

## Editor's Note

This special edition of Tech Forum brings much celebration for IES Philadelphia (IESPHL). Philadelphia Lights, lighting up the greater Delaware Valley region since 1988, is being held at the Pennsylvania Convention Center for the first time. The impressive line up of exhibitors and speakers reminds us how very fortunate IESPHL is to have so many dedicated and talented people involved. IESPHL continues to seek interested individuals to join us and share our many activities. If you are not involved right now, please consider joining one of the many committees listed below.

With Tech Forum, we strive to provide the lighting community with the latest information concerning product technology, illumination education programs and relevant legislation. Are there topics that we should cover and have not? Would you like to contribute articles? Let's hear from you. Please visit IESPHL at [www.iesphl.org](http://www.iesphl.org) or write to us at IES Philadelphia/ Tech Forum, c/o EAP, 40 Monument Road, Suite 107, Bala Cynwyd, PA 19004.

## IES Philadelphia Contacts [www.iesphl.org](http://www.iesphl.org)

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## Environmental Issues Affecting The Selection of Lighting Systems

Today, lighting system choices are impacted by a variety of energy and environmental concerns. These include mandatory product efficiency regulations, building energy codes, and disposal regulations.

During the 90's, the U.S. Department of Energy enacted regulations eliminating the least efficient fluorescent lamp and ballasts available at that time. The DOE is now developing regulations that will eliminate the production of most electromagnetic ballasts for T12 4' and 8' fluorescent lamps for use in new fixtures by April 1, 2005, forcing nearly all new fixtures to use electronic ballasts for these common lamp types. In addition, on July 1, 2010, magnetic ballasts for T12 4' and 8' lamps will no longer be manufactured for use in existing fixtures.

Earlier this year, a newly revised building energy standard was jointly published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society of North America (IESNA). Adoption of ASHRAE/IESNA Standard 90.1-1999 into state building codes is expected during the next few years. One of the many provisions of this standard limits the amount of watts per square foot that can be used for the lighting system depending on building type. Copies of the entire standard can be purchased from ASHRAE or IESNA ([www.iesna.org](http://www.iesna.org)). In addition, the IESNA has recently published the lighting section of the new standard as LEM-1-1999.

Commercial or Industrial Lighting Systems often produce lamp disposal issues. In 1990, the federal Resource Conservation and Recovery Act (RCRA) introduced a new, more stringent test, to evaluate if certain metals could potentially leach from landfills into groundwater. This new test is called the Toxicity Characteristic Leaching Procedure (TCLP) test. Traditional fluorescent lamp designs often fail this test for mercury. Traditional HID lamp designs often fail this test for lead and can also fail for mercury. Any mercury-containing or lead-containing waste that fails this test is considered a Characteristic Hazardous Waste by the federal Environmental

Protection Agency (EPA) and subject to stringent hazardous waste disposal regulations. Homeowners and small commercial facilities are exempt from these disposal regulations by federal law. However, some state laws, such as Pennsylvania's, do not allow the disposal of any known hazardous waste in municipal landfills by any commercial facility.

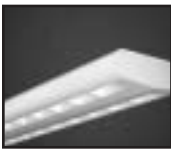
The major issues created by classifying lamps as hazardous waste lead to three significant developments in the 1990's. These include: the development of a new industry; the development of new lamp designs; and, the introduction of new lamp disposal regulations.

First was the creation of the lamp recycling industry. Lamp recycling businesses developed specialized equipment to remove mercury from the lamps and separate lamps back into their base materials of glass, metals, and phosphors. Several lamp recyclers are in operation today.

Second was the development of new low-mercury lamp designs, such as GE Lighting's ECOLUX product line. Other lamp manufacturers have similar products. These new low-mercury fluorescent and high pressure sodium lamps consistently pass the TCLP test while offering the same high quality performance of traditional lamp designs. Passing the TCLP test means they are not considered hazardous waste upon disposal. They are available in the most common 4' and 8' fluorescent lamp designs and in most high pressure sodium wattage designs.

Third was the introduction of reduced disposal regulations for lamps that fail the TCLP test. The EPA's new hazardous waste disposal regulation for lamps is called the Universal Waste rule. This rule became effective federally in January 2000. Most states have adopted, or are in the process of adopting this rule. For lamps that fail the TCLP test and must be treated as hazardous waste, the universal waste rule significantly reduces transportation, storage and record keeping requirements as long as the lamps are recycled.

-Joseph G. Howley Jr.,  
Manager - Environmental Marketing, GE Lighting



## What is LER?

The lighting industry has a new tool called the Luminaire Efficacy Rating, or LER, to compare the energy efficiency of fluorescent luminaires.

