



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REPORT OF THE SEVENTH MEETING OF THE
MIDANPIRG COMMUNICATION, NAVIGATION,
SURVEILLANCE/AIR TRAFFIC MANAGEMENT/
IMPLEMENTATION COORDINATION SUB-GROUP**

(CNS/ATM/IC SG/7)

(Cairo, Egypt, 07 – 09 October 2013)

The views expressed in this Report should be taken as those of the CNS/ATM/IC SG Sixth Meeting and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be published in due course as a Supplement to the Report.

Approved by the Meeting
and published by authority of the Secretary General

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TABLE OF CONTENTS

	Page
PART I - HISTORY OF THE MEETING	
1. Place and Duration	1
2. Opening	1
3. Attendance.....	1
4. Officers and Secretariat	1
5. Language	1
6. Agenda	2
7. Conclusions and Decisions – Definition	2
8. List of Conclusions and Decisions	2
PART II - REPORT ON AGENDA ITEMS	
Report on Agenda Item 1	1-1
Report on Agenda Item 2	2-1
Appendices 2A	
Report on Agenda Item 3	3-1/3-2
Report on Agenda Item 4	4-1/4-4
Appendices 4A	
Report on Agenda Item 5	5-1/5-7
Appendices 5A-5G	
Report on Agenda Item 6	6-1
Appendices 6A – 6E	
Report on Agenda Item 7	7-1
ATTACHMENT A	
List of Participants.....	1-5

CNS/ATM/IC SG/7
History of the Meeting

PART I - HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Seventh Meeting of the MIDANPIRG CNS/ATM/IC SG was held at the ICAO MID Regional Office in Cairo, Egypt, 07 – 09 October 2013.

2. OPENING

2.1 Mr. Mohammed Khonji, ICAO Regional Director Cairo welcomed all participants to the CNS/ATM/IC SG/7 meeting. A special welcome was extended to Sudan since Sudan and Libya will become members of MIDANPIRG as follow-up to the 12th Air Navigation Conference (AN-Conf/12) Recommendation 6/11 and need to attend all MIDANPIRG and its subsidiary bodies meetings.

2.2 Mr. Khonji highlighted the importance of this meeting which expected to address important subjects such as the MID Region Air Navigation Strategy and MIDANPIRG new Organizational Structure. He also indicated that the meeting will be apprised of the global developments such as the outcome of the AN-Conf/12, the fourth Edition of the Global Air Navigation Plan, the Aviation System Block Upgrades (ASBU) methodology, the progress achieved for the development of the new regional Air Navigation Plan Templates as well as the development of the first edition of the Global Air Navigation Report and Regional Performance Dashboards.

2.3 Finally, Mr. Khonji concluded by wishing the meeting productive deliberations and outcome.

3. ATTENDANCE

3.1 The meeting was attended by a total of twenty two (22) participants, which included delegates from five (5) States (Bahrain, Egypt, Saudi Arabia, Sudan and Yemen) and one (1) International Organizations (IATA). The list of participants is at Attachment A.

4. OFFICERS AND SECRETARIAT

4.1 Mr. Saleem Mohamed Hassan, Chief Air Traffic Management, Civil Aviation Affairs, Bahrain, Chaired the meeting. Mr. Raza Gulam, Regional Officer, CNS and Mr. Elie El Khoury, Regional Officer, ATM/SAR from the ICAO Middle East Office were the Secretaries of the meeting. Mr. Mohamed Smaoui, Deputy Regional Director, ICAO Middle East Office, supported the meeting.

5. LANGUAGE

5.1 The discussions were conducted in English and documentation was issued in English.

CNS/ATM/IC SG/7
History of the Meeting

6. AGENDA

6.1 The following Agenda was adopted:

- Agenda Item 1: Adoption of the Provisional Agenda
- Agenda Item 2: Follow-up on the Outcome of MIDANPIRG/13 Meeting and DGCA-MID/2 Conclusions and Decisions relevant to the CNS/ATM Field
- Agenda Item 3: Air Navigation Global Developments
- Agenda Item 4: Performance Framework for MID Region Air Navigation Planning and Implementation
- Agenda Item 5: Regional Air Navigation Planning and Implementation Issues
- Agenda Item 6: Future Work Programme
- Agenda Item 7: Any other Business

7. CONCLUSIONS AND DECISIONS – DEFINITION

7.1 The MIDANPIRG records its actions in the form of Conclusions and Decisions with the following significance:

- a) **Conclusions** deal with matters which, in accordance with the Group's terms of reference, merit directly the attention of States on which further action will be initiated by ICAO in accordance with established procedures; and
- b) **Decisions** deal with matters of concern only to the MIDANPIRG and its contributory bodies

8. LIST OF CONCLUSIONS AND DECISIONS

- DRAFT CONCLUSION 7/1: MID REGION AIR NAVIGATION PRIORITIES
- DRAFT CONCLUSION 7/2: MID REGION AIR NAVIGATION STRATEGY
- DRAFT CONCLUSION 7/3: ASSISTANCE FOR THE DEVELOPMENT/UPDATE OF THE NATIONAL AIR NAVIGATION PERFORMANCE FRAMEWORK

CNS/ATM/IC SG/7
History of the Meeting

DRAFT CONCLUSION 7/4:	MID REGION GNSS IMPLEMENTATION STRATEGY
DRAFT CONCLUSION 7/5:	MID REGION PBN IMPLEMENTATION STRATEGY AND PLAN
DRAFT CONCLUSION 7/6:	ESTIMATING ENVIRONMENT BENEFITS
DRAFT CONCLUSION 7/7:	INFPL POST IMPLEMENTATION-SYSTEM UPGRADE

CNS/ATM/IC SG/7
Report on Agenda Item 1

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA AND ELECTION OF CHAIRPERSON

1.1. The meeting reviewed and adopted the Provisional Agenda as at Para 6 of the History of the Meeting.

1.2. Due to the absence of the Chairperson and Vice Chairperson of the Sub-Group, the meeting elected Mr. Saleem Mohamed Hassan, Chief Air Traffic Management, Civil Aviation Affairs, Bahrain, to Chair the CNS/ATM/IC SG/7 meeting.

CNS/ATM/IC SG /7
Report on Agenda Item 2

**REPORT ON AGENDA ITEM 2: FOLLOW-UP ON THE OUTCOME OF MIDANPIRG/13 AND
DGCA-MID/2 CONCLUSIONS AND DECISIONS RELEVANT TO
THE CNS/ATM**

2.1 The meeting noted the status of relevant MIDANPIRG/13 and DGCA MID/2 Conclusions and Decisions related to the CNS/ATM and the follow up actions taken by States, the secretariat and other parties concerned as at **Appendix 2A** to the Report on Agenda Item 2. The meeting agreed also to review the Conclusions and Decisions, which are still current, under the associated Agenda Items with a view to propose to MIDANPIRG/14 appropriate follow-up action.

CNS/ATM/IC SG/7
Appendix 2A to the Report on Agenda Item 2

FOLLOW-UP ACTION PLAN ON MIDANPIRG/13 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 13/5: IMPLEMENTATION OF REDUCED RADAR LONGITUDINAL SEPARATION IN THE MID REGION</p> <p>That,</p> <p>a) States, that have not yet done so;</p> <p>i) be urged to implement the 20 NM radar longitudinal separation;</p> <p>ii) be encouraged to further reduce the radar longitudinal separation within the MID Region to 10 NM, where appropriate; and</p> <p>iii) be invited to agree with their neighbouring FIRs/States on the date of implementation and updating of the LoAs;</p> <p>b) the ATM Regional PFFs be updated to include the reduced radar longitudinal separation as an ATM objective for the MID Region.</p>	Implement the Conclusion	ICAO States	State Letter	30 Aug. 2012	Actioned AN 6/3 – 12/165 dated 12 June 2012 Feedback received from States (To be closed)
<p>CONCLUSION 13/13: AVOIDANCE OF THE AIRAC DATE 15 NOVEMBER 2012</p> <p>That, taking into consideration the worldwide impact of the ICAO New FPL format implementation, States be invited to avoid the use of the AIRAC date of 15 November 2012 as an effective date for the introduction of significant changes to the aeronautical information publications</p>	Implement the Conclusion	ICAO States	State Letter Feedback from States	30 Jun. 2012 20 Sep. 2012	Completed AN 8/2.1 – 12/232 dated 6 Aug. 2012

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 13/30: NATIONAL PERFORMANCE FRAMEWORK</p> <p>That, States be urged to:</p> <p>a) develop, update and/or complete their National Performance Framework, including the National Performance Framework Forms (PFFs), ensuring the alignment with and support to the regional performance objectives;</p> <p>b) incorporate the agreed MID Region Performance Metrics into their National performance monitoring process; and</p> <p>c) report relevant data necessary for performance monitoring of the air navigation systems to the ICAO MID Regional Office, on a regular basis, with a view to update the Regional PFFs and monitor the MID Region Performance Metrics.</p>	<p>Implement the Conclusion</p>	<p>ICAO States</p>	<p>State Letter Feedback and reports</p>	<p>30 Jun. 2012 On regular basis</p>	<p>Ongoing AN 7/26.1 – 12/233 dated 6 Aug. 2012 (To be closed)</p>

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>DECISION 13/32: ESTABLISHMENT OF THE MID AIR NAVIGATION PLAN AD-HOC WORKING GROUP (ANP WG)</p> <p>That, the MID Air Navigation Plan Ad-hoc Working Group (ANP WG) be established to fulfil the requirements set up by MIDANPIRG through Decision 12/49.</p>	Convene the ANP WG/1 meeting	MIDANPIRG/13	ANP WG established	Apr. 2012	Completed ANP WG/1 held in Cairo, 27-29 May 2013
<p>CONCLUSION 13/33: STATE ACTION PLANS FOR CO₂ EMISSION</p> <p>That, States, that have not yet done so, be urged to:</p> <p>a) send the contact details of their CO₂ emission focal point to the ICAO MID Regional Office; and</p> <p>b) submit their action plan for CO₂ emission to ICAO before 30 June 2012.</p>	Implement the Conclusion	States	Action Plan	30 Jun. 2012	Ongoing
<p>DECISION 13/34: ESTABLISHMENT OF THE AIR TRAFFIC MANAGEMENT MEASUREMENT TASK FORCE (ATMM TF)</p> <p>That, the ATMM TF be established with Terms of Reference (TOR) as at Appendix 4.5J to the Report on Agenda Item 4.5.</p>	Convene the ATMM TF/1 meeting	MIDANPIRG/13	ATMM TF established	Apr. 2012	Completed First meeting (8-9 September 2013)
<p>CONCLUSION 13/35: ESTIMATING ENVIRONMENT BENEFITS</p> <p>That, in order to allow the Air Traffic Management Measurement Task Force (ATMM TF) and the CNS/ATM/IC SG to follow-up the implementation of the ATM operational improvements and estimate the fuel savings accrued from the corresponding improvements on regional basis:</p> <p>a) States be urged to:</p> <p>i) use IFSET or a more advanced model/measurement capability available to estimate environment benefits accrued from</p>	Implement the Conclusion	ICAO States/Users ATMM TF and CNS/ATM/IC SG	State Letter Feedback (IFSET reports) Reports of meetings	Dec. 2012 2013	Actioned AN 6/15 – 13/028 dated 20 Jan 2013 First meeting (8-9 Sept 2013) (To be replaced and superseded)

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>operational improvements;</p> <p>ii) send the IFSET reports/the accrued environmental benefits to ICAO MID Regional office on a bi-annual basis.</p> <p>b) IATA to:</p> <p>i) encourage users to support the programme; and</p> <p>ii) consolidate users' inputs and report the accrued environmental benefits to ICAO MID Regional office on a bi-annual basis.</p>					by Draft Conc. 7/6)
<p>CONCLUSION 13/36: ICAO NEW FLIGHT PLAN FORMAT AWARENESS CAMPAIGNS</p> <p>That, States be urged to conduct internal awareness campaigns on INFPL and invite all stakeholders within their States.</p>	Implement the Conclusion	ICAO States	State letter	Jun. 2012	Completed
<p>CONCLUSION 13/37: ICAO NEW FPL FORMAT TESTING SCHEDULE</p> <p>That, States be urged to follow the testing schedule as at Appendix 4.5L to the Report on Agenda Item 4.5.</p>	Implement the Conclusion	ICAO States	State letter	Jun. 2012	Completed
<p>CONCLUSION 13/38: INFPL STRATEGIC SUPPORT TEAM (SST)</p> <p>That, in order to support INFPL implementation in the MID region, those States requiring support request the ICAO MID Regional Office to coordinate with the SST members the provision of the required support.</p>	Implement the Conclusion	States	State Letter	Jun. 2012	Completed
<p>CONCLUSION 13/39: REVISED STRATEGY FOR THE IMPLEMENTATION OF INFPL</p> <p>That, the revised MID Region Strategy for the implementation of INFPL be adopted as at Appendix 4.5M to the Report on Agenda Item 4.5.</p>	Implement the Strategy	MIDANPIRG/13	Strategy	Apr. 2012	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 13/40: MID REGION INFPL IMPLEMENTATION DOCUMENT</p> <p>That, the MID Region INFPL Implementation document be adopted as at Appendix 4.5N to the Report on Agenda Item 4.5.</p>	Implement the Conclusion	MIDANPIRG/13	Adopted Document	Apr. 2012	Completed
<p>CONCLUSION 13/41: MID REGION PROCESS FOR MODE S IC CODES ALLOCATION</p> <p>That, the process for the allocation of IC codes for Mode S radars in the MID Region be adopted as at Appendix4.5O to the Report on Agenda Item 4.5.</p>	Implement the Conclusion and follow the IC code allocation process	MIDANPIRG/13	Adopted process	April 2012	Completed
<p>DECISION 13/42: MID REGION SURVEILLANCE STRATEGY</p> <p>That, the CNS SG review MID Surveillance Strategy and ADS-B Strategy at Appendices 4.5P and 4.5Q to the Report on Agenda Item4.5 and develop a consolidated MID Surveillance Strategy.</p>	Implement the Decision CNS SG/5 develop consolidated Strategy	CNS SG/5	MID Surveillance Strategy	Dec. 2012	Completed CNS SG/5 11-13 Dec 2012 –Draft Conc 5/6
<p>CONCLUSION 13/43: ALLOCATION OF 24 BIT AIRCRAFT ADDRESS</p> <p>That, States be urged to:</p> <p>a) allocate 24 bit aircraft address according to Annex 10, Volume III, Part I, Chapter 9, Table 9-1 (allocation of aircraft addresses to States);</p> <p>b) send the allocation list to ICAO MID Regional Office and MIDRMA by 30 September 2012; and</p> <p>c) provide ICAO MID Regional Office and MIDRMA with regular updates to the allocation list.</p>	Implement the Conclusion	ICAO States MIDRMA	State Letter	Sep.2012	Completed AN 7/27 – 12/210 dated 11 Jul. 2012

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 13/44: PROTECTION OF GNSS SIGNAL</p> <p>That, States that are listed in the footnotes 5.362B and 5.362C be urged to take necessary measures to remove their names from these footnotes as soon as possible.</p>	Implement the Conclusion	ICAO States	State Letter	Jun.2012	Completed AN 6/28-12/217 dated 18 Jul. 2012
<p>CONCLUSION 13/45: STRATEGY FOR THE IMPLEMENTATION OF GNSS IN THE MID REGION</p> <p>That, the Strategy for implementation of GNSS in the MID Region be updated as at Appendix 4.5R to the Report on Agenda Item 4.</p>	Implement the Strategy	MIDANPIRG/13	Strategy	Apr. 2012	Completed
<p>CONCLUSION 13/46: GNSS SURVEY</p> <p>That, States complete the GNSS questionnaire as at Appendix 4.5S to the Report on Agenda Item 4.5 and send it to the ICAO MID Regional Office before 1 September 2012.</p>	Implement the Conclusion	ICAO States	State Letter Completed Survey	Sep.2012	Completed
<p>CONCLUSION 13/47: MID REGIONAL PBN IMPLEMENTATION STRATEGY AND PLAN</p> <p>That, the MID Regional PBN Implementation Strategy and Plan be updated as at Appendix4.5T to the Report on Agenda Item 4.5.</p>	Implement the Strategy	MIDANPIRG/13	Strategy	Apr. 2012	Completed
<p>DECISION 13/48: ESTABLISHMENT OF MID PBN SUPPORT TEAM (MPST)</p> <p>That, MPST be established with TOR as at Appendix 4.5U to the Report on Agenda Item 4.5.</p>	Implement Decision	MIDANPIRG/13	MPST established	Apr. 2012	Completed

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 13/49: MID PBN SUPPORT TEAM (MPST)</p> <p>That,</p> <ul style="list-style-type: none"> a) ICAO MID Regional Office provide the leadership for MPST; b) UAE be the champion for the MPST; c) IATA fully commit and support the MPST; and d) States assign members to MPST and allocate necessary resources 	<p>Implement the Conclusion</p>	<p>ICAO States UAE IATA</p>	<p>State Letter MPST Visit</p>	<p>Sep. 2012</p>	<p>On going Coordination ongoing with IATA, Egypt, Jordan and UAE</p>
<p>CONCLUSION 13/50: PBN IMPLEMENTATION PROGRESS REPORT</p> <p>That, for future reporting on the status of PBN implementation, States be urged to:</p> <ul style="list-style-type: none"> a) use the excel sheet as at Appendix 4.5X to the Report on Agenda Item 4.5, and PBN Implementation Progress Report Template as at Appendix 4.5Y to the Report on Agenda Item 4.5; and b) submit progress reports to ICAO MID Regional Office every six months and whenever major progress is achieved. 	<p>Implement the Conclusion</p>	<p>States</p>	<p>Progress Report</p>	<p>Every 6 months</p>	<p>On going AN 6/28-12/211 dated 11 Jul. 2012</p>

