



SIERRA LEONE CIVIL AVIATION AUTHORITY

ADVISORY CIRCULAR

SLCAA-AC-AGA022-Rev. 00

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Calculation of Declared Distances

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1 GENERAL

The Sierra Leone Civil Aviation Authority's Advisory Circulars contains information about standards, practices and procedures that the Authority has found to be an Acceptable Means of Compliance (AMC) with the associated Regulations.

An AMC is not intended to be the only means of compliance with a Regulation, and consideration will be given to other methods of compliance that may be presented to the Authority

Information considered directive in nature is described in this AC in terms such as "shall" and "must", indicating the actions are mandatory. Guidance information is described in terms such as "should" and "may" indicating the actions are desirable or permissive, but not mandatory

1.1 Purpose

This Advisory Circular provides methods, acceptable to the Authority, for showing compliance with the calculation of declared distances requirements of SLCAR's Part 14A as well as explanatory and interpretative material to assist in showing compliance. The calculation of declared distances is essential, to allow pilots to determine aircraft loading and performance requirements.

1.2 Description of Changes

This is the first AC to be issued on this subject.

1.3 References

- (a) The SLCAR's Part 14A

1.4 Definitions

- (a) **TORA** (Take-off Run Available) - The length of runway declared available and suitable for the ground run of an airplane taking off.
- (b) **TODA** (Take-off Distance Available) - The length of the take-off run available plus the length of the clearway, if provided.
- (c) **ASDA** (Accelerate-Stop Distance Available) - The length of the take-off run available plus the length of the stopway, if provided.
- (d) **LDA** (Landing Distance Available) - The length of runway which is declared available and suitable for the ground run of an airplane landing.
- (e) **Clearway** (CWY) - A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height

- (f) **Stopway (SWY)** - A defined rectangular area on the ground at the end of take-off run available (TORA) prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take off.

2 DECLARED DISTANCES - REQUIREMENTS

2.1 Introduction

This AC provides guidance to aerodrome operators on the calculation of runway declared distances. The SLCAR Part 14A requires Aerodrome Operators of a certified aerodrome to calculate and promulgate (to the nearest metre) the following declared distances for each aerodrome operational runway intended for use by international commercial air transport in both the Aerodrome Manual and the Aeronautical Information Publication (AIP).

Declared distances shall be measured for each runway direction. The distances are measured along the centre line of the runway and of any associated stopway and clearway.

3 CALCULATING DECLARED DISTANCES

- (a) The declared distances to be calculated for each runway direction comprise: the take-off run available (TORA), take-off distance available (TODA), accelerate-stop distance available (ASDA) and landing distance available (LDA).
- (b) Where a runway is not provided with a stopway (SWY) or clearway (CWY) and the threshold is located at the extremity of the runway, the four declared distances shown above shall normally be equal to the length of the runway, as shown in A of Figure 1.
- (c) Where a runway is provided with a clearway (CWY), then the TODA will include the length of clearway, as shown in B of Figure 1.
- (d) Where a runway is provided with a stopway (SWY) then the ASDA will include the length of stopway, as shown in C of Figure 1.
- (e) Where a runway has a displaced threshold, then the LDA will be reduced by the distance the threshold is displaced, as shown in D of Figure 1, a displaced threshold affects only the LDA for approaches made to that threshold; all declared distances for operations in the reciprocal direction are unaffected.
- (f) B through D of Figure 1 illustrates a runway provided with a clearway or a stopway or having a displaced threshold. Where more than one of these features exist, then more than one of the declared distances will be modified but the modification will follow the same principle illustrated. An example showing a situation where all these features exist is shown in E of Figure 1.
- (g) A suggested format for providing information on declared distances is given in F of Figure 1 if a runway direction cannot be used for take-off or landing, or both, because it is operationally forbidden, then this shall be declared and the words “not usable” or the abbreviation “NU” entered.

- (h) Where the provision of a RESA (runway end safety area) would be particularly prohibitive to implement, consideration shall be given to reduce the declared distances of the runway for the provision of a RESA and/or the installation of an arresting system.

