International Civil Aviation Organization

**WORKING PAPER**

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**(Information paper)**
**English and Arabic only**

# ASSEMBLY — 40TH SESSION

## TECHNICAL COMMISSION

**Agenda Item 30: Other issues to be considered by the Technical Commission**

## RECONSIDER REVIEWING THE NAVIGATION AIDS PROTECTION AREA REQUIREMENTS

(Presented by Egypt)


| EXECUTIVE SUMMARY | |
|---|---|
| This working paper highlights a problem which was identified in applying protection rules for navigation aids and surrounding; specifically related to instrument landing system (ILS), that rings bell for the need of clear rules of required protection against construction works around aerodromes, including the effect of periodic equipment replacement on published data related to this protection area. | |
| *Strategic Objectives:* | This working paper relates to Safety and Air Navigation Capacity and Efficiency. |
| *Financial implications:* | Nil |
| *References:* | Annex 10 — *Aeronautical Telecommunications*<br>Doc 9137, *Airport Services Manual*, Part 6 — *Control of Obstacles*<br>Doc 8071, *Manual on Testing of Radio Navigation Aids*, Volume I — *Testing of Ground-based Radio Navigation Systems* |


## 1. INTRODUCTION

1.1 Annex 10 — *Aeronautical Telecommunications*, Volume II — *Communication Procedures including those with PANS Status*, 3.3.1.3 describes ILS coverage area that require protection to assure the quality and efficiency of signal; which includes rules for dealing with obstacles in this area prior to its installation.

1.2 As Annex 10, Volume I — *Radio Navigation Aids* includes clear definition and requirements for very high frequency (VHF) omnidirectional radio range (VOR) sitting which include approved heights and construction materials within these areas.

[1] English and Arabic versions provided by Egypt.

1.3 By comparison; Annex 10 doesn't include same details for ILS; as it explains only the importance of assuring receiving signals within specific areas without any rules for allowed heights as set for VOR.

1.4 Taking into account the normal urban development around aerodromes against navigation aids upgrading projects, whether by installation of new equipments or upgrading existing ones; paying attention for the unavailability in some countries of using different systems like GBASS due to technical, security or political reasons; which take us to the importance of defining clear requirements for protection.

## 2. DISCUSSION

2.1 Annex 10, Volume I, Attachment C, described dimensions and slops for ILS protection areas as followed:

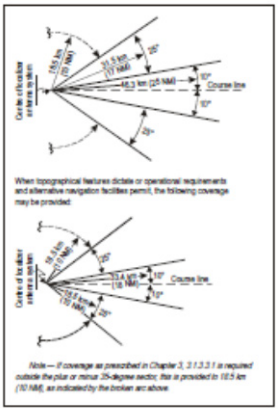


Figure C-7A. Localizer coverage with respect to azimuth

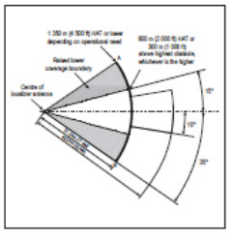


Figure C-7B. Reduced localizer coverage with respect to azimuth

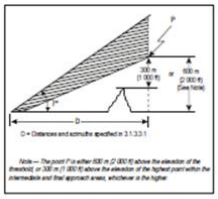
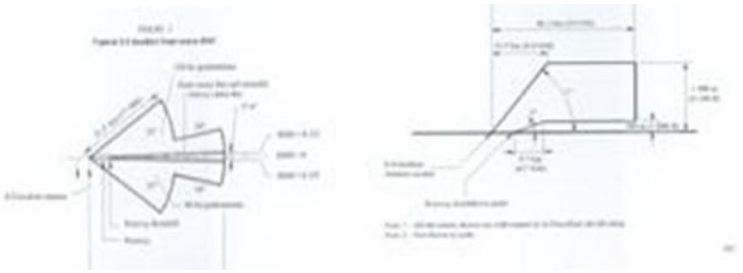


Figure C-8A. Localizer coverage with respect to elevation

2.2 It shows also the effect of an obstacle within the coverage area during survey work priors to installation; also Doc 8071, *Manual on Testing of Radio Navigation Aids* defined the required area around and above ILS that required protection.



