



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 1: Adoption of the Provisional Agenda

PROVISIONAL AGENDA

(Presented by the Secretariat)

SUMMARY This paper presents the provisional agenda for adoption by the meeting. Action by the meeting is at paragraph 2.
REFERENCES - MIDANPIRG Procedural Handbook - State Letter Ref.: ME 3/1-16/312 dated 30 September 2018

1. INTRODUCTION

1.1 The provisional agenda for the Sixth meeting of the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG) Steering Group (MSG/6) was circulated to States and concerned International Organizations as an attachment to MID Regional Office invitation letter Ref.: ME 3/1-18/312 dated 30 September 2018. States were requested to provide comment, if any, on the provisional agenda. No comments or proposal for change has been received.

2. ACTION BY THE MEETING

2.1 The meeting is invited to review and adopt the Provisional Agenda at **Appendix A**.

APPENDIX A

SIXTH MEETING OF THE MIDDLE EAST AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (MIDANPIRG) STEERING GROUP (MSG/6)

(Cairo, Egypt, 3 – 5 December 2018)

PROVISIONAL AGENDA

- Agenda Item 1:** Adoption of the Provisional Agenda
- Agenda Item 2:** Follow-up on the outcome of MIDANPIRG/16
- Review of action taken by the ANC on MIDANPIRG/16 Report
 - Review status of MIDANPIRG/16 Conclusions and Decisions
- Agenda Item 3:** Global and Regional Developments
- Agenda Item 4:** Air Navigation Safety Matters
- Agenda Item 5:** Air Navigation Planning and Implementation
- 5.1 State of Air Transport in the MID Region (aviation statistics for 2017)
 - 5.2 MID Region Air Navigation priorities and targets
 - ASBU Implementation
 - MID Region Air Navigation Report
 - MID Region Air Navigation Strategy and MID eANP Volume III
 - 5.3 Specific Air Navigation issues
- Agenda Item 6:** Air Navigation Deficiencies
- Agenda Item 7:** MIDANPIRG Working Arrangements
- Agenda Item 8:** Future Work Programme
- Agenda Item 9:** Any other Business

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 – 5 December 2018)

Agenda Item 2: Follow-up on the outcome of MIDANPIRG/16 Meeting

**REVIEW OF ACTION TAKEN BY THE ANC ON MIDANPIRG/16 REPORT
AND REVIEW OF MIDANPIRG/16 FOLLOW-UP ACTION PLANS**

(Presented by the Secretariat)

SUMMARY

This paper presents the Review of Action taken by the ANC on MIDANPIRG/16 Report and the status of MIDANPIRG/16 Conclusions and Decisions and the follow-up actions taken by concerned parties.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/16 Report
- AN.2017.WP/9167.

1. INTRODUCTION

1.1 The MIDANPIRG/16 meeting was held in Kuwait, 13 to 16 February 2017. The meeting developed Twenty-one (21) Conclusions and Eleven (11) Decisions. The meeting was attended by 80 participants from 13 States and 9 International Organizations.

1.2 The ANC Working Group of the Whole for Strategic Review and Planning presented its review of the reports of the MIDANPIRG/16 and RASG-MID/6 meeting to the Air Navigation Commission through AN.2017.WP/9167.

2. DISCUSSION

REVIEW OF ACTION TAKEN BY THE ANC ON MIDANPIRG/16 REPORT

2.1 The ANC noted that the MID Region 2016 Air Navigation Report includes the first regional report on the current status of implementation of priority 1 Block 0 modules as well as an outlook for 2020. It was noted that some States had a significant gap between the current ASBU status and their forecast for 2020. Whilst noting that the 2020 forecasts are based on States' own estimates, which may be overly optimistic, the ANC liked the concept of the report and forecast. It was highlighted that best practices with regards to the reporting of the MID ASBU implementation and forecasts could be harmonised globally in order to facilitate the analysis of current and forecast ASBU implementation.

2.2 The ANC noted the air navigation challenges of the 2022 Work Cup to be held in Qatar and commended the early implementation of a task force. It was highlighted that, although the region already has experience with high Haj traffic demand, the World Cup will concentrate a large amount of traffic into one airport over a very short period of time, necessitating coordination with neighbouring FIRs.

2.3 The ANC noted that many of the concerns of the MID region were similar to those of the Asia Pacific (APAC) and NAT-SPG regional reports discussed in the ANC's 206th session, such as SMS/SSP implementation, AIM implementation, SAR implementation, civil-military cooperation, insufficient State resources, and low State participation in PIRG and RASG working level meetings.

MIDANPIRG/16 FOLLOW-UP ACTION PLAN

2.4 Based on the outcome of the different MIDANPIRG subsidiary bodies, and the feedback received from some States, an updated follow-up action plan on MIDANPIRG/16 Conclusions and Decisions is at **Appendix A**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note:

- a) the action taken by the ANC on the MIDANPIRG/16 Report; and
- b) the progress made for the implementation of the MIDANPIRG/16 Conclusions and Decisions at **Appendix A**; and
- c) take action, as appropriate.

APPENDIX A

FOLLOW-UP ACTION PLAN ON MIDANPIRG/16 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/1: MID RVSM SAFETY MONITORING REPORT (SMR) 2015 That, the MID RVSM Safety Monitoring Report (SMR) 2015 is endorsed.		MID RVSM SMR 2016	MIDANPIRG/16	Feb 2017	Completed
CONCLUSION 16/2: MID RVSM SMR 2017 That, a) the FPL/traffic data for the period 1 – 30 September 2017 be used for the development of the MID RVSM Safety Monitoring Report (SMR 2017); b) only the appropriate Flight Data form available on the MIDRMA website (www.midrma.com) should be used for the provision of FPL/traffic data to the MIDRMA; and c) the final version of the MID RVSM SMR 2017 be ready for presentation to and endorsement by MIDANPIRG/17.		State Letter Traffic Data	ICAO State	Aug 2017 Oct 2017	Actioned SL Ref.: AN 6/5.10.15A dated 31 Aug 2017 Completed
CONCLUSION 16/3: MID REGION AIR NAVIGATION STRATEGY That, the revised MID Region Air Navigation Strategy (MID Doc 002, Edition February 2017) at Appendix 5.1A is endorsed.		MID AN Strategy (MID Doc 002)	MIDANPIRG/16	Feb 2017	Completed (to be closed)
CONCLUSION 16/4: APPROVAL OF THE AMENDMENT TO THE MID eANP VOLUME III That, the amendment to the MID eANP Volume III at Appendix 5.1B is approved.		Amendment Notification of Amendment	MIDANPIRG/16 ICAO	Feb 2017 May 2017	Completed (to be closed) Amendment was approved by MIDANPIRG/16 Notification of amendment issued on 18 June 2017

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/5: ASSESSMENT OF PBN IMPLEMENTATION That, States be invited to: a) explore means and ways to assess the benefit accrued from the implementation of PBN; and b) report on annual basis (by 1 November), the environmental benefits accrued from PBN implementation to the ICAO MID Office in order to be included in the MID Region Air Navigation Report.		State Letter	ICAO	Apr2017	Actioned SL Ref.: AN 6/28 – 17/120 dated 12 April 2017 (Bahrain, Jordan, Sudan)
		Benefits accrued from PBN Implementation	States	Nov 2017 (annual basis)	
CONCLUSION 16/6: ACTION PLAN FOR A-CDM IMPLEMENTATION That, in line with the MID Air Navigation Strategy, States concerned: a) be urged to develop their A-CDM implementation plan, with the support of ICAO MID Office, if required; and b) provide the ICAO MID Office with a copy of their plan before 1 November 2017.		State Letter	ICAO	Jun 2017	Actioned/Ongoing SL Ref.: AN 5/23 – 17/174 dated 27 June 2017 (Bahrain, Sudan, UAE)
		States National Plan	States	Nov 2017	
CONCLUSION 16/7: MID REGION AIR NAVIGATION REPORT-2016 That, the MID Region Air Navigation Report-2016 is endorsed.		MID AN Report	MIDANPIRG/16	Feb 2017	Completed (to be closed) The Report Posted and published

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/8: MID REGION AIR NAVIGATION REPORT-2017 That, MID States be urged to: a) develop/update their National ASBU Implementation Plan, ensuring the alignment with and support to the MID Region Air Navigation Strategy (MID Doc 002); and b) provide the ICAO MID Office, with relevant data necessary for the development of the MID Region Air Navigation Report-2017, by 1 November 2017.		State Letter	ICAO	Sep 2017	Completed (to be closed) SL Ref.: AN 1/7-17/188 dated 2 July 2017 (Bahrain, Egypt, Jordan, Qatar, Sudan & UAE) The Report was prepared to be endorsed by MSG/6
		National ASBU Implementation Plan	States	Nov 2017	
		Data for AN Report 2017		Nov 2017	
CONCLUSION 16/9: ESTABLISHMENT OF HELIPORTS DATABASE That, States be urged to establish and maintain a database for Heliports with information about location and type of use, as a minimum.		State Letter	ICAO	Jun 2017	Actioned SL Ref.: AN 6/25 – 17/185 dated 29 June 2017 (Bahrain, Jordan, Oman)
CONCLUSION 16/10: GUIDANCE FOR AIM PLANNING AND IMPLEMENTATION IN THE MID REGION That, a) the Guidance for AIM Planning and Implementation in the MID Region is endorsed as MID Doc 008; and b) States be encouraged to use the MID Doc 008 in their AIM planning and implementation.		MID Doc 008	MIDANPIRG/16	Feb 2017	Actioned/Ongoing SL Ref: AN 8/4-17/133 dated 30 April 2017 (UAE) The draft Guidance will be presented to AIM SG/5
		State Letter	ICAO	May 2017	
		Updated National AIM Roadmaps	States	Nov 2017	

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/11: AIRAC ADHERENCE MONITORING That, a) States be urged to: i. implement a system for AIRAC adherence monitoring; and ii. report on annual basis (by 31 March) to the ICAO MID Office the case(s) of late publication of aeronautical information of operational significance and non-adherence to the AIRAC provisions, using the AIRAC Adherence Monitoring Questionnaire at Appendix 5.2.2D. b) IATA report to the concerned State(s) and the ICAO MID Office any case of late publication of aeronautical information of operational significance and non-adherence to the AIRAC provisions.		AIRAC adherence monitoring system State Letter Filled Questionnaire	State Letter ICAO States IATA	Nov 2017 Mar. 2017/ continuous Apr.2017/ continuous Nov 2017/ continuous	Actioned/Ongoing SL Ref.: AN 8/4 – 17/087 dated 23 Mar 2017 13 States Replied (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan and UAE) The result of the survey will be presented to AIM SG/5
CONCLUSION 16/12: INTERREGIONAL SEMINAR ON “SERVICE IMPROVEMENT THROUGH INTEGRATION OF DIGITAL AIM, MET AND ATM INFORMATION” That, States, Organizations and Industry be invited to actively participate in the Interregional Seminar on “Service Improvement through Integration of Digital AIM, MET and ATM Information Services” (Brussels, Belgium, 2-5 October 2017).		State Letter Actively participate in the Seminar	ICAO States, Organizations and Industry	Jun 2017 Oct 2017	Completed (to be closed) SL Ref.: AN 8/28.1-17/175 dated 14 June 2017 Only 6 MID States participated
DECISION 16/13: DISSOLUTION OF THE MPCT That, the MAEP Projects Coordination Team (MPCT) is dissolved and its duties and responsibilities be taken over by the MAEP Board.		Dissolution of MPCT	MIDANPIRG/16	Feb. 2017	Completed

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
DECISION 16/14: MAEP BOARD TERMS OF REFERENCE That, the MAEP Board Terms of Reference be endorsed as at Appendix 5.2.2E.		MAEP Board ToR	MIDANPIRG/16	Feb 2017	Completed
CONCLUSION 16/15: MID IP NETWORK PROJECT (CRV) That, a) States that have already committed to join CRV, are invited to engage with the recommended supplier to establish individual service contracts; and b) States that have not yet done so, are urged to carry out a comprehensive CBA related to the implementation of an IP Network under the CRV framework; and inform the ICAO MID Office, as soon as possible, about their decision related to the joining of CRV.		State Letter	ICAO	May 2017	Actioned/Ongoing SL Ref.: AN 6/31.4-17/160 dated 29 May 2017 (Egypt)
		Engage with the recommended supplier	States	Dec 2017	
DECISION 16/16: ATFM TASK FORCE That, a) an ATFM Task Force be established to develop an ATFM Concept of Operations for the MID Region; b) the ATM SG/3 meeting develop the terms of reference of the ATFM Task Force; and c) States support the ATFM Task Force through: i. assignment of ATFM Focal Point to contribute to the work of the Task Force; and ii. provision of required data in timely manner, and in		Establishment of ATFM TF	MIDANPIRG/16	Feb 2017	Actioned (to be closed) Completed
		ATFM Concept of Operations	ATFM TF	Sep 2017	
		Assign ATFM FP Support ATFM TF and provide required data	ICAO States	Apr 2017 May 2017 Jan 2018	
					SL Ref.: AN 6/5.5 – 17/121 dated 12 Apr. 2017 (Bahrain, Jordan, Kuwait) Completed

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
particular to the survey that will be carried out related to the airspace and sectors capacity, hot-spots, ATFM measures/system, etc.					
DECISION 16/17: MID ROUTE DEVELOPMENT WORKING GROUP (MID RDWG) That, a) a MID Route Development Working Group be established to support the route development within the MID Region and at the interfaces with ICAO AFI, APAC and EUR Regions; and b) the ATM SG develop the terms of reference of the MID RDWG.		Establishment of RDWG	MIDANPIRG/16	Feb 2017	Completed (to be closed)
		RDWG ToR	ATM SG	May 2017	ToR to be endorsed by the meeting
DECISION 16/18: WORLD CUP 2022 TASK FORCE That, a) a World Cup 2022 Task Force be established to develop and follow-up the implementation of a collaborative action plan to accommodate the expected high increase in traffic, in a safe and efficient manner, taking into consideration similar experiences; b) the Task Force address other major events such as the EXPO 2020; and c) the ATM SG develop the terms of reference of the Task Force.		Establishment of World Cup 2022	MIDANPIRG/16	Feb 2017	Actioned (to be closed)
		TF ToR	ATM SG	May 2017	ToR to be endorsed by the meeting

