Agenda Item 6: Assessment of operational requirements in order to determine the implementation of communications and surveillance (CNS) capabilities improvement for en-route and terminal area operations

SEMINAR ON GROUND AND FLIGHT TESTS

(Presented by the Secretariat)

SUMMARY

This working paper presents, for the analysis of the Meeting, considerations for the carrying out of a seminar on ground and flight tests for the new navigation and surveillance systems, as well as on-flight verification of PBN applications in continental, terminal and approach areas in the SAM Region.

References:

- CAR/SAM PBN Roadmap, version 1.4 / July 009;
- Strategy for the evolution of air navigation systems for the CAR/SAM Regions; and
- Regional unified surveillance strategy for the CAR/SAM Regions.

***ICAO strategic objective**:*	*D - Efficiency*

1. Background

1.1 In accordance with regional PBN applications planning, in the short term, RNAV-5 is envisaged in selected airspaces where operational benefits can be derived and where the available CNS infrastructure will support it.

1.2 In the medium term, RNP-2 is expected in selected high-density continental airspaces, using GNSS only, taking into account that the ground infrastructure will not support RNAV applications. The establishment of a backup system for GNSS will be required, as well as the development of contingency procedures in case of GNSS failure. The use of RNP-2 will facilitate the application of PBN in airspaces that lack surveillance.

1.3 In the short term, the implementation of RNAV-1 is expected in TMAs selected by the States, under radar coverage, and with the appropriate ground navigation infrastructure that allows for DME/DME and DME/DME/INS operations. During this phase, both equipped and non-equipped aircraft will be allowed to operate, and RNAV-1 operations shall begin once the appropriate percentage of approved air operations has been achieved.

1.4 In non-radar environments and/or where there is no appropriate ground navigation infrastructure, the implementation of RNP-1 in the short term is expected in TMAs selected by the States, using GNSS alone, provided there is an appropriate percentage of approved air operations. Both approved and non-approved aircraft will also be allowed to operate in these TMAs.

1.5 PBN approach procedures shall be implemented in the short term as approach procedures with vertical guidance (APV) using baro-VNAV for runways, be it as primary approach or as backup for all final approaches to the runway, based on RNP APCH or RNP AR APCH navigation specifications.

1.6 Use of RNP APCH (basic GNSS) approach procedures is expected in the short term in most international airports selected by the State, maintaining conventional approach procedures for conventional non-equipped aircraft.

1.7 Use of RNP AR approach procedures is expected in the short term at airports selected by the State, where operational benefits to be obtained are evident, based on the existence of significant obstacles.

1.8 In the medium term, it is expected that RNAV or RNP 1 applications will be extended to TMAs selected by the States, depending on ground infrastructure and aircraft navigation capabilities. At more complex TMAs, the use of RNAV or RNP 1 (exclusionary airspace) equipment will be mandatory. At less complex TMAs, both equipped and non-equipped aircraft will be allowed to operate.

1.9 In the medium term, it is expected that RNP APCH and RNP AR procedures will be extended to selected airports. Initial implementation of GLS procedures is also envisaged, thus ensuring a smooth TMA-to-approach transition, basically using GNSS for the two phases.

2. **Analysis**

2.1 PBN implementation described in the background section requires a set of activities that the SAM/IG Group has been carrying out since the first workshop/meeting of the SAM implementation group, with the elaboration of action plans, guidance material and a training programme initially oriented to ATS personnel in charge of procedures design and airworthiness inspectors.

2.2 One of the most important areas for the implementation of PBN applications are the flight testing units, which because of these new air navigation applications, require of new ground and flight procedures.

2.3 Many of the flight test units of the Region are not capable of carrying out the flight and ground assessments required by the new navigation systems, as they do not have the training and equipment necessary to this end.

2.4 Also, with the short and medium term implementation of the new surveillance systems, such multilateration and ADS B, these units will also require the training necessary for their on flight assessment.

2.5 In this respect, with the aim of:

a) Assessing the current situation of the flight test units in the Region as regards their capability to make the necessary PBN and new surveillance systems flight and ground evaluations;
b) Becoming aware of the activities programmed by ICAO for the elaboration of guidance material or amendments with regard to the material published on ground and flight tests for navigation and surveillance systems;
c) Informing on the new instrument equipment, new techniques and ground and flight trends;

d) Gaining experience from other ICAO regions in the implementation of flight tests for PBN and the new surveillance systems; and
e) Establishing recommendations on possible actions to take for the current flight testing units in the Region to count with the necessary equipment and training fro the flight and ground evaluation of PBN applications, and the new navigation and surveillance systems.

A seminar on the flight and ground assessment of the new navigation and surveillance systems, as well as the validation of PBN flight procedures, will be required. The seminar would have a 3-day duration and would be initially carried out from 21 to 23 November 2011.

3. **Action suggested**

3.1 The Meeting is invited to**:**

a) Take note of the information provided in the working paper;
b) Analyze the possibility of holding a seminar on flight and ground test for navigation and surveillance systems, with the aim that it be taken under consideration at the fourth committee coordination meeting of RLA/06/901 project; and
c) Analyze any other matters which the Meeting may deem convenient.

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