2.3 After all it didn't include rules or guidance for dealing with heights or type of constructions in this protection area against proposed equipment; described by means of distances, slop or any type of restriction that guarantee no conflict with ILS requirements and efficiency degree.

2.4 Navigation aids specialists in Egypt has set local rules through regulations assuring the continues coverage of the signal according to Annexes and documentation requirements which defines the least required protection and gave each country the right to have more restricted rules. Egypt had set aviation law and ministerial decrees providing all protection rules related to Annex 14 — *Aerodromes* and Annex 15 — *Aeronautical Information Services* related to navigation aids protection as followed:

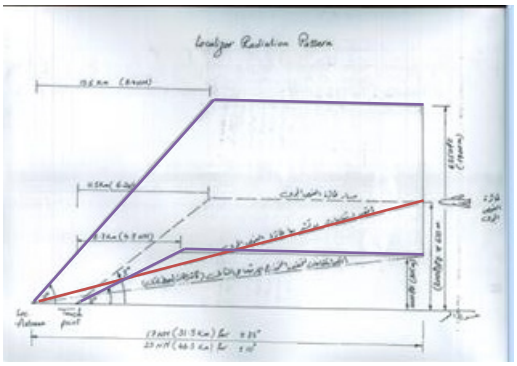
**Station runway centre locator:**

2.4.1 It is prohibited to establish any facilities, roads or trenches in the area extending from behind the station antenna 100 m to the runway threshold from the other side and 150 m wide on both sides of the runway.

2.4.2 Elevations from the station's antenna centre are declared at a 1 per cent upward slope and at a 45 degree angle on each side of the corridor.

**Station landing angle locator:**

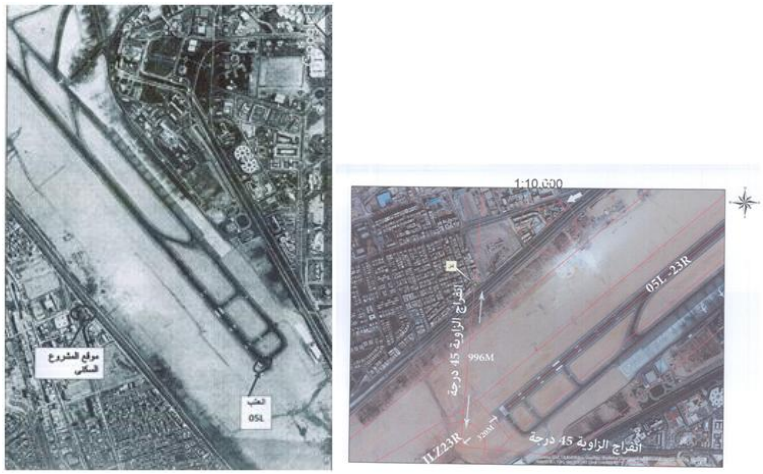
2.4.3 No installations or trenches in the area extending from the passage of the station antenna shall be constructed perpendicular to the runway centreline and 300 m wide from the runway centreline axis to the approach line.



2.5 It is mentioned above that an angle of 45 degrees been set for protection exceeding ICAO requirement for the purpose of assuring the continuity of signal within the 35 degrees to its both edges no matter the distance between ILS and threshold (300 m to 350 m) due to new developments or equipment replacement projects.

2.6 And as an example of a case in this area:

2.6.1 A site was identified exceeding the maximum allowed height for ILS; but not Annex 14.




2.6.2 The site is located between the ILS antenna and touchdown zone on the 32 degree.

2.6.3 Although there was no direct effect on the efficiency of the ILS performance as proved by fight check, but for sure it will have direct affect if no action taken an all sites around did same height.

## 3. CONCLUSIONS

3.1 The Assembly is invited to:

a) ask States to look for navigation aids protection requirements;

b) ICAO to review Annexes and related documents to have clear guidance for navigation aids protection rules that could be implemented in existing aerodromes taking into account the ILS efficiency against normal urban extensions; and

c) invite States and regions to provide their experience regardless its efficiency in the same issue.

— END —