The Energy Policy Act of 1992 (EPAct) called for a voluntary national testing and information program for "widely used luminaires with the potential for significant energy savings." Responsibility for creation of the program was given to the lighting community. The U.S. Department of Energy's (DoE) role was to provide financial and technical assistance, and to evaluate whether the program met EPAct's objectives. If it did not, EPAct prescribed government regulatory actions. Consensus-building has been a key element in the stakeholders' working group called the National Lighting Collaborative (NLC). The resulting program is based on NEMA (National Electrical Manufacturers Association) Standards Publication No. LE5, "Procedure for determining Luminaire Efficacy Ratings for Fluorescent Luminaires." The program received provisional approval from DoE on March 15, 1996. The program has gained momentum as more manufacturers test and rate their luminaires and publicize the results, and as designers and specifiers use the LER information in their specification decisions.

Currently, the program covers ten categories of fluorescent luminaires used in the commercial and industrial sectors. Other luminaire types will be added to the information program as additional NEMA standards are developed and reviewed by the NLC.

LER is a single figure that expresses luminaire efficacy, the luminaire's light output divided by the input power. the formula is:

$$\text{LER} = \frac{\text{luminaire efficiency} \times \text{total rated lamp lumens} \times \text{ballast factor}}{\text{luminaire watts input}}$$

LER attempts to include the effects of all components of the luminaire system. It is similar to "miles per gallon" rating for automobiles.

The LE5 document specifies the major fluorescent luminaire categories covered and the standard industry test procedure. In addition to LER, LE5 also contains a calculation for the relative energy costs of each rated luminaire. This estimates "cost of light," the yearly lighting energy cost per 1000 lumens of light output using identical assumptions for operating hours and electricity price. Because application and operating conditions vary widely, this number is intended for comparison purposes rather than prediction of actual energy usage.

The LER and the "cost of light" provide guidance on comparative energy efficiency and costs of fluorescent luminaire operations. It can be added to specifications to ensure efficiency standards and used to educate clients. LER should be used along with other application-specific criteria in selecting the proper luminaire.

Comparing the LER of two luminaires is not quite as simple as comparing two automobiles' miles per gallon ratings. Comparison of LER's should be done within the luminaire product category. LER rating contains a two letter code indicating source and product category, such as FL. "F" stands for fluorescent and "L" represents the lensed product category.

NEMA Standards Publication "LE5" is available free of charge from NEMA with funding from the DoE. To get your copy, contact Global Engineering Documents by phone (800)-854-7179; by fax (303) 397-2740; or visit the website: [global.ihs.com](http://global.ihs.com)

-Kyle Pitsor,  
Chair, National Lighting Collaborative

## Drexel Library Gets New IES Handbook

IES Philadelphia has made a long term commitment to support the recently chartered IES student chapter at Drexel University in Philadelphia. The chapter was established in 1998 with Professor John Morris of the Architectural Engineering department as the faculty advisor. As part of IES Philadelphia's commitment to support the student chapter, IES Philadelphia provided Drexel with a complete library of IES technical publications including lighting design guides, recommended practices, and other standards.

In 1999, IES Philadelphia pledged partial seed money needed to support the creation of a lighting design laboratory for use in educating students about modern lighting and controls technology. This lab is now under construction and is expected to be available for use in early 2001.

Recently, the Section added the latest version of the IES Lighting Handbook (9th edition) to the Drexel IES lighting library which resides at the reference section of Drexel Hagerty Library located at 33rd and Market Streets. The library is open to the public Monday to Friday, 9 am to 5 pm on most weeks of the year. Proper identification is required for admission.

-Carl Watson

## IIDA- International Illumination Design Award



2000 Award of Merit Project- The University of Pennsylvania, Irvine Auditorium by Daniel Eisenbaum.

### You did a great job! (Why not tell the world?)

The 2001 International Illumination Design Awards (IIDA) are meant for you. The IES recognizes projects like yours at the local, regional and international level. Not a competition, projects are evaluated by a panel of peer professionals against IES criteria.

### Good lighting should be on display! (Especially yours.)

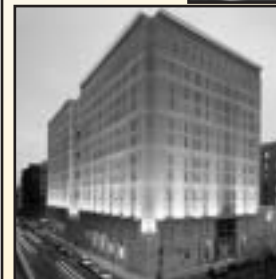
Photos of award projects are published on the web. Regional and international projects are published in LD&A, the magazine of the IES. And of course all award recipients receive certificates testifying to your accomplishments.

### You put a lot of work into your project! (The award is easy.)

Just fax or e-mail your name and contact information to Dave Safford at 215-627-8240 or [dwsafford@worldnet.att.net](mailto:dwsafford@worldnet.att.net) and you'll receive everything you need to enter.

