### Direction générale de **l'Aviation** civile

Service technique de l'Aviation civile

Avril 2020

# Operating conditions of an ADB SAFEGATE Led PAPI

Technical information note



Ministère de la Transition Écologique et Solidaire

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Service technique de l'Aviation civile Département Sûreté, Équipements/Sub EBA



## Introduction

The ADB SAFEGATE visual approach slope indicator (PAPI) type LPLI (or L-880(L) / L-881(L)) is equipped with a heated front glass (preheating function) designed to avoid dew and frost that could alter the light signal.

The emission of the light sources is not possible before a three minutes preheating period.

Each time the constant current regulator is switched on (even after a power supply loss), the warm-up function is automatically activated making the PAPI unavailable during three minutes. The de-icing function can be deactivated, but in this case, the front glass will no longer be protected against dew or frost and the light signal may be altered.

## **Regulatory reminders**

### CS ADR-DSN.S.880 Electrical power supply systems

(a) For a precision approach runway, a secondary power supply capable of meeting the requirements of Table S-1 for the appropriate category of precision approach runway should be provided. Electric power supply connections to those facilities for which secondary power is required should be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.

(b) For a runway meant for take-off in runway visual range conditions less than a value of 800 m, a secondary power supply capable of meeting the relevant requirements of Table S-1 should be provided.

(c) At an aerodrome where the primary runway is a non-precision approach runway, a secondary power supply capable of meeting the requirements of Table S-1 should be provided except that a secondary power supply for visual aids need not be provided for more than one non-precision approach runway.

(d) The following aerodrome .../...

Runway	Lighting aids requiring power	Maximum switch-over time
Non-instrument	Visual approach slope indicators <sup>a</sup> Runway edge <sup>b</sup> Runway threshold <sup>b</sup> Runway end <sup>b</sup> Obstacle <sup>a</sup>	See CS ADR-DSN.S.875(d) and CS ADR-DSN.S.880(d)
Non-precision approach	Approach lighting system <i>Visual approach slope indicators</i> <sup><i>a, d</i></sup> Runway edge <sup><i>d</i></sup> Runway threshold <sup><i>d</i></sup> Runway end <sup><i>d</i></sup> Obstacle <sup><i>a</i></sup>	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach Category I	Approach lighting system Runway edge <sup>d</sup> <i>Visual approach slope indicators</i> <sup><i>a</i>, <i>d</i></sup> Runway threshold <sup><i>d</i></sup> Runway end Essential taxiway <sup><i>a</i></sup> Obstacle <sup><i>a</i></sup>	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach Category II/III	Inner 300 m of the approach lighting system Other parts of the approach lighting system Obstacle <sup><i>a</i></sup> Runway edge Runway threshold Runway end Runway centre line Runway touchdown zone Runway guard lights All stop bars Essential taxiway	1 second 15 seconds 15 seconds 15 seconds 1 second 1 second 1 second 1 second 15 seconds 1 second 15 seconds 1 second
Runway meant for take-off in runway visual range conditions less than a value of 800 m	Runway edge Runway end Runway centre line All stop bars Essential taxiway <sup>a</sup> Obstacle <sup>a</sup>	15 seconds <sup>c</sup> 1 second 1 second 1 second 15 seconds 15 seconds

a. Supplied with secondary power when their operation is essential to the safety of flight operation.

b. The use of emergency lighting should be in accordance with any procedures established.

c. One second where no runway centre line lights are provided.

d. One second where approaches are over hazardous or precipitous terrain.

Table S-1. Secondary power supply requirements (see CS ADR-DSN.S.875(d))

## Conditions for approval and aerodrome operating procedures (CHEA)

#### **I.3 POWER SUPPLY**

(See "Switching delay" in the chapter "Transitional provisions").

The aerodrome has an adequate main power supply to ensure the safe operation of air navigation facilities.

An emergency power supply is required to compensate for the loss of normal power supply or a voltage or frequency disturbance exceeding the specified thresholds.

Normal power supply is provided by one or more lines of the public grid, by a stand-alone generating plant, or a combination of both.

Emergency power supply is provided by :

- generators, or
- accumulator batteries which are themselves backed up in the case of installations requiring imperative continuity of power supply, or
- an additional line from the public network which independence of the normal power supply is guaranteed by the supplier(s), or
- combination of the three different types of emergency power listed above.

The list of installations requiring emergency power is shown in Table 1.2.

The power supply system for visual and radio navigation aids at aerodromes is designed and constructed in such a way that, in the event of equipment failure, inadequate or misleading visual and non-visual indications are not given to pilots.

The maximum switching time required shall be 15 s or 1 s depending on the runway operating conditions specified in the chapters of this Annex and without prejudice to the application of the specifications for emergency power supply to radio navigation aids and ground components of telecommunications installations in accordance with Chapter 2 of ICAO Annex 10, Volume I.

The electrical power supply system for lighting shall be capable of meeting the switching delay provisions (of a light) as defined in the chapter 'DEFINITIONS-ABREVIATIONS'.

#### Table 1.2 Air navigation installations for which a secondary power supply is required.

1. Equipment requiring a maximum switch-over time of 15 sec.

<u>Lights</u> - approach lighting systems (except the last 420 meters for category II/III) - <i>PAPI</i> - taxiway (except rapid exit taxiway) - signs - visual aids for denoting obstacles
<u>Meteorological equipment</u> - chains of equipment, data processing, recording and broadcasting of weather information - visibilimeters : transmissometer, forward-scatter meter - luminance meters - cloud rangefinders

In the case of aerodromes equipped with a radio remote control for the implementation of lighting, the specifications for this type of equipment shall be laid down by order of the Minister responsible for civil aviation.

## **Operating conditions**

### Airports subject to EASA regulations

Where the installation and use of a PAPI is essential for flight safety, the maximum switching time shall not exceed 15 seconds and when flights are conducted over dangerous or steep terrain the maximum switching time shall not exceed 1 second.

To comply with CS ADR-DSN.S.880, the power supply to the PAPI regulator must be of the uninterruptible type in order to guarantee continuity of power supply to the PAPI LPLI in the event of transfer from the main power supply to the auxiliary power supply, and vice versa. It should be noted that the preheating function must be activated in order to prevent the formation of condensation and ice which could alter the light signal. For the majority of aerodromes, powering the PAPI from an uninterruptible power supply (UPS) is often the solution to achieve compliance.

When the uninterruptible power supply is unavailable and no longer ensures regulatory compliance, the existing operating limitations in the event of PAPI unavailability should apply.

### Airports subject to CHEA regulations

Where the installation and use of a PAPI is essential for flight safety, the maximum switching time shall not exceed 15 seconds.

To comply with Table 1.2 of Chapter I.3 Power supply, the power supply to the PAPI regulator must be of the uninterruptible type in order to guarantee continuity of power supply to the PAPI LPLI in the event of transfer from the main power supply to the auxiliary power supply, and vice versa. It should be noted that the preheating function must be activated in order to prevent the formation of condensation and ice which could alter the light signal. For the majority of aerodromes, powering the PAPI from an uninterruptible power supply (UPS) is often the solution to achieve compliance.

## **Publication**

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