Designers Lighting Forum

In the Dark: Emergency Lighting Requirements

Anne D. Cheney LEED AP, LC, MIES - *Moderator*
Senior Lighting Designer, Melanie Freundlich Lighting Design

Kyle MacKenzie PE, LEED AP BD+C – *Speaker/Panelist*
Principal, Polise Consulting Engineers P.C.

Steve Terry - Speaker/Panelist
Director of Standards and Industry Relations, ETC

Steven Zirinsky AIA, NCARB – *Panelist*
Partner, Zirinsky Architecture PC

March 12, 2019

leducation.org

LEDucation

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

leducation.org

Learning Objectives

At the end of the this course, participants will be able to:

1. Identify EM Lighting criteria required for projects filing under the 1968 and 2014 NYC Building Codes.

2. Understand the pros and cons of electrical systems powering emergency lighting (generator vs. inverter vs. battery pack).

3. Learn about changes to the National Electrical Code that will affect Emergency Lighting requirements in the upcoming 2019 NYC Electrical Code.

4. Understand types lighting control system of emergency lighting that are allowed under the current and future NYC Electrical Codes.

Speakers:

- **Kyle MacKenzie** has over a decade of engineering design experience. He is well versed in designing and managing complex and large-scale building projects. Dedicated to the NYC engineering design community, MacKenzie recently became a member of the New York City Electrical Code Interpretation and Revision Committee, with a specialization in emergency power systems. This volunteer organization is in the process of writing the 2019 NYC Electrical Code. MacKenzie holds a Master of Science in Energy Management and is licensed in the states of New York and New Jersey. In addition to his design experience prior to entering the design community, MacKenzie spent four years working for a mechanical contractor and an electrical contractor installing the systems he now specifies.

- **Steve Terry** is the Director of Standards and Industry Relations at ETC. From 2004 to 2017, he was the VP of Research and Development at ETC, where he led the group that is responsible for global development of new products. Since 1994, he has been a member of NEC Code Panel 15, which covers Health Care Facilities, Assembly Occupancies, Theatres, and Motion Picture Studios. He is a member of several UL Standards Technical Panels, including those for UL924 (Emergency Lighting and Power Equipment), UL1008 (Transfer Switch Equipment), and UL8750 (LED Equipment for use in Lighting Products). In 1986, he chaired the USITT committee that created the internationally accepted DMX512 standard for digital communication in lighting systems. Over the past 10 years, he has been directly involved with many controls-related changes to NEC Article 700—Emergency Systems. These changes have been critical as the industry has evolved to new system architectures and LED lighting for emergency illumination

In the Dark: Emergency Lighting Requirements

1. **Introduction – Anne D. Cheney**
2. Emergency Lighting Systems - Kyle Mackenzie
3. Emergency Lighting Controls – Steve Terry
4. Lighting Designer’s Role in Emergency Lighting Specifications – Anne D. Cheney
5. Panel Discussion with Q&A

In the Dark: Emergency Lighting Requirements

1. Introduction – Anne D. Cheney
2. **Emergency Lighting Systems - Kyle Mackenzie**
3. Emergency Lighting Controls – Steve Terry
4. Lighting Designer’s Role in Emergency Lighting Specifications – Anne D. Cheney
5. Panel Discussion with Q&A

Emergency Lighting Systems

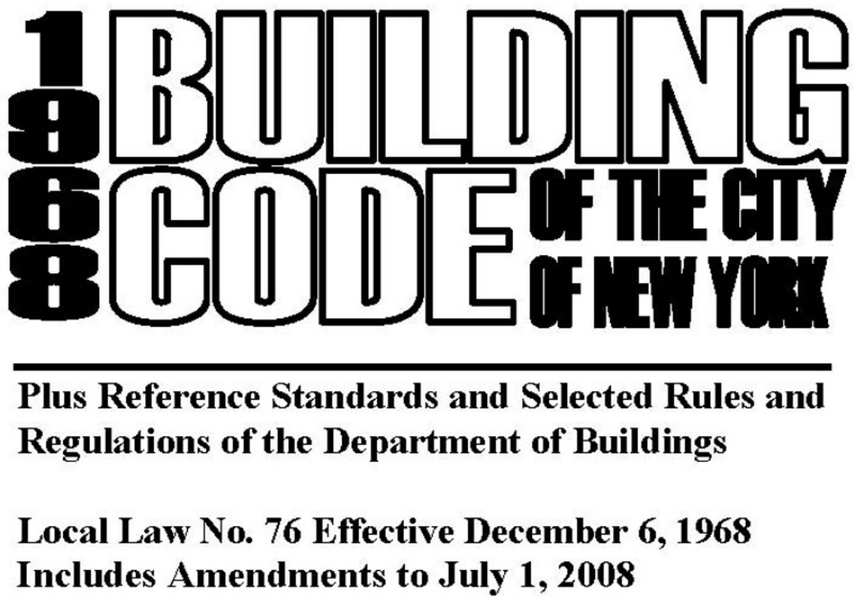
Kyle MacKenzie has over a decade of engineering design experience. He is well versed in designing and managing complex and large-scale building projects. Dedicated to the NYC engineering design community, MacKenzie recently became a member of the New York City Electrical Code Interpretation and Revision Committee, with a specialization in emergency power systems. This volunteer organization is in the process of writing the 2019 NYC Electrical Code. MacKenzie holds a Master of Science in Energy Management and is licensed in the states of New York and New Jersey. In addition to his design experience prior to entering the design community, MacKenzie spent four years working for a mechanical contractor and an electrical contractor installing the systems he now specifies.

Why Emergency Lighting

Codes on Emergency Lighting in NYC:

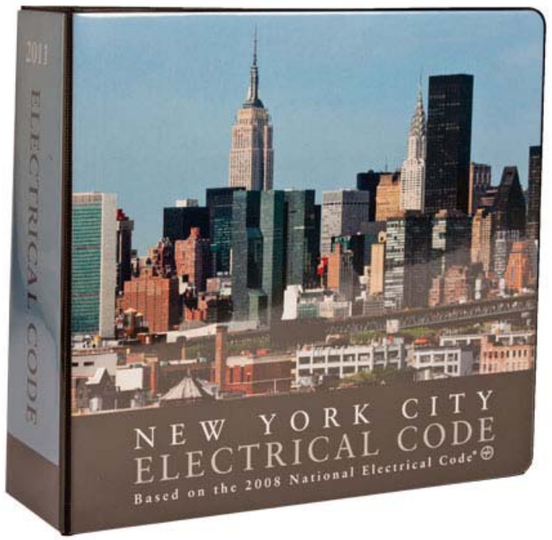
2014 NYC Building Code

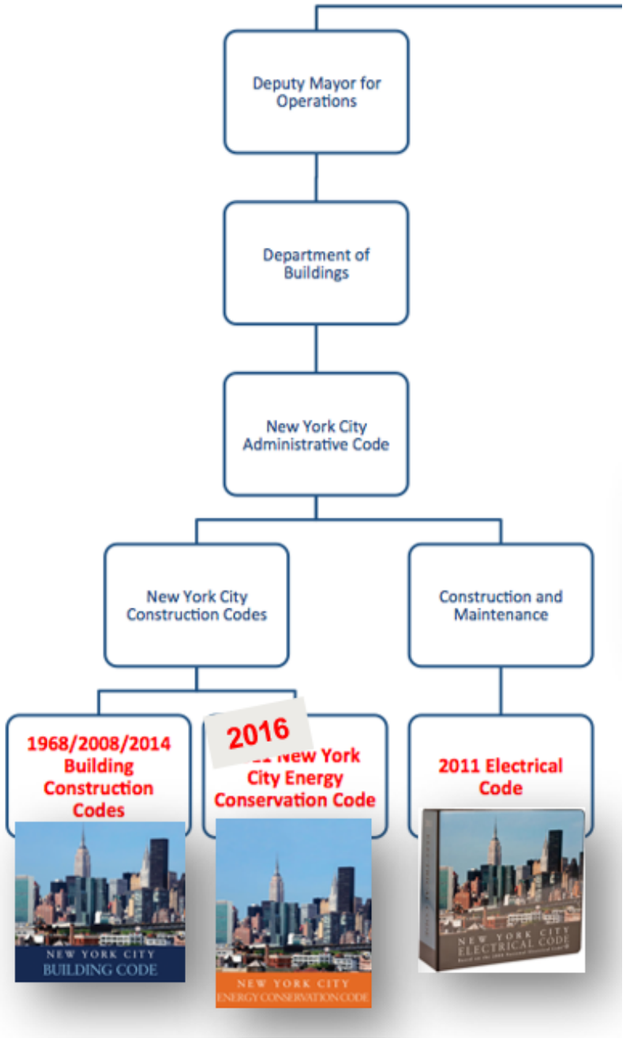
1968 NYC Building Code



Codes on Emergency Lighting in NYC:

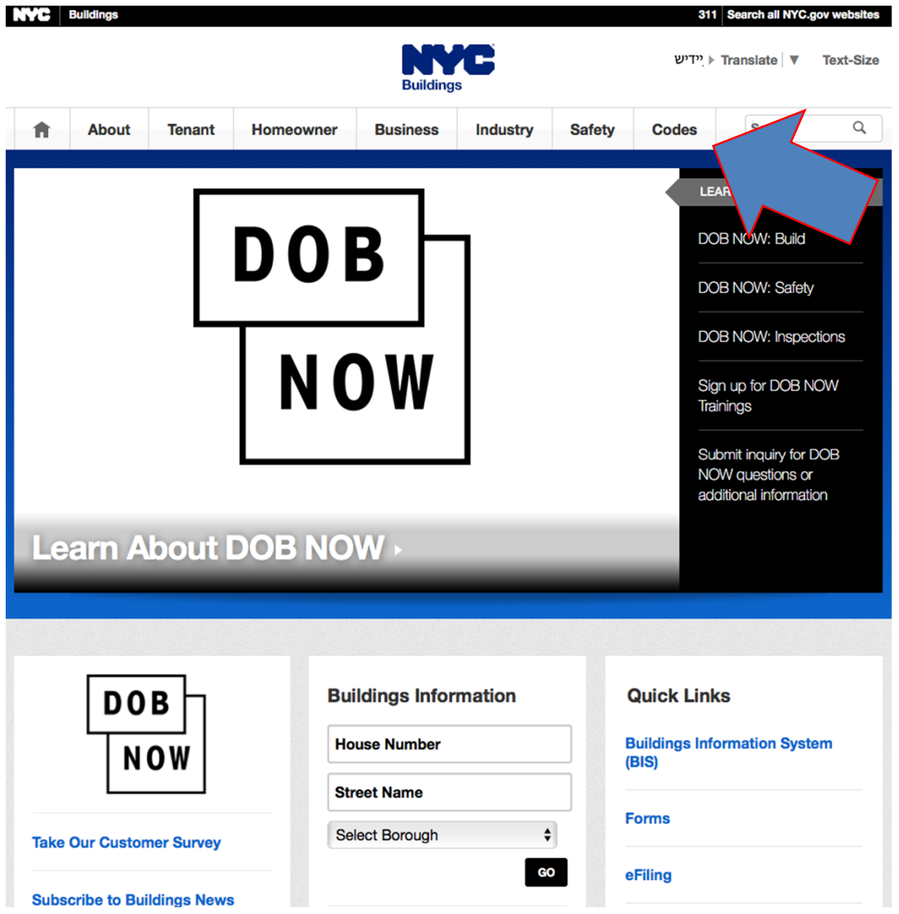
2011 NYC Electrical Code





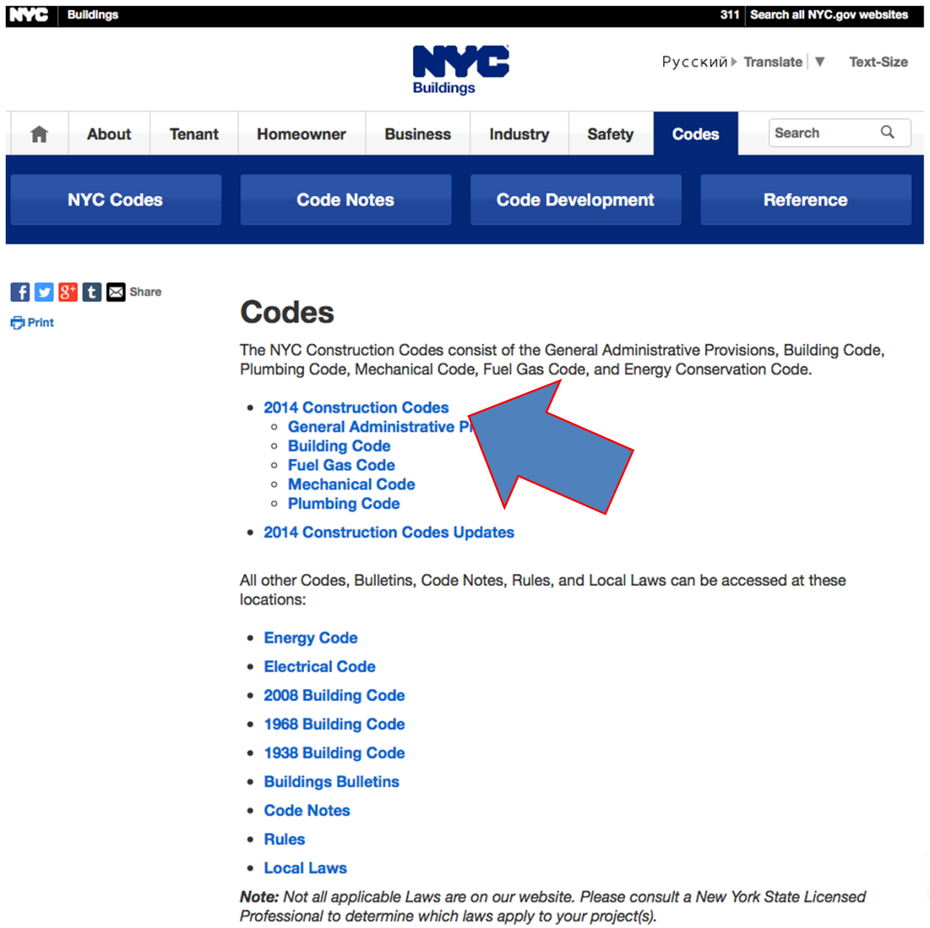
Where to find the Codes Online…

NYC Department of Buildings Website:
https://www1.nyc.gov/site/buildings/index.page



Where to find the Codes Online…

https://www1.nyc.gov/site/buildings/index.page



Which Code Applies

NYC BC Chapter 1 Administration
28-101.4.- Any work submitted after July 1st 2008 should be performed in accordance with 2014 NYC Building Code.
28-101.4.3- Construction work in prior code building may be preformed in accordance with 1968 NYC Building Code.
Only 1 Code may be utilized.

2014 NYC Building Code Requirements

2014 NYC 1006.3 Illumination Emergency Power:
Emergency lighting is required in:
Rooms and Spaces that require two or more means of egress.
Corridors, exit, enclosures, and exit passageways.
Exterior egress components on other then level of exit discharge (for buildings required to have two or more exits).
Interior exit discharge elements (For buildings required to have two or more exits).
Exterior landings for exit discharge doorways (For buildings required to have two or more exits).

