



AFRICAN CIVIL AVIATION COMMISSION
30th AFCAC PLENARY SESSION
(LIVINGSTONE, ZAMBIA, 4 – 5 DECEMBER 2018)

Agenda Item 6: Inputs for 2019-2021 AFCAC triennium Activities

Session 1: SUSTAINABLE DEVELOPMENT OF AIR TRANSPORT

Theme: Single African Air Transport Market (SAATM)-PROGRESS AND SUSTAINABILITY

Contribution of satellite navigation to the realisation of SAATM: AU GNSS and SBAS initiatives

(Presented by the African Union Commission)

EXECUTIVE SUMMARY

This paper presents the status of the on-going AUC GNSS and SBAS initiatives, including the status of the implementation of the Decision of AU Ministerial STC-TTIIET on the continental CBA and strategy studies, the Support to EGNOS in Africa Programme, the status on the institutionalisation of the Joint Programme Office (JPO) and way forward.

Action: The Plenary is invited to:

- a) Take note on the progress reported on the implementation of ongoing GNSS/SBAS initiatives.
- b) Instruct the Secretariat of AFCAC to prioritize the AU STC TTIIET recommendation on the continental CBA study for the implementation of SBAS in Africa and Strategy (as described in the WP/11 of the Secretariat).
- c) Encourage the States of the AFI Region and designated organisations to collaborate for the conduct of the CBA Study for the development and deployment of GNSS/SBAS services and applications in Africa in conjunction with RECs.
- d) Take note of the need to secure the continuation of the achievements of the JPO on the implementation of a multi-sectoral, collaborative and continental approach on satellite navigation, with its institutionalisation within the framework of the AU Space Policy and Strategy.
- e) Take note that AUC and AFCAC should take necessary measures to secure in the short term the GNSS/SBAS built capacity through a working arrangement between AFCAC and JPO as a transition phase towards its full institutionalisation. Such working arrangement shall exclude any financial impact on AFCAC and an internal AUC Task Force on the institutionalisation will define the modality of its implementation

References:

- Report of ICAO 13th Air Navigation Conference
- Global Air Navigation Plan (GANP); Global Air Safety Plan (GASP)
- AFI GNSS Strategy
- Reports of the 2nd, 3rd, 4th and 5th Africa-EU Summits
- Report of the 4th meeting of the Steering Committee of the Action Support to the JPO

1. INTRODUCTION

1.1 Space technologies are enabler to the continental Agenda 2063

Space technologies and applications are key in the achievement of the continental Agenda 2063 and AU Heads of States and Government 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.

1.2 GNSS and SBAS are strategic for the AFI region

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 APIR 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

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 Sky and the Single African Air Transport Market. Beyond their impact on the continuity of air navigation services on the continent, augmentation services benefit airlines and aircrafts operators by improving operations and enhancing safety scores by reduction of CFITs.

SBAS are very strategic as they provide corrections of GNSS (GPS, GLONASS, BEIDU or regional systems) errors over the service area coverage, and are therefore a mean of monitoring GNSS signals over a given region. This argument has motivated the development of several SBAS systems around the world.

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.

If the Cost Benefit Analysis for the deployment of SBAS in Africa, which is being conducted indicates that SBAS systems are also cost-effective, then they would significantly contribute to the reduction of the ground infrastructure required.

2. DISCUSSION

2.1 Contribution of Satellite Navigation to regional integration and SAATM

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 by providing the flexibility to design the airspace enabling direct fly from departure to destination using harmonized and standardized practices.

The signal in space has the specificity to cover a large area driving to regional integration by enforcing collaborative decision making between international, continental, regional and national

organisations for the provision of services that should respond to the need of various users communities. Satellite navigation supports complicated approaches and departures that cannot be served by the straight beams that emanate from ground transmitters.

SBAS provides the accuracy, integrity, service continuity and availability needed to rely on Global Navigation Satellite System (GNSS) navigation for all phases of flight, from en-route through Category 1 equivalent approach. SBAS technology provides the opportunity to cover very large airspace and areas formerly not served by other navigational aids. SBAS adds increased capability, flexibility, and often, more cost-effective navigation options than adding additional legacy ground-based navigation aids.

3. OBJECTIVE

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 Session 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, and the status on the institutionalisation of the JPO.

4. PROGRESS STATUS

4.1 Implementation of the AU STC-TTIET Declaration March 17, 2017 in Lomé

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 April 2017 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 in the implementation of EGNOS in Africa".

The Ministerial Declaration actually recognised the "progress made in the implementation of EGNOS in Africa project and capacity building of the Joint Project Office (JPO)", and therefore the study should consider the on-going initiatives and projects, which already involve more than 60% of AU member states.

