



LIGHT

the official

NEWSLETTER

of the **indian society of lighting engineers**

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FROM THE PRESIDENT'S DESK

Whatever the individual views on the pros and cons of the recently concluded Commonwealth Games in New Delhi, the one aspect that stole the show was the lighting. Whether it was the opening or closing ceremonies or the venues for the actual sporting events, the street lighting, approach roads and parking areas, the lighting has been acknowledged as professionally executed. It is to be hoped that this will lead to installations of similar quality elsewhere and help establish a culture of good lighting practice.

The creditable part of this is that all the lighting installations were designed and executed by Indian based lighting companies with the successful use of the latest international lighting technologies. The liberal use of LEDs, both for decorative, dynamic and utility applications were not only much in evidence but also much appreciated.

This is precisely what ISLE was set up to engender. To quote from our objectives: **"Promoting the art, science and practice of illumination engineering services as associated with built and open environment for the benefit of the public in general."** In the last 25 years we have indeed been able to achieve some measure of success in raising awareness of this and Indian lighting has arrived and proved that it can match world standards of excellence.

To quote further from the objectives laid out for ISLE: **"Advancing education and research in illumination engineering and publishing useful results of this research"** and **"Formulating lighting codes, guides and technical reports and publishing them along with newsletters, journals and books on illumination"**. I have been informed by Mr. P.K. Bandyopadhyay, Chairman of BIS ET24 that it was announced at the recently held BIS Divisional Council meeting in Delhi that the long awaited National Lighting Code has been printed and copies received from the Government Press in Nasik.

Here too we have complied with our mandate by ensuring the completion of this document and even

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supported the BIS with the editing, formatting and design of this publication after it had been compiled. We now need to spread this information to ensure that the document is actually used.

On the individual front I find that several members are being recognised for their work nationally and internationally as well. Dr. Ghosh has a chapter in the recently released Power for the World - The Emergence of Electricity from the Sun. Mr. M.S.N. Swamy was invited to Shanghai to address the China Public Lighting Summit. Dr. P.C. Barjatia was given an award by the Pune Mahanagar Palika for his contribution in the social and education fields. And Mr. P.K. Bandyopadhyay has been invited by UNESCO to make an expert contribution on Lighting to their Encyclopedia of Life Support Systems (EOLSS), the largest encyclopedia in the world.

One decade ago in July 2000 19 participants travelled to Troy NY to take part in a training course organised by ISLE at LRC. And this December, as part of this ongoing relationship three LRC faculty are travelling all the way to India to conduct courses at Chennai and Mumbai. (For details see below).

Looking at all this and looking back at our achievements in the last 25 years, the Society has definitely gone a good way along the road that the founders set us upon as they laid out the objectives. But of course, we still have a long way to go. While we can take pride in what we have achieved over the years, it is imperative to ensure that we continue our efforts to keep our fraternity updated through world class education programmes, seminars, technical publications, exhibitions and research. ISLE has a serious responsibility to fulfill as the Apex Body of lighting practitioners in India, and continuity has to be the basis of success.

So as this, our Silver Jubilee Year draws to a close we should rededicate ourselves to these objectives.

Avinash D. Kulkarni
President
dradk@hotmail.com

EDITORIAL

This issue announces two important events that are taking place shortly.

The first is the course that is being conducted by LRC at Chennai and Mumbai. The value and importance of the course is recognised by the Bureau of Energy Efficiency and they are partnering ISLE in this project. Since there are limited seats for each course, I would suggest that those who are interested register immediately. You will find the contact information for Mr. Balasubramanian

from Chennai and Dr. Barjatia and Mr. Alvares from Mumbai at the end of the writeup on the course.

The second is the upcoming Lii2011 International Exhibition and Conference at Chennai in March. The Exhibition is almost full with participation from both Indian and International companies in large numbers. As this is the first time that this fair, the most important lighting event in South Asia, is being held in Chennai it will be a great opportunity to showcase lighting products and technologies to a rapidly growing market. As space is almost sold out, exhibitors who are as yet undecided need to rush and make their bookings to avoid being left out.

The International Conference accompanying the exhibition is also progressing well. Already we have confirmations from Dr. Warren Julian (former Dean of Architecture and Design at the University of Sydney), Dr. Martine Knoop (Lighting Application Specialist from Philips Lighting, The Netherlands), Mr. Chip Israel and Mr. Archit Jain (Lighting Design Alliance, USA) and Mr. Ted Ferreira (CD+M Lighting Design USA). Other speakers from India and other countries are being finalised.

It gives us great pleasure to publish in this issue brief reports on the recognition given to four of our senior members in ISLE.

India played host to the Commonwealth Games last month and we can all be proud of the world class stadiums that were put in place in Delhi. International TV audiences admired the professional coverage which was made possible only because of the excellent lighting installed at each venue. Our congratulations to all the lighting engineers that made all this possible.

The success of the Games has focussed attention on stadium lighting all over the country and it is therefore appropriate that we present an article on sports lighting by the well known lighting designer, Mr. Vipin Gulati.

In this issue we present a few more of the IALD prize winning lighting projects for 2010. And of course, we have interesting updates on lighting matters from all over the world in the WebWatch column.

H.S. Mamak
Editor
hsmamak@hotmail.com

ISLE ACTIVITY

ISLE LRC Lighting Course
December 6-10, 2010, Chennai and Mumbai

ISLE is joining hands with BEE and the Lighting Research Centre, the foremost lighting institution in the

world, to conduct two lighting courses in Chennai and Mumbai in this our Silver Jubilee Year. The course in Chennai will be on December 6 and 7 and in Mumbai on December 9 and 10. The focus of the courses will be slightly different with the Chennai course aimed at lighting engineers and other lighting professionals while the course in Mumbai will be aimed at architects, designers and lighting professionals.

Both courses will focus on lighting technologies, human factors, and the appropriate application of lighting. The courses will be designed to increase the participants' knowledge and awareness of energy-efficient lighting technologies, lighting application, and design strategies.

The three member LRC faculty will present an interactive course including lectures, hands-on demonstrations of lighting technologies, workshop sessions, and other information covering lighting for various settings. A lighting manual will be developed summarising the information provided in the courses and giving participants a variety of tools to assist them to better select and apply lighting systems. The LRC will award continuing education credits and provide a continuing education certificate to each attendee of the courses.

Details of the three member faculty are given below. Also given below are the content and programme for the two courses.

Specific topics to be covered in the Chennai course include:

The Language of Lighting - Nearly every field or profession has a language that is unique to its own practitioners. The field of lighting is no exception to this. Designers, specifiers, and manufacturers within the lighting industry use unique terms and concepts, which have evolved into professional usage over a period of time and have been officially defined by professional bodies. These terms represent important concepts in the practice of lighting. Presenters will review these important terms and concepts to assist course participants to better understand the field of lighting.

Lighting Technology - Presenters will review the latest and most efficient lamp, luminaire, ballast, and control technologies typically used in commercial settings. Participants will be taught how to evaluate these technologies for quality, energy efficiency, and compatibility. Information will also be provided on new and emerging energy efficient lighting technologies such as light emitting diodes (LEDs). The objectives of this course section are to assist the participants to:

- understand the operating characteristics of various technologies commonly used in the lighting industry.

- be able to compare these technologies and evaluate factors that will affect their performance.
- be able to select among available lighting technologies to choose those that best meet an identified lighting need.

Lighting Audit, Evaluation, and Economic Analysis - This session will include information on how to conduct a thorough and consistent audit and evaluation of existing lighting conditions in a facility to identify opportunities for energy savings as well as improvements in the visual environment. Topics covered will include lighting measurement, illuminance and luminance assessment, occupant surveying, economic analysis, and other factors important to consider when conducting a lighting assessment.

Human Factors in Lighting - This session will include lectures and demonstration sessions covering an explanation of the human eye, lighting's impact on human vision, the effects of aging on vision and how to use lighting to accommodate the visual needs of older adults, lighting and task performance, and other human factors issues in lighting design. Information will be presented to help participants be able to:

- Analyse the visual requirements of a visual task, identify the aspects of lighting important for its performance, and make appropriate lighting recommendations;
- Recognize and predict lighting conditions likely to cause discomfort, generate specific impressions, and/or modify behavior; and
- Understand the visual needs of the elderly and partially sighted.

Light and Colour - This session will include information on light and colour including correlated colour temperature of light sources, colour rendering metrics, spectrum, colour and the human visual system, and other application issues dealing with light and colour.

Lighting Calculation - This session will cover both point and lumen method calculations including calculation of coefficient of utilization (CU), light loss factors, and so on to assist in the design and specification of lighting equipment for interior spaces.

Daylighting Calculation and Analysis - This session will provide information on daylighting design and the calculation of daylight levels to assist in effective design of daylight buildings and evaluate options to improve daylight access and penetration in buildings; understand the impact of building site, building configuration, window and skylight configuration, materials, and glazing type on daylight penetration.

Lighting Design and Application - Presenters will review recommended practices and important issues in lighting application and design for commercial and industrial, interior and exterior settings. This will include a discussion of determining when it makes sense to retrofit an existing lighting installation versus a redesign and installation of a new system. This session will address important considerations in lighting design, and the design process for both interior and exterior applications. Content will include such issues as client requirements, human needs, architecture, energy-efficiency, technology and daylight integration, lighting control, and life-cycle costs. This session will be designed to allow participants to:

- understand the lighting requirements of interior and exterior spaces, including appropriate siting of lighting equipment and daylight availability analysis;
- establish appropriate lighting criteria for efficient space utilization, task performance, and energy utilization; and
- develop designed illumination and lighting control systems, including fixture selection and design, and light source selection. Presenters will also review how to use new lighting technologies, equipment, and application techniques that have been proven effective in saving energy and maintaining acceptable lighting conditions.