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/19: IMPLEMENTATION OF REDUCED RADAR LONGITUDINAL SEPARATION IN THE MID REGION That, a) States, that have not yet done so; i) be urged to implement 20 NM radar longitudinal separation; and ii) be encouraged to further reduce the radar longitudinal separation within the MID Region to 10 NM; b) the ATM SG monitor the status of implementation and take appropriate actions to foster the implementation., metrics and targets, for which the necessary data is available.		State Letter	ICAO	Apr 2017	Actioned (to be closed) SL Ref.: AN 6/5.5 – 17/122 dated 12 Apr. 2017 Continuous
CONCLUSION 16/20: SIDs AND STARS NEW PHRASEOLOGIES That, States be urged to: a) implement the provisions of amendment 7 to ICAO Doc 4444, in particular those related to the SIDs and STARS new phraseologies; and b) provide the ICAO MID Office with their implementation plan by 1 May 2017.		State Letter Implementation plans for the new SIDs and STARS phraseologies	ICAO States	Apr 2017 May 2017	Actioned (to be closed) SL Ref.: AN 6/5.5 – 17/123 dated 12 Apr. 2017
DECISION 16/21: SAR LONGSTANDING DEFICIENCIES That, the ATM SG explore ways and means to support States in the elimination of the longstanding SAR deficiencies.		ATM SG	Means to support States with SAR deficiencies	May 2017	Actioned (to be closed) ATM SG/3 meeting agreed to include guidance in the MID Region SAR Plan

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/22: MODE S INTERROGATOR CODE (IC) ALLOCATION That, States, that have not yet done so, be urged to: a) provide the ICAO MID Office with their Mode S Interrogator Code (IC) Focal Points; and b) register to the MICA application for the allocation of the Mode S Interrogator Code (IC) at: https://ext.eurocontrol.int/mica/Index.action		State Letter	ICAO	Sep 2017	Actioned/Ongoing SL Ref.: AN 7/27 – 17/329 dated 26 Nov. 2017 (Egypt, Jordan, Kuwait, Saudi Arabia, Sudan) Regional Workshop to be conducted (Feb. 2019)
		Focal Point(s) MICA Registration		Dec 2017	
DECISION 16/23: MID REGION SURVEILLANCE PLAN That, the MID Region Surveillance Plan be developed by the CNS SG, based on the operational needs identified by the ATM SG.		MID Region Surveillance Plan	CNS SG	Q1 2018	Ongoing CNS SG/8 Draft Conclusion 8/9
CONCLUSION 16/24: FTBP TESTING DOCUMENT That, the First Edition of File Transfer Body Part (FTBP) Testing Document at Appendix 5.2.2N is endorsed.		FTBP Testing Document	MIDANPIRG/16	Feb 2017	Completed (to be closed)
DECISION 16/25: TERMS OF REFERENCE OF THE MIDAMC STG That, the Terms of Reference and Work Programme of the MIDAMC STG be updated as at Appendix 5.2.2O .		MIDAMC STG TORs	MIDANPIRG/16	Feb 2017	Completed (to be closed)
DECISION 16/26: ATM DATA SECURITY ACTION GROUP That, the ATM Data Security Action Group (ADSAG) be: a) established to develop the MID Region ATM Data Security Plan, to be presented to the CNS SG/8.		State Letter MID Region ATM Data Security Plan	ICAO ADSAG members	Jun 2017	Ongoing SL Ref: AN 6/38 – 17/334 dated 29 Nov. 2017 (Bahrain, Jordan, Kuwait, UAE)

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
b) composed of members from Bahrain, Iran, Kuwait, Oman, Saudi Arabia, UAE (Rapporteur), ICAO and IFAIMA.				Q1-2018	
CONCLUSION 16/27: SPECIAL AIR-REPORT TEST That States be encouraged to participate in the EUR Special Air-Report Test in order to identify deficiencies and associated solutions in the reporting and dissemination of these reports.		State Letter	ICAO	July 2017	Completed (to be closed) SL Ref: AN 10/16-17/208 dated 1 Aug 2017 (Bahrain)
CONCLUSION 16/28: MID REGIONAL SIGMET GUIDE That the MID Regional SIGMET Guide as provided at Appendix 5.2.2Q is endorsed and be published as ICAO MID Doc 009.		MID Doc 009 updated	ICAO	Feb 2017	Completed (to be closed)
CONCLUSION 16/29: PROPOSAL FOR AMENDMENT TO MID ANP VOLUMES I AND II (MET PART) That ICAO initiate proposals for amendment to the MID ANP (Doc 9708) Volumes I and II, to include the changes at Appendices 5.2.2R and 5.2.2S , respectively.		Coordination with HQ	ICAO	Apr 2018	Ongoing Coordination with HQ ongoing
DECISION 16/30: DISSOLUTION OF THE ATM PERFORMANCE MEASUREMENT TASK FORCE (APM TF) That, a) the APM TF is dissolved; and b) the MIDANPIRG Organizational Structure contained in the MIDANPIRG Procedural Handbook (MID Doc 001) be amended accordingly.		APM TF dissolution MID Doc 001 updated	MIDANPIRG/16 ICAO	Feb 2017 May 2017	Completed (to be closed) Completed Completed

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
CONCLUSION 16/31: ENVIRONMENTAL PROTECTION That, States that have not yet done so, be invited to: a) provide the ICAO MID Regional Office with updated contact details of their State's CO2 Action Plan/Environment Focal Points; b) develop/update their State Action Plans on CO2 emission reduction, using the guidelines contained in the ICAO Doc 9988; and submit them to ICAO through the APER website or the ICAO MID Regional Office; and c) take necessary actions for the implementation of the mitigation measures included in their Action Plan, commensurate with the establishment of a dedicated structure (e.g. Department, Section, etc.) within the Civil Aviation Authorities dealing with aviation environmental issues		State Letter	ICAO	May 2017	Actioned/Ongoing (to be closed) SL Ref: EN 1/5-17/171 dated 7 June 2017 (Egypt, Iraq, Qatar)
		CO2 Action Plans	States	2018	
		Dedicated structure to Environmental protection			
DECISION 16/32: REVISED ANSIG TERMS OF REFERENCE That, a) the ANSIG Terms of Reference (TORs) be updated as at Appendix 7A; and b) the MIDANPIRG Procedural Handbook (MID Doc 001) be amended accordingly.		Updated TORs	MIDANPIRG/16	Feb 2017	Completed (to be closed) Completed
		MID Doc 001 updated	ICAO	May 2017	Completed



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 – 5 Dec 2018)

Agenda Item 3: Global and Regional Developments

OUTCOMES OF THE 13th AIR NAVIGATION CONFERENCE

(Presented by the Secretariat)

SUMMARY This paper presents a list of the 13th Air Navigation Conference (AN-Conf/13) recommendations and proposes some follow up actions for the MIDANPIRG and the RASG-MID contributory bodies. Action by the meeting is at paragraph 3.
REFERENCES Thirteenth Air Navigation Conference (AN-Conf/13) Yellow cover report

1. INTRODUCTION

1.1 The Thirteenth Air Navigation Conference (AN-Conf/13), held in Montréal from 9 to 19 October 2018, dealt with eight agenda items. The meeting was attended by a total of 1 022 participants from 116 Contracting States and 37 observer delegations. The list of the participants and the full report of the Conference can be found on the AN-Conf/13 website at: www.icao.int/meetings/anconf13.

1.2 The AN-Conf/13 had two Committees. The Air Navigation Capacity and Efficiency (Committee A) that developed thirty-four recommendations and the Safety (Committee B) developed eighteen recommendations.

2. DISCUSSION

2.1 The Fifty-two recommendations, ranging over a wide variety of air traffic management (ATM), communications, navigation, and surveillance (CNS), aeronautical meteorology, information management, aerodrome, human factors, civil-military collaboration, implementation, Remotely Piloted Aircraft System (RPAS), Search and Rescue (SAR), Cyber resiliency, new operations types, Global Aviation Safety Oversight System (GASOS), State Safety Programme (SSP), Safety Management, Universal Safety Oversight Audit Programme (USOAP), continuous approach (CMA) and regional safety oversight organizations (RSOO) subjects were made by the Conference.

2.2 The Conference made no recommendations for amendment to Annexes.

2.3 The meeting may wish to note that the Air Navigation Commission will review these recommendations in January 2019 during its 210th session and act under delegated authority on certain recommendation and provide its report. The ICAO Council will review the report of the AN-Conf/13 and the ANC Report in March 2019 during its 216th Session.

2.4 The follow-up to the recommendations of the Conference will involve ICAO in considerable work, which will be completed by ANC panels, Regions and by the Secretariat. Furthermore, the work would require an amendment to the Work Programme of the Organization, which could include the addition of new tasks.

2.5 The full list of the AN-Conf /13 recommendations is in **Appendix A**. The meeting may wish to conduct an initial assessment and identification of follow-up actions to be undertaken by the MIDANPIRG and its contributory bodies.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information and identify the necessary follow-up action to be undertaken by MIDANPIRG, its contributory bodies, member States and Stakeholders.

APPENDIX A

RECOMMENDATIONS ADOPTED BY AN-CONF/13

FOLLOW-UP ACTIONS

Agenda Item 1: Air navigation global strategy — 1.1: Vision and overview of the sixth edition of the GANP; 1.2: Air navigation performance improvement and measurement through the aviation system block upgrades (ASBUs) and basic building blocks (BBBs) framework; 1.3: Air navigation roadmaps; and 1.4: Air navigation business cases

Recommendation 1.1/1 — Vision and overview of the Sixth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP)

That States:

- a) agree that the future *Global Air Navigation Plan* (Doc 9750, GANP), based on the outcome of the Thirteenth Air Navigation Conference (AN-Conf/13), be available as a web-based platform, including a concise, executive summary (printable) which outlined its key policies, priorities and strategies to ensure that the GANP was easily accessible to all States and key decision makers;
- b) agree with the proposed multilayer structure for the Sixth Edition of the GANP;
- c) welcome the proposed vision, performance ambitions and conceptual roadmap for the Sixth Edition of the GANP, with the inclusion of the civil-military dimension;
- d) recognize the importance of a separate but aligned GANP and *Global Aviation Safety Plan* (Doc 10004, GASP);

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That ICAO: e) consider the establishment of a GANP Study Group comprised of Member States from all regions and industry to undertake work on future editions of the GANP; f) make available the GANP global strategic level (printable) in the six ICAO languages; g) develop online training and organize regional seminars in conjunction with the planning and implementation regional groups (PIRGs), where possible, for the familiarization of the Sixth Edition of the GANP and support the deployment and implementation of regional and national air navigation plans; h) develop a national air navigation plan template available for voluntary use by States, as part of the Sixth Edition of the GANP, aligned with the global and regional air navigation plans and support States in developing their national air navigation plans while taking into consideration neighbouring requirements; i) strengthen the relationship between the GASP, the GANP and the newly developed Global Aviation Security Plan (GASeP); and j) continue to work with States, international organizations, air traffic management (ATM) modernization programmes and other stakeholders on the development of the Sixth Edition of the GANP, as required for subsequent endorsement at the 40th Session of the ICAO Assembly.	

Recommendation 1.2/1 — Global technical level of the Sixth Edition of the *Global Air Navigation Plan* (Doc 9750, GANP)

That States:

- a) agree with the proposed change management process to maintain an up-to-date aviation system block upgrade (ASBU) framework with the formal involvement of the ASBU Panel Project Team (ASBU PPT) to improve transparency, consistency and stability;
- b) welcome the updated ASBU framework and consider the initial version of the basic building block (BBB) framework;

That ICAO:

- c) map the global technical level of the *Global Air Navigation Plan* (Doc 9750, GANP) with the strategic level;
- d) make available the ASBU and proposed BBB frameworks in an interactive and simplified format, as part of the web-based GANP Portal, emphasizing the relationship between both frameworks, and between the frameworks and the regional air navigation plan (ANP) elements;
- e) enable the capability, within the GANP Portal, to upload relevant information related to the development and deployment of the ASBU and proposed BBB frameworks in order to allow States, regions and industry to share information;
- f) incorporate a flexible framework for emerging air navigation concepts such as unmanned aircraft systems

