



INTERNATIONAL CIVIL AVIATION ORGANIZATION

ELEVENTH MEETING OF THE NAFISAT SUPERVISORY COMMITTEE (NAFISAT-SVC/11)  
(NAIROBI, KENYA, 10-11 OCTOBER 2016)

**Agenda item 10(b): NAFISAT Network Upgrade**

**NAFISAT & GNSS**

*(Presented by Egypt)*

**SUMMARY**

This paper discusses the progress in implementation of EGNOS based satellite navigation services in Africa; full commitment from the African decision makers and ANSPs is needed. NAFISAT network and other African network AFISNET, CAFSAT and SADC 2 shall have a clear role for encouraging & applying GNSS techniques in Africa.

**REFERENCES:**

- EGNOS Service Provision Workshop (Copenhagen 28-29 September 2015)
- GNSS/I/TF/3 – REPORT (Lagos, 29-30 June 2005)
- SAFIR Working Session #5 (Kampala, Uganda, 21-24 July 2014)
- EGNOS AFRICA Joint Programme Office (JPO) -2016 report

**1. Introduction**

1.1 GNSS are currently used in a wide variety of applications; and its economic benefits have been growing year by year with the introduction of new applications.

1.2 The introduction of EGNOS SBAS in Africa started with bilateral cooperation programmes between EU and a number of individual African States and regional grouping to support EGNOS initiatives in Africa. It included initiatives in the MEDA region, with ASECNA, and also with the Republic of South Africa. The EU as a partner of the EU/Africa EGNOS initiated in 2011 a framework programme through Action Plan 2011-2013 “Support to Air transport sector and satellite navigation in Africa.

1.3 The Framework Programme included two projects (SAFIR project and TREGA project) which were specifically created to support the development and introduction of EGNOS SBAS services in Africa. The main outcome of SAFIR is the creation of the EGNOS-Africa Joint Programme Office (JPO) therefore ensuring that EGNOS SBAS is implemented in a coordinated way with a view to achieving a seamless, safe, and efficient provision of EGNOS services all over Africa.

1.4 SBAS complements the primary GNSS system performance to improve accuracy, integrity, continuity and availability making it compliant to the stringent requirements of specialized applications such as the operational requirements set by the International Civil Aviation Organization (ICAO) for use during the most critical phases of aircraft flight, in particular final approaches.

1.5 GNSS allows users with compatible receiver devices to determine their position, velocity and local time by processing signals from geo-stationary satellites in space. GNSS signals are provided by a variety of satellite positioning systems including core constellation systems,(e.g. USA’s GPS and Russia’s GLONASS), Satellite based augmentation systems (e.g. Europe’s EGNOS )

## 2. EGNOS –Africa Joint Programme office “JPO”

### 2.1 JPO role as a Pan-African GNSS/EGNOS coordinating entity:

- Part of institutional framework to ensure harmonized safe and efficient SBAS/EGNOS services in Africa.
- A core capacity building Team for Africa.

### 2.2 Proposed EGNOS services for Africa:

EGNOS implementation in Africa – “Modules” creation

Four Modules have been recommended for Africa

- Northern (M1)
- West Central (M2)
- Eastern Africa (M3)
- Southern (M4)



### 2.3 EGNOS implementation in Africa-“Modules “creation

- ✓ Can now support all types of applications for future programs related to GNSS/EGNOS in Africa.
- ✓ Developed GNSS/EGNOS services implementation stakeholders, the necessary guidelines to address EGNOS deployment in Africa.
- ✓ The modular concept as recommended in the roadmap will drive EGNOS implementation in Africa.

### 2.4 Potential applications in non-Aviation sector

- ✓ Surveying, Mapping and GIS
- ✓ Agriculture.
- ✓ Maritime / Road/Rail

2.5 In Africa, In Aviation Sector, once the EGNOS system is operational; there will be no need for additional infrastructure to be deployed at the airports. As a result 65% of the aerodromes in Africa that are not equipped with Navaids will benefit from EGNOS SoL service. In addition, about 21% of airports/ aerodromes equipped with non-precision Navaids and about 14% equipped with ILS will benefit from EGNOS as a primary navigation aid or as a backup.

