



Lumen Insights

Issue 2: 2019

The Complicating Consequences of Emergency Lighting Controls

By Michael Shulman, Principal Engineer, Lighting

The evolving digital lighting landscape presents many opportunities for enhanced system-level controls and automation intended to better manage energy consumption and improve the work and living conditions of building occupants. These advances have triggered the need to adjust codes and standards to ensure essential safety features are not compromised by expanded functionality and complexity. Among the considerations are the expected knowledge and diligence of those responsible for installing and maintaining these products where their action — or lack thereof — can compromise the safety of the building occupants.

National Electrical Code (NEC) Article 700, Emergency Systems, and UL 924, the Standard for Emergency Power and Lighting

Equipment, have recently been revised to address new generations of equipment, such as directly controlled emergency luminaires and a variety of integrated and remote sensing, communication and control devices. Code and standard requirements always need to be carefully crafted to be clear and enforceable, allowing for some flexibility but deterring excess risk. But even with precisely agreed-to wording, there is a reliance on the human stakeholders — certifiers, specifiers, installers, authorities having jurisdiction (AHJs) and building maintenance personnel — to continually educate themselves. Installing and maintaining this sophisticated equipment in ways that reduce the likelihood of failure is not a plug-and-play exercise. Attention must be given to detailed instructions that are integral to the product compliance and certification process in order to understand the operating parameters and avoid potential failure modes.

Adding to the complexity, this equipment can also include internet connectivity and the ability to receive software updates over time. The connectivity allows for a

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range of remote monitoring and data gathering functions that can be of great value to facility managers, while post-installation updating allows the equipment's functionality to be enhanced or expanded over time. But these features also create challenges for certifiers and those seeking confidence that compliance with the established safety requirements remains intact. Is the equipment adequately protected from internet communications that can adversely affect its performance? Do installed software updates retain the functionality that originally allowed the equipment to meet the safety requirements? And perhaps most importantly, who is responsible to ensure continued compliance when parties not part of the original compliance decision can gain access to equipment controls?

Choose your favorite metaphor, but the horse is not going back into the barn. Increased functionality means increased complexity and, even with a strong regulatory system, increased vulnerability. This is endemic across our society, as individuals and agencies across the globe wrestle with the joys and fears of our increasingly interconnected world. Emergency lighting has a simple, non-negotiable function — help people find their way out of a building. Effectively applying this mandate is now a team sport — everyone who touches the product, from design to maintenance, must recognize their role and act responsibly.

Spotlight: Letter from Hans A European Perspective

Change

The world is changing and so is the lighting industry. Success is for those who can adapt to change fastest: from conventional light sources to solid state lighting, from the metal processing industry to electronics. The innovation cycles of the electronic industry are the new heartbeat. Luminaires on stock are obsolete, and new production strategies need to be applied to keep up with the change.

Innovation

Current research and development (R&D) activities are influenced by megatrends. Connectivity, light and health, individualization and globalization are currently hot topics in the lighting industry. And after the LED revolution, the lighting industry needs the next innovation. Just saving energy with the next generation of LEDs is not enough, because the price erosion of the demands from year-on-year keeps the companies under pressure. These megatrends offer a variety of possibilities; but choosing the right direction can be difficult as the whole value chain needs to be considered. The most advanced human-centric lighting (HCL) luminaire is not ready

for the market, as the lighting designer and/or final user is not familiar with the topic and does not know how to use it. Nevertheless, the first international building standards have started dealing with this topic, and they may potentially become a demand driver for this technology.

When it comes to connectivity and the Internet of Things (IoT), the world seems to develop faster than ever before. UL already has testing capabilities for all relevant wireless protocols to support the design process. And even when it comes to cybersecurity matters, we can support with penetration testing and advisory services while the EU establishes the European Union Agency for Network and Information Security (ENISA) as a permanent authority to cover this topic. Which standard will be relevant for lighting in the EU is still an open discussion. Our answer is simple: test today, be safe, protect your brand, and reuse the test results for a future certification process if needed.

I truly believe this is an interesting time, and I look forward to joining you on your journey into the future of lighting.

With best regards!

