INTERNATIONAL CIVIL AVIATION ORGANIZATION

FIRST MEETING OF THE APIRG PERFORMANCE-BASED NAVIGATION TASK FORCE (PBN/TF/1)
REPORT

(Nairobi, Kenya, 29 – 30 May 2008)

Prepared by the PBN TASK FORCE

The PBN Task Force is a Task Force of the AFI Planning and Implementation Regional Group (APIRG).

Its Reports are therefore submitted to APIRG through the ATS/AIS/SAR Sub-Group for review and action.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Table of Contents

Appendices:

PART I – HISTORY OF THE MEETING

1.   Introduction

1.1   The First PBN Task Force (PBN/TF/1) was convened pursuant to APIRG 16 meeting Conclusion 16/2 by the ICAO ESAF Office Nairobi, from 29 to 30 May 2008.

1.2   The First meeting of PBN Task Force was opened by Mr. M. Ndiaye, Deputy Regional Director, ICAO ESAF Office.

1.3   The meeting nominated Mr. Harry Roberts of South Africa, as the Chairman of the meeting. He thanked the participants for the confidence given to him and appealed for their full cooperation to come up with the expected conclusions and decisions.

2.   Officers and Secretariat

2.1   Mr. Apolo Kharuga, Regional Officer, Air Traffic Management from the ICAO ESAF Office, Nairobi, was the Secretary of the meeting, Mr. Dave Vanness, TO/ATM HQ and K. Brou RO/ATM, Nairobi assisted him.

3.   Attendance

3.1   The meeting was attended by 42 participants from 17 States and 6 International Organizations namely; ASECNA, FIR Roberts, IATA IFALPA, IFATCA and KALPA. The list of participants is given at **Appendix A** to this report.

4.   Working Language

4.1   The meeting was conducted in the English language.

----

5.   **AGENDA**

5.1   **The following Agenda was adopted:**

Agenda Item 1

Adoption of Agenda and election of the Chairperson.

Agenda Item 2

Introduction to Performance Based Navigation (PBN).

Agenda Item 3

Review Terms of Reference, Work Programme and Composition.

Agenda Item 4

PBN implementation – Airline Perspective.

Agenda Item 5

Development of PBN implementation documents i.e. Task List and Action Plan Regional PBN Implementation Plan, Guidance Material, etc.

Agenda Item 6

Any other business.

LIST OF CONCLUSIONS/DECISION

Number	Title
Conclusion 1/1:	**Members of PBN Task Force** That the following states and international organizations shall nominate experts to serve as members of the PBN Task Force: Algeria, Benin, Burundi, Botswana, Cameroon, Cape Verde, Chad, Democratic Republic of Congo(DRC), Egypt, Ethiopia, Ghana, Kenya, Liberia, Mauritius, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Tunisia, Uganda, IFALPA, IFATCA, IATA, ASECNA and Roberts FIR.
Conclusion 1/2:	**Survey on aircraft equipage** That IATA utilize the format at **Appendix B** to solicit aircraft equipage in relation to CNS capability of aircraft operated within the AFI Region, for implementation of PBN as an ongoing activity.
Conclusion 1/3:	**PBN Approach and Terminal implementation status questionnaire** That the questionnaire at **Appendix C** (PBN Approach Terminal implementation status) be circulated to States, with copies provided to the PBN Focal Point of Contact (FPOC) and ANSPs in order to determine the implementation status of PBN Terminal Instrument Approach procedures (SIDs and STARs).
Conclusion 1/4:	**Categorization and specifications of PBN airspaces** That the AFI Regional PBN Plan Work Group (WG) shall take into account the requirement to categorize the AFI Region airspace as required, considering the following navigation specifications: a) Oceanic and/or remote continental areas- RNAV 10 or RNP 4; b) Continental en-route – RNAV 5, RNAV 2 or RNAV 1, or RNP 1 or RNP 2.
Conclusion 1/5:	**Model Guidance material to assist States in the implementation of PBN** That the material at **Appendix D** be adopted for the development of State approval documentation for the navigation specification.
Conclusion 1/6:	**Civil/Military Coordination** That in order to ensure the safe and coordinated implementation of PBN in the AFI Region, States should ensure that the military aviation authorities are fully involved in the planning and implementing process.

Number	Title
Conclusion 1/7:	**Nomination of a PBN Focal Point of Contact (FPOC)** That States/service providers nominate as soon as possible, but not later than **31 August 2008** a PBN Focal Point of Contact, who will be responsible for ensuring that the proper mechanism be put in place for the safe implementation of PBN.
Conclusion 1/8:	**Implementation of PBN in the AFI Region** That: a) States in the AFI Region ensure that all requirements be met with a view to safely implement PBN and; b) implementation of PBN in the AFI Region be harmonized and coordinated with other adjacent Regions.
Conclusion 1/9:	**Training of all personnel involved with the implementation of PBN in the AFI Region** That: a) ICAO explores the possibility of assisting States of the AFI Region through a Special Implementation Project (SIP) for training of personnel involved with the implementation of PBN in the AFI Region; b) Seminars/Workshops be organized in the Region for training of relevant personnel directly involved in the implementation of PBN namely pilots, controllers, procedures designers, dispatchers, Ops/Air, operators etc; c) States be invited to approach training institutions for the development of a training module in the PBN field representative of the AFI Region; and d) States having difficulties in implementing PBN implementation programme, may either individually or in group explore the possibility of seeking outside expertise.
Conclusion 1/10:	**PBN Legislation** That the States include in their legislation and regulations the provisions relating to PBN.
Conclusion 1/11:	**Participation of representatives of States involved in PBN approval process** That representatives of States involved in the PBN approval process of aircraft operators, be invited to attend the future meetings of the PBN Task Force.

Number	Title
Conclusion 1/12:	**Funding of the PBN Implementation Programme** That regulatory bodies, operators, service providers and other stakeholders be granted budgetary allocations for acquisitions and other activities necessary for ensuring that all the requirements be met in a timely manner in order to safely implement PBN in the AFI Region.
Conclusion 1/13:	**Adoption of the material for the development of the AFI Regional PBN Implementation Plan** That: a) the PBN Task Force accept the material at **Appendix E** as guidance material for the development of the AFI Regional PBN Implementation Plan. The Plan to be completed by December 2008; b) a Work Group be formed to develop the AFI Regional PBN Implementation Plan; c) the AFI Regional PBN Implementation Plan WG utilize the material at **Appendix E** as guidance material for the development of the AFI Regional PBN Implementation Plan; d) the AFI Regional PBN Implementation Plan WG use the material at **Appendix E –Attachment** to develop the AFI Regional PBN strategy/action Plan. e) a Work group be formed to develop a State PBN Plan in line with the AFI Regional PBN Implementation Plan;. f) the State PBN Plan Work Group utilize the material listed in **Appendix F for the development of State PBN Plan;** g) the AFI Regional PBN Implementation Plan Work Group and the State PBN Plan Work Group shall liaise with each other as required, in order to harmonize the plan and actions developed; and h) the composition of the two Work Groups are as follows: **AFI Regional PBN Implementation Plan Work Group**: **South Africa (Rapporteur)** Sudan Algeria Tanzania Benin Uganda Burundi ASECNA CapeVerde IATA DRC IFALPA Egypt IFATCA Liberia Roberts FIR Mauritius

Number	Title
	State PBN Plan Work Group: Botswana Cameroon Senegal Chad Tunisia Ethiopia **ASECNA (Rapporteur)** Ghana IATA Kenya IFALPA Liberia IFATCA Nigeria Roberts FIR Rwanda
Conclusion 1/14:	**Model Guidance Material to assist States in PBN Implementation.** That the PBN Strategy/Action Plan Work Group select a navigation specification from those available from the table at **Appendix D** and develop a model operational approval document to assist States in PBN implementation, by December 2008
Conclusion1/15:	**Establishment of an ICAO AFI Flight Procedure Office** That: a) The AFI PBN Task Force support the concept for the establishment of an ICAO AFI Flight Procedure Office; and b) The Task Force note that the Secretariat will be submitting a working paper to the AFI Special Regional Air Navigation (AFI SRAN) meeting, proposing the establishment of an ICAO AFI Flight Procedure Office.
Decision 1/1:	**Working Methodology** That the Task Force will: a) utilize Electronic means to post WP and IPs prior to meetings; site: www.icao.int/esaf/pbn; b) post at least one week prior to meetings on the following ICAO website: www.icao.int/esaf/pbn; c) conduct paperless meetings as far as possible; d) all correspondence will be via electronic means; e) initially meet in a plenary at the opening and closing sessions of each meeting and subsequently continue work as the two Work Groups; and f) between meetings the work by email or telephone conferences between the Rapporteur and the WG members keeping the Chairperson and the Secretary of the Task Force informed.

