



Future Imperatives – The Emerging LED Revolution

Learning objectives

- Review issues driving the movement toward solid-state lighting
- Review solid-state lighting technology
- Consider the impact of design in optimizing energy savings
- Look ahead to future developments
- Review specification concerns

Instructions

Refer to the learning objectives above and answer the questions below. Turn the page over and check your answers. Retain this report form for your records in submitting your self-report form for CES credit

Questions

1. List at least two factors driving the movement toward solid-state lighting

2. List at least two advantages of LEDs against conventional lamps

3. How can design increase lighting quality while reducing energy consumption?

4. What are the top three concerns in application of solid-state products?

5. What type of LED configuration is likely to produce the greatest performance, and what is likely to produce the lowest performance?

6. What impact does heat have on LED performance?

7. What components consume energy in a solid-state luminaire?

Answers

- 1. List at least 2 factors driving the movement toward solid-state lighting**
 - a. Growth in worldwide energy demand*
 - b. The impact of energy production on the environment*
 - c. The impact of operating expenses related to continuous re-lamping*

- 2. List at least two advantages of LEDs against conventional lamps**
 - a. Long life*
 - b. Greater optical control*
 - c. Improved efficacy*
 - d. Reduced need for redundancy to cover lamp failures*

- 3. How can design increase lighting quality while reducing energy consumption?**
 - a. Applying products with greater optical control and lower energy demand with more precision reduces waste light, which reduces energy demand*
 - b. Putting light only where it is needed, rather than using more energy to broadcast light throughout a space*

- 4. What are the top three concerns in application of solid-state products?**
 - a. Cost*
 - b. Insufficient light*
 - c. Poor quality light*

- 5. What type of LED configuration is likely to produce the greatest performance, and what is likely to produce the lowest performance?**
 - a. Packaged devices are most likely to produce the highest performance*
 - b. 5mm LEDs are likely to produce the lowest performance*

- 6. What impact does heat have on LED performance?**
 - a. Reduces light output*
 - b. Reduces product life*
 - c.*

- 7. What components consume energy in a solid-state luminaire?**
 - a. Power supply*
 - b. Driver*
 - c. Control electronics*
 - d. LEDs*



Course Evaluation

Please complete and return this form to the presenter for feedback in how the presentation can be improved

Future Imperatives – The Emerging LED Revolution

Please indicate your role:

- Architect Engineer Interior Designer Lighting Designer
 Intern Specification Writer Legal/Accounting Staff
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Circle one number for each of the questions below:

	Poor		Excellent	
1. Overall satisfaction with this session	1	2	3	4
2. Satisfaction with the format of this workshop	1	2	3	4
3. Met overall personal objectives for attending	1	2	3	4
4. Overall quality of training aides (handouts, audio/visuals, etc.)	1	2	3	4
5. Quality of session content	1	2	3	4
6. Overall knowledge and presentation of speaker	1	2	3	4
7. Applicability/value of new knowledge, ideas or information	1	2	3	4
8. The presentation was non-bias, non-promotional of product, material of service		<input type="checkbox"/> Yes		<input type="checkbox"/> No

If not please explain

How could this course be improved?

What other topics would be of interest? _____

Additional comments

AIA/CES Self Report Form

This form should be submitted for each learning activity or program.



Last name First name Middle Initial or name

AIA ID Membership Number Daytime Phone

Activity/ Program Title: Future Imperatives – The Emerging LED Revolution

Learning Units/Hours: 1 Start date: 3/17/2009 Completion date: 3/17/2009
I am reporting month day year month day year

- Indicate the number of hours spent in direct learning activities. Credit is not awarded for time spent on breaks, registration, travel, receptions or meals (unless an educational presentation is being offered and then credit is awarded only for educational time, not time spent eating.) 1 hour minimum (.25 for each additional quarter hour)

Check which type of activity you are reporting:

<input type="checkbox"/> Self-Designed Activity <ul style="list-style-type: none">• Learning activity is self-designed. You, the learner designed the activity and determined what will be learned.• Not acceptable for HSW credit regardless of subject.• <u>Recommended</u> minimum of three (3) hours. Sample categories : ___ Research: Time you spent researching new information preparing for lectures, presentations, study-travel committee or board research, etc. ___ Computers: Time you spent learning new computer programs that you can apply toward the profession.	<input checked="" type="checkbox"/> Structured Activity Program <ul style="list-style-type: none">• This is a structured activity offered by a formal organization that is not a CES Registered Provider.• One (1) hour minimum <i>Program sponsor's name:</i> Curtis Stout <i>Program sponsor's phone number (if known):</i> 501-372-2555 <ul style="list-style-type: none">• Additional documentation of attendance/participation is often required as supplement when reporting this type of activity as a State Licensure MCE requirement.
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This program qualifies for health, safety, or welfare of the public. (75% or more) **Yes** **No**

Health, safety, and welfare in architecture are defined as anything that relates to the structural integrity or soundness of a building or site. "Suitability for intended use." Check all areas that apply to your program.