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
(UAS), UAS traffic management (UTM), Big Data and the aviation Internet, into future editions of the GANP; g) include a Global Aeronautical Distress and Safety System (GADSS) thread in the Sixth Edition of the GANP in line with ICAO provisions; h) consider designing a thread for a Global Aviation Internet Network in the GANP, in coordination with aviation and non-aviation-related industries; i) emphasize and enhance a human-centric approach to system design and processes for change management; j) support the conduct of trials for new air navigation concepts as outlined in the ASBU framework within the GANP; and k) continue to work with States, international organizations, air traffic management (ATM) modernization programmes and other stakeholders on the development of the global technical level of the Sixth Edition of the GANP for subsequent endorsement at the 40th Session of the ICAO Assembly. Recommendation 1.3/1 – Air navigation roadmaps That States: a) provide ICAO with timely information on their modernization plans and the equipage plans of airspace users;	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That States and ICAO: b) work collaboratively to adopt a performance-based approach for developing performance requirements and acceptable means of compliance to support the implementation of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP) while considering the need for global interoperability; That ICAO: c) provide air navigation roadmaps, linked to the aviation system block upgrade (ASBU) elements, within the GANP which support: 1) new airspace users and emerging technologies; 2) greater flexibility where possible in the choice of technologies, based on performance needs; and 3) earlier adoption of new technologies and operational capabilities as they emerge, linked to the performance needs; d) continue to explore practical means to make use of international standards, in particular through the Standards Roundtable work with recognized standards-making organizations, to expedite the efficient development of ICAO provisions; and e) expedite the work on the Global Data Link Implementation Strategy and develop harmonized solutions to support air-ground data link communications.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 1.4/1 — Cost-benefit analysis (CBA) in support of assets deployment That States: a) perform a cost-benefit analysis (CBA) as part of all required impact assessments, in coordination with air navigation services providers (ANSPs) and among other relevant stakeholders, when defining optimum solutions for improvements in the performance of the air navigation system through the use of the aviation system block upgrades (ASBU) framework; b) use a simplified mechanism, if they do not have a process already in place, such as the checklist available on the Global Air Navigation Plan (GANP) Portal, for CBA of air navigation infrastructure investment projects to support improvements as described in the ASBU framework; and That ICAO: c) support the implementation of applicable CBA methodologies through dedicated workshops.	
Agenda Item 2:Enabling the global air navigation system — 2.1:Aerodrome operations and capacity; 2.2:Integrated CNS and spectrum strategy; and 2.3:Future provision of aeronautical meteorological service	
Recommendation 2.1/1 — Aerodrome capacity and efficiency enhancement	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That States: a) review, as needed, all options to increase aerodrome capacity, including increasing the efficiency of existing aerodrome infrastructure, reviewing the need for investment in new infrastructure and mitigating restrictions in surrounding airspace; b) establish a plan for the certification of aerodromes under their jurisdiction, in accordance with their national regulations, incorporating the identification of gaps and implementation of solutions to overcome those gaps, including the assessment and development of mitigation measures in areas of non-compliance; That ICAO: c) progress the work on the development of provisions related to aerodrome design and operations in support of aerodrome capacity and efficiency enhancement; d) explore new areas for enhancing aerodrome capacity and efficiency, including total airport management (TAM), reduced separation standards, joint civil-military aerodromes and other new initiatives and technologies such as folding wing tip (FWT); e) continue to provide assistance to States in the area of aerodrome certification; and f) monitor developments such as New Experience Travel Technologies (NEXTT) and consider the formulation of provisions, where necessary, to support their	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 2.1/2 — Total airport management (TAM) and airport throughput That States: a) implement airport collaborative decision-making (A-CDM) and, when appropriate, extend A-CDM to incorporate total airport management (TAM); That ICAO: b) update provisions and guidance on A-CDM by extending it to TAM with greater integration with air traffic flow management (ATFM); c) update provisions on wake turbulence and time-based separation; and d) update provisions on reduced runway separation minima. Recommendation 2.2/1 — Long-term evolution of communication, navigation and surveillance systems and frequency spectrum access That States: a) engage in the spectrum regulatory process to ensure the continued necessary access to and protection of safety-critical aeronautical communications, navigation, and surveillance (CNS) systems; b) ensure through the implementation of a safety oversight programme that the designated competent authorities are	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
involved in safety case assessments of the radio frequency environment so as to adequately protect the operational availability of aeronautical CNS systems; That ICAO: c) launch a study, built on a multi-disciplinary view of the C, N and S elements and frequency spectrum, to evolve the required CNS and frequency spectrum access strategy and systems roadmap in the short, medium and long term, in a performance-based and service-oriented manner, to ensure that CNS systems remain efficient users of the spectrum resource; and d) develop provisions, in collaboration with States and regional modernization programmes, to support increased civil-military interoperability and synergies with the optimum reutilization opportunities from State and military aviation technologies and to take advantage of opportunities arising from new entrants, such as unmanned aircraft systems (UAS) and suborbital vehicles. Recommendation 2.2/2 — Global navigation satellite system (GNSS) evolution	

That States:

- a) when defining their air navigation strategic plans, take advantage of the improved robustness and performance offered by dual-frequency, multi constellation (DFMC) global navigation satellite system (GNSS) to deliver incremental operational benefits and encourage related industry developments;
- b) avoid, in principle, prohibiting the use of available GNSS elements if they perform according to ICAO Standards and Recommended Practices (SARPs) and can meet all safety and regulatory requirements for the intended operations;
- c) avoid mandating equipage or use of any particular GNSS core constellation or augmentation system unless clear operational benefits are offered in return and appropriate consultations have been made with the relevant airspace users;
- d) ensure implementation of ICAO provisions for publication of information related to the use of GNSS elements in aeronautical information publications (AIP);
- e) take timely action to meet the long-term goal whereby every State accepts for lateral navigation use all GNSS elements that are compliant with SARPs, thus creating a positive environment for DFMC GNSS.

That ICAO:

- f) continue the development of SARPs and guidance material for existing and future GNSS elements in coordination with recognized standards-making organizations;

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
g) further develop provisions intended for States and organizations that provide GNSS services regarding publication of service performance standards, regular performance assessment and timely notification of events that may affect the service; and h) develop additional guidance addressing technical and regulatory aspects to assist States in their acceptance and use of existing and future GNSS elements.	
Recommendation 2.3/1 — Future provision of aeronautical meteorological service That States: a) and international user organizations ensure that adequate expert capacity is applied in the collaborative	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
management and development of aeronautical meteorological services for international air navigation; That ICAO: b) ensure it has sufficient capacity and expertise to progress the work on the development of provisions related to aeronautical meteorology, including the foreseen impact on international air navigation due to climate change, to be described in the Sixth Edition of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP); and c) develop implementation assistance, including guidance material, for space weather information service, the provision of globally-consistent, phenomena-based hazardous meteorological information, the meteorological component of system-wide information management (SWIM), cost-recovery solutions for regional and global systems, and potential new initiatives to address issues such as the impact of climate change on aviation, including provision of meteorological services to the air traffic management (ATM) community in the context of increased tropical convective systems. Recommendation 2.3/2 — Further Development of IWXXM for the Exchange of Aeronautical Meteorological Information That States:	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
a) provide ICAO with their ICAO Meteorological Information Exchange Model (IWXXM) implementation plans before 2020; That ICAO: b) promote the importance of exchanging meteorological information for aeronautical purposes in compliance with the IWXXM; c) in close coordination with the World Meteorological Organization (WMO); 1) ensure that the IWXXM format is the only standard exchange format by 2026; 2) develop the policies and procedures necessary to ensure a smooth transition from traditional alpha numeric code (TAC) format to IWXXM format for the purpose of data exchange to support international air navigation, as an interim step toward full IWXXM implementation; 3) promote awareness of the changes brought about by the IWXXM data format, production, dissemination and data exchange among operators; and 4) monitor the status of implementation of IWXXM at State and regional levels. Recommendation 2.3/3 — Provision of space weather information service meeting the operational needs of users	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That States: a) encourage the research of operational impacts of space weather phenomena on civil aviation using performance-based approaches and establish requirements for the use of space weather information for civil aviation; That ICAO: b) continue to facilitate coordination between the space weather information service providers and aeronautical users to clarify the needs and solutions for improved safety and efficiency of civil aviation through the provision of space weather information and training on the use of the information; and c) coordinate with other international organizations, such as the International Telecommunication Union - Radio communication Sector (ITU-R) and the World Meteorological Organization (WMO), to facilitate research of operational impacts of space weather phenomena on civil aviation using performance-based approaches and develop requirements and/or guidance for the use of space weather information for civil aviation. Recommendation 2.3/4 — Development of cost-recovery mechanisms for the provision of aeronautical meteorological information	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That ICAO: a) support the need to expeditiously identify how aeronautical meteorological service provision has changed, how it will continue to evolve, and how these changes (including those arising from the impact of climate change on aviation) may affect the recovery of relevant costs associated with service provision on a global, multi-regional, regional, and sub-regional basis; and b) in close coordination with the World Meteorological Organization (WMO); 1) review deficiencies in the current cost-recovery systems; 2) identify new cost-recovery challenges that have arisen (taking into consideration the issues described in a) above); and 3) identify possible mechanisms to recover these costs in a manner consistent with <i>ICAO's Policies on Charges for Airports and Air Navigation Services</i> (Doc 9082).	
Agenda Item 3: Enhancing the global air navigation system — 3.1: System-wide information management (SWIM); 3.2: Flight and flow information for a collaborative environment (FF-ICE) and trajectory-based operations (TBO); 3.3: Air traffic flow management (ATFM); 3.4: Civil/military cooperation; and 3.5: Other ATM issues	
Recommendation 3.1/1 — System-wide information management (SWIM) That States:	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
a) support developments and implementation of system-wide information management; b) via the mechanism of the planning and implementation regional groups (PIRGs), showcase regional system-wide information management (SWIM) demonstrations, highlighting the operational and economic benefits of SWIM, and evaluate possible transition and mixed-mode scenarios; c) share information, lessons learned and observations regarding SWIM development and implementation; d) develop national implementation plans in alignment with regional strategies and priorities and in accordance with the strategy outlined in the <i>Global Air Navigation Plan</i> (Doc 9750, GANP) which would include SWIM; That ICAO: e) while making use of already developed Standards and best practices, continue the development of provisions related to information services, while including relevant guidance, governance aspects, information content and related information exchange models, and supporting technical infrastructure and governance for SWIM in sufficient detail to ensure safe, efficient and secure globally seamless operations; f) consider the concept of a global SWIM framework as part of the GANP and the aviation system block upgrades (ASBUs);	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
g) consider security-by-design principles when developing interconnected trusted global SWIM frameworks; h) develop provisions related to the harmonization of information exchange models and globally interconnected registries; i) through regional events, and in collaboration with States and industry, promote SWIM and its benefits, as described in the <i>Manual on System-wide Information Management</i> (Doc 10039), as well as implementation best practices to the aviation community; and j) provide assistance to States to support the implementation of Annex 15 — <i>Aeronautical Information Services and Procedures for Air Navigation Services — Aeronautical Information Management</i> (Doc 10066, PANS-AIM). Recommendation 3.2/1 — Trajectory-based operations (TBO) That States, along with stakeholders: a) continue to provide ICAO with the developments and lessons learned from air traffic management (ATM) modernization programmes; b) work through ICAO to identify and address, not only potential issues, but also opportunities such as the improved management of global traffic flows through a global network-centric approach to ensure the successful development and implementation of trajectory-based operations (TBO);	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
c) through the mechanism of the planning and implementation regional groups (PIRGs), integrate current implementation efforts with regional transition plans for flight and flow information for a collaborative environment (FF-ICE), system-wide information management (SWIM) and TBO; That ICAO: d) finalize the global TBO concept and its elements in the Sixth edition of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP) and the aviation systems block upgrade (ASBU) framework; and e) develop guidance on transitioning to a globally interoperable TBO environment in the context of on-going ATM initiatives while addressing all domains of ATM systems and taking into consideration existing and new types of airspace users. Recommendation 3.2/2 — Flight and flow information for a collaborative environment (FF-ICE) That States, along with stakeholders: a) work through ICAO to finalize ICAO provisions and guidance material, in support of the initial implementation of flight and flow information for a collaborative environment (FF-ICE) by providing the	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
results of operational and technical performance validation and cost-benefit analysis (CBA); That ICAO: b) develop a robust transition strategy to minimize any potential negative impacts during the mixed mode operations of current ICAO flight plan processing and FF-ICE; and c) continue its work concerning the investigation of necessary information exchange content and supporting processes for the next evolution of FF-ICE. Recommendation 3.3/1 — Network operations (NOPS): That States: a) implement collaborative decision-making (CDM) processes in support of effective airspace management in the provision of air navigation services, including cross-border operations and resource management; b) plan and implement, according to their operational needs, operational improvements related to network operations in a coordinated manner within and across regions; That ICAO: c) develop further provisions and guidance material on air traffic flow management (ATFM), supporting a global collaborative network management in support of trajectory-based operations (TBO); and	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
d) support, through its Regional Offices, the sharing of best practices and the advancement of technical cooperation agreements between States in order to implement ATFM. Recommendation 3.4/1 — Civil-military collaboration That States: a) actively collaborate with their military authorities, including at the regional level, and encourage greater civil-military interoperability and appropriate use of performance equivalence; b) continuously inform their military authorities of the improvements to air navigation capacity and efficiency, safety, cyber threats and system resilience put forth by ICAO and advocate collaboration with ICAO at the global and regional levels; That ICAO: c) identify potential opportunities for civil-military collaboration, develop a mechanism to collaborate with the military community early in the development of global provisions and guidance, and establish guidance for collaboration with the military community at global and regional levels; d) incorporate the military dimension, including civil-military cooperation and collaboration, in future editions of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP); e) consider, with urgency and in collaboration with the military community, the interoperability and governance	

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principles for the military community in system-wide information management (SWIM) and in the development of the ICAO trust framework; and f) consider, where possible, the inclusion of civil-military cooperation and collaboration subjects at ICAO events, and highlight the participation of military authorities in relevant State letter invitations. Recommendation 3.4/2 – Civil-military cooperation implementation That States: a) encourage their military authorities to cooperate and coordinate with civil aviation authorities and air navigation services providers (ANSPs) on airspace use, including airspace access requirements, to achieve the most efficient use of airspace based on actual needs and, when possible, avoid permanent airspace segregation; That ICAO: b) promote civil-military coordination and cooperation of best practices, and provide forums and other opportunities, such as regional symposiums, for States to exchange best practices; and c) explore opportunities to provide guidance to enhance safety at joint civil-military aerodromes and to assist States in the promulgation of clear procedures for airspace access requirements.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 3.5/1 — ICAO location indicator system and database of significant points That States and industry stakeholders: a) urgently complete the population of the ICAO International Codes and Routes Designators (ICARD) database with all five-letter name codes (5LNC) used worldwide to ensure the accuracy of the database; b) ensure that whenever a 5LNC that is used for military purposes is published in an ICAO Aeronautical Information Publication (AIP) and consequently coded into aircraft flight management system (FMS), such 5LNCs are coordinated through the ICARD process; That ICAO: c) continue to address the limitations of both location indicator and 5LNC availabilities in the short-term and determine a long-term solution; d) consider, when developing such solutions, the need for global harmonization and interoperability; e) continue with its efforts to improve awareness and training on the use of ICARD in the regions that do not actively use ICARD; f) continue to work towards removing duplicated 5LNCs and sound-like conflicts; and g) implement improvements to the ICARD database functionality, including the use of maps depicting flight information regions (FIRs), more information regarding	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
5LNC history and sound-like proximity checks for codes held in reserve but not yet allocated to a region. Recommendation 3.5/2 – Coordinated crisis management That States: a) along with industry stakeholders, engage in an active and coordinated manner when dealing with crisis management, enhanced preparedness for disasters, contingency planning and post crisis reviews; and That ICAO: b) develop guidance on a coordinated approach to crisis management, including subjects such as business continuity, the role of air traffic flow management (ATFM) in support of crisis management and the importance of post crisis reviews. Recommendation 3.5/3 — Certification of ANSPs That ICAO investigate the potential benefits, balanced against the associated costs of the development of provisions and guidance material for certification of air navigation services providers (ANSPs). Recommendation 3.5/4 — True North That ICAO conduct a detailed study into the technical, operational, and economic feasibility of changing to a “True North” reference system.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Agenda Item 4: Implementing the global air navigation system and the role of planning and implementation regional groups (PIRGs) — 4.1: The economic benefits brought by aviation; 4.2: Implementing BBBs and minimum service Standards; 4.3: Implementing ASBUs for performance improvement; and 4.4: Implementing search and rescue (SAR) processes and procedures	
Recommendation 4.1/1 — State National Development Plans That States: a) establish a defined connection between their air navigation and safety plans, as well as other relevant national plans; b) include clear references to the United Nations Sustainable Development Goals (UN SDGs) in their air navigation and safety plans, as well as in other relevant national plans, with the objective of showcasing the contribution of aviation to the UN SDGs and national economies; That ICAO: c) engage with States to promote the importance of aviation development, taking into consideration environmental and socio-economic aspects, and to include aviation within their relevant national plans, and as necessary, national budgeting, which might be vital to unlocking funding for aviation needs; and d) develop guidance for States to include aviation within their relevant national plans taking into consideration global and regional planning. Recommendation 4.2/1 – Implementation of essential air navigation services	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That States: a) consider the use of more advanced technologies and procedures, in coordination with international organizations and industry stakeholders, to provide the essential air navigation services for international civil aviation, taking into account the principles of global interoperability and performance specification compliance; b) include planning for the implementation of the essential services outlined in the proposed basic building blocks (BBB) framework within their national air navigation plans; That ICAO: c) in coordination with the planning and implementation regional groups (PIRGs) and by making use of existing reporting mechanisms, verify the provision of the essential air navigation services for international civil aviation, as outlined in the proposed BBB framework, through the methodology for the identification of air navigation deficiencies against the regional air navigation plans; d) develop the necessary tools to support the PIRGs in the verification of the provision of the proposed basic building block (BBB) services at the regional and national levels; e) coordinate the interoperability of systems and harmonization of procedures at a regional level, through the PIRGs, in relation to the use of advanced	c