PART II: REPORT ON AGENDA ITEMS

Agenda Item 1:

1.   Adoption of Agenda and election of the Chairperson. (Refer to paragraphs 1.3
and 5.1 above).

Agenda Item 2: **Introduction to Performance Based Navigation (PBN).**

2.1   The Secretariat gave a presentation to the meeting providing an overview
of the history of the ICAO PBN Programme recalling the major PBN goals set by Assembly
Resolution A36-23, PBN concept, the PBN implementation process in the PBN Manual, and
the Airspace Concept, including context in the ICAO Global ATM strategy and elements
necessary for the development of the airspace concept.

Agenda Item 3:   Review Terms of Reference, Work Programme and Composition

 3.1   The meeting recalled that 36th Assembly Resolution under A36 -23
advocated for the States to develop a PBN implementation Plan by 2009, geared towards
achieving Global implementation performance objectives. It noted that it was essential that
the PBN implementation Plan be developed in full cooperation and coordination with all
stakeholders, including regulators, ANS Providers, aerodrome operators, air operators and
others as appropriate. Pursuant to   A36-23, APIRG 16 Meeting, under Decision 16/2 set up a
PBN Task Force to expedite action for the planning of an evolutionary implementation of
Performance based Navigation in the AFI Region.

> **DECISION 16/2:   ESTABLISHMENT   OF   AN   APIRG
> PERFORMANCE   BASED   NAVIGATION   TASK   FORCE
> (APIRG/PBN/TF):**
>
> **THAT AN APIRG PBN TASK FORCE, WITH TERMS OF
> REFERENCE AS OUTLINED BELOW, BE ESTABLISHED TO
> DEVELOP A PBN IMPLEMENTATION PLAN FOR THE AFI
> REGION AND ADDRESS RELATED REGIONAL PBN
> IMPLEMENTATION ISSUES.**

**Terms of Reference of the APIRG Performance Based Navigation (PBN) Task Force
(APIRG PBN/TF)**

3.2   Develop as part of the goal of moving towards a performance-based Global
ATM System, an African Regional PBN implementation plan, based on a gap analysis, in
line with the ICAO PBN goals and milestones. This PBN implementation plan must be based
on the following strategic objectives and guiding principles.

Strategic objectives:

a)   to ensure that the implementation of the navigation item of the CNS/ATM system is based on clearly established operational requirements;

b)   to avoid undue multiple equipment on the aircraft and/or multiple systems on ground;

c)   to avoid the need for multiple airworthiness and operational approvals for intra- and inter-regional operations;

d)   to explain in detail the contents of the Regional Air Navigation Plan and of the Regional CNS/ATM Plan, describing potential navigation applications.

Guiding principles:

a)   pre and post-implementation safety assessments will be conducted to ensure the application and maintenance of the established target levels of safety;

b)   continued application of conventional air navigation procedures during the transition period, to guarantee the operations by users that are not RNAV- and/or RNP-equipped;

c)   the first regional PBN implementation plan should address the short term (2009-2012) and medium term (2013-2017);

d)   target date for completion of the first regional PBN implementation plan is December 2008; and

e)   input will be considered from all stakeholders in the PBN implementation process.

3.3   Carry out specific studies, develop guidance material and facilitate training to assist States with RNAV/RNP implementation in the en-route, terminal, and approach flight phases, taking into account the performance based navigation (PBN) concept, according to the ICAO Strategic Objectives and Global Plan Initiatives (GPI) on this matter (GPI 5, 7, 10, 11, 12, 20, 21) (cf. **Appendix F** Attachment).

3.4   Identify other issues/action items arising from the work of the RNP SORSG or for consideration by the RNP SORSG in order to facilitate regional and global harmonization of existing applications as well as future implementation of Performance Based Navigation operations.

3.5   Review the States' PBN implementation documentation to ensure regional harmonization and for possible inclusion in ICAO-developed model documentation.

3.6   Address other regional PBN implementation issues as needed.

3.7   The Task Force should report to the APIRG, through the ATS/AIS/SAR Sub-group and briefing to the CNS Sub-group.

3.8   The Task Force noted that APIRG had agreed that in order to urgently respond to the intent of Assembly Resolution A36-23 it formulated   Conclusions 16/3 .It further noted that APIRG under Conclusion. 16/4 had agreed that the States under paragraph 3.9 below would be members of the PBN Task Force and that these States would be requested to nominate members of the Task Force and designate such a member as the National Focal Point of Contact (FPOC).

CONCLUSION 16/3:   DEVELOPMENT OF STATES PBN IMPLEMENTATION PLANS:

THAT, THE REGIONAL OFFICES ENCOURAGE STATES TO BEGIN DEVELOPMENT OF THEIR STATE PBN IMPLEMENTATION PLANS IN HARMONY WITH THE DEVELOPMENT OF THE AFI REGIONAL PBN IMPLEMENTATION PLAN BEING COORDINATED BY THE AFI PBN TASK FORCE FOR SUBMISSION TO APIRG.

CONCLUSION 16/4:   DESIGNATION OF CONTACT PERSON FOR PBN IMPLEMENTATION:

THAT, BY 28 FEBRUARY 2008, STATES DESIGNATES A FOCAL CONTACT PERSON RESPONSIBLE FOR PERFORMANCES BASED NAVIGATION IMPLEMENTATION AND PROVIDE DETAILS OF THE CONTACT PERSON TO ICAO REGIONAL OFFICES FOR THE AFI REGION.

Composition:

 3.9   Algeria, Benin, Burundi, Botswana, Cameroon, Capo Verde, Chad, Democratic of Republic Congo(DRC), Egypt, Ethiopia, Ghana, Kenya, Liberia, Mauritius, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Tunisia, Uganda, ASECNA, IATA, IFALPA, IFATCA, and Roberts FIR.

               In view of the discussions the meeting noted its Terms of reference as approved by APIRG. The TF also formulated Conclusion 1/1:

CONCLUSION 1/1: MEMBERS OF PBN TASK FORCE

THAT THE FOLLOWING STATES AND INTERNATIONAL ORGANIZATIONS SHALL NOMINATE EXPERTS TO SERVE AS MEMBERS OF THE PBN TASK FORCE: ALGERIA, BENIN, BURUNDI, BOTSWANA, CAMEROON, CAPE VERDE, CHAD, DEMOCRATIC REPUBLIC OF CONGO(DRC), EGYPT, ETHIOPIA, GHANA, KENYA, LIBERIA, MAURITIUS, NIGERIA, RWANDA, SENEGAL, SOUTH AFRICA, SUDAN, TANZANIA, TUNISIA, UGANDA, ASECNA, IATA, IFALPA, IFATCA AND ROBERTS FIR.

Agenda Item 4:   PBN implementation – Airline Perspective

4.1   Under this agenda item a presentation was made by IATA which recalled
of the emerging technologies innovations being developed to enhance flight operations
globally with emphasis and prioritization being given to new solutions on communications
Navigation Surveillance as well as ATM areas. In the presentation it was recalled that a
roadmap for the implementation of new technological solutions in CNS and ATM areas
needed to be updated. This undertaking was as a result of collaborative work between States,
regulators, ANS providers, manufacturers and operators. In this regard, the meeting noted
that IATA had developed a table for the collection of and dissemination of aircraft equipage
information from its member airlines. The meeting was provided with the results of the IATA
survey conducted in February 2008 on the equipage for its member airlines operating in the
AFI Area of Routing AR1 and AR2 (EUR/SAM corridor). The Task Force considered this
data collection approach and agreed that the Secretariat adopt the IATA Table for the
conducting of the surveys on the equipage and the relevant aircraft navigation performance
related data for the AFI Region. The data so collected would be updated regularly and made
available to the relevant bodies involved in the CNS/ATM implementation. The meeting
further agreed that the questionnaire be sent to the States for the collection of the data.

4.2   In view of the discussions the meeting formulated Conclusion 1/2:

CONCLUSION 1/2: SURVEY ON AIRCRAFT EQUIPAGE

**THAT IATA UTILIZE THE FORMAT AT APPENDIX B TO SOLICIT
AIRCRAFT EQUIPAGE IN RELATION TO CNS CAPABILITY OF
AIRCRAFT OPERATED WITHIN THE AFI REGION, FOR
IMPLEMENTATION OF PBN AS AN ONGOING ACTIVITY.**

**Agenda Item 5 :   Development of PBN implementation documents i.e. Task List and
                         Action Plan, Regional PBN Implementation Plan, Guidance
                         Material, etc**.

**Development of a questionnaire on status of implementation of PBN Terminal
Instrument Procedures (SIDs and STARs)**

5.1   The meeting recalled that the 36th ICAO General Assembly in Resolution
A36-23 set goals with specific timelines for implementation of approach procedures with
vertical guidance. In order for ICAO to track progress in achieving all the approach and
terminal goals in the resolution, it was necessary to obtain information from the States
regarding the current status of implementation as well as updates, on at least an annual basis.
This information would also be useful for Regions, sub-regional groups and States as they
develop and update their PBN implementation plans. In order to have the information
necessary to accurately report progress in the terminal and approach environment, and to
provide feedback to the States and Regions on their progress in PBN implementation, the
meeting agreed on an Excel spreadsheet questionnaire to sent to States to obtain the data.