Lessons Learned in Lighting Applications - Presenters will review case studies of lighting from a variety of commercial, residential, and industrial settings using the LRC's DELTA Portfolios and other available tools. Presenters will "take participants through" example settings explaining which technologies performed well in various applications and which did not. They will also review the various considerations that went into each lighting design.

For the course in Mumbai the course modules will be slightly modified to suit the focus. In place of module 3, 6 and 7 above, two modules on Lighting Quality and Effective Daylighting of Buildings will be included. Details of the content of these modules are given below.

Lighting Quality - This session will include information on lighting quality factors that should be considered when developing a lighting design. Factors discussed will include illuminance, luminance, glare, illuminance and luminance uniformity, colour appearance and colour contrast, aesthetics, appearance of the space and luminaires, daylight integration and control, light distribution, modeling of faces and objects, and other factors that need to be addressed in lighting design development.

Effective Daylighting of Buildings - This session will provide information on daylighting design to assist in effective design of daylight buildings. This session will include information to help architects and engineers to:

- Effectively design and evaluate options to improve daylight access and penetration in buildings; understand the impact of building site, building configuration, window and skylight configuration, materials, and glazing type on daylight penetration;
- Design effective sun control systems to minimize glare and heat gain in daylighted spaces;
- Understand the economic impacts of various daylighting options and the costs and benefits of each; analyse the impact of various daylighting options on building costs, energy use, and indoor environmental quality; and
- Objectively quantify the financial and human benefits of daylighting for building owners and developers; effectively communicate the value of daylighting to building owners, developers, and other decision-makers.

Lighting Research Center (LRC)

The Lighting Research Center (LRC) is the world's largest university based research and education institution dedicated to lighting. It employs an expert staff of more than thirty five researchers, educators, designers, and scientists dedicated to "advancing the effective use of light and thereby creating a legacy of positive change for society and the environment." The LRC is part of Rensselaer Polytechnic Institute, the oldest technical university in the United States located in Troy, New York.

The LRC's staff includes some of the world's leading vision and lighting scientists, engineers, physicists, designers, and energy-efficiency experts, who have been studying lighting for much of their careers. Their research has led to unique and innovative solutions that improve the visibility, efficiency, comfort, and safety of lighting installations.

Faculty

Russell P. Leslie, AIA, FIES, LC



Rensselaer Polytechnic Institute
Architecture M. Arch., 1980
Professor, School of Architecture,
Rensselaer Polytechnic Institute, 1999 to
Present

Associate Director, Lighting Research Center, 1988 to
Present

Principal, Russell P. Leslie Architect, PC, Architectural
Firm, 1989 to 2005

Daniel Frering, LC



Manager of Education and Adjunct
Assistant Professor Lighting Research Center
MS in Lighting (coursework in lighting
technologies, human factors in lighting,
leadership) Rensselaer Polytechnic Institute

Manages and develops the LRC Outreach Education

Program, including teaching, curriculum development, identifying audiences, and securing funding for LRC non-degree programs, production, editing, and informational services. Administers the LRC lighting graduate education program

Yiting Zhu



Rensselaer Polytechnic Institute
Architectural Science Ph.D., 2010

Rensselaer Polytechnic Institute Lighting
M.S., 2006

Fudan University (Shanghai, China)
Illuminating Engineering B.S., 2004

Lead Research Specialist, Lighting Research Center,
Rensselaer Polytechnic Institute, 2010

For further information on registration for these courses please contact:

Chennai

Mr. R. Balasubramanian
9840055645

balu@Lii2011.in

Mumbai

Dr. P.C. Barjatia
09370144389

dr.prakash.b@hotmail.com

Mr. Stan Alvares
09820602362

marketec@vsnl.com



March 4-7, 2011, Chennai

The Lii2011 Exhibition at the international trade fair grounds of the Chennai Trade Centre is looking good as the bulk of the total saleable area of 7980 sqm has already been booked. There are pavilions from Italy, Taiwan and China (2 pavilions in fact). Potential exhibitors need to rush and book space before everything is sold out. A full time secretariat under Mr. Raghavan former GM of ITPO is in place in Chennai to run the Exhibition and Conference and ensure a professionally managed world class event.

Lii2011 is being co-sponsored by the Bureau of Energy Efficiency of the Ministry of Power (Government of India). The Central Public Works Department, Elcoma and Lux Pacifica (which represents 60% of the world's population) have also agreed to be Co-Sponsors.

The International Conference will focus on "Sustainable Lighting - Smarter, Elegant and Energy Effective". The two day conference will have 4 sessions; the Inaugural and three technical sessions. The dates for the conference are March 5 and 6, 2011.

The Inaugural session will feature a celebrity speaker who is in the process of being finalised by the Technical Committee. Keeping in mind the concerns of the government, the users as well as the industry for green lighting, the technical sessions will focus on the following:

- Daylight Integration with Lighting and Architecture
- Urban Landscape Lighting (Street Lighting, Pedestrian Lighting, Monument Lighting and Garden Lighting)
- Retail Lighting

Each technical session will have 4 speakers with a duration of 2 hours. The Technical Committee is now in the process of finalising international and national expert speakers.

ISLE members are requested to spread the word about this major Lighting Event and to ensure that they personally attend. South India is progressing at a very fast pace and it is therefore very appropriate that we hold a lighting focused event in Chennai. Please look out at our website for information as we progress.

Display Profile

Residential, commercial, retail lighting

Industrial lighting

Street lighting

Security lighting

Environmental / Landscape lighting

City beautification lighting

Architectural lighting

Railway / Metro lighting

Airport & Runway lighting

Refineries / Mine lighting

LED lighting

Intelligent lighting

Lighting with non-conventional energy

Specialty lighting

Lighting accessories and controls

Power saving solutions

Testing, measuring instruments

For further information on stall bookings and conference registration contact:

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

MUMBAI STATE CENTRE

As part of its Silver Jubilee celebration on December 8, 2010 the Mumbai State Centre is planning to publish a brief history of ISLE. A request is made to members to contribute photographs, articles on important events/memories of 25 years to this publication. All photographs and original documents will be returned after publication.

At the function, which will include spouses, it is planned to felicitate the past Chairmen of the State Centre and life members present. A request is made for support from the Lighting Industry and Lighting Professionals in the form of sponsorship and/or advertisements.

The event is planned at The Western Terrace of the Jade Garden at the Nehru Centre in Mumbai following the State Centre AGM.

On December 9 and 10 in collaboration with BEE, a two day training seminar conducted by the Lighting Research Center will be held at the Board room of the Textile Committee, Prabhadevi in Mumbai. (See page 3).

For further details contact:

Dr. Prakash Barjatia 09370144389
dr.praksah.b@hotmail.com or

Mr. Stan Alvares 9820602362
marketec@vsnl.com

KARNATAKA STATE CENTRE

AGM

October 24, 2010, Bangalore

Karnataka State Centre held its 13th Annual General Body Meeting at the Century Club in Bangalore on October 24, 2010.

The Chairman, Mr. M.S.N. Swamy expressed his satisfaction with the projects including the rural education initiatives conducted by the State Centre and the involvement of members in activities.

Mr. M.G. Sathyendra, Hon. Secretary read out the annual report and the appreciation and publicity for the State Centre educational and awareness raising



programmes. In particular he thanked Mr. Swamy, Mr. Bhavani Prasad and Mr. Poonish Mehra.

The Hon. Treasurer, Mr. Riaz Kagalwala presented the audited accounts for the Year 2009-10 and after detailed deliberations the accounts were passed unanimously. Members were appreciative that a reserve of funds had been built up for use in future programmes.

The Secretary presented the budget for the year 2010-11 for which the Members expressed their full support.

Future programmes include an effort (lobbying with the State Government) to get lighting included in the curriculum of engineering colleges, lecture programmes at institutes of interior design, a membership drive to increase the membership. It was also decided to have a get-together of members with their families.

CIE ACTIVITY

CIE AND MESOPIC PHOTOMETRY

The CIE is the leading international organisation in the lighting field and is recognized by ISO as an international standardisation body. To be internationally accepted and used, a photometric system has to be adopted and recommended by the CIE.

The CIE TC 1-58 'Visual Performance in the Mesopic Range' has now concluded its work, and the outcome is a recommended system for mesopic photometry based on visual performance. This has just been published as CIE Technical Report 191:2010. The Technical Report will form the basis of a future joint ISO/CIE Standard which is being prepared at the moment.

The development of an effective system for mesopic photometry has been a topic of concern in the international lighting community for several decades. It is found encouraging within the CIE that, after more than 70 years of research the time has now come to publish a practical system of mesopic photometry, as this will be a major breakthrough for the CIE, too.

All lighting technology and practice is based on photometry, the measurement of visible radiation. Photometry provides a method to assess light in terms of human visual spectral sensitivity. Until now, the basis of all photometry has been the CIE photopic spectral luminous efficiency function, $V(\lambda)$, established in 1924. The CIE scotopic spectral luminous efficiency function, $V'(\lambda)$, was established in 1951, but it has not been used in practical photometry.

The mesopic luminance region covers a range of luminances between the scotopic and photopic regions.

Mesopic lighting applications include road and street lighting, outdoor area lighting and other night-time traffic environments. So far, there has been no internationally accepted system of mesopic photometry. This means that suitable methods to evaluate the visual effectiveness of lighting products and installations in the mesopic region have not been available.

The task of the TC 1-58 was to adopt a visual performance based approach, which means that the underlying spectral sensitivity functions are based on criteria of visual task performance, i.e. on recognition, detection, reaction time tasks, not on brightness matching.

In the mesopic region the spectral sensitivity of the human visual system is not constant, but changes with light level. This is due to the changing contribution of the rods and cones on the retina. Thus, we need not only one mesopic spectral sensitivity function, but instead several functions, together with a defined procedure for using these functions in a photometric measurement system. The new mesopic system describes spectral luminous efficiency, $V_{mes}(\lambda)$, in the mesopic region as a linear combination of the photopic spectral luminous efficiency function, $V(\lambda)$, and the scotopic spectral luminous efficiency function, $V'(\lambda)$.