Aspects of architecture that have salutary physical effects among users of buildings.

- Accessibility Acoustical systems Energy efficiency
- Mechanical, plumbing, electrical system concepts, materials, and methods of construction.
- Other(s) list all that apply _____

Aspects of architecture intended to limit or prevent accidental injury or death among users of buildings or sites.

- Codes and regulations Natural Hazards: Earthquake, Flood, and Hurricane
- Life safety systems - suppression, detection and alarm standards
- Other(s) list all that apply _____

Aspects of architecture that engender demonstrable positive emotional responses among, or enable equal access by, users of building or sites.

- Building design and materials, methods & systems Construction contracting, means and methods
- Construction documents and services Legal issues: Laws; contracts; documents; insurance
- Ethics and regulations governing practice of architecture Preservation and adaptive reuse, study of
- Construction administration Environmental issues
- Other(s) list all that apply _____

The back page must be completed

AIA/CES Self Report Form - Back page

Program Description

Learning Objective: See attached course outline and questionnaire

What new knowledge or skill did you gain from this learning activity?

Resources Used

Resources used in the completion of this activity/program?

Human resources used:

- | | |
|---|---|
| <input type="checkbox"/> In-house expert | <input checked="" type="checkbox"/> Practitioner in the field |
| <input type="checkbox"/> Industry representative | <input type="checkbox"/> School faculty member |
| <input checked="" type="checkbox"/> Independent expert/consultant | |
| <input type="checkbox"/> Other: _____ | |

Material resources used:

- | | |
|--|--|
| <input type="checkbox"/> Journal articles | <input type="checkbox"/> Books or manuals |
| <input type="checkbox"/> Computer software | <input checked="" type="checkbox"/> Program handouts |
| <input type="checkbox"/> Product sample | <input type="checkbox"/> Videotape |
| <input type="checkbox"/> Teleconference | <input checked="" type="checkbox"/> Slides-overheads |
| <input type="checkbox"/> Tutorial software | <input type="checkbox"/> On site observations |

NEW FOR 2000. The Quality Level does not affect the number of credits earned (AIA/CES policy starting January 1, 2000).

Research indicates that programs that involve participants and increase participation result in better and longer retention of material.

Check how this activity/program was delivered.

Passive Activity

One-way communication such as lecture, speech, or panel discussion.

Interactive participation

Two-way communication such as roundtable discussion, group exercises, or case studies (51% or more of the time).

Measurement of Learners' Progress

Pre and Post-test measuring the learning progress of the participants.

Several states now have a two-year reporting period. We recommend that you keep a personal copy of this record for two years.
Continuing education information Online at: www.e-architect.com >Continuing Education >CES Transcript >State MCE updates

Return this form to:

The University of Oklahoma, Continuing Education

AIA/CES, Room B-1

1700 Asp Avenue

Norman, OK 73072, or fax to (405) 325-6965

For additional information or assistance call (800) 605-8229



Course Outline

Sponsor:	Lumenique / Curtis Stout		
Length:	1 hour		
Credits:	1 LU Hour	HSW:	Yes
Program:	Future Imperatives – the Emerging LED Revolution		

Description: The program reviews the factors driving the movement toward solid-state lighting, the impact this has on design and energy conservation, how approaches to design impacts adoption of the technology to enhance performance, and areas of concern in the specification of solid-state lighting products.

Learning objectives

- Review issues driving the movement toward solid-state lighting
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How Taught: The presenter utilized a PowerPoint presentation to provide an in depth review of the factors affecting LED product performance. The session included an interactive period and encouraged feedback and questions and concluded with a “fill-in-the-blank” worksheet distributed to help enforce key points within the learning objectives.

Target Audience: Architects, specifiers, interior designers, lighting designers, owners, and other design professionals. This program was at the basic level to meet the need of professionals at every experience level.

Presenter Qualifications: Kevin Willmorth, Owner of Lumenique, LLC, has 29 years experience in lighting design, product design, and marketing within the lighting market. He is contributing editor to Architectural SSL magazine, Architectural Products magazine and Illuminate magazine. He speaks regularly at conferences and trade shows on the topic of solid-state lighting application and technology adoption in the general illumination market, and is facilitator for the ArchLED’09 conference to be held in Chicago, IL in October 2009. His contact phone number is 414-241-5124.