5.2   In view of the discussions the meeting formulated the following conclusion

> **CONCLUSION 1/3: PBN APPROACH TERMINAL**
> **IMPLEMENTATION STATUS QUESTIONNAIRE**
>
> **THAT THE QUESTIONNAIRE AT APPENDIX C (PBN APPROACH**
> **TERMINAL IMPLEMENTATION STATUS) BE CIRCULATED TO**
> **STATES, WITH COPIES PROVIDED TO THE PBN FOCAL POINT**
> **OF CONTACT AND ANSPS IN ORDER TO DETERMINE THE**
> **IMPLEMENTATION STATUS OF PBN TERMINAL INSTRUMENT**
> **PROCEDURES (SIDS AND STARS).**

Development of an AFI Regional Performance Based Navigation (PBN)
Implementation Plan

5.3   The meeting recalled that Assembly Resolution A36-23 had called for States
to develop a PBN implementation Plan by 2009, geared towards achieving Global
Implementation Performance Objectives. It noted that it was necessary that the Plan be
developed with full cooperation and coordination with all stakeholders, including regulators,
ANSPs, aerodrome operators, air operators etc. The Plan to be developed would also require
inter-regional coordination and harmonization with other regional Plans. Furthermore, the
PBN Plan should be pursued within the APIRG and harmonized and coordinated taking into
account the implementation of   adjacent regions. The meeting considered the PBN Plan
presented by the Secretariat and adopted it for application in the AFI Region.

5.4   The meeting further recalled, that in view of the large scope of areas to be
addressed as well as experts in different areas of specialization, States would wish to form a
national committee on PBN to be coordinated by a PBN National Programme officer who
would serve as a Focal Point of Contact on all issues on PBN. The meeting also considered
other issues related to PBN implementation namely: training, civil/military coordination,
PBN Legislation, funding of the Programme, the Tasks to be performed including airspace
categorization and the entire scope of the material to be used for the safe implementation of
the PBN. It was found necessary to establish a specific working Group named AFI Regional
PBN Implementation Plan Work Group to deal with all these issues relating to the
development of the Plan and another   Work Group named   State PBN Strategy/Action Plan
Work Group to specifically deal with the development of Model Guidance material for the
State PBN Plan. The meeting adopted the draft material at Appendix E , F (including
Attachment) and G (including Attachment) to be used by each the Work Group to accomplish
their assigned Plans.

5.5   In view of these discussions the following conclusions were formulated:

> **CONCLUSION 1/4: CATEGORIZATION AND SPECIFICATIONS OF PBN**
> **AIRSPACES**
>
> **THE AFI   REGIONAL PBN PLAN WORK GROUP SHALL TAKE INTO**
> **ACCOUNT THE REQUIREMENT TO CATEGORIZE THE AFI REGION**
> **AIRSPACE   AS   REQUIRED,   CONSIDERING   THE   FOLLOWING**
> **NAVIGATION SPECIFICATIONS:**

A) **OCEANIC AND/OR REMOTE CONTINENTAL AREAS RNAV 10 OR RNP 4;**

B) **CONTINENTAL EN-ROUTE – RNAV 5, RNAV 2 OR RNAV 1, OR RNP 1 OR RNP 2.**

CONCLUSION 1/5: MODEL GUIDANCE MATERIAL TO ASSIST STATES IN THE IMPLEMENTATION OF PBN

THAT THE MATERIAL AT APPENDIX D BE ADOPTED FOR THE DEVELOPMENT OF STATE APPROVAL DOCUMENTATION FOR THE NAVIGATION SPECIFICATION.

CONCLUSION 1/6: CIVIL/MILITARY COORDINATION

THAT IN ORDER TO ENSURE THE SAFE AND COORDINATED IMPLEMENTATION OF PBN IN THE AFI REGION, STATES SHOULD ENSURE THAT THE MILITARY AVIATION AUTHORITIES ARE FULLY INVOLVED IN THE PLANNING AND IMPLEMENTING PROCESS.

CONCLUSION 1 /7: NOMINATION OF A PBN FOCAL POINT OF CONTACT (FPOC)

THAT STATES/SERVICE PROVIDERS NOMINATE AS SOON AS POSSIBLE, BUT NOT LATER THAN 31 AUGUST 2008 A PBN FOCAL POINT OF CONTACT, WHO WILL BE RESPONSIBLE FOR ENSURING THAT THE PROPER MECHANISM BE PUT IN PLACE FOR THE SAFE IMPLEMENTATION OF PBN.

CONCLUSION 1/8: IMPLEMENTATION OF PBN IN THE AFI REGION

THAT:

A) **STATES IN THE AFI REGION ENSURE THAT ALL REQUIREMENTS BE MET WITH A VIEW TO SAFELY IMPLEMENT PBN ON THE AIRAC DATE OF 20 NOVEMBER 2009 AND;**

B) **IMPLEMENTATION OF PBN IN THE AFI REGION BE HARMONIZED AND COORDINATED WITH OTHER ADJACENT REGIONS.**

CONCLUSION 1/9: TRAINING OF ALL PERSONNEL INVOLVED WITH THE IMPLEMENTATION OF PBN IN THE AFI REGION

THAT:

A) **ICAO EXPLORES THE POSSIBILITY OF ASSISTING STATES OF THE AFI REGION THROUGH A SPECIAL IMPLEMENTATION PROJECT (SIP) FOR TRAINING OF PERSONNEL INVOLVED WITH THE IMPLEMENTATION OF PBN IN THE AFI REGION;**
B) **SEMINARS/WORKSHOPS BE ORGANIZED IN THE REGION FOR TRAINING OF RELEVANT PERSONNEL DIRECTLY INVOLVED IN THE IMPLEMENTATION OF PBN NAMELY PILOTS, CONTROLLERS, PROCEDURES DESIGNERS, DISPATCHERS, OPS/AIR, OPERATORS ETC;**
C) **STATES BE INVITED TO APPROACH TRAINING INSTITUTIONS FOR THE DEVELOPMENT OF   A TRAINING MODULE IN THE PBN FIELD REPRESENTATIVE OF THE AFI REGION; AND**
D) **STATES HAVING DIFFICULTIES IN IMPLEMENTING PBN IMPLEMENTATION PROGRAMME, MAY EITHER INDIVIDUALLY OR IN GROUP EXPLORE THE POSSIBILITY OF SEEKING OUTSIDE EXPERTISE.**

CONCLUSION 1/10: PBN LEGISLATION

THAT THE STATES INCLUDE IN THEIR LEGISLATION AND REGULATIONS   THE PROVISIONS RELATING TO PBN.

CONCLUSION 1/11:   PARTICIPATION OF REPRESENTATIVES OF STATES INVOLVED IN PBN APPROVAL PROCESS

THAT REPRESENTATIVES OF STATES INVOLVED IN THE PBN APPROVAL PROCESS OF AIRCRAFT OPERATORS, BE INVITED TO ATTEND THE FUTURE MEETINGS OF THE PBN TASK FORCE.

CONCLUSION 1/12: FUNDING OF THE PBN IMPLEMENTATION PROGRAMME

THAT REGULATORY BODIES, OPERATORS, SERVICE PROVIDERS AND OTHER STAKEHOLDERS BE GRANTED BUDGETARY ALLOCATIONS FOR ACQUISITIONS AND OTHER ACTIVITIES NECESSARY FOR ENSURING THAT ALL THE REQUIREMENTS ARE MET IN A TIMELY MANNER IN ORDER TO SAFELY IMPLEMENT PBN IN THE AFI REGION.

CONCLUSION 1/13:   ADOPTION OF THE MATERIAL FOR THE DEVELOPMENT OF THE   AFI REGIONAL PBN IMPLEMENTATION PLAN

THAT:

A) **THE PBN TASK FORCE ACCEPT THE MATERIAL AT APPENDIX E AS GUIDANCE MATERIAL FOR THE DEVELOPMENT OF THE AFI REGIONAL PBN IMPLEMENTATION PLAN. THE PLAN TO BE COMPLETED BY DECEMBER 2008;**

B) **A WORK GROUP BE FORMED TO DEVELOP THE AFI REGIONAL PBN IMPLEMENTATION PLAN;**

C) **THE AFI REGIONAL PBN IMPLEMENTATION PLAN WG UTILIZE THE MATERIAL AT APPENDIX E AS GUIDANCE MATERIAL FOR THE DEVELOPMENT OF THE AFI REGIONAL PBN IMPLEMENTATION PLAN;**

D) **THE AFI REGIONAL PBN IMPLEMENTATION PLAN WG USE THE MATERIAL AT APPENDIX E –ATTACHMENT TO DEVELOP THE AFI PBN STRATEGY/ACTION PLAN;**

E) **A WORK GROUP BE FORMED TO DEVELOP A STATE PBN PLAN   IN LINE WITH   THE AFI   REGIONAL PBN IMPLEMENTATION PLAN;**

F) **THE STATE PBN PLAN WORK GROUP UTILIZE THE MATERIAL LISTED IN APPENDIX F FOR THE DEVELOPMENT OF THE STATE PBN PLAN;**