For applying the mesopic photometry, the S/P-ratio of the light source, derived from its spectral data, is needed as input value. This is the ratio of the luminous output evaluated according to the scotopic $V'(\lambda)$, to the luminous output evaluated according to the photopic $V(\lambda)$. The higher the S/P-ratio the higher the luminous efficacy of the light source in terms of the mesopic design.

The use of mesopic dimensioning changes the luminous output and consequently the luminous efficacy orders of lamps. Many of the 'white light' sources currently used for applications such as road lighting have S/P-ratios between about 0,65 (high pressure sodium, for example) and 2,50 (certain metal halide lamps, for example). The S/P-ratios of warm white LEDs are around 1,15 and those of cool white LEDs around 2,15. The use of the new mesopic system to calculate the effective luminance of these white light sources results in significant changes in their apparent efficacy. For example, at a photopic luminance of $1 \text{ cd}\cdot\text{m}^{-2}$ the use of the recommended system results in a change between -5 % and +15 % for lamps with S/P-ratios between 0,5 and 2,5; at $0,3 \text{ cd}\cdot\text{m}^{-2}$ the change is between about -10 % and +30 %.

Due to their fast development, LEDs are increasingly penetrating the lighting markets. LEDs offer new solutions to various mesopic applications, too, not least because of the possibilities of producing light sources with varying spectral properties. Depending on the LED spectra, their

ranking on a luminous efficiency scale may be subject to significant changes if mesopic luminous efficiency functions are used instead of the photopic. A CIE system for mesopic photometry will give manufacturers foundations on which to develop LEDs that are optimised for low light level applications. Consequently, the coming CIE publication on mesopic photometry may also have a major impact on the evolution and adoption of LEDs as the future light sources.

As mesopic dimensioning favours 'white' light sources with high S/P-ratio, the extra benefits from using the mesopic design are good colour rendering characteristics of the lighting. This is expected to further pave way for the use of white LEDs in outdoor lighting.

The use of mesopic photometry will promote the development of mesopically optimised lighting products. It will give the manufacturers foundations on which to develop light sources that are optimised for low light level applications. This will result in better energy-efficiency and visual effectiveness in outdoor lighting conditions. The accuracy of photometric instrumentation used in mesopic applications can be increased by taking into account the actual spectral sensitivity at these levels. Industry and users should be strongly motivated to use a photometric method that is valid and functionally relevant.

The development of mesopic photometry is the outcome of a huge amount of research work carried out in several organisations and countries over several decades. It is a major breakthrough for the international scientific community and the CIE. Finally, in 2010 we will have a mesopic photometric system to accompany the photopic $V(\lambda)$, which has served since 1924.

Actions are now needed to get the new mesopic photometric system into practical use. What is now needed are design guidelines for mesopic lighting dimensioning, i.e. guidelines how to use the mesopic system for example in road, pedestrian way and urban area lighting. There are certain points that require consideration within the various specification organisations, road lighting authorities, designers and the international lighting community. For example, different specification criteria may be necessary in situations where there is a different weighting of on-axis and peripheral visual information to process. In order to reach the full benefits of the new mesopic photometric system, it is hoped that the development of the guidelines are included immediately within the CIE work in the form of a new TC.

Prof Liisa Halonen
Dr Marjukka Puolakka
Chair & Secretary, CIE TC1-58

New TC

TC 3-51: CIE Standard General Sky Guide
 Chair: Stanislav Darula (SK)

Terms of reference: To finalise a guide for the application of the CIE General Sky standard for general users and designers. The guide will provide an explanation of the CIE General Sky standard concept and its simplified use by practitioners with available references and recommended prediction methods/tools/computer programs.

The existing visual performance based systems for mesopic photometry were reviewed and tested with new independent data sources. The outcome of the analysis and testing is a recommended system for mesopic photometry based on visual performance. The report summarises the justifications for the recommended system and gives general guidelines for its use and application.

The publication is written in English, with a short summary in French and German.

It consists of 79 pages with 27 figures and 17 tables, and is readily available via the website of the Central Bureau of the CIE (www.cie.co.at).

The price of this publication is EUR 146, (Members of the National Committees of the CIE get 50% discount).









CIE PUBLICATIONS

Recommended System for Mesopic Photometry Based on Visual Performance
 CIE 191:2010

This report deals with visual task performance based approaches to mesopic photometry, with a major aim to establish appropriate mesopic spectral sensitivity functions to serve as the foundation of a system of mesopic photometry. A review of the most important visual tasks and the range of visual conditions typically encountered in the context of night-time driving is given.

MAILING ADDRESS

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

 Testing Instruments for Lamps and Lighting www.mangalinstrumentation.com		<ul style="list-style-type: none"> # Gonlo Photometer # Calori Meter # Temperature Rise Test # Life Cycle Test System # Humidity Test # Ball Pressure Test # Insulation Test # Glow Wire Test # Induced Failure Test 	
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MANGAL INSTRUMENTATION, 134, APNA BAZAR, NEHRU NAGAR, NEW DELHI-65, INDIA, Ph/Fax.29841033, 9811117940, E-mail:mangal_india@vsnl.com			

M.S.N. Swamy Addresses China Public Lighting Summit

Mr. M.S.N. Swamy Chairman ISLE KSC was invited to the China Public Lighting Summit-2010 at Shanghai on September 15-16, 2010 by the City Illumination Committee of China and China Municipal Engineering Association. The Summit invited government officials, senior managers from the leading industrial companies and leading university researchers from USA, Europe, Australia and Asian countries to discuss lighting policy and management for energy saving.



Mr. M.S.N. Swamy was the only representative from India. His presentation covered policy issues regarding lighting in India as well as the role of ISLE in awareness building of energy saving and the need to reduce pollution.

Mr. Swamy introduced ISLE as a non profit Society with membership from Government, Architects, Town Planners, Consultants, Engineers and all who are interested in Lighting and outlined its objectives and activities.

Further, Mr. Swamy explained how they go about empowering people through knowledge on lighting by organising seminars, lectures and workshops on the latest developments in the field of lighting for different interest groups including those in the rural areas.

The presentation also covered some examples of the Government policy initiatives to encourage energy saving such as Star Rating, Energy Efficiency Classes, Energy Audit, ECBC, National Lighting Code, Duty and Tax incentives and better planning.

Agreeing with other speakers that Solid State Lighting has come to stay and the LED is the future source for lighting, Mr. Swamy outlined the problems facing lighting

engineers and consultants including low quality products, inaccurate performance claims, insufficient information, colour rendering and high cost. He emphasised the need for more standards for all aspects of SSL.

Mr. Swamy also gave a sample requirement of a Municipal Corporation and asked those present to take up the challenge in coordination with their associates in India.

The delegates were impressed by the steps taken by ISLE for spreading awareness among the public about pollution from improper disposal of discharge lamps and the measures that need to be taken.

Mr. Swamy felt the seminar was really a great success as this was evident from the interaction with the Speakers from the Participants and the Manufacturers.

450 Delegates comprising of Architects, LED Lighting Manufacturers, Lighting Consultants, Government and Corporations and Public/Street Lighting Association participated in the summit.

Pune Mahanagar Palika Honours P.C. Barjatia

Dr. Prakash Barjatia, Chairman, Mumbai State Centre was felicitated on Independence Day his year by the Hon'ble Mayor of the Pune Municipal Corporation, Mr. Mohan Singh Rajpal for his commendable constructive contribution in the Social, Professional and Educational fields.



Active since his retirement as Deputy Director of the CIRT, Dr. Barjatia has initiated and managed several social work projects in the Jain community in Chichwad and Aundh in Pune. He is also the Director of the MIT Lighting Research Academy in Pune.

Dr. Barjatia carries his social commitment into his personal life by celebrating the birthdays of his grandchildren in orphanages.

Continued on page 24



indian society of lighting engineers



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and

Lighting Research Center



are organising two intensive Seminars
on

Lighting Technologies and Applications

Chennai 6th and 7th December, 2010

Mumbai 9th and 10th December, 2010

Faculty:

Russ Leslie, AIA, FIES, LC



**Professor and Associate Director
Lighting Research Center (LRC)**

Professor Leslie is an expert on energy efficient lighting, architectural lighting design and day lighting. He is a practicing architect, has authored Lighting Pattern Books for Home and Outdoor Lighting and published more than fifty papers on various areas of lighting.

Daniel Frering, LC



**Adjunct Assistant Professor
Manager of Education (LRC)**

Daniel Frering is an Adjunct Assistant Professor and the Manager of Education for the LRC. He teaches courses and seminars in lighting technology, day lighting, control systems, lighting applications and economic analysis. His current research includes photo voltaic outdoor lighting systems and energy efficient lighting for commercial buildings.

Yiting Zhu, Ph.D.



**Senior Research Specialist
Technical Director of Product Testing Programs (LRC)**

Dr. Zhu provides technical oversight to the product testing programs of LRC. She is an expert in optical design software and has modelled and designed many optical systems for LED luminaires. Dr. Zhu conducts research projects and has published many research papers of energy efficient and LED lighting technologies.