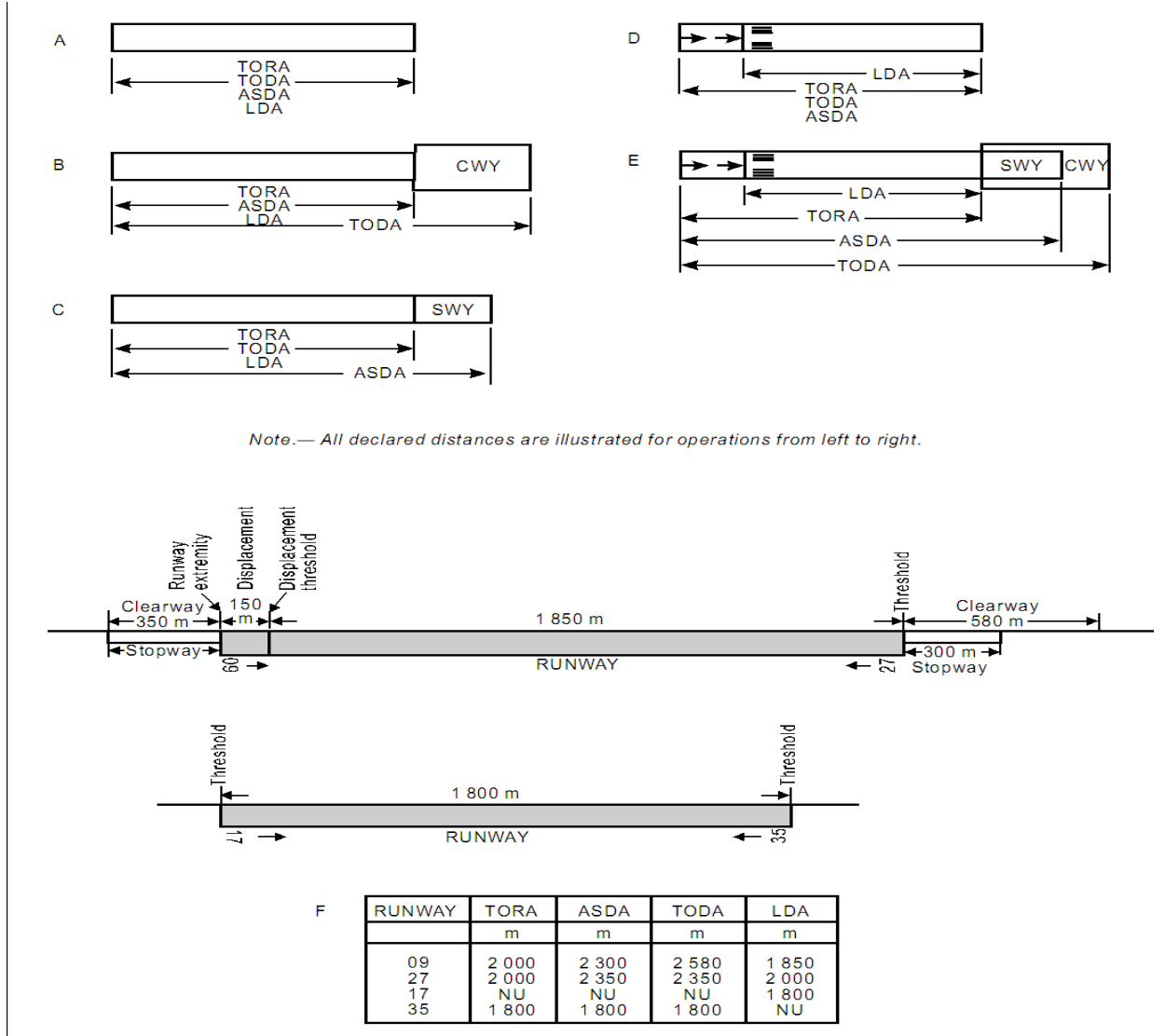


Figure 1 – Illustration of Declared Distances

4 DISPLACED THRESHOLD

The threshold is the start of that part of a runway that is declared as available for landing. When the individual requirements for strip width and length, and runway end safety area are met, the threshold will normally be located at the start of the runway. However, it may be necessary to account for any of those physical characteristics or an obstacle that cannot be removed and extends above the approach surface by displacement of the threshold from the runway end. The amount by which the threshold is displaced will vary with the individual circumstances of each situation, regards being given to; The nature and type of traffic. Whether the runway is an instrument runway or a visual runway, and if it is an instrument runway whether it is a precision approach runway or non-precision approach runway.

- (a) The position of any obstacle that either affects the RESA or infringes the approach surface, in relation to the threshold and extended centreline of the runway.
- (b) The amount by which the obstacle penetrates the approach surface and its significance in the calculation of the obstacle clearance height.
- (c) The angle of the glide path or nominal glide path for an instrument approach procedure and the calculated obstacle clearance height.
- (d) The limited visibility and cloud base conditions under which the runway will be used.

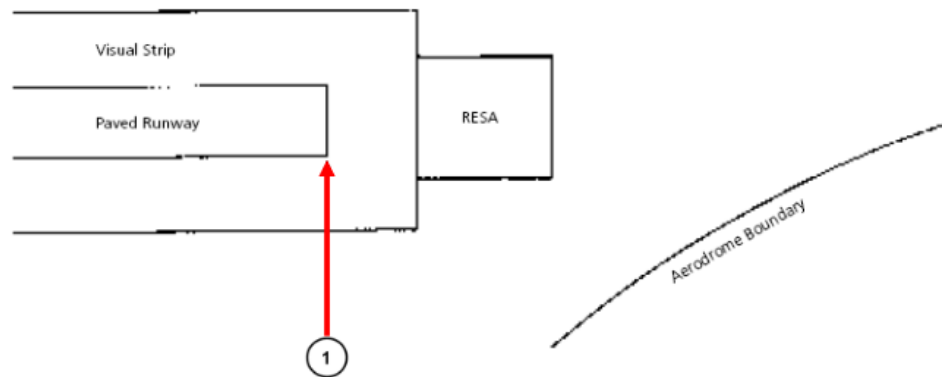


Figure 2

Note - (illustrated above in Figure 2) would be the end of TORA and ASDA (no stopway), and the end of LDA for a visual runway. It would be the start of TORA, ASDA and TODA in the reciprocal direction, and also LDA unless the threshold was displaced because of obstacles in the approach area.

