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WORKING PAPER

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ASSEMBLY — 38TH SESSION

TECHNICAL COMMISSION

Agenda Item 35: Air Navigation – Implementation Support

ASECNA PBN IMPLEMENTATION

[Presented by the Agency for Air Navigation Safety in Africa and Madagascar (ASECNA)]

EXECUTIVE SUMMARY

This information note has for object the state of the implementation of the navigation based on the performances (PBN) in ASECNA member states.

Action: The Assembly is invited to:
a) take note of the progress realized by ASECNA in the implementation of the PBN;
b) urge the States of the AFI region to accelerate the implementation of the PBN; and
c) encourage the States of the AFI Region to subscribe and to support the AFI-FPP.

Strategic objectives:	This working paper relates to the Strategic Objectives of Safety, and Environmental Protection and Sustainable Development of Air Transport.
Financial implications:	Not applicable.
References:	• Doc 9613, *Performance Based Navigation Manual* • Doc 9958, *Assembly Resolutions in Force (as of 8 October 2010)* • Letter of intent signed on 20 October 2012, between ICAO, ASECNA and the French DGCA • AFI road map for the PBN

[1] English and French versions provided by ASECNA.
(5 pages)

1. INTRODUCTION

1.1 With the aim of stopping the proliferation of the regional RNAV and RNP standards, the ICAO created in 2007 the PBN concept which clearly redefines the RNAV and the RNP according to the zones of operations. Resolutions A36-23 and A37-11 of the ICAO Assembly, call States contracting parties to implement ATS routes, departures and arrivals procedures, and approaches, corresponding to the PBN concept and demand for these States and regional groups of planning and implementation (PIRG) to develop each, implementation plans of the PBN (for at the latest, December 2009).

1.2 The navigation based on the performances (PBN) concept describes in terms of performances requirements, the embarked navigation system necessary for aircraft operating on ATS routes or flying instruments approaches procedures or in the airspaces defined. The purpose of the PBN is to arrive in:

a) a dynamic management of spaces;

b) the improvement of the accessibility of the airports of the inhospitable regions (mountainous, desert, oceanic, etc.);

c) the use of the real capacities of the aircraft and;

d) the reduction of the distances (loxodromic).

1.2.1 The requirements of performances are expressed in terms of precision, integrity, continuity and availability.

1.3 To follow up the ICAO resolutions, the planning and implementation group for the Africa and Indian-Ocean Region (APIRG) adopted in December, 2008, the «Road map for the Implementation of the Navigation based on the Performances (PBN) in the Africa and Indian-Ocean Region (AFI)».

1.4 The AFI road map for the PBN plans the implementation of the PBN in 3 stages, the short term (2008-2012), the middle term (2013-2016) and the long term (2017 and beyond).

1.4.1 The objectives of realization, according to the types of operations, defined for the short term are:

a) **Operations in oceanic and continental routes distant**: implementation in 2010 by States or concerned ANSP, of the RNAV 10 and RNP4 if necessary, in the distant oceanic and continental zones.

b) **Operations in continental routes**: revision of the conventional and the RNAV routes not PBN to pass in the specifications PBN RNAV5, RNAV 2 and RNAV 1 at the need.

c) **Operations in terminal zone**: implementation of the SIDs and the STARS PBN on 30 % of the international airports in 2010 and 50 % in 2012.

d) **Operations in approach**: Implementation of the RNP APCH (with Baro-VNAV) for 30 % of instruments runways in 2010 and 50 % in 2012.

2. STATE OF THE IMPLEMENTATION IN THE ASECNA ZONE

2.1 **En-route Oceanic:** In the airspaces managed by ASECNA, the progressive implementation of the flexible ATS routes RNP10 began with the creation of the airspaces called AORRA (Atlantic Ocean RNAV Random Routing Area) in four phases.

a) **Phase I**: the implementation began on 21 December 2006 and concerns the oceanic FIRs Johannesburg and Luanda, and the FIRs Atlantico, Ezeiza and Montevideo. No airspace managed by the ASECNA was involved in this phase.

b) **Phase II**: Dakar oceanic FIR and the oceanic FIRs Johannesburg and Luanda, Atlantico, Ezeiza, Montevideo are concerned. AORRA Space were implanted on 9 April 2009 by the Supplement of ASECNA AIP N 02 /A / 09GO, 12 February 2009.

c) **Phase III and IV:** only Dakar Oceanic FIR was concerned by the new AORRA creation, on 26 August 2010, by the Supplement of ASECNA AIP N°09/A/10GO, 29 July 2010. Six (6) ATS routes sections were deleted to give place to AORRA:

- ✓ UA560: AKRAN-ARLEM;
- ✓ UG433: SERIM-TUROT;
- ✓ UA572: ASDOK-TINIS;
- ✓ UA302: KODOS-TAROT;
- ✓ UL 435: URAPI-BUVUK;
- ✓ UR991G: EMTAL-ARLEM.