For Chennai Seminar contact:

Mr. R. Balasubramanian

09840055645

E-mail: balu@li2011.in

For Mumbai Seminar contact:

Dr. Prakash Barjatia

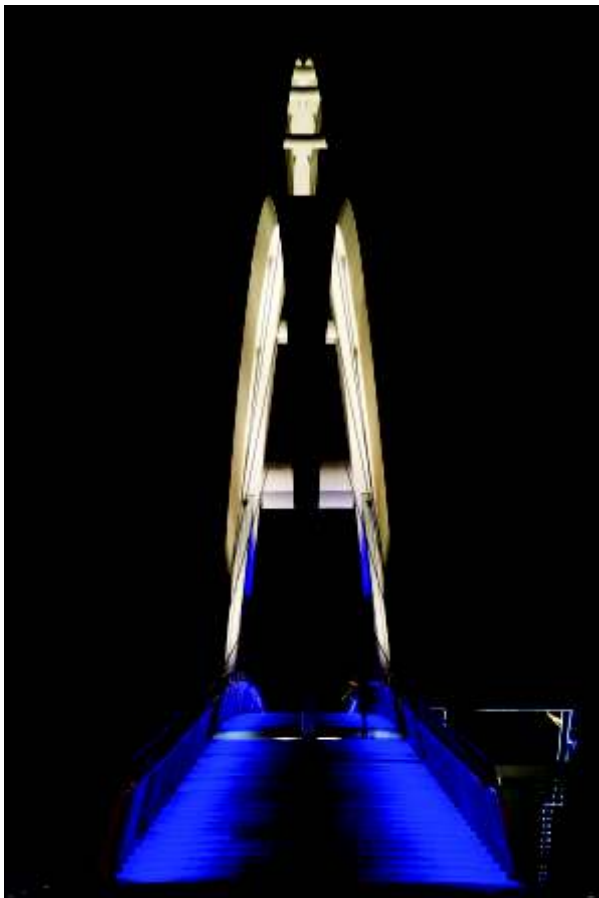
09370144389

dr.prakash.b@hotmail.com or

Mr. Stan Alvares

09820602362

Email: marketec@vsnl.com



INFINITY BRIDGE

STOCKTON ON TEES, UK

The brief for Infinity Bridge was to create a symbolic structure encouraging the public to access the opposite riverbank, encouraging investors to develop the available land. The city client was keen that its night time image created drama and interest as much as by day.

"If I'd only been shown images of this bridge taken in daylight, I would have said that there would be nothing anyone could do that would improve upon its simple, elegant, beauty - and of course I would have been wrong!," one judge commented.

The incredible structural design, with its sinuous form, required careful study to ensure it was properly and sensitively illuminated. Concealment of fixtures, minimizing disability glare and maintainability were key issues. The approach was to graphically illuminate the beautiful form of the arches lit white, with all the associated technical delivery problems. This graphic would be disturbed if the suspended pedestrian walkway was also lit white, hence using less obtrusive blue light.

"[The result is] engaging from near and afar," one judge praised. "The designers have bypassed technical challenges to reveal form on a large scale, and enlivening activity on the pedestrian scale."

LIGHTING DESIGN

Jonathan Speirs
Sandra Downie
Karl Reger
Iain Ruxton
Speirs & Major Associates

PHOTOGRAPHY

© James Newton



THE MODERN WING AT THE ART INSTITUTE OF CHICAGO

CHICAGO, IL USA

The Modern Wing at the Art Institute of Chicago puts light to use as a design feature, both natural and artificial. A unique roof shading system passively excludes direct sunlight within the uppermost galleries. Lighting track is carefully integrated into the scrim framing system and exposed concrete structure, laid out for maximum flexibility. The central Griffin Court is accented by illumination of the white flanking walls, while track lighting allows special event lighting.



LIGHTING DESIGN

Andrew Sedgwick
Arfon Davies
Giulio Antonutto
Arup Lighting

PHOTOGRAPHY

© Nick Lehoux, Renzo Piano Building Workshop
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LIGHTING DESIGN

Martina Weiss
 Thomas Möriz
 Andreas Schulz, Associate IALD
 Licht Kunst Licht AG

PHOTOGRAPHY

© Lukas Roth

NOVARTIS CAMPUS, MAKI OFFICE BUILDING

BASEL, SWITZERLAND

The concept of transparency and spatial flow was the main idea of Maki & Associates for the new office building on the Novartis Campus in Basel. A continuous, flexible working space has been created where all ceilings are sloped at different angles and all office floors are interlinked by double height spaces.

"The illumination at the Novartis Campus is one of the best examples of total integration between architecture and illumination that I've come across in a long time," stated one judge. "Whether you're viewing the building from a distance, or sitting at a typical work station, the integration of the lighting elements with the architecture is seamless."

To stress the open and flowing character, the main lighting objective was to indirectly highlight the ceiling surfaces and to illuminate the building whilst retaining the ceiling untouched. Specially designed luminaires for the open office have been designed to achieve the target of a softly uplit space.



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E 40



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Trends in Planning the Lighting System for Sports Facilities for Colour Television

Vipin Gulati

Introduction

Broadcasting engineering is progressing fast to provide viewers with immersive high-definition coverage of sports events. With the advancement of technology in high-definition television (HDTV) broadcasting, since its first implementation at the 1992 Olympics, it has gained wider acceptance today. The availability of receivers with higher resolutions and acceptance of a 16:9 aspect ratio together have surged the demand for exotic coverage of sports events.

HDTV cameras deliver high quality images with large amounts of detail in normal light conditions. The images are sharp and highly detailed. The high-definition digital broadcasting has brought in a revolution in televising sports events by frequent use of close-ups and slow-motion shots as a means of capturing the excitement of the action.



Figure 1. Croke Park Stadium, Dublin, Ireland

It is expected that by 2013, leading broadcasting companies of Europe, USA, Japan and the Middle East would have completed their on-going programme of upgrading their TV studios and OB vans to suit HDTV. This suggests that all venues at the planning stage and existing venues for Colour Television (CTV) coverage should review lighting requirements to make them suitable for HDTV coverage.

Planning the lighting system for colour television of today calls for re-addressing the following parameters:

- Lighting levels
- Colour temperature of the lighting
- Colour rendering of light sources
- Flicker effect
- Glare rating
- Reliability of continuity of broadcasting
- Sky-glow: Environment issue

Lighting Levels

To arrive at the recommended lighting level, sports events have been divided into three categories by CIE 83:1989, characterised mainly by the dimensions of the object and the speed of action occurring during camera shots. This document then relates sports category to service illuminance. The recommended maintained illuminance of CIE 169:2005 is related to service illuminance as below:

$$E_{\text{service}} = 0.8 * E_{\text{initial}}$$

$$E_{\text{maintained}} = 0.8 * E_{\text{service}} = 0.64 * E_{\text{initial}}$$

with a **typical** maintenance factor of 0.8.

The figure below explains the relationship between service illuminance and maintained illuminance.

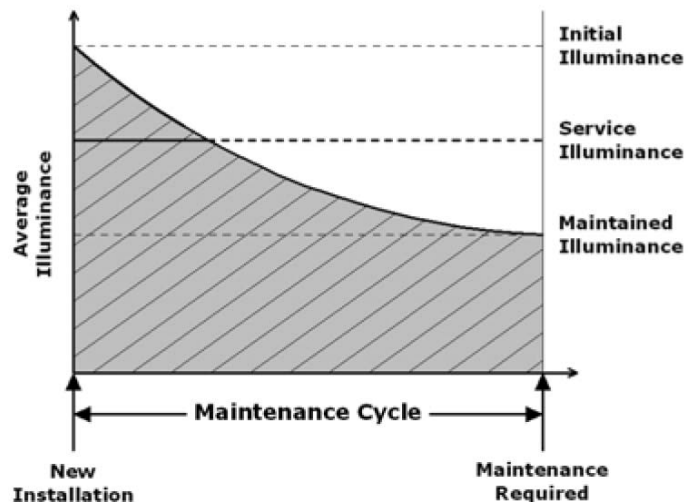


Figure 2. Service Illuminance and Maintained Illuminance

The maintained levels are illuminance levels at the end of the maintenance cycle, and service levels are mid-life illuminance level.

CIE 169:2005 has laid down a method to account for lamp depreciation and mortality to arrive at overall maintenance factor after considering environment influence on the light depreciation.

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To focus on the moving subject with precision from a distance on a close-up, framing demands more depth of the camera field. The need for replay of a sports event in slow and extra slow motion requires capturing more frames per second. The faster moving object through the field of view demands more frames to be generated. Further, fast moving objects would generally demand more depth. These days HDTV cameras are extremely sensitive in low light too and produce good quality images but strive for more picture frames and higher depth of field demanding higher illuminance. The requirement of more light is also strengthened as the distinction between the main camera and the moving camera is disappearing and appreciation for instant slow motion replay is growing.

Therefore, the lighting level has to be increased to produce the desired exposure. The increase in lighting level would depend on the speed of the game. Today's broadcast of 720p is getting replaced by 1080p with wonderful grain texture and more frames.

Colour Temperature of the Lighting

In the case of indoor installation with significant daylight contribution or outdoor installation, the colour temperature of artificial light would be between 4000 K and 6000 K. This temperature range is applied to select lamps that match better with the twilight period.



Figure 3. Al Shaqab, Qatar - Mixing of daylight and artificial light at a HDTV venue

The apparent colour temperature changes within the scene should be minimised as the reduction in daylight contribution is compensated by artificial lighting.

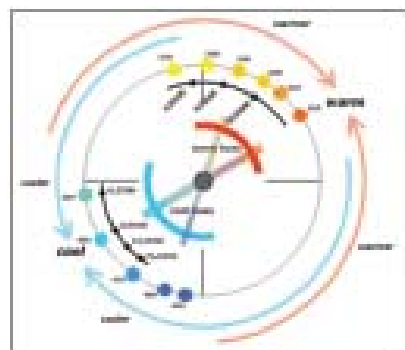


Figure 4. Colour analogs to daylight spectra

The variation in colour temperature gets embellished by the cameras. This is because unlike the human eye, cameras can adapt to one colour temperature. In view of this, within the reference area of an installation, the colour temperature of lamps should not deviate from the average value by more than 50 K.

Colour Rendering of Light Sources

The Australian Standard AS 2560:2002 has recommended different minimum required colour rendering for Physical Training, Match Practice and Professional Competition besides other lighting parameters. The reference suggests minimum colour rendering Ra of 90 for Professional Competition venues. However, like the previous edition, FIFA 2007 still continues to recommend Ra greater than 65 while some other sports federations recommend Ra of 80 or even 90 for lamps at professional venues.