Emergency Power system shall provide for not less than 90 minutes and shall consist of storage batteries (2 options), unit equipment, or an on-site generator.
Average of 1 foot candle measured at the path of egress at the floor level required.
Maximum to minimum uniformity ratio of 40 to 1.

1968 NYC Building Code Requirements

Article 6 of Title 27, 27-381 and 382:
Emergency Lighting is required in:
Corridor, balconies, exit passageways, stairs, ramps, escalators, bridges, tunnels, landings, platforms, and assembly spaces.

Modified by
NYC Memorandum “Emergency Lighting in Exits and Exit Access Facilities” (1/20/1987)
Minimum 2 foot candles measured at the floor level in exits
Average of 2 foot candles measured 18 inches above the floor in exit access facilities.
Illuminated path from elevator landing to 2 exits required
Illuminated path between floor exits is required.

Modified by
IES Lighting Handbook 1981 Application Volume
Maximum to minimum 40 to 1 uniformity ratio

1968 NYC Building Code Requirements

IES Lighting Handbook 1981 Application Volume
Emergency lighting may not be less then 1% of the average of normal lighting
Minimum of 3 foot candles at:
Intersection of corridors
Abrupt changes in direction of egress paths
Non-exit stairs
Outside of each exit
At each exit door
3 foot candles only required for a square with width and depth equal to double the egress opening or the corridor width (whichever is less)

Emergency lighting to be provided outside of door of rooms that are occupied by 5 or more people

1968 NYC Building Code Requirements

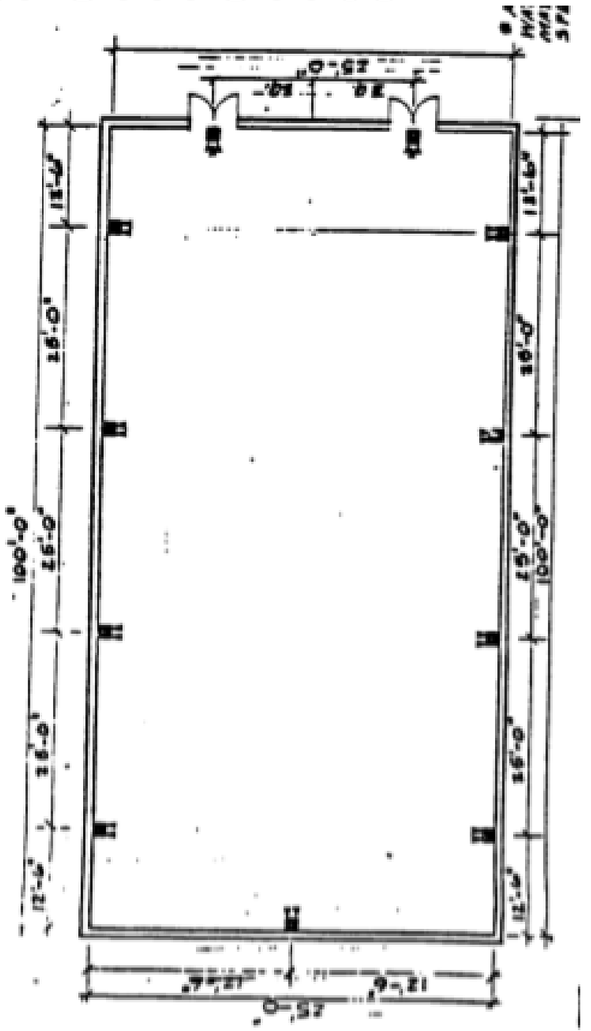
Article 8 of Title 27-542- Public Assembly
Modified By:
Local Law 41 of 1978
Modified By:
NYC Directive 5 of 1979

Minimum of 5 foot candles at:
Exit sign
Exit doorway
5 foot candles only required for a square with width and depth equal to double the egress opening or the corridor width (whichever is less) at the exit doorway.

Minimum 2 foot candles at 18 inches above the floor at cross aisles
Minimum 1 foot candle at 18 inches above the floor in all other areas.

1968 NYC Building Code Requirements

“Emergency Lighting” Memorandum of 2/19/81
Where unit equipment is utilized, in lieu of requirements of Directive 5 of 1979 the following lighting equipment layout is equivalent



Additional Code Requirements NYC Electrical Code

Article 700 Emergency Systems-
700.16, Emergency lighting systems shall be designed so that the failure of any individual lighting element such as the burning out of 1
Lamp cannot leave a space requiring emergency illumination in total darkness.

700.12- Storage batteries shall have the capacity to supply and maintain the total load for a minimum period of 90 minutes.

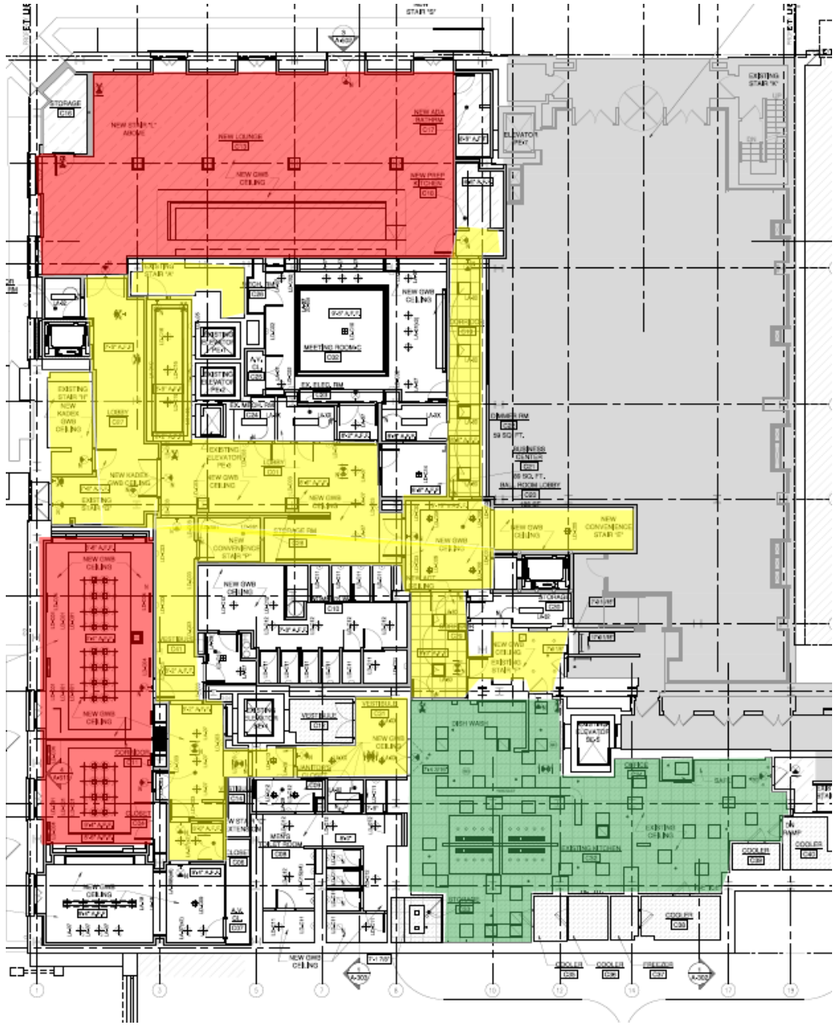
RCP with Required Em Lighting Coverage Areas

1968 NYC Building Code:

- 2 FC in Exits
- AVG 2FC in Exit Access
- 3 FC Specific Locations
- 5 FC at PA Exit Doors
- 2 FC at Cross Aisles
- 1 FC in other PA areas
- AVG 2FC from exit to exit & from elevator to 2 exits.