Dr. Hans Laschefski
Industry Marketing Manager
Business Development, Lighting, EMEA

Workshops and eLearning for the Lighting Industry

LED Light Source Design Essentials

Self-Ballasted Lamps, UL 1993

UL 48 Electric Signs, Program Overview

Standards corner

By Joe Musso, Standards Program Manager

Click here for standards information

Sign up for What's New **here** by selecting "Join Email List" to receive email notifications twice a month listing the various UL, UL Environment and ULC Standards documents published during that time frame.

UL 153 — Portable Electric Luminaires

A new proposal covering locking type attachment plug configurations was circulated for Standards Technical Panel (STP) ballot Jan. 25, 2019, with a closing date of Feb. 25. The proposal did not reach consensus.

UL 676 — Underwater Luminaires and Submersible Junction Boxes

A new set of 10 proposal topics have been circulated for STP ballot, opening in Collaborative Standards Development System (CSDS) April 26, 2019, closing June 10. The following topics are addressed in the proposals:

1. Scope clarifications for nonmetallic forming shells and junction boxes
2. Lens guards
3. Installation instructions related to flexible cords
4. Electric shock test luminaire constant (N)
5. Gasket testing
6. Luminaires mounted within 18 inches of the water level

7. Submersible luminaires — applicable clauses from part I
8. Cycling underwater test
9. Number of required grounding connections for submersible junction boxes
10. Editorial corrections and adjustments

UL 879 — Electric Sign Components

The current edition of UL 879, the Standard for Electric Sign Components, is under ballot to reaffirm its status as an American National Standard (ANS). The ballot opened in CSDS on April 12, 2019, closing May 27.

UL 924 — Emergency Lighting and Power Equipment

A survey was circulated to the STP soliciting feedback on several new, conceptual ideas for changes to the Standard. Depending on the input received in response to the survey, the topics may eventually be developed into new standard proposals. Any new proposals will follow the normal standards consensus process.

UL 1598 — Luminaires (Tri-National Standard)

Several new proposals have been received and are being compiled in preparation for the next revision cycle to begin. A call for proposals was circulated; new proposals were submitted in February 2019.

The technical harmonization committee is reviewing the complete set of proposals in preparation for STP preliminary and public review.

UL 1993 — Self-Ballasted Lamps and Lamp Adapters

A series of 20 new proposals are currently under review by the technical harmonization committee in preparation for the revision cycle, which is targeted for initiation in Q2 2019.

UL 8750 — Light Emitting Diode (LED) Equipment for Use in Lighting Products

A new, 10-topic proposal was circulated for preliminary STP review with comments due Jan. 11, 2019. Comments received were considered, and the STP ballot opened April 19, 2019, closing June 3. The new set of proposals includes the following topics:

1. Required spacings for wiring terminals
2. New supplement for Type IC LED drivers
3. Special use LED arrays
4. LVLE circuits
5. Temperature-coded LED arrays
6. Grounding and bonding
7. Class 2 circuits
8. Output loading- Output short circuit
9. Markings and product specification sheet
10. Supplement SG — Temperature value at TC point

Evaluating the Safety and Performance of Horticultural Lighting and Grow Systems

As concerns grow about the long-term sustainability of conventional farming and agricultural operations in meeting the world's future food requirements, increased attention is being given to the potential advantages of what some are calling controlled environment agriculture, or indoor farming for short. Indoor farming facilities can operate throughout the year, dramatically increasing production yields within a given footprint, while also reducing the environmental impact associated with conventional farming operations. As such, these alternatives hold significant promise in helping to provide billions of people around the world with access to fresh and nutritious food, while also supporting global sustainability initiatives.

Luminaires and grow systems specifically designed for horticultural applications are a critical element in these innovative agricultural environments. Based on light-emitting diode (LED) technology, most of today's advanced horticultural lighting systems are highly customizable and can provide light with color and intensity characteristics calibrated to meet the specific growing requirements of individual plants. This makes horticultural lighting essential for supporting plant germination, development and growth, as well as for optimizing overall agricultural productivity.

Read the full white paper [here](#).

Spotlight: IoT Security Top 20 Design Principles

In this white paper, you'll learn some simple steps that can be taken to increase the security of connected systems. These steps are organized with the most important requirements first, and it is recommended that these are addressed as the initial priority for all aspects within a system — product, system, cloud and app. Download the white paper [here](#).