CNS/ATM/IC SG/7-REPORT
APPENDIX 2A

2A-8

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION13/61: CENTRALIZED AIR NAVIGATION DEFICIENCY DATABASE</p> <p>That, States and international organizations be invited to:</p> <p>a) test the centralized air navigation deficiency database on iSTARS platform using the guidance in Appendix 5.1A to the Report on Agenda Item 5.1;</p> <p>b) update the data as necessary in coordination with the ICAO MID Regional Office; and</p> <p>c) provide feedback to the ICAO MID Regional Office by 31 August 2012</p>	<p>Implement the Conclusion</p>	<p>ICAO</p> <p>States</p>	<p>State Letter</p> <p>Feedback</p>	<p>30 Jun. 2012</p> <p>31 Aug. 2013</p>	<p>Ongoing</p> <p>AN 2/2 – 12/189 dated 21 Jun.2012</p>

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 13/63: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION</p> <p>That, States be urged to:</p> <p>a) review their respective lists of identified deficiencies, develop associated Corrective Action Plans and forward them to the ICAO MID Regional Office prior to 15 June 2012; and</p> <p>b) use the ICAO MID Air Navigation Deficiency Database (MANDD) for submitting online requests for addition, update, and elimination of air navigation deficiencies, until the official launch of the Centralized Air Navigation Deficiency Database on iSTARS.</p>	<p>Implement the Conclusion</p>	<p>ICAO States</p>	<p>State Letter CAP and necessary updates</p>	<p>15 Jun. 2012</p>	<p>Actioned</p> <p>AN 2/2 – 12/189 dated 21 June 2012</p> <p>(To be closed)</p>

FOLLOW-UP ACTION PLAN ON DGCA-MID/2 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 2/2: SUPPORT TO THE ICAO MID OFFICE ACTIVITIES</p> <p>That, taking into consideration the ICAO budget constraints and the expansion of the scope of the ICAO MID Regional Office activities:</p> <p>a) States and stakeholders be encouraged to use the SAFE fund earmarked contributions option to secure some funds that could be used for the implementation of the RASG-MID Work Programme; and</p> <p>b) ICAO take necessary measures for the establishment of a specific fund to receive the in-kind States' voluntary contributions supporting the MIDANPIRG and RASG-MID activities</p>	Implement the Conclusion	ICAO States	State Letter Feedback from States		Ongoing
<p>CONCLUSION 2/3: MID REGION ATM ENHANCEMENT PROGRAMME (MAEP) – SPECIAL COORDINATION MEETING</p> <p>That, the ICAO MID Regional Office organise a Special Coordination Meeting in September 2013 in order to agree on the best mechanism to establish a MID Region ATM Enhancement Programme, taking into consideration all initiatives.</p>	Implement the Conclusion	ICAO			Ongoing First meeting has been postponed to 2014
<p>CONCLUSION 2/4: MID REGION ATM ENHANCEMENT PROGRAMME (MAEP) BOARD</p> <p>That, a MID Region ATM Enhancement Programme Board composed of high level representatives from concerned States and Organizations, be established for overall supervision, direction, and management of the Programme.</p>	Implement the Conclusion	ICAO States	Board established		Ongoing First meeting has been postponed to 2014

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONCLUSION 2/5: ESTABLISHMENT OF MID REGION FLIGHT PROCEDURE PROGRAMME (FPP)</p> <p>That, a study related to the establishment of FPP be carried out within the framework of the PBN/GNSS Task Force.</p>	<p>Implement conclusion</p>	<p>ICAO States</p>	<p>Study</p>		<p>Ongoing</p>

CNS/ATM/IC/7
Report on Agenda Item 3

REPORT ON AGENDA ITEM 3: AIR NAVIGATION GLOBAL DEVELOPMENTS

Outcome of the Twelfth Air Navigation Conference (AN-Conf/12)

3.1 The meeting was apprised of the outcome of the Twelfth Air Navigation Conference (AN-Conf/12) held in Montreal, 19-30 November 2012.

3.2 The meeting noted that AN-Conf/12 made fifty-six (56) Recommendations. On 28 January 2013, the Air Navigation Commission (ANC) reviewed and acted under delegated authority on forty-eight of the Recommendations and proposed action by the Council on eight Recommendations. Subsequently, on 1 March 2013 the Council considered and approved the Report of the AN-Conf/12. In this respect, the meeting agreed that necessary follow-up actions related to these Recommendations should be taken by all concerned parties. This will be further addressed by MIDANPIRG/14.

3.3 It was highlighted that, as a follow-up action to *Recommendation 6/11 – Regional Performance Framework – Alignment of Air Navigation Plans and Regional Supplementary Procedures*, the process of alignment of the MID ANP with the ICAO MID Regional Office accreditation area has been already initiated. This concerns Egypt, Libya and Sudan.

Performance Monitoring Of the Air Navigation Systems

3.4 The meeting was apprised of the ASBU methodology highlighting the current challenges and future needs. In particular, the meeting noted the series of measurable, operational performance improvements, which are organized into flexible and scalable building blocks that could be implemented, as needed depending on the regional and national planning and identified priorities.

3.5 The meeting recalled that regional plans would be developed for the deployment of modules by drawing on supporting technology requirements. It was highlighted that this is an interactive planning process which may require repeating several steps until a final plan with specific regional targets is in place.

3.6 The meeting noted that the Air Navigation Report Form (ANRF) would be used for monitoring and reporting the performance of the air navigation systems for each ASBU Module.

3.7 The meeting noted that ICAO is presently introducing regional “Performance Dashboard” homepages for every public website of the ICAO Regional Offices. These dashboards will illustrate the regional implementation status relating to the strategic objectives on Safety, Air Navigation Capacity and Efficiency, and Environmental Protection. They will show targeted performance at the regional level and will, initially, contain graphics and maps with a planned expansion to include the Aviation System Block upgrades (ASBU) Block 0 Modules. This new interactive online system will be in place in January 2014 and will be updated at regular intervals.

CNS/ATM/IC SG/7
Report on Agenda Item 3

3.8 In the same vein, the meeting noted that the First Edition of the Global Air Navigation Report is planned for release in March 2014. The initial Report will cover the following subjects:

- global air navigation challenges;
- measuring against those challenges;
- status of operational measures for performance improvement;
- implementation progress of selected priority ASBU Block 0 Modules. The metrics or initial dataset that includes key global air navigation priorities are Performance Based Navigation (PBN), Continuous Decent Operation (CDO), Continuous Climb Operations (CCO), Aeronautical Information Management (AIM), Air Traffic Flow Management (ATFM) and estimated environmental benefits accrued from operational improvements based on ICAO Fuel Savings Estimation Tool (IFSET) or any other more rigorous tool recognized by Committee on Aviation Environmental Protection (CAEP). This initial dataset for both Regional Performance Dashboard and the Global Air Navigation Report was recently agreed by the PIRG Chairs; and
- sharing of successful initiatives and key demonstrations.

3.9 The meeting agreed that the air navigation global developments need to be taken into account in the development and monitoring of the Regional and National performance frameworks. In this respect, the need for additional training for the air navigation personnel at national level was underlined.

3.10 In connection with the above, the meeting recalled that the ICAO MID Regional Office held a Workshop in Cairo, Egypt, 30 September-4 October 2012 related to ASBU methodology. It was also highlighted that MIDANPIRG encouraged States to organize at the National Level Seminars, Workshop and Training courses, in coordination with and with the support of the ICAO MID Regional Office.

CNS/ATM/IC SG/7
Report on Agenda Item 4

**REPORT ON AGENDA ITEM 4: PERFORMANCE FRAMEWORK FOR MID REGION AIR
NAVIGATION PLANNING AND IMPLEMENTATION**

MID Region Air Navigation Strategy

4.1 The meeting recalled that the Global Air Navigation Plan GANP establishes a framework for incremental implementations based on the specific operational profiles and traffic densities of each Region and State, which is accomplished through the evaluation of the Aviation System Block Upgrades (ASBU) modules to identify which of those modules best provide the needed operational improvements. In this respect, it was highlighted that Recommendation 6/1 of the AN-Conf/12 calls upon States and PIRGs to finalize the alignment of Regional Air Navigation Plans with the Fourth Edition of the GANP by May 2014.

4.2 The meeting noted that MSG/3 meeting was apprised of the outcome of the Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs) Global Coordination Meeting (GCM) that was held in Montreal on 19 March 2013 under the Chairmanship of the President of the ICAO Council. It was highlighted that the outcome of the meeting included, inter-alia:

- a) agreement on establishing regional priorities and targets for air navigation by May 2014 consistent with the GANP/ASBU framework;
- b) agreement on the need to measure performance improvements to help demonstrate their positive impact on the environment; and
- c) endorsement of the envisioned regional performance dashboard prototype and envisioned determination of an initial set of indicators and metrics for air navigation.

4.3 The meeting recalled that MIDANPIRG/12 through Conclusion 12/47 endorsed 8 Metrics for performance monitoring of the Air Navigation Systems in the MID Region and MIDANPIRG/13 endorsed an initial set of operational improvements for further review/consideration taking into account the outcome of the AN-Conf/12.

4.4 The meeting noted that, in accordance with Recommendation 6/1 of the AN-Conf/12 and the outcome of the Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs) Global Coordination Meeting (GCM) held in Montreal on 19 March 2013, the DGCA-MID/2 meeting reiterated the need for the establishment of regional priorities and targets for air navigation by May 2014 consistent with the GANP and ASBU framework. Accordingly, the DGCA-MID/2 meeting:

- a) urged States to:
 - i. establish a performance measurement strategy for their air navigation system;
 - ii. share successful initiatives among each other; and
 - iii. support the ICAO MID Regional Office by providing the requisite information to demonstrate operational improvements; and

CNS/ATM/IC SG/7
Report on Agenda Item 4

- b) tasked MIDANPIRG and its Steering Group (MSG) with:
- i. the establishment of priorities and targets for air navigation by May 2014, in accordance with Recommendation 6/1 of the Twelfth Air Navigation Conference (AN Conf/12);
 - ii. the monitoring and measurement of the agreed air navigation Metrics and indicators, at regional level; and
 - iii. the identification of necessary measures/action plans to reach the agreed air navigation targets.

4.5 Based on all of the above and taking into consideration the outcome of the First Meeting of the ANP Ad-hoc Working Group (ANP WG/1) held in Cairo, 27-29 May 2013, the MSG/3 meeting agreed that the following ASBU Block 0 Modules be included in the MID Region Air Navigation Strategy, pending final endorsement by MIDANPIRG/14:

- 1) B0 – APTA: Optimization of Approach Procedures including vertical guidance
- 2) B0 – SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)
- 3) B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground □ Ground Integration
- 4) B0 – DATM: Service Improvement through Digital Aeronautical Information Management
- 5) B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety
- 6) B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories
- 7) B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CO)
- 8) B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

4.6 The meeting noted that, as a follow-up action to the MSG/3 *DRAFT CONCLUSION 3/1 – MID REGION AIR NAVIGATION STRATEGY*, the ICAO MID Regional Office issued State Letter Ref.: AN 1/7– 13/169 dated 30 June 2013, requesting States and Users to review the Draft MID Air Navigation Strategy, and provide comments/inputs to the ICAO MID Regional Office before 15 August 2013. It was highlighted that few replies were received but with no inputs regarding the Metrics, Key Performance Indicators (KPIs) and Action Plans.

4.7 Based on above, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 7/1: MID REGION AIR NAVIGATION PRIORITIES

That, the MID Region Air Navigation Performance Framework be based on the implementation of the following Block 0 Modules, as a priority: APTA, SURF, FICE, DAIM, AMET, FRTO, CDO and CCO.

4.8 The meeting noted that the initial Draft Air Navigation Strategy endorsed by the MSG/3 meeting was further reviewed, developed and updated by the secretariat, the AOP SG/9 meeting (Cairo, 23-25 September 2013) and the ATM/AIM/SAR SG/13 (Cairo, 30 September – 3 October 2013).

CNS/ATM/IC SG/7
Report on Agenda Item 4

4.9 The meeting was apprised of the outcome of the Middle East Airspace Users and Stakeholder Engagement (MEAUSE) Initiative, which aimed to gather data and conduct analyses of ANSPs, Airspace Users and stakeholders' requirements and future plans, through surveys. In this respect, it was noted that two surveys were launched under the MEAUSE initiative during 2013 to gauge the current and future ATM/CNS technology capabilities for ANSPs and Users' requirements and expectations. Accordingly, the meeting agreed that the results and analyses of the MEAUSE surveys, should be taken into consideration during the review/update of the MID Air Navigation Strategy.

4.10 Based on all of the foregoing, the meeting reviewed and updated the MID Region Air Navigation Strategy as at **Appendix 4A** to the Report on Agenda Item 4 and agreed to the following Draft Conclusion:

**DRAFT CONCLUSION 7/2: MID REGION AIR NAVIGATION
STRATEGY**

That,

- a) *the MID Region Air Navigation Strategy at **Appendix 4A** to the Report on Agenda Item 4 be adopted; and*
- b) *MID States be urged to:*
 - i. *develop their National Air Navigation Performance Framework, ensuring the alignment with and support to the MID Region Air Navigation Strategy;*
 - ii. *incorporate the agreed MID Region Performance Metrics into their National performance monitoring process; and*
 - iii. *report relevant data necessary for performance monitoring of the Air Navigation Systems to the ICAO MID Regional Office, on annual basis, with a view to monitor the MID Region Key Performance Indicators.*

4.11 The meeting agreed that the ICAO MID Regional Office is to issue a State Letter along with detailed questionnaire requesting States and all stakeholders to review the Draft MID Air Navigation Strategy, and provide comments/inputs to the ICAO MID Regional Office before **15 November 2013**, in order to be taken into consideration when finalising the version to be presented to MIDANPIRG/14 for endorsement.

4.12 In connection with the above, the meeting emphasized that collaboration and cooperation between all stakeholders to achieve the expected results and avoid duplication of efforts (i.e: different surveys, analyses, etc by ICAO, IATA, CANSO, etc) is a necessity. In addition, it was highlighted that in the future the process of collection of data from States and users (through questionnaires, State Letters, etc), should be driven by the agreed priorities. Furthermore, it was highlighted that some States have not yet developed/updated their National Air Navigation Performance Framework and close coordination with ICAO, IATA, CANSO, ACI, etc, might be needed to achieve this goal in an effective and timely manner.

CNS/ATM/IC SG/7
Report on Agenda Item 4

4.13 Based on the above, the meeting agreed to the following Draft Conclusion:

**DRAFT CONCLUSION 7/3: ASSISTANCE FOR THE DEVELOPMENT/
UPDATE OF THE NATIONAL AIR
NAVIGATION PERFORMANCE
FRAMEWORK**

That, ICAO, in coordination with concerned States and Stakeholders (IATA, CANSO, ACI, etc.):

- a) develop a plan for joint missions to identified States to support the development/update of the National Air Navigation Performance Framework in an effective and timely manner; and*
 - b) agree on the priorities and plans of action to be reflected in the National Air Navigation Performance Framework to improve the efficiency of air navigation at national and regional level, in accordance with the MID Air Navigation Strategy.*
-

MID Region Air Navigation Strategy



Table of Contents

- Strategic Air Navigation Capacity and efficiency Objective
- Background
- Stakeholders Roles and Responsibilities
- Introduction
- Aviation System Block Upgrade (ASBU) Framework
- MID Air Navigation Objectives
 - ASBU Modules prioritization/objectives for MID Region
 - Near Term Objective
 - Mid Term Objective
 - Long Term Objective
- Measuring and monitoring air navigation performance
- Action Plans
- Governance
- **Attachments**
 - A- Air Navigation Report Forms (ANRF)

MID Region Air Navigation Strategy

Strategic Air Navigation Capacity and Efficiency Objective:

To realize sound and economically-viable civil aviation system in the MID Region that continuously increases in capacity and improves in efficiency with enhanced safety, security and facilitation while minimizing the adverse environmental effects of civil aviation activities.

Background

The Global ATM Operational Concept was approved by the Eleventh Air Navigation Conference (Montreal, September-October 2003) and published as Doc. 9854-AN/458.

In order to align global planning to the ATM Operational Concept, the Eleventh Air Navigation Conference (AN-Conf/11), recommended States and Regional Planning and Implementation Groups (PIRG), through Recommendation 1/1, to consider the Concept as a common global framework to guide in the planning for the implementation of the systems in support of the air navigation services.

The 37 Session of the International Civil Aviation Organization (ICAO) General Assembly (2010) directed the Organization to double its efforts to meet the global needs for airspace interoperability while maintaining its focus on safety. The Aviation System Block Upgrades (ASBU) methodology was formalized at the Twelfth Air Navigation Conference (AN-Conf/12) (Montreal, November 2012) and is part of the new GANP, 4th Edition (Doc 9750) available at http://www.icao.int/Meetings/a38/Documents/GANP_en.pdf

The block upgrades describe a way to apply the concepts defined in the GANP with the goal of implementing regional performance improvements. They include the development of technology roadmaps, to ensure that standards are mature and to facilitate synchronized implementation between air and ground systems and between regions. The ultimate goal is to achieve global interoperability. Safety demands this level of interoperability and harmonization but it must be achieved at a reasonable cost with commensurate benefits.

