International Civil Aviation Organization

Performance Based Navigation/Global Navigation Satellite System Task Force (PBN/GNSS TF)

Third Meeting
(Cairo, Egypt, 02 - 04 October 2011)

Agenda Item 5: Update the States PBN Implementation Plan

UPDATE THE STATE PBN IMPLEMENTATION PLAN

(Presented by the Secretariat)

SUMMARY

This paper presents an update to State PBN Implementation Plans and requests information on the progress made in the MID States for PBN Implementations.

Action by the meeting is at paragraph 3.

REFERENCE

- MIDANPIRG/12 Report
- PBN/GNSS TF/3 Report

1. INTRODUCTION

1.1 The MIDANPIRG/12 meeting was held in Amman, Jordan 17-21 October 2010. The meeting adopted 80 Conclusions and Decisions of which two (11) Conclusions are considered relevant to the work of the PBN/GNSS TF.

1.2 The PBN GNSS TF/3 meeting held in Cairo, Egypt, 30 November - 02 December 2010, was attended by 35 participants, which included experts from eight (8) States (Bahrain, Egypt, Iraq, Jordan, Kuwait, Qatar, Saudi Arabia and U.A.E.) and two (2) International Organizations (IATA, and IFALPA). The meeting developed 5 Conclusions and decisions.

2. DISCUSSION

2.1 The meeting may wish to recall the 36th Session of the ICAO Assembly (18-28 September 2007) had endorsed Resolution 36/23 on PBN global goals. The Resolution urged all States to implement Area Navigation (RNAV) and Required Navigation Performance (RNP) Air Traffic Services (ATS) routes and approach procedures in accordance with the ICAO Performance Based Navigation (PBN) concept laid down in the ICAO PBN Manual (Doc 9613). It also resolved that States should complete a PBN implementation plan by 2009 to achieve:

- implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones;

- implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented Global Navigation Satellite Systems (GNSS)) for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones of 30 per cent by 2010 and 70 per cent by 2014.

2.2 The PBN GNSS TF/3 meeting noted that Assembly Resolution A36/23 was superseded by the 37th ICAO Assembly (28 September -8 October 2010) resolution A37-11, which resolves that, States complete a PBN implementation plan as a matter of urgency to achieve:

- implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including LNAV only minima, for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014; and
- implementation of straight-in LNAV only procedures, as an exception to the above, for instrument runways at aerodromes where there is no local altimeter setting available and where there are no aircraft suitably equipped for APV operations with a maximum certificated take-off mass of 5 700 kg or more

2.3 The PBN GNSS TF/3 meeting further noted that the modification of assembly resolution A36/23 with A37/11 basically means that aerodromes that do not have any operations of aircraft equipped with APV are exempted to introduce APV procedures. On one side this could be interpreted as a relaxation of the resolution, on the other hand, it is bolstering of Safety, the reason being that it was reported that many States had the excuse of not having APV equipped aircraft to particular aerodromes, not doing anything on improvement of the approach procedures. This means that even when there are GNSS equipped aircraft, they left old (less safe) approach procedures such as NDB and circling as the only option. Now with A37/11, even for those runways that are not served with APV aircraft there has to be at least a GNSS procedure with LNAV only

2.4 The meeting may wish to recall that the PBN/GNSS Task Force was established in order to foster PBN implementation in the ICAO MID Region. The meeting may further wish to recall that the first version of the MID Regional PBN Implementation Strategy and Plan were developed in October 2008 and were adopted by MIDANPIRG/11 in February 2009 in order to allow sufficient time for the MID States to complete the development of their States National PBN implementation plan by December 2009.

2.5 Furthermore, the PBN GNSS TF/3 meeting recalled that in order to assist States in developing their National PBN Implementation plan a common template with the list of content of the States National PBN implementation plan was developed and made available on the ICAO PBN web site: http://www2.icao.int/en/pbn/Pages/Documentation.aspx which was also endorsed by MIDANPIRG/11 in February 2009.