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
technologies and concepts of operations, taking into account global requirements; f) in line with the No Country Left Behind (NCLB) initiative, provide the necessary technical assistance to States for the provision of essential air navigation services as identified by the PIRGs and as reflected in State national air navigation plans; and g) urge the aviation manufacturing industry to create a testing environment for States to justify procurement decisions which guaranty interoperability and system functionality within local specific environments, as a follow-up to the provision of essential air navigation services. Recommendation 4.3/1 – Improving the performance of the air navigation system That ICAO study and make appropriate additions where required to the ICAO provisions, including: a) required navigation performance-authorization required departure navigation specification; b) the application of performance-based navigation standard terminal arrival routes for en-route independent simultaneous approaches; c) assessment of the need for ICAO provisions on the use of a ground-based augmentation system to support	a) to g) : approve, include the Air Navigation work programme and request the Secretary General to take appropriate action.

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standard instrument arrival and standard instrument departure procedures to approach and landing trajectory; d) development of separation minima to support all performance-based navigation specifications and which will also allow for operations where mixed performance requirements are in effect; e) advanced use of performance-based navigation to support aviation system block upgrade modules; f) continued development of provisions, guidance and training material in support of performance-based navigation implementation; and g) development and availability of the minimum qualification requirements for personnel to attend performance-based navigation procedure design training. Recommendation 4.3/1 — Improving the performance of the air navigation system That States: a) adopt and adapt as needed, the six-step performance management process for the planning and implementation of air navigation improvements and reflect this process in their national air navigation plans; b) align their national air navigation plans with regional plans to attain a globally harmonized performance management process and support the achievement of global performance objectives;	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
c) support ICAO in promoting the No Country Left Behind (NCLB) initiative and reaffirm their commitment to the development of timely and accurate national air navigation plans aligned with regional and global plans; That ICAO: d) encourage the planning and implementation regional groups (PIRGs) to embrace a performance-based approach for implementation and adopt the six-step performance management process, as described in the <i>Manual on Global Performance of the Air Navigation System</i> (Doc 9883), by reflecting the process in Volume III of all regional air navigation plans; e) continue to expedite the work on performance indicators related to the <i>Global Air Navigation Plan</i> (Doc 9750, GANP), including their review by an appropriate group of performance experts and consider establishing such an expert group under the Global Air Navigation Plan (GANP) Study Group; and f) examine possible operational incentives in the development of new air traffic management (ATM) concepts. Recommendation 4.3/2 — Regional and national collaboration and implementation initiatives That States: a) adhere to the implementation commitments agreed at the regional level, and reflected in the regional air	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
navigation plans, in order to effectively deploy regional initiatives; b) cooperate among themselves and with the industry to strengthen State implementation provisions within the framework of the No Country Left Behind (NCLB) initiative; c) plan the modernization of their air navigation system together with all stakeholders, based on local needs and available resources, taking into account regional and global commitments; d) recognize the important contribution being provided by the Africa-Indian Ocean (AFI) Plan towards the implementation of an effective regional framework for the African Air Navigation Services Provider (ANSP) Peer Review Programme to enhance the safety and efficiency of air transport operations in Africa; e) support the implementation of ICAO initiatives to improve the efficiency and effectiveness of regional processes; f) encourage the participation of high level authorities in the decision-making process for planning and implementation; That ICAO: g) encourage States, regions and international organizations to support cross-border, interregional and intra-regional collaborative planning, activities and	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
projects, supporting effective, efficient and expeditious harmonization; h) continue to provide support to the African air navigation services provider (ANSP) Peer Review Programme; i) urge States, in coordination with the industry, to support the implementation of regional priorities; j) support the implementation of an action plan for the development of aviation infrastructure in Africa under the Comprehensive Regional Implementation for Aviation Safety in Africa (AFI Plan); k) encourage States and organizations to continue sharing surveillance data to improve safety and efficiency in air traffic management; l) encourage regional collaboration and coordination as well as the use of incentives when planning the implementation of operational improvements to enable all stakeholders to achieve the benefits expected from the implementation; and m) encourage African States and industry to continue to work together within the African Flight Procedure Programme (AFPP). Recommendation 4.4/1 — Search and rescue (SAR) and the Global Aeronautical Distress and Safety System (GADSS) That States:	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
a) through the planning and implementation regional groups (PIRGs), examine the possibilities of combining their respective capabilities to improve search and rescue (SAR) effectiveness; b) take advantage of the PIRGS to actively promote the establishment of bilateral or multilateral SAR agreements; c) support regional initiatives to implement SAR by organizing high level conferences in coordination with ICAO, industry and international partners; That ICAO: d) complete the development of Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) provisions related to GADSS, as necessary, and support their implementation; e) organize regional SAR seminars and/or workshops to facilitate implementation of the Global Aeronautical Distress and Safety System (GADSS); f) emphasize to States the importance of implementing Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) provisions which support GADSS, related to aircraft tracking and to the location of an aeroplane in distress; g) invite the appropriate expert groups to provide advice on the implementation of GADSS;	. .

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
h) review the need for a requirement for a performance-based Standard to accurately determine the location of the end of flight, particularly over terrain, in the scope of efficient SAR operations; and i) include the general organization of SAR in future editions of the GANP.	
Agenda Item 5: Emerging issues — 5.1: Operations above Flight Level 600; 5.2: Operations below 1000 feet; 5.3: Remotely piloted aircraft system (RPAS); 5.4: Cyber resilience; and 5.5: Other emerging issues impacting the global air navigation system including unmanned aircraft systems (drones), and supersonic and commercial space operations	
Recommendation 5.1/1 — Operations above flight level 600 That States: a) with relevant experience in higher airspace operations, share, through ICAO where appropriate, their experience and expertise with other States and provide assistance to other States on the regulatory aspects of these operations; b) expected to benefit from higher airspace operations, agree to consider risk-based operational trials in their airspace; That ICAO:	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
c) support ongoing higher airspace operations by providing guidance and, as necessary, other provisions on the regulatory aspects of these operations; d) work with States and industry to share information on current and forecasted needs for higher airspace operations, to identify issues affecting the global air navigation system and to proactively address harmonization for these operations; e) consider establishing a multidisciplinary group of experts to consider needed criteria, operational issues, and operator and provider responsibilities for operations in higher airspace; and f) develop a performance-based global framework for higher airspace operations considering current and future work in emerging technologies, for example, in the areas of information management and sharing, strategic planning, separation and environmental Standards, situational awareness and security; and g) ensure that the framework includes flights transitioning through controlled airspace and to and through airspace above FL600, as necessary. Recommendation 5.2/1 — Very low altitude operations That States: a) collect and share information regarding very low altitude operations, including on unmanned aircraft systems traffic management (UTM) systems, autonomous	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
operations initiatives and tactical risk assessment models; b) ensure that UTM systems are interoperable with existing air traffic management (ATM) systems; That ICAO: c) contribute to the development of operational solutions and guidance, including on UTM systems, autonomous operations and tactical risk assessment models, to support the safe and coordinated implementation of aviation activities at very low altitude, particularly in urban and suburban environments, including in the vicinity of, and into, aerodromes; d) continue serving as the global and regional facilitator and forum for States, industry, academia and other interested stakeholders in the development of UTM systems, including developing guidance for the identification, structuring and implementation of necessary financing mechanisms such as public-private partnerships (PPPs); e) continue developing provisions and guidance material for the development, harmonization and implementation of UAS regulations, consistent with the key policy principles set forth in the Global Air Navigation Plan (GANP); f) develop a solution to enable States to authorize operations of non-certificated UAS over the high seas, using parameters to be defined in a transparent manner,	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
including investigating the maximum altitude at which these operations would be allowed; g) develop Standards and Recommended Practices (SARPs), guidance or “best practices” related to UTM, including autonomous operations, after States and regions have had sufficient time to test and validate concepts; h) encourage UTM providers to implement the highest level of cyber security standards that are consistent with aviation community expectations and guidelines for very low altitude airspace operations; i) support and coordinate the implementation of core airspace management services including, but not limited to, geofencing and geo-referencing, as well as ensuring ATM and UTM interfaces; j) actively cooperate with States at the regional level for the development and implementation of UTM; k) continue the development of a global aircraft registration network (ARN); and l) continue conducting awareness and educational activities amongst users, and facilitate the exchange of information amongst States regarding their UAS regulations. Recommendation 5.3/1 — Remotely piloted aircraft systems (RPAS)	

That States:

- a) collect and share information on remotely piloted aircraft systems (RPAS) operations;
- b) actively engage industry stakeholders to collect and provide technical data to ICAO on RPAS operations needed to support the development of SARPs for RPAS, including those SARPs required for detect and avoid (DAA) and C2 Link;
- c) support the cross-disciplinary development of RPAS-related SARPs and guidance material across expert groups of ICAO;

That ICAO:

- d) continue development of the regulatory framework necessary to support the integration of RPAS into non-segregated airspace and aerodromes, and facilitate related implementation roll-out activities;
- e) continue developing guidance material to support safe RPAS operations, to facilitate implementation through regional training activities, to conduct awareness and educational activities amongst users, and to facilitate the collection and sharing of information amongst States regarding their RPAS operations and regulations;
- f) assess the work underway in its expert groups and identify additional activities required to implement RPAS-related SARPs and guidance such as DAA and C2 Link;

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
g) provide an update on a fully integrated approach for ICAO's RPAS-related work programme to the 40th Session of the Assembly in 2019; h) in coordination with States and military stakeholders, propose the best selection for the establishment of a secondary surveillance radar (SSR) code for lost C2 Link events within appropriate Annexes, Procedures for Air Navigation Services (PANS), regional air navigation plans and other relevant documents; and i) consider the use of gender-neutral RPAS-related terminology, following appropriate research. Recommendation 5.4/1 – Cyber resilience That States: a) in coordination with stakeholders, provide the necessary support for ICAO to evolve the global trust framework as an enabler of flight operations in a digitally connected environment; b) recognize that the cyber resilience of the aviation system depends on continued coordination amongst all relevant aviation and non-aviation stakeholders; c) recognize the need to be prepared to respond to cyber events; d) in coordination with industry and international organizations, work with ICAO to increase awareness of cyber threats and system resilience processes, and	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
coordinate cyber-related incident information sharing and training activities; e) recognize the need to share information related to cyber events with other States and international organizations through appropriately designated channels; That ICAO: f) establish a formal project involving States, international organizations and relevant stakeholders for the urgent and transparent development of a globally harmonized aviation trust framework through a group of experts. Priority should be given to governance principles; g) coordinate with both aviation and non-aviation technical experts in the development of the trust framework, and in particular with the governing bodies of the Internet; h) incorporate the trust framework into the <i>Global Air Navigation Plan</i> (Doc 9750) in an appropriate manner to highlight its urgent need, its importance and to improve its visibility; i) develop, as a matter of priority, and promote high-level policies and management frameworks for cyber resilience to help mitigate cyber threats and risks to civil aviation based on international industry standards and preferably aligned or integrated with existing management systems; j) recognize the need for the aviation community to be prepared for and be able to respond to cyber events;	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
k) encourage States and international organizations to facilitate information sharing through appropriately designated channels at the global and regional levels; l) promote multidisciplinary State and relevant aviation and non-aviation stakeholders collaboration on cyber information sharing; m) promote tabletop exercises and maintain a repository of lessons learned and scenarios available to Member States; and n) promote a unified framework for an integrated risk management approach (safety, security, environment, financial, etc.) to cyber resilience, taking into account all hazards and threats to the air navigation system. Recommendation 5.5/1 — Supersonic transport (SST) That States: a) monitor the developments related to the re-emergence of the supersonic transport (SST) sector and, when necessary, engage their regulatory mechanisms to ensure that the necessary policies are in place before supersonic operations become routine; That ICAO: b) note the developments related to the re-emergence of the SST sector, including the work related to Appendix G of Assembly Resolution A39-1, <i>Consolidated statement of continuing ICAO policies and practices related to</i>	.