Through Recommendation 6/1 - *Regional performance framework – planning methodologies and tools*, AN-Conf/12 urged States and PIRGs to harmonize the regional and national air navigation plans with the ASBU methodology in response to this, the MID region is developing MID Region Air Navigation Strategy that is aligned with the ASBU methodology.

Stakeholder roles and responsibilities

Stakeholders including service providers, regulators, airspace users and manufacturers are facing increased levels of interaction as new, modernized ATM operations are implemented. The highly integrated nature of capabilities covered by the block upgrades requires a significant level of coordination and cooperation among all stakeholders. Working together is essential for achieving global harmonization and interoperability.

With the ASBU methodology States, operators and industry will benefit from the availability of Standards and Recommended Practices (SARPs) with realistic lead times. This will enable regional regulations to be identified, allowing for the development of adequate action plans and, if needed, investment in new facilities and/or infrastructure.

For the industry, this constitutes a basis for planning future development and delivering products on the market at the proper target time. For service providers or operators, ASBU should serve as a planning tool for resource management, capital investment, training as well as potential reorganization.

Introduction

As traffic volume increases throughout the world, the demands on air navigation service providers in a given airspace increase, and air traffic management becomes more complex. Increased traffic density brings about an increase in the number of flights that cannot fly their optimum path.

It is foreseen that the implementation of the components of the ATM operational concept will provide sufficient capacity to meet the growing demand, generating additional benefits in terms of more efficient flights and higher levels of safety. Nevertheless, the potential of new technologies to significantly reduce the cost of services will require the establishment of clear operational requirements.

Taking into account the benefits of the ATM operational concept, it is necessary to make many timely decisions for its implementation. An unprecedented cooperation and harmonization will be required at both global and regional level.

ICAO introduced the Aviation System Block Upgrades (ASBU) methodology as a systemic manner to achieve a harmonized implementation of the air navigation services.

With the introduction of the ASBU the Performance Framework Forms (PFF) are restructured and aligned with the ASBU modules, and renamed as Air Navigation Report Forms (ANRF) and presents a standard format for high level monitoring of the ASBU module implementation, where as detailed monitoring of the implementation will be developed in Volume III of the revised new Regional Air Navigation Plans.

Aviation System Block Upgrades (ASBU) framework

An ASBU designates a set of improvements that can be implemented globally from a defined point in time to enhance the performance of the ATM system. There are four components of a block upgrade.

Module – is a deployable package (performance) or capability. A module will offer an understandable performance benefit, related to a change in operations, supported by procedures, technology, regulations/standards as necessary, and a business case. A module will be also characterized by the operating environment within which it may be applied. The date allocated to a module in a block is that of the initial operating capability (IOC).

Of some importance is the need for each of the modules to be both flexible and scalable to the point where their application could be managed through any set of regional plans and still realize the intended benefits. The preferential basis for the development of the modules relied on the applications being adjustable to fit many regional needs as an alternative to being made mandated as a one-size-fits-all application. Even so, it is clear that many of the modules developed in the block upgrades will not be necessary to manage the complexity of air traffic management in many parts of the world.

Thread – describes the evolution of a given capability through the successive block upgrades, from basic to more advanced capability and associated performance, while representing key aspects of the global ATM concept

Block – is made up of modules that when combined enable significant improvements and provide access to benefits.

The notion of blocks introduces a form of date segmentation in five year intervals. However, detailed considerations will call for more accurate implementation dates, often not at the exact assigned block date. The purpose is not to indicate when a module implementation must be completed unless dependencies among modules logically suggest such a completion date.

Performance improvement area (PIA) – sets of modules in each block are grouped to provide operational and performance objectives in relation to the environment to which they apply, thus forming an executive view of the intended evolution. The PIAs facilitate comparison of on-going programmes.

The four PIAs are as follows:

- a) airport operations;
- b) globally interoperable systems and data – through globally interoperable system-wide information management;
- c) optimum capacity and flexible flights – through global collaborative ATM; and
- d) efficient flight paths – through trajectory-based operations.

Figure 1 illustrates the relationships between the modules, threads, blocks, and PIAs.

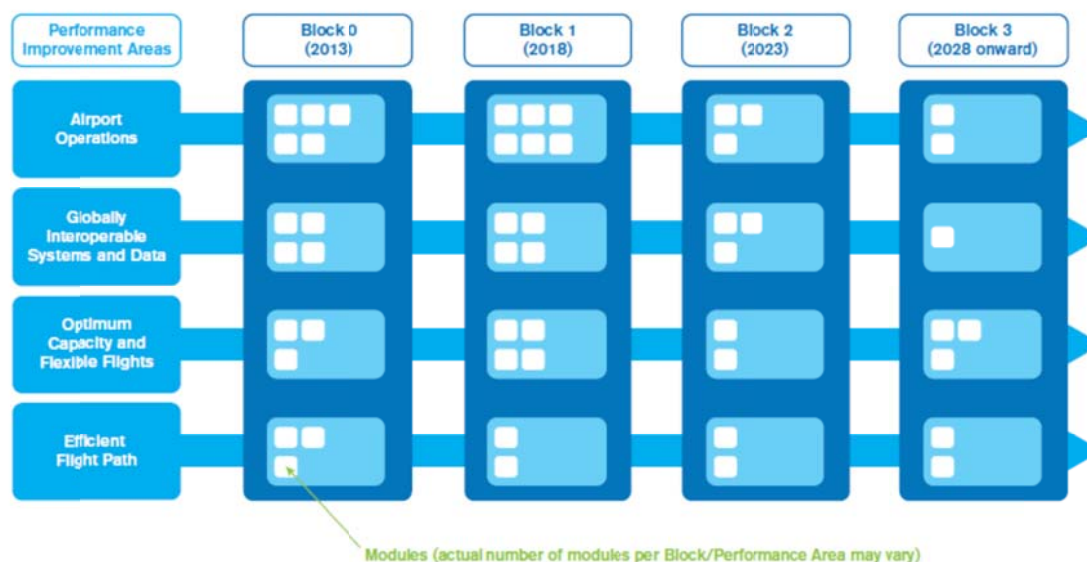


Figure 1.

MID Air Navigation Objectives:

States must focus on their Air Navigation Capacity and Efficiency priorities as they continue to foster expansion of the air transport sectors.

The ICAO Global Air Navigation Plan (GANP) represents a rolling strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives. The Block Upgrades are organized in five-year time increments starting in 2013 and continuing through 2028 and beyond. This structured approach provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers.

The Global Plan offers a long-term vision that will assist ICAO, States and industry to ensure continuity and harmonization among their modernization programmes. It also explores the need for more integrated aviation planning at both the regional and State level and addresses required solutions by introducing Aviation System Block Upgrade (ASBU) methodology.

The MID Region air navigation objectives are in line with the global air navigation objectives and address specific air navigation operational improvements identified within the framework of the Middle East Regional Planning and Implementation Group (MIDANPIRG).

The enhancement of communication and information exchange between aviation Stakeholders and their active collaboration under the framework of MIDANPIRG would help achieving the MID Region Air Navigation objectives in an expeditious manner.

Near-term Objective (2013 - 2018): ASBU Block 0

The Fourth Edition of the *Global Air Navigation Plan* introduces ICAO's ASBU methodology and supporting technology roadmaps based on a rolling fifteen-year planning horizon. Although the GANP has a global perspective, it is not intended that all ASBU modules are to be applied around the globe. Some of the ASBU modules contained in the GANP are specialized packages that should be applied where specific operational requirements or corresponding benefits exist.

Although some modules are suitable for entirely stand-alone deployment, an overall integrated deployment of a number of modules could generate additional benefits. The benefits from an integrated implementation of a number of modules may be greater than the benefits from a series of isolated implementations. Similarly, the benefits from the coordinated deployment of one module simultaneously across a wide area (e.g. a number of proximate airports or a number of contiguous airspaces/flight information regions) may exceed the benefits of the implementations conducted on an ad hoc or isolated basis.

An example of a need for global applicability would be performance-based navigation (PBN). Assembly Resolution A37-11 urges all States to implement approach procedures with vertical guidance in accordance with the PBN concept. Therefore, the ASBU modules on PBN approaches should be seen as required for implementation at all airports. In the same way, some modules are well suited for regional or sub-regional deployment and should take this into account when considering which modules to implement regionally and in what circumstances and agreed timeframes.

Block '0' features Modules characterized by operational improvements which have already been developed and implemented in many parts of the world today. It therefore has a near-term implementation period of 2013–2018, whereby 2013 refers to the availability of its particular performance Modules and 2018 the target implementation deadline. It is not the case that all States will need to implement every Module, and ICAO will be working with its Members to help each determine exactly which capabilities they should have in place based on their unique operational requirements.

The MID Region Air Navigation Strategy is aimed to maintain regional harmonisation. The States should develop their national performance framework, including action plans for the implementation of relevant ASBU Modules.

It is important to clarify how each ASBU module fits into the framework of the MID Regional Air Navigation system. On the basis of operational requirements and taking into consideration benefits associated, MID Region has chosen 8 out of 18 Block "0" Module for implementation as they respond to air navigation capacity and efficiency requirements for the Region for the period from 2013 to 2018.

Table 1

Performance Improvement Areas (PIA)	Performance Improvement Area Name	Module	Module Name
PIA 1	Airport Operations	B0-65 APTA	Optimization of Approach Procedures including vertical guidance
		B0-75 SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)
PIA 2	Globally Interoperable Systems and Data - Through Globally Interoperable System Wide Information Management	B0-25 FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
		B0-30 DATM	Service Improvement through Digital Aeronautical Information Management
		B0-105 AMET	Meteorological information supporting enhanced operational efficiency and safety
PIA 3	Optimum Capacity and Flexible Flights – Through Global Collaborative ATM	B0-10 FRTO	Improved Operations through Enhanced En-Route Trajectories
PIA 4	Efficient Flight Path – Through Trajectory-based Operations	B0-05 CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)
		B0-20 CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

Mid-term Objective (2018 - 2023): ASBU Block 1

Block 0 features Modules characterized by technologies and capabilities which have already been developed and implemented in many parts of the world today. It therefore features a near-term availability milestone, or Initial Operating Capability (IOC), of 2013 based on regional and State operational need. Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2018, 2023 and 2028 respectively.

Associated timescales are intended to depict the initial deployment targets along with the readiness of all components needed for deployment. It must be stressed that a Block's availability milestone is not the same as a deadline.

Long-term Objective (2023 - 2028): ASBU Block 2

The Block Upgrades incorporate a long-term perspective matching that of the three companion ICAO Air Navigation planning documents. They coordinate clear aircraft- and ground-based operational objectives together with the avionics, data link and ATM system requirements needed to achieve them. The overall strategy serves to provide industry wide transparency and essential investment certainty for operators, equipment manufacturers and ANSPs.

Measuring and monitoring air navigation Performance:

The monitoring of air navigation performance and its enhancement is achieved through identification of relevant air navigation Metrics and Indicators as well as the adoption and attainment of air navigation system Targets.

The MID Region Air Navigation Performance Framework is based on the implementation of the Block 0 Modules shown in **Table 1** as a priority.

The MID Region air navigation Key Performance Indicators, Targets and Action Plans are detailed in the **Table 2** below.

Attachment A presents the Air Navigation Report Forms for each of the eight ASBU Block 0 Module endorsed in the MID Region, as a priority.

Note: *The different elements supporting the implementation are explained in the ASBU Document, and Global Plan (Doc 9750)*

Table 2

**MONITORING OF THE AVIATION SYSTEM BLOCK UPGRADES (ASBUS)
IMPLEMENTATION IN THE MID REGION**

B0 – APTA: Optimization of Approach Procedures including vertical guidance

Description and purpose

The use of performance-based navigation (PBN) and ground-based augmentation system (GBAS) landing system (GLS) procedures will enhance the reliability and predictability of approaches to runways, thus increasing safety, accessibility and efficiency. This is possible through the application of Basic global navigation satellite system (GNSS), Baro vertical navigation (VNAV), satellite-based augmentation system (SBAS) and GLS. The flexibility inherent in PBN approach design can be exploited to increase runway capacity.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	Y

Applicability consideration:

This module is applicable to all instrument, and precision instrument runway ends, and to a limited extent, non-instrument runway ends.

B0 – APTA: Optimization of Approach Procedures including vertical guidance

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Action Plan	Remarks
LNAV	All Instrument RWYs	Indicator: % of runway ends with GNSS Approach Procedures (LNAV) Supporting metric: Number of instrument runways ends provided with GNSS Approach Procedures (LNAV)	All instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016		
LNAV/VNAV	All Instrument RWYs	Indicator: % of instrument runways ends provided with Baro-VNAV approach procedures Supporting metric: Number of instrument runways ends provided with Baro-VNAV approach procedures	All instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2018		
Precision Approach using GLS	TBD	Indicator: % of runway ends with GLS Supporting metric Number of runway ends with GLS			

Module N° B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)

Description and purpose

Basic A-SMGCS provides surveillance and alerting of movements of both aircraft and vehicles on the aerodrome thus improving runway/aerodrome safety. ADS-B information is used when available (ADS-B APT).

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	Y

Applicability consideration:

A-SMGCS is applicable to any aerodrome and all classes of aircraft/vehicles. Implementation is to be based on requirements stemming from individual aerodrome operational and cost-benefit assessments. ADS-B APT, when applied is an element of A-SMGCS, is designed to be applied at aerodromes with medium traffic complexity, having up to two active runways at a time and the runway width of minimum 45 m.

B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Action Plan	Remarks
A-SMGCS Level 1	TBD	Indicator: % of international aerodromes with A-SMGCS Level 1 Supporting Metric: Number of international aerodromes with SMGCS Level I			
A-SMGCS Level 2	TBD	Indicator: % of international aerodromes with A-SMGCS Level 2 Supporting Metric: Number of international aerodromes with A-SMGCS Level 2			

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration

Description and purpose

To improve coordination between air traffic service units (ATSUs) by using ATS Interfacility Data Communication (AIDC) defined by the ICAO *Manual of Air Traffic Services Data Link Applications* (Doc 9694). The transfer of communication in a data link environment improves the efficiency of this process particularly for oceanic ATSUs.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	N	Y

Applicability consideration:

Applicable to at least two area control centres (ACCs) dealing with enroute and/or terminal control area (TMA) airspace. A greater number of consecutive participating ACCs will increase the benefits.

B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration					
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Action Plan	Remarks
AMHS implementation	<i>All States'</i>	Indicator: % of States with AMHS implemented Supporting metric: Number of States with AMHS implemented			
AMHS interconnection	<i>All States'</i>	Indicator: % of States with AMHS interconnected with other States AMHS Supporting metric: Number of States with AMHS interconnections implemented with other States AMHS			
Implementation of AIDC/OLDI between adjacent ACCs	<i>All ACCs</i>	Indicator: Percentage of ACCs with AIDC/OLDI systems implemented between adjacent ACCs Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs			

B0 – DATM: Service Improvement through Digital Aeronautical Information Management

Description and purpose

The initial introduction of digital processing and management of information, through aeronautical information service (AIS)/aeronautical information management (AIM) implementation, use of aeronautical information exchange model (AIXM), migration to electronic aeronautical information publication (AIP) and better quality and availability of data

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	N	Y	Y	Y

Applicability consideration:

Applicable at State level, with increased benefits as more States participate

B0 – DATM: Service Improvement through Digital Aeronautical Information Management

<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Action Plan</i>	<i>Remarks</i>
1-AIXM	<i>All States</i>	Indicator: % of States that have implemented an AIXM-based Integrated Aeronautical Information Database (IAID) Supporting Metric: Number of States that have implemented an AIXM-based Integrated Aeronautical Information Database (IAID)			
2-eAIP	<i>All States</i>	Indicator: % of States that have implemented an IAID driven AIP Production (eAIP) Supporting Metric: Number of States that have implemented an IAID driven AIP Production (eAIP)			
3-QMS	<i>All States</i>	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM			

4-WGS-84	<i>All States</i>	<p>Indicator: % of States that have implemented WGS-84 for Enroute</p> <p>Supporting Metric: Number of States that have implemented WGS-84 for Enroute</p> <p>Indicator: % of States that have implemented WGS-84 for Terminal</p> <p>Supporting Metric: Number of States that have implemented WGS-84 for Terminal</p> <p>Indicator: % of States that have implemented WGS-84 for Aerodromes</p> <p>Supporting Metric: Number of States that have implemented WGS-84 for Aerodromes</p> <p>Indicator: % of States that have implemented Geoid Undulation</p> <p>Supporting Metric: Number of States that have implemented Geoid Undulation</p>			
5-eTOD	<i>All States</i>	<p>Indicator: % of States that have implemented required Terrain datasets</p> <p>Supporting Metric: Number of States that have implemented required Terrain datasets</p> <p>Indicator: % of States that have implemented required Obstacle datasets</p> <p>Supporting Metric: Number of States that have implemented required Obstacle datasets</p>			
6-Digital NOTAM*	<i>All States</i>	Plan for the implementation of Digital NOTAM			

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety

Description and purpose

Global, regional and local meteorological information:

- a) forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC);
- b) aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including wind shear; and
- c) SIGMETs to provide information on occurrence or expected occurrence of specific en-route weather phenomena which may affect the safety of aircraft operations and other operational meteorological (OPMET) information, including METAR/SPECI and TAF, to provide routine and special observations and forecasts of meteorological conditions occurring or expected to occur at the aerodrome.