G) **THE AFI REGIONAL PBN IMPLEMENTATION PLAN WORK GROUP AND THE STATE PBN PLAN WORK GROUP SHALL LIAISE WITH EACH OTHER AS REQUIRED, IN ORDER TO HARMONIZE THE PLAN AND ACTIONS DEVELOPED; AND**

H) **THE COMPOSITION OF THE TWO WORK GROUPS ARE AS FOLLOWS:**

AFI REGIONAL PBN IMPLEMENTATION PLAN WORK GROUP:

SOUTH AFRICA (RAPPORTEUR)	**MAURITIUS**
ALGERIA	**SUDAN**
BENIN	**UGANDA**
BURUNDI	**ASECNA**
CAPEVERDE	**IATA**
DEMOCRATIC REPUBLIC OF CONGO	**IFALPA**
EGYPT	**IFATCA**
LIBERIA	**ROBERTS FIR**
TANZANIA	

STATE PBN   PLAN WORK GROUP:

BOTSWANA	
CAMEROON	**SENEGAL**
CHAD	**TUNISIA**
ETHIOPIA	**ASECNA (RAPPORTEUR)**
GHANA	
KENYA	**IATA**
LIBERIA	**IFALPA**
NIGERIA	**IFATCA**
RWANDA	**ROBERTS FIR**

CONCLUSION 1/14:   MODEL GUIDANCE MATERIAL TO ASSIST STATES IN PBN IMPLEMENTATION

THAT THE PBN STRATEGY/ACTION PLAN WORK GROUP SELECT A NAVIGATION SPECIFICATIONS FROM THOSE AVAILABLE FROM THE TABLE AT APPENDIX D AND DEVELOP A MODEL OPERATIONAL APPROVAL   DOCUMENT   TO   ASSIST   STATES   IN   PBN IMPLEMENTATION, BY DECEMBER 2008.

Establishment of an ICAO Africa Flight Procedure Office

5.6   The meeting considered a paper presented by the Secretariat relating to the need to establish an ICAO Africa Flight Procedures Office. The meeting took note of the fact that the Secretariat would be submitting a working Paper to the AFI Special RAN (SRAN) meeting for their consideration.

5.7   In this regard the following conclusion was formulated.

CONCLUSION 1/15:   ESTABLISHMENT OF AN ICAO AFI FLIGHT PROCEDURE OFFICE

THAT:

A) THE AFI PBN TASK FORCE SUPPORT THE CONCEPT FOR THE   ESTABLISHMENT   OF   AN   ICAO   AFI   FLIGHT PROCEDURE OFFICE; AND

B) THE TASK FORCE NOTE THAT THE SECRETARIAT WILL BE SUBMITTING A WORKING PAPER TO THE AFI SPECIAL REGIONAL AIR NAVIGATION (AFI SRAN) MEETING, PROPOSING THE ESTABLISHMENT OF AN ICAO AFI FLIGHT PROCEDURE OFFICE.

Agenda Item 6: Any other Business

6.   The meeting agreed on its work methods and formulated Decision 1/1;

          DECISION 1/1 – WORKING METHODOLOGY

          THAT THE TASK FORCE WILL:

A) **UTILIZE ELECTRONIC MEANS TO POST WP AND IPS PRIOR TO MEETINGS; SITE: WWW.ICAO.INT/ESAF/PBN;**
B) **POST AT LEAST ONE WEEK PRIOR TO MEETINGS ON THE FOLLOWING ICAO SITE: WWW.ICAO.INT/ESAF/PBN;**
C) **CONDUCT PAPERLESS MEETINGS AS FAR AS POSSIBLE;**
D) **ALL CORRESPONDENCE WILL BE VIA ELECTRONIC MEANS;**
E) **INITIALLY MEET IN A PLENARY AT THE OPENING AND CLOSING SESSIONS OF EACH MEETING AND SUBSEQUENTLY CONTINUE WORK AS THE TWO WORK GROUPS; AND**
F) **BETWEEN MEETINGS THE WORK BY EMAIL OR TELEPHONE CONFERENCES BETWEEN THE RAPPORTEUR AND THE WG MEMBERS KEEPING THE CHAIRPERSON AND THE SECRETARY OF THE TASK FORCE INFORMED.**

FIRST MEETING OF THE APIRG PERFORMANCE-BASED NAVIGATION TASK FORCE (PBN/TF/1)
PBN LIST OF PARTICIPANTS

No.	Country/Etat	Name/Nom	Designation/Fonction	Address/Adresse	E-mail	Telephone, Fax
1.	**ANGOLA**	Mr. Antonio Pascoal DOMINGOES	INAVIC	RUA Amilcar Cabral NO. 110 3-Andar	Antonio.pascoal@mail.enana-co.com	Phone:+244-222651023 Fax:+244-222651038
2.		Mr. Francisco A. de CARVALHO	INAVIC	RWA Miguel Melo NO.96-6 ANDAR	fclolo@hotmail.com	Phone:+244-335936 Fax:+244-222390529
3.	**BENIN**	Mr. Legba KARL	Chief Division Telecommunication	B.P. 305 Cotonou	LEGBA_KARL@YAHOO.FR	Phone:+229-21300222 Fax:+229-21304571
4.	**BURUNDI**	Mr. Pascal . NTIMPIRANGEZA	Chief ARC	Régie des Services Aéronautiques	rsa@cbinf.com ntizapeco@yahoo.fr	Phone:+ 257-22223797 Fax:+257-22223428
5	**CAMEROON**	Ms. LEOPOLDINE ESSINI	CCA	B.P. 6998	n-eloundou@yahoo.com	Phone :+23722303090
6.	**CAPE VERDE**	Mr. Jose Luis Ramos Dos REIS	Manager, Communication		jreis@asa.cv	Phone:+238411394.
7.		Mr. AArlindo Lima NEVES	Director, Air Navigation		anevesg@asa.cv	Phone:+ Fax:+238-2413336
8.		Mr. Jose Paulo CABRAL	Manger, ATS		Paulocabral@hotmail.com	
9.	**TCHAD**	Mr. Traoguingue SARAHADUBAYE	CNS/ATM Division Manager	CAA, B.P. 96 N'Djamena	adac@intnet.td Sarabaye_kk@yahoo.fr	Phone:+235-2525414 Fax:+235-2522909 Mobile:+235 6298002
10.	**DRC**	Mr. Jean Theodore Muanda MAYALA	Chief Air navigation Division, CAA		Jean.theodoremuanda@yahoo.fr	Phone:+243812161440
11.		Mr. Yamba BIENGE	Chief Technical Control COM/NAV Equipment	CAA DRC	Cybienge@yahoo.fr	Phone+243-999925549
12.		Mr. Benny KASONGO	Director, Technical	DRC	bennykasongo@ties.itu.int	Phone:+243-813646404 Fax:+1-4136180420
13.		Mr. Izai Kepna PASCAL	Director of Air Navigation	DRC	Izai_pascal@yahoo.fr	Phone:243-998163945
14.	**KENYA**	Mr. Patrick M. Kinuthia	CATCO	Kenya Civil Aviation Authority (KCAA) P.O. Box 30163 Nairobi	pkinuthia@kcaa.or.ke	Phone:+254-20-827470 254-0733927647 Fax:+254-20-822300
15.	**LIBERIA**	Mr. Marcus Kpudeh ENDERS	Senior Air Traffic Controller	Roberts International Airport P.O. Box 1	towerroberts@yahoo.com	Phone:+ 231-6825835
16.	**MAURITIUS**	Mr. Rajbushan D. SERVANSINGH	Divisional Head, ATM	Department of civil Aviation PLaine Magnien	rservansingh@mail.gov.mu	Phone:+230-6032025 Fax:+230-6373164