2.6 The meeting may wish to recall that Bahrain, Oman and UAE, implemented RNAV1 routes. Furthermore the following States: Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar , Saudi Arabia, UAE and Yemen had officially submitted their State PBN Implementation Plans some of which are still in draft version. The PBN GNSS TF/3 meeting agreed that States National PBN implementation plan and progress reports will be posted on the ICAO PBN Global website. The status of the MID Region's State PBN implementation plan is as at **Appendix A** to this working paper.

2.7 The PBN GNSS TF/3 meeting reviewed and updated the list of PBN Implementation focal points, as at **Appendix B** to this working paper and was of the view that Focal points should have official emails.

2.8 The PBN GNSS TF/3 meeting noted that MIDANPIRG/12 approved the following conclusion 12/58 *PBN IMPLEMENTATION PROGRESS REPORT*, urging all MID States to keep the ICAO MID Regional office updated using the spreadsheet and the progress report, in this regard the PBN GNSS TF/3 meeting received the progress reports from the following States (Bahrain, Egypt, Jordan, Qatar and Saudi Arabia) as at **Appendix C** to this working paper.

2.9 Furthermore, the PBN GNSS TF/3 meeting was of the view that the above MIDANPIRG/12 Conclusion 12/58 be amended in para (b) in order that States send their report every six months and whenever major progress is achieved. Accordingly, the PBN GNSS TF/3 meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 3/2: PBN IMPLEMENTATION PROGRESS REPORT

That, for future reporting on the status of PBN implementation, MID States be urged to:

*a) use the excel sheet as at **Appendix D** (to this working paper) to the Report on the Agenda Item 5 and PBN Implementation Progress Report Template as at **Appendix E (**to this working paper) the Report on the Agenda Item; and*

b) submit progress reports to ICAO MID Regional Office every six months and whenever major progress is achieved starting January 2011

2.10 The PBN GNSS TF/3 meeting noted that MIDANPIRG/12 approved the updated performance framework forms (PFF) related to PBN implementation in the MID Region which was reviewed as at **Appendix F** to this working paper. The meeting PBN GNSS TF/3 urged MID States to develop their States National PFF and send to ICAO MID Regional Office.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this working paper and its Appendices;

b) provide progress reports as in para 2.9 and agree to present the conclusion to MIDANPIRG/13;

c) provide update to Appendices A and B, to this working paper; and

d) urge MID States to complete their State PBN implementation plans and PFFs.

APPENDIX A

STATUS OF MID STATES PBN IMPLEMETATION PLAN

State	Plan Submission	Plan Status	Percentage of Implementation	Remark
Bahrain	Submitted			
Egypt	Submitted	Draft		need user input
Iran	Not submitted			Only PBN approach and Terminal implementation status received
Iraq	Not submitted			
Israel	Not submitted			
Jordan	Submitted			
Kuwait	Submitted			
Lebanon	Not submitted			Only PBN approach and Terminal implementation status received
Oman	submitted			
Qatar	Submitted			
Saudi Arabia	submitted			
Syria	Submitted	Draft		
UAE	submitted			
Yemen	Submitted	Draft		

