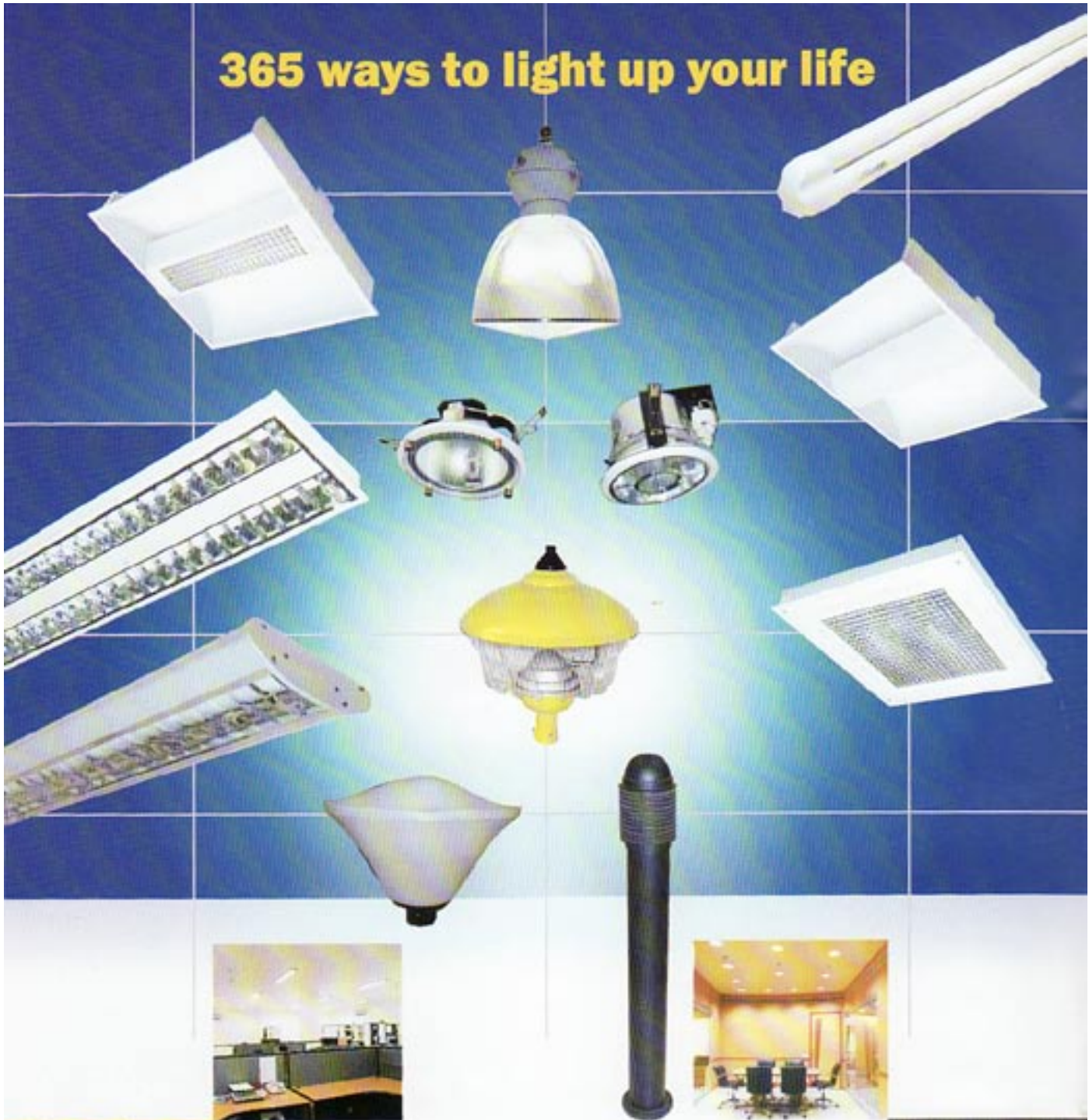
The success of the LRC Courses held at Chennai and Mumbai underscores the need for professional training in lighting. The response of the participants as well as of the cosponsors, BEE has been extremely positive and it is hoped that we will be able to hold more such programmes in the coming years.

In November the Governing Body approved the upgradation of Indore Local Centre to a fully fledged State Centre. We welcome the enthusiastic and energetic MP State Centre into our growing organisation.

The Silver Jubilee celebration of the Mumbai State Centre was held in December and that of the Kolkata State Centre at the end of January.

The next big event on the ISLE calendar is just around the corner, the Lii2011 International Exhibition and Conference at Chennai from March 4 to 7. While it has been necessary to call off the International Conference (Sustainable Lighting – Smarter, Elegant and Energy

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Effective) due to unavoidable circumstances, the event promises to be a great success.

As this is the first time that a lighting event on this scale is being held in southern India, ISLE members should make it a point to attend and I do look forward to seeing many of you at Lii2011 in March.

Avinash D. Kulkarni
President
dradk@hotmail.com

EDITORIAL

Though it is unfortunate that the Lii2011 International Conference has had to be cancelled for unforeseen circumstances, we have received permission from some of the authors to publish their papers in the newsletter which will enrich the content. In this issue we are carrying the papers by Dr. Warren Julian, Emeritus Professor, Faculty of Architecture, Design and Planning at the University of Sydney and Dr. Martine Knoop, Lighting Application Specialist, Philips Netherlands and Chair of CIE TC3-50.

There is a brief report on the launch of the long awaited National Lighting Code which is now available for sale. Many ISLE members have worked hard over a long period of time on this document and we express our gratitude to them for this important document.

This issue carries reports of the very successful courses conducted by the Lighting Research Centre at Chennai and Mumbai. The courses were well attended and greatly appreciated and will hopefully result in enhanced collaboration between LRC and ISLE.

There are reports on activities from all the State Centres including the new MP State Centre. To supplement the technical tour organised by Delhi State Centre, we have included photographs of the lighting for some of the sports facilities for the Commonwealth Games.

H.S. Mamak
Editor

OBITUARY

Sajjan Gupta 1938-2010

It is with deep regret that we announce the passing away of one of the earliest ISLE members, Mr. Sajjan Gupta on October 25, 2010 in Mumbai.

An active Fellow member of ISLE, Mr. Gupta was elected to the Governing Body



Young Sajjan Gupta in the sixties

of the Society for successive terms and held the post of Treasurer from 1991 to 2003.

Mr. Gupta began his career at Bajaj Electricals (and its sister company Hind Rectifiers) where he worked for 15 years. In 1972 he founded the Konark Group and set up his first luminaire manufacturing facility. Over the years he progressed to become one of the leading manufacturers of HID luminaires specialising in road lighting and accessories.

A firm believer in quality, in 1995 Mr. Sajjan Gupta worked towards acquiring ISO certification and his organisation was among the first to take ISO 9001, ISO14001, UL, CSA, SAB and CE certifications. He was also a recipient of the Ramakrishna Bajaj National Quality Award for 2003-2004.

He gradually extended his activities to other fields as well – testing and calibration laboratory, the herbal industry, bioremediation and water treatment. By 2010 the Konark Group had 10 manufacturing locations in Himachal, Tarapore and Daman.

In addition to his many professional activities, Mr. Gupta was committed to social work and philanthropy. An enlightened employer, he ensured access to free medical treatment to all his employees.

He was the Committee Head for the Rotary polio eradication programme for many years. He was also active in Mahavir International for philanthropic activity. He set up medical centres in Himachal Pradesh and Mumbai for the needy and established and maintained a school in Rajasthan.



Sajjan and Gayatri Gupta at the Ajanta caves in 1973

He took an active part in the early international activities of ISLE and was on the Organising Committee of Prakash 95, the 1995 CIE Session, Prakash 99, Lux Pacifica 2002 and Lii2002.

Sajjan Gupta is survived by his wife Gayatri, a son Rakesh and a daughter Rajni. In their bereavement all of us at ISLE share their grief.

ISLE ACTIVITY



March 4-7, 2011 Chennai

We are now just weeks away from the next international event being organised by ISLE. The Lii2011 Exhibition at the Chennai Trade Centre in Chennai is shaping up to be a landmark event. Even now there is still a little space available at the exhibition. For those interested immediately get in touch with

Mr. R. Balasubramanian
Hon. Secretary
ISLE Chennai State Centre
Mobile No: 91 9840055645
balu@Lii2011.in

Mr. S. Raghavan
Advisor, ISLE
Mobile No: 91 9790974048
Sraghavan@Lii2011.in

Launch of National Lighting Code

The launch of the long awaited National Lighting Code was held at the BIS Auditorium on January 27, 2011 in the presence of members of ET24, invitees and the electronic and print media.

Mr. Alinda Chandra, Additional Director General BIS gave the welcome address. He thanked ISLE and Chairman ET 24, Mr. P.K. Bandyopadhyay for the help given to BIS



Messrs. P.K. Bandyopadhyay, Ajay Mathur, Rajiv Agarwal, Alinda Chandra and P.K. Gambhir

in compiling and subsequently editing the NLC and making it print ready. Dr. Ajay Mathur, Director General BEE and Chairman of the Divisional Council of BIS addressed the audience highlighting the significance of the document. Mr. Rajiv Agarwal, Secretary, Department of Consumer Affairs, Government of India gave the Inaugural Address stressing the importance of the NLC as an essential and much needed guide for all consumers of lighting. He then formally released the National Lighting Code.



Mr. P.K. Bandyopadhyay, Chairman ET24 and former President of ISLE thanked all those who helped compile the NLC some of whom were present. He thanked Mr. Alinda Chandra Addl. DG and Mr. P.K. Mukherjee former Dy. DG of BIS for their help in making this important document into a reality.



Mr. P.K. Bandyopadhyay addressing the audience

The vote of thanks was given by Mr. P.K. Gambhir, Sc G (Tech) BIS.

The launch was followed by high tea.

KOLKATA STATE CENTRE

Technical Programme

May 25, 2010, Kolkata

A programme was organised at the CPWD Employees Institute, Nizam Palace, Kolkata. Dr. Indranil Saha, Asst. Professor, Calcutta Medical College Hospital gave a presentation on 'The Effect of Light on Human Beings'.

Technical Programme

August 27, 2010, Kolkata

A programme was organised at the Seminar Hall of Electrical Engg. Deptt, Jadavpur University, Kolkata. Mr. R.N. Palai, General Manager Testing, Operation & Maintenance of BSNL, Kolkata gave a presentation on 'Application of Laser'

Technical Programme

November 09, 2010, Kolkata

A programme was organised at the R.N. Mukherjee Hall of Institution of Engineers, Kolkata. Mrs. Kamalika Ghosh, Faculty, Electrical Engg. Deptt. Jadavpur University gave a presentation on 'Light and Plants'. The presentation was organised before the 22nd AGM of ISLE, Kolkata.

Annual General Meeting

November 09, 2010, Kolkata

The 22nd Annual General Meeting of ISLE, Kolkata was held at the R.N Mukherjee Hall of Institution of Engineers, Kolkata. Apart from the usual business, detailed discussions were held for organising a special programme to celebrate the Silver Jubilee of ISLE. It was decided to hold the programme by the end of January 2011.

Silver Jubilee Celebration

January 29, 2011, Kolkata

The Kolkata State Centre celebrated the Silver Jubilee of ISLE on 29th January, 2011 at the newly constructed Gandhi Bhavan Auditorium at Jadavpur University Campus.

Though the inauguration of the Silver Jubilee year was organised in January, 2010, the final mega event was in continuation of year-long series of celebration activities.

The full day programme which was very eventful had both technical sessions and display of products by reputed organisations. This was followed by a cultural programme in the evening.

The function was graced by eminent dignitaries like Prof. P.N. Ghosh, VC Jadavpur University, Prof. S. Sengupta, and VC WBU, Mr. S.P. Gan Chowdhury,



Mr. Prakash Chatterjee honouring Prof. S.R. Bandyopadhyay

Managing Director, West Bengal Green Energy Development Corporation and Mr. J.P. Agarwal, a distinguished Architect.

