



AEROSPACE RECOMMENDED PRACTICE	ARP503™	REV. H
	Issued 1956-12 Revised 2025-08	
	Superseding ARP503G	
Emergency Evacuation Illumination		

RATIONALE

This document has been revised to provide updated references and clarifications to the definition of self-illuminated signs and their perception/visibility and ground contact areas. All other changes made to the document presented herein were editorial in nature.

1. SCOPE

This SAE Aerospace Recommended Practice (ARP) provides criteria for design and location of power supplies, controls, light fixtures, and associated equipment which are used to provide emergency illumination in transport aircraft, designed to comply with 14 CFR Part 25 (see Reference 1) for operation under 14 CFR Part 91 (see Reference 11) and 14 CFR Part 121 (see Reference 2), and also in compliance with FAA Advisory Circulars AC 25.812-1A (see Reference 3) and AC 25.812-2 (see Reference 10).

It is not the purpose of an ARP to specify design methods to be followed in the accomplishment of the stated objectives.

1.1 Introduction

The purpose of this ARP is to provide criteria that will lead to and support existing regulatory standards of illumination for emergency evacuation in passenger or cargo transport aircraft such that the emergency illumination will facilitate egress under emergency conditions.

Consideration is given to existing requirements of the FAA and to the recommendations of aircraft operators and those involved in the manufacture or use of the emergency lighting system. Occupant safety is the primary objective, with appropriate provisions for crew system control taken into consideration. The criteria established herein are intended to produce an emergency lighting system that will comply with the Federal and International Regulations for Commercial Transport Airplanes. However, these recommendations are but one means of meeting the objective. Alternate practices may provide equivalent or superior results, although all of the recommendations within this document should still be considered when using an alternate means of compliance.

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2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

1. Title 14 Code of Federal Regulations Part 25, Airworthiness Standards: Transport Category Airplanes, Amendments 25-1 through 25-140. Emergency Lighting § 25.811 and § 25.812, last revision 25-88 and 25-128, respectively.
2. Title 14 Code of Federal Regulations Part 121, Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft, Amendments 121-1 through 121-363.
3. FAA Advisory Circular AC 25.812-1A, Floor Proximity Emergency Escape Path Marking 5-22-1989.
4. DOT/FAA/CT-82/55, Examination of Aircraft Interior Emergency Lighting in a Postcrash Fire Environment; James Demaree, June 1982.
5. FAA/AM-80-13, Readability of Self-Illuminated Signs Obscured by Black Fuel-Fire Smoke; P.G. Rassmussen et al., July 1980.
6. Allard's Law and Smoke-Filled Cabins, A Preliminary Report, presented at the meeting of Subcommittee A-20C, of the SAE Aircraft Lighting Committee A-20, Orlando, Florida, May 16, 1977; Ted projector.
7. FAA-AM-81-7, Emergency Cabin Lighting Installation: An Analysis of Ceiling vs. Lower-Mounted Lighting during Evacuation Trials; P.G. Rassmussen et al., February 1981.
8. ARP577, Emergency, Instruction, and Information Placards - Internal and External.
9. FAA Advisory Circular AC 25-17A, Transport Cabin Interiors Crashworthiness Handbook 05-24-2016.
10. FAA Advisory Circular AC 25.812-2, Floor Proximity Emergency Escape Path Marking Systems Incorporating Photoluminescent Elements 7-24-97.
11. Title 14 Code of Federal Regulations Part 91, General Operating and Flight Rules.
12. European Aviation Safety Agency Certification Specifications and Acceptable Means of Compliance for Large Aeroplanes (CS-25) at Amendment 27, November 24, 2021, CS 25.811 and CS 25.812. Emergency Lighting CS 25.812(b)(1)(i) and associated AMC 25.812(b)(1).
13. Reserved.
14. Title 14 Code of Federal Regulations Part 25, Airworthiness Standards: Transport Category Airplanes, General and Dynamic Evaluation of Seat Restraint Systems and Occupant Protection § 25.561 and § 25.562, respectively.
15. International Organization for Standardization (ISO) 3864-3, Graphical symbols - Safety colours and safety signs - Part 3: Design principles for graphical symbols for use in safety signs, June 15th, 2012.
16. International Organization for Standardization (ISO) 7010, Graphical symbols - Safety colours and safety signs - Registered safety signs, June 1st, 2011.
17. RTCA DO-160 Revision G., Environmental Conditions and Test Procedures for Airborne Electronics/Electrical Equipment and Instruments.

18. Title 14 Code of Federal Regulations Part 25, Airworthiness Standards: Transport Category Airplanes, Retention of items of mass in passenger and crew compartments and galleys § 25.789.
19. DOT/FAA/AM-14/3: Identification and Comprehension of Symbolic Exit Signs for Small Transport-Category Airplane 02-2014.
20. Title 14 Code of Federal Regulations Part 25, Airworthiness Standards: Transport Category Airplanes, Emergency exit arrangement § 25.809.