APPENDIX B

PBN IMPLEMENTATION FOCAL POINT

STATE	NAME	TITLE	ADDRESS	EMAIL	FAX	TEL	MOBILE
Bahrain	Fareed Abdullah Al Alawi	Head, air Traffic Operations	Civil Aviation Affairs P.O. Box 586	falalawi@caa.gov.bh	+973 17321992	+973 17321158	+97339651596
Bahrain	Saleem Mohamed Hassan	Chief Air Traffic Management	Civil Aviation Affairs P.O. Box 586	saleemmh@caa.gov.bh	+973 17329966	+973 17321117	+97339608860
Egypt	Mohsen Lotfy Mohamed	Director of Research and Development	National Air Navigation Services Company Cairo Navigation Center Cairo International Airport	Mohsen.elagaty@nansceg.org Mohsen.elagaty@yahoo.com	+222680627 +22871056	+222 650743 +222 657849	010 1623922
Iran	Habib Davoudi Dana	Chief of Procedure Design Office	ATM Department Mehrabad International Airport Tehran 13445	h.davoudi@yahoo.com	+982144649269	+982 166025013	
Iran	Mohammad Khodakarami	D.G. of Aeronautical Affairs (in CAO)	Mehrabad International Airport P.O. Box 13445 – 1798	mkhd4444@yahoo.com	+98214464 9269	+982 16603 6241	
Iraq							
Israel	Libby M. Bahat	Division Manager, Aerial Infrastructure & ATS	Civil Aviation Authority of Israel	bahatl@mot.gov.il		+972-3-9774512\552	
Jordan		Director Studies and Planning/ANS	P.O. Box 7547	dplanans@carc.gov.jo	+962 6 4891653	+962 6 4891708	
Kuwait	Adel Mohammed Al Yagout	Superintendent of Air Navigation Department	Directorate General of Civil Aviation Kuwait International Airport P.O. Box 17 Safat 13001	Q8dgca_danoff@hotmail.com	+965 4346221	+965 4346220	+965 9571755
Lebanon	Walid Alhassanieh	Chief ACC	Air Navigation Department Beirut Rafic Hariri Int'l Airport	hassaniehw @beirutairport.gov.lb	+9611629023 +9611629106	+961 1629026	+961 3509902
Oman	Sabri Said Saud Al-Busaidy	DMS Manager	Directorate General of Meteorology & Air Navigation (DGMAN) Muscat International Airport P.O. Box 1 CPO Seeb	sabri@dgcam.gov.om	+96824518990 +24519 939	+968 24519501	+968 99359415

STATE	NAME	TITLE	ADDRESS	EMAIL	FAX	TEL	MOBILE
Qatar	Ahmed Al-Eshaq	Director Air Navigation	Civil Aviation Authority P.O. Box 3000 Doha – QATAR	ahmed@caa.gov.qa	(974) 465 6554	(974) 462 2300	(974) 555 0440
Saudi Arabia	Ali H. Hakami	Navigational Aids Systems Planner	General Authority of Civil Aviation P.O. Box 21444 Jeddah 21444	yaro123@yahoo.com	+966 2 671 7717 Ext 1594	+966 2 671 7717 Ext 1593	+966 59 840 2598
Syria	Al Layth Al Hammoud	Chief of Air Navigation					
UAE	Hassan Karam	Director Air Navigation Services	General Civil Aviation Authority P.O. Box 666 Abu Dhabi – UAE	hkaram@szc.gcaa.ae	+97124054545	97124054501	+971508187492
Yemen	Ahmed Mohamed Al Kobati	Director Air Navigation Operations	Air Navigation Sector CAMA Airport Road P.O. Box 3473 Sana'a – REPUBLIC OF YEMEN	cama570@yahoo.com	+9671344047	+9671345402	+967 777241375

APPENDIX C

Progress Reports from States

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	MID												RNAV-1		
2							Y						RNAV		

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

Bahrain PBN Implementation time frame

Navigation Specification	Airspace Application	Short Term				Medium Term				Long Term	
		2009	2010	2011	2012	2013	2014	2015	2016	2017….	2025
RNAV10	NA	Will not be used									
RNP4	NA	Will not be used									
RNAV2	NA	Will not be used									
RNP5 into RNAV5	Enroute										
RNAV1	Enrout										
RNAV1	TMA Dep. and Arr. Sur										
Basic RNP1	TMA Dep. and Arr. Non sur										
RNP APCH	Approach										
RNP AR APCH	Approach KHIA										
RNAV1	SIDs / STARs										
Basic RNP1	Enrout										
advanced-RNP-1	en-route										
advanced-RNP-1	terminal airspace										
Use of NDB	Approach operations					Stop using the NDB for approach operations					
Conventional NPA procedures										Stop the conventional NPA procedures	