Spotlight – UL's new myUL™

Our new myUL™ client portal is a full access digital tool designed to support UL clients with a single source of transparency into their UL accounts and activities. Registration is free and includes detailed access to orders, quotes, documents, samples, locations, inspection reports and variation notices. **Register** for free today.





GMA Corner

European Union — Four New Hazardous Substances Will be Banned in July

Elena Andreula, EMEA Regulatory Program expert.

On June 4, 2015, the European Commission published a new Directive (EU) 2015/863 adding four additional substances to the list in the Annex II of RoHS Directive 2011/65/EU.

Until now the following six substances have been regulated:

1. Mercury (Hg) — 0.1%
2. Lead (Pb) — 0.1%
3. Cadmium (Cd) — 0.01%
4. Hexavalent chromium (Vi) — 0.1%
5. Polybrominated diphenyl ethers (PBDE) — 0.1%
6. Polybrominated biphenyls (PBB) — 0.1%

The restriction of the four new substances, which applies starting July 22, 2019, concerns phthalates with the following maximum concentration permissible:

1. Bis(2-ethylhexyl) phthalate (DEHP) — 0.1%
2. Benzyl butyl phthalate (BBP) — 0.1%
3. Dibutyl phthalate (DBP) — 0.1%
4. Diisobutyl phthalate (DIBP) — 0.1%

Manufacturer's obligations

Manufacturers must comply with Restriction of Hazardous Substances (RoHS) requirements if they utilize any of the restricted material.

They must do the following:

- Ensure that the design and manufacturer of the product complies with RoHS
- Set up production control to ensure that product remains compliant over time
- Draw up technical documentation demonstrating compliance
- Complete an assessment of conformity with the regulations
- Prepare a declaration of conformity
- Fix the CE marking

How UL can help

UL is expertly qualified to assist companies in demonstrating their products meet the requirements of the RoHS Directive, providing testing for appliances. These updates are for information purposes only and are not intended to convey legal or other professional advice.

Belarus – Mandatory Energy Efficiency Requirements for Lighting Products

By Paola Pesconi, EAC Regulatory Program expert

In 2017 Belarus, implemented mandatory energy efficiency and energy labeling requirements.

With the latest amendment to resolution No. 849, the list of products subject to mandatory energy efficiency requirements has been updated and clarified. The amended version is now implemented for Belarusian market access.

For products included in the list, compliance with the Energy Efficiency requirements is ensured on the base of national standards, based on the corresponding European Directive. In addition, an energy label in Russian language, a product fiche in Russian language and a National Certificate of Conformity (STB certification scheme) may be required, depending on the product category.

If the national approval STB is required, it is necessary to involve a local accredited certification body for the issuance of a certificate covering energy efficiency requirements.

Reference document:

Resolution of the Council of Ministers of the Republic of Belarus No. 849 dated by Oct. 21, 2016, amended with the Resolutions No. 77 dated Jan. 27, 2017, No. 156 dated Feb. 26, 2018, and No. 759 dated October 23, 2018.

Stay informed with UL

UL continues to monitor the energy efficiency regulations move toward finalization. In addition to providing testing for appliances, we keep our customers aware of changes by becoming one trusted source of compliance information and support the registration process of products.

HS code	Product	Conformity marking	Mandatory EE Certification	Mandatory EE Label	Additional documents required
8504 40 300 9	External power sources. Except for those having more than one output, with independent voltage transformation for each output	STB Mark, voluntary	YES From Sept. 1, 2017	NO	Technical documentation
8539 22, 8539 29, 8539 31, 8539 39 000 0, 8539 50 000 0	Nondirectional lamps (incandescent, fluorescent, LED)	STB Mark, voluntary	YES From July 1, 2018	YES from July 1, 2018	Product Fiche Technical documentation

Saudi Arabia, Market Access – New Energy Efficiency Requirements for Street Lighting Products

Eslam Abdelaal, Saudi Regulatory Program expert

Saudi Standards, Metrology and Quality Organization (SASO) has prepared a new standard, Energy Efficiency Functionality and Labelling Requirements for Lighting Products – **Part 3: Street Lighting** based on

relevant ADMO, International and National Foreign Standards and references.