This module includes elements which should be viewed as a subset of all available meteorological information that can be used to support enhanced operational efficiency and safety.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	Y

Applicability consideration:

Applicable to traffic flow planning, and to all aircraft operations in all domains and flight phases, regardless of level of aircraft equipage.

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety					
<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Action Plan</i>	<i>Remarks</i>
SADIS 2G satellite broadcast	<i>All States</i>	Indicator: % of States implemented SADIS 2G satellite broadcast Supporting metric: : % of States implemented SADIS 2G satellite broadcast			
Secure SADIS FTP service	<i>All States</i>	Indicator: % of States implemented Secure SADIS FTP service Supporting metric: % of States implemented Secure SADIS FTP service			

B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories

Description and purpose

To allow the use of airspace which would otherwise be segregated (i.e. special use airspace) along with flexible routing adjusted for specific traffic patterns. This will allow greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight length and fuel burn.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
Y	Y	Y	Y	N/A

Applicability consideration:

Applicable to en-route and terminal airspace. Benefits can start locally. The larger the size of the concerned airspace the greater the benefits, in particular for flex track aspects. Benefits accrue to individual flights and flows. Application will naturally span over a long period as traffic develops. Its features can be introduced starting with the simplest ones.

B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories

<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Action Plan</i>	<i>Remarks</i>
Flexible use of airspace (FUA)	<i>All States</i>	Indicator: % of States implementing FUA Supporting metric: number of States implementing FUA			Implementation should be based on the published aeronautical information
Flexible routing	<i>All States</i>	Indicator: % of established Routes overflying segregated airspace Supporting metric: Number of established Routes overflying segregated airspace			Published

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)

Description and purpose

To use performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles and increase capacity in terminal areas.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	Y

Applicability consideration:

Regions, States or individual locations most in need of these improvements. For simplicity and implementation success, complexity can be divided into three tiers:

- a) least complex – regional/States/locations with some foundational PBN operational experience that could capitalize on near term enhancements, which include integrating procedures and optimizing performance;
- b) more complex – regional/States/locations that may or may not possess PBN experience, but would benefit from introducing new or enhanced procedures. However, many of these locations may have environmental and operational challenges that will add to the complexities of procedure development and implementation; and
- c) most complex – regional/States/locations in this tier will be the most challenging and complex to introduce integrated and optimized PBN operations. Traffic volume and airspace constraints are added complexities that must be confronted. Operational changes to these areas can have a profound effect on the entire State, region or location.

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)

<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics)</i>	<i>Targets</i>	<i>Action Plan</i>	<i>Remarks</i>
PBN STARS	TBD	Indicator: % of International Aerodromes/TMA with PBN STAR implemented Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented			
International aerodromes/TMAs with CDO	TBD	Indicator: % of International Aerodromes/TMA with CDO implemented Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented		\	

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

Description and purpose

To implement continuous climb operations in conjunction with performance-based navigation (PBN) to provide opportunities to optimize throughput, improve flexibility, enable fuel-efficient climb profiles and increase capacity at congested terminal areas.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N/A	N/A	Y	Y	Y

Applicability consideration:

Regions, States or individual locations most in need of these improvements. For simplicity and implementation success, complexity can be divided into three tiers:

- least complex: regional/States/locations with some foundational PBN operational experience that could capitalize on near-term enhancements, which include integrating procedures and optimizing performance;
- more complex: regional/States/locations that may or may not possess PBN experience, but would benefit from introducing new or enhanced procedures. However, many of these locations may have environmental and operational challenges that will add to the complexities of procedure development and implementation; and
- most complex: regional/States/locations in this tier will be the most challenging and complex to introduce integrated and optimized PBN operations. Traffic volume and airspace constraints are added complexities that must be confronted. Operational changes to these areas can have a profound effect on the entire State, region or location.

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)

<i>Elements</i>	<i>Applicability</i>	<i>Performance Indicators/Supporting Metrics</i>	<i>Targets</i>	<i>Action Plan</i>	<i>Remarks</i>
PBN SIDs	TBD	Indicator: % of International Aerodromes/TMA with PBN SID implemented Supporting Metric: Number of International Aerodromes/ TMAs with PBN SID implemented			
International aerodromes/TMAs with CCO	TBD	Indicator: % of International Aerodromes/TMA with CCO implemented Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented			

Action Plans:

MIDANPIRG through its activities under the various subsidiary bodies will continue to develop, update and monitor the implementation of Action Plans to achieve the air navigation targets.

A progress report on the implementation of the Action Plans and achieved targets will be developed by the Air Navigation System Implementation Group (ANSIG) and presented to MIDANPIRG.

Governance:

The MIDANPIRG will be the governing body responsible for the review and update of the MID Region Air Navigation Strategy.

The MID Region Air Navigation Strategy will guide the work of MIDANPIRG and all its member States and partners.

Progress on the implementation of the MID Region Air Navigation Strategy and the achievement of the agreed air navigation targets will be reported to the ICAO Air Navigation Commission (ANC), through the review of the MIDANPIRG reports; and to the stakeholders in the Region within the framework of MIDANPIRG.

DRAFT

CNS/ATM/IC SG/7
Report on Agenda Item 5

REPORT ON AGENDA ITEM 5: REGIONAL AIR NAVIGATION PLANNING AND IMPLEMENTATION ISSUES

Outcome of the PBN/GNSS TF/5 Meeting

5.1 The meeting was apprised of the outcome of the Fifth Meeting of the PBN/GNSS Task Force (PBN/GNSS TF/5) that was held at the ICAO MID Regional Office Cairo, Egypt, 15– 17 April 2013.

5.2 The meeting recognized that frequency interference-free operation of Global Navigation Satellite System (GNSS) is essential, and that the frequency band 1559 - 1610MHz, is used for elements of GNSS.

5.3 The meeting recalled that the International Telecommunication Union (ITU) process, allows under footnotes No. 5.362B and 5.362C the operation of fixed service in some States on a secondary basis until 1 January 2015. The continued use by the fixed service constitutes a severe constraint on the safe and effective use of GNSS in some areas of the world, as distances of up to 400km between the stations of the fixed service and the aircraft is required to ensure safe operation of GNSS. In this respect, it was highlighted that Ten States at the global level have removed their names from footnotes 5.362B and 5.362C during WRC-12. This was a significant step forward towards achieving better worldwide protection of GNSS.

5.4 The meeting noted that MIDANPIRG/13 urged the following MID States (Iraq, Jordan, Qatar, Sudan, Syria and Yemen) to delete their names from the footnotes 5.362B and/or 5.362C and agreed to the Conclusion 13/44: Protection of GNSS Signal. In this respect, ICAO MID Regional Office issued State Letter AN 6/28-12/216 dated 18 July 2012, and the following States replied (Jordan, Kuwait, Oman, and Qatar).

5.5 The meeting reiterated the importance of protection of the GNSS Signal and urged Iraq, Jordan, Qatar, Sudan Syria and Yemen to have their names removed from footnotes 5.362B and/or 5.362C in coordination with their States spectrum regulatory authorities, according to the ITU procedures.

5.6 The meeting recalled that the 12th Air Navigation Conference (AN-Conf/12) noted the status of implementation for different Global Navigation Satellite System (GNSS) constellations and augmentations systems, mainly the modernization of Global Positioning System (GPS), Global Navigation Satellite System (GLONASS), Galileo GNSS constellation, BeiDou system, EGNOS, and GAGAN. The AN-Conf/12 discussed the introduction of multi-constellation, multi-frequency GNSS that will entail number of new technical and regulatory challenges beyond those already associated with current GNSS implementation.

5.7 The meeting was apprised of the outcome of the PBN Symposium held at ICAO HQ (Montreal 15 to 19 October 2012). The theme of the Symposium was “Expediting Implementation Together”, which indicated the collaborative team approach required for successful PBN implementation.

5.8 It was highlighted that during the symposium, ICAO endorsed some Instrument Procedure Design Organizations. This endorsement is simply a statement of support; it does not constitute an authorization, an approval or a certification of an Organization nor the procedures it designs. The State is solely responsible for approving and authorizing an Instrument Approach Design Organization as well as the Instrument Flight Procedures it designs for use within the State.

CNS/ATM/IC SG/7
Report on Agenda Item 5

5.9 The meeting was also apprised of other ICAO Regions activities related to PBN in order to harmonize the implementation between regions and share experiences. It was noted that all regions are conducting Regional Seminars and Workshop related to PBN and GNSS. In this regard, the meeting encouraged States to conduct Workshop/Seminars at National level.

5.10 The meeting was apprised of the following AN-Conf/12 Recommendations related to GNSS:

- *Recommendation 6/7–Assistance to States in Mitigating Global Navigation Satellite System Vulnerabilities*
- *Recommendation 6/8 –Planning for Mitigation of Global Navigation Satellite System Vulnerabilities*
- *Recommendation 6/9 – Ionosphere and Space Weather Information for Future Global Navigation Satellite System Implementation*
- *Recommendation 6/10 – Rationalization of Terrestrial Navigation Aids*

5.11 Based on the above the meeting reviewed and updated the MID Region GNSS Implementation Strategy as at **Appendix 5A** to the Report on Agenda Item 5 and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 7/4: MID REGION GNSS IMPLEMENTATION STRATEGY

That, the MID Region GNSS implementation Strategy be updated as at Appendix 5A to the Report on Agenda Item 5.

5.12 The meeting underlined that the lack of procedure designers is one of the challenges to PBN implementation. It was emphasized that a cooperative efforts is necessary to overcome this challenge. In this respect, the meeting noted that a Regional Procedure Design Office has been established in the ICAO APAC Region and work is in progress for a similar project in the AFI Region.

5.13 In connection with the above, the meeting noted that during the DGCA-MID/2 meeting, Saudi Arabia made a proposal for the establishment of a Flight Procedure Programme (FPP). Given the importance of the flight procedures design, the DGCA-MID/2 meeting agreed that a study related to the establishment of FPP be carried out within the framework of the PBN/GNSS TF, taking into consideration similar programs in other ICAO Regions. Accordingly, the DGCAMID/2 meeting agreed to the following Conclusion:

DGCA-MID/2 CONCLUSION 2/5 – ESTABLISHMENT OF MID REGION FLIGHT PROCEDURE PROGRAMME (FPP)

That, a study related to the establishment of FPP be carried out within the framework of the PBN/GNSS Task Force.

CNS/ATM/IC SG/7
Report on Agenda Item 5

5.14 Based on the above, the meeting noted that the task related to the study for the establishment of the MID FPP Office was included in the Terms of Reference (TOR) of the PBN Sub-Group, which will replace and take over the tasks and responsibilities of the PBN/GNSS Task Force, in accordance with new MIDANPIRG Organizational Structure. In the same vein, it was highlighted that the PBN SG will be responsible for PBN implementation for Terminal and Approach, while the ATM SG will be responsible for PBN implementation for Enroute.

5.15 The meeting reviewed and updated the MID Region PBN Implementation Strategy and Plan taking into consideration the global and regional developments. Accordingly, the meeting agreed to the following Draft Conclusion:

***DRAFT CONCLUSION 7/5: MID REGION PBN IMPLEMENTATION
STRATEGY AND PLAN***

*That, the MID Region PBN Implementation Strategy and Plan be updated as at **Appendix 5B** to the Report on Agenda Item 5.*

5.16 The meeting noted that MIDANPIRG/13 meeting was of the view that prompt action by the Region and States is required to accelerate PBN planning, development and implementation to a pace of at least achieving closer to the ICAO Resolution implementation targets. Accordingly, MIDANPIRG/13 agreed to comprehensive Regional Support Strategy that includes the following objectives:

- promotion of PBN to decision makers within States to create the political will to invest and devote the necessary resources for PBN implementation;
- establishing a regional working-level team or forum to identify implementation needs and to direct and/or organize the appropriate resources that will deliver PBN solutions to States;
- formulation of cooperative arrangements to assist States in PBN implementation; and
- development of additional support mechanisms that create skills and capabilities within States to implement and to sustain PBN operations.

5.17 Based on the above, MIDANPIRG/13 established the MID PBN Support Team (MPST), and agreed that UAE be the champion of MPST and IATA provide the required support. Furthermore, MIDANPIRG/13 encouraged MID States that are advanced in PBN implementation to support in the work of MPST.

5.18 The meeting noted that Egypt, Jordan and Oman expressed interest to receive MPST visits.

5.19 The meeting was briefed on the progress made for the MPST visit to Egypt, which was planned for May 2013. The pre-visit preparations including Egypt gap analysis were coordinated with Egypt, UAE and IATA. However, the visit was postponed to January 2014 upon Egypt request.

5.20 The meeting reviewed and updated the status of the MID Region States' PBN Implementation Plan as at **Appendix 5C** to the Report on Agenda Item 5. The meeting reviewed also and updated the list of PBN focal points as at **Appendix 5D** to the Report on Agenda Item 5.

CNS/ATM/IC SG/7
Report on Agenda Item 5

5.21 The meeting emphasized on the importance of providing PBN Implementation progress reports as per MIDANPIRG/13 Conclusion 13/50. In this respect, it was noted with concern that only Bahrain, Egypt, Jordan, Kuwait, Qatar and UAE provided their progress reports.

5.22 The meeting noted with concern the low pace of implementation of PBN, CDO, CCO in the MID Region. Accordingly, the meeting urged States to take necessary measures to expedite implementation.

5.23 The meeting noted that a PBN workshop will be held in Tunis, 24-28 February that will be a joint event between ACAC, ICAO EUR/MID, with the support of Eurocontrol. The invitation Letter will be sent in due course.

Outcome of the ATMM TF/1 Meeting

5.24 The meeting was apprised of the First Meeting of Air Traffic Management-Measurement Task Force (ATMM TF/1) held at the ICAO Middle East Regional Office in Cairo, Egypt, 8-9 September 2013.

5.25 The meeting recalled that Operational improvements are a key strategy that can be applied to deliver tangible reductions in aircraft fuel consumption. The Global Air Navigation Plan (Doc 9750) and the Operational Opportunities to Minimize Fuel Use and Reduce Emissions (Circular 303) are among several documents providing guidance regarding operational improvements being implemented to improve efficiency of the ATM System.

5.26 Implementation of operational improvements will generally have benefits in areas such as improved airport and airspace capacity, shorter cruise, climb and descend times through the use of more optimized routes and an increase of unimpeded taxi times. These improvements have the potential to reduce fuel burn and lower levels of pollutants.

5.27 The meeting noted that ICAO Fuel Savings Estimation Tool (IFSET) was developed to assist States to estimate and report fuel savings consistently with the models approved by ICAO's Committee on Aviation Environmental Protection (CAEP) and aligned with the Global Air Navigation Plan.

5.28 The IFSET, as well as instructions on its use, can be accessed at: <http://www.icao.int/environmental-protection/Pages/Tools.aspx>. It was highlighted that ICAO is committed to update the tool based on the feedback received from all stakeholders. In this respect, the meeting noted the feedback provided by Egypt.

5.29 The meeting noted with concern that only Egypt sent an IFSET Report to the ICAO MID Regional Office, in accordance with MIDANPIRG Conclusion 13/35. Accordingly, the meeting endorsed the following Draft Conclusion emanating from the ATMM TF/1 meeting, to replace and supersede the MIDANPIRG Conclusion 13/35:

DRAFT CONCLUSION 7/6: ESTIMATING ENVIRONMENTAL BENEFITS

That, in order to follow-up the implementation of the ATM operational improvements and estimate the fuel savings accrued from the corresponding improvements on regional basis:

CNS/ATM/IC SG/7
Report on Agenda Item 5

- a) *States be urged to:*
- i) *identify the operational improvements which have been implemented within their FIR and/or international aerodromes;*
 - ii) *collect necessary data for the estimation of the environmental benefits accrued from the identified operational improvements;*
 - iii) *use IFSET to estimate the environmental benefits accrued from operational improvements; and*
 - iv) *send the IFSET reports/the accrued environmental benefits to ICAO on bi-annual basis; and*
- b) *IATA to:*
- i) *encourage users to support the ATM-M TF in the development of the MID Region Air Navigation Environmental Reports; and*
 - ii) *consolidate users' inputs and report the accrued environmental benefits to the ICAO MID Regional Office on bi-annual basis.*

5.30 The meeting thanked Egypt for sharing their experience including the detailed IFSET User Manual (Arabic version), which was distributed to the ATMM TF/1 participants.

5.31 The meeting emphasized that what is required is an **estimation** of the environmental benefits accrued from **implemented** operational improvements and not the determination of the exact amount of fuel saving or CO₂ Emission, which would require more advanced model/tool to capture all the operational elements needed to calculate the environment benefits.

5.32 The meeting noted with concern the difficulties related to the collection/provision of required data for the generation of the IFSET reports such as the number of movements for the old and new scenarios, aircraft categories, Flight Levels and the reporting frequency/period. The meeting underlined that coordination between the different Departments/Units within the States is very important for the generation of more realistic estimation of Fuel Savings reports.