Annex 1

ANNEX 1 – TIME FRAME OF STATE OF QATAR PBN NATIONAL PLAN

Navigation Specification	Airspace Application	Short Term				Medium Term				Long Term	
		2009	2010	2011	2012	2013	2014	2015	2016	2017…	2025
RNAV10	NA	Will not be used									
RNP4	NA	Will not be used									
RNAV2	NA	Will not be used									
RNP5 into RNAV5	Enroute										
RNAV1	Enroute										
RNAV1	TMA Dep. and Arr. Sur										
Basic RNP1	TMA Dep. and Arr. Non Sur										
RNP APCH	Approach										
RNP AR APCH	Approach KHIA										
RNAV1	SIDs / STARs										
Basic RNP1	Enroute										
advanced-RNP-1	Enroute										
advanced-RNP-1	Terminal airspace										
Use of NDB	Approach operations					Stop using the NDB for approach operations					
Conventional NPA procedures										Stop the conventional NPA procedures	

Egypt

Terminal area and approach implementation schedule by aerodrome

NO	ICAO REGION	ICAO DESIG	AIRPORT NAME[5]	COUNTRY	INTL (Y/N)[1]	RUNWAY	INST RWY Y/N	RESTRICTI-ONS IF ANY	APP. 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	MID	HE CA	CAIRO INT AIRPORT	EGYPT	Y	O5R	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		NIL		
	MID	HE CA	CAIRO INT AIRPORT	EGYPT	Y	23L	Y	LANDING& TAKEOFF	RNAV(GNSS)		RNAV	Sep-09	NIL		
	MID	HE CA	CAIRO INT AIRPORT	EGYPT	Y	05L	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP	NIL	NIL		
	MID	HE CA	CAIRO INT AIRPORT	EGYPT	Y	23R	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP	NIL	NIL		
2	MID	HE SH	SHARM ELSHIEKH AIRPORT	EGYPT	Y	04R	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		
	MID	HE SH	SHARM ELSHIEKH AIRPORT	EGYPT	Y	22L	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		
	MID	HE SH	SHARM ELSHIEKH AIRPORT	EGYPT	Y	04L	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		
	MID	HE SH	SHARM ELSHIEKH	EGYPT	Y	22R	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		
3	MID	HE GN	HURGAD AIRPORT	EGYPT	Y	16	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		
	MID	HE GN	HURGAD AIRPORT	EGYPT	Y	34	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		
4	MID	HE BA	BORG ELARAB AIRPORT	EGYPT	Y	32	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP		

5	MID	HEAX	ALEX AIRPORT	EGYPT	Y	4	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
	MID	HEAX	ALEX	EGYPT	Y	22	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
	MID	HEAX	ALEX	EGYPT	Y	18	Y	LANDING& TAKEOFF	NIL		NIL		NIL	
	MID	HEAX	ALEX	EGYPT	Y	36	Y	LANDING& TAKEOFF	NIL		NIL		NIL	
6	MID	HELX	LUXOR	EGYPT	Y	2	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
	MID	HELX	LUXOR	EGYPT	Y	22	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
7	MID	HESN	ASWAN	EGYPT	Y	17	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
	MID	HESN	ASWAN	EGYPT	Y	35	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
8	MID	HETB	TABA	EGYPT	Y	4	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
	MID	HETB	TABA	EGYPT	Y	22	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
9	MID	HEAT	ASUT	EGYPT	Y	13	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
	MID	HEAT	ASUT	EGYPT	Y	31	Y	LANDING& TAKEOFF	RNAV(GNSS)		SUSP		SUSP	
10	MID	HEAR	ARISH	EGYPT	Y	34	Y	LANDING& TAKEOFF	NIL		NIL		NIL	
	MID	HEAR	ARISH	EGYPT	N	16	N	NIL	NIL		NIL		NIL	
11	MID	HEMA	M.ALAM	EGYPT	Y	15	Y	LANDING& TAKEOFF	NIL		NIL		NIL	
	MID	HEMA	M.ALAM	EGYPT	Y	33	Y	LANDING& TAKEOFF	NIL		NIL		NIL	
12	MID	HEAZ	ALMAZA	EGYPT	N	36	N	LANDING& TAKEOFF	NIL		NIL		NIL	MILITARY
13	MID	HEPS	PORTDAID	EGYPT	N	10	N	LANDING& TAKEOFF	NIL		NIL		NIL	
14	MID	HEOW	S.OWIENAT	EGYPT	N	1	N	LANDING& TAKEOFF	NIL		NIL		NIL	
15	MID	HESC	S.CATRIN	EGYPT	N	17	N	LANDING& TAKEOFF	NIL		NIL		NIL	