The above delegates as well as Past Chairman and Secretaries of Kolkata State Centre were felicitated with presentation of floral bouquets and mementos. This was followed by the lighting of the ceremonial Mangal Deep by the dignitaries and distinguished guests.

Mr. P. K. Chatterjee, Chairman, Kolkata State Centre welcomed the dignitaries on the dais. During his welcome speech he thanked the distinguished guests and members of ISLE Kolkata State Centre for the contribution they had made for the growth and success of the State Centre in all its activities. This was followed by the addresses of all the dignitaries.

Earlier, during registration, special metallic badges made especially for the occasion were tagged on all the members of ISLE to commemorate the Silver Jubilee Celebration.

During the technical presentation session, product and paper presentations were made on Lighting and electrical equipment by various organisations.

The Technical Session was followed by a musical programme presented by an amateur group from Jadavpur University.



Technical product demo in progress

The Silver Jubilee celebration wound up with a mesmerising choreographic presentation by none other than the illustrious danseuse and actress Shrimati Mamata Shankar along with her glorious Ballet Troupe.



Mamata Shankar Ballet Troupe

Secretary, Kolkata State Centre, Mr. A.K. Daschowdhury, proposed a vote of thanks to all those present on the occasion. This was followed by a stately dinner for all the Kolkata State Centre members and their families along with guests.

DELHI STATE CENTRE

Technical Tour

November 26, 2011, New Delhi



Jawaharlal Nehru Stadium

ISLE, Delhi State Centre had organised a very special technical tour on Friday 26th November from 6 to 10 p.m. to show the excellent lighting work done by CPWD in the Jawaharlal Nehru Stadium and Indira Gandhi Indoor Stadium. This was attended by GB members as well as DSC ISLE members who had come in large numbers.

The participants were welcomed at JN Stadium by Mr. A.K. Jain, Chairman Delhi State Centre. Mr. Sandeep Mehta SE and Mr. Vivek Gupta Ex.En. of CPWD gave a detailed technical rundown of the lighting installations. Questions were answered by Mr. M.K. Ganguli of CES.

Jawaharlal Nehru Stadium hosted the 2010 Delhi Commonwealth Games opening ceremony as well as the closing ceremony. While the flood lighting has been done with 2kW luminaires to light up the arena, the 'Inverted V' columns have been lit up by colour changing LED lights. White lights are placed at the top of the ring, where the

'inverted V' members meet giving it a form of a 'jewel in the crown'.

CPWD had organised light refreshments in the stadium for the guests.

From here guests were transferred in a special bus organised for the occasion to the Indira Gandhi Indoor Stadium where the Director General of CPWD, Mr. S.K. Mandal joined the technical tour. This venue has three stadiums located within it. The main one hosted the Volleyball, Badminton and Gymnastics, while the other two hosted the Cycling and Wrestling events (see page 16).

There was a lot of enthusiasm among the participants who asked many questions from the experts from CPWD, the Consultant from CES and the lighting suppliers who were present there till the end of the programme.

The tour was concluded with Dinner on the lawns of Stadium.

Technical Lecture

January 11, 2011

Delhi State Centre kicked off the new year by organising a lecture by Mr. David Gasser of Tridonic; 'LED is more than a light source'. Mr. Gasser is the Lead Trainer of the Tridonic Sales Academy and is also part of their Global Cooperation Management - Controls.

LED lighting serves the lighting market by better and more efficient lighting solutions. As the title of the talk indicates Mr. Gasser explained that the LED is really a system rather than a light source where issues like thermal management are very important. The fixture that houses the LED is another level of the system. He pointed out the importance for the technical needs to be scaled to the application being considered. He ran the audience through the initiatives of Zhaga, an industry wide consortium which consists of manufacturers of light engines, luminaires and components (heat sink, optics etc.). The objectives of Zhaga include the promotion of the application of LEDs for general illumination, defining stable design platforms for luminaire makers by standardisation of interfaces, preventing fragmentation into a large number of incompatible light engines, stimulating market growth by fostering competition and reducing development cost of lighting applications.

The Chief Guest was Mr. C.S. Prasad, Director General CPWD. After the lecture Mr. Prasad gave his reflections on the subject and made several interesting observations.

Mr. Sudesh Gupta, Secretary Delhi State Centre gave the vote of thanks. The meeting was followed by cocktails and dinner sponsored by Tridonic Atco.

MUMBAI STATE CENTRE

Annual General Meeting

December 08, 2010, Mumbai

The Annual General Body Meeting of Mumbai State Centre was held on 08.12.2010 at Jade Garden, Worli, Mumbai. Points as per the Agenda were discussed. It was announced that the website of Mumbai State Centre www.isle-msc.org had been recently launched. Members suggested that an exhibition of Lamps be organised. As a mark of respect to the memory of Mr. Sajjan Gupta, former Hon. Treasurer of ISLE and Mumbai State Centre 2 minutes silence was observed. The AGM was immediately followed by the ISLE Silver Jubilee Celebration and evening of cultural entertainment attended by members along with their spouses and guests.

Silver Jubilee Celebration

December 8, 2010

ISLE Silver Jubilee Celebration and evening of cultural entertainment by Mumbai State Centre was organised on 8th December 2010 at Jade Garden, Mumbai. The Chairman, Dr. Prakash Barjatia welcomed the gathering of over hundred guests including members and their spouses who joined the celebration. He then welcomed on the dais, the Chief Guest Mr. R. Ramakrishnan, Executive Director, Bajaj Electricals; Dr. Avinash Kulkarni, President ISLE; Ar. Rohini Mani, ISLE GB Member, who were presented with floral bouquets. Mr. Amal Auddy, Hon. Treasurer ISLE MSC, introduced Mr. R. Ramakrishnan to the gathering. Dr. A.D. Kulkarni gave the inaugural address and spoke about the achievements of ISLE in the last twenty five years. The cultural entertainment programme then commenced with a prayer dance followed by a colorful presentation of folk dances from the western region of India by the Komal Shah Entertainment Group.



Mr. R. Ramakrishnan, Mr. A. Auddy, Dr. P.C. Barjatia and Mr. S. Alvares



Release of the special Silver Jubilee publication

The highlight of the Silver Jubilee function was the remembrance of all Past Chairmen of the Mumbai State Centre.

Mr. Anil Valia (1989-91)
Mr. V. R. Majumdar (1991-93)
Mr. S. H. Miller (1993-95)
Late Mr. Jayantibhai Mahidharia (1995-97)
Mr. Vijay Panse (1997-99)
Mr. B. Sivakumar (2000-02)
Late Mr. T. K. Chatterjee (2002-03)
Dr. Prakash Barjatia - 2003 till date

Ar. Rohini Mani, Mr. Arvind Mule, Mr. D.H. Patel, Mr. Stan Alvares, Mr. Bhavesh Mehta highlighted the contributions made by all Past Chairmen. Mr. Anil Valia and Dr. Prakash Barjatia who were present during the function were felicitated with a specially designed memento to a big round of applause.

In the next part of the function Mr. R. Ramakrishnan released the Silver Jubilee Souvenir containing messages from GB members and Memories of 25 years of ISLE which was founded in Mumbai. Addressing the gathering he congratulated all members on the success of last 25 years. He dwelt on the important role that ISLE has been playing and wished them to carry it to greater heights in future years. He also highlighted the ISLE-BEE-LRC Course to be held next day and felicitated the faculty members from



LRC, USA: Prof. Russ Leslie, Asst. Prof. Dan Frering and Dr. Yiting Zhu. Mementoes were also presented to Sponsors: Bajaj Electricals, Luminaire Division, NVC Lighting Technology Corporation and Advertisers for their support to the Silver Jubilee Program and LRC Course.

Mr. K. Naveen, Past Secretary, MSC proposed the vote of thanks. Mr. Stan Alvares, Hon. Secretary MSC was felicitated with a memento for his sincere efforts in organising the Silver Jubilee function and LRC Seminar. He expressed his sincere gratitude to all members for their support and cooperation.

The evening ended with the presentation of a lively patriotic dance which thrilled the gathering who then proceeded to a sumptuous dinner organised by Jewel of India.

LRC Course

December 9-10, 2010, Mumbai

The LRC Course on Lighting Technology and Applications sponsored jointly by ISLE and BEE, and organised by Mumbai State Centre of ISLE was held on 9th and 10th December 2010 at the Board Room, Textiles Committee, Mumbai.

Welcoming the Chief Guest, faculty members, invitees and participants, Dr. Prakash Barjatia, Chairman, ISLE-MSA emphasised the need for awareness about the right type of light sources to make our environment and globe worth living. Dr. Kulkarni then highlighted the role and activities of ISLE.

After a brief introduction by Ar. Rohini Mani, Convener, the course was inaugurated by the Chief Guest Mr. Kapil Mohan, IAS, Dy. Director General, BEE. In his inaugural address he emphasised the need for lighting education in the country and appreciated the initiative taken by ISLE for arranging such programmes. He also highlighted the need for energy conservation and mentioned the BEE initiatives in this direction.



Mr. Kapil Mohan felicitating Prof. Leslie



Mr. Dan Frering taking a session

A brief presentation on 3L was made by Mr. Ashok Kumar, Advisor-Information, BEE.

In his vote of thanks, Dr. Barjatia thanked all participants, their organisations and faculty members who travelled all the way from USA for disseminating knowledge on Lighting. He specifically thanked BEE and ISLE for jointly sponsoring this event. In particular he thanked Dr. Avinash Kulkarni, President, ISLE and Mr. H.S. Mamak, Director, Exhibition & Conferences for their efforts of making this event happen. The Chief Guest and all faculty members were felicitated by a memento, Silver Jubilee LED kit, and also a copy each of Directory and Conference Proceedings of Lii2008.

The Seminar covered all aspects of lighting concepts and applications with a broad focus on Day lighting. The three experts from LRC, Prof. Russ Leslie, Mr. Dan Frering and Dr. Yiting Zhu took the participants through various facets of lighting practice. While Prof. Russ Leslie introduced them to Frontiers in Lighting, Lighting Design and Application, Day lighting Analysis and Calculation; Dan Frering demystified Lighting Terminology, Luminaires and Lighting Controls; Dr. Yiting Zhu shared her rich knowledge of LED, Lighting, Lamps and Ballasts as well as Lighting Calculation by Point and Lumen Methods. All presentations were very interesting and educative.

During the Valedictory Session, Mr. Alvares. Hon. Secretary, ISLE, MSC made a presentation on ISLE, MSC and its activities for the last 5 years. The session was presided over by Mr. Praveen Thampi, Creative Director, Illumania Designs who wished the participants a bright future in their career as lighting professionals. He was felicitated with a memento by Ar. Rohini Mani. The interesting part was the slide show showing coincidentally the presence of some of the seminar participants at different ISLE programs, which drew surprising appreciation and applause. After the presentation some participants shared their satisfaction at attending the seminar by learning a lot and refreshing their knowledge about lighting. At the end, all participants were awarded with a certificate of participation.



PUNE LOCAL CENTRE

Labsphere, USA & MITLRA Joint Seminar
 January 4, 2011, Pune

While there is a spurt of events on LEDs, the field of Testing and Specification on LEDs / SSL is not focused on adequately so far. Keeping this in mind, an initiative was taken by MITLRA, Pune for an International Seminar on Testing (Radiometry/Photometry) of LED/SSL Devices and Standards. This was organised jointly by MITLRA, Pune and Labsphere, USA, a leading manufacturer of photometric equipment on January 4 at the MIT Campus in Pune. The event was supported by their Indian Representative, Advance Photonics, Mumbai, ISLE Pune Local Centre and the Litex Group of Copanies, Pune.

Emphasising the need for interaction on the subject, Dr. P.C. Barjatia, Director-MITLRA and Chairman, Mumbai State Centre of ISLE welcomed the Chief Guest, Mr. S. Chakraborty, Vice President (Technology), Surya Roshni, speakers and participants. During his inaugural address Mr. Chakraborty appreciated the initiative taken by MITLRA and more personally by Dr. Barjatia in this vital but neglected field of measurement and testing of LEDs.