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
<i>environmental protection — General provisions, noise and local air quality; and</i> c) monitor the developments and, when necessary, engage regulatory mechanisms to ensure that the necessary policies are in place before supersonic operations become routine. Recommendation 5.5/2 — Commercial space transport (CST) In recognizing the issues related to commercial space transport (CST) operations potentially affecting international civil aviation, including the safe accommodation of CST operations in airspace and the joint use of aerodromes and other aviation infrastructure: That States a) and stakeholders support ICAO activities in the CST field through the sharing of relevant expertise; b) share guidance material, best practices and national provisions related to commercial space operations through controlled airspace, including risk models and the application of relevant safety management principles; That ICAO: c) coordinate its work related to CST operations with the United Nations Office for Outer Space Affairs; and	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
d) establish a means to facilitate the sharing of information as applicable to the interaction between aviation and commercial space transport. Recommendation 5.5/3 — Standard-making processes ICAO should review and enhance its Standard-making processes in order to meet the requirements of the rapid pace of technological developments.	
Agenda Item 6: Organizational safety issues - 6.1 Strategic plan — 6.1.1: Vision and overview of the Global Aviation Safety Plan (GASP), 2020-2022 edition; 6.1.2: Enabling safety performance monitoring; goals, targets and indicators in the 2020-2022 edition of the GASP; and 6.1.3: Global Aviation Safety Oversight System (GASOS)	
Recommendation 6.1/1 — Draft 2020-2022 Edition of the Global Aviation Safety Plan (Doc 10004, GASP) That States: a) agree in principle with the draft 2020-2022 edition of the <i>Global Aviation Safety Plan</i> (GASP, Doc 10004), with the inclusion of GASP goals and targets; and That ICAO: b) take into consideration input from the Conference, the questionnaire and the future work of the GASP Study Group for subsequent endorsement of the 2020-2022	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
edition of the GASP at the 40th Session of the ICAO Assembly. Recommendation 6.1.3/1 — The global aviation safety oversight system (GASOS) That States: a) support the development of a global aviation safety oversight system (GASOS); That ICAO: b) continue developing an ICAO GASOS comprised of voluntary and standardized competency assessments of safety oversight organizations for recognition of safety oversight functions provided to States, including its legal framework and assessment mechanisms while ensuring those States maintain their obligations and responsibilities under the <i>Convention on International Civil Aviation</i> (Doc 7300);	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
c) develop appropriate guidance for States to support the delegation of safety oversight functions and monitoring of safety oversight organizations accepting delegations; d) design adequate interfaces between GASOS and other ICAO programmes and to avoid duplication of activities between GASOS and the Universal Safety Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA); e) present GASOS for endorsement at the 40th Session of the ICAO Assembly if the liability, governance and cost-benefit analysis issues and other concerns raised by the Committee have been addressed; and f) encourage safety oversight organizations, including regional safety oversight organizations (RSOs), State civil aviation authorities (CAAs) and other regional State-based mechanisms, to participate in GASOS in order to expand and enhance the safety oversight support provided to States.	
Agenda Item 6: Organizational safety issues - 6.2 Implementation of safety management — 6.2.1: State safety programmes (SSPs); 6.2.2: Safety management systems; and 6.2.3: Developing safety intelligence Recommendation 6.2/1 — Supporting Effective Safety Management Implementation That States and international organizations:	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
a) identify focal points for the submission of practical examples and tools to be reviewed, validated and posted on the ICAO safety management implementation (SMI) website as a means of sharing successful experiences with the aviation community; b) support the ICAO SMI website by providing practical examples of their respective safety management practices, methodologies and tools for the purpose of sharing with other Member States; That ICAO: c) commit to the ongoing development, promotion and maintenance of the safety management implementation (SMI) website in order to ensure active use of the tool and relevance of content to the aviation community; d) devise strategies to support the submission and validation of practical examples for the SMI website in the six ICAO working languages (English, Arabic, Chinese, French, Spanish, and Russian) and ensure the translation of the content posted on the website into the six ICAO working languages; e) develop initiatives tailored to each region with inputs from the regional aviation safety groups (RASGs) in support of the goals and targets of the Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP) with a focus on the effective implementation of State safety programmes (SSPs) and safety management systems (SMSs) at the State and service provider levels, respectively, including the development of the required safety management competencies and/or the delegation	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
to States, regional safety oversight organizations (RSOOs) and regional accident and incident investigation organizations (RAIOs); f) further support the development of appropriate harmonized safety performance indicators (SPIs) at the regional, State and service provider levels and explore the development of means to monitor the effectiveness of SSP and SMS on a more real-time basis; g) in collaboration with States, RSOOs and industry explore more powerful methods of identifying hazards and managing risk, suitable for complex socio-technical systems such as aviation and adaptable, regardless of the type of risk; h) in collaboration with States, RSOOs and industry explore the benefits of a unified framework for integrated risk management (safety, security, environment, etc...) taking into account the evolution of ISO management standards; and i) update, for adoption by the 40th Session of the ICAO Assembly, Assembly Resolutions related to safety management to reflect Amendment 1 to Annex 19 — <i>Safety Management</i>, as well as Amendment 15 to Annex 13 — <i>Aircraft Accident and Incident Investigation</i>, with consideration given to an overarching safety management Assembly Resolution to complement Assembly Resolution A39-12, Appendices A and B, related to the Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP) in order to focus the attention of States on key aspects of achieving effective SSP implementation.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 6.2.1/1 — State safety programmes (SSPs) That States: a) identify and address the need to build capacity at the State level for the management of change; and b) share their experiences in civil-military cooperation for State safety programmes (SSPs) implementation in conferences, meetings and/or on the safety management implementation (SMI) website; That ICAO: c) review the acceptable level of safety performance (ALoSP) concept taking into consideration the experience of States; d) review the need for additional guidance on the management of change at the State level; and e) ensure that appropriate emphasis is placed on safety management in the update of Appendix I, Coordination and cooperation of civil and military air traffic, of Assembly Resolution A38/12, <i>Consolidated Statement of continuing ICAO policies and associated practices related specifically to air navigation</i>. Recommendation 6.2.3/1 — Developing safety intelligence That States and international organizations: a) collaborate for the development of trust sharing networks and adhere to the protective provisions as	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
provided in Amendment 1 to Annex 19 — Safety Management; and That ICAO: b) support States with right-to-know laws in addressing the provisions for the protection of safety data, safety information and related sources in Amendment 1 to Annex 19.	
Agenda Item 6: Organizational safety issues - 6.3: Monitoring and Oversight — 6.3.1: The evolution of the Universal Safety Oversight Audit Programme (USOAP) continuous monitoring approach (CMA); and 6.3.2: Support and the USOAP CMA Online Framework (OLF) Recommendation 6.3/1 — Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) That States: a) continue to engage fully in the Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA); b) complete their self-assessments of the USOAP Protocol Questions (PQs) in a detailed and reliable manner and keep them up-to-date as needed; c) enhance cooperation and sharing of experiences in the implementation of USOAP CMA, in particular at regional level; That ICAO:	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
d) continue to evolve the USOAP CMA methodology, processes and tools; e) as a matter of priority, implement the recommendations and observations of the Group of Experts for USOAP CMA Structured Review (GEUSR) and, in particular, make available to States the set of indicators forming part of the State safety risk profile; f) ensure that pertinent information is not lost when reducing the total number of USOAP CMA PQs, especially with respect to PQs not directly related to safety oversight, which should be included in the appropriate ICAO audit mechanism; g) implement as a matter of priority the GEUSR recommendations regarding the structured revision of the PQs (Group A recommendations) and the identification of 'Priority PQs' (Group B recommendations); h) ensure the continuous monitoring of the States remains robust, relevant and up-to-date; and i) establish a study group before the 40th Session of the ICAO Assembly for the further evolution of the USOAP CMA, beyond the GEUSR recommendations, to address means to avoid duplication of efforts and find synergies to enhance the efficiency of the USOAP CMA while maintaining safeguards to guarantee the independence, universality, standardization and global acceptance in the implementation of the programme.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Agenda Item 7: Operational safety risks — 7.1: Facilitation of data-driven decision-making in support of safety intelligence to support safety risk management; 7.2: Operational safety risks at the global, regional and national levels, and the role of RSOOs and RASGs in achieving the GASP goals; and 7.3: Other implementation issues	
Recommendation 7.1/1 — Data-driven decision-making That States: a) implement data-driven decision-making processes, taking into account the ICAO safety and air navigation indicators, within their safety and air navigation activities and to build data analysis capacity; b) consider using ICAO’s air navigation analysis solutions, especially during the initial development of their State safety programmes (SSPs), and joining the ICAO Safety Information Monitoring System (SIMS) project to better utilize their stored data; c) exchange safety and air navigation information with other Member States through data analysis tools such as SIMS in support of safety risk management; d) continue joint development of safety risk assessment models that support and enable baseline risk quantification, safety risk assessment and forecasting to support risk-based decision making, accident and incident modeling, barrier analysis, sensitivity, and “what if?” analyses to ensure that primary safety considerations are addressed within the integrated safety risk assessment models; e) together with industry stakeholders, support regional mechanisms and platforms for greater data sharing and alignment of safety priorities;	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That ICAO: f) further develop and promote iSTARS and SIMS and other analysis solutions, and conduct regular iSTARS User Group Meetings so as to continually adapt to the changing safety environment; g) encourage activities that facilitate global reporting of safety events and vulnerabilities to assure that the necessary safety data is available; h) review and develop guidance to further facilitate the sharing of safety data between operators and those responsible for the type design and manufacture of aircraft; i) raise awareness in States on the importance of initiating SSP and SMS implementation with simple processes that optimize resources to demonstrate benefits and develop momentum required to achieve the needed change in the organizational culture; j) take action to foster the creation of uniform processes in States that promote the sharing of safety data; k) encourage States to use the ICAO Safety Management Implementation website as an information sharing platform to facilitate the exchange of experience in regional data sharing among regional groups; and l) support regional mechanisms and platforms that enable States and industry stakeholders to share and align safety priorities in support of the RASGs.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 7.1/2 — Standardized risk-based decision making policies and best practices for validation of foreign products That States: a) support ICAO’s work, through the appropriate group of experts to determine the need for developing new materials to support further reduction in duplicated certification activity, by conducting a feasibility study for developing common standards and recommended best practices for recognizing the capabilities of SoD certification systems (including design approvals/design organization recognition); b) support the development of ICAO Standards and Recommended Practices (SARPs), guidance material and manuals that Member States use to issue certificates for products, and complement them with guidance for best practices in conducting validation activities; That ICAO: c) continue to encourage the reduction of duplicate certification action conducted by Member States that offers no commensurate increase in safety; and d) review and develop materials for inclusion in the <i>Airworthiness Manual</i> (Doc 9760), <i>Safety Management Manual (SMM)</i> (Doc 9859), Annex 8 — <i>Airworthiness of Aircraft</i> , and/or Annex 19 – <i>Safety Management</i>, for States of Registry (SoR) to determine the appropriate level of involvement in validation/recognition principles for States of Design (SoD) approvals.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 7.2/1 – Strengthening RSOOs That States: a) further support the strengthening of regional safety oversight organizations (RSOOs) by engaging actively in the development of their RSOO, by securing adequate and sustainable RSOO funding mechanisms, and, as appropriate, by further delegating safety oversight functions to the RSOO; That ICAO: b) recognize that RSOOs have an important role to play in carrying out safety oversight functions on behalf of their Member States and, within the Global Aviation Safety Plan (GASP) framework, in addressing safety issues at the regional level; c) further support the strengthening of RSOOs and their recognition within the ICAO safety system by facilitating access to technical support, facilitating the sharing of experience and knowledge between RSOOs through the RSOO Cooperative Platform, establishing the proposed Global Aviation Safety Oversight System (GASOS) and by reinforcing direct cooperation between ICAO and RSOOs in the framework of the GASP; and That RSOOs: d) continue to engage in the RSOO Cooperative Platform and engage actively in the establishment of the proposed GASOS by supporting its implementation and, where	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
applicable, by taking steps towards recognition and in strengthening their safety oversight capabilities. Recommendation 7.2/2 — ICAO Runway Safety Programme — Global Runway Safety Action Plan That States: a) recognise that runway safety-related accident categories, particularly runway excursions and incursions, continue to be a global safety priority for aviation stakeholders as determined by a risk-based analysis; b) urge runway safety stakeholders, including aircraft operators, air navigation service providers, aerodrome operators, aerospace industry, and regional aviation safety groups, to implement the actions in the GRSAP to reduce the global rate of runway excursions and runway incursions; c) continue to establish requirements and activities aimed at improving runway safety through State runway safety programmes; d) encourage aerodrome operators to establish effective runway safety teams and encourage all runway safety stakeholders to actively participate in established runway safety teams; and That ICAO: e) continue to lead and coordinate the runway safety programme with its partner organizations to work together to mitigate runway safety-related risks.	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
Recommendation 7.3/1 – ICAO implementation strategies That ICAO: a) strengthen the linkage between the Global Air Navigation Plan (GANP), the Global Aviation Safety Plan (GASP) and the Global Aviation Security Plan (GASeP) to achieve an integrated implementation approach; b) take into account implementation support needs when developing provisions; c) support better alignment and harmonization between PIRGs and RASGs while maintaining the safety framework of the RASGs through consultation with Member States; d) further improve the planning and implementation regional group (PIRG) and regional aviation safety group (RASG) mechanisms to enhance the coordination and alignment of implementation between regions; e) consider the development of a global collaboration mechanism to facilitate interregional alignment, harmonization, and sharing of best practices and lessons learned; f) support the development of a flexible, progressive and risk-based strategy to improve global implementation of Standards and Recommended Practices (SARPs);	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
g) request an appropriate group of experts to further review and explore a process that would facilitate short-term (successive) aircraft interchange operations; and h) further develop risk management capabilities and facilitate implementation of multilateral arrangements for the sharing of risk information and (regional) contingency planning related with civil aircraft operations over or near conflict zones. Recommendation 7.3/2 — Aviation Safety Implementation Assistance Partnership (ASIAP) That ICAO: a) continue to develop the prioritization of States and areas of technical assistance criteria in order to achieve appropriate and transparent prioritization; That ASIAP Partners: b) strive for greater commitment to, and participation in, the Aviation Safety Implementation Assistance Partnership (ASIAP) Programme, and invite other States and international organisations that can provide technical assistance to States to join ASIAP; c) and other stakeholders providing technical assistance (including States, regional safety oversight organisations (RSOOs), international organisations, industry and financial institutions) coordinate their technical assistance activities and make use of the online Project Database (https://www.icao.int/safety/ASIAP/Pages/Tools.aspx) in order to reduce duplication of activities and effort;	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
d) apply the Project Outcome Indicators (POIs) to their projects and review the measurable results in coordination with each other; and e) including ICAO, States, international organizations, industry and financial institutions provide funding to support technical assistance activities. Recommendation 7.3/3 — State national planning framework That States: a) reaffirm support for the fundamental roles and responsibilities of Contracting States, Council and the Air Navigation Commission, as provided in the <i>Convention on International Civil Aviation</i> (Doc 7300), for the development of quality and timely Standards and Recommended Practices (SARPs); b) enhance their involvement in all stages of the provision development process and encourage RSOOs and other aviation stakeholders to do the same; c) support the ICAO Next Generation of Aviation Professionals (NGAP) Programme in light of the international need to address the existing aviation personnel shortages and to ensure a competent workforce capable of meeting the needs and challenges of the global aviation community into the future; and	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
d) share best practices on applied strategies to promote more productive recruitment, training and education, development and retention programmes. Recommendation 7.3/4 — Regional office resources for implementation activities That ICAO: a) give due consideration in the allocation of resources to regional offices for the support of implementation activities; b) recognise, and take appropriate measures to address, the particular challenges and growing workload of the APAC Region; and c) support the Asia Pacific (APAC) Region in the implementation of Beijing Declaration and progress towards ICAO global targets. Recommendation 7.3/5 — Support for the continuation of the Comprehensive Regional Implementation Plan for Aviation Safety in Africa (AFI Plan) That States: a) support the continuation of AFI Plan activities and the project-based approach; b) request ICAO, international organizations and industry partners to support the AFI Plan and its associated projects;	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
c) consider adopting an approach similar to the AFI Plan to address safety deficiencies and challenges in their region; and That ICAO: d) extend the AFI Plan in order to enable it to accomplish its objectives.	
Agenda Item 8: Emerging safety issues — 8.1: Measures to proactively address emerging issues; and 8.2:	
Recommendation 8.1/1 — Measures to proactively address emerging issues That ICAO: a) raise awareness and inform States of existing guidance on identifying and addressing emerging safety issues, including mitigation actions and balancing the integrated management of distinct risks (existing/emerging); b) urge the regional aviation safety groups (RASGs) or other regional organizations, including regional safety oversight organizations (RSOs), to institute a process for addressing emerging safety issues based on a data-driven analysis; c) urge States, regional entities and industry to participate actively in regional and sub-regional studies on emerging safety issues conducted by the RASGs; d) urge States, regional entities and industry to share information on emerging safety issues with other States and ICAO through the dedicated website;	Emerging safety issues

