Agenda Item 4: Report on activities and deliverables for the GESEA and Subgroups

APPLICATION OF DASA IN AIRSPACE MANAGEMENT

(Prepared by Brazil)

SUMMARY

This information paper provides a high-level overview of the DASA system (Digital Airspace System Analysis), listing its core capabilities, the level of technical and operational complexity involved, and the strategic value it brings to airspace management in the context of Free-Route Operations (FRTO). DASA has evolved from a visualization tool into an airspace intelligence and management platform, becoming a cornerstone of the modernization and dynamic management of Brazilian airspace.

References:
- ICA 100-36 – Special Use of Airspace Request Process
- AIP BRAZIL
- GANP

1. Background

1.1 Brazil is developing several initiatives to promote greater efficiency, safety, and flexibility in airspace management—a finite resource whose capacity is limited by physical, operational, and regulatory factors. The continued growth of air traffic and other activities that require airspace access (such as aerial sports, military exercises, and drone operations) demands innovative solutions to optimize its use in a balanced and sustainable way while ensuring operational safety.

1.2 In this context, DASA (Digital Airspace System Analysis) acts as a tool for managing the special use of airspace. Its scope includes the request and assessment process for activities that may pose risks to aviation, as well as active management through the activation and deactivation of reserved or restricted airspaces, Direct Routing (DCT), User Preferred Routes (UPR), Coded Departure Routes (CDR), and Playbook Routes—all within the Flexible Use of Airspace (FUA) framework. This enhances both efficiency and safety in airspace management, centralized on a single platform.

2. Analysis

2.1 Core capabilities of the system

2.1.1 DASA is designed to centralize, process, and automate the handling of complex aeronautical data. Its key capabilities include:

2.1.2 Digitalization and Structuring of Aeronautical Data: The system consumes data from multiple sources, including PDF files of procedures (SID, STAR, IAC) from AISWEB (Brazil's official aeronautical information source), converting unstructured documents into geospatial and relational data ready for analysis and digital use.

2.1.3 Geospatial Analysis and Visualization: Data is represented in an interactive map environment, allowing analysts to view procedures, airways, and other information layers in an integrated manner, offering comprehensive situational awareness.

2.1.4 Automated Analysis Engine: DASA includes a rules engine capable of conducting complex conflict analyses, such as verifying drone flight requests against multiple restriction layers.

2.1.5 Validation and Quality Control System: The system features a dedicated module for logging and analyzing parsing errors (ErrorLayer), allowing proactive data quality management and identification of failure patterns for continuous process improvement.

2.2 **Technical and operational complexity**

2.2.1 DASA's sophistication lies in its ability to tackle highly complex technical and operational challenges, acting as a central hub in an ecosystem of critical systems.

2.2.2 Strategic Integration Ecosystem: DASA connects with:

2.2.3 Operational Databases: Direct integration with legacy and modern databases such as SYSAGA, SDIA, SARPAS, and the GEA database—CGNA's current airspace management source.

2.2.4 National Partner APIs: Ingests data from ANAC (aircraft), SISCLATEN (Ministry of Defense), and interacts with the Ministry of Agriculture, a frequent system user.

2.2.5 Traffic Management Platforms: DASA is key for the evolution of ECO UTM in Brazil, serving as the analysis platform for drone traffic management.

2.2.6 Drone Flight Analysis Automation (UAS/UTM)**: DASA currently automates the analysis of 92% of drone** flight requests, covering everything from agricultural operations to public security missions. It checks proposed trajectories against critical zones like Protection Zone Basic Plans (PBZPA, PBZPH, PZPANA) and prison exclusion zones, freeing analysts to focus only on complex cases.

2.2.7 Strategic Planning (Playbook): CGNA's strategic sector uses DASA to plan and visualize route playbooks, enabling simultaneous simulation of multiple airspace scenarios. This facilitates the creation of more efficient routes and impact assessment of future changes.

2.2.8 Flow Management (FMC): By centralizing all active areas and procedures, DASA provides FMC with a clear, unified view to balance air traffic capacity and demand, enabling proactive conflict alert generation.

2.2.9 AIS Room and Flight Plan Room Optimization (NLP):

2.2.10 Flight Plan Room: DASA integration allows automatic validation of flight plans, cross-checking submitted routes against real-time active areas, instantly identifying conflicts and drastically speeding up approval.

2.2.11 AIS Room: DASA accelerates the information lifecycle. Area requests can be analyzed, approved, and published via NOTAM more quickly and with lower error risk, ensuring airspace users have access to up-to-date information.

2.3 Strategic value in airspace management

2.3.1 DASA's capabilities deliver direct strategic value, positioning the system as the main enabler of Flexible Use of Airspace (FUA) implementation in Brazil. The FUA concept assumes that airspace is a dynamically managed resource. DASA embodies this philosophy by enabling fast creation, activation, and deactivation of areas (restricted, danger, etc.). This is foundational for allocating airspace blocks to various users (civil or military) during specific timeframes, optimizing usage and increasing system capacity.

2.3.2 For FUA to be viable, a "digital twin" of the airspace must exist, enabling real-time status changes to yield positive operational impact—i.e., increasing capacity without compromising safety. DASA's role is to digitize airspace and provide interfaces—either visual (user interaction) or APIs for system integration—allowing responsible stakeholders to manage their respective areas. DASA's integration capabilities allow impact evaluation and decision-making support, in addition to automating authorizations.

2.3.3 By centralizing and digitizing diverse airspace uses on a single platform, DECEA is advancing in FUA adoption and tackling emerging air traffic management challenges such as UTM. While DASA development is a major step, other efforts such as GADHOC ASM (ad hoc Airspace Management Group under GEPEA) and training courses like ATM049(Airspace Technical Analysis) also contribute to improving Brazilian airspace management and harnessing the potential of digitalization.

2.4 Internationalization

2.4.1 A key enhancement opportunity in airspace management is cross-border integration to provide a unified view, especially for international flights. A DASA Workshop was held from 9 to 13 June 2025 with participants from South American countries including Ecuador, Paraguay, Uruguay, Bolivia, and Chile, as well as international airline Delta Airlines and Brazilian carrier LATAM.

2.4.2 The Workshop's objective was to present DASA's implementation in UPR route analysis to other countries, serving as a reference for process standardization—which would yield operational gains for airlines overflying the SAM region. The tool and its potential for expediting airline requests and analysis were showcased during the event.

2.5 Conclusion

2.5.1 DASA has transcended its original role as a viewer to become an airspace management ecosystem. It is the platform that enables implementation of Flexible Use of Airspace (FUA) in Brazil by automating critical processes, generating operational intelligence, and providing a solid and dynamic foundation for decision-making. Ongoing investment in its evolution is essential for the efficiency, flexibility, and safety of air operations.

3. Suggested actions

3.1 The Meeting is invited to:

a) Recommend that States take note of DASA's capabilities;

b) Record the success of the *DASA Workshop (June 2025)* as a model of regional cooperation for dynamic airspace management;

c) Encourage participation in future workshops or technical training (e.g., ATM049 course or on-demand training);

d) Suggest that States consider implementing platforms with similar functionalities to DASA (aeronautical data digitalization, automated conflict analysis, integration with UTM/FUA), tailored to national realities; and

e) Emphasize interoperability as a priority, ensuring future systems can share data via APIs or standards such as AIXM (Aeronautical Information Exchange Model).

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