



*International Civil Aviation Organization*

**MIDANPIRG Communication Navigation and Surveillance  
Sub-Group (CNS SG)**

**Sixth Meeting**  
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**Agenda Item 5: Performance Framework for CNS Implementation in the MID Region**

**DME INFRASTRUCTURE ASSESSMENT**

*(Presented by I.R.Iran)*

**SUMMARY**

This paper presents the assessment study conducted by Iran for the use of the Distance Measuring Equipment (DME) for RNAV operations.

**1. INTRODUCTION**

1.1 Due to the existing base of equipped users, Distance Measuring Equipment (DME) has been identified in IRAN as the sensor of choice to support Area Navigation (RNAV) in addition to or in support of GNSS (Global Navigation Satellite System). In order to meet the requirements associated with the implementation RNAV5 and RNAV1 according to the ICAO Performance Based Navigation Manual, a detailed assessment of the DME infrastructure supporting a proposed procedure is necessary.

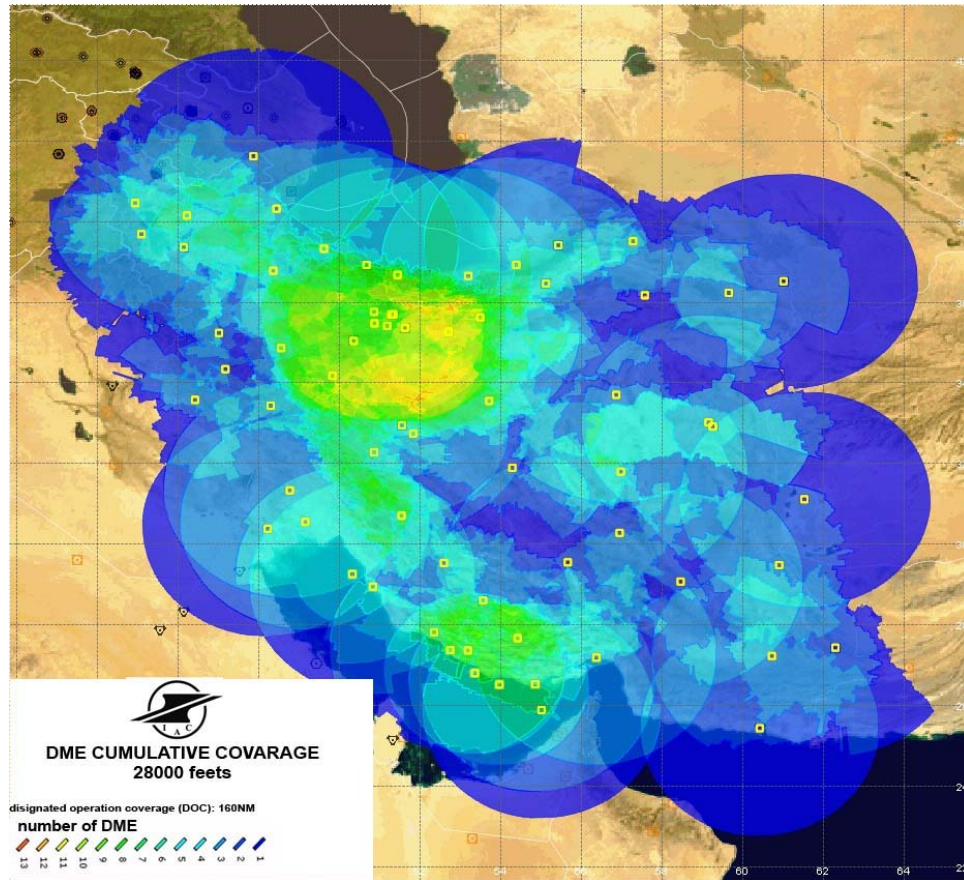
**2. DISCUSSION**

***Assessment Considerations***

2.1 Iranian Airport Company Operation tried to assess the coverage of installed DME over the country by the use of software. For the First Phase of assessment, we have considered the coverage for Enroute application. The Designated Operational Coverage (DOC) for each DME has been specified to 160 NM and because of the Enroute flight phase has been considered, we have just assessed the cumulative coverage of multiple DME in the software simulation.