5.5Q-2

ISLAMIC REPUBLIC OF **IRAN** PBN APPROACH and TERMINAL IMPLEMENTATION STATUSLNAV

NO	ICAO REGION	ICAO DESIG	AIRPORT NAMES	C O U N T R Y	INTL (Y/N)	RUNWAY	INST RWY Y/N	RESTRICTIONS	APPROACH LNAV/VNAV	APP R EFF DATE	RNAV/RNP SID`	S I D EFF DATE	RNAV /RNP STAR	STAR EFF DATE	MMENTS
1	MID	OIIE	IMAM KHOMAINI	ISLAMIC REPUBLIC OF IRAN	Y	29 11	Y Y		LNAV	OCT-09	RNAV-1	OCT-09	RNAV	OCT-09	
2	MID	OIII	MEHRABAD	ISLAMIC REPUBLIC OF IRAN	Y	29L 29R 11L 11R	Y Y Y Y		LNAV	OCT-10	RNAV-1	OCT- 10	RNAV	OCT-10	
3	MID	OIMM	MASHHAD (SHAHID HASHEMI NEJAD)	ISLAMIC REPUBLIC OF IRAN	Y	31L 31R 13L 13R	Y Y Y Y		LNAV	OCT-10	RNAV-1	OCT- 10	RNAV	OCT-10	
4	MID	OISS	SHIRAZ (SHAHID DASTGHAIB)	ISLAMIC REPUBLIC OF IRAN	Y	29L 29R 11L 11R	Y Y Y Y		LNAV	OCT-10	RNAV-1	OCT- 10	RNAV	OCT-10	
5	MID	OIFM	ESFAHAN (SHAHID BEHESHTI)	ISLAMIC REPUBLIC OF IRAN	Y	26L 26R 08L 08R	Y Y Y Y		LNAV	OCT-10	RNAV-1	OCT- 10	RNAV	OCT-10	

5.5Q-3

LEBANON PBN APPROACH &TERMINAL IMPLMENTATION STATUS

NO	ICAO REGION	ICAO DESIG	AIRPORT NAME[5]	COUNTRY	INTL (Y/N)[1]	RUNWA	INST RWY Y/N	RESTRICTIONS IF ANY	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	MID	OLBA	BEIRUT INTL AIRPORT	LEBANON	Y	16	Y	LANDING ONLY	RNAV(GNSS)	11APR08	NIL	NIL	RNAV	11APR08	
2	MID	OLBA	BEIRUT INTL AIRPORT	LEBANON	Y	34	Y	TAKEOFF ONLY	NIL	NIL	NIL	NIL	NIL	NIL	
3	MID	OLBA	BEIRUT INTL AIRPORT	LEBANON	Y	03	Y	NIL.	RNAV(GNSS)	11APR08	NIL	NIL	RNAV	11APR08	
4	MID	OLBA	BEIRUT INTL AIRPORT	LEBANON	Y	21	Y	NOT USED FOR LANDING DURING NIGHT	RNAV(GNSS)	11APR08	NIL	NIL	RNAV	11APR08	
5	MID	OLBA	BEIRUT INTL AIRPORT	LEBANON	Y	17	Y	SECODARY RWY	RNAV(GNSS)	11APR08	NIL	NIL	RNAV	11APR08	
5	MID	OLBA	BEIRUT INTL AIRPORT	LEBANON	Y	35	Y	NOT USED FOR LANDING	NIL	NIL	NIL	NIL	NIL	NIL	
7															
17															
18															
19															
20															
21															

