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**Agenda Item 4: Monitoring of the implementation of digital datasets (e-AIP, TOD, etc.) and preparation of SWIM.**

**BRAZIL'S PROGRESS IN THE IMPLEMENTATION OF DIGITAL DATASETS (DDS)  
(Presented by Brazil)**

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| <b>SUMMARY</b>   |   |
| This information paper discusses Brazil's progress in relation to Digital Data Sets, e-AIP and AIXM.   |   |
| <b>REFERENCES</b>  |   |
| <ul style="list-style-type: none"><li>• Annex 15 – Aeronautical Information Service</li><li>• Doc. 10066 – PANS – AIM</li><li>• SAM/AIM Meeting 16</li></ul> |   |
| <i>Strategic objectives from ICAO:</i>   | <i>A – Operational Safety<br/>B – Capacity and efficiency</i> |

**1. Introduction**

1.1. The International Civil Aviation Organization (ICAO) plays a key role in promoting aviation safety and efficiency around the world. As part of this effort, monitoring the implementation of digital datasets and preparing for the implementation of SWIM (System Wide Information Management) are crucial aspects of improving information management and sharing in aviation. This paper focuses on monitoring the implementation of specific digital datasets in Brazil and the actions needed to effectively prepare for SWIM.

**2. Datasets**

2.1. AIP dataset: The AIP dataset provides up-to-date operational and regulatory information essential for safe and efficient flight planning.

2.2. Terrain and Obstacle Dataset: This data is crucial for identifying and mitigating terrain and obstacle-related risks near airfields and flight paths.

2.3. Aerodrome Mapping Dataset: Provides detailed information on aerodrome infrastructure, essential for the safe navigation of aircraft during ground operations.

2.4. Instrument Flight Procedures Dataset: Contains vital information about instrument flight procedures, ensuring the accuracy and safety of flight operations.

2.5. Digital NOTAM: Provides temporary and important information for the safety of air operations.

### **3. Aeronautical Information Exchange Model (AIXM)**

3.1. The objective of the Aeronautical Information Exchange Model (AIXM) is to make aeronautical information that is part of the Aeronautical Information Services (AIS) available in digital format. AIS information/data flows are becoming increasingly complex and consist of interconnected systems. They involve many actors, including multiple suppliers and consumers. In the global air traffic management (ATM) system, there is also a growing need for high-quality, cost-effective data.

3.2. To meet the demands of this increasingly automated environment, AIS is shifting from supplying paper-based products and messages to collecting and supplying digital data. AIXM supports this transition by enabling the collection, verification, dissemination and transformation of digital aeronautical data along the entire data chain, especially in the segment linking the AIS to the next user.

### **4. System-wide information management (SWIM)**

4.1. SWIM is a concept proposed by ICAO that aims to provide a global environment for the interoperability of air traffic management (ATM)-related data and information, to make the full complexity of operational information exchange transparent to users, thus promoting greater situational awareness through real-time information exchange, ensuring the quality, integrity and security of the data.

4.2. SWIM consists of standards, infrastructure and governance that enable the management of ATM-related information and the exchange of this information between qualified parties through interoperable services.

4.3. The aim of SWIM is to integrate air traffic management systems on a global scale, enabling the exchange of information between ground and on-board systems through a common architecture.

### **5. Development**

5.1. Brazil began its transition from AIS to AIM in 2012 and has gone through several stages and challenges in the last 11 years of transition. We have gone through two modernization processes, the first started in 2012 where we migrated our publications data to the AIXM 4.5 compliant database and another modernization started in 2019 where we adapted our data to AIXM 5.1 and migrated it to an AIXM 5.1 compliant database. This process required dedicated work, coordination, study, and management.

5.2. Today we can say that we have the e-AIP available, we have an AIXM 5.1 compliant database that can import and export data according to the model, and we have the TOD of the main airfields in the country.

5.3. However, this in itself is nothing more than the publication of data using the intended modelling. It does not constitute a dataset, because datasets are products that follow a standard and have their own minimum data requirements, i.e., their necessary characteristics compatible with the AIXM standard. As we will see later, there are still some types of data to work on in order to have all the DDS available as well.

5.4. On the situation of digital datasets in Brazil:

5.4.1. AIP Dataset: We already have the capacity to produce and publish data through our Data Distribution Portal, which is still being implemented.

5.4.2. Terrain dataset: We already have the data for the main aerodromes in Brazil, currently published through [GEOAISWEB](#).

5.4.3. Obstacle dataset: We already have the data for the main airfields in Brazil, and we have the ability to import this data into the aeronautical database for export in AIXM 5.1. We publish them through [GEOAISWEB](#) in various formats and on [AISWEB](#).

5.4.4. Aerodrome mapping dataset: According to the EUROCONTROL website, there is a correspondence between the ED-99/DO-72 and AIXM models. We already have the structured data to make this dataset available, but we haven't built the product yet.

5.4.5. Instrument Flight Procedures Dataset: We are in the initial stages of storing our procedures in the aeronautical database, but the initial goal is to produce automated procedure charts using the database data. Once we have this data, we will start working on creating the dataset. We currently have 329 procedures stored in the database, out of a total of 1400 published procedure tables. The output of these stored procedures is currently being tested in AIXM 5.1.

5.4.6. NOTAM digital: We already have a tool capable of producing it, but we are still in the initial testing phase.

5.4.7. As for SWIM, we are currently in the study phase, with groups focused on this task. More information is available on the [SWIM BR Portal](#).

5.4.8. To ensure the transition to SWIM and optimize the use of digital datasets, the following objectives will be pursued:

- to. Ensure that all datasets are up-to-date and meet the standards set by ICAO.
- b. Implement systems that facilitate the effective and secure exchange of information between stakeholders.
- c. Provide adequate training to users of datasets, enabling them to use the information effectively.
- d. Perform tests and evaluations to ensure the interoperability and functionality of systems prior to implementing SWIM.

and. Collaborate with other ICAO Member States to share experiences and best practices in preparing for SWIM and using digital datasets.

## 6. Suggested Actions

6.1 We invite participants to:

- to. Take note of the information submitted; and
- b. Propose other actions if they deem them necessary.
- c. Exchange AIXM files between states for testing.

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