No.	Country/Etat	Name/Nom	Designation/Fonction	Address/Adresse	E-mail	Telephone, Fax
17.	**RWANDA**	Mr. MAKUZA	Rwanda CAA	RCAA	info@caa.gov.rw	Phone+250-585499 Fax:+250-582609
18.		Mr. Emmanuel SABIITI	Chief Air Navigation Technical Services	B.P. 1122 RCAA, KIGALI, RWANDA	esabiiti@caa.gov.rw, esabiiti@yahoo.com	Phone :+250-08508271, (250) 583441 Fax :+250-582609
19.		Mr. Claver BAZATOHA	Director, Safety Standards	B.P. 1122 RCAA, KIGALI, RWANDA	cbazatoha@caa.gov.rw, nshuti2000@yahoo.com	Phone:+250-585845/583441 Fax:+250-582609
20.	**SENEGAL**	Ms. Ndoumbe Niang THIOUNE	ANACS	ANACS Airport B.P. 8184 Dakar	Ndoumbe_thioune@yahoo.fr	Tel :+221-338695335 Fax :+221-338200403
21.	**SOMALIA**	Mr. Humphrey K. Mwachoki	FIC Supervisor	P.O.. Box 46294-00100 Nairobi	Humphrey.mwachoki@icao.unon.org	Phone:+254-20-7622785 Fax:+254-20-7122340
22.		Mr. Peter Mbugua	Chief, ATS	P.O. Box 46294 Nairobi	icaosomnet@icao.or.ke	Phone:+254-20-7622785 Fax:+254-20-7122340
23.	**SOUTH AFRICA**	Mr. Harry ROBERTS	ATM Specialist	AFI RVSM NPM **SOUTH AFRICA**	harryr@atns.co.za	Phone:+27 119610123 Fax:+ 27-11-961-0403
24.		Mr. Wayne Roger LESSARD	ATM Specialist	121 Van Buuren Estates Van Buuren Road Bedfordview Johannesburg	WAYNEL@ATNS.CO.ZA	Phone:+0798494147 +279619121
25.		Mr. Ronnie MOTHUSI	Inspector	Department of Transport	mothusir@caa.co.za	Phone+27-115451068 Fax:+2711-5451281
26.		Mr. Mabitsi LEGODI	Deputy Director	Department of Transport Private Bag X193 Pretoria, 0001- RSA	LEGODIM@DOT.GOV.ZA	Phone:+027-123093932 Fax:+
27.		Mr. Kevins EWELS		ATNS, South Africa		
28.	**SUDAN**	Mr Elawad Ibrahim Awad EL KARIM	Director, ATS	P.O. Box 430 Khartoum, Sudan	Alawad.caa@gmail.com	Phone:+249-83784964
29.		Mr Ibrahim Musa IBRAHIM	Assistant Manager	Sudan Civil Aviation	Ibrahimbha@hotmail.com	Phone:+249-916113943 Fax:+249-8377125
30.		Mr. Bushara Nasr BUSHARA	Assistant Director	Khartoum Airport	busharanasr@gmail.com	Phone:+249-83779125 Fax:+248-83779125
31.		Mr. Abulmonem Elsheikh AHMED	Air Traffic Controller	Civil Aviation (Air Traffic Control) P.O. Box 430 Khartoum, Sudan	Abdulmonem.caa@yahoo.co.uk	Phone: +249-183779125 Fax: +249-183779125

No.	Country/Etat	Name/Nom	Designation/Fonction	Address/Adresse	E-mail	Telephone, Fax
32.	**TUNISIA**	Mr. Hatem OUESLATI	Head of Air navigation and Airports Safety Department	Tunisia CAA	hatem.oueslati@mt.gov.tn	Phone:+21697580754 Fax:+216-71806469
33.	**UGANDA**	Mr. Moses SEZIBWA	Principal, ATM	P.O. Box 5536 CAA Uganda	msezibwa@caa.co.ug	Phone:+256-712320907 Fax:+256-414320964
34.	**IFALPA**	Capt. Arif JINNAH	Regional Vice Preseident	P.O. Box 561 Dar Es Salaam Tanzania	ARIF@ARIF.CO.TZ	Phone+ :255-784780112 Fax :+255-222119742
35.	**KALPA**	Capt. Gilbert GAkuya	Member	P.O. Box 19002 JKIA, Nairobi	Gilbert-gakuya@kenya airways.com	Phone:+0206422000 ext. 3079
36.		Capt. Martin Butt	Member			
37.	**IFATCA**	Ms. Keziah OGUTU	RSG Member	P.O. Box 56819-00200 Nairobi	Kezogutu@yahoo.com	Phone:+254-722386001 Fax:+254-20827102
38.	**ASECNA**	Mr. Amadou Yoro DIALLO	Chef Bureau Etudes ATM et Programmes	B.P 3144 Dakar, Senegal	Email: dialloamad@asecna.org ; or diamadyor@hotmail.com	Tel.: +221 8695664 Fax:+221-8207495
39.		Mr. Assani ADJIBOLA	Safety Manager	B.P 3144 Dakar, Senegal	adjibolaass@asecna.org	Phone:+221-338205746 Fax:+221-338202722
40.		Mr. Sidy GUEYE	ATS Manager	B.P. 10136, Dakar Liberte, Senegal	gueyesid@asecna.org	Phone:+221-776384931 Fax:+221-338200656
41.	**IATA**	Mr. ZOO'O-Minto'o P.	Assistant Regional Director Safety, Operations and Infrastructure	88 Stella Street Sandown Mews SANDTON, Johannesburg, SAF	ZooMintooP@iata.org	Phone:+27-115232724 Fax:+27-115232701
42.		Mr. Alimamy D. CONTEH	Senior Air Traffic Controller	Roberts Flight Information Region P.O. Box 79 Robertsfield 1520 Harbel, Margbi County Liberia	alimamydexon@yahoo.co.uk	Phone:+ 231-6887160
43.	**ICAO SECRETARIAT**	Mr. Van Ness, DAVID	PBN Implementation Resource Development Coordinator	ICAO Montreal	DVanness@icao.int	Phone:+514-954-8219
44.		Mr. Apolo Kharuga	Regional Officer, ATM	ICAO, Nairobi	Apollo.kharuga@icao.unon.org	Tel:254-20-7622372 Fax:254-20-7621092
45.		Mr. Brou Konan	Regional Officer, ATM	ICAO, Nairobi	Konan.Brou@icao.unon.org	Tel:254-20-7622373

**FIRST MEETING OF THE APIRG PERFORMANCE-BASED NAVIGATION
TASK FORCE (PBN/TF/1) (NAIROBI, KENYA, 29 – 30 MAY 2008)**

APPENDIX B: **IATA SURVEY ON BOARD NAVIGATION, SURVEILLANCE AND
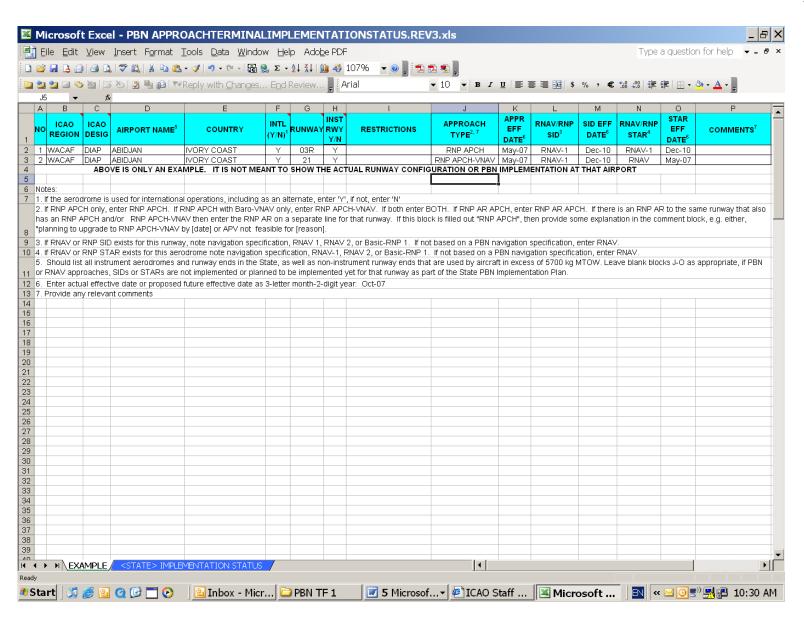COMMUNICATION EQUIPMENT IN THE REGION**

