

**SUBJECT** : **Position lighting system with protective tape in the lens – minimum intensities**

**REQUIREMENTS incl. Amdt.** : **CS 25.1389(b)(1)(2), 25.1391, 25.1393 at Amdt. 26**

**ASSOCIATED IM/MoC<sup>1</sup>** : Yes  / No

**ADVISORY MATERIAL** : **N/A**

#### INTRODUCTORY NOTE:

The following Equivalent Safety Finding (ESF) has been classified as important and as such shall be subject to public consultation in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) which states:

*"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."*

#### IDENTIFICATION OF ISSUE:

EASA received an application for Major Change to TC related to the *"Application of Polyurethane Tape on Winglet Position/Anticollision Lights Lens"* for a large aeroplane. The results obtained from the analysis performed show that the installation does not meet the minimum intensity requested by the certification specification. Therefore, the applicant requested an equivalent level of safety finding for CS 25.1389(b)(1)(2), 25.1391 and 25.1393.

CS 25.1389(b)(1) and 25.1389(b)(2) specify that the intensities of each position light in the horizontal and vertical planes must meet CS 25.1391 and 25.1393, respectively, to allow detection of the aeroplane at a safe distance and to allow an observing aeroplane to detect the relative orientation of the observed aeroplane.

The applicants aeroplane position light system consists of red and green lights mounted on the left and right wing tips, respectively, and aft-facing white lights mounted on each winglet trailing edge. Each position light assembly has two high output halogen lamps. The normal operating mode for dispatch is a single lamp operating in each light. A standby mode happens when one of the normal operating mode lamps fails, in this case, all remaining normal operating mode lamps are de-energized and the second lamp in each light is energized. An abnormal mode may occur if a lamp fails in one of the lights while the system is already in the standby mode; in this case, all remaining functional lamps are energized. In this abnormal mode some lights may have two lamps operating, while other lights will have only one lamp operating.

<sup>1</sup> In case of SC, the associated Interpretative Material and/or Means of Compliance may be published for awareness only and they are not subject to public consultation.

The applicant has informed EASA that some points do not meet the minimum intensity requested by the certification specification, as follows:

*“...depending on the operating mode, the red and green lights could not meet the minimum intensity requirements at the extreme dihedral angles of 105 to 110 degrees, and in the area of 5 to 10 degrees up azimuth. The intensities at all other angles are well above the requirements.”*

Considering all the above, the following Equivalent Safety Finding is proposed:

**Equivalent Safety Finding to CS 25.1389(b)(1)(2), 25.1391 and 25.1393 at Amdt. 26**

**Position lighting system with protective tape in the lens – minimum intensities**

1. Applicability

This ESF may be applied to large aeroplanes featuring a position lighting system with protective tape in the lens.

1.1 Affected CS

CS 25.1389(b)(1) in combination with 25.1391 and CS 25.1389(b)(2) in combination with 25.1393, all at Amendment 26.

2. Equivalent Safety Finding

In lieu of direct compliance with CS 25.1389(b)(1) in combination with 25.1391 and CS 25.1389(b)(2) in combination with 25.1393, and provided that the below compensating factors are complied with, the following may be accepted by EASA:

- Depending on the operating mode, the red and green lights of the position lighting system may be below the minimum intensity requirements at the extreme dihedral angles of 105 to 110 degrees, and in the area of 0 to 15 degrees up azimuth (see figure 1 in Appendix A).
- Only in the standby operating mode, the red light of the position lighting system may be below the minimum intensity requirements at the extreme dihedral angles of 15 to 20 degrees, and in the area of 0 to 5 degrees up azimuth (see figure 2 in Appendix A).