AUC has mandated AFCAC to develop the ToRs of the study and to set up a specific Task force involving ICAO, AFRAA, IATA, ASECNA, ATNS, States CAAs and ANSPs, to undertake the study.

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 AFCAC Work Programme.

4.2 On-going regional SBAS programmes and feasibility studies

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

ASECNA 17 member states expressed their willingness on implementing SBAS in the region in 2011. In 2017, ASECNA signed an Agreement with the European Union for the development of an independent SBAS-ASECNA based on EGNOS. Definition studies of the technical scenario are on-going and impact assessments and market analysis have been performed proving positive impacts of the system in aviation but also for other applications.

ACAC 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.

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.

South Africa also conducted an initiative under ESESA.

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.

5. The proposed institutionalisation of the JPO

5.1 Achievements of the JPO on satellite navigation in Africa

During the first session of the AU STC-TTIET, AU member States have recognised the progress made in the implementation of EGNOS in Africa project and the capacity built in RECs with the JPO.

JPO aims at supporting decision making from RECs and African organisations with interest in satellite navigation with the objective of adopting a single, harmonised and coordinated system for the development of applications in aviation and other sectors; a seamless sky with harmonised standards; interoperability on the continent and with other existing systems to guarantee continuity of service; Increased safety; Coordination in the decision making process on satellite navigation matters.

The JPO has been operational since 2013 and has numerous achievements with the AUC, AFCAC, RECs, Civil Aviation Authorities, ANSPs to support the definition of their SBAS programmes. Maritime and other sectors (agriculture, rail, road, Location based services, survey/ mapping drone and UAVs) organisations are also involved in the process as important beneficiaries of GNSS and participant to the governance of the system.

The JPO is supporting Eastern Africa RECs (COMESA, EAC and IGAD) and Eastern and Central (ECCAS, ECOWAS, UEMOA) on the feasibility studies they are undertaken to define the SBAS implementation strategy and the creation of specific modules. The JPO is also supporting on-going programmes, ASECNA for instance, and has working arrangement with other (ACAC).

The Steering Committee of the JPO is co-chaired by AUC and European Commission, with the participation of RECs, AFCAC, ACAC, ICAO. Since its creation, the JPO is hosted by ASECNA and its activities are missing the continental outreach they require.

5.2 Outcomes of studies on the institutional options and business plans for the JPO

After five (5) years of operationalisation, the JPO aims at being institutionalised within the AU environment, especially the African Space Agency and its dedicated component on Positioning Navigation and Timing (PNT).

An external Consultant has performed a study on possible options for the institutionalisation of the JPO and analysed the sustainability of the most feasible scenario. Outcomes of the study revealed the feasibility of a sustainable solution of the JPO by enforcing its framework with the African Union and its specialised agencies.

While awaiting the effective operationalisation of AfSA, expected in 2020, a transitory solution needs to be implemented to guarantee the continuity of the programme and improve its operational frameworks in Africa.

It is therefore envisaged to strengthen the relationship between AFCAC and the JPO, with the officialisation of their cooperation framework through a Memorandum of Understanding. Such a working arrangement shall exclude any cost impact to AFCAC, while providing the JPO with a continental framework for the implementation of its activities especially with RECs.

Furthermore, the 4th session of the Steering Committee of the JPO has recommended the creation of an internal AUC task force in charge of proposing guidelines for the institutionalisation of the JPO. The AUC task force will also provide directions on the AFCAC-JPO MoU.

6. CONCLUSION

The Plenary is invited to:

- a) Take note on the progress reported on the implementation of ongoing GNSS/SBAS initiatives.
- b) Instruct the Secretariat of AFCAC to prioritize the AU STC TTIET recommendation on the continental CBA Study and Strategy for the implementation of SBAS in Africa (as described in the WP/11 of the Secretariat).
- c) Encourage the States of the AFI Region and designated organisations to collaborate for the conduct of the CBA Study for the development and deployment of GNSS/SBAS services and applications in Africa in conjunction with RECs.
- d) Take note of the need to secure the continuation of the support and coordination activities of the JPO on the implementation of a multi-setorial collaborative and continental approach on satellite navigation, with its institutionalisation within the framework of the AU Space Policy and Strategy.
- e) Take note that AUC and AFCAC should take necessary measures to secure in the short term the GNSS/SBAS built capacity through a working arrangement between AFCAC and JPO as a transition phase towards its full institutionalisation. Such working arrangement shall exclude any financial impact on AFCAC and an internal AUC Task Force on the institutionalisation will define the modality of its implementation.