



ICAO

International Civil Aviation Organization

The Seventh Meeting of the Asia/Pacific Aerodrome Design and Operations Task Force (AP-ADO/TF/7)

(Bangkok, Thailand, 17 to 20 February 2026)

Agenda Item 4: Planning, Design, Construction and Operation of Aerodromes

ESTABLISHING THE SERVICEABILITY LEVELS FOR THE SEQUENCE FLASHLIGHT/ SYSTEM

(Presented by INDIA)

SUMMARY

This paper presents aeronautical ground lighting system compliance is determined by the serviceability levels as defined in Chapter 10 of Annex 14, Volume 1 in different categories of the operation. Sequence Flashlights (SFL) are recommended to be provided in the barrette centre line approach lighting system, for providing centre line guidance in lower visibilities and considering the nature of meteorological conditions. Aerodrome Design Manual (Doc 9157), Part 4, has provided the guidance material for measurement of light intensities of the flashing lights, while the serviceability requirements for the same is not defined.

The paper presents the need to establish the serviceability levels for the SFL system and recommended serviceability levels based on regulations followed by other State regulations. Also, opinions are sought from the industry experts for including the same in the relevant documents.

1. INTRODUCTION

1.1 Aeronautical Ground Lighting (AGL) system consists of several lighting systems which include approach, threshold, runway edge, runway centre line lighting, runway end lighting, etc. The serviceability levels of these lighting systems vary based on the category of operations. For example, the serviceability levels of the Category I lighting systems would in general be 85% (10.5.10 Annex 14, Volume I) and for the CAT II/III lighting system would be 95% (10.5.7 Annex 14, Volume I). While, for better understanding the serviceability levels have been given in the table below based on the requirements from Chapter 10, Annex 14, Volume I.

AGL system	CAT I	CAT II/III
Approach lighting	85%	95% within 450 m
Runway threshold lights	85%	95%
Runway edge lights	85%	95%
Runway end lights	85%	75%
Runway centre line lights	NA	95%
Touchdown zone lights	NA	90%

1.2 Additionally, for certain lighting systems, unserviceable light shall not be permitted adjacent to another unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted. Even at the fixture failure level, such as reduction of the intensity level to less than 50% is unserviceable.

2. DISCUSSION

2.1 As per the Annex 14, Volume I, 5.3.4.17 and 5.3.4.34, sequence flashing lights shall be supplemented for the entire stretch for the Category I operations and from the 300 m section till the end of approach lighting system for the Category II/III operations based on the characteristics of the system and nature of meteorological conditions.

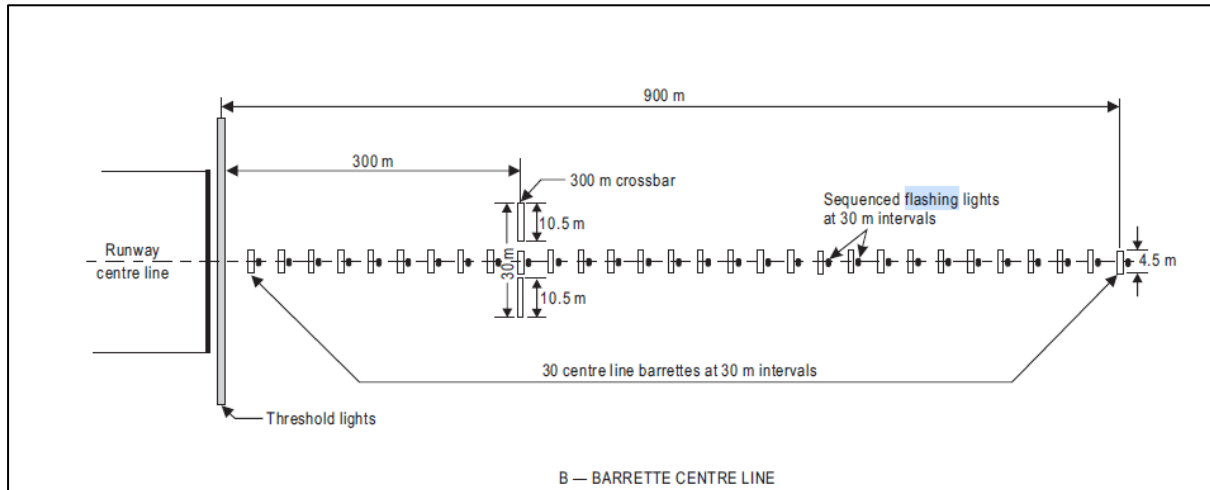


Fig 1. Typical Category I approach lighting system supplemented with SFL system

2.2 In general, for full length approach lighting system, the number of flashing lights for the precision approach CAT I is 30 and for the CAT II/III is 21.

2.3 There is ambiguity in declaring the serviceability levels for these lights as specific serviceability levels are not defined. For example, if one of the lights doesn't function or doesn't flash as per the frequency, whether the system is functionally fit for the operations or not is the question.

2.4 The guidance below from CASA, Part 139 (Aerodromes) Manual of Standards 2019, Chapter 9 — Visual aids provided by aerodrome lighting:

(4) *A flashing light is deemed to be on outage if:*

- (a) *the light ceases to flash; or*
- (b) *the frequency or duration of flash is outside the specified range by a ratio equal to or greater than 2:1; or*
- (c) *within a 10 minute period — more than 20% of flashes fail to occur.*

2.5 While, the above clause refers to the serviceability levels for the flashing light, for the entire system clear guidance of the serviceability levels are not defined. For example, how many unserviceable flashing lights can be accepted to ensure the basic pattern of the lighting system is not disturbed, which could impact the pilot's visual field.

2.6 For determining an unserviceable flashing light, the above conditions may be incorporated.

2.7 While, for the entire flashing lighting system, the serviceability standards need to be incorporated. Considering the existing serviceability levels for the flashing light, the same logic as defined as "c) within a 10 minute period — more than 20% of flashes fail to occur", extending the same to the CAT I and CAT II/III lighting system, 80% should be the serviceability criteria for the same.

2.8 The proposal is to incorporate the below clauses to Annex 14, Volume 1:

10.5.13 The system of preventive maintenance employed for a sequence flashing lighting system if installed for the precision approach runway Category I, II or III shall have as its objective that, during the use of the sequence flashing lighting system at least 80% of the lights function as intended.

10.5.14 A flashing light is deemed to be on outage if:

(a) the light ceases to flash; or

(b) the frequency or duration of flash is outside the specified range by a ratio equal to or greater than 2:1; or

(c) within a 10 minute period — more than 20% of flashes fail to occur.

~~10.5.13~~ **10.5.15 Recommendation.**— *During low visibility procedures the appropriate authority should restrict construction or maintenance activities in the proximity of aerodrome electrical systems.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.