Figure 5. Skilled Park Stadium, Sydney, Australia

For most of the televised sports, distortion free colour reproduction is important. For venues of CTV and HDTV, the colour rendering index Ra should be better than 90. It would be observed that lamps with Ra less than 80 are lacking in the red. This would result in non-faithful capturing of true colours such as red, brown and may be orange by the camera. Such distortion of colours is generally not acceptable to advertisers as they rely on colour fidelity to promote their brand identity.

The difference in colour recognition properties of lamps with different colour rendering are best compared under ten colour chart samples (eight standard colour chart samples and two skin tone samples defined as TCS09 and TCS10).

Flicker Effect

HID light sources, when operated on an alternating current circuit, produce a noticeable flicker causing stroboscopic effect on rapidly moving objects. This effect is noticeably visible during slow motion replay. It is because each frame captures the artificial light of the floodlights

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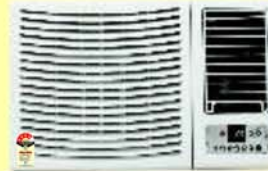
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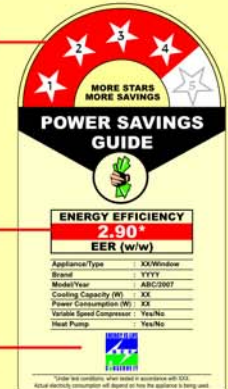
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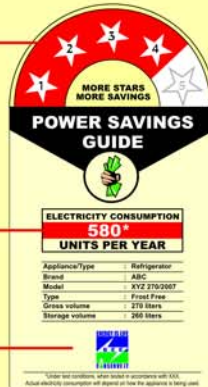
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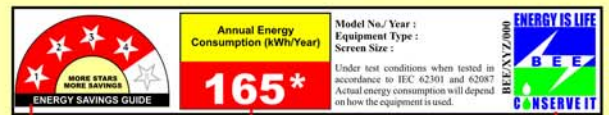
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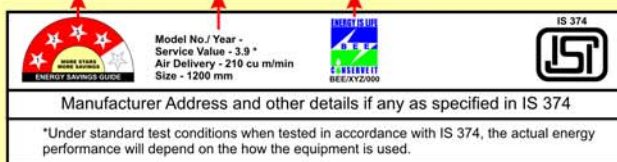
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at a different point in the sine wave, causing a flicker if the frame rate does not synchronize with the lighting frequency. To practically eliminate this flicker effect, the total electrical load should be symmetrically loaded on the three phases for electrical balance. The lighting at each point should be produced by contributions from lighting units connected to each of the three phases. Therefore, the aiming pattern should consider electrical load balancing for each switching option and location of aiming.

Rendering software has to be deployed to position the luminaires, adjust the aiming angles for the floodlights to interlace to eliminate shadows for the TV broadcasts, and provide electrical phase balancing to avoid flicker.

Such a solution will only minimise the flicker and will not completely eliminate it. The best solution would be to use high-frequency electronic gear.

Glare Rating

The degree to which a lighting installation causes glare depends upon the luminous intensity distribution and aiming of the luminaires, their number, their arrangement and mounting height, and on the brightness of the illuminated area.

The quantitative relationship between glare and the calculable and measurable lighting parameters for sports lighting enables the evaluation of lighting designs and comparison of lighting installations. It is suggested that a more onerous restriction for glare be considered for critical positions of players. Depending on the intent usage of the venue, certain glare evaluation positions would be more critical to players than the others and therefore, for such locations, there is a need for more stringent control of glare.

In addition to the present concept of restricting maximum glare for various observer positions, it is also suggested to contain overall glare experienced by the moving player to enhance the degree of visual comfort over the entire playing arena.

Reliability of Continuity of Broadcasting

The CTV broadcasting companies demand reliability of the power supply system for important sport venues. It is common to have at least two transformers, each sharing equal load in addition to part of the load being on generator for basic lighting. To guard against possible momentary dip in supply voltage, the use of expensive hot restrike lamps is inevitable for important venues.

Today's state-of-the-art lighting system would have PCs which control all the lighting, from the high floodlights on decorative towers or architectural roof to the corridor and basement lighting. A situation-based

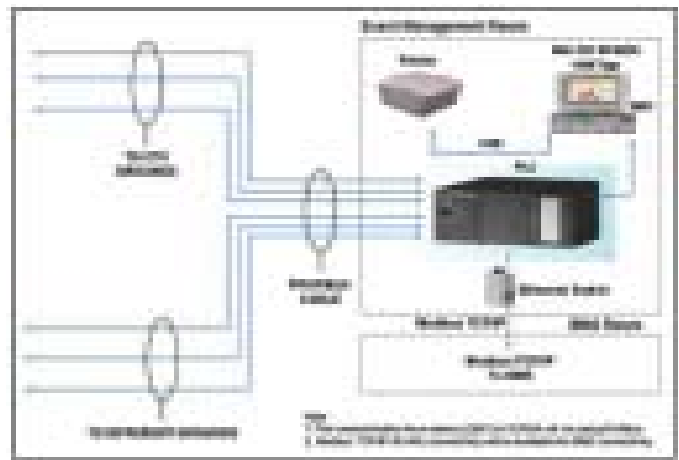


Figure 6. Lighting control system schematic for a sports complex

lighting control system, using a single touch-screen PC to switch easily between lighting levels for different events is desired. The system should also allow manual operation for authorised personnel to control any lamp or group of lamps anywhere in the stadium. Such a control system would avoid high starting and re-ignition currents by step-by-step switching of a group of lights. In the event of the control system failing, all floodlights would be turned on rather than failing.

SKY-GLOW: Environment Issue

CIE 126:1997, CIE 150:2003 and FIFA: 2007 have recommended measures to control spill light. Table 2 of CIE 126:1997 recommends limiting values of sky-glow. It is felt that these recommendations can be made simpler and yet more stringent.

For an installation having luminaires with different aiming angles CIE 150:2003 considers portion of the total flux of the luminaires **directly** emitted at and above the horizontal in the installed position as

$$ULR = \frac{ULOR}{LOR}$$

$$ULR = \frac{DLOR + ULOR}{ULOR}$$

where ULOR = cumulative upward light output ratio of all luminaires of the lighting installation

DLOR = cumulative downward light output ratio of all luminaires of the lighting installation

LOR = total fluxes of all the luminaires of the lighting installation to the cumulative nominal fluxes from the lamps in use

Computation as per CIE does not take into account the photometric properties of the surfaces and is limited

to estimation of direct sky-glow only therefore, an alternative approach is suggested.

The suggested approach below requires computation of total upward lumen flux of the installation Φ_{Upinst} as a percentage of total lamp flux installed. It is suggested;

$$\text{Sky-glow } (\Delta) = (\Phi_{Upinst} / \Phi_{la}) * 100$$

where Φ_{la} is the total lamp flux installed.

The upward lumen flux of the installation Φ_{Upinst} has two components as shown in figure below:

- a) Direct flux to the sky
 - b) Reflected flux to the sky
- a) Computing direct flux to the sky $ULOR_{inst}$
Photometry software programmes are available that can generate ULOR for different angle of tilt of a luminaire. From this data, the installation direct flux to the sky can be worked out as a sum over all the luminaires under consideration.
 - b) Computing reflected flux to the sky. This requires estimation of downward light ratio of the installation and relating it to the photometric properties of the lit surfaces.

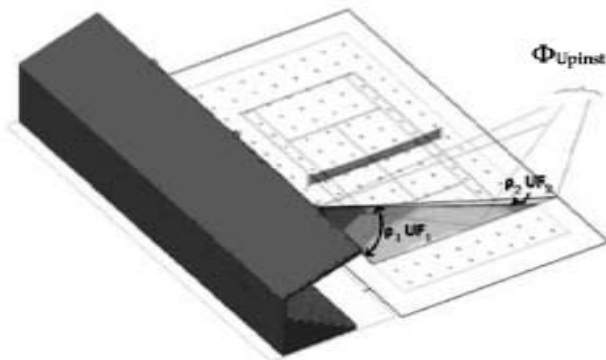


Figure 7. Distribution of installed luminous fluxes

Therefore, total upward installation flux Φ_{Upinst}

$$= \Phi_{la} [ULOR_{inst} + \rho_1 U_f + \rho_2 U_f + \rho_3 U_f + \dots]$$

where U_n refers to utilization factor for the surface n with reflection factor ρ_n

$$= \Phi_{la} [ULOR_{inst} + \rho_1 U_f + \rho_2 U_f + \rho S(DLORU_f - U_f)]$$

In the above equation, reflection factor of principal playing arena (PPA) ρ_1 and its immediate surrounds ρ_2 are generally known. The last term of the above equation would be small and may be ignored for venues with high spectator gallery having roof or canopy.

It is felt that such a computation would lead to improved evaluation of sky-glow. However, more work is needed to arrive at an improved measure and setting of upper limits of sky-glow.

Conclusions

In this paper, attempt has been made to highlight some of the special considerations that should go into the design, installation and management of a lighting system for a sport ground or stadium for HDTV.

The sports venues of the future have to do more to make arena lighting suitable for HDTV coverage with higher depth combined with its suitability for flicker free slow motion coverage. For best results, the aiming patterns of luminaires and electrical distribution should be examined together to minimise flicker.

More investigations are needed to develop single measure of sky-glow.

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Vipin Gulati C.Eng MCIBSE
Chief Engineer
Thorn Gulf LLC
301/302 Al Shoula Bldg, 'E' Block
Airport Road, Dubai, U.A.E
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Biswajit Ghosh in New Solar Power Book



At the 5th World PV Congress held at Valencia in September 2010 the book *Power for the World - The Emergence of Electricity from the Sun* was released. The book concentrates on photovoltaic (PV) solar power and its scientific, technological, industrial, political, environmental and social implications.