IATA SURVEY

ON BOARD NAVIGATION, SURVEILLANCE AND COMMUNICATION EQUIPMENT IN THE REGION

Airline	Airplane type	NAVIGATION																			SURVEILLANCE				COMMUNICATIONS					COMMENTS
		1 x FMS	2 x FMS	GNSS STAND ALONE	GNSS COUPLED TO FMS	INV	RNAV DME/DME	RNAV DME/DME/IRU	RNAV GNSS	RNP 10	RNP X Oceanic	RNAV 5	RNAV 1	RNP 1.0	RNP 1	RNP 4.5	SBAS	GBAS	FANS	ADS	ADS-B	Mode S	Mode S Enhanced	HF	HF DATA LINK	ACARS	VDL2	SATCOM	
Air Europa	A330-200		Y		Y	Y		Y		Y	Y	Y	Y		Y					Y	Y		Y	Y		Y	Y	Y	
	B737-800	Y			Y	Y		Y				Y	Y			Y							Y	Y		Y	Y		
	B767-300		Y		Y	Y		Y		Y	Y	Y			Y						Y		Y	Y					
Air France	A320		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y		Y			ADS-B OUT capable but not certified
	A330		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y		Y		Y	ADS-B OUT capable but not certified
	A340		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y		Y		Y	ADS-B OUT capable but not certified
	B747-200F		Y		Y	Y	Y		Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y		
	B747-400/400ERF		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y		Y	Y		Y	Y*	Y	*only 8 VDL2 equipped airplanes
	B777-200ER/300ER		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y		Y	Y		Y		Y	
British Airways	A319		Y		Y	Y		Y	Y		Y	Y	Y	Y						Y	Y	Y		Y			
	A320		Y*		Y*	Y		Y	Y*		Y	Y	Y	Y						Y	Y	Y		Y			* except older A320s
	B737-400	Y			Y			Y			Y	Y	Y							Y	Y	Y		Y			
	B747-400		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y		Y		Y	
	B767-300		Y	Y		Y		Y	Y		Y	Y							Y	Y	Y		Y			
	B777		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y		Y		Y	
Delta	B737-800		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y					Y		Y		Y	
	B757-200		Y	Y*	Y		Y	Y		Y	Y	Y	Y					Y		Y		Y		* approx 20% have GPS
	B757-200ER		Y	Y*	Y		Y	Y	Y		Y	Y	Y	Y					Y		Y		Y		* approx 25% have GPS
	B767-300/300ER		Y	Y*	Y		Y	Y	Y	Y	Y	Y	Y	Y			Y*	Y*		Y	Y	Y		Y	Y*	* approx 25% have GPS
	B767-400		Y	Y*	Y		Y	Y	Y	Y	Y	Y	Y	Y			Y*	Y*		Y	Y	Y		Y	Y*	* approx 40% have SATCOM currently
	B777		Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y		Y		Y	
	MD88	Y			Y		Y				Y									Y		Y		
	MD-90	Y			Y		Y				Y									Y		Y		we are currently updating our fleet with GPS and SATCOM
Emirates	A310/F		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y		Y	
	A330-200		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y		Y		Y	
	A340-300		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y		Y		Y	
	A340-500		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y	Y		Y		Y	
	B777-200/300		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y		Y		Y	
	B777-300ER		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y		Y		Y	
FedEx	A300		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y		Y	Y	
	A310		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y		Y	Y	
	B727		Y*						Y										Y			
	MD-10		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y	Y	Y	Y	Y	* approx 20% of fleet has GPS
	MD-11		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Iberia	A319		Y		Y	Y	Y	Y	Y	Y		Y	Y						Y	Y	Y		Y		
	A320		Y		Y	Y	Y	Y	Y		Y	Y							Y	Y	Y		Y		
	A340		Y		Y	Y	Y	Y	Y		Y	Y							Y	Y	Y		Y		Y	
KLM	A330-200		Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y		Y	Y	Y		Y		Y	
	B747-400		Y		Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y		Y		Y	
	B747-400F		Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y		Y	Y	Y		Y		Y	
	B777-200		Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y		Y	Y	Y		Y		Y	
	MD-11		Y		Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y		Y		Y	
LAN	A319-100		Y		Y	Y	Y	Y	Y	Y	Y	Y		Y						Y		Y		
	A320-200		Y		Y	Y	Y	Y	Y	Y	Y	Y		Y					Y	Y		Y		
	A340-300		Y		Y	Y	Y	Y	Y	Y	Y	Y				Y	Y		Y	Y		Y		Y	
	B767-300		Y		Y*	Y	Y	Y	Y		Y	Y							Y	Y*	Y		*10 of 29 B767s have GPS. Non-GPS 767s have HF datalink
Lufthansa	A340-300		Y		Y	Y	Y		Y				Y		Y	Y	Y		Y	Y	Y	
	A340-600		Y		Y	Y	Y		Y				Y				Y	Y		Y	Y	Y	
	B747-400		Y		Y	Y	Y		Y				Y		Y	Y	Y		Y	Y	Y	
Pluna	A318		Y		Y		Y			Y			Y		Y			Y		
	A319		Y		Y		Y			Y			Y		Y	Y*		Y		* 3 of 16 have HF
	B767-300		Y		Y	Y	Y		Y	Y	Y			Y			Y		Y		
	A319	Y	Y		Y		Y		Y	Y	Y	Y	Y				Y	Y	Y		

IATA SURVEY
ON BOARD NAVIGATION, SURVEILLANCE AND COMMUNICATION EQUIPMENT IN THE REGION

Airline	Airplane type	1x FMS	2x FMS	GNSS STAND ALONE	GNSS COUPLED TO FMS	IRU	RNAV CAT/CAT2	RNAV DME/DME/IRU	RNAV GNSS	RNP 10	RNP 4/RNP	RNAV 5	RNAV 1	RNP 1.0	RNP	PRNP AR	SBAS	OBAS	FANS	ADS	ADS-B	Mode S	Mode A/Enhan	HF	HF DATA LINK	ACARS	VDL	SATCOM	COMMENTS
SAA	A340-200		Y			Y				Y	Y	Y	Y	Y	Y									Y		Y		Y	
	A340-300		Y			Y				Y	Y	Y	Y	Y	Y				Y	Y	Y			Y	Y	Y		Y	
	A340-600		Y			Y				Y	Y	Y	Y	Y	Y				Y	Y	Y			Y	Y	Y		Y	
	B737-800		Y			Y				Y		Y												Y	Y*	Y			* 6 of 21 have HF datalink
	B747-400		Y	Y*	Y	Y				Y	Y	Y							Y*					Y	Y	Y		Y*	* some aircraft only. Only 4 aircraft have SATCOM.
Singapore Airlines	A340-500		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y		Y		Y	
	A380		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y		Y	
	B747-400		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y		Y		Y	
	B747-400F		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y		Y		Y	
	B777		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y		Y		Y	
TAM	A319		Y		Y	Y	Y	Y		Y		Y	Y		Y							Y		Y		Y		Y	
	A320		Y		Y	Y	Y	Y		Y		Y	Y		Y							Y		Y		Y		Y	
	A330-200		Y		Y	Y	Y	Y		Y		Y	Y	Y	Y				Y			Y	Y	Y		Y		Y	
	F100		Y			Y	Y	Y														Y		Y					
	MD-11		Y			Y	Y	Y		Y		Y										Y		Y					

Microsoft Excel - PBN APPROACHTERMINALIMPLEMENTATIONSTATUS.REV3.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF

Type a question for help

Arial   10   B I U

J5

NO	ICAO REGION	ICAO DESIG	AIRPORT NAME[5]	COUNTRY	INTL (Y/N)[1]	RUNWAY	INST RWY Y/N	RESTRICTIONS	APPROACH TYPE[2,7]	APPR EFF DATE[6]	RNAV/RNP SID[3]	SID EFF DATE[6]	RNAV/RNP STAR[4]	STAR EFF DATE[6]	COMMENTS[7]
1	WACAF	DIAP	ABIDJAN	IVORY COAST	Y	03R	Y		RNP APCH	May-07	RNAV-1	Dec-10	RNAV-1	Dec-10	
2	WACAF	DIAP	ABIDJAN	IVORY COAST	Y	21	Y		RNP APCH-VNAV	May-07	RNAV-1	Dec-10	RNAV	May-07	

ABOVE IS ONLY AN EXAMPLE. IT IS NOT MEANT TO SHOW THE ACTUAL RUNWAY CONFIGURATION OR PBN IMPLEMENTATION AT THAT AIRPORT

Notes:

1. If the aerodrome is used for international operations, including as an alternate, enter 'Y', if not, enter 'N'

2. If RNP APCH only, enter RNP APCH. If RNP APCH with Baro-VNAV only, enter RNP APCH-VNAV. If both enter BOTH. If RNP AR APCH, enter RNP AR APCH. If there is an RNP AR to the same runway that also has an RNP APCH and/or RNP APCH-VNAV then enter the RNP AR on a separate line for that runway. If this block is filled out "RNP APCH", then provide some explanation in the comment block, e.g. either, "planning to upgrade to RNP APCH-VNAV by [date] or APV not feasible for [reason].

3. If RNAV or RNP SID exists for this runway, note navigation specification, RNAV 1, RNAV 2, or Basic-RNP 1. If not based on a PBN navigation specification, enter RNAV.

4. If RNAV or RNP STAR exists for this aerodrome note navigation specification, RNAV-1, RNAV 2, or Basic-RNP 1. If not based on a PBN navigation specification, enter RNAV.

5. Should list all instrument aerodromes and runway ends in the State, as well as non-instrument runway ends that are used by aircraft in excess of 5700 kg MTOW. Leave blank blocks J-O as appropriate, if PBN or RNAV approaches, SIDs or STARs are not implemented or planned to be implemented yet for that runway as part of the State PBN Implementation Plan.