3. Compensating Factors

- a) The intensities at all other angles are well above the requirements.
- b) The shortcoming in the required intensity is less than one percent of the required area. It is compensated by the overall intensity provided over the rest of the coverage area. Moving up and down from the critical vertical angle at the same dihedral angle, the supplied light intensity is multiple times the minimum of the value required by the corresponding CS.
- c) The shortcoming is limited to extreme dihedral angles, a very unlikely approach angle for a collision or it only occurs in a temporary failure scenario. Even if such an overtaking scenario did occur, the overtaking airplane will rapidly advance through the lower intensity area and into higher intensities further forward. The total angular range for which the minimum intensity requirements are not met is so narrow that it would be impossible for an overtaking aircraft to remain in that slot long enough that any issue of position light intensity would have an impact on the overtaking flight crew's ability to visually detect/identify the travelling direction and avoid the leading airplane.

**Appendix A**

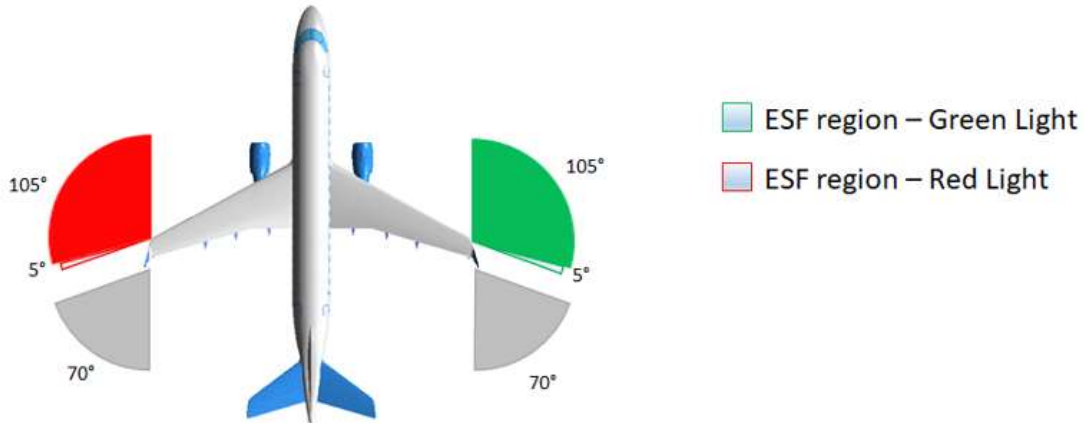


Figure 1: Position lighting system intensity coverage in normal operation

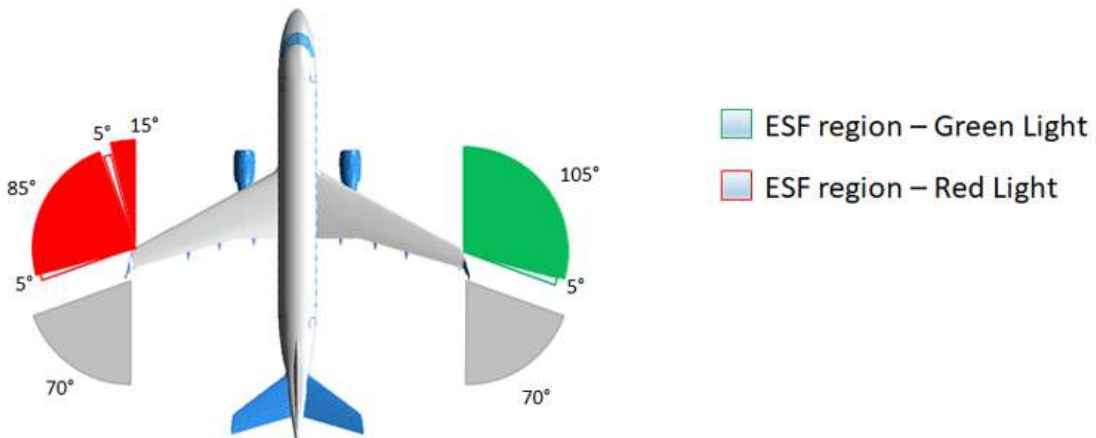


Figure 2: Position lighting system intensity coverage in stand by operation mode