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
e) systematically collect information from States and regional organizations, for the purpose of assessing and monitoring their global safety impact, on the following: new concepts of operations and new technologies; new risk management concepts and methods coping with the dynamics and complexity of the aviation system; as well as the initial implementation of such new concepts, methods and technologies; f) establish a holistic, performance-based process for the development of ICAO provisions in response to these emerging issues and risks to assess if the established provisions achieve the objectives for which they were designed; g) provide guidance for the implementation of risk and performance-based assessment and oversight at both State and regional levels; h) provide a global, inclusive civil-military cooperation mechanism to move from a reactive situation to a proactive one by applying predictive, holistic risk management to emerging issues; and i) based on data from regional aviation safety groups and risk analysis, consider developing a study on the subject of objects falling from aeroplanes and guidance material on preventive measures. Recommendation 8.2/1: Remotely piloted aircraft systems (RPAS) operations	

RECOMMENDATIONS ADOPTED BY AN-CONF/13	FOLLOW-UP ACTIONS
That ICAO continue developing Standards and Recommended Practices (SARPs), Procedures for Air Navigation Services (PANS) and guidance material to support safe remotely piloted aircraft systems (RPAS) operations, and continue facilitating implementation of RPAS-related provisions through regional training activities. Recommendation 8.2/2: Medical Standard for pilots of light aircraft That ICAO: a) review national medical certification protocols currently used by a number of States in order to identify commonalities; and b) based on this review of commonalities among the various States' national medical certification protocols, develop a Standard specifically addressing pilots flying light aircraft.	



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 4: Air Navigation Safety Matters

**RASG-MID ACTIVITIES AND
COORDINATION BETWEEN MIDANPIRG AND RASG-MID**

(Presented by the Secretariat)

SUMMARY This paper provides an update on the activities of the Regional Aviation Safety Group – Middle East (RASG-MID). It highlights the activities coordinated between RASG-MID and MIDANPIRG for an improved efficiency of both Groups and to avoid duplication of efforts. Action by the meeting is at paragraph 3.
REFERENCES - ASRT/3 - RSC/6 Report

1. INTRODUCTION

1.1 The Sixth Meeting of the Regional Aviation Safety Group – Middle East Steering Committee (RSC-MID/6) was held in Cairo, Egypt, 25-27 June 2018.

2. DISCUSSION

RASG-MID Activities

2.1 The Seventh Edition of the MID Annual Safety Report (MID-ASR) was reviewed and approved by the ASRT/3 meeting. In addition, the Sixth MID-ASR was endorsed by the RSC-MID/6. The following are the main highlights related to the reactive and proactive safety information of the MID-ASR:

- MID Region had an accident rate of **1.45** accidents per million departures in 2017, which is below the global rate (**2.4**).
- The 5-year average accident rate (2013-2017) is **2.67**, which is equal to the global average rate for the same period

- The 5- year average rate of fatal accidents in the MID Region for the period (2013-2017) is **0.64** accident per million departures, compared to 0.44 for the globe.
- The MID Region had no fatal accidents in 2013 and 2017. However, three fatal accidents occurred in 2014, 2015 and 2016. The 2014 accident caused 38 fatalities, 224 fatalities were registered in 2015 and 1 fatality in 2016
- No Controlled Flight Into Terrain (CFIT) related accident occurred in the MID Region for the period 2013-2017.
- the main Focus Areas identified for the period 2012-2016 and endorsed by the RSC-MID/6 in the MID Region are as follows:
 - 1- Runway Safety (RS); Runway Excursion (RE) and Abnormal Runway Contact (ARC) during landing;
 - 2- System Component Failure- Power Plant (SCF-PP); and
 - 3- Loss of Control In Flight (LOC-I)
- The main Focus Areas identified for the period 2013-2017 in the MID Region are:
 - 1- Runway Safety (RS); (mainly RE and ARC during landing);
 - 2- Loss of Control Inflight- (LOC-I);
 - 3- Controlled Flight Into Terrain- (CFIT); and
 - 4- Mid Air Collision- (MAC)
- The following Emerging Risks which were identified and included in the 6th and 7th ASRs :
 1. Security risks with impact on safety-SEC;
 2. Fire/Smoke-non impact- (F-NI);
 3. Runway Incursion- (RI);
 4. Birdstrike- (BIRD);
 5. Wake Turbulence;
 6. System Component Failures- (SCF-NP); and
 7. Wildlife (Wild).

2.2 With respect to the Emerging Risks, the RSC-MID/6 meeting agreed that Runway Incursion and Birdstrike should be addressed by the RGS Working Group. It was also agreed that the Mid-Air Collision (MAC) and Turbulence Encounter (TURB) should be addressed by the Regional Aviation Safety Team (MID-RAST)

2.3 It is to be noted that during the RSC/6 meeting, the UAE raised a concern about the repeated occurrences of TCAS TA/RA including STCA warnings, due to military aircraft interfering with civil aircraft that have happened since January 2018 in the Region. UAE stated that *“these occurrences demonstrated a negative trend and require that a careful analysis of these occurrences is conducted in the next MID Annual Safety Report with the identification of mitigation measures to ensure that the exposure to MAC in the Region is not worsen”*. It is to be highlighted that the UAE statement was supported also by Bahrain and Saudi Arabia.

2.4 It is to be recalled that the ASRT/2 meeting agreed:

- to consolidate the list of Emerging Risks using the ADREP Taxonomy based on the previously identified emerging risks, the new emerging risks identified in the Sixth MID-ASR and the top 5 areas of concern endorsed by the RASG-MID/6 meeting;
- that the State of Occurrence Data will be used at this stage;
- that States provide the ICAO MID Office by end of March 2018 with the number of accidents, serious incidents and incidents related to each category for the past 3 years (2015 – 2017), using the template in **Appendix A**;
- the ICAO MID Office, in coordination with the MID-ASRT Rapporteur review the data provided and classify the different risk categories in terms of frequency; and
- the top (X) Emerging Risks will be then communicated to States in order to share with the MID-ASRT their data analysis and safety recommendations.

2.5 The ASRT/3 meeting reviewed the consolidated inputs received by the ICAO MID Office from six (6) States as reflected in the **Table 1**.

#	Occurrence Category	2015			2016			2017		
		# Accident	# Serious incidents	# Incidents	# Accident	# Serious incidents	# Incidents	# Accident	# Serious incidents	# Incidents
1	CFIT			5			1			5
2	Mid Air Collision (MAC)		35	66		20	66		16	102
3	Fire/Smoke (F-NI)		8	26		2	42		8	30
4	Runway Incursion- (RI)		5	15		2	19		9	17
5	SCF-NP		14	122		9	267		9	257
6	Turbulence Encounter (TURB)	2		326			351		1	325
7	BIRD			119			198			297
8	Wildlife (Wild)			3			7			3

Table 1

Near Mid Air Collision

2.6 The ASRT/3 meeting noticed a significant increase of the NMAC occurrences and agreed that the Mid Air Collision (MAC) risk should be considered as a Focus Area. However, additional safety data is needed for further analysis in order to identify the underlying safety issues.

2.7 It is to be highlighted that the ATM-SG/4 meeting noted with concern the significant increase in the NMAC occurrences and agreed on the establishment of an Action Group composed of the ATM SG Chairpersons and Secretariat and experts from Saudi Arabia, UAE and IATA to carry out further analysis of the reported occurrences, based on the safety analyses and recommendations

emanating from the SMSs of concerned States, and provide feedback to the ASRT. Accordingly, the meeting agreed to the following Draft Decision:

DRAFT DECISION 4/7: NEAR MID AIR COLLISION (NMAC) ACTION GROUP

That, the NMAC Action Group be established to carry out further analyses of the reported MAC incidents and provide feedback to the ASRT.

Wake Turbulence

2.8 The ASRT/3 meeting noticed a significant increase of turbulence encounter occurrences mentioned on the table1 and decided to break it down to wake vortex category in order to conduct a meaning full analysis and urged the States to share the occurrences related to wake Turbulence.

2.9 The ASRT/3 meeting also noted the data shared by IATA on Wake Turbulence, as presented in **Appendix B**. It is to be highlighted that in 2017, 624 reports were retained for analysis, which equals to 0.01 report per 1,000 flights or 1 encounter in every 100,000 flights. The data analysis also showed that:

- a. Muscat, Bahrain, Jeddah and Tehran FIRs are the top FIRs in terms of number of reports.
- b. the CAT D (139 reports) and CAT B (156 reports) were the most frequent aircraft categories report.
- c. A380, B777 and B747 are the top three generator of wake turbulence in the data set analysed.
- d. The highest number of reports occurred when both aircraft were in level flight (186 reports).
- e. The highest number of injuries occurred in moderate wake turbulence events.

2.10 The ATM-SG/4 agreed that in respect to Turbulence Encounter (TURB), it would be beneficial if the analysis would be breakdown (at the level of the ATM SG) to the monitoring of the component related to Wake Turbulence.

2.11 It is to be noted that an RSA regarding the wake turbulence is being prepared by UAE and will be published once approved by the RASG-MID.

Strategy for the Enhancement of Cooperation in the Provision of AIG Services in the MENA Region

2.12 Regarding the Strategy for the Enhancement of Cooperation in the Provision of AIG Services in the MENA Region. The RSC/6 meeting recalled that the Strategy for the enhancement of cooperation among the MENA States in the provision of AIG functions at **Appendix C** was endorsed by the DGCA-MID/4 meeting (Muscat, Oman, 17-19 October 2017).

2.13 The RSC-MID/6 meeting recognized the need to establish an AIG Core Team led by the Rapporteur of the SST to develop the Roadmap and to monitor the implementation of the Strategy.

2.14 The RSC-MID/6 meeting reviewed and updated the Roadmap for AIG Regional Cooperation as at **Appendix D**, and endorsed the following Draft Conclusion.

DRAFT CONCLUSION 6/1: ROADMAP FOR AIG REGIONAL COOPERATION

That, the Roadmap for AIG Regional Cooperation at Appendix 3U is endorsed

2.15 The RSC-MID/6 meeting noted that the questionnaire on AIG level 1 of cooperation at **Appendix E** was sent to the MENA States through State Letter Ref.: ME 4/1.3-18/074 dated 4 March 2018. The meeting urged the remaining States to send their replies to the ICAO MID Office, as soon as possible.

2.16 It is also to be noted that:

- Replies to the AIG questionnaire were received from eight (8) States, namely Bahrain, Egypt, Iran, Morocco, Saudi Arabia, Sudan, UAE, and Yemen.
- Seven (7) States out of the eight (8) replies have bilateral agreements of cooperation with other States. Only one State (Yemen) does not have a bilateral agreement of cooperation with other States. Two States (Egypt and UAE) mentioned that they have bilateral agreements of cooperation with other States but without indicating the number of agreements
- Six (6) States (Bahrain, Iran, Morocco, Saudi Arabia, Sudan, and UAE) stated clearly that they are willing to move to the level 2 of cooperation in accordance with the Strategy for the enhancement of cooperation among the Middle East and North Africa (MENA) States in the provision of AIG Functions.

3. ACTION BY THE MEETING

3.1 The meeting is invited to urge States to:

- a) provide the ICAO MID Office with the required safety data and analysis pertaining to ANS-related accident, serious incidents and incidents;
- b) review the information in **Table 1** and take action as appropriate;
- c) contribute to the work programme of the ASRT and MID-SST; and
- d) reply to the questionnaire on AIG level 1 of cooperation at **Appendix E** as soon as possible, if not yet done so.