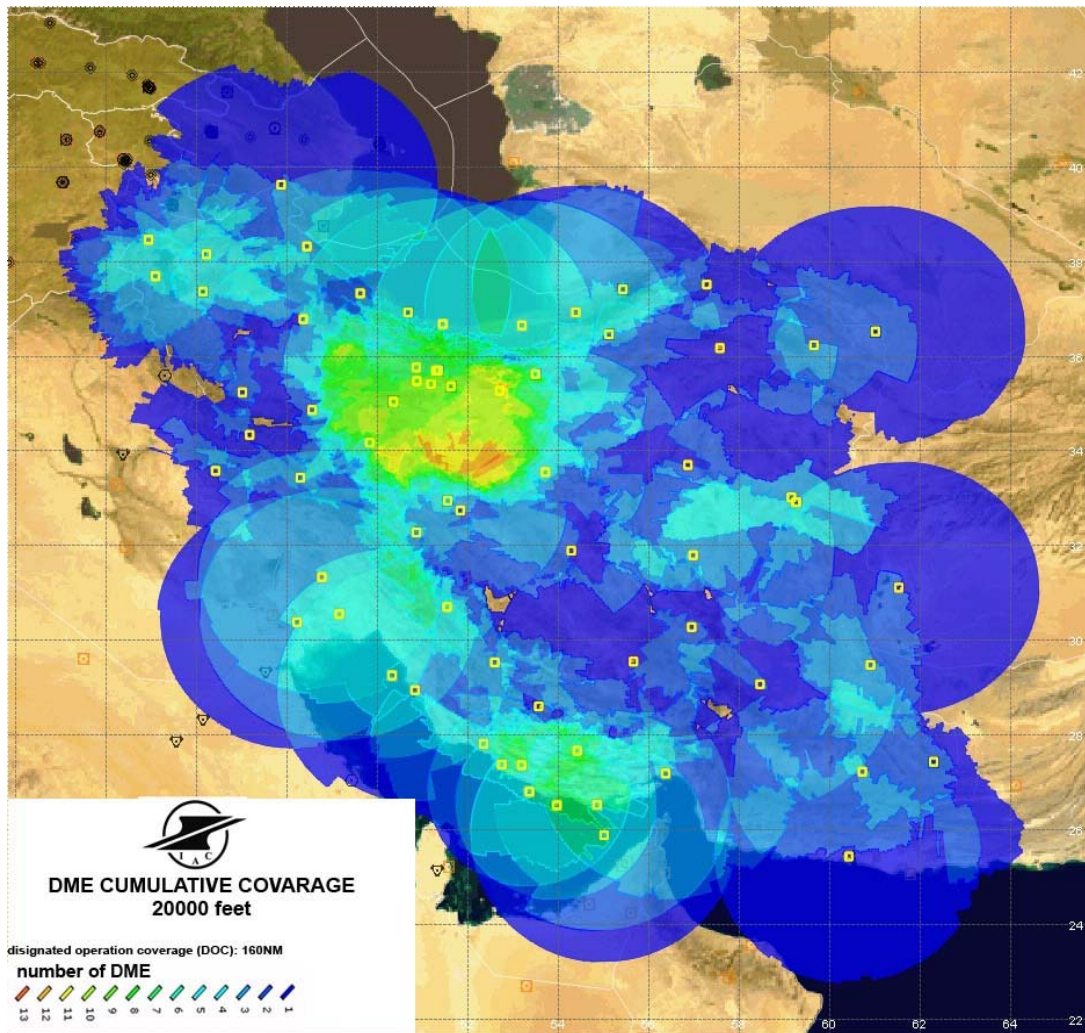
***Assessment Results***

2.2 The coverage of DME/DME signals for the airspace at flight altitudes of 28000, 20000 and 16000 feet is illustrated in **Figures 1, 2 and 3** respectively.



