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THIRTEENTH AIR NAVIGATION CONFERENCE

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COMMITTEE A

Agenda Item 2: Enabling the global air navigation system
2.2: Integrated CNS and spectrum strategy

GNSS MONITORING SYSTEM PROGRAMME IN THE EASTERN AFRICAN REGION

(Presented by Uganda on behalf of East African Community)

EXECUTIVE SUMMARY

This paper presents an overview of the global navigation satellite system (GNSS) monitoring system programme planned for the Eastern African region.

Action: The Conference is invited to:
a) take note of the current initiative to establish a GNSS monitoring system in the Eastern African region; and
b) request ICAO, States and organizations to undertake a joint funds mobilization in order to support the implementation of the GNSS monitoring system in the Eastern African region.

1. INTRODUCTION

1.1 The East African Community (EAC) is a regional economic community comprised of six partner States namely: Burundi, Kenya, South Sudan, Tanzania, Rwanda and Uganda. EAC in collaboration with two other regional economic communities namely the Intergovernmental Authority on Development (IGAD) and Common Market for Eastern and Southern Africa (COMESA) are considering the implementation of a global navigation satellite system (GNSS) monitoring system over the Eastern African region covered by member /partner States. The definition of the geographical area is attached.

1.2 This system shall facilitate States to implement the recommendations on GNSS monitoring and data recording as stipulated in Annex 10 — *Aeronautical Telecommunications*, Volume I — *Radio Navigation Aids*, recommendations 6/8 and 6/9 of the 12th Air Navigation Conference that underline the stakeholder responsibilities towards the mitigation of GNSS vulnerabilities, as well as the recommendations on the mitigation of GNSS vulnerabilities found in the *Global Navigation Satellite System (GNSS) Manual* (Doc 9849).

[1] English and French versions provided by Uganda on behalf of East African Community (EAC).

1.3 Additionally, the GNSS system shall be a useful tool for raising awareness and building capacity in competencies such as GNSS signal processing, performance measurement, monitoring, and analysis, among others.

2. DISCUSSION

The following are the specific objectives of the GNSS monitoring system in the Eastern African Region:

2.1 The GNSS monitoring system shall be used by States to conduct GNSS performance assessments aiming to demonstrate that the signal in space (SIS) performance meets relevant Annex 10 requirements. The performance assessments shall be conducted on core constellations and core constellations combined with an existing and/or augmentation system for different operational applications (such as en-route, terminal, and approach operations).

2.2 A second objective of the system is to perform GNSS data recording with the objective of having historical data of GNSS status to support post-incident/accident investigations. This data could also be used to comply with any legal requirements for recording based on national regulations. Additionally, it is envisaged that the data recorded can facilitate the implementation of various trials to demonstrate the benefits of using augmentation systems in aviation.

2.3 The system shall enable States to perform GNSS operational status monitoring with the main objective of providing timely information to technical staff and ATC services on the operational status of GNSS services in relation to a defined operation in a particular airspace.

2.4 Finally, the system shall facilitate States to carry out GNSS interference monitoring with the objective of providing timely warnings to technical staff and/or air traffic control (ATC) services in case of detection of interferences on relevant GNSS frequency band for a specific location (and therefore to inform the user of any operating restrictions that may be required). Ionosphere characterization studies could also be conducted by interested stakeholders, leading to the development of specific ionospheric models for use in global navigation satellite systems for the region.

Implementation modalities

2.5 Depending on available funds for the programme, implementation of this system to perform all the above objectives shall be undertaken using a phased approach. Cooperation between States and organisations is required for funds mobilization to implement this programme. Various opportunities exist including but not limited to the following:

a) The Africa - EU strategic partnership adopted by Heads of State and Government from Africa and Europe at the Lisbon Summit in December 2007. Under the second action plan of the Joint Africa-EU Strategy (JAES) adopted in 2011, following the Tripoli Africa-EU Summit in 2011, a specific item to expedite cooperation on satellite navigation with the main aim of supporting the improvement of aviation safety and efficiency of air navigation in Africa was included. Implementation of a GNSS monitoring system for the Eastern Africa region can be leveraged under this framework.

b) Another opportunity being considered is the expected creation of an Inter-regional economic community (REC) cooperation between regional economic communities

such as EAC, IGAD and COMESA towards implementation of this initiative. This will fulfil their objective of widening and deepening co-operation among the partner/member States in the political, economic and social fields for their mutual benefit. Within an Inter REC framework, political, institutional, financial, and technical studies on GNSS and augmentation systems including the implementation of the GNSS monitoring system can be conducted to facilitate improvement of aviation safety in the region.

c) Other opportunities include leveraging of cooperation with organizations like ICAO, United Nations Economic Commission for Africa (UNECA), and financial institutions like East African Development bank, African Development Bank, to mention but a few.

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APPENDIX

- EAC partner States: Burundi, Kenya, Rwanda, South Sudan, Tanzania, Uganda
- IGAD member States: Djibouti, Ethiopia, Sudan, Somalia
- COMESA member States: Democratic Republic of Congo (DRC), Eritrea



Area of concern of the GNSS monitoring project

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