In his vote of thanks, Mr. Alvares thanked the ISLE GB for awarding this course to Mumbai State Centre, as well as the LRC experts for their excellent presentations. In a special way he thanked Ar. Rohini Mani, Member GB and Convener of the course for preparing the syllabus, Dr. Prakash Barjatia, Chairman for his personal commitment in making it a success - even from Pune, and MSC Committee for their support in organising the course. He also thanked Bajaj Electricals for their Associate Sponsorship and the Textiles Committee for their cooperation. At the end, Mr. K. Naveen, General Manager, Lighting Design, Bajaj Electricals and Past Secretary, ISLE-MSC proposed a standing ovation to Mr. Alvares for his sincere efforts for making the course, a success.

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Dr. Vishwanath Karad addressing the seminar

Understanding LEDs was the theme of the key note address made by Mr. S. Chakraborty. Everything about LEDs including construction, application, advantages, myths and misunderstanding as the solution for all situations was discussed by him. At the end he hoped and suggested the Institutes like MITLRA take the initiative for the setting up of a national facility for the testing and calibration in the photometric field as a Third Party - an independent agency for the testing and evaluation of LEDs, other light sources and luminaires.

Subsequently an informative and interesting presentation on Current Industry Standards and Instrumentation on LED/SSL Lighting was made by Mr. Vikrant Mahajan, Applications Engineering Manager of Labsphere Inc., USA. LED Down Lighter - Product Validation, Importance, Relevant Issues & Testing Protocol was the topic covered by Mr. P.K. Sood, CEO of Regnant Group of Companies, based on their experience. Automotive Lighting: SSL/LED - Current Trends and Standards was the topic covered by Dr. Madhusudan Joshi, Senior Project Engineer of International Centre for Automotive Technology (ICAT), Gurgaon. Lastly Mr. Rajesh Mehta, President-R&D, Asian Electronics, had a lively discussion on the LED: Industry Perspective and Crystal Gazing.

It was heartening to note that in a short period of about 15 days of announcement of the Seminar, it was attended by more than 70 participants from all over the country.

During the Concluding Panel Discussion and Valedictory Session, Prof. (Dr.) Vishwanath D. Karad, Executive President and Founder Director General, MAEER's MIT, Pune spoke on the vision of MIT Group on Lighting and related activities.

The Seminar was conducted by Prof. Dr. Mrunal Kothari, and Prof. Dr. Milind Pande, Project Director of MIT was specially present on the occasion. Dr. B.M. Prasad, Director, Advanced Photonics, proposed the vote of thanks. He thanked the Chief Guests, Speakers, all participants and their organisations, sponsors and students who had worked hard to make this event successful. He also thanked Mr. S. Alvares, Hon. Secretary of ISLE - MSC who



coordinated and travelled from Mumbai for the purpose. He specifically thanked MITLRA for their initiative in organising this event, and assured their full co-operation for any activity in future. During the seminar a practical demo on the testing equipment was also made by Labsphere and Advance Photonics. All participants were given a certification of participation.

CHENNAI STATE CENTRE

LRC Course

December 5-6, 2010, Chennai

ISLE's maiden attempt to invite the expert faculty from abroad and conduct an educational course for the benefit of the lighting fraternity came true at the first ISLE-LRC course on Lighting Technologies and Applications organised by the Chennai State Centre at Chennai on 6th and 7th of December.

The seminar was conducted at GRT Grand Days, a star hotel. The expert faculty team from USA had Mr. Russell Leslie, Professor and Associate Director of the Lighting Research Centre, Mr Daniel Frering, Assistant Professor and the Manager of Education, Dr. Yiting Zhu, a senior research specialist and technical director of product testing programme.

The participants came from not only Tamil Nadu but also from Mumbai, Delhi, Bangalore, Hyderabad and other places. The background of the participants included architects, electrical consultants, interior designers,



Mr. Kumbhat addressing the participants



Dr. Yiting Zhu lighting the lamp

research scholars, faculty from IIT/ Kharagpur, luminaire manufacturers, lighting designers. In spite of the incessant rains at Chennai the commencement and the duration of each session was perfectly maintained.

The seminar was inaugurated by a leading electrical consultant with international repute, Mr. Ramesh, Managing Director, Madras Electrical Consultants. Mr. Daniel Frering gave an outline of the topics to be covered.

The hard copy of the course materials were handed over to the participants right at the beginning and a soft copy was also provided at the end of the seminar.

The list of topics covered are (a) Lighting Terminology (b) Lighting Technologies (Lamps and ballasts, LEDs, Luminaires and controls (c) Frontiers in Lighting (Research areas undertaken by LRC) (d) Human factors of Lighting (e) Lighting Calculation (Lumen method and Point Method) (f) Day lighting analysis and calculation (g) Lighting design and application.

Each lecture was followed by an interactive question answer session. The participants were also permitted to intervene and raise questions or clear doubts. The faculty as well as the participants really meant business during the lecture sessions.

A notable feature was that the participants wanted each topic to be covered in depth and were prepared to stay even late nights, However, the sessions had to be closed at the appointed time since the halls were to be handed over after 6.00 pm.

In every topic, application of LED or an LED related question was invariably posed.

At the valedictory function, the faculty response was provided by Mr. Russell Leslie. He commented that the questions posed by the participants were very perceptive and alert, posed a wide spectrum of questions and they had to sometimes accept openly that their expertise is limited to

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certain areas and, in fact, LRC has researchers numbering around 35 and every one has a specialty domain. It was also commented that they have faced so many questions for the first time in their experience. They appreciated the interest shown by the participants and indicated that, within the limited time in two days, they could not extend the topics beyond what was planned.

The participant's response was given by a participant from Delhi after a group discussion among themselves. It was acknowledged that most of the participants had come from far off places and ISLE/LRC did not fail their expectations. This is the first lighting course, conducted within India, which had been truly professional. They had however few suggestions (a) the duration of the course should be four days so that some of the important lighting design applications such as stadium lighting etc., could be covered (b) at least some specific projects for design application should have been provided for hands on experience and a wholesome feel to the participants (c) an extension to the present course to cover more topics could be organised during the coming year.

KARNATAKA STATE CENTRE

Family Get-Together January 7, 2011, Bangalore

A family get together of ISLE KSC members was organised at the palace grounds on 7th January 2011 in connection with the Silver Jubilee celebrations of ISLE.

About 75 members with their families participated in the programme "Rang De Basanti 2011" at Gayatri Vihar, Palace Grounds, Bangalore, a Mega Musical Mahotsav of evergreen vintage Hindi film songs organised by professionals and enjoyed the food along with music by professional singers from Mumbai, who sang all old melodies of Hindi film songs of Kishore, Manna De, Rafi, Lata and other legends.

This was an opportunity to have fellowship with members and their families and to come closer. With this it



should be possible to have better cooperation to take ISLE KSC to next level and with continued support to further the objectives of the Society.

Press Meet January 19, 2011, Bangalore

The ISLE Karnataka State Centre called a press meet at the Press Club in Bangalore in response to a report published in one of the leading newspapers indicating that LEDs were being dropped due to lack of technical expertise and the cost factor.

The meet was addressed by the following Committee members: Mr. M.S.N. Swamy, the Chairman ISLE KSC, Mr. Bhavani Prasad, former Director General (W) CPWD, Mr. Sathyendra, Hon. Secretary ISLE KSC with 25 years experience in the field of standardisation and Mr. Ravi Rao with thirty years in lighting with expertise in controls.

The panel explained the advantages of using LEDs and dispelled the notion that there was lack of technology or standardisation initiatives. They emphasised that LEDs were indeed the light source of the future for reasons of energy efficiency, ease of maintenance, long life and absence of toxic substances.

The electronic media covered this on the same day and the press the next day in all the languages. The question and answer session was educative and Interesting.



Mr. Swamy addressing the press

RAJASTHAN STATE CENTRE

Seminar and Exhibition

November 27, 2010, Jaipur

A one day Seminar cum Exhibition on Recent Trends in the Field of Lighting and Renewable Energy was organised by the ISLE Student Chapter of the Poornima Group of Colleges (PGC), Jaipur at the Arbuda Convention Centre, PGC, Jaipur. The programme was sponsored by the Indian Society of Lighting Engineers Rajasthan State Centre. More than 450 students and 20 faculty members benefited from the programme.



Dr. S.M. Seth felicitating Mr. Aghi

The objective of the seminar was to create awareness among students about energy conservation, renewable energy sources and current trends in field of lighting. After the lighting of the lamp and Ganesh Vandana the seminar commenced.

Dr. S.M. Seth Director General, PGC welcomed the guests and introduced the mission and vision of PGC and the various ongoing academics and non-academic activities. The dignitaries were introduced and felicitated.

In his address, the Chief Guest Mr. Gulshan Aghi Vice President, ISLE spoke about current trends and the future of lighting. Starting from energy generation and consumption he said that current data showed that 17% of the total electrical energy generated in India is used in lighting, whereas it is just 5 to 7% in developed countries so that there was great scope for improvement.

He established that LEDs will be the future of lighting with various examples and facts. He concluded with informing students about career opportunities in the lighting industry. Thereafter, he answered queries from the students.

The Guest of Honour, Mr. R.S. Saxena, Chairman, Rajasthan State Centre spoke about ISLE including its objectives, activities and membership. He gave a review of current activities and future plans of ISLE, Rajasthan

State Centre. He congratulated students of ISLE Student Chapter, PGC for organising this event and their active participation in all activities of ISLE.

Dr. Jyotirmay Mathur, Professor MNIT Jaipur gave a presentation on Renewable Energy and Day Light. He gave a detailed explanation of different renewable energy sources like the sun and daylight, wind, tides, and geothermal. He also touched upon the burning issues like global warming, climate change, environmental impact of pollution, CO₂ emission etc. Using examples he explained how day light i.e. energy coming from sun can be used for lighting as well as heating.

Mr. Anil Bhalla, Surya Roshni gave an expert talk on Lighting Design. Mr. Anil Bhalla explained the lighting design concepts with the help of some examples using a software. He added that proper lighting design leads to a reduction in energy consumption. He concluded that CFLs and LEDs should be preferred over other lighting devices to reduce the energy consumption.

Mr. Manoj Gupta proposed the vote of thanks and expressed his gratitude to all the dignitaries and experts for sparing their valuable time and sharing their words of wisdom with the students. He congratulated the students of the ISLE Student Chapter, Rajasthan State Centre for the successful organisation of this event.

After the seminar in auditorium a workshop on Working and Concepts of CFL was also conducted by Mr. Prashant Bajpai, Treasurer, ISLE, Rajasthan State Centre for around 100 interested students, members of the student chapter. He explained the construction and working of the tube light, CFL, incandescent lamp and other light sources. With some calculations, he explained about energy saving by using CFLs and LEDs.

M P STATE CENTRE

Monthly Last Sunday Breakfast Seminar

November 28, 2010, Indore

In continuation with the Sunday morning seminar series by the (now) MP State Centre at Indore, this time it was Energy Auditor and Consultant, Er. Mahesh Agrawal, COO, Technocom Marketing, who talked on the Why and How of Conserving Energy in Domestic Lighting.