### 3. Targeted EGNOS services for Africa

The following levels of service are expected to emerge in Africa:

#### 3.1 EGNOS v2 services

Service	Date
Open Service GPS	2020
Date Safety of Life NPA GPS	2021
Safety of Life NPA+APV1+LPV200 GPS	2023

#### 3.2 EGNOS v3 services

Service	Date
Open Service GPS, GPS+GALILEO	2025
Safety of Life NPA GPS, GPS+GALILEO	2026
Safety of Life NPA+APV1 + LPV200 GPS, GPS+GALILEO	By 2028
Safety of Life Maritime TBD EDAS services	TBD
EDAS service	TBD

### 4. ICAO, ANSPs, CAAs, User Communities' Roles:

4.1 Considering that ICAO PBN drives GNSS/EGNOS uptake, ICAO guidance and its involvement during the consideration of technical matters is crucial. For ANSPs (air navigation service providers), Aerodromes operators, and Aviation Training Organizations (ATOs), they have crucial inputs on the exploitation of EGNOS system. States through the CAAs have the oversight and regulatory functions making them major partners in the implementation process. All user communities benefit from safe and reliable services making them natural partner in the decision making and implementation processes.

### 5. Looking ahead to a nearer future of EGNOS

5.1 The Africa-EU strategic partnership on satellite navigation adopted by Heads of States and Governments of Africa and Europe is an opportunity for Africa to benefit from satellite technology, as other regions of the world, and to develop and streamline its competences in GNSS/EGNOS technology with a view to become a global player in the field of satellite navigation services.

5.2 Completion of the support to capacity building programme as a prerequisite for the development and introduction of EGNOS SBAS services in Africa marks an important milestone in the operationalization of the Africa-EU strategic partnership regarding the introduction of EGNOS based satellite navigation in Africa. The required competences to address EGNOS multi-domain technologies and multi-disciplinary skills requirements have been made available through the Programme, therefore enabling Africa to move forward with the next phase of the implementation of EGNOS-based satellite navigation services.

5.3 The high-level political commitment to the introduction of EGNOS based satellite navigation services in Africa, the fact that approximately 50% of the African States are already participating in ongoing EGNOS initiatives in Africa (MEDA region, ASECNA, and the Republic of South Africa), the establishment of JPO as an African GNSS programme management entity and acquired GNSS competences and skills by African

stakeholders, and the availability of EGNOS implementation roadmap serve as a significant baseline that Africa shall exploit to ensure harmonized, safe and cost effective introduction of EGNOS based satellite navigation services.

5.4 To ensure progress in implementation of EGNOS based satellite navigation services in Africa, full commitment from the African decision makers and stakeholders is needed.

## **6. Action by the meeting**

6.1 The meeting is invited to:

- a) Take note of the information provided in this working paper;
- b) Ask NAFISAT Service providers (ATNS & IATA) to start negotiation with EC under the umbrella of ICAO to pave the way to apply EGONS covering with NAFISAT countries;
- c) Exchange views on ways and means of sharing NAFISAT and other VSAT network provider (AFISNET,SADC II and CAFSAT) on GNSS roadmap on Africa;
- d) Recommend a common regional approach in the search for necessary financing with the view to:
  - Achieving effective inter-operability between VSAT network provider and EGNOS administration to take the benefits of their experience in SBAS field.
  - Asking for performing the EGNOS Test Bed with NAFISAT countries,
- e) Encourage sharing of co-operation between NAFISAT and ASECNA to apply SBAS approach;
- f) Request AFCAC and ICAO to propose co-operation mechanisms between States/ Organizations in the Region, for SBAS technology.

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