**Figure 1: DME Cumulative Coverage 28000 Feet**

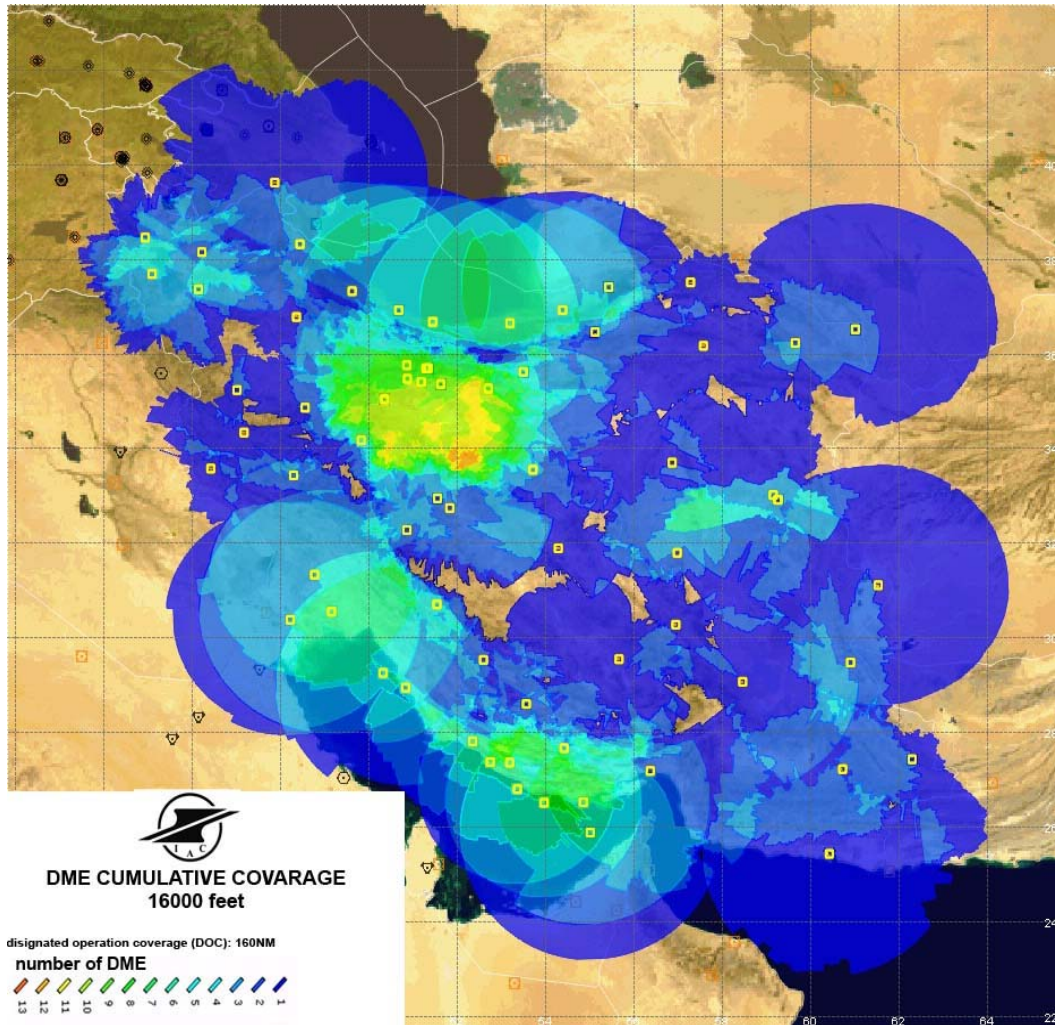
2.3 According to the coverage analysis for altitude of 28000 by using software ,installed DME facilities provide a sufficient coverage without any gap in this altitude and DME/DME could be considered as a navigation infrastructure sensor to support the specified RNAV airspace where required along the available Enroute or on any new designed route.



**Figure 2: DME Cumulative Coverage 20000 Feet**

2.4 According to the coverage analysis for altitude of 20000 by using software ,installed DME facilities provide a sufficient coverage except for the north east region and central region where multiple DME coverage because of the terrain has been reduced in this altitude and extra DME installation should be considered to improve the coverage and eliminate the identified gaps.





**Figure 3: DME Cumulative Coverage 16000 Feet**

2.5 According to the coverage analysis for altitude of 16000 by using software, installed DME facilities does not provide a sufficient coverage especially for the East Region, Central Region and a part of the West Region. For providing multiple DME extra DME installation should be considered to improve the coverage and eliminate the identified gaps.

### 3. CONCLUSION

3.1 According to the analysis results, current DME infrastructure can support RNAV DME/DME based procedures for Enroute flight phase in altitude 28000 and above.

3.2 Current DME infrastructure can support more than 80% of RNAV DME/DME based procedures for Enroute flight phase in altitude between 28000 and 20000 feet and below according to the current infrastructure it would be rational and cost effective to consider installing extra DME to eliminate the identified gaps.

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