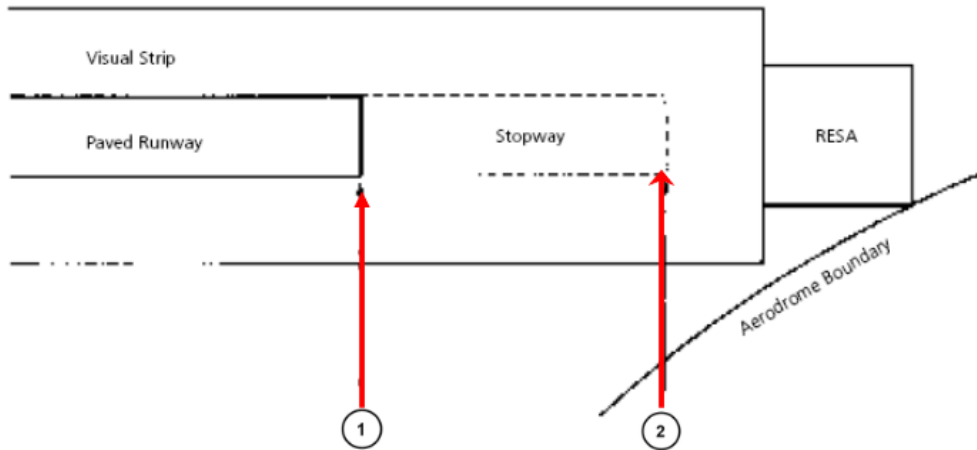


Figure 3

Here the runway depicted in Figure 3 has been supplemented by the provision of a stopway.

Note 1 - illustrated above, Figure 3 would be the end of TORA and LDA for a visual runway. It would be the start of TORA, ASDA and TODA in the reciprocal direction, and also the start of LDA unless the threshold was displaced because of obstacles in the approach area.

Note 2 - (illustrated above in Figure 3) would be the end of ASDA, limited by the RESA short of the aerodrome boundary not by the strip width

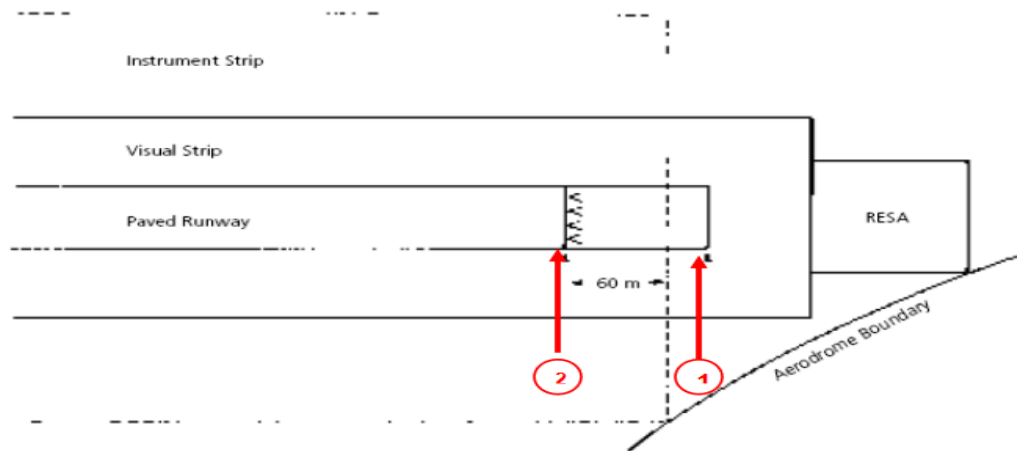


Figure 4

The runway of Figures 3 and 4 have been extended by paving the declared stopway of Figure 4 to full runway strength.

Note 1 - (illustrated above) would be the end of TORA and LDA for a visual runway. It would be the start of TORA, ASDA and TODA in the reciprocal direction, also LDA unless the threshold was displaced because of obstacles in the approach area.

Note 2 - (illustrated above) would be the end of LDA for an instrument runway, the provision of the required instrument strip becoming the limiting factor, and the start of LDA in the reciprocal direction, subject to the availability of an acceptable obstacle free approach surface.

4.1 Information to be reported to Aeronautical Information Services

The declared distances shall be calculated and reported by the aerodrome operator to Aeronautical Information Services (AIS). Such information shall subsequently be made available to pilots via Aeronautical Publications.