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, enter RNP AR AP

5.5Q-4

Appendix 1

Jordan

PBN implementation time schedule

Navigation Specification	Airspace Application	Short Term				Medium Term				Long Term	
		2009	2010	2011	2012	2013	2014	2015	2016	2017….	2025
RNAV10	NA	Will not be used									
RNP4	NA	Will not be used									
RNAV2	NA	Will not be used									
RNP5 into RNAV5	Enroute										
RNAV1	Enrout										
RNAV1	TMA Dep. and Arr. Sur										
Basic RNP1	TMA Dep. and Arr. Non sur										
RNP APCH	Approach										
RNP AR APCH	Approach KHIA										
RNAV1	SIDs / STARs										
Basic RNP1	Enrout										
advanced-RNP-1	en-route										
advanced-RNP-1	terminal airspace										
Use of NDB	Approach operations					Stop using the NDB for approach operations					
Conventional NPA procedures										Stop the conventional NPA procedures	

SAUDI ARABIA PBN (Performance-Based Navigation) Timeline

	Navigation Specification	Airspace Application	Near Term				Medium Term				Long Term								
			2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1	RNAV10	N/A	Will not be used																
2	RNP4	N/A	Will not be used																
3	RNAV2	N/A																	
4	RNP5 into RNAV5	Enroute																	
5	RNAV1	Enroute																	
6	RNAV1	TMA Dep. And Arr.Sur																	
7	Basic RNP1	TMA Dep. And Arr. Non sur																	
8	RNP APCH	Approach																	
9	RNP AR APCH	Approach International Airport																	
10	RNAV1	SIDs / STARs																	
11	Basic RNP1	Enroute																	
12	advanced-RNP-1	Enroute																	
13	Advanced-RNP-1	Terminal Airspace																	
14	Use of NDB	Approach Operations	Stopped using the NDB for Approach Operations																
15	Conventional NPA procedures										< - - - - - - - - - - - - - stopped the conventional NPA procedures - - - - - - - - - - - - >								

APPENDIX E

PBN IMPLEMENTATION PROGRESS REPORT

State: (Name of State) Date: (DD/MM/YY)

Designation of PBN Focal Point

Reference: MID State Letter Ref AN 6/28 – 149 dated 21 April 2008 and follow up letter Ref AN6/28 – 293 dated 10 August " in order to facilitate necessary follow-up and coordination, to provide a PBN Implementation Focal Point by 21 August 2008 "

Status: (Nominated/ To be Nominated)
Focal Point: (Name, Designation, Mailing Address, Email, Phone, Fax)

State PBN Implementation Plan

Reference: MIDANPIRG Conclusion 11/74 – PBN State implementation Plan

"That, That, in order to give effect to Assembly Resolution A36-23: Performance based navigation global goals, MID States are urged to complete development of their individual State Implementation plans based on the regional PBN implementation plan by 30 September 2009 so that it may be reviewed by the ATM/SAR/AIS SG as part of the Regional agreement process.

Status: (Adopted / To be adopted) by (name of a national body) and (Reviewed / To be reviewed) by ICAO *PBN/GNSS* TF
Note(s): (States may include information on publication date and location for State PBN Implementation Plan and other relevant information.)

Approach Operations

Reference: ICAO Assembly Resolution A36-23

"States and planning and implementation regional groups (PIRGs) complete a PBN implementation plan by 2009 to achieve: implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS) for all instrument runway ends, either as the primary approach or as back up for precision approaches by 2016 with intermediate milestones as follows: 30 percent by 2010, 70 percent by 2014."

Status:

Implementation Targets (# of RWY Ends)			**Completed** (# of RWY Ends)		**On Progress** (# of RWY Ends)	
Y2010	Y2014	Y2016	LNAV	LNAV/VNAV	LNAV	LNAV/VNAV

Note(s): (States may include information on recent publications of new PBN approach procedures.)