-Dave Safford

1999 Award of Merit Project -Portland Public Market by Alfred R. Borden, IV, Michael A. Barber, Hugh A. Boyd



2000 Award of Merit Project - Federal Detention Center by Mary Alcaraz-Edgcombe, Thomas Appelquist



Year 2000 Project - Lighting of Banana Republic, Walnut Street Store, Philadelphia.

Design With Light is a student lighting design competition that is co-sponsored by the IES Philadelphia and Philadelphia area design firms that offer creative lighting design services on a commercial basis. This year our co-sponsor is Grenald Waldron Associates and the project Banana Republic, Walnut Street Store, Philadelphia.

The program offers a \$500 first prize and a \$250 second prize for the best student-designed solution for lighting of this year's project. Also offered are \$1,000 and \$500 to the coordinating academic department of the first and second prize students. Details of this year's competition are made available in the competition entry package which can be obtained through participating colleges or can be downloaded from [www.iesphl.org](http://www.iesphl.org). Entry deadline is December 15, 2000. Contact Julie Panassow at 215-238-1644 or email [jpanassow@thelightingpractice.com](mailto:jpanassow@thelightingpractice.com) if you have any questions.

The competition is open to all students enrolled in any accredited college-level (undergraduate and graduate) degree program in the greater Philadelphia area and any campus of the Pennsylvania State University. Entries are judged by a panel of lighting design professionals. Awards are made at an awards dinner in the spring.

IES Philadelphia thanks The Lighting Practice for sponsoring DESIGN WITH LIGHT 1999 and congratulates the team of Jennifer Crane and David Myers of Philadelphia University for winning the first prize.

- Julie Panassow



Year 1999 Project - Lighting of Princeton Day School, Princeton, NJ.



Two of Penn State's lighting courses are now available to interested individuals worldwide via the university's World Campus, an Internet-based learning environment. These courses operate in an asynchronous environment, permitting lighting professionals and others who seek to advance their knowledge of lighting systems to enroll in a university course without leaving their home. The courses are designed so that all coursework can be done in the evenings and on weekends, whenever time permits, within a set schedule. The courses operate for approximately 16 weeks, with assignments due every week or two. Design and analysis projects and examinations are also included. Materials for the course include a CD-ROM with all course lessons, presentations, and interactive learning exercises.

Commercially available lighting analysis software is also provided to all students for use on course projects and assignments. Students communicate with the professor and with one another through a customized course website, so that class topics, assignments, related case studies, and projects are discussed in an enhanced virtual classroom.

**AE 461, Architectural Lighting Design Practice**, will be offered for the first time in January 2000. Registration for this course begins in late October. Enrollment will be limited to the first 40 students, and the cost of the course is \$1250, which includes the IESNA Lighting Handbook and all other course materials, including analysis software. Additional information on the upcoming offering of AE 461 can be accessed through the World Campus web site: [www.worldcampus.psu.edu](http://www.worldcampus.psu.edu).

**AE 565, a graduate course on Architectural Daylighting**, was offered from February 2000 through June 2000. It received a Judge's Citation and a Category Innovator Award at the new product showcase at LightFair International 2000 in May. This course is scheduled to be offered again during the 2001-2002 academic year.

In the future, we also expect to develop and offer two additional courses, with these four Internet-based lighting courses comprising the Penn State World Campus Certificate Program in Architectural Lighting Design. Professionals and students at other universities may also register for individual courses, and may apply the credits earned toward LC or AIA recertifi-

cation, or to degree programs at Penn State or other institutions.

At Penn State, we are excited about the opportunity to offer these selections from our lighting curriculum to individuals around the globe through the World Campus. Inquiries can be made through the World Campus Website or by contacting Prof. Richard Mistrick at Penn State ([RMistrick@psu.edu](mailto:RMistrick@psu.edu)).

-Dr. Rick Mistrick, Penn State AE Department

PENN STATE Student Chapter Update

The Penn State IES student chapter is up and running starting Wednesday, September 6 and is looking forward to a very active year. At our first meeting, we had thirty(30) students attending, a mix of third, fourth and fifth year Architectural Engineering (AE) students. The purpose of the meeting was to gain new membership and to discuss our current plans. Dr. Richard Mistrick, the chapter's advisor, started the meeting with an explanation of IESNA and Penn State's lighting department. Officers then introduced themselves. This year's officers are: President, Alison McKenzie; Vice President and IESNA representative, Shannon Yott; Treasurer, Melissa Goren. Current plans are to update the AE lighting/ electrical catalog library and create a filing system to aid all architectural engineering students to access lighting industry information, to seek professional speakers in the lighting industry for our chapter meetings, and to plan a bus trip to the Philadelphia Lights show in October.

