



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
THIRTEENTH MEETING (APIRG/13)**

(Sal, Cape Verde, 25 - 29 June 2001)

Agenda Item 4.5: Review of the Report of the CNS/ATM/IC/SG/3 Meeting

Review of the report of the GNSS Study Group

(Presented by the Secretariat)

SUMMARY

This paper (WP/8B) presents the report of the Third meeting of the CNS/ATM/IC Sub-group on GNSS implementation activities in the AFI Region.

Action by the Meeting is at paragraph 3.

References

CNS/ATM/IC/SG/3 Report
AFI CNS/ATM Implementation Plan, Doc 003, Version 5.0

2.5 Agenda Item 5: Review of the report of the GNSS Study Group

2.5.1 Under this agenda item, the Meeting reviewed the report of AFI GNSS Study group on its activities. The Meeting reviewed WGS-84 implementation and adopted a format for reporting WGS-84 implementation status.

GNSS test bed

2.5.2 The Sub-group was briefed on the activities of the Study Group relating to implementation of the GNSS test bed in the AFI Region. The Meeting was informed that there was the need to establish an AFI-EUR SBAS Working Group for the preparation of the test bed activities. The AFI and EUR partners had developed a preliminary work plan for the implementation of Phase I of the AFI GNSS strategy, which encompassed the deployment of an EGNOS test bed, the conduct of the trials and preparatory work for the definition of activities leading to the implementation of Phase II of the AFI GNSS strategy. Among the urgent tasks is the preparation of a project document to be submitted in June 2001 to the EC for the funding of the test bed.

2.5.3 The meeting was advised that, in order to enhance the usefulness and impact of GNSS test bed, activities should be extended to other modes of transport in the AFI region. Furthermore, with regard to trials in the AFI Region, the Sub-group identified the need to seek the participation of States and navigation service providers for the provision of test-bed resources (on-site facilities and services, flight

calibration, design of GNSS-based approach procedures at locations where tests would be conducted, communications services, etc...).

2.5.4 In view of the above, the Meeting adopted the following draft conclusions.

Draft Conclusion 3/12 - AFI/EUR GNSS Test bed Working Group

That:

- a) South Africa and ASECNA be the representatives of the AFI GNSS Study Group in the AFI/EUR GNSS test bed Working Group; and
- a) States or navigation services providers, which want to support GNSS test bed activities, be invited to join the AFI/EUR GNSS test bed Working Group.

Draft Conclusion 3/13: AFI Test bed project document

That South Africa and ASECNA prepare a draft AFI test bed project document to be submitted by ASECNA in June 2001 to the European Commission for funding.

Draft Conclusion 3/14: Involvement of multimodal transport organizations in the AFI GNSS test bed trials

That contact be established with multimodal transport organizations in the AFI Region for their participation in the AFI GNSS test bed trials, as follows:

- a) ICAO with IMO, ECA;
- b) ATNS with SASAR (South African SAR Organization); and
- c) ASECNA with ECOWAS and CEMAC.

Draft Conclusion 3/15: Contact with flight calibration organizations

That ICAO contact the operators of flight calibration aircraft in the AFI Region for their participation in the AFI GNSS test bed trials.

Draft Conclusion 3/16: Assistance for GNSS procedures design

That ICAO contact the following organizations to assist in designing GNSS-based approach procedures (NPA, APV-1, APV-2) at locations where trials will be conducted: Eurocontrol, FAA, French DGCA, ASECNA, ATNS, Dutch RLD.

Documentation on criteria for State approval of aircraft operations using GNSS

2.5.5 The Meeting recalled that the AFI/7 RAN Meeting adopted Conclusion 13/5, which, inter alia, requested that APIRG “develop criteria for the approval of aircraft operations using GNSS, giving consideration to the needs of all phases of flight, for en route navigation in oceanic areas and continental areas and for terminal area navigation”. This task has been assigned to the GNSS Study Group for follow up.

- 2.5.6 The Meeting recognized that in order to implement GNSS, it will be necessary for all States to introduce any legislative and/or regulatory changes which may be needed in order to authorize the use of GNSS as a means of navigation within their airspace. There could be considerable variation in the nature of the amendments required, depending on the structure of the legislation and regulations in each State..