5.33 The meeting questioned about the period to be used for the development of the IFSET reports (i.e: previous year, 2 years, 5 years, etc) as well as the format of the Regional Air Navigation Environmental Report and recognized that if the period was to be just 1 year, this might limit the number of implemented operational benefits. Accordingly, the meeting agreed that for the First MID Air Navigation Environmental Report, the following periods would be considered as follows:

- a) 2009-2011 (just a listing of the operational improvements which have been implemented during this period and which had environmental benefits) as in **Appendix 5E** to the Report on Agenda Item 5;
- b) 2012-2013: period to be used for the generation of the First Regional IFSET Report as in **Appendix 5F** to the Report on Agenda Item 5; and
- c) 2014 and beyond (listing of planned operational improvements which will have environmental benefits) as in **Appendix 5G** to the Report on Agenda Item 5.

CNS/ATM/IC SG/7
Report on Agenda Item 5

5.34 The meeting emphasized that future ATM plans should consider the environmental benefits and urged States to inform the ICAO MID Regional Office of all initiatives/programmes which will have positive impact on the environment.

5.35 The meeting agreed that the implementation of new instrument approach procedures at the following Aerodromes/RWYs are to be considered by States when planning for future operational improvements

- Alexandria/Borg El-Arab Intl (HEBA), RWY 14;
- Shiraz/Shahid Dastghaib INTL (OISS), RWYs 11L and 11R
- Al Najaf (ORNI), RWY 10;
- Tripoli INTL (HLLT), RWY 09; and
- Benghazi/Benina INTL (HLLB), RWYs 15R and 33L

5.36 The meeting noted that the First MID Region IFSET Report consolidated by the Secretariat and presented to the meeting included only two operational improvements from Egypt. Accordingly, the meeting urged States to provide their IFSET Reports/Inputs related to the operational improvements to the ICAO MID Regional Office before **15 November 2013**, in order for the secretariat to consolidate the First MID Air Navigation Environmental Report for presentation to and endorsement by MIDANPIRG/14 (Jeddah, Saudi Arabia, 15-19 December 2013).

INFPL Post Implementation

5.37 The meeting was apprised of the lessons learned from the implementation of the ICAO New Flight Plan (INFPL). In this respect, it was highlighted that both ANSPs and airlines in the MID Region were ready on the 15 November 2012 cut-over date. Accordingly, the INFPL implementation in the MID Region was achieved without hindrance; owing to the good preparations and collaboration between ANSPs, airspace users, airports, regulators, manufacturing industry, and International and Regional Organizations.

5.38 The meeting noted that there still remain some outstanding issues that need to be addressed at global level.

5.39 The meeting noted with concern that some States are still using convertors and/or support from other States to convert flight plans to old flight plan format. The meeting recalled that the use of convertors was a temporary solution for States to meet the INFPL implementation date of 15 November 2012. It was highlighted that the continuous use of convertors will limit the benefits of the INFPL and will not serve the purpose for which the new format was introduced.

5.40 Based on the above the meeting agreed to the following Draft Conclusion:

***DRAFT CONCLUSION 7/7: INFPL POST IMPLEMENTATION-
SYSTEM UPGRADES***

That, concerned States be urged to upgrade their systems to ensure handling of the ICAO New Flight Plan format before 31 December 2014.

CNS/ATM/IC SG/7
Report on Agenda Item 5

5.41 The meeting was apprised of the Middle East Airspace User & Stakeholder Engagement Initiative (MEAUSE) objectives. In this respect, the meeting encouraged States to support the MEAUSE initiative and attend MEAUSE Conference in November 2013, as appropriate.

APPENDIX 5A

MID REGION GNSS IMPLEMENTATION STRATEGY

The following is the MID Region GNSS Implementation Strategy:

Considering:

- a) Safety is the highest priority;
- b) Global Air Navigation Plan 4th edition defines GNSS as the core technology that has led to the development of Performance Based Navigation (PBN);
- c) GNSS is the basis for future improvements in navigation services;
- d) Standards and Recommended Practices (SARPs), PANS, and guidance material for GNSS implementation are available;
- e) human, environmental, availability of avionics, capabilities and the level of user equipment and economic factors will affect the GNSS implementation;
- f) developments of GNSS systems including new satellite constellations, augmentation systems and improvement in system performance;
- g) airworthiness and operational approvals allowing the current GNSS applied for en-route and non-precision approach phases of flight without the need for augmentation services external to the aircraft;
- h) the effects of ionosphere on GNSS and availability of mitigation techniques;
- i) the implementation of GNSS in the operations as foreseen in the MID Region PBN implementation strategy and plan;
- j) the monitoring of the GNSS signal according to Annex 10, Doc 9849 and other related ICAO documents;
- k) the AN-Conf/12 recommendations 6/5, 6/6, 6/7, 6/8 and 6/9; and
- l) the working document for the Aviation System Block Upgrade.

The general strategy for the implementation of GNSS in the MID Region is detailed below:

- 1) Introduction of GNSS navigation capability should be consistent with the Global Air Navigation Plan;
- 2) implementation of GNSS and augmentations systems should be in full compliance with ICAO Standards and Recommended Practices and PANS;
- 3) assessment of the extent to which the GNSS system accessible in the Region can meet the navigational requirements of ATM service providers and aircraft operators in the Region;
- 4) implementation of RNAV and RNP operations for en-route and terminal areas-as follows:
 - 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
 - implementation of straight-in LNAV-only procedures, as an exception to 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;

- 5) States, in their planning and introduction of GNSS services, take full advantage of future benefits accrued from using independent core satellite constellations, other GNSS elements and their combinations, and avoid limitations on the use of specific system elements;
- 6) facilitate the use of GNSS; as enabler for PBN for en-route, terminal, approach and departure navigation;
- 7) States should coordinate to ensure that harmonized separation standards and procedures are developed and introduced concurrently in adjacent flight information regions along major traffic flows to allow for a seamless transition to GNSS based navigation;
- 8) States should to the extent possible work co-operatively on a multinational basis to implement GNSS in order to facilitate seamless and inter-operable systems;
- 9) States should undertake education, training and R&D programs to provide necessary knowledge in PBN, GNSS, augmentation systems and operational application;
- 11) States, in their planning for implementation of GNSS services, provide effective spectrum management and protection of GNSS frequencies to reduce the possibility of unintentional interference;
- 12) during transition to GNSS, sufficient ground infrastructure for current navigation systems must remain available. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip accordingly;
- 13) States should approach removal of existing ground infrastructure with caution to ensure that safety is not compromised, such as by performance of safety assessment, consultation with users through regional air navigation planning;
- 14) States should plan for complete **decommissioning of NDBs by 2014**;
- 15) implement GNSS with augmentation as required for APV where operationally required in accordance with the MID Regional and National PBN Implementation plans;
- 16) States continue their efforts to implement GNSS applications for en-route, APV and TMA operations. Attention should be accorded to meeting all GNSS implementation requirements, including establishment of GNSS legislation, regulatory framework, and approval procedure; and
- 17) introduce rationalizing terrestrial navigation aids, retaining a minimum network of terrestrial aids necessary to maintain safety of aircraft operations; in accordance with AN-Conf/12 recommendation 6/10.

MID REGION PERFORMANCE-BASED NAVIGATION IMPLEMENTATION STRATEGY AND PLAN

1. EXECUTIVE SUMMARY

1.1 The MID Regional Performance Based Navigation (PBN) Implementation Strategy and Plan has been produced and updated in line with Resolutions A36/23 and A37/11. The Regional Plan addresses the strategic objectives of PBN implementation based on clearly established operational requirements, avoiding equipage of multiple on-board or ground based equipment, avoidance of multiple airworthiness and operational approvals and explains in detail contents relating to potential navigation applications.

1.2 This version was prepared to align the MID Region PBN implementation Strategy and Plan with the Aviation System Block Upgrades (ASBU) methodology, taking into consideration, outcome of the twelfth Air Navigation Conference (AN-Conf/12) , the Fourth Edition of the Global Air Navigation Plan, MID Region Air Navigation Plan and the MID Region Air Navigation Strategy.

1.3 The plan envisages pre- and post-implementation safety assessments and continued availability of conventional air navigation procedures during transition. The plan discusses issues related to implementation which include traffic forecasts, aircraft fleet readiness, adequacy of ground-based CNS infrastructure etc. Implementation targets for various categories of airspace for the short term (2013 – 2017) and for the medium term (2018 – 2022) have been projected in tabular forms to facilitate easy reference. For the long term (2023 and beyond) it has been envisaged that GNSS will be the primary navigation infrastructure. It is also envisaged that precision approach capability using GNSS and its augmentation system will become available in the long term.

2. EXPLANATION OF TERMS

2.1 The drafting and explanation of this document is based on the understanding of some particular terms and expressions that are described below:

2.1.1 **MID Region PBN Implementation Strategy and Plan:** A document offering appropriate guidance for air navigation service providers, airspace operators and users, regulating agencies, and international organizations, on the evolution of navigation, as one of the key systems supporting air traffic management, and which describes the RNAV and RNP navigation applications that should be implemented in the short, medium and long term in the MID Region.

2.1.2 **Performance Based Navigation:** Performance based navigation specifies RNAV and RNP system performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in an airspace.

2.1.3 **Performance requirements:** Performance requirements are defined in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept. Performance requirements are identified in navigation specifications which also identify which navigation sensors and equipment may be used to meet the performance requirement.

3. ACRONYMS

3.1 The acronyms used in this document along with their expansions are given in the following List:

AACO	Arab Air Carrier Association
ABAS	Aircraft-Based Augmentation System
ACAC	Arab Civil Aviation Commission
AIS	Aeronautical Information System
APAC	Asia and Pacific Regions
APCH	Approach
APV	Approach Procedures with Vertical Guidance
ATC	Air Traffic Control
ASBU	Aviation System Block Upgrades
Baro VNAV	Barometric Vertical Navigation
CCO	Continuous Climb Operations
CDO	Continuous Decent Operations
CNS/ATM	Communication Navigation Surveillance/Air Traffic Management
CPDLC	Controller Pilot Data Link Communications
DME	Distance Measuring Equipment
FASID	Facilities and Services Implementation Document
FIR	Flight Information Region
FMS	Flight Management System
GBAS	Ground-Based Augmentation System
GNSS	Global Navigation Satellite System
GLS	GBAS Landing System
IATA	International Air Transport Association
IFALPA	International Federation of Air Line Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IFF	Identification Friend or Foe
INS	Inertial Navigation System
IRU	Inertial Reference Unit
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
MID RMA	Middle East Regional Monitoring Agency
MLAT	Multilateration
PANS	Procedures for Air Navigation Services
PBN	Performance Based Navigation
PIRG	Planning and Implementation Regional Group
RCP	Required Communication Performance
RNAV	Area Navigation
RNP	Required Navigation Performance
SARP	Standards and Recommended Practices
SBAS	Satellite-Based Augmentation System
SID	Standard Instrument Departure
STAR	Standard Instrument Arrival
TMA	Terminal Control Area
VOR	VHF Omni-directional Radio-range
WGS	World Geodetic System

4. INTRODUCTION

Need for the Roadmap

4.1 The Performance Based Navigation (PBN) concept specifies aircraft RNAV system performance requirements in terms of accuracy, integrity, availability, continuity and functionality needed for the proposed operations in the context of a particular airspace concept, when supported by the appropriate navigation infrastructure. In this context, the PBN concept represents a shift from sensor-based to performance –based navigation.

4.2 The implementation of RVSM on 27 NOV 2003 in the MID Region brought significant airspace and operational benefits to the Region. However, the realizations of new benefits from RVSM have reached a point of diminishing returns. The main tool for optimizing the airspace structure is the implementation of PBN, which will foster the necessary conditions for the utilization of RNAV and RNP capabilities by a significant portion of airspace users in the MID region.

4.3 In view of the need for detailed navigation planning, it was deemed advisable to prepare a PBN Roadmap to provide proper guidance to air navigation service providers, airspace operators and user, regulating agencies, and international organization, on the evolution of performance base navigation, as one of the key systems supporting air traffic management, which describes the RNAV and RNP navigation applications that should be implemented in the short and medium term in the MID Region.

4.4 Furthermore, the MID PBN roadmap will be the basic material for the development of a boarder MID air navigation strategy, which will serve as guidance for regional projects for the implementation of air navigation infrastructure, such as SBAS, GBAS, GLS etc., as well as for the development of national implementation plans.

4.5 The PBN Manual (Doc 9613) provides guidance on RNAV/RNP navigation specifications and encompasses two types of approvals: airworthiness, exclusively relating to the approval of aircraft, and operational, dealing with the operational aspects of the operator. RNAV/RNP approval will be granted to operators that comply with these two types of approval.

4.6 After the implementation of PBN as part of the airspace concept, the total system needs to be monitored to ensure that safety of the system is maintained. A system safety assessment shall be conducted during and after implementation and evidence collected to ensure that the safety of the system is assured.

Benefits of Performance-Based Navigation

- a) *Access and Equity*: Increased aerodrome accessibility.
- b) *Capacity*: In contrast with ILS, the GNSS-based approaches (PBN and GLS) do not require the definition and management of sensitive and critical areas resulting in potentially increased runway capacity.
- c) *Efficiency*: Cost savings related to the benefits of lower approach minima: fewer diversions, overflights, cancellations and delays. Cost savings related to higher airport capacity in certain circumstances (e.g. closely spaced parallels) by taking advantage of the flexibility to offset approaches and define displaced thresholds.
- d) *Environment*: Environmental benefits through reduced fuel burn.
- e) *Safety*: Stabilized approach paths.

- f) *Cost Benefit Analysis*: Aircraft operators and air navigation service providers (ANSPs) can quantify the benefits of lower minima by using historical aerodrome weather observations and modeling airport accessibility with existing and new minima. Each aircraft operator can then assess benefits against the cost of any required avionics upgrade. Until there are GBAS (CAT II/III) Standards, GLS cannot be considered as a candidate to globally replace ILS. The GLS business case needs to consider the cost of retaining ILS or MLS to allow continued operations during an interference event

Goals and Objectives of PBN Implementation

4.7 The MIDANPIRG/11 Meeting required that PBN be implemented in a strategic manner in the MID Region and accordingly established the PBN/GNSS Task Force which, *inter alia*, was required to follow up developments related to PBN and develop an implementation strategy. The 36th Session of ICAO Assembly adopted Resolution A36-23: *Performance based navigation global goals*, which, amongst others, highlighted global and regional harmonization in the implementation of PBN. Accordingly, the MID PBN Implementation Regional Plan has the following strategic objectives:

- a) To ensure that implementation of the navigation element of the MID CNS/ATM system is based on clearly established operational requirement.
- b) To avoid unnecessarily imposing the mandate for multiple equipment on board or multiple systems on ground.
- c) To avoid the need for multiple airworthiness and operational approvals for intra and inter-regional operations.
- d) To avoid an eclipsing of ATM operational requirements by commercial interests, generating unnecessary costs States, international organization, and airspace users.
- e) To explain in detail the contents of the MID air navigation plan and of the MID CNS/ATM plan, describing potential navigation application.

4.8 Furthermore, the MID PBN roadmap will provide a high-level strategy for the evolution of the navigation applications to be implemented in the MID region in the short term (2013-2017), medium term (2018-2022). This strategy is based on the coverage of 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.

4.9 The MID PBN implementation regional plan is developed by MID States together with the international and Regional organizations concerned, and is intended to assist the main stakeholders of the aviation community to plan a gradual transition to the RNAV and RNP concepts. The main stakeholders of the aviation community that benefit from this roadmap are:

- Airspace operators and users
- Air navigation service providers
- Regulating agencies
- International and Regional organizations
- Military Authorities

4.10 The plan is intended to assist the main stakeholders of the aviation community to plan the future transition and their investment strategies. For example, airlines and operators can use this Regional Plan to plan future equipage and additional navigation capability investment; 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.

Planning Principles

4.11 The implementation of PBN in the MID Region shall be based on the following principles:

- a) develop strategic objectives and airspace concepts as described in the PBN manual (Doc 9613) to justify the implementation of the RNAV and/or RNP concepts in each particular airspace;
- b) States conduct pre- and post-implementation safety assessments to ensure the application and maintenance of the established target level of safety;
- c) development of airspace concept, applying airspace modelling tools as well as real-time and accelerated simulations, which identify the navigation applications that are compatible with the aforementioned concept;
- d) continued application of conventional air navigation procedures during the transition period, to guarantee the operation by users that are not RNAV- and/or RNP-equipped;
- e) operational requirement and Stake holder consultation; and
- f) early implementation is encouraged based on operational requirements and States readiness.

4.12 Planning Documentation: The implementation of PBN in the MID Region will be incorporated into the Regional Supplementary Procedures (Doc 7030) as approved by the ICAO Council. The States' PBN implementation plan will include a concise and detailed schedule of implementation for all phases of flight which will be endorsed through Regional agreement processes and considered by the Council as requirements for incorporation in the Air Navigation Plan (ANP).

5. PBN OPERATIONAL REQUIREMENTS AND IMPLEMENTATION STRATEGY

5.1 Introduction of PBN should be consistent with the Global Air Navigation Plan. Moreover, PBN Implementation shall be in full compliance with ICAO SARPs and PANS and be supported by ICAO Global Plan Initiatives.

