INTERNATIONAL CIVIL AVIATION ORGANIZATION

First Meeting of the Africa - Indian Ocean Aviation System Planning and Implementation Group (AASPG/1)

Libreville, Gabon, 3 - 7 November 2025

Agenda Item 4: Implementation of air navigation goals and indicators, including the priorities set in the regional air navigation plan

Implementation issues of eTOD and AMDB data in the AFI region – *ANSP & Airport cooperation in the implementation of eTODs: case of AIBD, as pilot site*

(Presented by ASECNA

SUMMARY
This working paper presents on the one hand ASECNA's operational approach in the digitization of obstacle and terrain data (eTOD) and airport map data (AMD), required since 2010 to support PBN flight operations in the AFI region and on the other hand in the provision of the **eTOD digital dataset service**, required since November 12, 2015, as an automated aeronautical information service. This experience, which is a milestone in the implementation of the governance and infrastructure of the SWIM thread modules (SWIM-B2/1 and SWIM-B2/2), was conducted thanks to the cooperation of ANSP (ASECNA) and AIBD Airport Operator in Senegal. **Action by the Meeting:** The meeting is invited to take note of ASECNA's operational approach as feedback and to validate the draft conclusion in favor of a distribution of roles between the different actors in the continuous process of digitization of reference data of obstacles and field, so that the PBN approach will be supported by accurate and updated data and dataset

References	ICAO Annexes 4, 11, 15 and 19 Doc 9906 volume 1, Doc 10066, Doc 10203 and Doc 9859 Doc 9750 GANP SNET-B0/4 Approach Path Monitoring (APM) Doc 9750 GANP APTA-B0/2 to B0/5 PBN SID and STAR CDO CCO Procedures Doc 9750 GANP DAIM-B1/3 to B1/5 Provision of digital data of obstacle terrain and aerodrome charts
Strategic Objectives	A – Safety, B – Capacity and efficiency of air navigation, D – Economic development of air transport, and E – Environmental protection

1 INTRODUCTION

1.1 To integrate ATM support systems through flight procedures and aeronautical information, to improve air navigation performance, ASECNA as ANSP has set up a three-phase - structured operational approach to respond to the obligation of implementing eTOD data and AMD data as dataset service.

- Phase 1: The data acquisition phase.
- Phase 2: The implementation phase of data and datasets and.
- Phase 3: The delivery phase of the eTOD and AMDB datasets.

1.2 This phasing facilitates the assessment of the implementation of the applicable elements of the APTA and DAIM, SNET threads (efficiency of MSAW and APM).

1.3 As part of the development of conventional PBN LNAV, Baro VNAV, CAT1 ILS and soon LPV SBAS flight procedures, ASECNA needs to have up-to-date, reliable and accurate obstacles and terrain datasets to improve the safety and quality of stabilized instrument approaches in accordance with the provisions of ICAO Doc 9906 on quality assurance.

1.4 In addition, this obstacle and terrain data is also essential in the context of air traffic management, for the setting of MSAW (traffic safety net against proximity to the ground) alerts, especially during stabilized approach descents or initial take-off climbs.

1.5 Finally, the eTOD and AMDB data are essential for improving the quality and integrity of the terrain and obstacle database to be published to serve as a reference for the calibration of TAWS on-board systems on the Navigation Display in 2D cartographic mode and to enhance crew situational awareness.

1.6 The RBIS project "AIM Results-Based Implementation Support" of the IIM sub-group which, in accordance with APIRG decision 25/14, has highlighted in its action plans resulting from the assistance to the States of the AFI region, the need to designate by eTOD zone the organizations responsible for the acquisition and maintenance of eTOD data.

2. DISCUSSION

2.1. In the context of the development of flight procedures, particularly in the PBN environment, data validation is an obligation (§7.2.6 Verification and validation of incoming data of Doc 9906, volume 1) with regard to the data quality requirements to ensure the optimization of the trajectories of approach flights, which is the subject of the applicable elements of the APTA threads (B0 and B1). This obligation leads to a set of significant periodic activities likely to delay the revision of flight procedures which must be done every five (05) years. Thus, it appears that there is a need to assign responsibilities at the national level in terms of acquisition, implementation of eTOD data and continuous provision of digital services of eTOD datasets, in accordance with the ICAO Annex 15 § 5.3.3 standard and the DAIM ASBU objective (B0 and B1).

As such, ASECNA has launched a pilot project for the implementation of eTOD data and the provision of digital aeronautical information services via a WEB portal, from a single aeronautical database in AIXM5. X, currently in the conceptual format of AICM5.1 data. For the purposes of validating the digital infrastructures and services to be provided, ASECNA has integrated as a key phase in the project, the acquisition and control of data quality on the pilot site of the Blaise Diagne International Airport (AIBD) of Diass (Dakar).

