



ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 29: Aviation Safety and Air Navigation Regional Implementation Coordination Mechanisms

PROGRESS ON THE IMPLEMENTATION OF THE GNSS IN AFRICA

(Presented by the 54 Contracting States², Members of the African Civil Aviation Commission (AFCAC))

EXECUTIVE SUMMARY

This paper presents the status of the on-going AUC global navigation satellite system (GNSS) and satellite-based augmentation system (SBAS) initiatives, including the progress of the implementation of the Decision of AU Ministerial STC-TTIET on the continental cost benefit analysis (CBA).

<i>Strategic Objectives:</i>	This information paper relates to Strategic Objectives: (1) Safety, (2) Capacity and efficiency, and (4) economic development
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<i>Financial implications:</i>	Under AUC authority
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<i>References:</i>	Doc 10115, <i>Report of the Thirteenth Air Navigation Conference (AN-Conf/13)</i> Global Air Navigation Plan (GANP); Global Air Safety Plan (GASP) Reports of the First and Second STC TTIET meetings
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1. INTRODUCTION

1.1 Space technologies are enabler to the continental Agenda 2063

1.1.1 Space technologies and applications are key in the achievement of the continental Agenda 2063 and AU Heads of States and Government have adopted an African Space Policy and Strategy in 2016 and they have endorsed the creation of the African Space Agency (AfSA) in 2018, which operationalisation is on-going. The continental space strategic objectives focuses on four key thematic namely Communication, Earth Observation, Positioning and Navigation (P&N,) and Space Sciences and Astronomy. 1.2 GNSS and SBAS are strategic for the AFI region.

¹ English and French versions provided by AFCAC.

² Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Cote d'Ivoire, Democratic Republic of the Congo, Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

1.2 GNSS and SBAS are strategic for the AFI region

1.2.1 In the domain of air transport, AFI GNSS strategy has recommended the introduction of satellite navigation (GNSS) and its augmentations (SBAS) as a solution in reaching the objectives of the Performance Based Navigation (PBN). GNSS capabilities enable unrestricted point-to-point flight paths; flight is no longer restricted to the pathways dictated by ground-based radio navigation. Following APIRG 19 meeting in Dakar, AFI region has endorsed the ASBUS Block 0, which also indicates SBAS as a solution in supporting reaching targeted performances.

1.3 Benefits of Satellite navigation and its augmentations to Africa

1.3.1 Satellite navigation (GNSS) and their augmentation (SBAS) provide wide-area coverage navigation solutions to African civil aviation and air transport community with the potential to enable the Single African Air Transport Market (SAATM).

1.3.2 Their implementation in Africa aims at providing a cost effective way of filling the gap on air transport infrastructure while improving regional accessibility by making services available even in remote areas. They are also an enabler to regional integration by promoting collaborative decision-making processes between all beneficiaries of services in wide continental areas.

2. DISCUSSION

2.1 Contribution of Satellite Navigation to regional integration and SAATM

2.1.1 Satellite Navigation provides position and timing information supporting many flight and Air Traffic Management (ATM) operations. It contributes to the realisation of the Single African Sky and Single African Air Transport Market (SAATM) by providing the flexibility to design the airspace enabling direct fly from departure to destination using harmonized and standardized practices. It also supports complex approaches and departures that cannot be served by the straight beams that emanate from ground transmitters.

2.2 OBJECTIVE

2.2.1 The objective of the document is to present status of the on-going AU GNSS and SBAS initiatives, including the status of the implementation of the Decision of the first and Second Sessions of the AU ministerial Specialised Technical Committee on Transport, Transcontinental and Interregional Infrastructure, Energy and Tourism (STC-TTIET) on a continental CBA and strategy studies.

2.3 PROGRESS STATUS

2.3.1 Implementation of the declarations of the first and second sessions of AU STC-TTIET Declarations (13-17 March, 2017, Lomé; 14-18 April 2019, Cairo). In order to comply with the AFI GNSS strategy and the recommendations of successive APIRG meetings since 2009 on the need of impact assessment studies, the first session of the STC-TTIET meeting in Lomé in March 2017 has requested the AUC “to establish a Continental Cost benefit study and strategy on the implementation of the SBAS project in Africa, taking into consideration existing initiatives.

2.3.2 AUC mandated AFCAC to develop the ToRs of the study and to set up a specific task force involving ICAO, AFRAA, IATA, ASECNA, states CAAs, to undertake the study.

2.3.3 The outcomes of such a study will support the decision making process for the adoption of GNSS and SBAS systems in Africa through a continental integrated approach, which is key in guaranteeing their sustainability, including sharing of assets and resources and mutualisation of costs. It is therefore important that the implementation of the STC-TTIET be prioritized in the AU/AFCAC Work Programmes.

2.3.4 Taking into consideration the progress made since 2017 by regional initiatives, the Second Session of the AU STC-TTIET (14-18 April, Cairo) encouraged Member States to support AFCAC in the data collection and validation process for the CBA Study recommended while recommending to consider the achievements of regional initiatives such as ASECNA, ACAC, RECs modules.

2.4 On-going regional SBAS programmes and feasibility studies

2.4.1 The implementation of SBAS is on-going on the continent with more than half of AU members involved in on-going programmes (ASECNA, ACAO) or feasibility studies (COMESA, EAC and IGAD) in Eastern Africa; (ECCAS, ECOWAS, UEMOA) in Western and Central Africa.

2.4.2 The “SBAS for Africa and Indian Ocean” initiative, developed by the Agency for Air Navigation Safety in Africa and Madagascar (ASECNA), pursues the provision in the AFI region of SBAS services, as key enablers to the Single Sky for Africa, one of the elements of the operationalisation of the Single African Air Transport Market (SAATM) at Continental level, and to the implementation of the Space Policy and Strategy of the Africa Union.

2.4.3 This SBAS programme, recognised by ICAO, primarily aims to provide autonomously airspace users with mono-frequency (L1) SBAS services from 2021/022, with a progressive coverage of the ASECNA area and potentially beyond. These services are intended to support en-route/NPA, APV-1 and CAT-I operations, and thereby to enhance PBN and ADS-B operations in Africa for all phases of flight, improving ultimately flight safety and efficiency.

2.4.4 ACAO Member States (12) including **Northern Africa** have already adopted a technical scenario for SBAS implementation and impact assessment studies have also revealed positive impact of SBAS for the aviation sector.

2.4.5 **Eastern Africa** RECs, COMESA, EAC and IGAD are beneficiaries of the Support to EGNOS in Africa Programme and have undertaken within this framework technical and economic feasibility studies for the creation of an Eastern Africa SBAS module, with the support of the JPO. Results also provided for this regional modular approach positive impacts on aviation and other sectors.

2.4.6 **South Africa** also conducted an initiative under ESESA and a feasibility study of SBAS services through a Consortium composed of AVANTI, PildoLabs, SANSA and ASECNA.

2.4.7 **Western and Central Africa** RECs, ECCAS, ECOWAS and UEMOA have also developed cooperation frameworks with the JPO for the development of a regional module and the definition studies are on-going.

3. CONCLUSION

The Assembly is invited to:

- a) take note on the progress reported on the implementation of ongoing continental and regional GNSS/SBAS initiatives;
- b) take note on the need for prioritisation of the implementation of the AU STC TTIET recommendation for States to support AFCAC in the data collection and validation process of the continental Cost Benefit Analysis (CBA) Study of SBAS for Africa; and
- c) take note that the SBAS CBA study should take into account the achievements of regional initiatives such as ASECNA, ACAC and RECs modules.

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