2014 NYC Building Code:

- Average of 1 Foot Candle in Exit/Exit Access
- Average of 1 Foot Candle in Public Assembly
- Average of 1 Foot Candle in other areas requiring 2 means of egress



Electrical Systems Powering Emergency Lighting

Generator

Unit Equipment

Central Lighting Inverter

Integral Battery Pack

Lighting Fixture with Integral Battery Pack

Pros

- Initial cost generally lower (installation and equipment)
- No additional floor space allocation required.
- No additional fixtures required.
- No additional relays/modules required to accommodate lighting control systems.

Cons

- Not all lighting fixtures can be provided with integral batteries. Some lighting fixtures require remote batteries (access required).
- Due to LED Technology, lighting fixtures are being manufactured within a smaller profile and integral battery availability is becoming less prevalent.
- Test switches and led indicators visible and may affect space aesthetic intent.
- Multiple points of ongoing maintenance required.
- Lighting output of battery typically less then standard fixture operation.

Unit Equipment (Standalone EM Light)

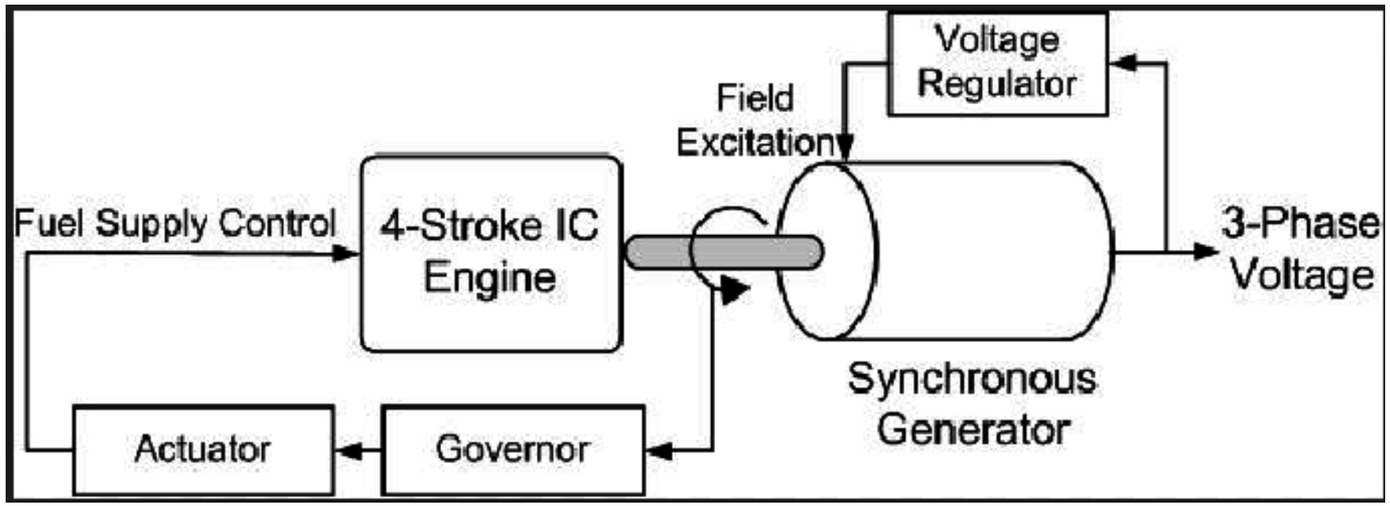
Pros

- Initial equipment cost generally lower
- No additional floor space allocation required
- Coordination with lighting control system not required.
- Retrofit applications do not required existing lighting system be modified.

Cons

- Unit equipment lights are in addition to ambient space lighting and require additional electrical wiring to support.
- May not be viable based on architectural aesthetic intent.
- Multiple points of ongoing maintenance required.
- Several manufacturers do not provide photometry files for unit equipment and only list “Rules of Thumb” within fixture literature.

Emergency Generator



Combination of a Diesel Engine (similar to a Truck Engine) and an Electric Generator.
The Diesel Engine is an internal combustion engine in which ignition of fuel causes high pressure gas to move a crankshaft which in this case is coupled with the electric generator.
The Electric Generator converts mechanical energy into electric power.
In NYC Diesel is required for all applications except for R-2.

Emergency Generator

Pros

- Generator system can support other loads in addition to emergency lighting.
- Generator system can extend function of emergency lighting beyond 90 minutes (6 hours code required).
- Single point of ongoing maintenance.
- Code required for specific building sizes and heights
- Generator systems may already be available onsite for renovation projects.
- LEDs have facilitated the use of smaller generators and less significant associated electrical infrastructure requirements due to FC to W ratio.

Cons

- Physical dimensions and working clearances.
- Weight
- Noise and vibration production.
- Additional electrical system infrastructure required including automatic transfer switches and fire rated feeders.
- High initial equipment cost.
- Ongoing maintenance requirements typically more extensive then inverter system.
- Interface with lighting control system requiring UL-924 control relays.
- Additional MEP systems required to support generator (i.e. fuel oil system, exhaust system, cooling system).

Emergency Generator

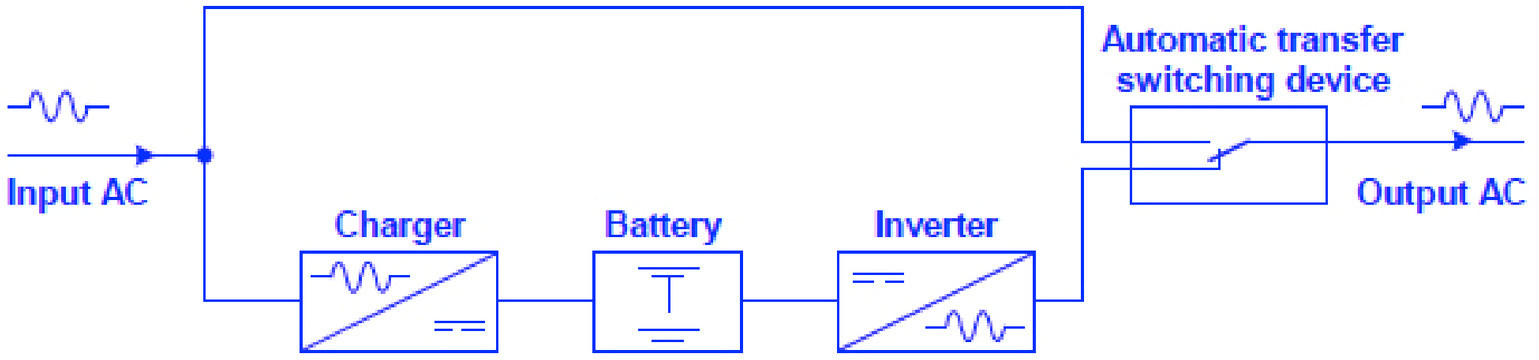
Pros

- Generator system can support other loads in addition to emergency lighting.
- Generator system can extend function of emergency lighting beyond 90 minutes (6 hours code required).
- Single point of ongoing maintenance.
- Code required for specific building sizes and heights
- Generator systems may already be available onsite for renovation projects.
- LEDs have facilitated the use of smaller generators and less significant associated electrical infrastructure requirements due to FC to W ratio.

Cons

- Physical dimensions and working clearances.
- Weight
- Noise and vibration production.
- Additional electrical system infrastructure required including automatic transfer switches and fire rated feeders.
- High initial equipment cost.
- Ongoing maintenance requirements typically more extensive then inverter system.
- Interface with lighting control system requiring UL-924 control relays.
- Additional MEP systems required to support generator (i.e. fuel oil system, exhaust system, cooling system).