Mr. Akhilesh Jain, Chairman M P State Centre welcomed the audience. Mr. Rajendra Raje, a senior member highlighted the various functions held by Indore Centre during last 12 months:

- | | |
|--------|---|
| Nov 09 | Modern Trends in Lighting by Mr Rajendra Raje |
| Dec 09 | Optimisation of Building Lighting by Ar. Dr. Kiran P Shinde |



Celebrating the advent of the MP State Centre

- Jan 10 Sun Light - The Gift of Nature by Prof. Shreekant Tare
- Feb 10 Metal Halide Lighting - Overview & Advancements by Mr. Akhilesh Jain
- Mar 10 Illumination for SR Facility @ Indus - II RR CAT - A Case Study by Mr. Anil Pundalik
- Apr 10 Lighting Trends & Technologies - Vision 2020 (National Workshop)
- May 10 Lighting for Green Buildings by Mr. Bharat Kumar Rawlani
- Jun 10 Light Pollution by Dr. Alok Mittal
- Jul 10 LED - Lighting of the 21st Century by Dr. G.D. Gidwani
- Aug 10 Role of Lighting Design for Saving Energy by Mr. Shailendra Kulkarni
- Sept 10 Energy Management, Audit & Lighting by Mr. Vivek Barve
- Oct 10 Tele Lighting (Light Transportation) by Ar. Vinay Babar
- Nov 10 Why & How of Energy Conservation & Control in Domestic Lighting by Mr Mahesh Agrawal.

To add a feather to the cap, the celebration of the upgradation of Indore Local Centre to the MP State centre was marked with enthusiastic zeal, cake cutting, cute fireworks in the seminar hall and above all felicitation of veteran members. The past Chairmen present, Mr. P.L. Nene and Mr. Vijay Panse were felicitated

A well prepared presentation by Er. Mahesh Agrawal, who talked on 'Why and How of Conserving Energy in Domestic Lighting' covered a vast range of topics , which included carbon credits, pollution and reduction in emissions, the testing of a zero watt night lamp showing consumption in watts, mobile chargers left plugged in without the mobile instrument connected, mosquito repellants in switched on condition during the day, use of solar energy for domestic applications etc.

The punch line of his talk - it is not just about switching lights and fans when not in use, it is about using energy intelligently was well taken and accepted by



the august gathering, which exceeded 90 members of the local centre, academic institutions, industry executives and office bearers of the local centre. Mr. Dinesh Wadhwa, Hon. Secretary gave the vote of thanks.

CIE ACTIVITY

CIE 2011 - Quadrennial Session in Sun City, South Africa

Dear Colleagues,

The International Commission on Illumination (CIE) is the original and the most respected International Lighting Organisation, dealing with all the different aspects of this subject. It is our tradition and obligation in terms of our Statutes to hold a Session of the Commission every four years, with a Midterm Meeting between two successive Sessions. The CIE Statutes read:

The activities of the Commission shall be organised in terms, these being the periods between two Sessions. The normal length of a term is four years and starts at the end of the Session.

The Statutes further state:

The General Assembly shall hold one or more meetings at a Session of the Commission, and one midterm meeting. Additional meetings may be called at the request of the Board of Administration or at the request of at least one tenth of the members.

The CIE General Assembly meets at CIE Sessions as well as at CIE Midterm Meetings, which can be interpreted as a two-year meeting cycle (apart from the fact that the General Assembly could be convened several times during a Session). The period between quadrennial CIE Sessions therefore defines a term in the activities of the CIE, including a term of office for the office bearers.

The Session was previously divided into a Conference part followed by a part for the meetings of the CIE Divisions and the Division's Technical Committees (TCs). For the Session from Sunday, 10 to Friday, 15 July 2011, the Conference part has been allocated to the mornings and

Continued on page 31



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LIGHT INDIA INTERNATIONAL

4-7 March 2011

Chennai Trade Centre, Chennai, India

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Energy Savings Potential of Lighting Control Combinations that Save Energy and Enhance Well Being

Martine Knoop

Abstract

The use of daylight responsive lighting control systems that harvest the energy savings potential offered by daylight situations is well established. Studies show a savings potential of 20 to 70% on the energy consumption for the artificial lighting installation. The savings that can be achieved depend primarily on the daylight contribution to the room and the ability of the artificial lighting system to respond to the availability of daylight. When additional controls are applied to enhance the well being of the users in the room these savings can reduce, but also increase.

Within the CIE (International Commission on Illumination) a committee is assigned to create a decision scheme to determine the most applicable controls solution or combination of controls for an application. The scheme will focus on the user requirements (visual comfort, performance and personal control) and include the consequences for the overall energy savings.

This decision scheme will, for example, help to determine the suitability of the use of a daylight responsive lighting control system in combination with algorithmic lighting control. Algorithmic lighting offers higher lighting levels during the course of the day to enhance people's well being.

A number of parameters, such as the timeline of the offered lighting sequence and the daylight contribution to the room, will determine if it is appropriate to combine both control systems.

This paper will focus on the interaction of controls and the potential of its combination to realise a proper balance between lighting quality, user comfort and energy efficiency.

Introduction

In daylight situations, energy consumption of artificial lighting solutions can be significantly reduced when



appropriate controls are in place. Studies show an energy-saving potential up to 30 – 40% or more in some types of buildings (e.g. Jennings et al. 2000, Li and Lam 2001, Roisin et al. 2006, Littlefair 2006, Kobav and Bizjak 2010). The actual energy savings depend on a large number of aspects, such as the daylight contribution to the room, the required illuminance in the room as well as the ability of the artificial lighting system to respond to the availability of daylight (e.g. Knoop 1998).

These savings can be determined in a number of ways, of which two distinct methods are:

1. Daylight Factor based, as for example proposed by for example Knoop (1998) and Littlefair (2006), or as referred to in EN 15193 (CEN 2007).
2. Dynamic modelling software that predicts short time-step development of indoor daylight availability, to predict energy savings from daylight responsive lighting control systems (e.g. DAYSIM, described in for example Reinhart and Walkenhorst (2001) or on <http://www.daysim.com/index.html>).

Whereas the approaches under 1) work with average values, the assessment methods under 2) can take into consideration changes in time. DAYSIM, for example, uses an occupant behavior model to mimic occupant use of personal control of artificial lighting and window blinds (Reinhart 2004). Especially when different control strategies are combined, this seems to be necessary, which is the main topic of this paper.

Combine control strategies – useful or not?

Next to daylight responsive lighting control systems, a number of other lighting control systems can be applied to improve the energy efficiency of a building, such as:

- time scheduling Lighting is dimmed or switched in response to a preprogrammed time schedule, e.g. when lighting in an office building is automatically switched off between 20:00 and 06:00, or façade lighting is switched off between 23:00 and 07:00.
- occupancy control Lighting is automatically turned off or dimmed down within a certain

- load shedding time frame of an occupant leaving a space. Lighting is dimmed or switched to reduce the lighting loads. This is typically done to shave peak demand. Also called demand control.

Other lighting control solutions are typically used to add functionality or enhance well being, such as:

- personal control Lighting is controlled by the individual users of a workplace, typically to suit their preferences.
- user demand Different lighting settings with default light levels are offered to suit a particular task, user group, or use of a workspace. This is done to eliminate over lighting. An example of user demand is offering two different lighting levels at school, one for pupils during day time and higher level one for adults during evening classes.
- scene setting Pre-setting of various scenes in time and/or location is used to create different atmospheres or support different functions, such as having different settings in

meeting rooms to offer lighting that is suitable for presentations, group meetings or brain storm sessions.

- algorithmic lighting Preprogrammed sequences that automatically change in lighting level, direction and/ or color temperature, taking into consideration non-visual, biological, effects of lighting.





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Whereas the first category of controls will typically reduce the energy consumption in a building, this might not be the case for the controls that are used to add functionality to a building.

Combining controls with time varying distribution

A combination of one of the above mentioned control strategies with daylight responsive lighting controls is not always beneficial. Some control solutions are not compatible in specific applications. This paper will give more insight in the suitability of combining of different strategies, specifically occupancy control, scene setting and algorithmic lighting.

Daylight responsive lighting control has a time varying distribution. Typically the daylight contribution to the room at noon is higher than the daylight contribution early in the morning and late in the afternoon. When the added control strategy is a time-independent variable, the probability the savings will occur is constant throughout the day. In that case, the savings of the daylight responsive lighting control and the additional control can be combined. Nonetheless, when the additional control strategy has a time varying distribution as well, the combination can offer more or less savings. This concept will be illustrated with occupancy control, which can be a time-independent variable, as well as a time-dependent one.

Occupancy control

Energy savings that can be achieved by application of occupancy sensors to the artificial lighting solution ranges from 0 – 50% in regularly occupied spaces or even more in irregularly occupied spaces (e.g. Richman et al. 1996, Manicca et al. 1999, Jennings et al. 2000, reviews in Von Neida et al. 2000 and Guo et al. 2010). The actual savings depend on a number of aspects, such as the type of office area and the occupant schedules and habits. In open plan offices little savings will be found between 08:00 to 17:00 at workdays. Monitoring in private offices showed that energy savings for one single occupant can differ significantly, from 7% over a day, when the user only left the office once, and 28 – 37% on other days. On average 20% was achieved in the monitored offices (Jennings et al. 2002, Jennings et al. 2000).

Rubinstein and his colleagues (2003) evaluated occupancy profiles in 35 single person offices. On single office basis, differences in occupancy profiles can be found. Nonetheless, average occupancy behavior across all rooms shows peak occupancy periods between 08:00 and 17:00 and a reduced occupancy at lunch time, as the general trend in these specific offices was to leave during the middle of the day. Space utilisation profiles derived in a public sector organisation for both administration and support staff, as well as managers and professionals, do show a trend to have lower occupancy during the middle of the day. The profiles also show low utilisation by managers

and professionals, and high utilisation by administration and support staff (Toshiba Information Systems and HOP Associates, online information).

Based on the research conducted by Rubinstein and his colleagues (2003), Wang and colleagues (2005) propose to use a time varying model that fits the occupancy intervals

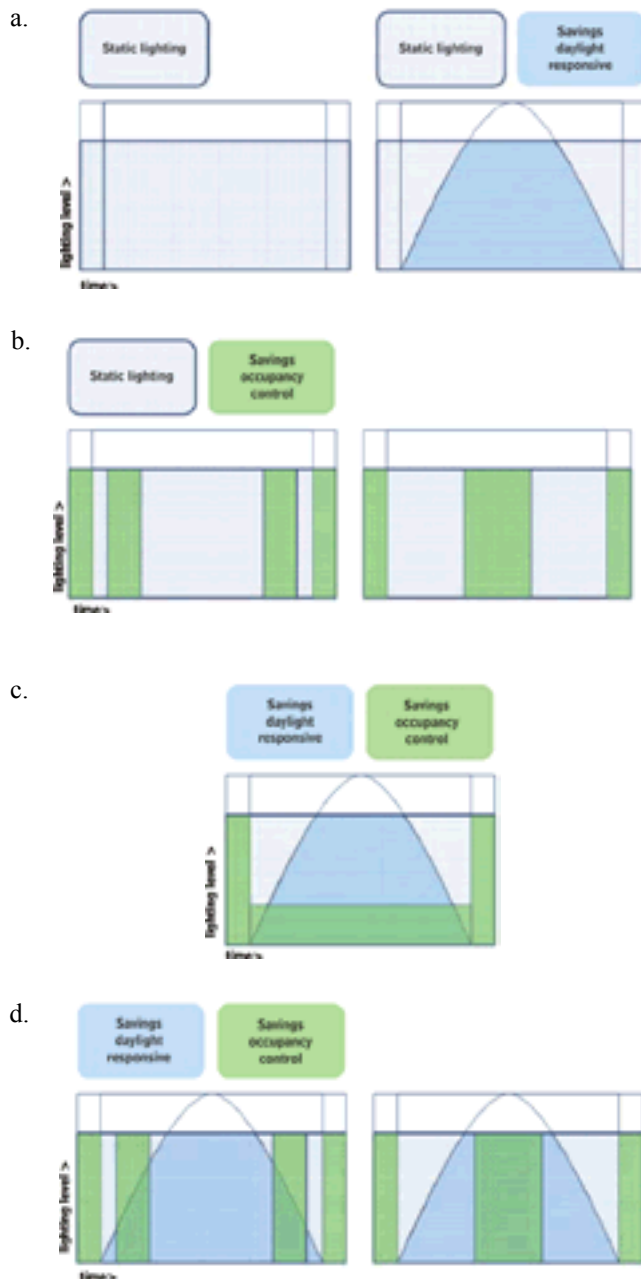


Figure 1: Schematic representation of a control strategies combination

- a) Evaluation of possible savings due to daylight responsive lighting control
- b) Evaluation of two different occupancy profiles, resulting in identical possible savings due to occupancy control
- c) Evaluation of the combination of daylight responsive lighting controls and occupancy control without a time-dependent distribution
- d) Evaluation of the combination of controls mentioned in a) and b), indicating that occupancy control does not offer additional savings in the situation in the right schematic (overlap of occupancy and daylight responsive control), whereas additional savings are achieved in the left schematic.

better, taking into consideration that some occupants will leave during the middle of the day, some others will leave twice a day, once in the morning and once in the afternoon, and others tend to stay in the office during the entire working day. In the first two situations, there is a time varying distribution due to which the achievable savings with a combination of occupancy control and daylight responsive lighting control needs greater consideration.