This phase also allowed the creation of the points of Input-output towards AORRA spaces (Atlantic Ocean RNAV Random Routing Area): about 47 points were created within the limits of Dakar Oceanic and Robert FIRs, on one hand, and the limits of the Accra and Brazzaville FIRs, on the other hand.

d) **Phase V:** On July 26, 2012 (Ref. SUP AIP N°28 N°28/A/12 GO) in application of the SAT / 17 / 01 conclusion of the 17th meeting of the SAT group, ASECNA, in coordination with Accra and the IATA, widened successfully the AORRA space of the parallel 00°to the parallel 4°N in which the fixed routes were thus suspended. ASECNA is also involved in the implementation of airspace random routing in the Indian Ocean. For that purpose, ASECNA participates in the initiative INSPIRE (Indian Ocean strategic partnership to reduce Emission) within the framework of the ASIOACG group (Arabian Sea / Indian Ocean ATS coordination Group).

2.2 **En-route Continental:** In association with the IATA, ASECNA and States concerned by the AFI region, implanted dozens of fixed PBN routes, between 2007 and 2010.

a) 14 routes RNAV-10 : UN741, UN866, UN857 UN873, UM 104, UM 114, UM 122, UM 214, UM 372, UM 608, UM 725, UM 731, UM 974, UM998.

b) 09 regional routes RNAV10, East/West: UV207, UT139, UT142, UT143, UT149, UT258, UT267, UT365 and UT368.

2.2.1 This collaboration continued with IATA in 2012. It allowed the implementation of 20 flexible ATS routes of capacity required for the RNAV10 navigation by the Supplements of ASECNA AIP N°05 / A/12 FC, 9 February 2012, for an enforcement on 8 March 2012.

2.2.2 The experience was decisive as well for the airspace users as the concerned ANSPs.

2.2.3 The AFI workgroup on the development of the PBN network routes (PRND) of which ASECNA is a member, met in Dakar, 5-7 August 2013, to pursue this process of implementation of ATS PBN routes in the AFI region.

2.2.4 The Group proposed about fifty new ATS routes optimized to implement (after studies of air traffic and studies of safety).

2.3 **Approach and Terminal Zone:** Within the framework of the AFI road map for the PBN implementation, ASECNA develops and implements SIDs, STARS and the approaches procedures based on the PBN criteria on every 30 international airports of member States. The finalization of the implementation of the STAR and PBN approaches on all the main airports is envisaged for the end of year 2014.

2.3.1 The PBN approach of ASECNA also aims at the conformity of member States with the concept of upgrade by blocks of the system of the aviation (ASBU), in particular at the level of Block 0.

2.4 **ICAO AFI PBN Programme**

2.4.1 The special regional meeting of air navigation Ocean-Indian and Africa (SP AFI/08 RAN) held in November 2008, envisaged the flight procedures Office to strengthen the safety of the trajectories of instruments flight (IFR) and help to improve the safety and the efficiency of the IFR procedures in Africa. In support of Resolution A37-11, ASECNA, with the cooperation of ICAO and of the French DGAC, and his States partners for AFI Region agreed to establish a programme of flight procedures in the region to develop the capacity of States to support the implementation of the PBN.

2.4.2 For that purpose, on 20 November 2012, ICAO, ASECNA, as host administration, and the DGCA France, as sponsor, signed a letter of intent with the aim of the creation of the AFI Flight Procedures Programme.

2.4.3 The purpose of the programme is to promote the implementation of safe and efficient flight procedures by taking a particular attention to techniques of PBN procedures and airspace design to facilitate the realization of the advantages of the PBN, including the approaches with vertical guidance. The following activities of support, among others, are envisaged:

- ✓ training and support of the local designers of air space and procedures;
- ✓ design of IFR procedures for States without capacity of design of procedures;
- ✓ training on the regulatory processes of approval of the procedures (including the PBN procedures);
- ✓ training on the processes of validation and quality assurance;

- ✓ PBN training for the ATC and ATM staff; and
- ✓ training and support on the operational approval PBN of aircraft operators.

2.4.4 In coordination with ASECNA and the French DGCA, ICAO established the programme in Dakar, Senegal. The administrations of the civil aviation of the AFI Region are invited to participate in the FPP AFI by signing the document of the programme and by making financial contributions or technical contributions in kind (instructors, designers, etc.).

2.4.5 The AFI Flight Procedures Programme has started its activity in July 2013 in the office based in Dakar, Senegal.

2.4.6 The very first activity is to create a team according to the human resources described in ICAO Secretary General State letter. Experts from ASECNA and participing States have to be seconded to the AFI Flight Procedures Office. An action plan document presenting in details the programme work plan, personnel resources, financial commitments and milestones is presently developed.

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