Central Lighting Inverter



Sketch showing a typical
Central Battery Static Inverter System

A Central lighting inverter is a combination of an inverter, which is an electronic device that converts DC to AC and a DC battery(s) that discharges DC voltage. AC (alternating current) is the type of power utilized by the building's electrical distribution/ provided by the utility company.

Central Lighting Inverter

Pros

- Single point of ongoing maintenance.
- Ongoing maintenance requirements typically less extensive then other systems.
- Availability/ feasibility of replacing batteries generally more realistic then lighting fixtures with integral batteries.
- Greater quantity of system discharges then integral batteries or unit equipment.
- LEDs have facilitated the use of smaller inverters and less significant associated electrical infrastructure requirements due to FC to W ratio.

Cons

- Physical dimensions and working clearances.
- Weight.
- High initial equipment cost (however generally less then generator).
- Interface with lighting control system requiring UL-924 control relays.
- Additional ventilation and in some cases cooling systems required to support inverter.
- Additional power wiring is required to accommodate control systems.

LEDucation

Emergency Lighting Re-cap

- Emergency Lighting systems… Save Lives!
- NYC 1968 Code-
- NYC 2014 Code- Average of 1 FC.
- Both- 90 minutes back-up required.
- Code is the minimum requirement… Design from code not for code.
- Emergency Power systems that support emergency lighting consists of diesel engine generator, central lighting inverter, integral battery packs, and unit equipment.
- Diesel engine generator and lighting inverter are centralized power systems, unit equipment and integral battery packs are distributed systems.
- Generator and lighting inverter systems require specific relays/ controls for interface with lighting control systems.

In the Dark: Emergency Lighting Requirements

1. Introduction – Anne D. Cheney
2. Emergency Lighting Systems - Kyle Mackenzie
3. **Emergency Lighting Controls – Steve Terry**
4. Lighting Designer’s Role in Emergency Lighting Specifications – Anne D. Cheney
5. Panel Discussion with Q&A

Emergency Lighting Control

Steve Terry has been involved in codes and standards work for more than 35 years. From 2004 to 2017, he was the VP of Research and Development at ETC, where he led the group that is responsible for global development of new products. Since 1994, he has been a member of NEC Code Panel 15, which covers Health Care Facilities, Assembly Occupancies, Theatres, and Motion Picture Studios. He is a member of several UL Standards Technical Panels, including those for UL924 (Emergency Lighting and Power Equipment), UL1008 (Transfer Switch Equipment), and UL8750 (LED Equipment for use in Lighting Products). In 1986, he chaired the USITT committee that created the internationally accepted DMX512 standard for digital communication in lighting systems. Over the past 10 years, he has been directly involved with many controls-related changes to NEC Article 700—Emergency Systems. These changes have been critical as the industry has evolved to new system architectures and LED lighting for emergency illumination.

New Rules & New Tools
for Emergency Lighting Control

LEDucation

Overview

- Advancements in control technology and energy management have made compliance with the National Electrical Code, Article 700, Emergency, more complex, with more design choices.

- “It’s UL Listed” does not mean “It’s the right application.”

The Constellation of Emergency Lighting Standards

Life Safety Code
NFPA 101
Section 7.9 - Emergency Lighting

Standard for Emergency and Standby Power Systems
NFPA 110

Emergency Lighting and Power Equipment
UL924

National Electrical Code
NFPA 70
Article 700 - Emergency Systems
Article 701 – Legally Required Standby Systems
Section 702 – Optional Standby Systems

Standard on Stored Electrical Energy Emergency and Standby Power Systems
NFPA 111

Transfer Switch Equipment
UL1008

Legally Required & Optional Standby

- Standby Systems are NOT Emergency Systems as defined by the NEC® and are not designed to ensure life safety via safe egress.
  - Article 701 is for Legally Required Standby Systems
    - Article 701 provides for lighting and power to areas for rescuers or repair crews
    - 60 second power up vs. 10 seconds for Emergency
  - Article 702 is for Optional Standby Systems
    - Article 702 provides for lighting and power to prevent discomfort or serious damage to a process or product

UL 1008 vs. UL 924

- UL 1008 covers the requirements for automatic, non-automatic (manual), and by-pass/isolation transfer switches intended to provide for lighting and power for use in:
  - Emergency systems in accordance with NEC® Articles 517 - Health Care Facilities &
    700 - Emergency Systems
  - Branch Circuit Emergency Lighting Transfer Switches (BCELTS)—CCN WPWR
  - Transfer switches for use in NEC® Article 701-Legally Required Standby Systems—CCN WPWR
  - Transfer switches for use in optional standby systems in accordance with NEC® Article 702—CCN WPXT

UL 1008 vs. UL 924

- UL 924 covers the requirements for emergency lighting and power equipment intended to automatically supply illumination or power or both to critical areas and equipment in the event of failure of the normal supply, in accordance with NEC® Articles 700 or 701—CCN FTBR
  - Examples of such equipment include
    - Exit Signs
    - Emergency Luminaires and Unit Equipment
    - Automatic Load Control Relays
    - Directly Controlled Luminaires and associated “bypass” equipment
    - Dimmer or relay systems used under 700.23

New Control Concepts in UL924 for 2018

- 4.18.1 EMERGENCY LIGHTING CONTROL DEVICE (ELCD) – A separate or integral device intended to perform one or more EMERGENCY LIGHTING CONTROL FUNCTIONS. Upon loss of normal power, an ELCD defaults to a position that does not disrupt the flow of emergency power to any controlled emergency load.
- Purposely generic to cover equipment that has “not been thought of yet”—UL924 is now an evolving standard.

More New Control Concepts in UL924 for 2018

- 4.18.2 EMERGENCY LIGHTING CONTROL FUNCTION (ELCF) – An activity related to the performance of an emergency lighting system, including but not necessarily limited to one or more of the following:
- a) **Sensing** normal power status and transmitting a normal power status signal to a separate or integral device;
- b) **Interpreting** a normal power status signal (receiving and translating to some other type of signal);
- c) **Controlling** the lighting output level (e.g., changing “off” to “on”; “dim” to “full”);
- d) **Distributing** emergency power or control signals among connected devices;
- e) **Simulating** a loss of normal power (for manual testing or self-test/self-diagnostic purposes).

New Emergency Control Devices

- Automatic Load Control Relay (ALCR)—NEC 700.26
- Dimmer or Relay Systems—NEC 700.23
- Directly Controlled Luminaires—NEC 700.24
- Branch Circuit Emergency Lighting Transfer Switch (BCELTS)—NEC 700.25

LEDucation

New in the 2011 NEC® - Revised in 2014

- **700.2 Definition**
  - **Relay, Automatic Load Control**. A device used to set normally dimmed or normally-off switched emergency lighting equipment to full power illumination levels in the event of a loss of the normal supply by bypassing the dimming/switching controls, and to return the emergency lighting equipment to normal status when the device senses the normal supply has been restored.