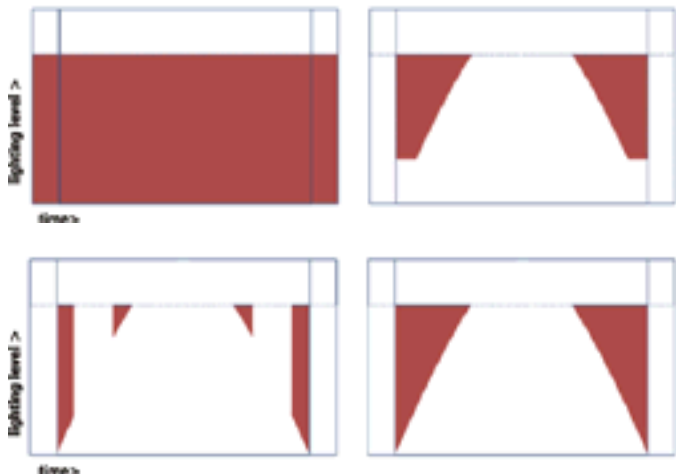


Figure 2: Schematic representation of required artificial lighting for situation without controls (top) and situations shown in figure 1c and 1d

Figure 1 and figure 2 show in principle what can be expected if more than one control strategy has a time varying distribution. As a result, assessments that focus on lighting control strategies separately and summarise the effects by adding up the savings are not always representing the actual savings. If 30% savings can be reached with the daylight responsive lighting control in place, and 30% savings can be achieved with the occupancy control, the common approach to assess the impact of the combination results in savings of 51%. The actual savings can be more, but also be less, especially when the occupant leaves the room when the daylight contribution to the room is sufficient and additional artificial lighting is already switched off.

An accurate estimation can only be made, if occupancy profiles are available. Some dynamic modeling software incorporates these, e.g. DAYSIM includes the manual lighting control model Lightswitch and a stochastic user occupancy model (Newsham et al. 1995, Reinhart 2004). The user occupancy model considers arrival, temporary absence and departure probabilities based on observed occupancy behavior. Claridge and Abushakra (2001) indicate that occupancy profiles can be derived from the lighting and receptacles load profiles of a building, and these profiles are becoming more available (Abushakra et al. 2000), especially in buildings with Building Management Systems.

When it comes to combining daylight responsive lighting control systems and occupancy control, it seems that the

type of work and the resulting occupancy rate sets the preferences for one of the systems:

- When occupants tended to stay at their desks all day, daylight responsive lighting controls save more energy (Jennings et al. 2000). Addition of a presence control offers minimal supplementary gains during working hours; therefore daylight responsive lighting control might be preferred when the occupancy rate is higher than 44% (Roisin et al. 2008). Nonetheless, the value occupancy controls in large spaces with high occupancy rates is in ensuring that lights are switched off after working hours (Jennings et al. 2002).
- When office workers come in and out of their offices frequently occupancy control is more suitable (Jennings et al. 2000). Roisin and colleagues (2008) indicate that this is appropriate if the occupancy rate is lower than 27%.

Scene setting and Algorithmic lighting

When a lighting system permits pre-setting of various illumination scenes in time and location for different activities in a room or zone, one speaks of scene setting. Parameters influencing the potential energy savings are the duration of a specific setting, the lighting level of that setting and the occurrence of lighting scenes. If scenes are used randomly and the chance a scene is chosen is always the same, you can combine the savings of both daylight responsive control and the scene setting control system. If the scenes have a time varying distribution, the time line needs to be determined, and savings can be established with dynamic modelling software only.

Practical Example: School Vision

In a class room with a SchoolVision lighting solution the rhythm of activity in the classroom is supported with changing patterns of warm white light and cool white light. Four lighting scenes are available (see Figure 3). In the Normal scene standard light levels are suitable for regular classroom activities. When pupils need to be more active, the cool white light in the Energy scene helps to invigorate them. For more challenging tasks, the teacher can switch to bright light in the Focus scene to aid concentration. The warm white light in Calm scene brings a relaxing ambience to individual work or quiet time. A change of scene is done manually, according to the teacher's demands. Research has shown that the dedicated light settings for different activities increase the performance and reduce hyperactivity when required (Wessolowski et al. 2009). The lighting is appreciated and enhances wellbeing of pupils and teachers.

In order to reduce energy consumption of the system, when possible, a daylight responsive lighting control system is installed; the artificial lighting is dimmed down according to the required level in each chosen scene.



Figure 3: Lighting scenes SchoolVision solution: Energy, Normal, Calm and Focus

The timing of settings is of importance in the determination of the possible energy savings reached with the installed daylight responsive lighting control system (see also figure 5 and 6). An example profile for a primary school is given in figure 4. Time lines of activities differ per school and class. Therefore information on the time schedule of the class is essential in determination of the potential energy savings that can be reached by using both scene setting and daylight responsive lighting control.

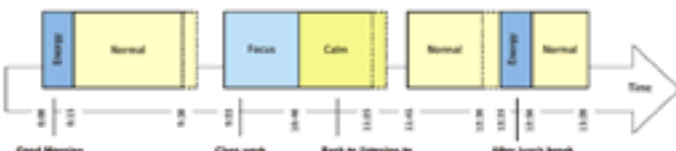


Figure 4: Example for usage and timing of lighting scenes of the SchoolVision solution

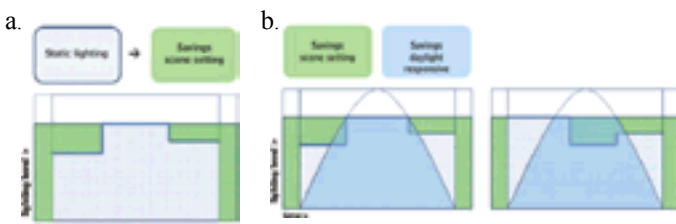


Figure 5: Schematic representation of a control strategies combination 2
 a) Evaluation of savings due to use of scenes, compared to all lighting on (installed power based)
 b) Evaluation of two different scene setting profiles, combined with daylight responsive lighting control. The daylight responsive lighting control is more beneficial in the left picture.



Figure 6: Schematic representation of required artificial lighting for situation with scene setting (left) and situations shown in figure 6b

Algorithmic lighting

In algorithmic, lighting preprogrammed sequences automatically change in lighting level, direction and/or color temperature are offered, taking into consideration non-visual, biological, effects of lighting (e.g. Hoffmann et al. 2008).

In principle, the energy consumption assessment for algorithmic lighting is following the same line of thought as with scene setting. The sequences have a time varying distribution, but typically the time line of sequences is known (as for example shown in figure 7 and figure 8).

Therefore this example will be used to demonstrate another level of complexity: the use of glare control. When considering daylight availability only, it does not take into account that sunlight and high sky luminances can lead to visual discomfort. Use of sun and glare protection, e.g. blinds or screens, can reduce the energy-saving potential of the building's lighting installation (see figure 9 and 10). Manual control patterns of blinds have been studied (review in Reinhart 2003) and guidelines are given when blinds will be used. This information can be applied to evaluate the effectiveness of the combination of control strategies with dynamic modelling software. Yet, not enough research results are available to draw general conclusions with respect to the combination of algorithmic lighting and daylight responsive lighting control systems.

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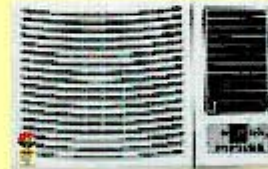
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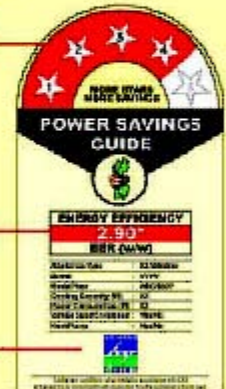
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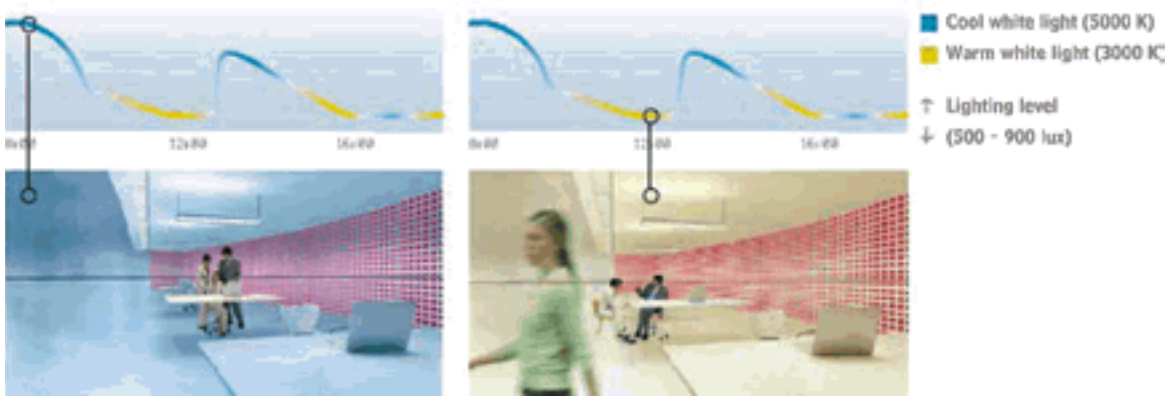
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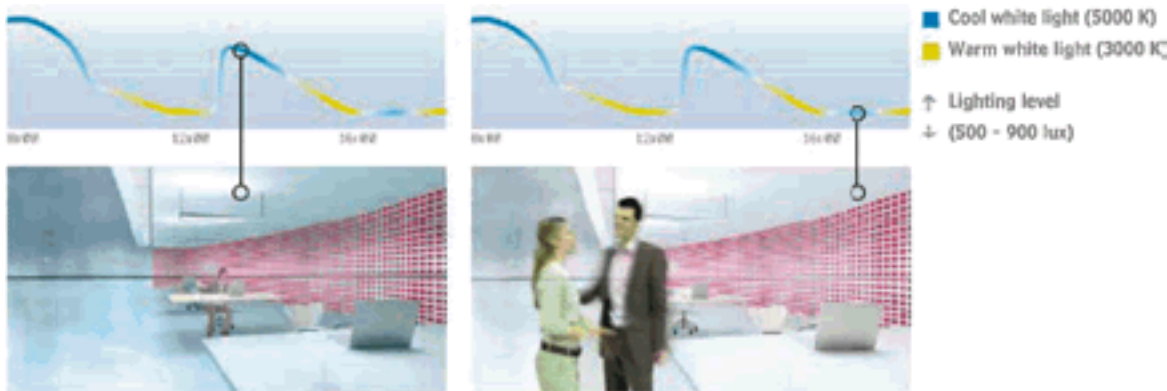


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Left: Cool light, increased lighting level, to raise the energy level and provide a good start of the day
 Right: Lunch time. Warm light, decreased lighting level. Time to recharge batteries



Left: After lunch. Cool light, increased lighting level, to counter the 'post lunch dip'
 Right: Happy hour. Cool light, lower lighting level, to raise concentration before going home