The data acquisition phases and the implementation of the eTOD data on the pilot site have been finalized, with the submission of the eTOD and AMDB data and datasets to the State of

Senegal for approval.

ASECNA's operational approach in the data acquisition phase consisted of:

2.1.1. Training of ANSP actors, airport manager actors and the Civil Aviation Authorities in the digital transformation of aeronautical information.

2.1.2. The definition and implementation of the terms of reference for data acquisition and maintenance, which have been mastered in the same way as those of the WGS-84 campaign since 1995 with the introduction of GNSS as a support for surface navigation (RNAV).

2.1.3. Definition and clarification of the functionalities required in the configuration, update and contingency of the platform as well as the presentation by eTOD zone of the datasets via a web portal.

2.1.4. Invites it, through the Civil Aviation Authority, to key players in the acquisition and maintenance of TOD data.

2.1.5. The acquisition of initial data on the pilot site, thanks to coordination between ASECNA, the airport manager and the Civil Aviation Authority.

2.2. For the data implementation phase, the initial eTOD data and datasets were successfully integrated into the flight procedures design software and resulted in a better 3D profile of the final approach and initial take-off climb flight procedures, compared to the results obtained by the numerical models of common terrains. As such, ASECNA has launched a pilot project for the implementation of eTOD data and the provision of digital aeronautical information services via a WEB portal, from a single aeronautical database scalable in AIXM5. X, currently in the conceptual format of AICM5.1 data.

The initial eTOD data and datasets integrated into the flight procedure design software facilitated the completion of the collision risk model (CRM) analysis. This makes it possible to have the figures for assessing the safety risk ensured through flight procedures based on eTOD data and a mastery of the implementation of the applicable elements of the APTA operational threads (lowering of the DH/MDH accommodating ceiling drops and visibility) in the AFI region

This phase made it possible to experiment internally with AISP and FPDS with the interest of DAIM applicable elements in the implementation of digital data on obstacles and terrains, in particular:

2.2.1. A better 3D profile of flight procedures on final approach and initial take-off climb.

2.2.2. The development of an electronic obstacle and terrain chart, covering and replacing the workload of AOC Type A and Type B aeronautical charts and the retirement of some non-ICAO charts still in production by safety interest

A real advance in the safety of PBN and even conventional approaches, which to be consolidated would require that at the level of each State, the datasets constituted and approved be **maintained by an actor adequately qualified and designated by the State**, to support the effectiveness of the eTOD implementation in the AFI region.

2.3. **Regarding the phase of provision of digital services of the Datasets** via a WEB portal, a safety study (EDS) based on the data acquired at the AIDB pilot site with the participation of the airport manager and ANACIM (Senegal CAA) was carried out in May 2025. Actions to comply with regulations and mitigate the identified hazards are underway. The implementation of these actions should lead to the satisfaction of the requirements of the safety study currently

being accepted by the Civil Aviation Authority. These include:

2.3.1. Training of the operational staff of the AIBD pilot center (ANSP and AO).

2.3.2. The development, signature and disclosure of the Service Continuity Plan and the backup plan for the database and configuration of the access link in the event of impossibility of access to the user web portal.

2.3.3. The mock-up of the eTOD platform with the end users associated with the ASECNA approach such as FMS coding companies and airlines operating at the airport.

2.3.4. The integration of altitude ranges into the DBM of the air traffic monitoring tool, in simulation mode and later in the real position, to differentiate the avoidance from a danger of collision with the ground that would be located below the flight, or even in front of the flight direction.

2.4. In view of this approach, ASECNA is willing to play its part in the AFI regional efforts for the controlled deployment of eTOD and AMDB, as it has done in the introduction of the WGS-84 reference framework in aviation with all the aeronautical stakeholders concerned in the AFI region, such as the Civil Aviation Authorities, the ICAO RBIS working group, airport managers, FMS coding companies, airlines.

For the AIBD pilot site, **subject to the designation and commitment of the actor in charge of data acquisition and maintenance**, ASECNA in coordination with the airport manager and ANACIM will publish soon the aeronautical information circular and the **publication of the implementation of the electronic obstacle data and AMDB as AICM5.1 data and the electronic terrain data compatible with the OGC standard from the first quarter of 2026.**

3   ACTION BY THE MEETING

3.1   The AASPG meeting is invited to :
   a) Take note of the feedback from this operational approach for the implementation of electronic field and obstacle data and aerodrome mapping data
   b) Note the operational value of the implementation of eTODs and AMDBs for airlines, Flight Procedures Service Providers (PDSPs), ATS Service Providers (ATSPs) and AIS Service Providers (AISPs) and FMS coders
   c) Encourage States to implement the operational actions of the RBIS project.
   Among the actions of the RBIS project, for each State, to identify the responsibilities of the actors in the acquisition and maintenance of eTOD data at the national level, to support the extension of the operational approach undertaken by ASECNA, in the provision of eTOD dataset services in AFI region.