



**Agenda Item 3: Report of working groups activities and deliverables of the GT-Interop and Subgroups**

**ADS-B IMPLEMENTATION IN CAR/SAM REGIONS**

(Presented by IATA)

**SUMMARY**

The objective of this working paper is to make a follow-up of the proposals presented during GREPECAS/20 and previous SAM/IG meetings regarding ADS-B implementation, as well as to present proposal for principles to be applied in the ADS-B planning and implementation.

**References:**

- ICAO DOC. 9971
- Global Air Navigation Plan

**1. Background**

1.1. GREPECAS/20 meeting agreed that ADS-B is a surveillance system that has advantages over secondary radars and other methods such as multilateration (MLAT) and Wide Area Multilateration System (WAM), due to its high precision and low infrastructure costs. Many States are already migrating towards this technology and collaboration with other States is recommended to have an integrated regional system.

1.2. GREPECAS recognized, through conclusion GREPECAS/20/03 below, the need that, the Secretariat, in coordination with the industry, executes a study on the operational priorities for the implementation of ADS-B and on aspects of the use of ADS-B in ATC units, based on the technical guidance documentation available for the CAR/SAM Regions by GREPECAS/21. The objective of such study is to promote the coherent and harmonized implementation of ADS-B in the CAR/SAM Regions, within the framework of the Alternative Surveillance (ASUR) module of the GANP, recognizing the priorities of airspace optimization and the provision of ATS services in the regions.

CONCLUSION GREPECAS/20/03		STUDY ON OPERATIONAL PRIORITIES FOR THE IMPLEMENTATION OF ADS-B AND ASPECTS OF THE USE OF ADS-B IN ATC UNITS.	
<b>What:</b> That, the Secretariat, in coordination with the industry, executes a study on the operational priorities for the implementation of ADS-B and on aspects of the use of ADS-B in ATC units, based on the technical guidance documentation available for the CAR/SAM Regions by GREPECAS/21.	<b>Expected impact:</b> <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Operational/Technical		
<b>Why:</b> To promote the coherent and harmonized implementation of ADS-B in the CAR/SAM Regions, within the framework of the Alternative Surveillance (ASUR) module of the GANP, recognizing the priorities of airspace optimization and the provision of ATS services in the region.			
<b>When:</b> By GREPECAS/21	<b>Status:</b> <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Superseded / <input type="checkbox"/> Completed		
<b>Who:</b> <input type="checkbox"/> States <input checked="" type="checkbox"/> ICAO <input type="checkbox"/> Other:	NACC/SAM Secretariat		

1.3. During SAM/IG/29 meeting, IATA presented NE/3.2 highlighting the importance of taking into consideration the principles and recommendations set out in Doc 9082 for the implementation of new systems for the provision of air navigation services. The working paper has been presented also at other ICAO events, such as the Seventeenth Meeting of Civil Aviation Authorities of the South American Region (RAAC/17), held in Santiago/Chile 10-14 April, 2023.

1.4. As an example, although the paragraph 3.71 of the SAM/IG/29 report (and similar paragraph 1.82 of the RAAC/17 report) below is correct, it is not enough to justify the implementation of ADS-B in any airspace. It is not clear the benefits in terms of direct routing, fuel savings, emission of CO2 and safety, without a consistent cost-benefit analysis. It might be possible to implement direct routing in SAM without implementation of ADS-B, either using the present surveillance infrastructure or due to the very low volume of traffic in the Region. Besides, there is no guarantee that the implementation of ADS-B will lead to direct routes and safety improvement, without considering an integrated CNS/ATM planning.

**Report SAM/IG/29 item 3.71**

*“Considering that, according to IATA, “Jet fuel accounts for almost 30% of airline operating expenses.” (IATA - Fuel), and “Total user charges for air navigation and airport services share 5-6% of the airline’s total cost.” (IATA - Air Navigation Service Charges), it is in the interest of airlines and other aircraft operators the provision of Space-based ADS-B surveillance, even with there is an increase in tariff, in accordance with the principles advocated in Doc 9082; because the advantages of having conditions to perform more direct flights, with better occupation of airspace, allowing fuel savings in air operations and less emission of gases into the atmosphere, in addition to the significant increase in operational safety”*

**2. Discussion**

2.1. IATA supports ADS-B implementation through a formal position stated in the document User Requirements for Air Traffic Services (URATS), which can be obtained at: [https://www.iata.org/contentassets/fb1df0e634454acc9207418a5d1d636b/requirements-urats-cns-technology\\_edition203\\_2017.pdf](https://www.iata.org/contentassets/fb1df0e634454acc9207418a5d1d636b/requirements-urats-cns-technology_edition203_2017.pdf). A summary of IATA’s position on surveillance can be seen in the table and notes below:

Technology / Application	Support	Maintain	Neutral	Do not support
PSR				X
SSR Mode A/C		X		
SSR Mode S	X			
MLAT			X (See Note 6)	
PAR				X
ADS-C	X			
ADS-B OUT	X (See Note 7)			
Space-based ADS-B	X (See Note 8)			
ADS-B IN	To be determined (See Note 9)			
TIS-B				X

Table 3 – Surveillance

*Note: ADS-B OUT should not be implemented as a redundant surveillance capability. Performance requirements for ADS-B OUT should be consistent with ICAO Circular 326.*

2.2. It is important to empathize that support for a technology does not automatically extend to specific usage of that technology. For example, support for ADS-B does not automatically imply that a mandate is supported.

2.3. It is also important to note that ICAO Circular 326 is an excellent guidance material for ADS-B implementation, including, among other aspects: separation standards, need of Airspace Concept, identification of ADS-B performance requirements and safety assessment. SAM/IG should ratify the need of using ICAO Circular 326 as guidance material for SAM implementations groups, as well as for the States to apply during their planning and implementation process.

2.4. The ADS-B implementation, as any new technological solutions, must be based on a positive business case, maximising existing aircraft capabilities, and only where operationally justified. The ADS-B implementation and related infrastructure should consider, among other aspects:

- a) Measurable safety and/or operational improvements as agreed by stakeholders.
- b) Follow an inclusive airline consultation process prior to investments being made.
- c) Be supported by coordinated cost-benefit analysis.
- d) Follow ICAO user charges principles.

2.5. ADS-B should not be implemented as a redundant surveillance capability, and, provided there is a positive business case, it should replace radar, or be used in non-radar airspace to improve ATS surveillance. Transition timelines need to be determined in consultation with airspace users.

2.6. Mandating ADS-B OUT avionics equipage should be considered only for airspace where ADS-B is planned to be the only surveillance capability. Once ADS-B ground stations become operational, ANSPs should, in consultation with airlines, publicly and transparently establish a timeline to decommission other surveillance infrastructure.

2.7. Performance requirements for ADS-B OUT should be consistent with ICAO Circular 326. Requiring unnecessarily high performance, without appropriate safety and/or cost benefit justification, cannot be supported. In this sense, SAM/IG should study under GT INTEROP/ CNS/SUR Subgroup, with support of ATM experts, the separation minima that could be used by applying the existing ADS-B avionics available onboard of the aircraft, using as guidance the information provided in the ICAO Circular 326.

2.8. ADS-B implementation should be part of an integrated planning, including, at least, communication, navigation, and ATM systems/procedures to implement concrete airspace user benefits such as enhanced air traffic flow management, optimized air traffic separation provision, FRTO (e.g., User Preferred Routings – UPR, Strategic Direct Routing – SDR and Free Route Airspace – FRA). In

this sense, in accordance with guidance provided by ICAO for planning/implementation of the Global Air Navigation Plan, States should use the Six Steps Method, provided in the ICAO Doc. 9883 to perform the mentioned integrated planning/implementation, applying its main principles:

- a) Strong focus on desired/required results;
- b) Reliance on facts and data for decision making; and
- c) Collaborative justified decision-making

### **3. Suggested Action**

3.1. The Meeting is invited to:

3.1.1. Take note of the information provided in this working paper.

3.1.2. Urge ICAO and States to adopt the following principles for planning/implementation of ADS-B:

- a) Use ICAO Circular 326 and Six Steps Method (Doc. 9883) as guidance material in the process of ADS-B planning and implementation.
- b) Establish cost-benefit analysis and development of a CONOPS as basic requirements for ADS-B planning and implementation.
- c) Application of measurable safety and/or operational improvements as agreed by stakeholders.
- d) Follow an inclusive airline consultation process prior to investments being made.
- e) Follow ICAO user charges principles.
- f) ADS-B should not be implemented as a redundant surveillance capability, and, provided there is a positive business case, it should replace radar, or be used in non-radar airspace to improve ATS surveillance.
- g) Mandating ADS-B OUT avionics equipage should be considered only for airspace where ADS-B is planned to eventually be the only surveillance capability.
- h) Once ADS-B ground stations become operational, ANSPs should, in consultation with airlines, publicly and transparently establish a timeline to decommission other surveillance infrastructure.
- i) Performance requirements for ADS-B OUT should be consistent with ICAO Circular 326 and apply, as far as possible, the existing ADS-B avionics available onboard of the aircraft.

3.1.3. Urge SAM/IG to study, under GT INTEROP/ CNS/SUR Subgroup, with support of ATM experts, the separation minima that could be used by applying the existing ADS-B avionics available onboard of the aircraft, using as guidance the information provided in the ICAO Circular 326.

END