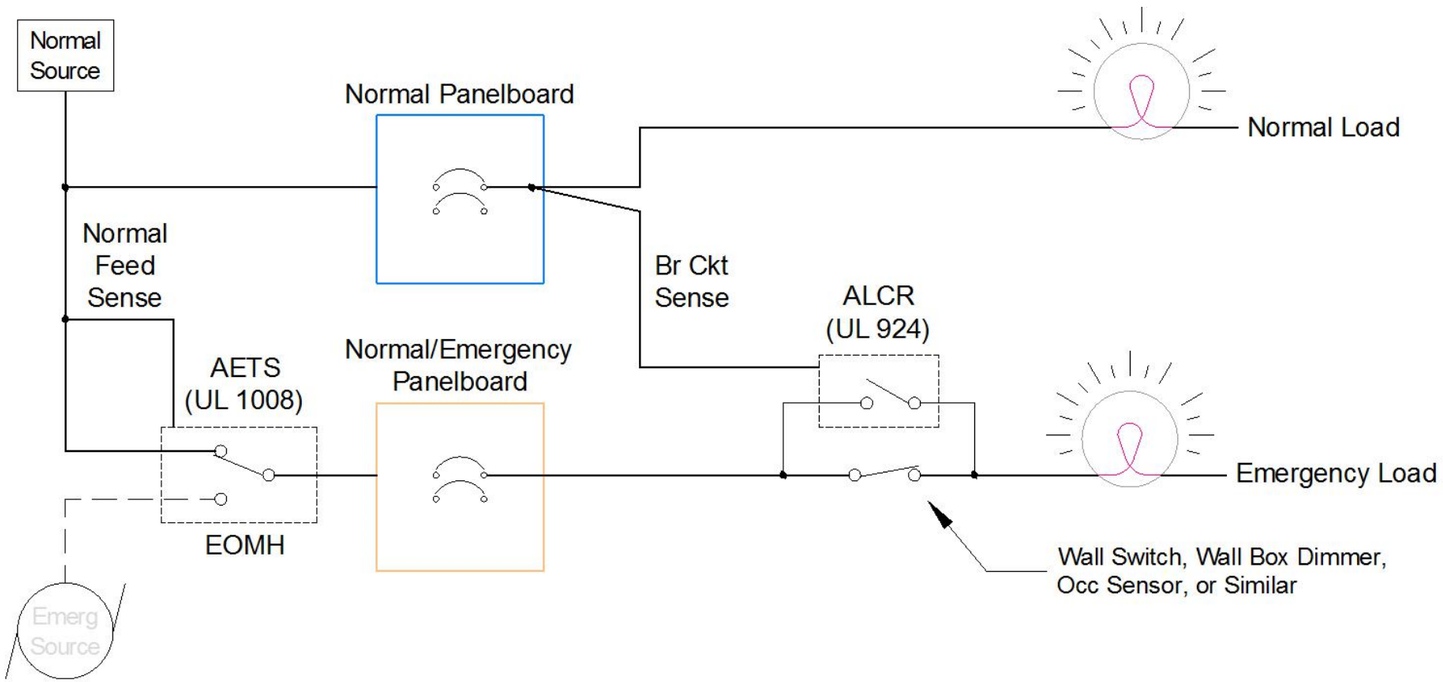
    Informational Note: See ANSI/UL 924, Emergency Lighting and Power Equipment, for the requirements covering automatic load control relays.

New in the 2011 NEC®

- **700.24 Automatic Load Control Relay**. If an emergency lighting load is automatically energized upon loss of the normal supply, a listed automatic load control relay shall be permitted to energize the load. The load control relay shall not be used as transfer equipment.
- Section **700.25** in the 2014 Edition.
- Section **700.26** in the 2017 Edition.

Bypass for Wall Switch or Wallbox Dimmer

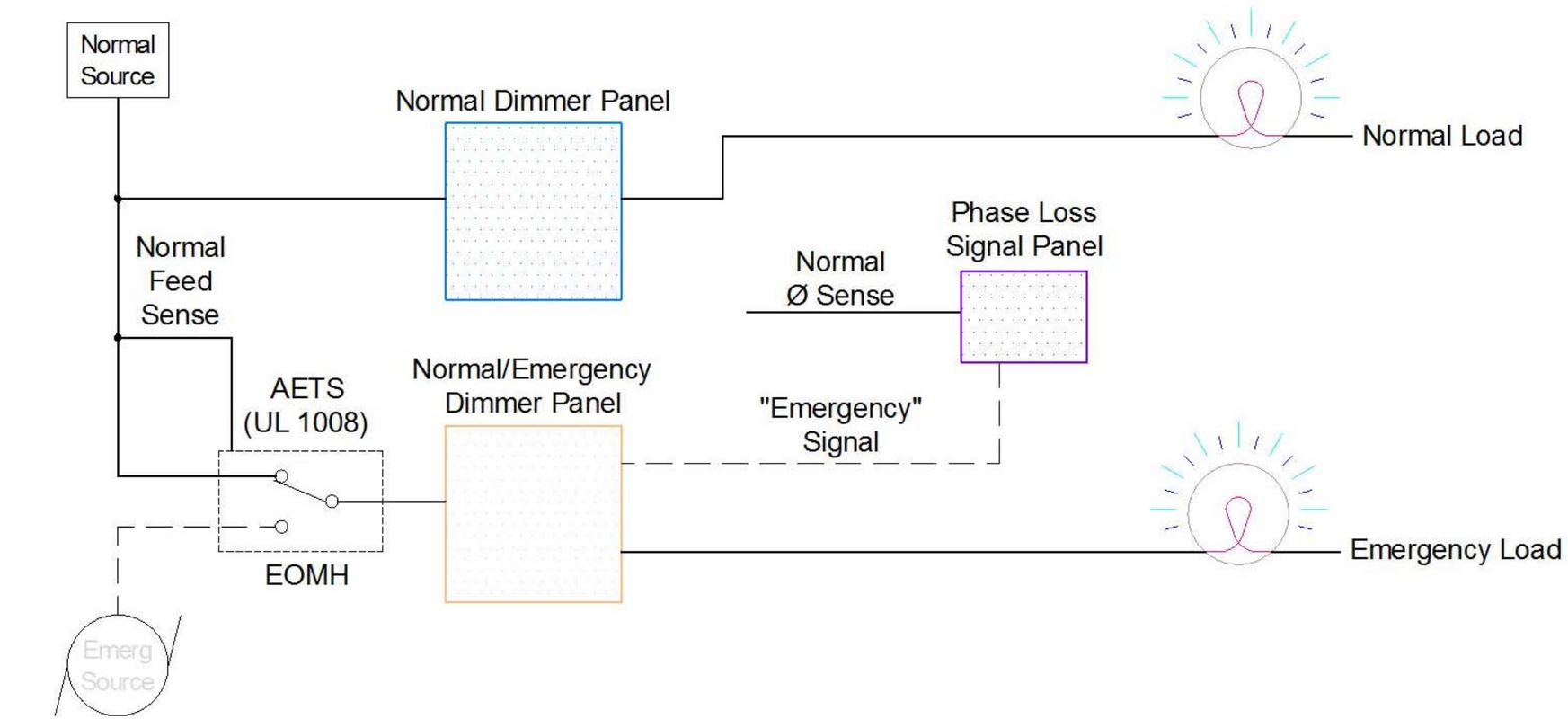
- Advantage – simplicity.
- Disadvantages – does not work for Relay and Dimmer Systems (*panel).



Internal Dimmer or Relay Electronic Bypass

- Advantage – can use dimmer or relay cabinet Listed for Emergency under UL 924 under provisions of NEC® section 700.23. Relay cabinets specifically were added in 2014.
- Disadvantage – the requirement for all circuits to be installed per Article 700, determining the emergency feeder capacity along with meeting selective coordination requirements, and concerns regarding the complexity of the equipment and comfort level of the engineer or inspector with this approach.

Internal Dimmer or Relay Electronic Bypass



LEDucation

New in the 2017 NEC®

- **Definition (700.2**)
  - **Branch Circuit Emergency Lighting Transfer Switch (BCELTS)**. A device connected on the load side of a branch circuit protective device that transfers only emergency lighting loads from the normal utility supply to a continuously available synchronous or asynchronous emergency supply.