APPENDIX A

TEMPLATE FOR THE COLLECTION OF
ACCIDENT, SERIOUS INCIDENT AND INCIDENT DATA

Name of State:

Traffic: Nb. of Departures per year [2015:] [2016:] [2017:]

#	Occurrence Category	2015			2016			2017		
		# Accidents	# Serious incidents	# Incidents	# Accidents	# Serious incidents	# Incidents	# Accidents	# Serious incidents	# Incidents
1	CFIT									
2	Mid Air collision (MAC)									
3	Fire/Smoke (F-NI)									
4	Runway Incursion- (RI)									
5	SCF-NP									
6	Turbulence Encounter (TURB)									
7	BIRD									
8	Wildlife (Wild)									

States should provide the number of accident, serious incidents, and incidents related to each category mentioned in the template above for the past three years (2015-2017)

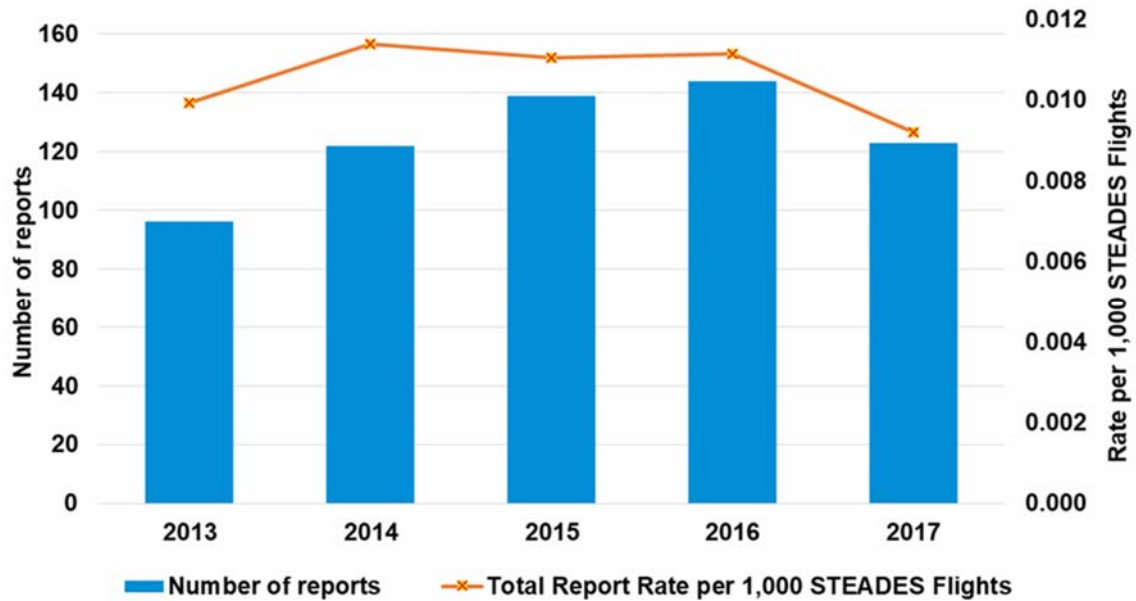
Scope: State of Occurrence

APPENDIX B

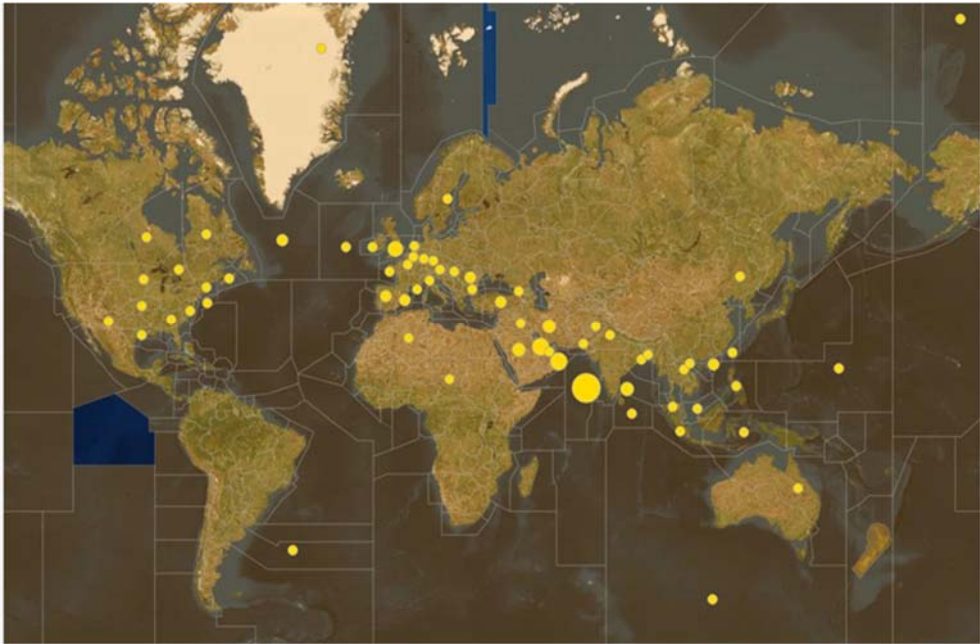
IATA Incidents Reported by Airlines - STEADES Data

Wake Turbulence

The data query resulted in a total of 1,159 reports in 2017. After quality controls were performed, 624 reports were retained for analysis, which equals to 0.01 reports per 1,000 flights or 1 encounter in every 100,000 flights. The figure below shows the number of reports and the rate per 1000 STEADES flights for the period 2013-2017.



Muscat, Bahrain, Jeddah and Tehran FIRs are the top FIRs in terms of number of reports.



Muscat	12
Bahrain	11
Jeddah	7
Tehran	7

Upper Heavy (CAT B) and Upper Medium (CAT D) aircraft reported the highest number of events

Number of reports per Aircraft Wake Turbulence Category

Encountering							
Generator		A	B	C	D	E	F
A	15	99	7	62	5	-	
B	-	37	8	73	14	-	
C	-	1	1	5	1	-	
D	-	2	-	16	4	1	
Total # of reports		15	139	16	156	24	1

A pairing based on the Wake Turbulence RECAT, shows that CAT D and CAT B were the most frequent aircraft categories to report encountering wake turbulence, mainly generated by CAT A and CAT B aircrafts, mostly of Moderate & Severe intensity

Wake Turbulence generator: top aircraft type by category



The highest number of reports occurred when both aircraft were in level flight 186 reports.

The highest number of injuries occurred in moderate wake turbulence events

Key findings

- Mumbai, Muscat and Bahrain are the top 3 FIRs in terms of number of reports
- Upper Heavy (CAT B) and Upper Medium (CAT D) aircraft reported the highest number of events of wake turbulence encountered
- Wake Turbulence Encountered by CAT B, C and D generated from CAT A and B is mainly Moderate and Severe in intensity
- A380, B777 and B747 are the top three generator of wake turbulence in the dataset analyzed
- B777, A320, A330 and B737 are the top aircraft that encountered wake turbulence in the dataset analyzed
- The highest number of reports occurred when both aircraft were in level flight

APPENDIX C

**STRATEGY FOR THE ENHANCEMENT OF COOPERATION AMONG THE MIDDLE EAST
AND NORTH AFRICA (MENA) STATES IN THE PROVISION
OF AIG FUNCTIONS**

1- Background

Whereas it is incumbent on the State in which an accident occurs to institute an inquiry into the circumstances of the accident in conformity with Article 26 of the Convention;

Whereas Assembly Resolution A36-10, inter-alia:

- urges Contracting States to undertake every effort to enhance accident prevention measures, particularly in the areas of personnel training, information feedback and analysis and to implement voluntary and non-punitive reporting systems, so as to meet the new challenges in managing flight safety, posed by the anticipated growth and complexity of civil aviation;
- urges Contracting States to cooperate with ICAO and other States in a position to do so, in the development and implementation of accident prevention measures designed to integrate skills and resources to achieve a consistently high level of safety throughout civil aviation;

Whereas, amendment 15 of Annex 13 (STD 3.2) stipulates that a State shall establish an accident investigation authority that is independent from State aviation authorities and other entities that could interfere with the conduct or objectivity of an investigation;

Whereas, owing to the growing sophistication and complexity of modern aircraft, the conduct of an accident or serious incident investigation requires participation by experts from many specialized technical and operational fields and access to specially equipped facilities for investigation;

Whereas many Contracting States do not have such specialized technical and operational expertise and appropriate facilities;

Whereas the costs of salvage and investigation of major aircraft accidents may place a heavy financial burden on the resources of the State where the accident occurred;

Whereas Assembly Resolution A37-15 (Appendix U), recommends that Contracting States cooperate in the investigation of major aircraft accidents or accidents in which the investigation requires highly specialized experts and facilities;

Whereas, the ICAO Universal Safety Oversight Audit Programme (USOAP) audit findings indicate that a number of States have not been able to implement an effective accident and incident investigation system for their aviation activities;

Recognizing that the USOAP findings have been associated, in general, with a lack of resources (both human and financial), lack of appropriate legislation and regulations, lack of an organization for the investigation of accidents and incidents, lack of a training system for investigators, lack of equipment to conduct investigations and lack of policies, procedures and guidelines for accident and incident investigations;

Recognizing that combined with the expected increase in air transport operations, the relatively unchanged trend in the accident rate over the past several years might lead to an increase in the number of accidents per year;

Recognizing that there are many challenges to effective accident prevention, and that more effective identification and correction of aviation hazards and system deficiencies are required in order to complement regulatory efforts in further reducing the number of worldwide accidents and to improve the accident rate;

Recognizing that a regional investigation system can provide economies of scale by allowing for the sharing of required resources, and that by working together, States of a region or sub-region can have a more persuasive voice on the world stage and can help secure a more favorable climate aimed at a safer international air transportation system;

Acknowledging that during the AIG Divisional Meeting (2008) several States highlighted that, in regions where individual States do not have investigation capability, implementing a regional accident and incident investigation organization (RAIO) would ensure the effectiveness of investigations, reinforce conformity with the provisions of Annex 13, and contribute to the enhancement of aviation safety;

Whereas, Annex 13 (STD 5.1 and 5.1.2) stipulates that the State of Occurrence shall institute an investigation into the circumstances of the accident and serious incident (maximum mass of over 2 250 kg) and be responsible for the conduct of the investigation, but it may delegate the whole or any part of conducting of such investigation to another State or a RAIO by mutual arrangement and consent. In any event, the State of Occurrence shall use every means to facilitate the investigation;

Considering that the DGCA-MID/2 meeting (Jeddah, Saudi Arabia, 20 - 22 May 2013) noted that it is widely considered that implementing a RAIO would ensure the effectiveness of investigations, reinforce conformity with the provisions of Annex 13, and contribute to the enhancement of aviation safety; and accordingly through Conclusion 2/11 endorsed the First version of the Strategy for the establishment of RAIO(s);

Considering the AIG needs and capabilities of the Middle East and North Africa (MENA) States; and the implementation of different levels of cooperation for the provision of AIG services/functions at the regional/sub-regional level; and

Considering the challenges related to the establishment of a RAIO;

A strategy is crucial for the enhancement of cooperation in the provision of AIG services/functions among the Middle East and North Africa (MENA) States.

2- Objective

Contribute to improvement of aviation safety in the MENA States by enabling States to conduct effective and independent investigations of aircraft accidents and incidents; and support States in fulfilling their investigation obligations in Annex 13.

3- Methodology

During the ACAC/ICAO AIG Workshop held in Jeddah, Saudi Arabia, 25-27 April 2017, three (3) levels of cooperation for the provision of AIG services/functions in the MENA States have been defined as follows:

Level 1:

Cooperation among MENA States under the framework of Annex 13 and/ or a standard bilateral MOU to share, on ad-hoc basis, resources, training, information, documentation and capabilities; and strengthen conformity with Annex 13.

Level 2:

Cooperation among MENA States under the framework of a regional cooperation mechanism (well-defined scope and set of coordinated, organized and harmonized procedures and mechanisms) for the conduct of accidents and serious incidents investigations.

Level 3:

Establishment of a RAIO with well-defined mandate, roles and responsibilities, organization (human resources), funding mechanism, etc.; with a centralized decision-making process on RAIO activities.

The Table in **Attachment 1** provides more details about each level.

4- Strategic Plan

- (a) States are urged to develop and further strengthen regional/sub-regional cooperation for accidents and incidents investigation.
 - (b) MENA States should take necessary measures to reach at least level 2.
 - (c) An implementation Roadmap for MENA States should be developed, under the framework of RASG-MID, to provide the details and timelines related to the implementation of the different levels.
 - (d) Key Performance Indicators (KPIs) should be developed for the monitoring of the implementation of the Roadmap to ensure that the agreed goals are achieved.
 - (e) The decision on whether to continue towards the establishment of a full MENA RAIO, or to be satisfied with level 2 cooperation, will be taken in due course, depending on the achievement of the expected KPIs/goals.
-

ATTACHMENT 1

	Level 1 (Bilateral Agreements)	Level 2 (Regional Cooperation Mechanism)	Level 3 (RAIO)
Human resources	Shared between the two States	List of MENA States' investigators available to support States in the conduct of investigations, as required. The State conducting the investigation will hold the cost	Investigators from RAIO will lead/participate in investigation conducted by a member State, The cost share is determined by RAIO
AIG training	Shared between the two States	List of planned training courses in all member States is maintained by a voluntary State. Member States may benefit from training conducted by other member States.	- The syllabus of the basic training is RAIO-centralized. - Advanced and specialized trainings are determined by RAIO
Equipment, tools, and technology	Shared between the two States	List of MENA States' special equipment is determined and maintained by a voluntary State for use by all member States, as required. The State conducting the investigation will hold the cost	RAIO-centralized tools and equipment are used by member States. Cost share is determined by RAIO
Accidents and incidents database	Access may be granted to the other State's accident/incident database	Database is shared voluntarily and managed by a voluntary State	Database is obliged to be shared and is RAIO-centralized
Data repository	Access may be granted to the other State's data repository	Common data repository is managed by a voluntary State	Data repository is RAIO-centralized
Knowledge, safety information, and procedures	Shared between the two States	- Knowledge and information is stored in data repository managed by a voluntary State - Procedure is common	- Knowledge and information is stored in RAIO-centralized data repository - Procedure is centralized

	Level 1 (Bilateral Agreements)	Level 2 (Regional Cooperation Mechanism)	Level 3 (RAIO)
Services of State's National Centers of research, laboratories, institutions, experts, etc. (External to the AIG)	A State can utilize the other State's National Centers	List of MENA States' Centers that can be utilized by any member State. The State conducting the investigation will hold the cost	RAIO-centralized list of Centers. Cost share is determined by RAIO
Investigation regulations	Individual, but a State can benchmark the other State	Harmonized and coordinated by a voluntary State	RAIO-centralized
Oversight of the State investigation authority	Individual, but a State may conduct a peer-review upon the other State request	Pooled peer-review group maintained by a voluntary State	RAIO oversight (either by a RAIO group or by outsourced organization)
Funding of conducting investigations	The State responsible for initiating the investigation holds the cost	The State responsible for initiating the investigation holds the cost	Investigations into certain category of accidents are conducted by RAIO based on published criteria. Cost share is determined by RAIO
Funding of regional investigation organization	-	-	Centralized fund by States' contributions