Arrival and Departure Operations

Reference: 1) ICAO Assembly Resolution A36-23

"States and planning and implementation regional groups (PIRGs) complete a PBN implementation plan by 2009 to achieve: implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones."

2) MID PBN Regional Implementation Plan and Strategy

"Short-term Implementation Targets: ☐ RNP APCH (with Baro-VNAV) in 30% of instrument runways by 2010 and 50% by 2012 and priority should be given to airports with most significant operational benefits RNAV-1 SIDs/STARs for 30% of international airports by 2010 and 50% by 2012 and priority should be given to airports with RNP Approach RNP-5 and B-RNAV which is implemented in MID Region to be redefined as per ICAO PBN terminology by 2009 (MIDANPIRG/11), full implementation of PBN by 2012 for continental en-route.."

- *"Medium-term Implementation Targets: RNP APCH with Baro-VNAV or APV in 100% of instrument runways by 2016. RNAV-1 or RNP-1 SID/STAR for 100% of international airports by 2016 and RNAV-1 or Basic RNP-1 SID/STAR at busy domestic airports where there are operational benefits*

Implementation Targets (# of Int'l Airports)			**Completed** (# of Int'l Airports)		**On Progress** (# of Int'l Airports)	
Y2010	Y2014	Y2016	Arrival	Departure	Arrival	Departure

Note(s): (States may include information on recent publications with new PBN arrival/departure procedures.)

APPENDIX F

MID REGIONAL PERFORMANCE OBJECTIVES
ATM PERFORMANCE OBJECTIVES

OPTIMIZATION OF THE ATS ROUTE STRUCTURE EN-ROUTE AIRSPACE	
Benefits	
Environment	reductions in fuel consumption and CO_2 emission
Safety	Improved safety of ATS routes
Efficiency	• ability of aircraft to conduct flight more closely to preferred trajectories • increase in airspace capacity
KPI	• status of implementation of RNAV 1 in the MID Region • status of implementation of the ATS Routes listed in the MID ATS Route Catalogue • status of implementation of RNAV 5 area in the level band FL160-FL460, in the MID Region • status of Duplicated 5LNCs in the MID Region • status of deficiencies related to non-implementation of ATS Routes • status of implementation of 20NM longitudinal separation
Performance Metrics:	• number of RNAV 1 Routes implemented, in accordance with the MID Basic ANP • number of implemented ATS Routes from the MID ATS Route Catalogue • number of States having implemented RNAV 5 area in the level band FL160-FL460 • number of duplicate 5LNC eliminated • number of eliminated deficiency related to non-implementation of ATS Routes • number of concerned States implementing 20NM longitudinal separation

Strategy
Short term (2010-2012)
Medium term (2013-2016)

ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AOM	***En-route airspace***			
	• develop Airspace Concept based on the MID PBN implementation plan, in order to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN and, in particular, RNAV 5, taking into account interregional harmonization	ongoing	ATM/SAR/AIS SG (ARN TF)	valid
	• develop State PBN implementation plans related to ATS Route development	2008-2012	States	valid
	• monitor user requirements for the establishment of ATS routes in the MID Region	Ongoing	ATM/SAR/AIS SG ARN TF	valid
	• provide status of PBN implementation	2010-2011	States	valid

Strategy ***Short term (2010-2012)*** ***Medium term (2013-2016)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
	• monitor the implementation of pending ATS Routes and update the MID Basic ANP and the MID ATS Route catalogue	Ongoing	ATM/SAR/AIS SG ARN TF	valid
	• follow–up with States on the implementation of pending ATS Routes and update the list of air navigation deficiencies, accordingly	Ongoing	ATM/SAR/AIS SG ARN TF	valid
	• monitor the implementation of RNAV 5 area in the level band FL160 - FL460 (inclusive)	2008-2012	ATM/SAR/AIS SG ARN TF	valid
	• monitor the implementation of RNAV 1 routes in the MID Region	Ongoing	ATM/SAR/AIS SG ARN TF	valid
	• implementation of 20NM longitudinal separation between States	2010-2011	Bahrain; Iraq; Jordan; Kuwait; Saudi Arabia; Syria and UAE	
	• monitor the process of allocation of 5LNCs	Ongoing	ICAO	valid
	• elimination/Reduction of the use of duplicate 5LNCs	2010-2011	ICAO States	valid
linkage to GPIs	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/20: WGS-84			