Our next meeting will be held on Wednesday, September 21 with the mission to organize the various committees that will coordinate professional speakers and update catalogs. We will also elect a secretary and a representative for each class. All members will be asked to participate in a committee. We will also collect any other ideas that would help to advance the students professionally and academically. The meeting will include a panel of upperclassmen discussing their summer internship experiences in the lighting industry, sharing their experiences with all.

-Alison McKenzie and Shannon Yott



## Looking for a piece of our History

IES Philadelphia has a new committee, Section History, to research our long and colorful past, and we need your help. Any Section Officer records are welcome. When were you an officer? Did you serve through the entire 5 years (Secretary, Treasurer, Vice President, President and Past-President) and who were your fellow officers? Please submit your information to Kathy Beacher, darkat@chesco.com. Our goal is to have this information complete by the national IESNA Centennial Celebration in 2006. Drop Kathy a note with any information you can recall and we'll put it together!

## Education Update

A spring intermediate lighting fundamental course -ED150 will be offered by IES Philadelphia in April, 2001. Please contact Joseph Doyle, Philadelphia Section IES Education Chair, 215-686-5515 for more information.

## Roadway Lighting Committee Coming to Philadelphia

We are pleased to announce that IES Philadelphia is hosting the national IESNA Roadway Lighting Committee Spring meeting, March 22 through March 24, 2001. A joint program meeting with Lamplighters is planned specially on March 22, 2001. Mark your calendars now!

## Welcome to Our New Members

Nicholas L. Gurganus of Onsite Sycom Energy Corp.; John Hodos Jr of Bruce E. Brooks & Assoc.; Gary R. Jones of Conectiv Power Delivery; Terrance J. Mulham of Mulham Consulting Engineers; Michael J. Mutmansky of Mutmansky Lighting Design; Linda O. Schade of Schade Engineering Inc.; Randy Solliday - Metalumen; Kimberly Upham; Fred Villano of Diversified Lighting Assoc.

## Baby, Sweet Baby

Congratulations to Mary Alcaraz & Steve Edgcumbe for their lovely new bundle of joy, Marielle Edgcumbe. Marielle arrived on September 1 at a nice 7lbs 13 oz. Mother and daughter are doing well. At the moment, Mary is still not sure which committee to enroll Marielle. All bets are on Program Committee.



## IES Philadelphia 2000-2001 Program Schedule

<u>Date</u>	<u>Topic</u>
September 28, 2000	Center City Hotel Lighting Tour
October 11 & 12, 2000	Philadelphia Lights
November 28, 2000	University of Pennsylvania, Irvine Auditorium & Campus Master Lighting Tour
December, 2000	Holiday Social - to be announced
January, 2001	Lighting Careers
February, 2001	Control Review
March 22, 2001	Joint meeting with Lamp Lighters
April, 2001	IIDA Award Banquet
May 22, 2001	Golf Outing at the Westover Country Club.
June, 2001	Officers Installation

## News from Other Local Organizations

Engineer's Week is fast approaching and the Delaware Valley Engineers (DVE) is looking for helpers. DVE needs people to serve as judges, competition support, and mentors for the Future City Competition to be held on Saturday, January 20, 2001, at the Franklin Institute. Call Jennifer Wetzel at 215-573-3935 or email [jwetznel@pobox.upenn.edu](mailto:jwetznel@pobox.upenn.edu).

Engineer's Club's Fall Meeting will be held at noon on October 25, 2000 at the Wyndham Franklin Plaza Hotel. The guest speaker will be Paul Dayton, Executive Director of Delaware River Port Authority who will present a review of projects being undertaken by the Delaware River Port Authority.

## Events from IESNA National

October 23-28, 2000 The Illuminating Engineering Society Aviation Committee Lighting Seminar, Sheraton Safari Hotel in Orlando, contact Frank Kazienko of Multi-Electric, 773-722-1900, fax 773-722-5694, or check the website [www.iesalc.org](http://www.iesalc.org).

May 29-June 1, 2001 The IESNA Lightfair International, Las Vegas, NV, contact AMC Inc. 404-220-2221/2215 for more information.

August 5-8, 2001 The IESNA Annual Conference in Ottawa, Canada, contact Valerie Landers, 212-248-5000, ext. 117 or visit [www.iesna.org](http://www.iesna.org).

# Tech Forum

[www.iesphl.org](http://www.iesphl.org)

Fall Edition, 2000

Place  
Stamp  
Here

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