It has been translated into 4 languages already and further translations are underway.

ISLE Fellow and former Governing Body member, Dr. Biswajit Ghosh is the author of Chapter 16 on *Lighting the World: Yesterday, Today and Tomorrow*, the Indian initiatives.

P.K. Bandyopadhyay for UNESCO Publication



The UNESCO has developed the largest publication of the world, the *Encyclopedia of Life Support Systems (EOLSS)*, as an archival source of reference to a great variety of subjects relevant to sustainable life on this planet.

In October 2010 the UNESCO-EOLSS Joint Committee has invited Mr. Pranab K. Bandyopadhyay to make a comprehensive contribution to the EOLSS, in view of his wide experience in the field of Illumination Education.

The subjects given to Mr. Bandyopadhyay as of now are:

- 1) A Theme-level writing of a chapter on Illumination covering basics for a wide audience including non-experts and presenting a perspective on the nature and history of Light and an overview of the current status.
- 2) A treatise on Exterior Lighting and other Applications covering Area Lighting for different industries and operations; Security Lighting; Lighting for Parks, Gardens, Monuments etc. and City Beautification; Sports Lighting; Road Lighting; Lighting Maintenance; and prevention of Light Pollution.

The EOLSS is an integrated compendium of twenty encyclopedias. The first Earth Summit of 1992, held in Rio de Janeiro, issued a document that is now famous as Agenda 21. This document refers to the Earth's life support systems, considering the whole of our planet as a grand intensive care unit which supports all forms of life (both natural and human engineered systems). The EOLSS is based on this concept and the above definition of 'life support systems'.

Unlike most encyclopedias, the contents of which are alphabetically arranged, EOLSS has a thematic organization. It can almost be regarded as an 'encyclopedia of encyclopedias', presenting a wide range of major core subjects in a process of gradual development, from broad overview to great detail. Subjects covered include: Earth and Atmospheric Sciences; Biological, Physiological and Health sciences; Mathematical and Physical Sciences; Chemical Sciences; Water Sciences and Engineering; Energy Sciences and Engineering; Biotechnology; Tropical Biology and Conservation Management ; Land Use, Land Cover and Soil Sciences; Control Systems, Robotics and Automation; Environmental and Ecological Sciences and Engineering; Food and Agricultural Sciences; Human Resources Policy, Development, and Management; Natural Resources Policy; Development and Economic Sciences; Ships and Offshore Structures; Regional Sustainable Development; Social Sciences and Humanities; Institutional and Infrastructural Resources. EOLSS is augmented and updated on a monthly basis.

EOLSS-online is made available free of charge to universities in the UN list of least developed countries and disadvantaged individuals including minority colleges and universities worldwide.

EOLSS body of knowledge is also made available in the form of e-books in pdf format. Presently about 560 e-books (volumes) are ready and gradually this number will increase to ultimately capture the entire EOLSS-online body of knowledge in about 600 volumes. Proposals are presently being studied for making the e-books also available in some major languages in addition to the original set in English in collaboration with the Universal Networking Digital Language (UNDL) Foundation, Geneva, Switzerland. The EOLSS On-line has emerged as the largest and the most authoritative source of thematically organized current knowledge. Users will find the EOLSS On-line a convenient reference to help them in their chosen field of specialization and support their efforts in gaining a holistic understanding of many current problems through interdisciplinary subjects and transdisciplinary pathways forged across disciplines. The EOLSS On-line is rapidly becoming the most sought-after reference site in the world.

This is a well deserved recognition of a lifetime's dedication to Lighting for Mr. Bandyopadhyay. A Founder Member of ISLE, Mr. Pranab K. Bandyopadhyay is a past President of ISLE (1997-2003). He was the first Indian and the first from a developing country to be appointed as Chairman a CIE Technical Committee in 1987 and Editor of CIE Division 5 and Member, CIE Publication Board in 1995. He was also a UGC Visiting Professor of M.E. (Illumination Engineering) at Jadavpur University in Kolkata.

Lighting Industry at the Edge of the Unknown

Everyone involved with the LED world is involved in a massive industry transformation, which has parallels with the changes that were seen in another industry - Cameras.

A key challenge for lighting majors will be the fact that the drivers of success will change rapidly. Currently, distribution, brand and pricing largely determine the performance of firms in the lighting industry and new entry is almost impossible. In the LED segment, technology (and price) will become the key performance driver until a shakeout takes place in the industry. After the shakeout, technology will become less important as often seen after shakeouts in such situations. This shakeout may lead to the exit of one or more current lighting majors, as has happened in many other industries in the past.

So what does all this imply for the firms eyeing the emerging LED market? The take-away depends on who you are. If you are a lighting major, you ought to be very careful lest you repeat the mistakes that camera majors made. If you are a startup, you need to keep an eye on how the industry evolves and capture emerging niches the same way that firms like Flickr and Shutterfly did in the photography industry. LED will nicely play into niches such as wellness and aesthetics that will need capabilities that lighting majors and newcomers do not possess today.

If you are an LED technology firm entering from other domains into lighting, you need to know that although head-on collision with the majors will be possible now, you have to cover your vulnerabilities, especially in non-technical capabilities that you still do not own. It may be best to influence the LED game to your advantage in the first round while trying to build missing capabilities. However, all players will have to think out of the box to create a compelling future ahead.

No matter how you are involved with the LED world, one fact is indisputable: you are involved in a massive transformation of an industry that will touch every life on this planet. It is rare to be a part of something so monumental.

LINK :

<http://www.ledsmagazine.com/features/7/7/2?cmpid=EnlLEDsJuly142010>

LEDs and Automated Control Technologies Identified as Keys to Lighting Efficiency

Lux Research has released new research that identifies lighting as the best target for energy savings in commercial

buildings, and LEDs and automated control technologies as the keys to maximum savings.

According to Lux Research, lighting accounts for 20% of the electricity usage in commercial buildings and therefore is the top target when organizations seek to curb energy usage. Lux estimates that by 2020, automated control technologies combined with LED-based solid-state lighting (SSL) and more efficient fluorescent lamps can reduce lighting electricity use by 60%.

Lighting efficiency is especially important given the ramp in commercial building space. Lux estimates that the developed world is adding commercial buildings at the rate of 11.3 billion square feet per year. The company believes that today electricity for lighting costs \$174 billion globally, but that the number can drop to \$119 billion by 2020 even with the ramp in building space.

The report "The Future is so bright: Energy, carbon, and cost savings through better lighting" highlights the role LEDs and automated control technologies will play. Lighting controls such as occupancy sensors, lighting sensors, and fixtures that can be dimmed and controlled remotely can reduce lighting energy by 60%. Today such controls are in 12% of buildings but will be in 30% by 2020.

LED explosion in 2014

Lux projects that LED-based SSL will "explode onto the scene in 2014." The analyst firm reports that SSL will begin to supplant T8 fluorescent in 2014 despite the fact that today the LED-based T8s are not performing well. Lux projects that by 2020, LEDs will provide 60% of the light in commercial buildings and 42% of the light in the residential market.

Lux does warn that the early deployments of more-efficient lighting may ironically slow adoption later on. The report suggests that electrical rates will stagnate or drop as lighting efficiency improves over the next decade. That could lengthen the payback period associated with efficient lighting deployment and actually slow the momentum.

LINK :

https://portal.luxresearchinc.com/research/document_excerpt/6574

(This is a document excerpt. The full contents are available to clients of the following services:

*Lux Research Green buildings Intelligence
Lux Research Carbon Intelligence)*

How Artificial Light Helped Create the Modern World

"Having seen nothing but kerosene lamps for illumination, this was like getting a sudden vision of

Heaven," wrote a young girl visiting the World's Columbian Exhibition of 1893. For many visitors, the lighting at the Chicago World's Fair was their first encounter with the dazzling brilliance of what modern people take for granted - immediate access to artificial light.

In her new book "Brilliant: The Evolution of Artificial Light," award-winning author Jane Brox traces a chronologic path from animal oil lamps to light-emitting diodes (LEDs) to show how artificial light has transformed our existence. Along the way the traditional players of a niche history - politics, technology, money and power - play important roles. Clearly written with an engaging cast of characters, "Brilliant" is a thought-provoking account of arguably one of the greatest technological changes in the history of the world.

Humans have always sought artificial light. Initially, we relied on animals, such as caged fireflies, a lit chunk of dried salmon on a stick, or whale oil, so valued as a light source that hunters nearly drove several species to extinction, but then came rock-based light. Gas arrived first, followed by kerosene, and light crept out of the house and spread to city streets and factories, which led to more hours to play and to work. Not all benefited. Neither the poor nor those in the countryside could always get access and so often remained in the dark.

LINK :

http://seattletimes.nwsourc.com/html/books/2012377523_br18brilliant.html

Lighting Design is an Art

We've all experienced the bleak confines of a poorly designed waiting room or office space with pulsating fluorescent bulbs casting a cold and seemingly lifeless glow onto everything beneath them.

But we've also experienced similar spaces that are much more inviting in atmosphere, where light is varied in its source, interesting in its layout and harmonious in its composition. The light within a space profoundly affects the way we perceive it and can easily make two identical spaces feel worlds apart.

Lighting design is as much an art as any process in the creation of a home. Every space within a house has its own specific living requirements -- a bedroom is very different than a workshop -- and the creation of a lighting layout for its users needs to be based on an analysis of its own unique illumination needs.

Read more:

<http://www.nsnews.com/Lighting+design/3304131/story.html>

Free Tutorials Educate Consumers and Businesses about LEDs

Curious businesses and consumers now have a better way of learning about the most energy efficient and stylish lighting option on the market-LEDs. San Francisco-based LED lighting retailer Elemental LED recently launched LEDucation, an online learning center for all things LED. Comprised of both instructional PDFs and videos, LEDucation ensures that any LED consumer can easily understand how to assemble their product, and/or how to modify products to fit their individual needs.