OPTIMIZATION OF THE TERMINAL AIRSPACE	
Benefits	
Environment **Safety**	• reductions in fuel consumption and CO_2 emission • enhance safety in terminal air space
Efficiency	• ability of aircraft to conduct flight more closely to preferred trajectories • increase in airspace capacity • facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency
KPI	• status of implementation of PBN routes in terminal airspace • status of implementation of SID and STARS
Proposed Metrics:	• number of States implemented PBN routes in terminal airspace • total Number of PBN routes in MID region terminal airspace • number States implemented SID and STARS

Strategy
Short term (2010-2012)
Medium term (2013-2016)

ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AOM, AO	***In terminal airspace***			
	• develop Airspace Concept based on the MID PBN implementation plan, in order to design and implement optimized standard instrument departures (SIDs), standard instrument arrivals (STARs), instrument flight procedures, holding, approach and associated procedures (particular RNAV 1 and Basic RNP1) in accordance with Regional Plan	Ongoing	States	valid
	• develop State PBN implementation plans related to terminal Airspace	Ongoing	(ATM/SAR/AIS SG) States	valid
	• formulate safety plan (assessment and monitoring)	2009-2012	States	valid
	• publish national regulations for aircraft and operators approval using PBN manual as guidance and considering available foreign approval material	2008-2010	States	valid
	• training	2008-2012	States	valid
	• system performance measuring (measurement and monitoring plan	2009-2012	States, ATM/SAR/AIS SG	valid
	• implement SIDs and STARs	2009-2012	States	valid

Strategy ***Short term (2010-2012)*** ***Medium term (2013-2016)***				
ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
	• monitor implementation progress in accordance with MID PBN implementation roadmap and States implementation plan	2009-2012	States, ATM/SAR/AIS SG	valid
Linkage to GPIs	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: Functional integration of ground systems with airborne systems.			

IMPLEMENTATION OF RNAV AND RNP APPROACHES	
Benefits	
Environment **Efficiency** **Safety**	• Reduce CO2 emission • reductions in fuel consumption and emissions; • improvements in capacity and efficiency at aerodromes • improvements in safety at aerodromes
KPI	• status of implementation of RNAV/ RNP Approaches in the MID Region • status of implementation of PBN approaches
Proposed Metrics:	• number of States having implemented PBN approaches • number of RNAV/RNP APP in each States

Strategy
Short term (2010-2012)
Medium term (2013-2016)

ATM OC COMPONENTS	**TASKS**	**TIMEFRAME START-END**	**RESPONSIBILITY**	**STATUS**
AOM, AO	***At airports***			
	• develop Airspace Concept based on the MID PBN Implementation Plan, in order to design and implement RNP APCH APV in most possible airports; RNP AR APCH at airports where there are obvious operational needs	2009-2012	States	valid
	• develop State PBN implementation plans regarding Guided RNP Approaches	Ongoing	MIDANPIRG/12 (ATM/SAR/AIS SG) States	valid
	• formulate safety plan (assessment and monitoring)	2009-2012	States	valid
	• publish national regulations for aircraft and operators approval using PBN manual as guidance and considering available foreign approval material	2008-2012	States	valid
	• system performance measuring (measurement and monitoring plan	2009-2012	States, ATM/SAR/AIS SG	valid
	• implement APV procedures	2009-2012	States	valid
	• monitor implementation progress in accordance with MID PBN implementation roadmap and States implementation plan	2009-2012	States, ATM/SAR/AIS SG	valid
Linkage to GPIs	GPI/5: performance-based navigation, GPI/7: dynamic and flexible ATS route management, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs and GPI/12: FMS-based arrival procedures			