2.2 Definitions

Emergency illumination is the lighting provided when normal illumination is unavailable in the event there is a survivable emergency. It provides the way guidance needed to egress the airplane. Emergency illumination shall be sufficient to permit passengers and crew when leaving seats to proceed to and locate emergency exits then operate and use those exits. The emergency illumination also needs to provide sufficient illumination to allow the use of life jackets, special survival equipment, egress via escape slides, life rafts, and slide rafts.

This document presents minimum criteria for the design and installation of emergency lighting in commercial aircraft. The use of “shall” in this specification expresses provisions that are binding. Non-mandatory provisions use the term “should.”

There are numerous references to FAA 14 CFR Part 25 and EASA CS-25 regulations by way of guidance and ease of information access. The author recommends that the reader should obtain the latest copy of the regulations referenced to ensure that they are working with the latest revision of the text.

3. DETAILED RECOMMENDATIONS

3.1 General Provisions

3.1.1 System Description

An emergency lighting system(s), independent of the main lighting system, shall be provided for (1) interior emergency lighting which includes illumination of the cabin, exit areas, floors of the passageways leading to each passenger emergency exit; (2) exit locating and marking signs; (3) exterior emergency lighting; (4) floor proximity escape path lighting/markings; and (5) lighting to accommodate emergency egress of flight deck occupants.

3.1.2 Dark Adaptation/Glare

Emergency illumination should be designed to minimize glare and not reduce dark adaptation in such a way as to compromise the ability to escape while still providing an acceptable means of evacuation.

3.1.3 Obstruction of Light

Emergency light fixtures should be in locations that assure that devices such as open life raft compartment doors or emergency equipment doors do not obstruct the illumination of emergency equipment and escape routes.

3.1.4 Crash Protection

The emergency illumination system should be designed as specified in 3.1.10 and located in a manner that will minimize damage and prevent loss of any portion of the emergency illumination as a result of a survivable emergency landing on land or water.

3.1.5 Fuselage Transverse Vertical Separation

A single vertical transverse separation of the fuselage shall not render inoperative more than 25% of the required electrically powered emergency lights in addition to those directly damaged by the break (refer to 14 CFR/CS 25.812[l][1]). At least one required exterior emergency light on each side of the airplane shall be operative exclusive of those that are directly damaged by the separation (refer to 14 CFR/CS 25.812[l][3]). At each useable exit, each exit marking sign shall remain operative exclusive of those that are directly damaged by the separation (refer to 14 CFR/CS 25.812[l][2]). For transport aircraft with multiple decks, each deck should be considered separately when addressing the 14 CFR/CS 25.812(l) requirements.

3.1.6 Operating Duration

Both interior and exterior electrically powered emergency illumination shall be maintained at or above minimum levels for no less than 10 minutes at critical ambient conditions after an emergency landing on land or water.

Operational environmental limits shall be determined for each application as per RTCA DO-160 (see Reference 17) and the limits shall be utilized for testing to satisfy this recommendation. If battery packs are used, key conditions to be considered are: cold soak at lowest ambient temperature anticipated, cabin heating for an appropriate period, passenger loading, taxi, and emergency evacuation. If battery packs are used and installed outside the heated and/or pressurized compartment, the cabin heating period may not be appropriate; the landing phase after a long cruise may be more critical. Refer to AC 25.812-1A (see Reference 3) for additional guidance on recommended warm and cold soak operational requirements.

3.1.7 Control and Indication

The emergency lighting system shall provide means for manual operation of the lights from the flight crew station and from a location in the passenger compartment that is within reach of at least one flight attendant seated in an assigned seat. When the system is ARMED, the emergency lighting system design should activate the system automatically when normal aircraft power is lost.

3.1.7.1 The flight deck control device shall have OFF, ARMED, and ON positions and have means to safeguard against inadvertent operation of the control device from the ARMED and from the ON positions. When either the flight deck control or the control at the cabin attendant's seat is ON, the lights shall remain illuminated upon interruption of the airplane's normal electrical power source, except as noted in 3.1.5. In addition, when the flight deck control is in the ARMED position, the lights shall become illuminated upon interruption of the airplane's normal electrical power sources and shall remain illuminated, except as noted in 3.1.5. Operation of the emergency lighting system shall not be dependent upon normal aircraft power. The cabin control device shall have a means to safeguard against inadvertent operation and be capable of turning ON the emergency light system, even with the flight deck control device is in the OFF or ARMED position.

3.1.7.2 There shall be a flight crew warning light or display warning that indicates when normal aircraft power is on in the airplane and the emergency lighting system is not ARMED.

3.1.7.3 Lighting shall be provided to aid the pilot using the emergency escape equipment and routes in dark and night ambient conditions. This includes illumination for the escape path, flight deck exits, door handle areas, and any necessary equipment.

3.1.8 Other Use of Emergency Lighting System Components

Illuminated signs and other portions of the emergency lighting system may be used under normal conditions, provided that depletion of the emergency illumination power supply does not impinge on the requirement defined in 3.1.6 to provide 10 minutes of emergency illumination.