"We realized that many consumers think using LED lights is more complicated than it actually is. We want to make sure that everybody can reap the benefits of LED lights, which include saving electricity, reducing your carbon footprint and improving the aesthetics of your home. That's why we came up with LEDucation," says Elemental LED CEO Max Darling.

LEDucation provides clear instruction on LED installation, putting power in the hands of consumers to customize their lighting solutions on an individual and situational basis. Plus, the instructional videos make LED installation easy, even fun! Here are some LEDucation topics, with more being added every day.

LINK :

<http://www.elementalled.com/leducation/>

TERI Unveils New Generation Cost Effective Off-Grid Lighting Solutions for Rural Electrification Under its Lighting a Billion Lives Campaign

In continuation of its efforts and commitment towards providing clean lighting solutions in rural regions of the country and beyond, The Energy and Resources Institute (TERI) under its flagship project "Lighting a Billion Lives" (LaBL), unveiled new models of solar lanterns jointly designed and developed by TERI along with its technology partners. These new solar lanterns will provide cutting edge, affordable lighting solutions, ensuring high quality illumination.

In his address Mr. Jitin Prasada, Minister of State for Petroleum and Natural Gas said "It is a matter of personal gratification for me to be associated with unveiling of these new generation cost effective solar lanterns under TERI's "Lighting a Billion Lives" initiative. Since I myself represent a rural constituency I can appreciate the importance of such projects to the vast majority of our rural brothers and sisters. This fact reflects that this vast majority is not only unable to join the

mainstream of development, but also suffers on account of adverse implications on human health. We cannot expect our fellow citizens to wait for the last mile of electrification grid. It is, therefore, important that we seek solutions like LaBL, which definitely has the potential of fulfilling the gap between effective supply demand in rural lighting. This initiative provides as excellent opportunity for the public and private sector to synergize their efforts and maximize the benefits."

LINK :

http://www.teriin.org/index.php?option=com_pressrelease&task=details&sid=197

Experts Illuminate the Future of Lighting

When lighting designer Randall Whitehead of San Francisco set out to remodel a two-bedroom home on Potrero Hill, he knew he wanted to upgrade the lighting and make it more energy efficient. But while Whitehead wanted to be green, he had no plans to sacrifice the style and look of his home.

"I have made it my personal mission to find energy-efficient lighting that can be attractive - and dare I say it - sexy," he says.

"All the lighting in my home has been changed to energy-efficient lighting. OK, to be totally truthful, the fridge and the oven still have incandescent lamps. I haven't yet found a viable alternative for those two locations. I could buy a new refrigerator with LED lighting but that just isn't in the budget at the moment."

What Whitehead knows that most homeowners don't is that energy-efficient lighting also can be aesthetically pleasing.

LINK :

<http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/07/23/HODL1EAQIE.DTL>

Creative student shines at UK national lighting awards

A product design student at Nottingham Trent University has won the Student Lighting Designer of the Year Award. John Etherington fought off competition from across Europe to win the top prize in the Lighting Association's annual Student Lighting Design Awards with his inspired 'ARC' decorative table light design.

The design features an arced body which allows it to be rolled into various positions giving different angles of light on a desk or side table. Influenced by contemporary design and engineering, alongside traditional and new

manufacturing techniques such as sheet metal rolling, the light has been created from a combination of stainless steel, white oak and copper. Its light source comes from 18 LEDs.

John has received £1,500 for winning the top prize in the competition, which is held to enable students to use their creative skills to develop new lighting products whilst gaining valuable knowledge about the lighting industry. John, who has just graduated from the university's School of Architecture, Design and the Built Environment said: "It feels great to have won this award. Throughout the day I was given the opportunity to talk to many industry professionals and have gained a number of key contacts for the future. I am currently developing my idea further with a view to marketing the product."

The design was perceived as an elegant combination of minimal aesthetics and simple functionality.

LINKS :

<http://www.lightingassociation.com/>
http://www.lightingassociation.com/pdf/LA_SLDA10_290710.pdf

<http://www.john-etherington.co.uk/portfolio.html>

MEMBERSHIP APPLICATIONS APPROVED BY GOVERNING BODY

New Members Admitted List July, August and September 2010

M. No	Name & Addresses	Grade	Centre
I.0145	Mr. Vishwajeet Jayant Rajwaday Ligman Lighting India Pvt. Ltd. "Anurag" Plot No 10, Pushpak Park off ITI Road, Aundh Pune 411 007	Institutional	Mumbai
F.0688(L)	Santosh Kr Gupta (Pipersania) B-7, Shanti Sudha Rajendra Vihar New Akashwani Kota Rajasthan	Fellow (Life)	Rajasthan
F.0689(L)	Mohit Mathur Thorn Lighting India Pvt. Ltd. A-274, First Floor Defence Colony New Delhi 110 024	Fellow (Life)	Delhi
F.0690(L)	Gulab Chand Jangid Village/Post Jai Pahari Distt. Jhunjhunu Rajasthan	Fellow (Life)	Rajasthan
F.0691(L)	Rajendra Raje 579/1/3, MG Road Behind Sunrise Tower Indore 452 001	Fellow (Life)	Mumbai
F.0692(L)	Mahesh Aggarwal 17, Shankar Nagar Saket Indore 452 018	Fellow (Life)	Mumbai
F.0694(L)	Vivek Barve Engineering Solutions 118, Peace Point, Limbodi Khandwa Road Indore 452 001	Fellow (Life)	Mumbai

F.0695(L)	Dinesh Wadhwa 575/14 MG Road B/H Bank of India Palasia Branch Indore	Fellow (Life)	Mumbai	M.1553(L)	Manish Gupta Universal Transformers C/o Dr. D.L.Gupta 95-96 Greater Vaishali Annapurna Road Indore	Member (Life)	Mumbai
F.0696(L)	Alok Mittal C-6, Chandra Nagar A.B. Road Indore 452 008	Fellow (Life)	Mumbai	M.1554(L)	Shailendra Kulkarni Trouble Shooters #201 Swastik, 9/1 Mandramaganj A.B. Road Indore	Member (Life)	Mumbai
F.0697(L)	Ashok N. Dubey 99 Silveroaks Colony Annapurna Road Indore 452 009	Fellow (Life)	Mumbai	M.1555(L)	Jyotsna Kekre 143 Kalindi Kunj Pipalyahana Indore 452 001	Member (Life)	Mumbai
F.0698(L)	Mohan Mokhariwale Crallium Electronics (P) Ltd 1, Paraspar Nagar Annapurna Road Indore 452 009	Fellow (Life)	Mumbai	M.1556(L)	Anoop Mukund Kekre 143 Kalindi Kunj Pipalyahana Indore 452 001	Member (Life)	Mumbai
F.0699(L)	Ajoy K Mukherjee Flat No 7, Third Floor 1/384 Jodhpur Park Kolkata 700 068	Fellow (Life)	Kolkata	M.1557(L)	Avinash Talreja Jai Bharat Elec. Co. 2 Jail Road Indore	Member (Life)	Mumbai
F.0700(L)	Sunil Nayyar J-2/32, DLF-II Gurgaon	Fellow (Life)	Delhi	M.1558	Nitin Gangrade Axis Fincap 50 Kanchan Bag Indore 452 001	Member	Mumbai
F.0702(L)	B.M. Bhatia B-13 Inderpuri New Delhi 110 012	Fellow (Life)	Delhi	M.1559(L)	Sudhir Krishan Sood Bungalow No 10 Shalimar Township A.B. Road Indore 452 010	Member (Life)	Mumbai
F.0703(L)	Ramesh Kumar Bhandari Sigma Overseas P Ltd P-27 Sagar Manna Road Kolkata 700 060	Fellow (Life)	Kolkata	M.1560(L)	Tarun Lodha 6 Anurag Nagar B/H Shalimar Township Gram Niranjapur Indore 452 010	Member (Life)	Mumbai
M.1544	Chandrasekhar Valiyaveettil Maascons Management Services 4-200, First Floor, Geeta Nagar Ferozguda Hyderabad 500 042	Member	Chennai	M.1561(L)	Sandeep Mathur 304, Imperial Sakar Residency Sch, 54, A.B. Road Indore	Member (Life)	Mumbai
M.1545	Shyam Gopal Mishra Future Lighting Solutions 512, Ansal Tower, Nehru Place New Delhi 110 019	Member	Delhi	M.1562(L)	Niraj Patil 48-A, Mishra Nagar Annapurna Road Near Adarsh School Indore 452 009	Member (Life)	Mumbai
M.1546(L)	Anand Whardhan 322, Old Post Office Street Chota Bazaar, Shahdara Delhi 110 032	Member (Life)	Delhi	M.1563(L)	Sulabh Muchhal A-One Electrical Agencies 15, Dhenu Market Indore 452 003	Member (Life)	Mumbai
M.1547(L)	Upendra Shrivastava 120, Golour Colony Near Annapurna, Indore	Member (Life)	Mumbai	M.1564(L)	Bharat Ghule Bridgestone India Pvt Ltd Plot No 12, Kheda Groth Centre Post - Sagore District Dhor 454 774	Member (Life)	Mumbai
M.1548	Abhishek Jain C/o Prof. V.C. Jain 5-B, Menon Colony, In front of Star Regency Near Little Flower School Near Shrinagar Extension Indore	Member	Mumbai	M.1565(L)	Rakesh Saxena 6/2, Staff Quarters SGSITS Campus Y N Road Indore	Member (Life)	Mumbai
M.1549(L)	Hitendra Mehta 28, Gulmohar Colony Indore	Member (Life)	Mumbai	M.1566(L)	Vinay Babar Technocraft 23, Kalpana Lok Indore 452 018	Member (Life)	Mumbai
M.1550(L)	Banwari Lal Lowanshi 36, Mangal Nagar NXA In front of Petrol Pump Sukhliya Indore	Member (Life)	Mumbai	M.1567(L)	Naeemuddin Qureshi "Crystal" 118 Telephone Nagar Indore 452 018	Member (Life)	Mumbai
M.1551(L)	Vipin Soni Solution Consultants 88, MG Road, 229 Phadnis Complex Near Kothari Market Indore	Member (Life)	Mumbai	M.1568(L)	Arvind Sahu 296/2, Shakti Nagar BPL Arvindam Bhopal	Member (Life)	Mumbai
M.1552(L)	Dinesh Gupta Allied Sales Corporation G-6, R.P. Apartment 29/1 Race Course Road Dr. R.S. Bhandari Marg Indore	Member (Life)	Mumbai				