    Informational Note: See ANSI/UL 1008 *Transfer Switch Equipment* for the requirements covering branch circuit emergency lighting transfer switches.

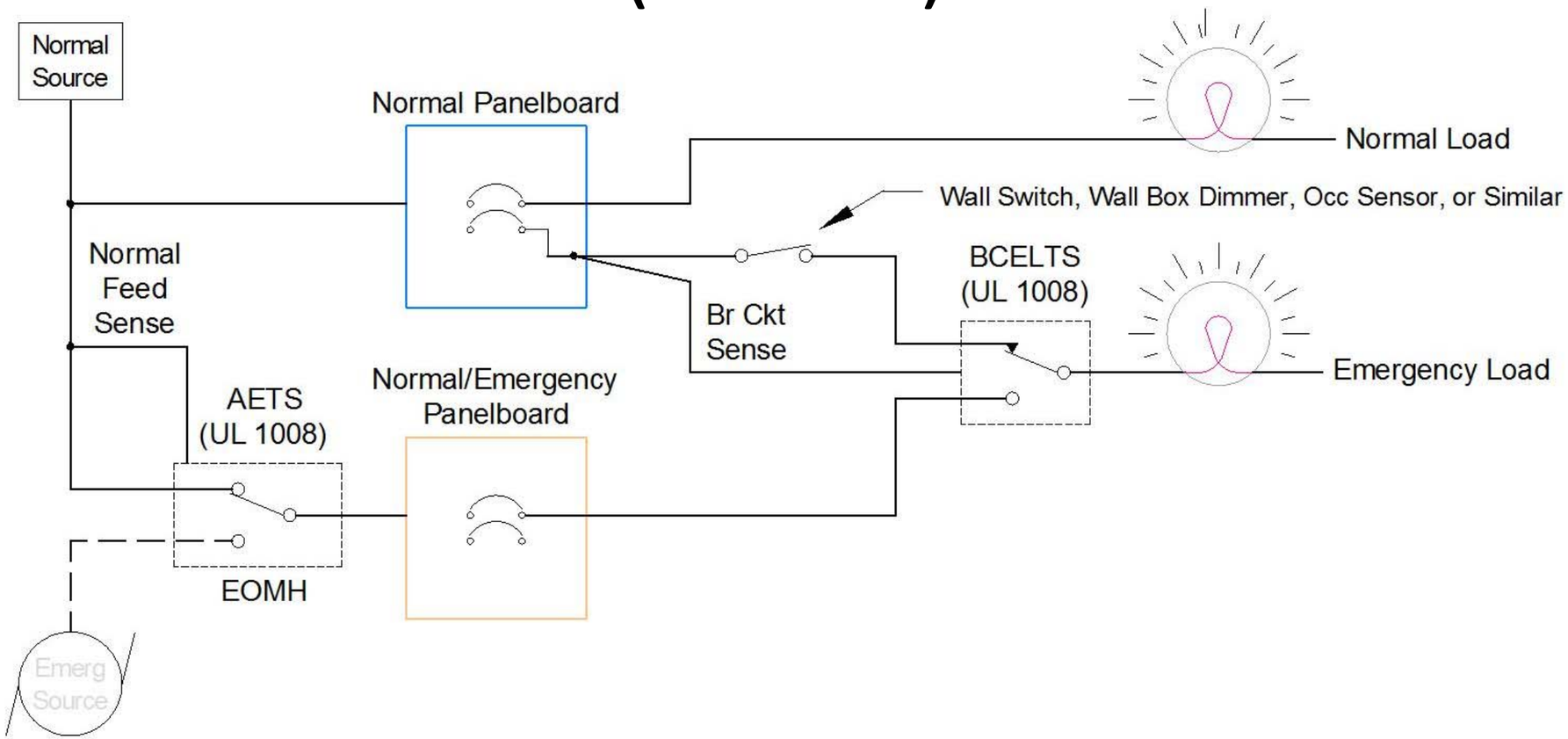
New in the 2017 NEC®

- **700.25 Branch Circuit Emergency Lighting Transfer Switch (BCELTS)**.
  - Emergency lighting loads fed by branch circuits rated at not greater than 20A shall be permitted to be transferred from the normal branch circuit to an emergency branch circuit using a listed branch circuit emergency lighting transfer switch. The mechanically held requirement of section 700.5(C) shall not apply to listed branch circuit emergency lighting transfer switches.

New in the 2017 NEC®

- **700.25 Branch Circuit Emergency Lighting Transfer Switch (BCELTS)**.
  - BCELTS is potentially more cost effective due to the removal of the mechanical hold requirement, yet it still meets all the stringent UL1008 requirements for fault current, endurance, and source interconnection prevention.

Branch Circuit Emergency Lighting Transfer Switch (BCELTS).



Where is a BCELTS more useful than an ALCR?

- Since many systems use an upstream ATS, why use *another* transfer switch on a branch circuit?
- Where a controlled dimmer or relay panel contains only a *few* emergency lighting circuits, it can be useful to transfer them to an emergency panel in order to resolve issues of reduced–size emergency feeders and load shedding.

New in the 2014 NEC®

- 700.24 Directly Controlled Luminaires. Where emergency illumination is provided by one or more directly controlled luminaires that respond to an external control input to bypass normal control upon loss of normal power, such luminaires and external bypass controls shall be individually listed for use in emergency systems.

- In 2014 Edition, there was no definition, so minimal if any enforcement.

New in the 2017 NEC® - Definition

- Luminaire, Directly Controlled
  An emergency luminaire that has a control input for an integral dimming or switching function that drives the luminaire to full illumination upon loss of normal power.

  Informational Note: See ANSI/UL924, Emergency Lighting and Power Equipment for information covering directly controlled luminaires.

Likely Coming in the 2020 NEC®

- Emergency Luminaire, Directly Controlled
  An emergency luminaire that has a control input for an integral dimming or switching function that drives the luminaire to ~~full~~ the required illumination level upon loss of normal power.