Airworthiness and operational approval

- 2.5.7 The Meeting was aware that development and implementation of procedures for airworthiness and operational approval of GNSS is a State responsibility. It was noted that there is no ICAO guidance material available for these approval procedures.
- 2.5.8 There are a number of airworthiness and operational approval examples available from States which have already implemented GNSS procedures. The Meeting noted the list of documents published by some these States.
- 2.5.9 The Meeting agreed that some of these documents could be made available to States. It was agreed that States would be provided with the Internet address of the bulky documents and be invited to request from the originators those available in hard copy form. In discussing the main impediments to AFI States in authorizing use of GNSS, the Sub-group identified the lack of expertise in GNSS airworthiness and operational approval. The Meeting adopted the following draft conclusion.

Draft Conclusion 3/17: Documentation for States

That, further to AFI/7 RAN Conclusion 13/5:

- d) the following documentation be sent to States for their studies and use as appropriate for criteria on approving aircraft operations using GNSS:
- | | |
|-------|----------------------------------|
| - FAA | N8110.60 |
| - FAA | Advisory Circular (AC No.20-130) |
| - FAA | TSO-C129a |
- b) The European Commission *Manual for the Validation of GNSS in Civil Aviation* (MUSST) be made available on the ICAO web site; and
- c) ICAO conduct workshops in AFI Region to sensitize States on the need and importance of airworthiness and operational certifications of on board equipment for GNSS operations.

Update of the AFI GNSS Strategy

- 2.5.10 The Meeting was aware that the augmentation systems being developed (EGNOS and WAAS) will not achieve the requirements for sole-means navigation. Furthermore, both systems are experiencing delays in their implementation schedules. WAAS is expected to be operational in 2002 over the continental USA and EGNOS will be available in late 2003 over the ECAC area. In addition, Europe is developing a civil navigation constellation, Galileo, which will be available in the ECAC, at the earliest, around

2008, and about 2010 in the AFI Region.

2.5.11 In view of the above developments, the Study Group undertook a review and update of the AFI GNSS strategy. A three-phase approach was agreed:

Phase I (up to 2004)

- GNSS as a primary-means of navigation for en route
- GNSS as a supplemental-means for TMA and NPA
- Implementation of a test bed (up to 2003)
- Implementation and validation of SBAS to be operational at the end of Phase I (2004). This will allow APV-I to be available at the beginning of Phase II.

Phase II (from 2005 to 2011)

- APV-I, 20 m vertical accuracy available over the AFI Region
- GNSS sole-means for en route
- Decommissioning of en route Nav aids
- GNSS sole-means for terminal areas
- Decommissioning of terminal Nav aids (VOR/DME and NDB)
- ILS maintained at airports
- Development of Long term GNSS

Phase III (2012 onwards)

- Two GNSS constellations are available
- GNSS sole-means from en route to CAT-I landing
- Decommissioning of ILS Cat I
- CAT II/III requirements implemented by GBAS or SBAS.

2.5.12 The Meeting formulated amendments to the AFI GNSS strategy as shown in **Appendix A**. The following draft conclusion was adopted.

Conclusion 3/18: AFI GNSS Strategy

The AFI GNSS strategy be amended as shown in **Appendix A**.

Uniform format for reporting WGS-84 implementation

2.5.13 The Meeting reviewed the status of implementation of WGS-84 in the AFI Region. It was noted that not all States had published the results of their surveys. The Meeting reviewed a format for the reporting of WGS-84 implementation by States adopted by the ALLPIRG/4 meeting for use by Regional Planning Groups. The Meeting adopted the following draft conclusion.

Draft Conclusion 3/19: Adoption of a uniform format for the reporting of WGS-84 implementation

That the table available at **Appendix B** be adopted as a uniform format for the reporting of WGS-84 implementation by States in the AFI Region.

3. **Action by APIRG**

3.1 The APIRG is invited to:

- a) note the report of the Third meeting of the CNS/ATM/IC Sub-group; and
- b) to review and adopt **Draft Conclusions** 3/12, 3/13, 3/14, 3/15, 3/16, 3/17, 3/18 and 3/19.