M.1569(L)	Amit Rai H No-235, Adharshila Barkhera Pathani Khajurikala Bhopal	Member (Life)	Mumbai	S.0498	Aparna Dube 1626, Sector-D Sudama Nagar Indore	Student	Mumbai
M.1570(L)	Vipeen Gaur Narmada Associates BDA Shop No 28 B/H Raja Parisar M P Nagar Bhopal 462 011	Member (Life)	Mumbai	S.0499	Raghvendra Singh Bhadouria 116, Radir Colony Indore	Student	Mumbai
M.1571(L)	Indrajit Sinha A-6/96, Kendriya Vihar VIP Road Kolkata 700 052	Member (Life)	Kolkata	S.0500	Lalit Mehtani 102, Ruchi Apartment J/143 MIG Colony Indore	Student	Mumbai
M.1572(L)	Sankar Kumar Datta Shivalaya Apartment BL-II, Flat No E/2 53A, Peary Mohan Roy Road Kolkata 700 027	Member (Life)	Kolkata	S.0501	Rahul Pandey 38, Raghuvanshi Colony Mari-Mata Square Indore	Student	Mumbai
M.1573(L)	Prodip Kumar Saha Qtr No 117, EB Block Labony Kolkata 700 064	Member (Life)	Kolkata	S.0502	Kavita Gupta E-K-7-8 Scheme No 54, Vijaynagar Indore	Student	Mumbai
M.1574(L)	Ashis Sen Gupta 80, Silpara Road, Gopal Colony M M Block Vidyasagar Sarani Barisha Kolkata 700 008	Member (Life)	Kolkata	S.0503	Ankit Tiwari 50/2 Nehru Nagar Patnipura Indore	Student	Mumbai
A.1041(L)	Niranjan Gupta 30, Gorerdhanpura Kota Rajasthan	Associate (Life)	Rajasthan	S.0504	Seema Jain C/o Rajesh Jain 36, Martand Chowk, Rambagh Indore	Student	Mumbai
A.1042	V.P. Ajayakumar TC-31/779 (1), Gokulam Pulli Lane, Pettah P.O. Thiruvananthapuram	Associate	Chennai	S.0505	Pooja Singh 910, Ranibag Khandwa Road Indore	Student	Mumbai
A.1043	M. Rizwan TC-39/707 MNP Compound-P.O. Trivandrum Kerala 695 036	Associate	Chennai	S.0506	Harsh Mehta 1533-B Sch. No. 71 Behind Ranjeet Hanuman Mandir Indore	Student	Mumbai
A.1044(L)	Haritha Bothireddy New No 3, Stone Link Avenue RA Puram Chennai 400 028	Associate (Life)	Chennai	S.0507	Arpit Dammani AG-153 Sch. 54 Vijay Nagar Indore	Student	Mumbai
A.1045	Ramchayan Yadav C-25/5 RRCAT Colony Indore 450 013	Associate	Mumbai	S.0508	Karuna Nikum A-14/8 Mahananda Nagar Ujjain	Student	Mumbai
A.1046(L)	Sandeep Ahlawat 30, Pragati Nagar Indore	Associate (Life)	Mumbai	S.0509	Amit Omer C/o Sri Satya Prakash Omer Gular Naka Banda 210 001 (UP)	Student	Mumbai
A.1047(L)	Samdarsh Nayyar J-2/32 DLF-II Gurgaon	Associate (Life)	Delhi	S.0510	Mulchand H. Ayalani "Shivam" Talawadivas Shakti Chowk Morbi 363 341 (Gujarat)	Student	Mumbai
A.1048(L)	Siddarth Doshi Doshi Consultant Pvt Ltd 401, City Centre 570, MG Road Indore		Mumbai	S.0511	Paresh J. Shah Jay, Plot No 23, Gate No 2B Mukati Nagar Jalgaon	Student	Mumbai
A.1049(L)	Tausif Ahmed Treasure MEP Services Pvt Ltd Design Studio, 6th Floor Treasure Island MG Road, South Tukoganj Indore	Associate (Life)	Mumbai	S.0512	Pervez Khan Sharan Boy's Hostel Shakambhari Avenue Near Aurbindo Hospital Gram Reoti Indore	Student	Mumbai
A.1050	Ankit Agrawal Alok Electricals 23, Siyaganj Street No 2 Opp. Hanuman Mandir Indore	Associate	Mumbai	S.0513	Shriom Awasthi Sharan Hostel Shakambhari Avenue Reotigaon, B/H SAIMS Indore	Student	Mumbai
				S.0514	Bhaskar Singh Schm No 114, Naye Sadak Vijay Nagar Indore	Student	Mumbai

S.0515	Arvind Kumar Sharma Sharan Boys Hostel Shakambhari Avenue Sanwer Road Indore	Student	Mumbai	S.0531	Gaurav Kumar Swarnkar 5-LIG Duplex Behind Astha Talkies Indore	Student	Mumbai
S.0516	Jaykishor Bisen 551/7 Nehru Nagar Indore	Student	Mumbai	S.0532	Pradhumn Agrawal 79/2, Nehru Nagar Near Patnipura Indore	Student	Mumbai
S.0517	Brajmohan Sharma 13/7 South Tuko ganj Indore	Student	Mumbai	S.0533	Varun Jaiswal 36-3 CPWA Colony Near Airtel Office, Kanchanbagh Indore	Student	Mumbai
S.0518	Subhash Kumar Gupta Sharan Boys Hostel Shakambhari Avenue Near Aurobindo Hospital Gram-Revati Indore	Student	Mumbai	S.0534	Smita Surana C/o Mr. Ashok Jain O/x Laxmi Villa, HLN Colony Indore	Student	Mumbai
S.0519	Anoop Awasthi 13-14, Ganraj Nagar Sector-A, Khajrana Indore	Student	Mumbai	S.0535	Dileep Kumar Sable 50/2, Nehru Nagar Patnipura Indore	Student	Mumbai
S.0520	Ashutosh Joshi Flat No 412, Block A Vasundara Complex Vandana Nagar Indore	Student	Mumbai	S.0536	Mahendra Parmar 306/A, Krishna Vihar Complex Opp. Collectorate Indore	Student	Mumbai
S.0521	Krishan Kant Malviya 120-A, Sunder Nagar Colony Near G.B. Pant School Swadesh Nagar Ashoka Garden Bhopal	Student	Mumbai	S.0537	Deepak Dhaketa EK-357, Scheme 54 Vijay Nagar, Indore	Student	Mumbai Indore
S.0522	Mayank Paliwal Sharan Boys Hostel Shakambari Avenue Behind Aurbindo Hospital Reotigaon Indore	Student	Mumbai	S.0538	Manish Biswas EK-357, Scheme 54 Vijay Nagar Indore	Student	Mumbai
S.0523	Shakti Singh Sharan Boys Hostel, Shakambari Avenue Behind Aurbindo Hospital Reoti Gaon Indore	Student	Mumbai	S.0539	Ankit Singh Chouhan 441/4 Meghdoor Nagar Indore	Student	Mumbai
S.0524	Sanchita Sharma Aastha Girls Hostel 1/15 Vijay Nagar Indore	Student	Mumbai	S.0540	Nishant Kumar 367-A, Mishrilal Nagar Near Aachman Vidya Niketan A B Road, Dewas	Student	Mumbai
S.0525	Ajay Singh Sharan Boys Hostel Shakambari Avenue Behind Aurbindo Hospital Reoti Gaon Indore	Student	Mumbai	S.0541	Abhishek Gayakwad Sharan Boys Hostel Shakambhari Avenue Near Aurbindo Hospital Revati Gram, Sawer Road Indore	Student	Mumbai
S.0526	Nilesh Diwaniya 23, Shri Krishna Nagar Dewas (MP)	Student	Mumbai	Transfer of grade			
S.0527	Pushpendra Singh C/o Shri Dharendra Singh Behind Mandi Thana Sehore 466 001 (MP)	Student	Mumbai	F.0693(L)	Akhilesh K. Jain Network Marketing & Consultants G-10, MG Road, B/H HDFC Indore 452 001	Fellow (Life) from M.0239(L)	Mumbai
S.0528	Rashmeet Chhabra 20/3 Suvas Girls Hostel Manoramaganj, Near Geeta Bhawan Indore	Student	Mumbai	F.0701(L)	Anil D. Pundalik Raja Ramanna Centre for Advanced Technology Construction & Services Division P.O. CAT Indore 452 013	Fellow (Life) from M.1315(L)	Mumbai
S.0529	Purva Patni 31, Sukhdev Nagar Airport Road Indore	Student	Mumbai	F.0704(L)	Mr. A.K. Das Chowdhury Flat CC-304 Ashabari Housing Complex Block O/31/1 BP Township Kolkata 700 094	Fellow (Life) from M.1385(L)	Kolkata
S.0530	Kishor Kumar Shukla EK-357, SCH-54 Vijaynagar Indore	Student	Mumbai	F.0705(L)	Mr. Biswanath Roy Electrical Engg. Dept. Jadarpur University Kolkata 700 0032	Fellow from M.0834(L)	Kolkata
				M.1575(L)	Mr. Vnu Mehta Sigma Search Lights Ltd. P-27, Sagar Manna Road Kolkata 700 060	Member from A.0775(L)	Kolkata



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