Figure 7: Principles of Dynamic Ambience, an example of algorithmic lighting

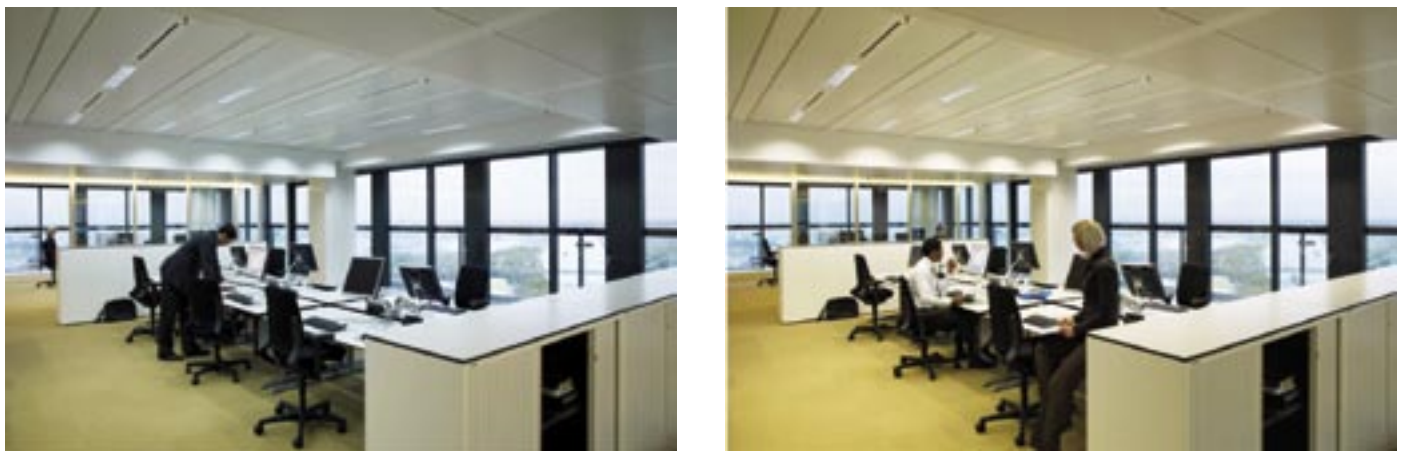


Figure 8: Application of algorithmic lighting in an office environment

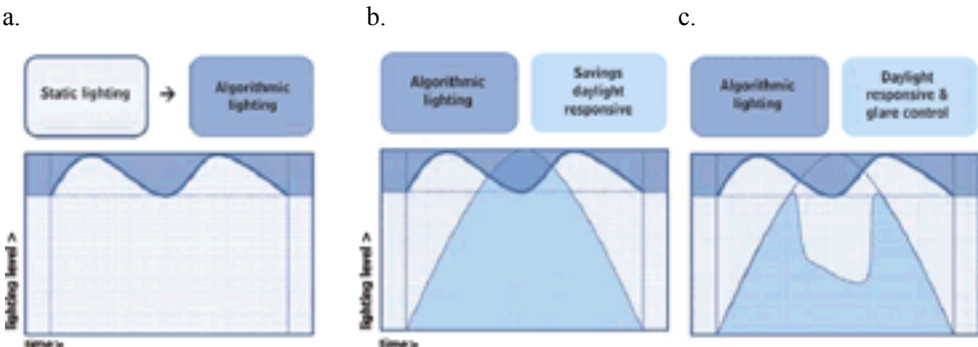


Figure 9: Schematic representation of a control strategies combination 3

- a) Evaluation of savings due to use of algorithmic lighting, compared to all lighting on (installed power based)
- b) Evaluation of savings due to use of daylight responsive control and algorithmic lighting, compared to all lighting on (installed power based). There is an overlap around noon – so the savings cannot be combined though multiplying only.
- c) Evaluation of savings due to use of daylight responsive control, glare control and algorithmic lighting.



Figure 10: Schematic representation of required artificial lighting for situation with algorithmic lighting (left) and situations shown in figure 9b and figure 9c

Conclusion

A combination of control strategies is not always getting the best out of both. If a daylight responsive lighting control system, in which time varying depending plays a role, is combined with another time varying depending strategy a more in depth evaluation of savings possibilities, preferably using dynamic modeling software, is required.

In general, research has focused on the energy savings potential of single control strategies, not on the combination of strategies. A number of laboratory and field studies combining occupancy and daylight responsive lighting control indicate that a combination of these strategies is most suitable when the occupancy rate is above approximately 25%. The studies also suggest that occupancy control seems to be more suitable when office workers come in and out of their offices frequently. Nonetheless, time dependent variation of occupancy profiles could shed a completely different light on this. Occupancy profiles are required to get more insight into the topic.

All other combinations of control strategies are rarely studied. As lighting controls are increasingly, applied further research is required, as the energy savings potential can increase as well as decrease significantly.

Outlook

Within the CIE (International Commission on Illumination) a technical committee 'Decision Scheme for Lighting Controls for Tertiary Lighting in Buildings' is assigned to create a decision scheme to determine the most applicable controls solution or combination of controls for an application. The scheme will focus on the user requirements (visual comfort, performance and personal control) and include the consequences for the overall energy savings.

The technical committee will offer guidelines in order to balance lighting quality, user comfort and energy efficiency in lighting controls solutions for tertiary lighting in buildings.

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Dr. Martine Knoop
Lighting Application Specialist
Philips Netherlands and
Chair, CIE TC3-50

Integration of Lighting and Architecture

Warren Julian

Introduction

Much has been written about the integration of lighting and architecture, particularly when designers are making a case for winning awards in lighting design competitions. Mostly, they are talking about the integration of electric lighting equipment and the building; either making the lighting inconspicuous or making a bold statement in the form of a chandelier or similar. In other cases, the integration refers to lighting that reveals some of the architecture. On a grander scale, urban lighting or city beautification lighting makes use of buildings (architecture) along with other elements of the urban environment in the lighting schemes. In fact, in many urban lighting schemes, the buildings are the only significant elements, especially where there are few parks and gardens.

This paper will explore the integration of lighting and architecture and suggests a meaning that might be related to the purpose of both architecture and lighting.

In the beginning...

In the beginning there was no architecture but there was light: daylight, that amazing energy source that allows life on earth and under which our visual system evolved. Once we came down from the trees and moved into the grasslands we were confronted with the considerable problem of shelter; shelter from predators and shelter from the extremes of the environment. For a long time, we were hunter-gathers and had to be on the move to follow the available food. Sometimes we could stay in a favourable area; otherwise we had to move large distances. In the former case, shelters could be caves (either existing or dug into soft rock or soil) or huts built from available materials. If we had to be nomadic, we needed portable shelters, usually made from wood and animal skins.

With the discovery of agriculture and animal husbandry, the need for most people to be nomadic ceased and villages developed with some eventually growing into cities. A settled life allowed time for other than subsistence by some of the population. That time allowed the development of written languages and ultimately the technological age in which we now live. Technology appeared as weapons for hunting, receptacles for carrying food and fire for the preparation of food, making weapons and for light. Manufacturing was in cottage industries, many of which still exist in India today. People needed light for spinning, weaving and sewing; that light was from daylight. Again, in India, these processes can still be seen, carried out in the threshold zones of houses, in shaded daylight.

"Architecture" might be thought of as "building" in those societies where parts of the community had wealth that allowed buildings for other than shelter. Rich towns became cities and the rich could build permanent buildings from stone and brick - the surviving examples form architecture's physical history. The rich were rich from war, religion and commerce. The buildings of the less rich are forgotten, since most were destroyed by fire, erosion, insects, fungi or redevelopment.

The majority of the world's buildings (architecture) is residential and the majority of that is probably "informal" (in the planning sense), simply constructed on available land and from available materials. They are shelters in the literal sense - shelters from the environment and from external threats. In many cases they are a single room in which a family lives, with cooking and ablutions being done outside. Work is also done outside. Traditional buildings make use of available materials (stone, brick, timber, grass, soil, animal skins, caves and even ice) and their "design" is appropriate to the local environment. That might be contrasted with the ubiquity of current architecture, world-wide, that seems to ignore both available materials and design appropriate to the local environment.

Traditional shelters have some form of door and some have at least another opening, a window, that allows the admission of daylight and some ventilation while the closed door maintains security. Some windows are also glazed, if it can be afforded and if glass is available. Glazing admits light while providing better thermal performance in colder environments.

It is important not to forget shelter when talking about architecture and lighting. However, the remainder of this paper will leave aside the vast majority of the world's buildings, past and present, and concentrate on the buildings of the rich; the real world of architecture. The rich are rulers (palaces, forts, estates, etc), religions (churches, mosques, temples, monasteries, stupas, prangs, pagodas, some schools, etc) and commerce (factories and offices and giving rise to public buildings, roads, bridges, schools, etc).

The examples used in the remainder of this paper will be mainly from western architecture with some examples from elsewhere.

Daylight and architecture

Until the invention of the electric lamp in the late 19th century or, arguably the invention of the tubular fluorescent lamp in the late 1930s, architecture had always been dominated by daylight. Large buildings are difficult to light during the day, so architects became skilled at design that admitted daylight. The electric lamp freed architects from that constraint. Parallel developments that exacerbated the problem of dependence on electric lighting by day were mechanical ventilation, framed construction and the electric lift. The latter three technologies allowed tall buildings and large span structures to be built free from consideration of the local external environment.

An examination of large, pre-industrial revolution buildings shows that religious buildings, palaces and (the few) public buildings, were all dominated by windows. The larger the building, the more was the skill needed to admit sufficient daylight. In Europe, the development of the Gothic cathedral shows how buttresses, the stabilising structure of the high walls, were modified to minimise the obstruction to skylight. Flying buttresses comprise only the necessary structural elements, opening the otherwise solid buttresses so that windows saw a larger area of the sky.

On a smaller scale, public buildings, such as town halls and universities, were dominated by large windows, shallow room depths and courtyards. Even palaces, depending upon the risk of attack, made use of outward or inward facing large windows to admit light. Similar examples can be found in Islamic architecture and there are many fine examples of this in India from the Mughal period.

One of the difficulties of load-bearing construction is the creation of openings without the structural failure of brittle masonry spanning the openings. Therefore, before framed construction, windows had to be narrow. Load-bearing walls were also thick which meant that the depth of the window wall reduced the effective area of the window. This problem was solved by splaying window reveals and also by splaying the glazing bars necessary for supporting the small panes of glass that were available. Again, similar examples can be seen in Islamic architecture but with perforated screens being used instead of glass. The advantage of the screens was that not only was privacy achieved but the depth of the screening provided sunshading, limiting the thermal load on the interior.

The Industrial Revolution necessitated large buildings to house the machines that replaced cottage industries. Architects applied the techniques that existed in the design of palaces to the new factories as well as later developing various roof forms that would admit light to single storey,

large-span structures. Examples are sawtooth, monitor and clerestory roofs.

Increased commerce also led to an increase in bureaucracy and the office building became a major building in cities. Again, the techniques used with palaces were applied and London and many other cities in the world have examples of office buildings that appear to occupy whole city blocks but are actually shallow buildings on the perimeter with one or more courtyards forming light wells in the centre. The Pentagon in Washington DC is probably the last of this type of large building that tried to make use of daylight rather than being dependent upon electric lighting. Windows in these buildings also provided ventilation.

Since WWII factory and office buildings have become less dependent upon daylight and natural ventilation. Factories are basically windowless, portal frame buildings. Office buildings have huge floor plates and ceiling heights that are at the ergonomic minimum but still have windows, presumably for the view and for visual contact with the outside. The contribution of daylight for useful lighting purposes is roughly about twice the height of the window above the working plane, so in most office buildings the daylight contribution is negligible and electric lighting has to be used at all times. Even where the daylight is adequate, the electric lighting is still needed to minimise the glare and gloom effects created by the windows.