5.2 In November 2006 the ICAO Council accepted the second amendment to the Global Air Navigation Plan for the CNS/ATM System, which has been renamed the Global Air Navigation Plan (Doc 9750), referred to as the Global Plan. A key part of the Global Plan framework are Global Plan Initiatives (GPIs), which are options for air navigation system improvements that when implemented, result in direct performance enhancements. The GPIs include implementation of performance based navigation (PBN) and navigation system. The introduction of PBN must be supported by an appropriate navigation infrastructure consisting of an appropriate combination of Global Navigation Satellite System (GNSS), Self-contained Navigation System (inertial navigation system) and Conventional Ground-based Navigation Aids.

5.3 It is envisaged that for the short term and medium term implementation of PBN, the establishment of a backup system in case of GNSS failure or the development of contingency procedures will be necessary.

En-route

5.4 Considering the traffic characteristic and CNS/ATM capability of the region, the en-route operation can be classified as Oceanic, Remote continental, Continental, and local/domestic. In principle, each classification of the en-route operations should adopt, but not be limited to single RNAV or RNP navigation specification. This implementation strategy will be applied by the States and international organizations themselves, as coordinated at regional level to ensure harmonization.

5.5 In areas where operational benefits can be achieved and appropriate CNS/ATM capability exists or can be provided for a more accurate navigation specification, States are encouraged to introduce the more accurate navigation specification on the basis of coordination with stakeholders and affected neighbouring States.

Terminal

5.6 Terminal operations have their own characteristics, taking into account the applicable separation minima between aircraft and between aircraft and obstacles. It also involves the diversity of aircraft, including low-performance aircraft flying in the lower airspace and conducting arrival and departure procedures on the same path or close to the paths of high-performance aircraft.

5.7 In this context, the States should develop their own national plans for the implementation of PBN in TMAs, based on the MID PBN Region Implementation Plan, seeking the harmonization of the application of PBN and avoiding the need for multiple operational approvals for intra- and inter-regional operations, and the applicable aircraft separation criteria.

Approaches

5.8 During early implementation of PBN, IFR Approaches based on PBN should be designed to accommodate mixed-equipage (PBN and non-PBN) environment. ATC workload should be taken into account while developing approach procedures. One possible way to accomplish this is to co-locate the Initial Approach Waypoint for both PBN and conventional approaches. States should phase-out conventional non-precision approach procedures at a certain point when deemed operationally suitable and taking in consideration GNSS integrity requirements, and planning for CDO implementation.

5.9 Recognizing the efficiency and environmental benefits of CCO and CDO, and the need to harmonize these operations in the interest of safety, MID States are encouraged to include implementation of CCO and CDO as part of their PBN implementation plans in accordance with the ICAO CCO and CDO Manuals Doc 9993 and 9931 respectively..

Implementation Strategy

5.10 In order to address the operational requirements, the following PBN Implementation & Harmonisation Strategy for the ICAO MID Region is formulated as follows:

- a) Implementation of any RNAV or RNP application shall be in compliance with ICAO PBN Manual (Doc 9613);
- b) implementation of RNAV5/RNAV1 depending on operational requirements for continental en-route and local/domestic en-route applications at least until 2016;

- c) implementation of RNAV1/Basic-RNP-1 depending on operational requirements for terminal applications at least until 2016;
- d) implementation of RNAV-10 for oceanic/remote continental until at least 2016;
- e) the use of RNAV 5 / RNAV 1 specification by RNP specifications (e.g. advanced-RNP-1) for the use in the en-route and terminal airspace to commence by 2016;
- f) 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 2018;
- g) implementation of straight-in LNAV only procedures, as an exception to f) 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;
- h) the use of NDB for approach operations shall be terminated not later than 2014. the following States (Egypt, Iran, Jordan and Syria) requested extension and would provide their plans for termination of NDB to ICAO MID;
- i) the operation of CCO and CDO to commence 2014; and
- j) the RNP AR Approaches to commence depending on States operational requirement starting 2012.

6. CURRENT STATUS AND FORECAST

MID Traffic Forecast

6.1 The GEN part of FASID (Part II) provides the information and data of the following traffic forecasts and trends:

- air traffic demand for air navigation systems planning
- Passenger traffic
- Aircraft movements
- Major city-pairs traffic

6.2 The forecast data as well as the figures contained in the FASID document are the results of the regular meetings of, MIDANPIRG Traffic Forecasting Sub-group, which had in last meeting in April 2007. Notably however, in the past two years, air traffic growth trend for the MID Region has signalled a significantly higher aircraft fleet and traffic growth than was previously forecast.

6.3 World scheduled traffic measured in terms of Passenger-kilometers Performed (PKPs) is forecast to increase at a “most likely” average annual rate at 4.6 per cent for the period 2005-2025. International traffic is expected to increase at 5.3 per cent per annum.

6.4 The airlines of the Middle East Regions are expected to experience the highest growth in passenger traffic at 5.8 per cent per annum through to the year 2025 compared to the world average of 4.6%.

6.5 World scheduled freight traffic measured in terms of tonne-kilometres performed is forecast to increase at a “most likely” average annual rate of 6.6 per cent for the period 2005-2025. International freight traffic is expected to increase at an average annual growth rate of 6.9 per cent.

6.6 Air freight traffic of the airlines of Middle East region is expected to remain higher than the world average at 7.8 per annum.

6.7 The following major route groups to, from and within the Middle East Region have been identified:

- Between Middle East – Europe
- Between Middle East - Africa
- Between Middle East - Asia/Pacific
- Between Middle East - North America
- Intra Middle East

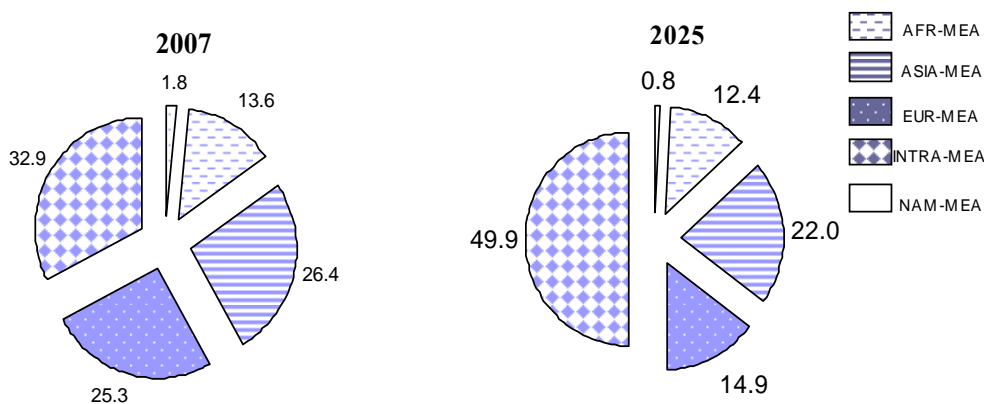
6.8 Movement forecasts for the major route groups for the 2007-2025 periods are depicted in **Table 1**:

TABLE 1
AIRCRAFT MOVEMENTS FORECAST TO THE YEAR 2025

	Actual	Forecast	Average	Annual	Growths
	2007	2025		(per cent)	
				2007-2025	
AFR-MEA	84933	291159		7.1	
ASIA-MEA	165364	514979		6.5	
EUR-MEA	158346	350380		4.5	
INTRA MEA	205769	1170709		10.1	
NAM-MEA	11075	18703		3.0	
TOTAL	625487	2345929		7.6	

6.9 The total aircraft movements to/from and within the Middle East region are estimated to increase from some 625000 in 2007 to around 2346000 in 2025 at an average annual growth rate of 7.6 per cent. The resulting movements’ shares for the year 2025 are depicted in **Figure 1**:

FIGURE 1
SHARES OF SELECTED ROUTE GROUPS IN AIRCRAFT MOVEMENTS



Aircraft Fleet Readiness

6.10 IATA had circulated survey and will be compiling the results in report which could be referred to for details.

CNS Infrastructure

Navigation infrastructure

Global Navigation Satellite System (GNSS)

6.11 Global Navigation Satellite System (GNSS) is a satellite-based navigation system utilizing satellite signals, such as Global Positioning System (GPS), for providing accurate and reliable position, navigation, and time services to airspace users. In 1996, the International Civil Aviation Organization (ICAO) endorsed the development and use of GNSS as a primary source of future navigation for civil aviation. ICAO noted the increased flight safety, route flexibility and operational efficiencies that could be realized from the move to space-based navigation.

6.12 GNSS supports both RNAV and RNP operations. Through the use of appropriate GNSS augmentations, GNSS navigation provides sufficient accuracy, integrity, availability and continuity to support en-route, terminal area, and approach operations. Approval of RNP operations with appropriate certified avionics provides on-board performance monitoring and alerting capability enhancing the integrity of aircraft navigation.

6.13 GNSS augmentations include Aircraft-Based Augmentation System (ABAS), Satellite-Based Augmentation System (SBAS) and Ground-Based Augmentation System (GBAS).

6.14 Multilateration (MLAT) employs a number of ground stations, which are placed in strategic locations around an airport, its local terminal area or a wider area that covers the larger surrounding airspace. Multilateration requires no additional avionics equipment, as it uses replies from Mode A, C and S transponders, as well as military IFF and ADS-B transponders. MLAT is under consideration by several MID States.

Other PBN Infrastructure

6.15 Other navigation infrastructure that supports PBN applications includes INS, VOR/DME, DME/DME, and DME/DME/IRU. These navigation infrastructures may satisfy the requirements of RNAV navigation specifications, but not those of RNP.

6.16 INS may be used to support PBN en-route operations with RNAV-10 and RNAV 5 navigation specifications.

6.17 VOR/DME may be used to support PBN en-route operations based on RNAV 5 navigation specification.

6.18 DME/DME and DME/DME/IRU may support PBN en-route and terminal area operations based on RNAV 5, and RNAV 1 navigation specifications. Validation of DME/DME coverage area and appropriate DME/DME geometry should be conducted to identify possible DME/DME gaps, including identification of critical DMEs, and to ensure proper DME/DME service coverage.

Note.- The conventional Navaid infrastructure should be maintained to support non-equipped aircraft during a transition period until at least 2016.

Surveillance Infrastructure

6.19 For RNAV operations, States should ensure that sufficient surveillance coverage is provided to assure the safety of the operations. Because of the on-board performance monitoring and alerting requirements for RNP operations, surveillance coverage may not be required. Details on the surveillance requirements for PBN implementation can be found in the ICAO PBN Manual and ICAO PANS-ATM (Doc 4444), and information on the current surveillance infrastructure in the MID can be found in ICAO FASID table.

Communication Infrastructure

6.20 Implementation of RNAV and RNP routes includes communication requirements. Details on the communication requirements for PBN implementation can be found in ICAO PANS-ATM (Doc 4444), ICAO RCP Manual (Doc 9869), and ICAO Annex 10. Information on the current communication infrastructure in the MID can also be found in ICAO FASID table.

7. IMPLEMENTATION ROADMAP OF PBN

ATM Operational Requirements

7.1 The Global ATM Operational Concept: Doc 9854 makes it necessary to adopt an airspace concept able to provide an operational scenario that includes route networks, minimum separation standards, assessment of obstacle clearance, and a CNS infrastructure that satisfies specific strategic objectives, including safety, access, capacity, efficiency, and environment.

7.2 In this regard, the following programmes will be developed:

- a) Traffic and cost benefit analyses
- b) Necessary updates on automation
- c) Operational simulations in different scenarios
- d) ATC personnel training
- e) Flight plan processing
- f) Flight procedure design training to include PBN concepts and ARINC-424 coding standard
- g) Enhanced electronic data and processes to ensure appropriate level of AIS data accuracy, integrity and timeliness
- h) WGS-84 implementation in accordance with ICAO Annex 15
- i) Uniform classification of adjacent and regional airspaces, where practicable
- j) RNAV/RNP applications for SIDs and STARs
- k) Coordinated RNAV/RNP routes implementation
- l) RNP approach with vertical guidance
- m) Establish PBN approval database

7.3 The above programmes should conform to the performance objectives and regional action plan supporting the regional implementation plan (roadmap).

Short Term (2013-2017)

En-route

7.4 During the planning phase of any implementation of PBN routes, States should gather inputs from all aviation stakeholders to obtain operational needs and requirements. These needs and requirements should then be used to derive airspace concepts and to select appropriate PBN

navigation specification.

7.5 In this phase, the current application of RNAV 10 is expected to continue for Oceanic and Remote continental routes.

7.6 For Continental routes, the applications of RNAV 5 and RNAV 1 navigation specifications are expected. Before the PBN concept was established, the MID Region adopted the Regional implementation of RNP 5. Under the PBN concept it is now required that RNP 5 will change into RNAV 5. Based on operational requirements, States may choose to implement RNAV 1 routes to enhance efficiency of airspace usages and support closer route spacing, noting that appropriate communication and surveillance coverage is provided. Details of these requirements are provided in the PBN manual (Doc 9613) and PANS-ATM (Doc 4444).

7.7 **Operational approval.** Operators are required to have operational approval for RNAV 5. Depending on operational requirement RNAV 1 for terminal operations and RNAV 10 for Oceanic/Remote Continental operations.

7.8 Application of RNAV 5 or RNAV 1 for continental en-route will be mandated by the end of 2012.

Terminal

7.9 In selected TMAs, the application of RNAV-1 in a surveillance environment can be supported through the use of GNSS or ground navigation infrastructure, such as DME/DME and DME/DME/IRU. In this phase, mixed operations (equipped and non-equipped) will be permitted.

7.10 In a non-surveillance environment and/or in an environment without adequate ground navigation infrastructure, the SID/STAR application of Basic-RNP 1 is expected in selected TMAs with exclusive application of GNSS.

7.11 **Operational approval.** Operators are required to have operational approval for RNAV 1. In addition, operators are required to have Basic RNP 1 approval when operating in procedural control TMAs.

Note: In order to avoid unnecessary approvals, operators equipped with GNSS should apply for combined RNAV 1 and Basic RNP 1.

Approach

7.12 The application of RNP APCH procedures is expected to be implemented in the maximum possible number of airports, primarily international airports. To facilitate transitional period, conventional approach procedures and conventional navigation aids should be maintained for non-equipped aircraft.

7.13 States should promote the use of APV operations (Baro-VNAV SBAS) to enhance safety of RNP approaches and accessibility of runways.

7.14 The application of RNP AR APCH procedures should be limited to selected airports, where obvious operational benefits can be obtained due to the existence of significant obstacles.

7.15 States should implement CCO and CDO in their International Airports, in accordance with ASBU Module B0-APTA.

7.16 **Operational approval requirements.** Operators shall plan to have operational approval for RNP APCH with VNAV operations (Baro-VNAV). Depending on operational need, aircraft shall also meet the RNP AR APCH specification.

7.17 Application of RNAV 1 or Basic RNP-1 for all terminal areas and APV/Baro VNAV or APV/SBAS for all instrument runway ends, either as the primary approach or as a back-up for precision approaches will be mandated by 2016.

SUMMARY TABLE AND IMPLEMENTATION TARGETS

SHORT TERM (2013-2017)		
<i>Airspace</i>	<i>Navigation Specification Preferred</i>	<i>Navigation Specification Acceptable</i>
En-route – Oceanic	RNAV 10	RNAV 10
En-route - Remote continental	RNAV 5, RNAV 10	RNAV 10
En-route – Continental	RNAV 5, RNAV 1	RNAV 5
En-route - Local / Domestic	RNAV 5, RNAV 1	RNAV 5
TMA – Arrival	RNAV 1 in surveillance environment and with adequate navigation infrastructure. Basic RNP 1 in non-surveillance environment	RNAV 1
TMA – Departure	RNAV 1 in surveillance environment and with adequate navigation infrastructure. Basic RNP 1 in non-surveillance environment	RNAV 1
Approach	RNP APCH with Baro VNAV in all possible airports; RNP AR APCH in airport where there are obvious operational benefits. Implementation of straight-in LNAV only procedures, as an exception	LNAV/VNAV
Implementation Targets		
<ul style="list-style-type: none"> ▪ 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% 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. 		

Medium Term (2018-2022)

En-route

7.18 Noting the current development of route spacing standards for RNAV 1, in this phase, it is expected that the implementations of all existing RNAV/RNP routes are consistent with PBN standards. However, in order to ensure implementation harmonization, States are urged to implement their RNAV/RNP routes based on a Regional agreements and consistent PBN navigation specifications and separation standards.

7.19 With regard to oceanic remote operations, it is expected that with the additional surveillance capability, the requirement for RNAV 10 will disappear, and be replaced by navigation specifications for continental en-route applications.

7.20 **Operational approval.** Operators are required to have operational approval for RNAV 5 and RNAV 1.

Terminal

7.21 RNAV 1 or Basic RNP 1 will be fully implemented in all TMAs by the end of this term.

7.22 **Operational approval.** Operators are required to have operational approval for RNAV 1/Basic RNP 1 approval.

Note: In order to avoid unnecessary approvals, operators equipped with GNSS should apply for combined RNAV 1 and Basic RNP 1

Approach

7.23 In this phase, full implementation of RNP APCH with Baro VNAV or APV SBAS for all instrument runways is expected. These applications may also serve as a back-up to precision approaches.