6. Enter actual effective date or proposed future effective date as 3-letter month-2-digit year: Oct-07

7. Provide any relevant comments

EXAMPLE <STATE> IMPLEMENTATION STATUS

Ready

Start   Inbox - Micr...   PBN TF 1   5 Microsof...   ICAO Staff ...   Microsoft ...   EN   10:30 AM

MODEL GUIDANCE MATERIAL TO ASSIST STATES IN THE IMPLEMENTATION OF PBN

Navigation Specification	Organization responsible	Status	Projected completion
RNAV (RNP) 10			
RNAV 5	APRIG PBN TF	Not started	Dec 2008
RNAV 1 and 2	APIRG PBN TF	Not started	Dec 2008
RNP 4			
Basic-RNP 1			
RNP APCH & Baro-VNAV	APIRG PBN TF	Not started	Dec 2008
RNP AR APCH			

MATERIAL FOR THE DEVELOPMENT OF THE AFI PBN IMPLEMENTATION PLAN – CONTENTS OF THE AFI PBN REGIONAL PLAN

- Table of Contents
- Executive Summary
- Explanation of Terms
- Acronyms
- Introduction
o Need for the Road Map
o Navigation roles in supporting operations
o Benefits of performance-based navigation
o Goals & Objectives of PBN Implementation
o Principles
- PBN Operational requirements & Implementation Strategy
o Route
  Remote oceanic
  Oceanic
  Remote continental
  Continental en-route
o TMA
  Arrival
  Departure
o Approach
- Current Status & Forecast
o AFI traffic forecast
o Aircraft fleet readiness status
o CNS Infrastructure
  Existing navigation capabilities
• GPS Assessment
• Other PBN navigation infrastructure
  Existing surveillance capabilities (Note: as related to PBN)
• Surveillance requirements
• Surveillance coverage maps
o RADAR coverage map above 29000 ft
o ADS-B coverage map above 29000 ft
  Existing communication capabilities (Note: as related to PBN)
• Communication requirements
- Implementation Roadmap of Performance Based Navigation
o ATM Operational Requirements
o Short Term
  Route
• Remote oceanic
• Oceanic
• Remote continental
• Continental en-route
  TMA

- Arrival
- Departure
  Approach
  Summary table & Implementation targets
Regional Plan
Short Term (2008-2012)
Airspace Navigation Specification
Route - Remote oceanic
Route – Oceanic
Route - Remote continental
Route - Continental en-route
TMA – Arrival
TMA – Departure
Approach
o Medium Term
  Route
- Remote oceanic
- Oceanic
- Remote continental
- Continental en-route
  TMA
- Arrival
- Departure
  Approach
  Summary table & Implementation targets
Medium Term (2013-2016)
Airspace Navigation Specification
Route - Remote oceanic
Route – Oceanic
Route - Remote continental
Route - Continental en-route
TMA – Arrival
TMA – Departure
Approach
o Long Term (2016 and beyond)
  Implementation strategies
- Transitional Strategies
- Safety Assessments & Monitors
o Methodology
o Roles & Responsibilities
- Post-implementation activities
o Implementations status
o Challenges
Appendix A -Reference documentation for developing operational and airworthiness approval
Appendix B – Practical Example of tangible benefits
Appendix C – Procedure to modify the regional plan.

LIST OF PBN IMPLEMENTATION ISSUES

Preliminary
Senior Management (up to DG and Minister level)
Education/Knowledge
Commitment
Timeline
Safety Assessments
Gap analysis
Equipage
Personnel / Capability
Shortage of procedure designers
Legislation
WGS 84
Benefits:
Safety (CFIT)
Access
Airspace capacity
Efficiency
Environment
Cost/Benefit Analysis
All stakeholders
RNP vs. RNAV

PBN implementation plan (short and medium term)
CNS/ATM considerations integrated in PBN implementation plan
Integration with Regional Plan
Pans Ops criteria
Regulations/Legislation

Navigation infrastructure plan
Backup navigation strategy/plan
Regional basis
WGS 84
Operations
Approach
Terminal
STARs
SIDs
Enroute
Oceanic/Remote
Aircraft Ops Spec Issues

Training
Regulator
Controller
Procedure Designer
Pilots
Regulators
Dispatcher
Aircraft Maintenance
Flight and Ground validation
Flight Inspection

Fleet Equipage/Capability
Domestic operators
Intl operators operating to your airspace
Navaid infrastructure
Transition issues
Mixed fleet/mixed mode operations
Separation standards
AIS integrity
Coordination and cooperation with other States, Regions, FIRs
Regional Supp Procedures
User charges

Attachment A to Appendix E

Material for the development of the AFI PBN strategy/ Action Plan
GPI 1, 12, 16, 21, 23

PBN AFI Action Plan GPI 1, 12, 16, 21, 23			
1 Airspace Concept	Start	End	Remarks
1.1 Establish and prioritize Strategic Objectives (Safety, Capacity, Environment, etc)			
1.2 Analyse aircraft fleet navigation capacity operating in the Airport			
1.3 Analyse communication, ground navigation (VOR, DME) and surveillance for navigation specification and reversionary mode compliance			
1.4 Design Instrument Approach Procedure (RNP APCH/APV Baro-VNAV or RNP AR), based on the strategic objective of the airspace concept. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc.			
2 Develop Performance Measurement Plan			
2.1 Prepare Performance Measurement Plan, including gas emission, safety, efficiency, etc.			
2.2 Conduct Performance Measurement Plan			
3 Procedure safety assessment			
3.1 Determine which methodology shall be used to evaluate procedure safety, depending on the navigation specification. Consider Airspace Modelling, ATC simulations (fast time and/or real time), Live Trials, etc.			
3.2 Prepare a data collection programme for airspace safety assessment			
3.3 Prepare preliminary procedure (s) safety assessment			
3.4 Prepare final procedure (s) safety assessment			
4 Establish collaboration decision making (CDM) process			
4.1 Coordinate planning and implementation needs with Air Navigation Service Providers, Regulators, Users, aircraft operators and military authorities			
4.2 Establish implementation date			

PBN AFI Action Plan **GPI 1, 12, 16, 21, 23**			
4.3	Establish the documentation format of the AFI PBN website		
4.4	Report planning and implementation progress to the corresponding ICAO Regional Office		
5	ATC Automated Systems		
5.1	Evaluate the PBN implementation in the ATC Automated Systems, considering the Amendment 1 to the PANS/ATM (FPLSG).		
5.2	Implement the necessary changes in the ATC Automated Systems		
6	Aircraft and operator approval		
6.1	Be aware of the national implementation programme and of the required navigation specifications		
6.2	Analyse aircraft approval requirements, aircrew and operator approval requirements for the navigation specifications to be implemented, as contained in the ICAO PBN Manual		
6.3	Publish the national regulations to implement the required ICAO navigation specifications		
6.4	Approval of aircraft and operators for each type of procedure and navigation specification		
6.5	Establish and keep updated a record of approved aircraft and operators		
6.6	Verify operations with a continuing monitoring programme		
7 8	Standards and procedures		
7.1	Evaluate regulations for GNSS use, and if such were the case, proceed to its publication.		
7.2	Develop and publish AIC notifying PBN implementation planning		
7.3	Publish AIP Supplement including applicable standards and procedures		
7.4	Review Procedural Manuals of the ATS units involved		
7.5	Update Letters of Agreement between ATS units, if necessary		
7.6	Provide procedures to accommodate non-approved RNAV/RNP aircraft, when applicable		
7.7	Conduct ATC simulations to identify the workload/operational factors, if necessary.		

PBN AFI Action Plan GPI 1, 12, 16, 21, 23			
8	Training			
8.1	Develop a training programme and documentation for operators (pilots, dispatchers and maintenance)			
8.2	Develop training programme and documentation for Air Traffic Controllers and AIS Operators			
8.3	Develop training programme to regulators (aviation safety inspectors)			
8.4	Conduct training programmes			
8.5	Hold seminars oriented to operators, indicating the plans and the operational and financial benefits expected			
9	Decision for implementation			
9.1	Evaluate operational documentation availability (ATS, OPS/AIR)			
9.2	Evaluate the percentage of approved aircraft and operations (mixed equipage concerns)			
9.3	Review safety assessment results			
10	System Performance Monitoring			
10.1	Develop post-implementation APP operations monitoring programme			
10.2	Execute post-implementation APP operations monitoring programme			
10.3	Pre operational implementation date			
10.4	Definitive implementation date			

Attachment to B Appendix E

PBN AFI strategy/action Plan

Task No.	Task Description	Start	End	Remarks/Status
	Working Methods and Resources			
1	Agree on structure of TF to enable efficient handling of specialist technical tasks			
2	Identify resources for performing specialist technical tasks			
3	Investigate methods of funding any outside assistance required			
4	Identify clear goals and objectives			
5	Develop a questionnaire to determine the State implementation status of PBN instrument procedures and Approaches			
6	Develop the AFI PBN strategy/action Plan			
7	Develop the AFI PBN implementation Plan			
8	Develop training guidance material for Controllers, Pilots, airspace designers, dispatchers ,Ops/Air, operators etc			
9	Nomination of PBN National Programme Managers (Focal Point of Contact- (FPOC)			
	Safety Assessment and Monitoring			
10	Conduct preliminary data collection and readiness assessment			
11	Evaluate options for carrying out the safety analysis			
12	Develop detailed program for safety analysis			

Task No.	Task Description	Start	End	Remarks/Status
13	Establish requirements for pre and post-implementation monitoring			
14	Undertake initial safety analysis			
15	Carry out pre-implementation safety analysis			
16	Carry out pre-implementation readiness assessment			
17	Carry out post-implementation safety analysis during verification phase			
18	Ensure transferability of aircraft data from other Regions			
19	Devise methodologies for incorporating the effects of projected traffic growth and system changes on occupancy & collision risk in the future environment			
20	Perform periodically other data collections (eg. ASE stability) in order to ensure that the parameter values used remain current			
	ATM Operational Issues			
21	Establish/identify airspace categorization for en-route and areas.			
22	Develop and Harmonize ATS Operational procedures			
23	Identify transition areas and transition procedures			
24	States assess the impact of PBN implementation on controller automation systems and plan for upgrades/modifications			
25	Restructuring of airspace as appropriate			
26	Develop procedures for integration of general aviation handling non-compliant civil aircraft (inc ferry & maintenance)			