Railway terminus buildings constructed in the heyday of rail transport were probably the cathedrals of the day and these large buildings were good examples of the use of daylight in design.

The modern equivalent of the cathedral is the shopping mall. These started as a windowless buildings to allow the control of the environment but later allowed daylight into the circulation areas to eliminate the soporific effect of an unchanging luminous environment.

Airport terminal buildings are the successor to the railway terminus building and there are some good examples of the use of daylight in these buildings. There are many other examples where the price of daylight admission leads to a vast volume that can have thermal problems as a result.

It could be argued that architects have forgotten how to design with daylight (and with other environmental elements) as their reliance on "bolt-on" technology has increased. However, architects are not free agents; they have to meet clients' expectations regarding minimising capital cost and maximising site exploitation. Both of these lead to buildings that are almost guaranteed not to be habitable, let alone comfortable, without environmental control technology. Fashion also sees the same glass boxes in every climatic zone.

Modern factories and warehouses, as noted above, tend to be windowless sheet metal-clad boxes. Logic would suggest that commercial buildings should be the same since windows are not only very expensive but compromise the thermal design of buildings, remembering that windows no longer serve any lighting or ventilation function. Windowless office towers would be going too far! If windowless factories are acceptable, why the double standard?

Strangely, most lighting designers do not see daylighting design as part of their rôle; some see themselves a front-of-house decorative designers while others see their domain as all electric lighting. Most are unconcerned with roadlighting.

Electric light and architecture

This is probably what most people think of when mention is made of the integration of lighting and architecture. To some architects, "integration" means almost invisible lighting (equipment) resulting in the use only of downlights, sometimes with wallwashing. Downlights rarely give satisfactory vertical luminances.

In other cases, "integration" can mean grouping the technologies into, say, strips along the ceiling containing lighting, air registers, sprinkler heads, various sensors, EWIS speakers, etc. There are many other examples of integration but in many cases all that is really integrated is the lighting equipment.

The real meaning of "integration" can be found in its Latin root (*integrare*, to make whole or one) and generally means combining parts so that they work together or form a whole. This means that the lighting and architecture are one, suggesting that they should be designed together. Most lighting designers comment that they are usually brought into a project when "it's too late"; all the major design decisions have already been made. Clients resist "even more consultants". Electrical consultants often claim that they "can do the lighting", presumably because it is connected to the electrical supply, like a pump. So called "free" design services from suppliers and merchants are not free, since the cost is built into the product price and there must be conflicts of interest involved in the process.

There are some good examples of the integration of lighting and architecture but almost all are the result of the lighting designer being part of the design team from the inception of the design process.

Light and urban design

Some think of this as decorative floodlighting or "city

beautification". However, it should also include sunlight and daylight design in urban planning and the physical planning of urban design.

It is interesting to contrast Old and New Delhi. The former is a pedestrian city, with narrow lanes and load bearing construction. Buildings shade each other from the fierce summer sun and retain heat on winter nights. New Delhi seems to have been designed with cars (and tanks) in mind; it is impossible to walk around, except in the very centre. The car dominates and buildings bake in the sun. Shanghai is similar with the "old" part (Pu Xi) having a human scale and enjoyed by humans on foot. The new Pu Dong district is unpleasant for pedestrians, being dominated by vast roads and towering office buildings. Buildings are designed on the "mine is bigger than yours" principal and many are floodlit, others are really huge video screens while others have meaningless arrays of LEDs built into their exterior walls. This produces oohs and ahs and amazing photographs when viewed from afar but within it is sterile, glaring and in some cases, disturbing.

The purpose of the integration of lighting and architecture

Without light(ing) there is no architecture. I find it amazing that many architects seem to take no real interest in the lighting of buildings, except with regard to the appearance of luminaires. I would have imagined that there would be great interest in lighting since architectural lighting is not unlike stage lighting in that the set's (and people's) appearance is determined by the quantity, colour and direction of the light. Building exteriors get some attention since the sun produces the modelling of the building and the visibility or otherwise of the detailing. However, the internal appearance isn't really considered, except in the prestige areas.

Over the last 30 years I have seen, in many western countries, a decline in the teaching of lighting (and many other design technologies) in architecture schools. This is contrary to the increasing expectations of architects with regard to the performance of buildings, especially with regard to energy efficiency.

Over the same period, a fledgling lighting design profession has emerged, mainly in the developed countries, working on predominantly high-end projects. There also exist a handful of university programs producing technically competent lighting designers; others produce decorative lighting practitioners.

In developed countries homes and commercial

buildings account for about 33% of energy use and about 40% of that in commercial buildings is for lighting. In those countries, most of the buildings already exist, however, in the emerging economies much of the building stock is being replaced. But it is being replaced with copies of the profligate energy users of the developed countries.

A golden opportunity exists in India and China not to repeat the errors of Europe and America but there little evidence of appropriate, sustainable design in the growth cities, such and Mumbai and Shanghai.

The integration of lighting and architecture will be achieved when lighting and architecture is considered as a whole and when lighting is understood to be more than just electric lighting.

Emeritus Professor Warren Julian
Chair of Lux Pacifica
Faculty of Architecture, Design and Planning
University of Sydney, Australia

Continued from page 14

the Division and TC meetings to the afternoon. This new arrangement is aimed at encouraging the attendance of both parts by the majority of participants.

I would like to stress very strongly that ANYBODY with an interest in the work of any CIE TC is more than welcome not only to attend the Conference part in the mornings but also the applicable Division meetings, TC meetings and workshops in the afternoons. If the interest is strong enough, interested persons may also apply to the TC chair to become a member of the particular TC of interest. For a full list of all CIE Divisions and their TCs, please visit the CIE website at <http://www.cie.co.at>.

I should also emphasise that the CIE is the pre-eminent international standards body for light and lighting and is recognised as such by both ISO and IEC (see CIE website). Consequently, a lot of the work in CIE TCs deals with the drafting of international standards in this field.

The international character of our organisation is also illustrated by the venues of the various Sessions and midterm Sessions. The most recent of these were

- 1991 Melbourne, Australia (Session)
- 1995 New Delhi, India (Session)
- 1997 Durban, South Africa (Midterm Session)
- 1999 Warsaw, Poland (Session)
- 2001 Istanbul, Turkey (Midterm Session)
- 2003 San Diego, USA (Session)
- 2005 Leon, Spain (Midterm Session).
- 2007 Beijing, China (Session)

- 2009 Budapest, Hungary (Midterm Session)
- 2011 Sun City, South Africa (Session)

The next midterm Session in 2013 has been assigned to France, the country in which the CIE was hosted and nurtured after its formation in 1913. This midterm Session will therefore celebrate our centennial as an organisation and the forthcoming Session in South Africa in 2011 will be the last Session in the CIE's first century. It will, significantly, also be the first full CIE Session to be held on the African continent. South Africa successfully hosted the Soccer Worldcup in 2010 and the Illumination Engineering Society of South Africa (IESSA) is confident that it can organise an equally successful CIE Session in 2011.

As President of the CIE and as a South African, I am therefore proud to invite you to our 2011 CIE Session in Sun City. It has recently been predicted that Africa will eventually become the hub of tourism internationally due to its incredible wildlife, huge game parks, the warmth of its people and its sheer natural beauty. Experience this unique environment before, during and after our conference - and before everybody else does.

For further information and detailed arrangements, please contact the Conference Website, either through the CIE homepage at www.cie.co.at or directly at <http://www.iessa.org.za/cie2011>.

Looking forward to seeing you at the CIE Session in South Africa in July 2011,

Dr. Franz Hengstberger
President: CIE

CIE PUBLICATIONS

Proceedings of CIE Expert Symposium on Spectral and Imaging Methods for Photometry and Radiometry CIE x036:2010

This Symposium was organised by CIE Division 2 in cooperation with the Swiss Lighting Society (SLG), and was hosted by the Federal Office of Metrology (METAS), Bern, Switzerland. The two-day Symposium included a one day tutorial presenting the state-of-the-art techniques in the field of photometry. On the second day, a Scientific Symposium featured 35 contributed papers presenting recent research in photometry, colorimetry, and radiometry with a focus on the methods using spectral and imaging techniques. The Symposium had four sessions, Session I: Goniophotometry and Spatial Methods, Session II: Imaging and Spectral Methods, Session III: Metrology for LEDs, and Session IV: Advances in Radiometry.

The Proceedings of this Symposium include 16 papers on oral presentations as well as 19 papers on poster presentations.

The publication consists of 163 pages including 35 contributions with 169 figures and 20 tables. CIE x036:2010 is readily available on CD-ROM via the website of the CIE Central Bureau (www.cie.co.at).

Practical Daylight Sources for Colorimetry CIE 192:2010

This publication discusses the state-of-the-art of practical daylight sources for colorimetry. It provides information on these lamps and devices used for illumination in the visual evaluation and instrumental measurement of non-fluorescent and fluorescent specimens.

Suppliers of lamps, booths and spectrophotometers provided some of the data on daylight sources. TC members and advisors at four institutions measured the rest. These institutions are the University of Derby (UK), the Hong Kong Polytechnic University (Hong Kong, China), the University of Pannonia (Veszprém, Hungary) and SENAI/CETIQT (Rio de Janeiro, Brazil).

The report concludes from these data that practical daylight sources are commercially available that satisfy the criteria of the relevant national and international standards for both visual evaluation and instrumental measurement. Filtered tungsten, filtered xenon and fluorescent lamps currently provide the best results for visual evaluation. Pulsed filtered xenon provides the best results for instrumental measurements. Light-emitting diode (LED) sources may appear as viable alternatives for both applications in the not too distant future.

Standardisation of any particular source as "best representing daylight" is not recommended. There are significant differences between the spectral properties of the sources currently used in visual evaluation and the sources used in instrumental measurement. These differences produce large differences in the rendering of colours of specimens, especially fluorescent specimens.

The publication is written in English, with a short summary in French and German. It consists of 39 pages with 14 figures and 10 tables, and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

Emergency Lighting in Road Tunnels CIE 193:2010

This report makes recommendations for emergency lighting in road tunnels longer than 500 m, to facilitate the safe evacuation of vehicle occupants in emergency situations such as fire. The recommendations may also be valid for tunnels less than 500 m in length, where conditions such as high traffic volume, or severe curvature or gradient apply. The report addresses the fundamental issues of

emergency lighting for evacuation routes, emergency exits, escape routes and lay-bys, as well as giving some practical advice regarding aspects of installation and maintenance in road tunnels. It recommends lighting levels and general provisions for emergency lighting installations that, based on experience, are considered to be necessary for the safety of people driving through road tunnels in case of an incident and particularly of fire. However, as there are different types of road tunnels, both in construction and traffic conditions and various types of incidents may occur, this report should be considered as a list of minimum recommendations for emergency lighting in tunnels, to be completed by means of specific risk analysis for the particular tunnel.

This report is intended to be used in conjunction with CIE 88 (2nd revision - 2004 or any further revision) or with relevant Regional or National standards, directives and regulations for road tunnel lighting. The latter may include requirements that differ from the recommendations of this report, and take priority over them. Before following the recommendations of the report in a particular location, the existence of any relevant legal requirements should be investigated.

The publication is written in English, with a short summary in French and German. It consists of 14 pages with 7 figures and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

NEWS ABOUT MEMBERS

Pradeep Nettur Receives Energy Conservation Award

Mr. Pradeep Nettur, ISLE KSC Committee member was the recipient of the First Prize of the National Energy Conservation Awards for 2010 on 14th December 2010 at New Delhi. The award was for the Telephone Bhavan at the Medical College in Trivandrum.

His achievements prior to his retirement were published in four newspapers.



