



International Civil Aviation Organization

CAR/SAM Regional Planning and Implementation Group (GREPECAS)

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GREPECAS/18 - WP/29

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Agenda Item 4: Regional air navigation planning and implementation performance framework: Review of programmes and projects
4.6 Projects under the AIM Programme (B0-DATM)

ELECTRONIC TERRAIN AND OBSTACLE DATA (eTOD) MAIN CHALLENGES IN THE CAR REGION

(Presented by the Secretariat)

SUMMARY

This paper provides information on the challenges and requirements to implement Electronic Terrain and Obstacle Data (eTOD) within States based on the ICAO requirements relating to data integrity and accuracy, source data collection methods, data management and maintenance as well as quality standards consideration.

References:

- ICAO Annex 15 — *Aeronautical Information Services*
- ICAO Doc 9881 — *Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information*
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1. INTRODUCTION

1.1 On 23 February 2004, the ICAO Council adopted Amendment 33 to Annex 15, *Aeronautical Information Services* which included the addition of a new chapter 10 – Electronic Terrain and Obstacle Data (eTOD), requirements, and several amendments to Appendix 1 – contents of Aeronautical Information Publications (AIP) and Appendix 7 – Aeronautical Data Quality requirements.

1.2 All ICAO participating States were to ensure the availability of terrain and obstacle data in accordance with Area 1 (entire territory of a State), Area 2 (a, b, c and d areas or TMA boundary), Area 3 and Area 4 (Category II or III operations area) between 20 November 2008 and 12 November 2015.

1.3 During the development of the Programs and Projects of GREPECAS, a working paper for eTOD Project was tabled containing AIM projects identified by GREPECAS groups as a follow up to the GREPECAS, for consideration by the PPRC/04 meeting.

1.4 The Projects identified by the Group was derived from the ICAO Aviation System Block Upgrade (ASBU) Modules and the regional performance objectives adopted by GREPECAS. eTOD was identified as an AIM project under the Project G - AIM.

2. DISCUSSION

2.1 The implementation of eTOD provisions as defined in ICAO Annex 15 is possibly a challenge for all States concerned; not only due to the costs involved in collecting the data, but also for ensuring the correct regulatory framework is in place which defines the roles and responsibilities of all parties involved in the data processing chain.

2.2 eTOD was identified as a key enabler of the ICAO Aviation System Block Upgrade (ASBU) Modules as it has a direct impact on the design of Instrument Flight Procedures in support of Performance Based Navigation (PBN) as well as the use of this data on charts, within Air Traffic Management and Flight Management Systems.

2.3 Implementation of eTOD requirements are at the same time the main challenges to be consider for States:

- i. Implement adequate regulations to support the collection and management of eTOD data with regards to the responsible authority - State/Government Authorities, Air Navigation Service Providers (ANSPs), Aerodrome Operators, Military part, etc.
- ii. Define the method in which the data will be collected, either through surveying (using WGS-84) or through other means (Drones, satellite imagery/3D graphic/LIDAR information processing).
- iii. Define the format in which the data will be stored and distributed.
- iv. Implement the required infrastructure (a database -GIS) capable of managing/hosting the eTOD data. (The database must be capable of loading the required terrain data in either Digital Surface Model (DSM) or Digital Terrain Model (DTM) format with associated Meta-Data traceability)
- v. Ensure the State has the required resources to manage and maintain the eTOD Database in coordination with the Military representatives (National Security issues).
- vi. Ensure the resources of the State are adequately trained in managing terrain and obstacle data (i.e., understanding the complexities of terrain data file formats and packaging of these terrain data files).
- vii. Ensure the State has implemented a Quality Management System (QMS) with associated processes and procedures to ensure quality in the processing of data from originator to publication (Controlled Harmonised Aeronautical Information Network – CHAIN) in the AIP AD 2.10 section (or other related IAIP documents).

2.4 The implementation of eTOD requirements within a State's Civil Aviation Regulations would allow for the creation of instrument flight procedures based on accurate, verified, quality assured information, which in turn could bring about significant changes in approach and missed approach gradients and allowing the user a more optimised instrument flight procedure.

2.5 Significant safety- and efficiency benefits for civil aviation could be provided by in-flight- and ground-based applications that rely on quality eTOD. Performance of these applications, which often make use of multiple data sources, could be severely affected by inconsistent or erroneous eTOD.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

- a) note the information contained in this working paper;
- b) support the adoption of items listed under point 2.3 above, as project deliverables under the AIM G Project for eTOD;
- c) urge States to comply with the proposed action plans, including revised dates, as provided by ICAO for eTOD implementation; and
- d) form an Ad hoc Group to define strategies for eTOD implementation.

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