7.24 The extended application of RNP AR Approaches should continue for airports where there are operational benefits.

7.25 To progress further with the universal implementation of PBN approaches. States should consider the implementation of PBN and GLS (CAT II/III) procedures to enhance the reliability and predictability of approaches to runways increasing safety, accessibility and efficiency.

7.26 **Operational approval requirements.** Operators are required to have operational approval for RNP APCH with VNAV operations (Baro VNAV). Depending on operations, aircraft shall also meet RNP AR specification and the PBN and GLS (CAT II/III) operations.

SUMMARY TABLE AND IMPLEMENTATION TARGETS

MEDIUM TERM (2018-2022)		
<i>Airspace</i>	<i>Navigation Specification (preferred)</i>	<i>Navigation Specification (/acceptable)</i>
En-route – Oceanic	RNAV 10	RNAV 10
En-route - Remote continental	NIL	RNAV 10
En-route – Continental	RNAV 1, RNAV 5	RNAV 1, RNAV 5
En-route - Local / Domestic	RNAV 1 , RNAV 5	RNAV 1,
TMA – (Arrival, Departure)	RNAV1 or RNP 1 application	RNAV 1 or RNP 1 application
Approach	RNP APCH (with Baro VNAV) and APV Expansion of RNP AR APCH where there are operational benefits Introduction of landing capability using GNSS and its augmentations	RNP APCH (with Baro VNAV) and APV Expansion of RNP AR APCH where there are operational benefits Implementation of landing capability using PBN and GLS
<p>Implementation Targets</p> <ul style="list-style-type: none"> ▪ RNP APCH with Baro VNAV or APV or LNAV in 100% of instrument runways by 2016 ▪ RNAV 1 or RNP 1 SID/STAR for 100% of international airports by 2016 ▪ RNAV 1 or Basic RNP 1 SID/STAR at busy domestic airports where there are operational benefits ▪ Implementation additional RNAV/RNP routes ▪ CCO and CDO Implementation will continue in this term 		

Long Term (2023 and Beyond)

7.27 In this phase, GNSS is expected to be a primary navigation infrastructure for PBN implementation. States should work co-operatively on a multinational basis to implement GNSS in order to facilitate seamless and inter-operable systems and undertake coordinated Research and Development (R&D) programs on GNSS implementation and operation.

7.28 Moreover, during this phase, States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance.

7.29 Noting the current development of Advanced RNP-1 navigation specification, it is expected that this navigation specification will play an important role in the long term implementation of PBN for enroute and terminal operations.

7.30 With the expectation that precision approach capability using GNSS and its augmentation systems will become available, States are encouraged to explore the use of such capability where there are operational and financial benefits.

7.31 During this term the use of Advanced RNP-1 for terminal and en-route will be mandated by a date to be determined.

8. TRANSITIONAL STRATEGIES

8.1 During the transitional phases of PBN implementation, sufficient ground infrastructure for conventional navigation systems must remain available. Before existing ground infrastructure is considered for removal, users should be consulted and given reasonable transition time to allow them to equip appropriately to attain equivalent PBN-based navigation performance. States should approach removal of existing ground infrastructure with caution to ensure that safety is not compromised, such as by performance of safety assessment, consultation with users through regional air navigation planning process and national consultative forums. Moreover, noting that navigation systems located in a particular State/FIR may be supporting air navigation in airspaces in other States/FIRs States are required to cooperate and coordinate bilaterally, multilaterally and within the framework of Regional agreements, in the phasing out of conventional ground based navigation systems and maintaining the serviceability of required navigation aids for area navigation (e.g. DME).

8.2 States should ensure that harmonized separation standards and procedures are developed and introduced concurrently in all flight information regions to allow for a seamless transition towards PBN.

8.3 States should cooperate on a multinational basis to implement PBN in order to facilitate seamless and inter-operable systems and undertake coordinated R&D programs on PBN implementation and operation.

8.4 States are encouraged to consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance, taking due consideration of the need of State/Military aircraft.

8.5 States should encourage operators and other airspace users to equip with PBN avionics. This can be achieved through early introductions of RNP approaches, preferably those with vertical guidance.

8.6 ICAO MID Region Regional Office should provide leadership supporting implementation and transition towards PBN.

8.7 States should have PBN operational approval process.

8.8 Early Implementation of PBN are encouraged.

9. SAFETY ASSESSMENT AND MONITORS

Methodology

Need for Safety Assessment

9.1 To ensure that the introduction of PBN en-route applications within the MID Region is undertaken in a safe manner and in accordance with relevant ICAO provisions, implementation shall only take place following conduct of a safety assessment that has demonstrated that an acceptable level of safety will be met. This assessment may also need to demonstrate levels of risk associated with specific PBN en-route implementation. Additionally, ongoing periodic safety reviews shall be undertaken where required in order to establish that operations continue to meet the target levels of safety.

Roles and Responsibilities

9.2 To demonstrate that the system is safe, it will be necessary that the implementing agency – a State or group of States - ensures that a safety assessment and, where required, ongoing monitoring of the PBN en-route implementation are undertaken. The implementing agency may have the capability to undertake such activities or may seek assistance from the Middle East Regional Monitoring Agency (MID RMA). The latter course of action is preferred as the MID RMA would be in a position to establish the necessary monitoring and data collection activity in an effective manner. Furthermore, the MIDANPIRG/10 meeting in April 2007 adopted the revised Terms of Reference of the MID RMA, whose scope includes safety monitoring of RNP/RNAV.

9.3 In undertaking a safety assessment to enable en-route implementation of PBN, a State, implementing agency or the MID RMA shall:

- a) Establish and maintain a database of PBN approvals;
- b) monitor aircraft horizontal-plane navigation performance and the occurrence of large navigation errors and report results appropriately to the MID RMA;
- c) conduct safety and readiness assessments and report results appropriately to the MID RMA;
- d) monitor operator compliance with State approval requirements after PBN implementation; and
- e) initiate necessary remedial actions if PBN requirements are not met.

9.4 The duties and responsibilities of the MID RMA as well as the agreed principles for its establishment are available from the ICAO MID Regional Office.

10. PERIODIC REVIEW OF IMPLEMENTATION ACTIVITIES

Procedures to Modify the Regional Plan

Whenever a need is identified for a change to this document, the Request for Change (RFC) Form should be completed and submitted to the ICAO MID Regional Office. The Regional Office will collate RFCs for consideration by the PBN/GNSS Task Force.

10.1 When an amendment has been agreed by a meeting of the PBN/GNSS Task Force, a new version of the PBN Regional Plan will be prepared, with the changes marked by an “[” in the margin, and an endnote indicating the relevant RFC, to enable a reader to note the origin of the change. If the change is in a table cell, the outside edges of the table will be highlighted. Final approval for publication of an amendment to the PBN Regional Plan will be the responsibility of MIDANPIRG.

Appendix A – Practical Examples of Tangible Benefits (living document)

Egypt/ Bahrain / UAE with figures will be provided and inserted here.

Practical examples of tangible benefits derived from the implementation of PBN are:

- Increased airspace safety through the implementation of continuous and stabilized descent procedures using vertical guidance;

- Provision of runway-aligned final approach path which may not be possible from conventional navigation;
- Reduced aircraft flight time due to the implementation of optimal flight paths, with the resulting savings in fuel, noise reduction, and enhanced environmental protection;
- Improved airport and airspace arrival paths in all weather conditions, and the possibility of meeting critical obstacle clearance and environmental requirements through the application of optimized RNAV or RNP paths;
- Implementation of more precise approach, departure, and arrival paths that will reduce dispersion and will foster smoother traffic flows;
- Reduced delays in high-density airspaces and airports through the implementation of additional parallel routes and additional arrival and departure points in terminal areas;
- Reduction of lateral and longitudinal separation between aircraft to accommodate more traffic;
- Decrease ATC and pilot workload by utilizing RNAV/RNP procedures and airborne capability and reduce the needs for ATC-Pilot communications and radar vectoring;
- Increase of predictability of the flight path; and
- Reduction of maintenance and flight inspection costs associated with conventional navigation aids

Appendix B – Reference Documentation for Developing Operational and Airworthiness Approval Regulations/Procedures

Performance-Based Navigation (PBN) Operational Approval Manual (Doc 9997) and General Guidelines for Obtaining Airworthiness and Operational Approvals for PBN Navigation Specifications, Version 1.0, International Air Transport Association, August 2008.

CNS/ATM/IC SG/7
 Appendix 5C to the Report on Agenda Item 5

**STATUS OF MID STATES PBN IMPLEMENTATION PLAN
 (APRIL 2013)**

State	Plan Submission Last update	Percentage of Implementation				Remark
		SID %	STAR %	Approach%		
				LNAV	LNAV/ VNAV	
Bahrain	Submitted	100	100	100	0	RNAV 1 implemented for En-route
Egypt	Submitted	37	40	57	0	Plan need user input
Iran	Not submitted	0	0	0	0	Only PBN approach and Terminal implementation status received
Iraq	Not submitted	0	0	0	0	
Jordan	Submitted	0	0	0	0	
Kuwait	Submitted	100	100	100	100	
Lebanon	Not submitted	0	100	100	0	Only PBN approach and Terminal implementation status received also 2 runways end are not used for landing
Oman	submitted	0	0	0	0	
Qatar	Submitted	0	0	33	16	
Saudi Arabia	submitted	0	33	33	0	
Syria	Submitted	0	0	12	12	
UAE	submitted	70	60	50	40	Implemented (4) RNP AR
Yemen	Submitted	25	37	37	25	

CNS/ATM/IC SG/7
Appendix 5D to the Report on Agenda Item 5

PBN IMPLEMENTATION FOCAL POINT

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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

CNS/ATM/IC SG/7-REPORT
APPENDIX D

5D-2

STATE	NAME	TITLE	ADDRESS	EMAIL	FAX	TEL	MOBILE
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CNS/ATM/IC SG/7
Appendix 5E to the Report on Agenda Item 5

State	Implemented Operational Improvement 2009-2011	Remarks
Bahrain	<ol style="list-style-type: none"> 1- New Eastern Apron established for 9 code E aircraft or 19 code C. This apron Ramp services are all underground such as APU etc. 2- Reducing the final approach separation to 3NM, due to newly established rapid. TWY D. 3- Using EUROCAT system. 4- New ATS & NOTAM Management System Installed and operational. 5- eAIP is available on Web. 6- Full Airport aeronautical Survey was done up to annex 15 Ch 10 requirements. 7- ISO 9001:2008 certified. 8- New VISALA automatic weather observation system (Aerodrome station). 9- New weather radar system. 10- Climate database upgrade CLDB. 11- Terminal area forecast TAF verification. 12- New messages switch (Moving Weather). 13- Competency Assessment System for Aeronautical Meteorological Personnel (CAS). 14- Radar winds and temperature profiler system. 15- First weather radar link interface between Bahrain and UAE. 16- New VISALA automatic weather observation system Backup (Aerodrome station). 	
Egypt	<ol style="list-style-type: none"> 1- Ban of air traffic over Sidi Krair and P18 & P19 is cancelled 2- Ban of air traffic over Ras El Hekma P20 is cancelled. 3- Ban of air traffic between FYM & CVO via R778 is partially suspended. 4- Restrictions regarding landing on 05L and departure on 23R are cancelled 5- Establishing route Q680 between DBA & SALUN 6- Traffic between Cairo and Arish via V602-ISM-V606 is permitted. 7- Establishing route L315 between CVO & HGD 	
Iran		
Iraq	<ol style="list-style-type: none"> 1- RVSM Implementation 2- implementation of ATS route UP975 to increase the traffic flow capacity from Turkey to the Gulf through Baghdad FIR. 	
Jordan	<ol style="list-style-type: none"> 1- METZA- MAZAR-ZELAF (UM690) 2- GRY-BUSRA-DAM (G662) 3- ZELAF DCT QAA (A412) 4- GRY DCT QAA (UN318) 	
Kuwait	SIDs and STARS implementation	

Lebanon	RNAV STARs implementation	
Libya	New ATS Routes Implemented	
Oman		
Qatar		
Saudi Arabia		
Sudan		
Syria		
UAE	RNAV1/5 SID/STARs, PBN routes	
Yemen		

CNS/ATM/IC SG/7
 Appendix 5F to the Report on Agenda Item 5

APPENDIX B

State	Identified Operational Improvement 2012-2013	Nr. of Movements Per Month	Total Fuel Saving Per Month
Bahrain	UN318 ()	4285	
	UL604 ()	7013	
	UL308 ()	9456	
	UP559 ()	6323	
	UL602 ()	10817	
Egypt	NABED-KATAB (T55)	1800	396000
	TBA-NWB-KITOT (UL550-N697) via Saudi Arabia	1170	330000
Iran			
Iraq			
Jordan	End of 201: Implementation of RNAV SIDs, STARs and Approach Procedures at OJAI, OJAM and OJAQ.	N/A	N/A
Kuwait	No Operational Improvement implemented		
Lebanon	No Operational Improvement implemented		
Libya			
Oman			

Qatar			
Saudi Arabia	UM449 ()		
	UM318 ()		
	UM863 ()		
	UL564 ()		
	UM430 (SALWA-HAS)		
	UL681 ()		
	UP517 ()		
	UL550 ()		
	UB411 ()		
	R652 ()		
Sudan			
Syria			

5F-3

UAE	L308	5343	
	P559	3720	
	M557	5865	
	N571	4448	
	P699	2340	
	N318	2389	
	L604 / N685	4041	
	L305	1049	
	Arrival Manager (AMAN) implemented (1 min flight time saved/arrival to OMDB)		
	RNP-AR STARs at Abu Dhabi		
Yemen			

CNS/ATM/IC SG/7
Appendix 5G to the Report on Agenda Item 5

APPENDIX C

State	Planned Operational Improvement 2014 and beyond	Planned Year	Remarks
Bahrain	1- RNAV1 SIDs and STARs. 2- Introducing new RNAV1 AWYs with Kuwait FIR. 3- Installation of Ground radar which will be used during CAT 2 operations and during LVP. 4- We are planning for ASMGCS for the TWR to be used at the airport. 5- DCL system in test. 6- Upgrading ILS CAT 1 to CAT 2. This is under study. 7- Special producer for A380 handling at Bahrain airport. 8- IAPs will be reviewed and republish to reflect the new Airport Survey results. 9- We are planning to open Clearance Delivery Position (CDP) at the TWR to release TWR GMC workload and frequency congestions. 10- Also, planning to have ADM 270 degree simulator to train them on all emergencies and different abnormal situations to enhance the efficiency of our TWR operations. 11- New automatic weather observation system three stationary and one portable station for Bahrain. 12- Second weather radar link interface between Bahrain, UAE and Kuwait. 13- Third weather radar link interface between Bahrain, UAE, Kuwait and Riyadh. 14- Fourth weather radar link interface between Bahrain, UAE, Kuwait, Riyadh and Oman. 15- Link common meteorological system with other GCC in order to enhance the cooperation (Integrated GCC automatic weather observation system).	2014	
Egypt	PBN Implementation at HECA	2016	
Iran			
Iraq	SIDs, STARs and RNAV Approach at ORBI	2014	
Jordan	1- Airway between METZA and MDB 2- airway between PASIP and METSA 3- airway between PASIP and METSA 4- Expansion of GNSS	2014	
Kuwait			

Lebanon	1- Planning for shorter RNAV SIDs and STARs 2- Direct routing between boundary points for over flight traffic.		
Libya	SIDs, STARs at HLLT	2014	
Oman			
Qatar			
Saudi Arabia			
Sudan			
Syria			
UAE	<ol style="list-style-type: none"> 1. Advanced AMAN/DMAN 2. PRISMA system updates additional ATS Routes Civil/Military cooperation 3. Seamless ANS provision throughout the UAE 4. PBN route structure throughout the UAE 5. Flight procedures optimised for CCO/CDO 6. Airport infrastructure that maximises throughput and minimises congestion 7. Interoperable ATM systems in the UAE 8. Cost effective service provision. 9. ANSP facilities accommodate the needed number of operational positions, support equipment, and personnel. 10. ATM systems have sufficient capacity and functional capability to meet operational needs. 11. Sufficient capacity without routine delays. 12. Stakeholders are afforded a collaborative active role. 13. Aviation policy development. 14. Strategic planning. Tactical decision making. 15. Routine and frequent communications among stakeholders, ANSP, and governmental organisations. 16. Best Capable – Best Served during peak periods. 17. Ground-Based Augmentation System (GBAS) for major airports 	2014/2030	
Yemen			

CNS/ATM/IC SG/7
Report on Agenda Item 6

REPORT ON AGENDA ITEM 6: FUTURE WORK PROGRAMME

6.1 The meeting recalled that taking into consideration the global developments related to air navigation planning and implementation and performance monitoring of the air navigation systems, and in order to increase the efficiency of MIDANPIRG, the Third Meeting of the MIDANPIRG Steering Group (MSG/3) reviewed several proposals related to a new MIDANPIRG Organizational Structure and agreed that the proposals at **Appendices 6A** and **6B** to the Report on Agenda Item 6 be further reviewed and considered.

