



International Civil Aviation Organization

**The Twenty-Second Meeting of the APANPIRG ATM/AIS/SAR Sub-Group
(ATM/AIS/SAR/SG/22)**

Bangkok, Thailand, 25 – 29 June 2012

**Agenda Item 5: Provision of ATM/AIS/SAR in the Asia/Pacific Region, including associated
CNS matters**

**CONSIDERATION OF OBSTRUCTIONS BEYOND ILS CRITICAL AND
SENSITIVE AREAS**

(Presented by India)

SUMMARY

This paper presents study on the critical and sensitive area of ILS which is maintained in accordance with the guidance provided in Annex 10, Vol 1. In India, the obstructions beyond the critical and sensitive area are being controlled as per the coverage required in course and clearance area. But it has been experienced that certain structures, despite being below the coverage volume, are affecting the performance of ILS and there is need to redefine the guidelines and control the obstructions in the area of influence.

This paper relates to –

Strategic Objectives:

A: *Safety – Enhance global civil aviation safety*

Global Plan Initiatives:

GPI-21 Navigation systems

1. INTRODUCTION

1.1 The critical and sensitive area of ILS is maintained in accordance to the guidance provided in Annex 10, Vol 1 to ensure adequate protection to the ILS. The ILS critical area is an area of defined dimensions about the localizer and glide path antennas where vehicles, including aircraft, are excluded during all ILS operations. The critical area is protected because the presence of vehicles and/or aircraft inside its boundaries will cause unacceptable disturbance to the ILS signal-in-space; while the ILS sensitive area is an area extending beyond the critical area where the parking and/or movement of vehicles, including aircraft, is controlled to prevent the possibility of unacceptable interference to the ILS signal during ILS operations. The sensitive area is protected against interference caused by large moving objects outside the critical area but still normally within /outside airfield boundary.

2. DISCUSSION

2.1 In India, in case of Localiser beyond the critical area the structures are restricted as - within ± 10 degrees azimuth in front of antenna, an object should not subtend an angle of elevation more than 0.75 degrees at the centre of antenna array. and beyond ± 10 degrees to ± 35 degrees azimuth in front of antenna an object should not sustain an angle of elevation more than 1.1 degree. This is based on the coverage requirement specified in annex 10. vol 1. as reproduced below

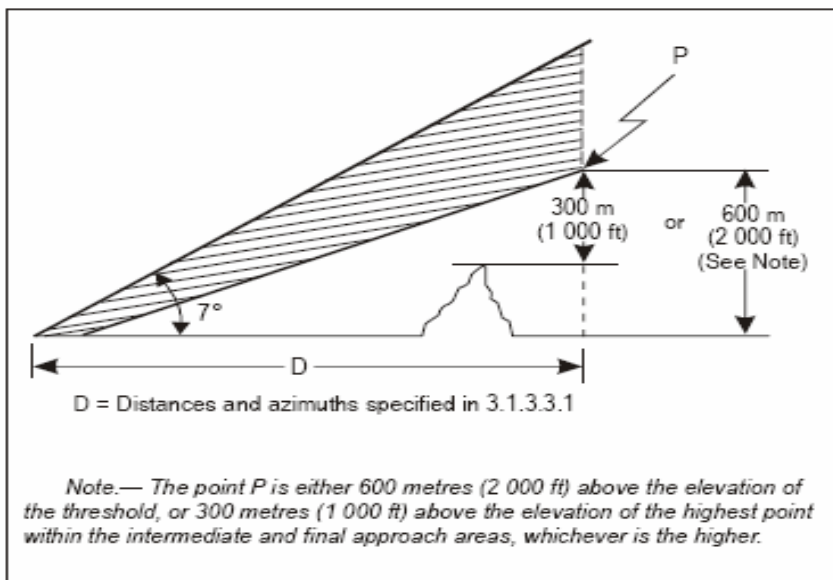


Figure 1: Localizer coverage requirements

2.2 Similarly, in case of glide path the obstructions beyond critical area and within ± 8 degrees azimuth in front of the glide path antenna, a building/structure should not subtend an angle of elevation more than 1.1 degree at antenna base. This is based on the coverage requirement of Glide path in Annex 10 vol I. given as below:

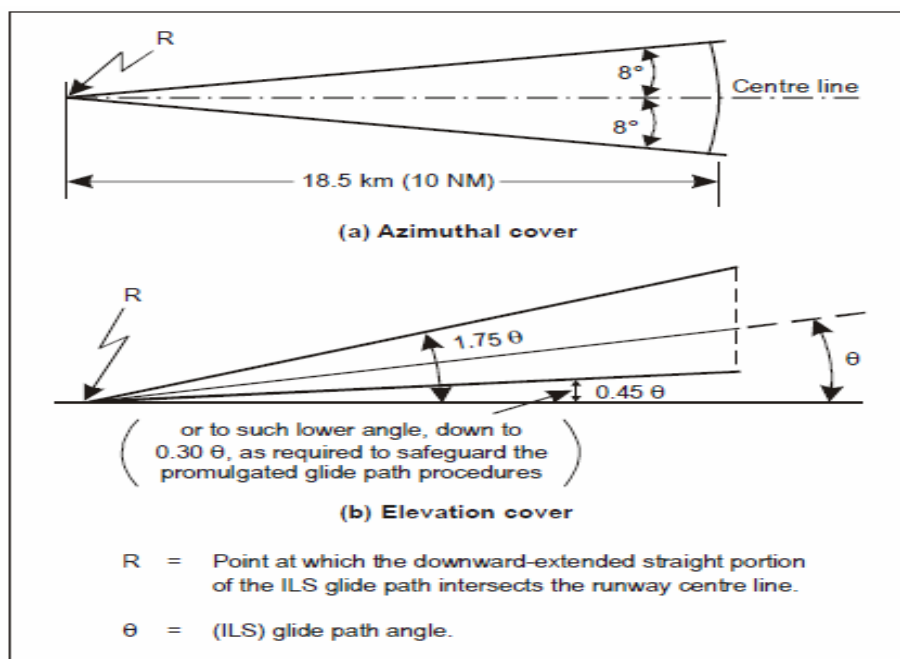


Figure 2: Glide path coverage requirement

2.3 Though the No Objection Certificate for height clearance on above basis (NOC) for structure requested to be put up by intending agencies is issued as per Geographical Coordinates of site and distances from CNS facilities, there are no guidelines on of material to be used for creating the structure (like RCC, steel, fibre sheet etc.). The characteristics of the material used are not taken into consideration while issuing NOC.

2.4 India would like to share the experience of a recent case of Delhi airport where ILS 28 is functioning as CAT III B. This ILS was commissioned in Oct 2010 and was meeting CAT III criteria as specified in annex 10 Vol I. During the next flight inspection it was observed that there is a sharp spike between point T and D as a result of which ILS was downgraded to CAT II.

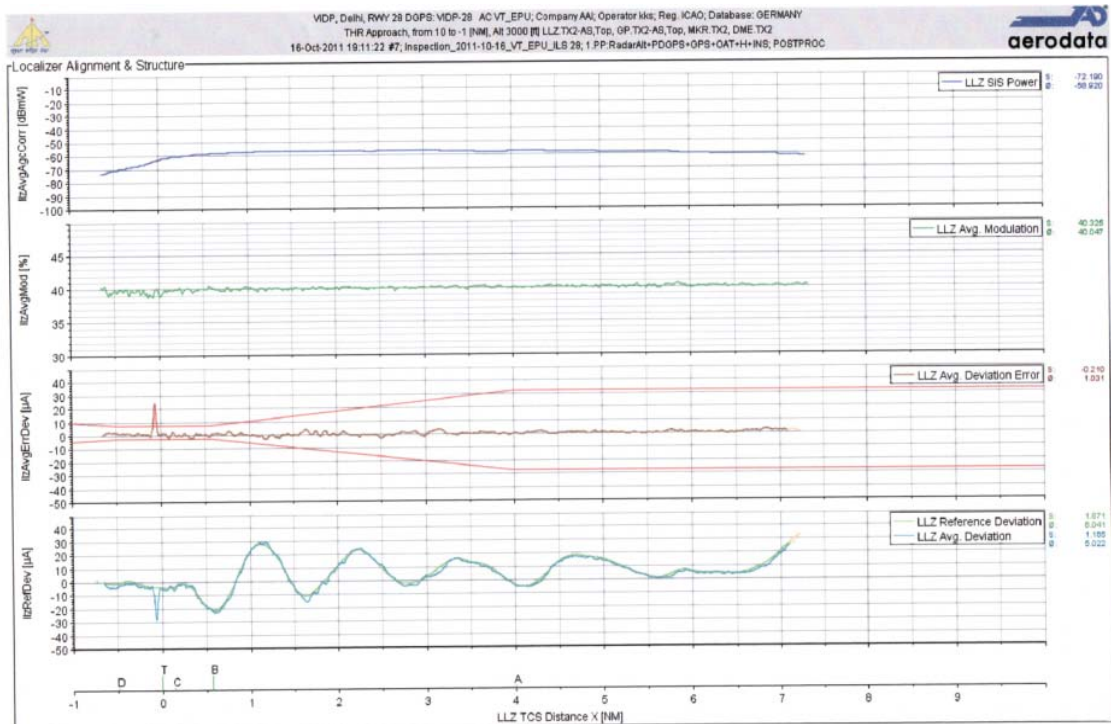


Figure 3: Flight Inspection Graphs

2.5 In the recent past, numbers of buildings/structures were coming up around Delhi Airport. A survey of these new structures was carried out to find out the reason of the problem. After the study / simulation / mathematical modelling it was concluded that Terminal 1D building in which some modifications were made by incorporating certain metallic structures was the source of problem. These metallic structures were found to reflect the LLZ beam and affect the ILS Category. To nullify this effect certain measures were taken for absorbing the reflected beam and facility was restored to CAT III

2.6 From the above experience it is seen that Control of critical areas, designation of sensitive areas on the airport and restricting the structure merely below the minimum elevation requirement of ILS may not be sufficient to protect an ILS from multipath effects caused by large, fixed ground structures. Structures inside and outside the boundaries of the airport may also affect ILS course quality, even if they meet the existing Obstacle Limitation Criteria.



Figure 4: Delhi airport runway 28 and adjacent structures

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper.
- b) take up such issues at the appropriate forum to modify the guidelines provided for protection of ILS or other NAVAIDS. The forum may decide on the type of material to be used for construction of structure or to be specific in term of coverage of Localiser /Glide path apart from the permissible height of structure.

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