L to R: Mr. Bharat Singh Solanki, MoS Ministry of Power, Mr. Sushil Kumar Shinde, Minister for Power, Dr. Ajay Mathur, DG BEE, Mr. Gopal Das, CMD BSNL, Mr. Pradeep Nettur, Mr. Jyoti Shankar, GM Trivandrum

Under his leadership of different teams significant energy conservation was achieved in different buildings over the last 5 years, which had resulted in BSNL getting 5 National Awards. (New Telecom Building, Bangalore 1st prize 2006, Regional Telecom Training Centre, Mysore 2nd prize 2006, Telephone Exchange Building, Bangalore East, 2nd prize 2007, Regional Telecom Training Centre, Trivandrum, 2nd prize 2008, Telecom Bhavan, Medical College, Trivandrum, 1st prize 2010)

In addition he was able to help BSNL in getting four Kerala State Energy Conservation awards, and an individual award in his personal capacity as a Certified Energy Auditor.



Dr. Barjatia being felicitated

OTHER NEWS

LED Summit 2011

December 17-18, 2010, New Delhi

An LED Summit was held to coincide with the LED Expo in Delhi in December.



Dr. Prakash Barjatia

Dr. Prakash Barjatia, Director MITSEL and Chairman Mumbai State Centre was invited to make a presentation on lighting education in India as well as to chair a session at the summit. Interest was expressed in the setting up of lighting education programmes in northern India to meet the need for lighting professionals. The event was attended by 180 participants and addressed by 22 Indian and international speakers and experts.

SYMPOSIUM

September 9-10, 2010, Indore

Prestige Institute of Management & Research, Indore in collaboration with Indian Society for Technical Education, New Delhi organised the PIMR Fifth National IT Conference on IT Initiatives for Building Creative Organisations on September 09-10, 2010 at Indore. Dr. Prakash Barjatia, Chairman-Indian Society of Lighting Engineers, Mumbai State Centre and Director, MIT Lighting

Research Academy, Pune was specially invited to conduct the subject symposium on September 10, 2010. The Conference was attended by more than 150 participants including students, academicians and professionals.

WEBWATCH

MIT Media Lab's Intel-Powered Desk Lamp Will Change How You Shop at Best Buy

This week at Intel's "Connected Store" booth at the National Retail Federations 2011 show in New York, Maes and her students at the MIT Lab unveiled LuminAR, a tricked-out desk lamp that can turn any surface into an interactive product guide for shoppers. If it eventually finds its way into retail stores, it has the potential to be a combination of Consumer Reports, Cnet, Shopzilla, and the geek of your dreams – without the attitude.

LuminAR (think: Lumin, as in light, and AR as in augmented reality) is a project underwritten by two Media Lab sponsors, Intel and Best Buy. It turns a light bulb, souped up with an Intel Atom Processor into a robotic, digital information device. In simple terms, it projects information – like product specs and reviews – onto a surface like a store counter. What's more, it allows a shopper torn between, say, two cameras, to interact with the projected information, drilling down for more details, or tapping into video conferencing to hear more about the product from an expert.

But don't expect to see this bit of wizardry at your local mall in the next year, Maes says. "There are no major tech hurdles that need to be resolved, but it usually takes 2-3 years from the moment a company takes on a piece of research like this until you see it in the market," she says. "It could be as much as five years out."

LuminAR reinvents the traditional incandescent bulb and desk lamp, evolving them into a new category of robotic, digital information devices. The LuminAR Bulb combines a Pico-projector, camera, and wireless computer in a compact

form factor. This self-contained system enables users with just-in-time projected information and a gestural user interface, and it can be screwed into standard light fixtures everywhere. The LuminAR Lamp is an articulated robotic arm, designed to interface with the LuminAR Bulb. Both LuminAR form factors dynamically augment their environments with media and information, while seamlessly connecting with laptops, mobile phones, and other electronic devices. LuminAR transforms surfaces and objects into interactive spaces that blend digital media and information with the physical space. The project radically rethinks the design of traditional lighting objects, and explores how we can endow them with novel augmented-reality interfaces.

LINKS :

<http://goo.gl/fuzSw>

<http://goo.gl/qtBDx>

A Lamp that Devours Insects and Uses the Biomass to Power Itself

We have seen mosquitoes getting attracted to light sources. But what about a lamp that devours them and use the biomass to power itself? That was one of the concepts showcased by the duo Jimmy Loizeau, faculty at Goldsmiths College, University of London and James Auger, faculty at Royal College of Arts, University of London at IIT Madras on Wednesday.

It doesn't look like your typical robot. In fact, it is just like your lamp with holes on it. But the catch lies in the detail. These holes are cleverly designed in such a way that pests can enter it but can't come out. These pests are funnelled into a microbial fuel cell which converts them into electricity. The lampshade robot, as it is called, is smarter. When you go to sleep, the lamp switches itself off. But if it still needs more energy to fulfil its requirement, it switches on its ultraviolet source to attract insects in the dark.

Another concept consists of a rolling conveyor belt coated with honey to lure insects. Insects flock to get their dose of honey not realising that the belt is coated with a special adhesive which traps them. At the base of the roller is a scraper which removes the insects. The insects then fall into the microbial fuel cell which converts them into electricity, which is used to turn the rollers. "It demonstrates the idea of a carnivorous robot that has the potential to become self sustaining in terms of energy," says Auger.

Some of these concept robots are cleverer. The fly-stealing robot' first attracts spiders to build web around it. It has a camera which keeps a close watch on insects that get entangled in the web. Then its robotic arm steals' the insect from the web and takes it to the microbial fuel cell to generate electricity. "If we steal too many, the spiders

would move away. So there is an ultraviolet source to attract more insects into the web than it usually does, making these webs superwebs. This compensates for the stealing," says Auger.

LINK :

<http://goo.gl/spWow>

<http://goo.gl/LexOR> : pdf file, Page 74

<http://goo.gl/2aEWv>

<http://goo.gl/6yNwo>

New LED Ceiling Lights Transmit Data Using Visible Light

We all know that light is an efficient way to transfer data. Just take a look at the incredible amounts of data we can push around with fiber optics and devices like Blu-ray players and recorders. One company, though, is trying to combine the energy efficiency of LEDs but also use their light as a way to transfer information wirelessly without using radio waves.

The company is called LVX, and recently they installed their first ceiling based optical communication systems in government offices located in St. Cloud, Minnesota. These lighting systems use special LED lights that have the capability of transferring data by oscillating their luminescence. Special modems attached to computers below the lights can pick up this light data, much like computers now pick up Wi-Fi using wireless network devices. But don't expect offices to be lit up like raves. The oscillation of light is so fast that the human eye can't register the modulation of data.

Current LVX lighting communication systems can transfer data at a rate of 3Mbps per second, comparable to a residential DSL circuit. In addition, the LVX can also offer savings with smart technology that could adjust lighting levels for room occupancy. So not only are these LED lights intelligent, but they are also efficient.

LINK :

<http://goo.gl/LK6PG>

Bonn Physicists Create 'Super-Photon' - Completely New Source of Light for Many Applications

Physicists from the University of Bonn have developed a completely new source of light, a so-called Bose-Einstein condensate consisting of photons. Until recently, experts had thought this impossible. This method may potentially be suitable for designing novel light sources resembling lasers that work in the x-ray range. Among other applications, they might allow building more powerful

computer chips. The scientists are reporting on their discovery in the upcoming issue of the journal "Nature" (doi: 10.1038/nature09567).

By cooling Rubidium atoms deeply and concentrating a sufficient number of them in a compact space, they suddenly become indistinguishable. They behave like a single huge "super particle." Physicists call this a Bose-Einstein condensate.

For "light particles," or photons, this should also work. Unfortunately, this idea faces a fundamental problem. When photons are "cooled down," they disappear. Until a few months ago, it seemed impossible to cool light while concentrating it at the same time. The Bonn physicists Jan Klärs, Julian Schmitt, Dr. Frank Vewinger, and Professor Dr. Martin Weitz have, however, succeeded in doing this - a minor sensation.

LINK :

<http://goo.gl/6WD6z>

EPA Releases Final Draft of Energy Star Luminaires Specification

The Luminaires specification now has an effective date of October 1, 2011.

The US Environmental Protection Agency (EPA) has released the Final Draft of the Energy Star Luminaires V1.0 specification.

The specification is available from the Energy Star Luminaires web page, which also carries comments on Draft 1 of the specification (released May 10, 2010) and Draft 2 (released October 4, 2010).

The Luminaires V1.0 specification will replace the Residential Light Fixtures (RLF, V4.3) and Solid State Lighting Luminaires (SSL, V1.2) specifications.

EPA expects to distribute the finalised Energy Star Luminaires V1.0 specification before the end of January, 2011. Stakeholders wishing to provide additional comments on the Final Draft should submit these to luminaires@energystar.gov by Friday, January 14, 2011.

As well as finalising the Luminaires specification, EPA has been engaged in the revision of Energy Star Program Requirements for all product categories in preparation for third-party certification requirements which take effect on January 1, 2011. Details of those changes, including Revised Partner Commitments for Residential Light Fixture and Solid State Lighting Luminaire manufacturers, can be found at www.energystar.gov/testingandverification. Please note that beginning January 1, 2011, manufacturers seeking qualification of new product models must do so through an EPA-recognised

certification body prior to using the Energy Star mark.

LINKS :

<http://www.energystar.gov/luminaires>

<http://www.energystar.gov/testingandverification>

Mr. Anool Mahidharia

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

New Members Admitted in November and December 2010

M. No	Name & Addresses	Grade	Centre
I(L).0146	Tesscorn Systems India Pvt Ltd # 1285, 5th Main, 17th Cross HSR, Sector 7 Bangalore 560 068	Institutional (Life)	Karnataka
IM(L).0146	Abhijeet Bhowmick Tesscorn Systems India Pvt Ltd # 1285, 5th Main, 17th Cross HSR, Sector 7 Bangalore 560 068	Institutional Representative	Karnataka
I.0147	Jay Instruments & Systems P.L. E-16, Everest Tardeo Road Mumbai 400 034	Institutional	Mumbai
IM.0147	Sandeep Bharucha Jay Instruments & Systems P.L. E-16, Everest Tardeo Road Mumbai 400 034	Institutional Representative	Mumbai
I.0148	Nagal Electricals Near Ram Mandir Mala Road Kota Junction 324 002	Institutional	Rajasthan
IM.0148	Rajendra Kumar Nagal Nagal Electricals Near Ram Mandir Mala Road Kota Junction 324 002	Institutional Representative	Rajasthan
I(L).0149	UL India Private Limited Kalyani Platina-Block 1 3rd Floor, No 24, EPIP Zone Phase II, Whitefield Bangalore 560 066	Institutional (Life)	Karnataka
IM(L).0149	Divya Narayan UL India Private Limited Kalyani Platina-Block 1 3rd Floor, No 24, EPIP Zone Phase II, Whitefield Bangalore 560 066	Institutional Representative	Karnataka
F(L).0706	Venkatamangalam Pandurangam Plot No. 220, 12th Street Choudry Nagar, Valasaravakam Chennai	Fellow (Life)	Chennai
F(L).0707	M. Vijayakumar 3 Nehru Street Thenpalani Nagar Extension Kolathur Chennai 600 099	Fellow (Life)	Chennai
F(L).0708	Sohrab Handa 402/6, Heritage City MG Road Gurgaon 122 002	Fellow (Life)	Delhi

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F(L).0710	Raghuveera Hosdurg Canara Engineering College Bantwal Taluka Dakshina Kannada Benjanapadavu Karnataka 574 219	Fellow (Life)	Karnataka	M(L).1587	Nirmal Kumar Deb GE Consumer & Industrial GE India Industrial Pvt Ltd The Millinia, Tower B, 6th Floor # 1 and 2, Murphy Road, Ulsoor Bangalore 560 008	Member (Life)	Karnataka
F(L).0711	M. Prem Sundar Kelecheth GE India Industrial Pvt. Ltd. The Millenia, Level 6, Tower B # 182, Murphy Road, Ulsoor Bangalore 560 008	Fellow (Life)	Karnataka	M.1588	M.S. Dinesh Philips Electronics India Limited Temple Towers, 5th Floor Old No. 476, New No. 672 Annasalai, Nandanam Chennai 600 035	Member	Chennai
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