



## REVIEW OF LIGHTING SYSTEMS

Procedure Number: E2-14

Revision Date: November 5, 2021

S. M. Peterson, CDR, Chief, Engineering Division

### **Purpose**

This Plan Review Guideline (PRG) covers non-hazardous area electrical lighting requirements for vessels applicable to 46 CFR Subchapter J. Other vessel classifications (e.g. 46 CFR Subchapter T, K, L) requirements may differ from those listed below.

### **Contact Information**

If you have any questions or comments concerning this document, please contact the Marine Safety Center (MSC) by e-mail or phone. Please refer to Procedure Number E2-14.

E-mail: [msc@uscg.mil](mailto:msc@uscg.mil)

Phone: 202-795-6729

Website: [www.dco.uscg.mil/msc](http://www.dco.uscg.mil/msc)

## Table of Contents

1. Applicability .....	3
2. Background .....	3
3. References .....	3
4. Content .....	3
Lighting Materials .....	3
Lighting Design .....	4
Lighting Ampacity and Overcurrent .....	4
Navigation Lighting .....	4
Emergency Lighting .....	5
5. Disclaimer .....	5

## **1. Applicability**

This Plan Review Guideline (PRG) is applicable to all vessels subject to 46 CFR Subchapter J non-hazardous lighting requirements. For 46 CFR Subchapter J applicability, reference the parent subchapter governing vessel inspection requirements (46 CFR Subchapter D, H, I, I-A, K, L, O, Q, R, T, U, and W). For guidelines and design requirements regarding hazardous area lighting, please reference PRG E2-12.

## **2. Background**

Lighting requirements are largely concerned with redundancy for passenger or crew member safety in the event of an emergency. Additionally lighting must be materially suitable for marine use, conform to specific design requirements and overcurrent protection.

## **3. References**

Title 46 CFR 111.75 “Lighting Circuits and Protection”

Title 46 CFR 112.43 “Emergency Lighting Systems”

UL 1598A “Standard for Supplemental Requirements for Luminaires for Installation on Marine Vessels”

IEC 93-306 “Electrical Installations in Ships; Part 306 Equipment – Luminaires and Accessories”

IEEE Std 45-2002, “Recommended Practice for Electric Installations on Shipboard”

## **4. Content**

### **Lighting Materials**

a. All lighting fixtures are required to be suitable for the marine environment and appropriately rated. (Fixture globes, lenses, and diffusers must be made of high strength material in accordance with 46 CFR 111.75-20(b). Certificated compliance with the standards below is sufficient to verify this requirement.) Ensure that lighting specification details are provided with your submission or listed on the appropriate plan. Lighting fixtures for non-hazardous locations must conform to one of the following standards (46 CFR 111.75-20(a)):

- (1) UL 1598, including UL 1598A (Marine Supplement Certification)

Note: Nonemergency and decorative interior-lighting fixtures need to meet the applicable type-fixture standards in UL 1598 and part of UL 1598A “Type Fixture Standards” only, in accordance with 46 CFR 111.75-20(e). A light certified to UL 1598 with vibration clamps, secure mounting of glassware, and rigid support mounting meets this regulation.

- (2) IEC 60092-306

b. Each crew berth must have a fixed berth light that is not wired with a flexible cord (46 CFR 111.75-15(d)). This should be shown on the lighting layout plan.

### Lighting Design

- c. Lighting circuits in passageways, public spaces and berthing compartments accommodating 25 or more persons shall be divided into two circuits; one may be an emergency lighting circuit (46 CFR 111.75-15(a)).
- d. Lighting shall be arranged such that a fire in one main vertical zone does not interfere with the lighting in another fire zone (46 CFR 111.75-1(a)).
- e. Lighting for machinery spaces shall be powered via two or more feeders; one of the feeders shall be from the ship's service switchboards (46 CFR 111.75-1(b)).
- f. Lighting circuits for machinery spaces shall be arranged such that failure of a branch circuit does not leave an area without light (46 CFR 111.75-15(b)).
- g. Lighting fixtures may not serve as a connection box for other than the branch circuit supplying the fixture (46 CFR 111.75-20(c)).

### Lighting Ampacity and Overcurrent

- h. Lighting fixtures should be powered by a lighting branch circuit and protected by overcurrent protection not to exceed 20 amps except:
  - (1) 25-30 amp circuits for fixed, non-switched lighting fixtures for cargo holds or deck lighting with mogul type lamp holders.
  - (2) Other lamps requiring 300 watts of power (46 CFR 111.85-5(c)-(e)).
- i. Branch circuits of a lighting distribution panel shall not exceed 30 amps (46 CFR 111.75-5(a)).
- j. The connected load of a lighting branch circuit shall be less than 80% of the branch circuit overcurrent protection (46 CFR 111.75-5(b)).

### Navigation Lighting

- k. Regulations may require a navigation lighting plan to be submitted for review. Navigation lighting plans are distinguished between the lighting plan and the bridge visibility plan. Neither of these plans are reviewed by MSC and should be forwarded to the OCMI for local review.
- l. Navigation lights are required to meet UL 1104 certification as required by 46 CFR 111.75-17(d). Light certification documentation should be provided by the submitter in the bill of materials.
  - (1) Note: Underwriters Laboratory has stopped review and updating of the UL 1104 standard and subsequently, navigation lights are not being kept under UL listing like other equipment (I.E. UL 248 fuses). Certification to the UL 1104 standard is being provided by testing laboratories. An approved list of testing laboratories is maintained on the [CGMIX](#) website.

(2) Note: Light Emitting Diode Navigation Lights should be reviewed in accordance with MTN 01-18. This MTN is being utilized in the interim period while a more formalized navigation light standard is developed.

m. On vessels required to have a final emergency power source by 46 CFR 112.05-5(a) of this chapter, each navigation light panel must be supplied by a feeder from the emergency switchboard (see 112.43-13). The feeder must be protected by overcurrent devices rated or set at a value of at least twice that of the navigation light panel main fuses. (46 CFR 111.75-17(a))

n. Each self-propelled vessel must have a navigation light indicator panel in the navigating bridge to control side, mast and stern lights. The panel must visually and audibly signal the failure of each of these navigation lights. Each light source must be connected to a separate fused branch circuit. The panel must have a fused feeder disconnect switch, and the fuses must have at least twice the rating of the largest branch circuit fuse and must be greater than the maximum panel load. (46 CFR 111.75-17(b))

o. Each self-propelled vessel must have duplicate light sources for the side, masthead, and stern lights. (46 CFR 111.75-17(c)).

### Emergency Lighting

p. Lighting for survival and rescue craft launch stations shall be fed from an emergency power source. Adjacent launching stations shall be fed from separate branch circuits (46 CFR 111.75-16).

q. Emergency lighting circuits shall not have a switch except for the breaker at the distribution panel or as required for hazardous spaces (46 CFR 112.43-1).

r. Passenger and crew spaces shall be provided with adequate normal lighting and sufficient emergency lighting to provide for safe egress from each space and damage control (46 CFR 111.75-15(b)).

## **5. Disclaimer**

This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is not intended to nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other federal and state regulators, in applying statutory and regulatory requirements. You can use an alternative approach for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative, you may contact MSC, the unit responsible for implementing this guidance.