Task No.	Task Description	Start	End	Remarks/Status
27	Develop procedures for suspension of PBN			
28	Evaluate the need for simulations to assess ATC workload and possible need for airspace/air route/Sector changes (SIDs & STARs, environmental issues etc)			
29	Sharing of resources and experience			
30	Develop ATC regional training guidance material			
31	Identify issues to be addressed in Letters of Agreement			
32	Aeronautical Information management (AIM) issues i.e WGS 84 , AIP Suppliments, NOTAMs .etc			
33	**CNS infrastructure issues**			
	OPS/AIR Issues			
34	States to examine existing legislation and regulations to identify any changes required for PBN			
35	Develop and promulgate information on the operational approval process			
36	Develop procedures for aircraft found to be non-compliant through monitoring			
37	Evaluate the need for chart amendments related to PBN			
38	Monitor progress with operator approvals			
	Joint Tasks			
39	Review preliminary readiness assessment			

Task No.	Task Description	Start	End	Remarks/Status
40	Set target proportion of PBN approved aircraft for full PBN implementation			
41	Prepare/maintain regional status report detailing PBN implementation plans			
42	Develop a regional PBN informational campaign			
43	Develop regional PBN Guidance Material			
44	Review weather and contingency procedures for applicability under PBN			
45	Undertake coordination and harmonization of procedures with adjacent Regions			
46	PBN Meetings			
47	Develop monitoring and evaluation program for the verification phase			
48	Seminars and Workshops			
49	Determine implementation date			
50	Post implementation analysis			

Attachment C Appendix E

AFI PBN TASK LIST

No	ICAO Performance Objectives	ICAO Strategic Objectives	Associated GPIs	Tasks/strategy	Benefits	Deliverables	Target Date	Members	Status
1	**PBN Planning**	**A:Safety: D:Effciency C:Enviromment**	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Introduction** Section for PBN Regional Plan	To facilitate the development of the Regional Plan	Draft documment	**15 Aug. 2008**	**ICAO, ASECNA**	**Ongoing**
2	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **PBN Operational requirements & Implementation Strategy** Section for PBN Regional Plan	To facilitate the development of the Regional Plan	Draft document			
3	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Current Status & Forecast: AFI traffic forecast** Section for Section for PBN Regional Plan	To facilitate the development of the Regional Plan	Draft document			Ongoing
4	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Current Status & Forecast: Aircraft fleet readiness status** Section for PBN Regional Plan	To facilitate the development of the Regional Plan	Draft document			
5	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Current Status & Forecast: CNS Infrastructure** Section for PBN Regional Plan	To facilitate the development of the Regional Plan	Draft document			

No	ICAO Performance Objectives	ICAO Strategic Objectives	Associated GPIs	Tasks/strategy	Benefits	Deliverables	Target Date	Members	Status
6	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Safety Assessments and Monitors** Section for PBN Regional Plan To facilitate the development of the Regional Plan					
7	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Appendix A - Reference documentation for developing operational and airworthiness approvals** Section for PBN Regional Plan	To facilitate the development of the Regional Plan				
8	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Appendix B – Practical Example of tangible benefits** Section for PBN Regional Plan	To facilitate the development of the Regional Plan				
9	PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Draft **Appendix C – Procedure to modify the regional plan** Section for PBN Regional Plan	To facilitate the development of the Regional Plan				
10	PBN Coordination & Implementation PBN Planning	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Identify the short falls preventing the implementation of PBN	To identify preventive measures and to support PBN implementation	Working Papers		**TF members**	

No	ICAO Performance Objectives	ICAO Strategic Objectives	Associated GPIs	Tasks/strategy	Benefits	Deliverables	Target Date	Members	Status
11	PBN Coordination & Implementation	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Identify training requirements	To assist States in their planning and implementation	**Working Papers**		**TF members**	
12	PBN Coordination & Implementation	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Assess possibilities of future PBN seminar	To assist States in their planning and implementations				
13	PBN Coordination & Implementation	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Identify ways and means to share resources	To assist States in their planning and implementations				
14	PBN Certification Process	A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	Develop standard template for application & approval package	To harmonize PBN approval process within the region				
15	PBN Planning	15 A: Safety D: Efficiency C: Environment	GPI-5, GPI- 7, GPI-10, GPI-11, GPI-12, GPI-20, GPI-21	ICAO, via a State letter, to request States to update information on CNS infrastructure in the FASID table	To obtain information necessary for regional planning State letters	Updated FASID table		**ICAO**	

PBN
Implementation Plan
State X

Version 1

December 2009

About the Plan

ICAO Assembly Resolution A36-xx calls for each State to develop a national PBN implementation plan by 2009. This is a template developed by the ICAO PBN Programme as an example for use by the ICAO Contracting States as they each develop their own plans. This is only one example of what subjects a "National PBN Implementation Plan" that meets the intent of the resolution might include. States are encouraged to tailor their plans to meet their needs. This may mean that the "PBN Implementation Plan" is not stand-alone, but part of a broader plan for development of aviation in the State. This is a determination that only the State can make. It should be pointed out that if the State has not yet met its obligations with regard to conversion to the WGS-84 coordinate system, this should be included in the plan, as all RNAV and RNP operations are conducted solely with reference to WGS-84 coordinates.

We have posted State PBN Implementation Plans or "Roadmaps" on the PBN web site (www.icao.int/pbn), Documentation link. These will give you some idea of what information some States have included in their plans.

Why is a PBN implementation plan or roadmap needed?

With RVSM implemented or soon to be implemented in most of the world, the main tool for optimising the airspace structure is the implementation of performance based navigation (PBN), which will foster the necessary conditions for the utilisation of RNAV and RNP capabilities by a significant portion of airspace users in the Regions and states.

Current planning by the Regional Planning and Implementation Groups is based on the Air Navigation Plans and the Regional CNS/ATM Plans. Currently, these plans are mostly made up of tables that do not contain the necessary details for the implementation of each of the CNS and ATM elements. For this reason, the Regions will be developing Regional PBN implementation plans. The necessary concurrent and follow-on step is to develop national plans that implement the regional plans at the State level and address PBN implementation strategy at the national level.

In view of the need for detailed navigation planning, it was deemed advisable to call for preparation of a national PBN Implementation Plan by each State, to provide proper guidance and direction to the domestic air navigation service provider(s), airspace operators and users, regulating agency, as well as foreign operators who operate or plan to operate in the State. This guidance should address the planned evolution of navigation, as one of the key systems supporting air traffic management, and describe the RNAV and RNP navigation applications that should be implemented in at least the short and medium term, in the State.

What are the objectives of the PBN Implementation Plan or Roadmap?

The PBN implementation plan should meet the following strategic objectives:

a) provide a high-level strategy for the evolution of the navigation applications to be implemented in the State in the short term (2008-2012) and medium term (2013-2017). This strategy is based on the concepts of PBN, Area Navigation (RNAV) and Required Navigation Performance (RNP), which will be applied to aircraft operations involving instrument approaches, standard departure (SID) routes, standard arrival (STAR) routes, and ATS routes in oceanic and continental areas in accordance with the implementation goals in the Assembly resolution;

b) ensure that the implementation of the navigation portion of the CNS/ATM system is based on clearly established operational requirements;

c) avoid unnecessarily imposing the mandate for multiple equipment on board or multiple systems on the ground;

d) avoid the need for multiple airworthiness and operational approvals for intra- and inter-regional operations;

e) prevent commercial interests from outdoing ATM operational requirements, generating unnecessary costs for the State as well as for airspace users.

What is the intent of the PBN Implementation Plan or Roadmap?

The PBN Implementation Plan should be developed by the State together with the stakeholders concerned and is intended to assist the main stakeholders of the aviation community plan a gradual transition to the RNAV and RNP concepts. The main stakeholders of the aviation community that benefit from this roadmap and should therefore be included in the development process are:

• Airspace operators and users
• Air navigation service providers
• Regulating agencies
• National and international organizations

The PBN Implementation Plan is intended to assist the main stakeholders of the aviation community plan the future transition and their investment strategies. For example, airlines and operators can use this roadmap to plan future equipage and additional navigation capability investments; air navigation service providers can plan a gradual transition for the evolving ground infrastructure. Regulating agencies will be able to anticipate and plan for the criteria that will be needed in the future as well as the future regulatory workload and associated training requirements for their work force.

What principles should be applied in development of the PBN Implementation Plan or Roadmap?

The implementation of PBN in the State should be based on the following principles:

a) Continued application of conventional air navigation procedures during the transition period, to guarantee availability by users that are not RNAV- and/or RNP-equipped;

b) Development of airspace concepts, applying airspace modelling tools as well as real-time and accelerated simulations, which identify the navigation applications that are compatible with the aforementioned concept;

c) Conduct of cost-benefit analyses to justify the implementation of the RNAV and/or RNP concepts in each particular airspace;

d) Conduct of pre- and post-implementation safety assessments to ensure the application and maintenance of the established target levels of safety.

e) Must not conflict with the regional PBN implementation plan.

Table of Contents