In addition to the products already in scope of the energy efficient lighting standards: Part 1 2870/2018 and Part 2 2902/2018, the lighting products that fall under this new standard Part 3 will also require to be tested and have the SASO energy efficiency certificate and label.

The draft of the standard was released on March 30, 2019, and is in the collection of comments stage until May 28, 2019.

Standard scope:

The new standard will cover requirements for street and road lighting applications, covering:

- Classification of street/road lighting: Three type of lighting classification (M, C and P)
- Tunnel lighting: Daylight and night for tunnel
- Technical requirements of lighting products: Illustrates all lighting products included in the scope of standards

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List of products covered:

Regulatory parameters	Metal halide	High intensity discharge (HID)	Control gear	Luminaires
Energy efficiency	YES	YES	NO	YES
Functionality/performance	YES	YES	NO	YES
Electrical requirements	YES	YES	YES	YES
Mechanical requirements	YES	YES	YES	YES
Energy efficiency labeling	YES	YES	NO	YES

Example for the new energy efficiency label for street lighting products.



Figure 16: Label for lighting products

How UL can help

UL is providing technical expertise, a worldwide network of Certification Body (CB) and performance testing laboratories and qualified staff that can support in delivering technical assessments and reports to cover the applicable international standards, national differences and regulatory requirements.

UL's National Certification Bodies (NCBs) in all regions can supply CB Test Certificates in a reliable and effective way. UL's laboratories are fully equipped and accredited to carry out tests and issue valid test reports according to SASO and International Electrical Safety Standards, and the latest Saudi Energy Efficiency Standards.

UL also has Arabic speaking staff who are experts in SASO's processes, online systems and requirements. UL can support in the achievement of SASO energy efficiency labels and SASO IECCE Recognition Certificates.

Changes to Peru Energy Labeling Requirements

By Abel Primo, Certification Office Manager, Mexico, Peru

On April 7, 2018, new Peru Energy Labeling Requirements were established for various appliance and lighting products. Originally, these requirements were set to become effective on April 8, 2019, but the official date has since been postponed. However, this postponement has not stopped UL from preparing for the road ahead. We were ready for this April effective date; as a result, manufacturers have the opportunity to meet these requirements in advance.

To the right is a table with the new effective dates.

These requirements state that products must be evaluated as specified in the applicable annexes and must be marked with the New Energy Label with certification issued by an accredited certification office. Applicable products that were in the market prior to the effective dates must also comply with the new energy labeling requirements at the point of sale.

With energy efficient products gaining traction around the world and many countries implementing new regulations or updating their existing requirements to better address these new products, manufacturers only stand to benefit from acting today. UL can help by conducting testing in support of your compliance needs. In addition to testing, we can also issue certification and conduct the necessary market surveillance that will be valid for compliance with the above effective dates.

Product Category	Effective Date
Lamps for domestic use and similar uses for general lighting	Nov. 3, 2019
Three-phase asynchronous or induction electric motors with squirrel cage rotor	Dec. 3, 2019
Refrigeration appliances for domestic use	April 1, 2020
Washing machines for domestic use	April 1, 2020
Tumble dryers for domestic use	April 1, 2020
Air conditioning equipment	April 1, 2020
Instantaneous water heaters	April 1, 2020
For ballasts and boilers where no certification office is established	The effective date will be 360 days after the first CB is accredited and published in the Peruvian Official Gazette

We remain confident in our ability to support your market access efforts into Peru. In preparation for the original effective date, we built a successful service path to this key market and have already demonstrated our ability to deliver certificates to large, global manufacturers. Let us help you achieve compliance now, so you don't have to face potential delays down the road.

To learn more about these new regulations and how UL can help keep your market access plans moving forward, email us at LightingInfo@ul.com.

Webinars

On-demand: UL 8800 Horticultural Lighting and System – A Comparison with UL 1598

In this free webinar, you will learn the function of horticultural lighting in controlled environment agricultural operations and the specific safety and performance requirements applicable to these specialized luminaires and systems.

Click [here](#) to view recording.

On-demand: The Power of UL's Flexible Sign Certification Program

This webinar will highlight some straightforward steps that can help sign companies of any size successfully implement and take full advantage of UL's flexible sign certification program.

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