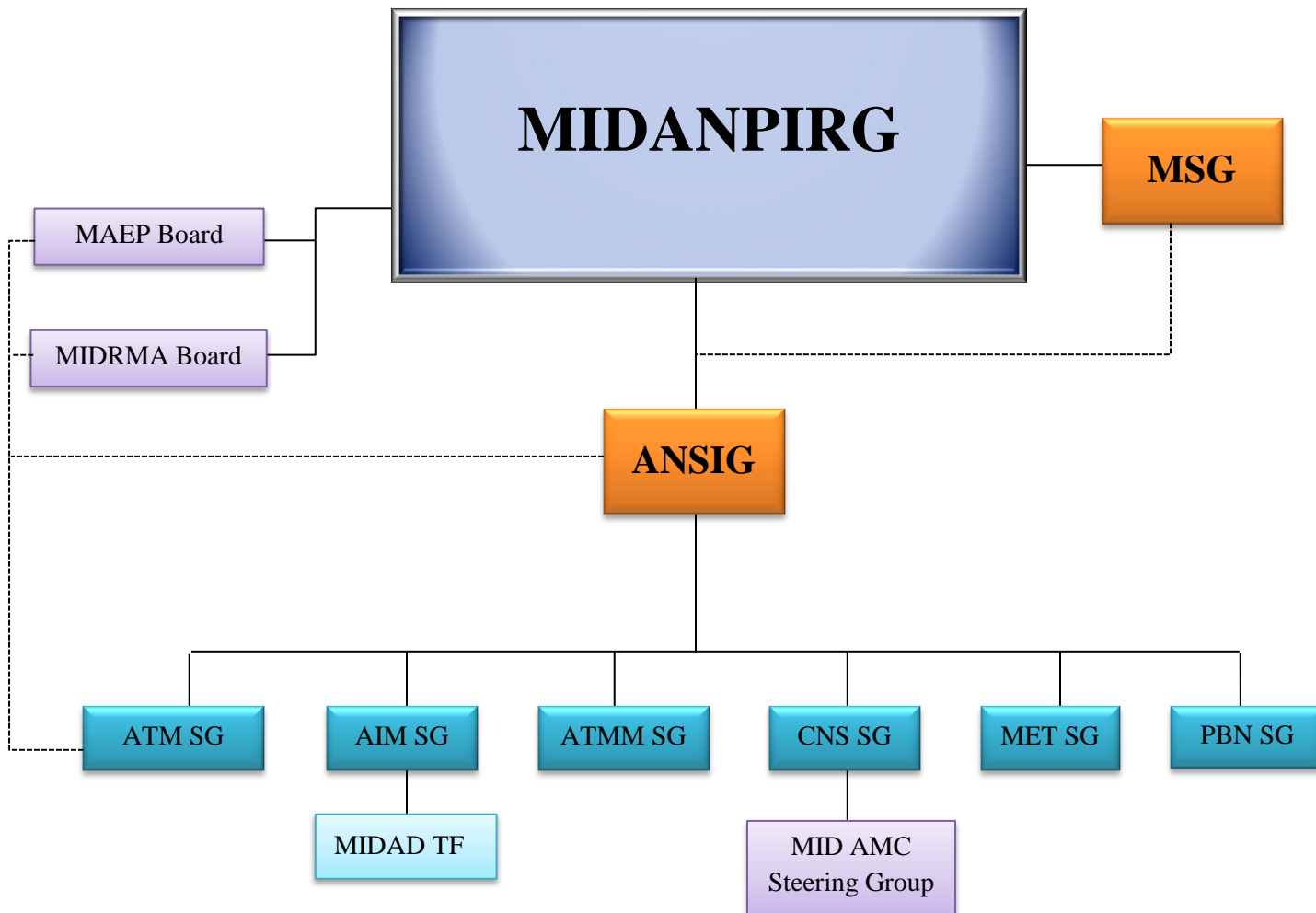
6.2 Accordingly, as a follow-up action to the MSG/3 Draft Conclusion 3/2, the ICAO MID Regional Office issued State Letter Ref.: ME 3/56 – 13/170 dated 3 July 2013, requesting States to advise the ICAO MID Regional Office about their preferred Organizational Structure (Proposal A or B). Likewise, States were requested to provide their inputs related to the Terms of Reference (TOR) of the different MIDANPIRG subsidiary bodies according to the new Organizational Structure.

6.3 The meeting noted that out of the nine (9) replies received by the ICAO MID Regional Office, eight (8) States supported the Organizational Structure at **Appendix 6A** to the Report on Agenda Item 6. The meeting further noted that no input has been received with regard to the TOR of the different MIDANPIRG subsidiary bodies.

6.4 The meeting reviewed and supported the Draft TOR proposed for the ANSIG, ATMM SG and PBN SG at **Appendices 6C, 6D** and **6E** to the Report on Agenda Item 6, respectively.

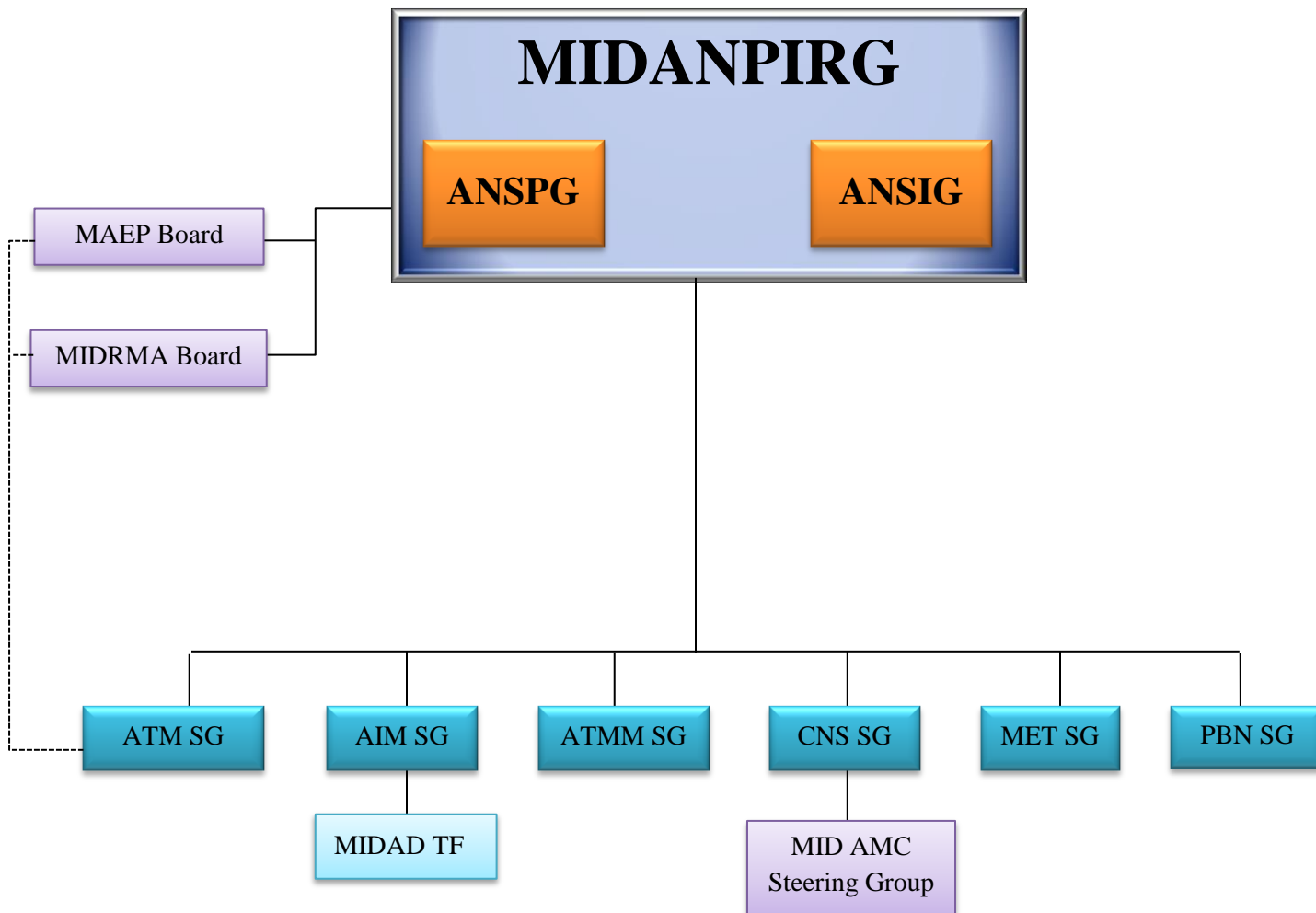
6.5 The meeting agreed that the exact dates, duration and venue of the ANSIG, ATMM SG and PBN SG meetings be determined by the ICAO MID Regional Office in due course.

PROPOSAL A



MSG	MIDANPIRG Steering Group	MET SG	Meteorology Sub-Group
ANSIG	Air Navigation Systems Implementation Group	PBN SG	Performance Based Navigation Sub-Group
AIM SG	Aeronautical Information Management Sub-Group	MIDAD TF	MID Region AIS Database Task-Force
ATM SG	Air Traffic Management Sub-Group	MAEP Board	MID Region ATM Enhancement Programme Board
ATMM SG	Air Traffic Management Measurement Sub-Group	MIDRMA Board	Middle East Regional Monitoring Agency Board
CNS SG	Communication Navigation Surveillance Sub-Group	MID AMC Steering Group	MID Region ATS Message Management Centre Steering Group

PROPOSAL B



ANSIG	Air Navigation Systems Implementation Group	MET SG	Meteorology Sub-Group
ANSPG	Air Navigation Systems Planning Group	PBN SG	Performance Based Navigation Sub-Group
AIM SG	Aeronautical Information Management Sub-Group	MIDAD TF	MID Region AIS Database Task-Force
ATM SG	Air Traffic Management Sub-Group	MAEP Board	MID Region ATM Enhancement Programme Board
ATMM SG	Air Traffic Management Measurement Sub-Group	MIDRMA Board	Middle East Regional Monitoring Agency Board
CNS SG	Communication Navigation Surveillance Sub-Group	MID AMC Steering Group	MID Region ATS Message Management Centre Steering Group

**TERMS OF REFERENCE (TOR) OF
AIR NAVIGATION SYSTEMS IMPLEMENTATION GROUP
(ANSIG)**

1. TERMS OF REFERENCE

1.1 The Terms of Reference of the ANSIG are:

- a) ensure that the implementation of Air Navigation Systems in the MID Region is coherent and compatible with developments in adjacent regions, and is in line with the ATM Operational Concept (Doc 9854), Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) methodology and the MID Region Air Navigation Plan/Strategy;
- b) monitor the status of implementation of the MID Region Air Navigation Systems and related ASBU Modules included in the MID Region Air Navigation Plan/Strategy as well as other required Air Navigation facilities and services, identify the associated difficulties and deficiencies and provide progress reports, as required;
- c) keep under review the MID Region Air Navigation Strategy, and propose changes to the MID Region Air Navigation Plan/Strategy and Air Navigation priorities, as appropriate;
- d) seek to achieve common understanding and support from all stakeholders involved in or affected by the Air Navigation Systems developments/activities in the MID Region;
- e) provide a platform for harmonization of developments and deployments of the MID Air Navigation Systems;
- f) monitor and review the latest Air Navigation developments and provide expert inputs for the implementation of the Air Navigation Systems based on ATM operational requirements;
- g) ensure that the work programmes of all Subsidiary Bodies reporting to ANSIG are harmonized and coordinated, achieving the agreed air navigation performance targets;
- h) provide regular progress reports to the MSG and MIDANPIRG concerning its work programme; and
- i) review periodically its Terms of Reference and propose amendments, as necessary.

1.2 In order to meet the Terms of Reference, the ANISG shall:

- a) agree on the necessary data to be collected for monitoring the MID Key Performance Indicators and Metrics;

- b) monitor the status of implementation of the different ASBU Module elements included in the MID Air Navigation Plan/Strategy and ensure that the associated performance targets are met;
- c) consolidate inputs from all Subsidiary Bodies and propose changes to the Plan/Strategy and Air Navigation priorities, as appropriate;
- d) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU methodology;
- e) Develop and continuously update the MID regional Air Navigation Report Forms (ANRF) in order to reflect the MID Region Performance Objectives;
- f) review and identify intra and inter-regional co-ordination issues and where appropriate recommend actions to address those issues;
- g) identify the environmental effect and use the guidance provided by the Committee on Aviation Environmental Protection (CAEP) in the analysis of environmental benefits of implementing Air Navigation Systems;
- h) support the implementation of the performance framework and propose new technical elements for the continuous improvement of the performance framework; and
- i) foster the integrated improvement of MID Air Navigation systems implementation through proper training and qualification of the personnel

2. COMPOSITION

2.1 The Sub-Group is composed of:

- a) MIDANPIRG Member States;
- b) concerned International and Regional Organizations as observers; and
- c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

CNS/ATM/IC SG/7
Appendix 6D to the Report on Agenda Item 6

**TERMS OF REFERENCE (TOR) OF
AIR TRAFFIC MANAGEMENT-MEASUREMENT SUB-GROUP
(ATMM SG)**

1. TERMS OF REFERENCE

1.1 The Terms of Reference of the ATMM Sub-Group are:

- a) develop the MID Regional Air Navigation environmental Reports based on the benefits accrued from operational improvements, using IFSET;
- b) provide regular progress reports to the ANSIG and MIDANPIRG concerning its work programme; and
- c) review periodically its Terms of Reference and propose amendments, as necessary.

1.2 In order to meet the Terms of Reference, the ATMM Sub Group shall:

- a) follow-up the implementation of the ATM operational improvements required in the MID Air Navigation Strategy and Regional Air Navigation Plan (ANP) or in national plans and to place special emphasis on identifying and estimating the fuel savings accrued from the corresponding improvements;
- b) carry out permanent coordination with various MIDANPIRG contributory bodies in order to ensure appropriate integration of all tasks contributing to the estimation of environment benefits related to the implementation of the ANP or national operational improvements;
- c) harmonize, at a regional level, the estimation of the environment benefits from operational improvements in order to reach consistent results;
- d) collect and analyse the data related to the implemented operational improvements provided by States and users;
- e) use the IFSET to generate the MID Regional Air Navigation environmental Reports;
- f) develop proposals to keep and upgrade the ICAO Fuel Savings Estimation Tool (IFSET) as necessary; and
- g) keep under review the MID Region ATM performance objectives/priorities related to environmental benefits, and propose changes through the ANSIG, as appropriate.

2. COMPOSITION

2.1 The Sub-Group is composed of:

- a) MIDANPIRG Member States;
 - b) concerned International and Regional Organizations as observers; and
 - c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.
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CNS/ATM/IC SG/7
Appendix 6E to the Report on Agenda Item 6

**TERMS OF REFERENCE (TOR) OF
PERFORMANCE BASED NAVIGATION SUB-GROUP
(PBN SG)**

1. TERMS OF REFERENCE

1.1 The Terms of Reference of the PBN Sub-Group are:

- a) ensure that the implementation of PBN in the MID Region is coherent and compatible with developments in adjacent regions, and is in line with the Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) methodology and the MID Region Air Navigation Strategy;
- b) monitor the status of implementation of the MID Region PBN-related ASBU Modules included in the MID Region Air Navigation Strategy as well as other required PBN supporting infrastructure, identify the associated difficulties and deficiencies and provide progress reports, as required;
- c) keep under review the MID Region PBN performance objectives/priorities, develop action plans to achieve the agreed performance targets and propose changes to the MID Region PBN plans/priorities, through the ANSIG, as appropriate;
- d) seek to achieve common understanding and support from all stakeholders involved in or affected by the PBN and GNSS developments/activities in the MID Region;
- e) provide a platform for harmonization of developments and deployments of PBN concentrating on PBN for approach and terminal areas;
- f) monitor and review the latest developments in the area of PBN and procedure design, provide expert inputs for PBN-related issues; and propose solutions for meeting ATM operational requirements;
- g) monitor and review the latest GNSS developments and activities;
- h) carry out necessary studies for the establishment of a MID Flight Procedure Programme Office;
- i) provide regular progress reports to the ANSIG and MIDANPIRG concerning its work programme; and
- j) review periodically its Terms of Reference and propose amendments, as necessary.

1.2 In order to meet the Terms of Reference, the PBN Sub Group shall:

- a) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU methodology;
- b) provide necessary inputs to the MID Air Navigation Strategy through the monitoring of the agreed Key Performance Indicators related to PBN;
- c) identify and review those specific deficiencies and problems that constitute major obstacles to the provision of efficient PBN implementation, and recommend necessary remedial actions;
- d) develop and lead the work programme of the MID PBN Support Team (MPST) including the conduct of MPST visits;
- e) assist States that may require support in the implementation of PBN, through MPST support teams;
- f) conduct study related to the establishment of the MID Flight Procedure Programme office;
- g) monitor the progress of studies, projects, trials and demonstrations by the MID Region States, and other ICAO Regions in PBN and GNSS;
- h) study requirements for GNSS Augmentation Systems in the MID Region, and develop implementation plans; and
- i) foster the implementation of PBN through proper training and qualification of the procedure design personnel and all other personnel involved in PBN implementation.

2. COMPOSITION

2.1 The Sub-Group is composed of:

- a) MIDANPIRG Member States;
- b) concerned International and Regional Organizations as observers; and
- c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

CNS/ATM/IC SG/7
Report on Agenda Item 7

REPORT ON AGENDA ITEM 7: ANY OTHER BUSINESS

7.1 Nothing has been discussed under this Agenda Item.

CNS/ATM/IC SG/7
Attachment A to the Report

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