  Note: This will not be final until September 2019

A Clarification Likely Coming in the 2020 NEC

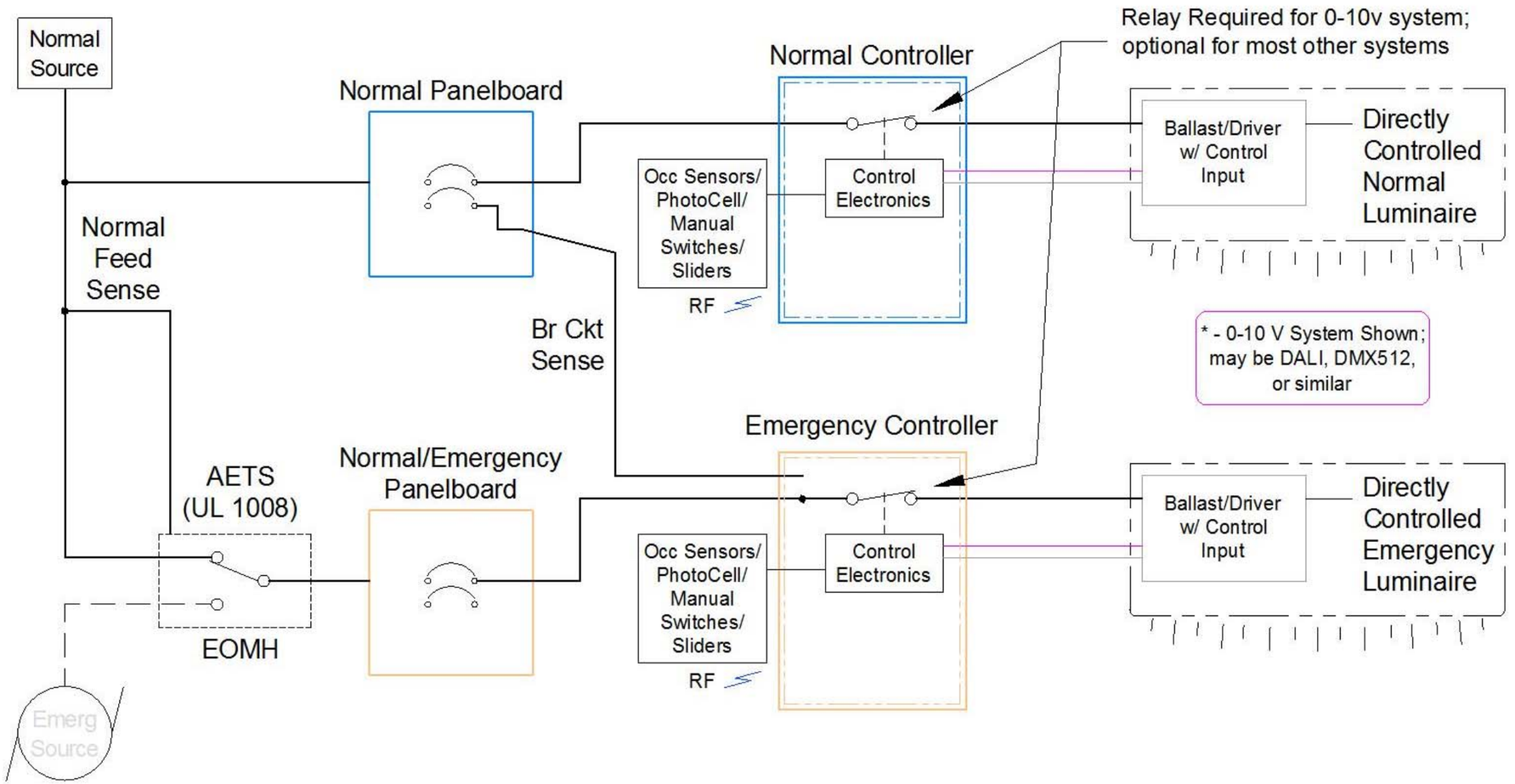
- 700.24 Directly Controlled Emergency Luminaires. Where emergency illumination is provided by one or more directly controlled emergency luminaires that respond to an external control input, or loss thereof, to bypass normal control upon loss of normal power, such luminaires and external bypass controls shall be individually listed for use in emergency systems.

- *Note: This will not be final until September 2019*

Directly Controlled Luminaire Examples

- 1-10V (0-10V)
- DALI
- DMX512
- ZigBee
- Ethernet
  - Including Power Over Ethernet (PoE)
- 3 approaches:
  - Loss of signal
  - External input (can be a normal power sense—a “built-in ALCR”)
  - Override commands on control input

Directly Controlled Luminaires



Likely Coming in 2020 NEC

- **700.16 Emergency Illumination.**
- **(B) System Reliability.** Emergency lighting systems shall be designed and installed so that the failure of any illumination source cannot leave in total darkness any space that requires emergency illumination. Control devices in the emergency system shall be listed for use in emergency systems. Listed unit equipment in accordance with 700.12(F) shall be considered as meeting the requirements of this section.
  - Informational note: 700.23 through 700.26 provide requirements for applications of emergency control devices
  - *Note: this will not be final until September 2019.*

In the Dark: Emergency Lighting Requirements

1. Introduction – Anne D. Cheney
2. Emergency Lighting Systems - Kyle Mackenzie
3. Emergency Lighting Controls – Steve Terry
4. **Lighting Designer’s Role in Emergency Lighting Specifications – Anne D. Cheney**
5. Panel Discussion with Q&A

Who Specifies Emergency Lighting?

LEDucation

Lighting Designer – Emergency Lighting

What the LD can Provide

- LD can advise the Architect/Client about EM Lighting options:
  - Architectural Lights on Inverter
  - Architectural Lights on Battery
  - Emergency Lights
    - Surface mounted EM Luminaire
    - Recessed flip-down hidden EM Luminaire
- LD can advise about pros and cons of EM Lighting Options – cost, space, maintenance burden…
- LD specifies architectural lighting that meets building code required Normal Lighting levels that *can* meet EM light levels and uniformity *if* the Client decides to use architectural lights for Emergency Lighting.
- LD can run EM Lighting Calculations.

What the LD can't Provide

- LD can't take responsibility for the full Emergency Lighting System:
  - Lights
    - Architectural Lighting System used for EM – LD
    - Emergency Lights – EE/PE or LD
  - Controls – EE/PE or LD (with Lighting Control Manufacturer)
  - Wiring – EE/PE
- LD can't file compliance documents – only a Licensed Professional can sign off on code compliance.
- LD can't confirm EM Lighting Calculations meet all relevant codes.
- LD can't publish EM Lighting Calculations for proof of code compliance.

LEDucation

Emergency Lighting Specification Team

- **Lighting Designer**
  - Reviews code requirements with PE/EE and RA.
  - Discusses EM Lighting options with Design Architect, Client, PE/EE.
  - Provides architectural lighting system that can meet code compliant EM Lighting levels/uniformity and restart time.
  - May specify controls.
  - May run lighting EM Lighting calculations.
- **Electrical Engineer**
  - Advises on code requirements.
  - May specify EM Lighting controls.
  - May run lighting EM Lighting calculations.
  - Documents/publishes full EM Lighting System – lights, controls, wiring**.**
- **Architect**
  - Coordinates EM Lighting system with Client, architectural constraints, aesthetic concerns, and with the other project members.
  - Documents EM Lighting System Locations.
- **Lighting Control Manufacturer – Specification Engineer**
  - Provides control options with space required, cost of equipment, complexity of system.
  - Provides EE with Single Line Diagram and other system specific data for inclusion in DOB filing documents.

In the Dark: Emergency Lighting Requirements

1. Introduction – Anne D. Cheney
2. Emergency Lighting Systems - Kyle Mackenzie
3. Emergency Lighting Controls – Steve Terry
4. Lighting Designer’s Role in Emergency Lighting Specifications – Anne D. Cheney
5. **Panel Discussion with Q&A**

In the Dark: Emergency Lighting Requirements

Panel:

Anne D. Cheney – Moderator, Lighting Designer

Kyle Mackenzie – Panelist, Professional Engineer

Steve Terry – Panelist, Control Specialist

Steven Zirinsky – Panelist, Registered Architect

Questions & Answers

LEDucation

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

leducation.org

This concludes The American Institute of Architects Continuing Education Systems Course

leducation.org

Emergency Lighting Links

- New York City Building Code 2014, Chapter 10, Means of Egress: https://www1.nyc.gov/assets/buildings/apps/pdf_viewer/viewer.html?file=2014CC_BC_Chapte_10_Means_of_Egress.pdf&section=conscode_2014
- New York City Electrical Code 2011: https://www1.nyc.gov/site/buildings/codes/electrical-code.page
- NFPA 70 NEC 2008: https://archive.org/details/gov.law.nfpa.nec.2008
- NFPA 70 NEC 2014: https://archive.org/details/gov.law.nfpa.nec.2014
- NFPA 101 Life Safety Code 2006: https://archive.org/details/gov.law.nfpa.101.2006
- Construction Code Lookup: https://www.constructconnect.com/building-codes/?search=
- NEC Adoption Map: https://www.nfpa.org/NEC/NEC-adoption-and-use/NEC-adoption-maps