APPENDIX D

ROADMAP FOR AIG REGIONAL COOPERATION

Level of Cooperation	Action		Target date	Deliverable	Champion	KPI
	No.	Description				
Level 1 Cooperation among MENA States under the framework of Annex 13 and/ or a standard bilateral MoU to share, on ad-hoc basis, resources, training, information, documentation and capabilities; and strengthen conformity with Annex 13	1	Develop a questionnaire and disseminate to States through a State Letter for surveying the current status of the MENA States in bilateral cooperation, and their willingness to move to Level 2	30 Sep. 2018	Survey	AIG Core Team ICAO States	Number of States' responses
	2	Analyze the received responses including the assessment of the effective implementation of the cooperation elements as listed in the Strategy (Level 1)	31 Oct. 2018		AIG Core Team	- Number of bilateral agreements per State - Level of effective implementation of Level 1 elements - Number of States willing to move to Level 2
Level 2 Cooperation among MENA States under the framework of a regional cooperation mechanism (well-defined scope and set of coordinated, organized and harmonized procedures and mechanisms) for the conduct of accidents and serious incidents investigation	3	Develop a Draft Questionnaire to survey States AIG capabilities	31 Dec. 2018	Draft Questionnaire	AIG Core Team	
	4	Develop a Draft AIG RCM MoU	31 Dec. 2018	Draft AIG RCM MoU	AIG Core Team	
	5	Endorsement of the Questionnaire by the RASG-MID/7 Meeting	Apr. 2019	RASG-MID/7 Report	ICAO/RASG-MID	Questionnaire endorsed
	6	Endorse the Draft AIG RCM MoU by the DGCA-MID/5 Meeting and ACAO EC	Nov. 2019	DGCA-MID/5 Report and ACAO EC Report	ICAO/DGCA-MID/5 ACAO EC	AIG RCM MoU endorsed
Remaining level 2 actions will be detailed in due course						

APPENDIX E

**Questionnaire on Accidents and Incidents Investigation (AIG) Level 1 Cooperation-
MENA States**

State Name:

Name of AIG Organization:

No.	Question	State Reply
1	Has the State established an accidents and incidents investigation (AIG) Organisation?	
2	Is the AIG Organisation structured on a form of authority independent from the State's aviation authorities?	
3	Has your AIG Authority/Organization established bilateral agreements (e.g. Memoranda of Understanding (MoUs)) with other States or with AIG Regional Organization (RAIO) for the delegation of whole or any part of conducting accidents and serious incidents investigation? If YES, please provide the total number of signed agreements and list them, then answer the following questions.	
The following questions are to be answered by States who had established agreements with other States or with RAIO. Does the agreement contain a clause for the parties, to:		
3	Support each other with expertise in the event of an accident or serious incident investigation?	
5	Cooperate with each other for the provision of initial, recurrent, and/or OJT training to their investigators?	
6	Support each other with investigation equipment/tools?	

No.	Question	State Reply
7	Share investigation procedures/policies manuals, guidance material, safety information, etc.?	
8	Share accidents and incidents data?	
This question is to be answered by all States (whether they had established agreements or not)		
9	Is your State willing to move to the level 2 of cooperation in accordance with the Strategy for the enhancement of cooperation among the Middle East and North Africa (MENA) States in the provision of AIG Functions?	

- END-



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

**Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 – 5 December 2018)**

Agenda Item 5.1: State of Air Transport in the MID Region

MID REGION AVIATION STATISTICS AND FORECASTS

(Presented by the Secretariat)

SUMMARY This paper presents the MID Region Aviation Statistics and Forecasts to support regional air navigation planning and implementation processes. Action by the meeting is at paragraph 6.
REFERENCES – ICAO State of Air Transport 2017

1. INTRODUCTION

1.1 The development of forecasts for major traffic flows from, to and within the MID Region is necessary to support regional air navigation planning and implementation processes.

2. GLOBAL STATE OF AIR TRANSPORT IN 2017 (SCHEDULED SERVICES)

2.1 The Total number of passengers carried on scheduled services rose to 4.1 billions in 2017 with an increase of 7.2% compared to 2016 and the total number of departures reached 36.7 million in 2017, with an increase of 3.1% compared to 2016.

2.2 Passenger traffic, expressed in terms of total scheduled Revenue Passenger-Kilometers performed (RPKs), posted an increase of 7.9 per cent, with approximately 7 699 billion RPKs performed in 2017.

2.3 In 2017, the operating profit of scheduled airlines of Member States was estimated at about 7.9 per cent of operating revenues. The operating profit was expected to be around USD 60 billion in 2017 based on operating revenues of USD 758 billion.

2.4 After an estimated 3.1 per cent growth in real Gross Domestic Product (GDP) in 2017, the World Bank has forecasted growth to remain unchanged at 3.1 per cent GDP growth for 2018. Accordingly, ICAO has forecasted that total passenger traffic will grow by about 7.5 per cent in 2018. The operating profit for the industry is expected to increase to around USD 56 billion in 2018 due to the

combined effects of improving economic growth, continuing traffic growth, and better capacity utilisation that is expected to offset the increase in jet fuel prices in 2018.

2.5 According to the latest ICAO long-term air traffic forecasts, the 4.1 billion airline passengers carried in 2017 are expected to grow to about 10.0 billion by 2040, and the number of departures is projected to rise to some 90 million in 2040.

3. MID REGION STATE OF AIR TRANSPORT IN 2017 (SCHEDULED SERVICES)

3.1 The Middle East has been the fastest growing region for passenger and cargo traffic since 2011, and airlines in the MID region have posted double-digit passenger traffic growth every year since 2012 except for 2017. Traffic is mainly international and the region now ranks third in international passenger traffic, overtaking North America in 2012. The Load factors remain lower than the world average and airlines also have lower costs than the average.

Passenger traffic performed - Revenue Passenger-Kilometers (RPK)

3.2 The Middle East Region, representing 9 per cent of the world traffic, accounted for 14 per cent of international RPKs and recorded a growth rate of 6.5 per cent in 2017, significantly lower than the double-digit growth recorded in previous years.

3.3 The 2017 growth was supported by the expansion of air carriers such as Saudi Arabian Airlines (+15.4%) and Oman Air (+19.0%). Those air carriers expanded their networks and benefited from their excellent geographical position to link different cities with only one stop in their respective hubs. Moreover, passenger traffic growth among the top 15 was more balanced in the region with one State, namely Yemen, experiencing a decrease of -45.4%. Airlines of the United Arab Emirates, Qatar and Saudi Arabia account for 74.8% of the total passenger traffic of airlines in Middle East

3.4 International traffic of air carriers in the Middle East represented 95.9% of the airlines' total RPK in 2017. Saudi Arabia and the Islamic Republic of Iran were the largest domestic markets in the Middle East with 55.2% and 40.4%, respectively, of domestic traffic in the region. Domestic traffic in the Middle East increased by +5.9% in RPK in 2017 with growth in capacity of +7.0%.

Capacity – Available Seat Kilometers (ASK)

3.5 Middle-Eastern airlines increased their capacity in ASK by +6.2% in 2017. The capacity in ASK increased by +6.1% for international air services and by +7.0% for domestic services. In absolute terms, the States that contributed the most to increased capacity were Qatar (+10.5%), Oman (+20.7%) and Kuwait (+40.1%).

Passenger load factor

3.6 The passenger load factor increased in 2017. It reached 74.5% compared to 74.3% the previous year. The passenger load factor achieved 74.5% for international services and 76.2% for domestic services.

Freight Traffic - Freight Tonne Kilometers (FTK)

3.7 Cargo traffic performed by Middle-Eastern carriers recorded an annual growth of +8.7% in 2017 in terms of FTK, compared to +7.7% in 2016. Air freight services performed by Middle-Eastern

carriers are mostly international, and carriers of United Arab Emirates and Qatar, accounting for 89.3% of the traffic, recorded annual growth of +2.3% and +19.2%, respectively.

Low Cost Carriers (LCCs)

3.8 The Middle East had a lower LCC traffic share than the world average. In 2017, around 21% of the available seats within the region were offered by LCCs, -12 percentage points lower than the world average. The number of seats within the region offered by LCCs has increased from 2008 to 2017. In 2008, there were about 5.3 million seats offered by LCCs, and this increased to around 25.8 million in 2017. LCC market share in the Middle East has increased rapidly in the last ten years. The percentage of seats within the region offered by LCCs increased from only 9% in 2008 to 21% in 2017. The total increase, +12 percentage points, is faster than the world total growth of +9 percentage points. LCC penetration in the Middle East has grown rapidly in the last ten years.

Air Traffic – Nr. of Scheduled Commercial Departures

3.9 The airlines of the MID Region showed a stable growth in terms of aircraft departures. The total number of scheduled commercial departures in 2017 grew at a pace of **5.4 per cent** to reach about **1.37 million departures**, compared to **1.3 million departures** in 2016 and **1.08 million departures** in 2013.

4. TRAFFIC FORECASTS

4.1 According to the ICAO forecasts, the passenger traffic to, from and within the MID Region on the five major route groups concerned for the period **2012-2042** is expected to increase at an average annual rate of **5.2 per cent**. In 2042, the **Middle East-Central South West Asia** Route Group is expected to become the largest traffic route group to/from Middle East with an average annual growth rate of **8.2 per cent** per annum, followed by Europe-Middle East, North Asia and Pacific South East Asia-Middle East, Africa-Middle East and North America-Middle East Route Groups with growth rates of **2.9 per cent**, **3.5 per cent**, **4.7 per cent** and **3.4 per cent**, respectively, for the period concerned.

5. ICAO EUR/MID AVIATION DATA ANALYSES SEMINARS

5.1 An ICAO Aviation Data Analyses Seminar was held in Tehran, Iran, 20-23 February 2017; and the ICAO EUR/MID Aviation Data Analyses Seminar was held in the ICAO EUR/NAT Office, Paris, France, 4 – 6 April 2018. Unfortunately, the level of attendance to both Seminars was very low.

5.2 The main objective of the Seminars was to bring together all stakeholders (Regulators, Air Navigation Service Providers (ANSPs), Aerodrome Operators, Aircraft Operators, International Organizations and Industry) and foster the dialogue on the use of aviation data and analysis to facilitate data-driven decision making, including the synergies between aviation, tourism and trade. The Seminars provided also an opportunity to participants to learn about the new ICAO solutions with respect to the available aviation data and analysis to help States to optimize the social and economic benefits of air transport.

5.3 The Documentation and presentations delivered during the Seminars are available at: <https://www.icao.int/MID/Pages/2017/Aviation%20Data%20and%20Analysis%20Seminar.aspx>; and <https://www.icao.int/Meetings/aviationdataseminar/Pages/default.aspx>, respectively.

6. ACTION BY THE MEETING

6.1 The meeting is invited to take into consideration the MID Region Aviation Statistics and Forecasts in the regional air navigation planning and implementation processes.

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.2: MID Region Air Navigation Priorities and Targets

**ASBU IMPLEMENTATION MONITORING:
MID AIR NAVIGATION REPORTS**

(Presented by the Secretariat)

SUMMARY
This paper presents updates on the MID eANP Volume III and the Second Edition of the MID Air Navigation Report (2017), for endorsement. Action by the meeting is at paragraph 3.
REFERENCES
- ANSIG/3 Report - MIDANPIRG/16 Report - MID eANP Vol III

1. INTRODUCTION

1.1 The MIDANPIRG/16 meeting (Kuwait, 13-16 February 2017), through MIDANPIRG Conclusion 16/4, approved updated version of the MID eANP Volume III.

1.2 The MIDANPIRG/16 meeting, through MIDANPIRG Conclusion 16/7, endorsed the First Edition of the MID Air Navigation Report-2016. The MID Air Navigation Report-2016 is available on the ICAO MID Office website at:

<https://www.icao.int/MID/Documents/1/MIDANReport2016.pdf>

2. DISCUSSION

MID eANP Volume III

2.1 The ANSIG/3 meeting (Cairo, Egypt, 3-5 July 2018) agreed with the changes to the MID eANP Vol III proposed by the AIM SG/4, ATM SG/4, CNS SG/8 and MET SG/7 meetings (Tables B0-ACDM, B0-DATM, B0-FICE, B0-FRTO, B0-NOPS, B0-ACAS, B0-SNET and B0-AMET), as at **Appendix A**. Accordingly, the following Draft MSG Conclusion is proposed:

DRAFT MSG CONCLUSION 6/X: AMENDMENT TO THE MID eANP VOLUME III

*That, the amendment to the MID eANP Volume III at **Appendix A** is approved.*

Second Edition of the MID Air Navigation Report (2017)

2.2 The meeting may wish to recall that the MIDANPIRG/16 meeting, through Conclusion 16/8, agreed that States should provide the ICAO MID Office, with relevant data necessary for the development of the Second Edition MID Region Air Navigation Report, by 1 November 2017.

2.3 The ANSIG/3 meeting reviewed a draft version of the Second Edition of the MID Air Navigation report and, through Draft Conclusion 3/5, urged States to provide necessary inputs/updates to the ICAO MID Office before 31 August 2018, in order to consolidate the Final version of the Report.

2.4 The ANSIG/3 meeting agreed that the Draft Methodology for the estimation of environmental benefits accrued from the implementation of priority 1 Block 0 Modules in the MID Region, at **Appendix B**, be used for the estimation and reporting of environmental benefits in the Second Edition of the MID Air Navigation Report (2017). Additional Details about the Methodology (explanation of assumptions, calculations, etc.) is at **Appendix C**.

2.5 A consolidated version of the Second Edition of the MID Region Air Navigation Report (2017) is at **Appendix D**.

2.6 The meeting may wish to note that Bahrain, Egypt, Jordan, Lebanon, Qatar, Sudan and UAE made a good progress in the implementation of the priority 1 ASBU Block 0 Modules. From a regional perspective, the progress for the implementation of B0-SNET, B0-AMET and B0-ACAS is very good. However, the progress for the implementation of B0-ACDM, B0-CDO and B0-CCO is far below expectation.

2.7 Based on the above, the following Draft MSG Conclusion is proposed:

DRAFT MSG CONCLUSION 6/X: SECOND EDITION OF THE MID REGION AIR NAVIGATION REPORT (2017)

*That, the Second Edition of the MID Region Air Navigation Report (2017) at **Appendix D** is endorsed.*

Third Edition of the MID Region Air Navigation Report (2018)

2.8 The meeting may wish to agree that the ICAO MID Office start the development of the Third Edition of the MID Region Air Navigation Report (2018), beginning of 2019. Therefore, States should provide the ICAO MID Office, with necessary data by **15 February 2019**. Accordingly, the meeting is invited to agree on the following Draft MSG Conclusion:

DRAFT MSG CONCLUSION 6/X: MID REGION AIR NAVIGATION REPORT (2018)

That, MID States be urged to provide the ICAO MID Office, with relevant data necessary for the development of the Third Edition of the MID Region Air Navigation Report (2018), by 15 February 2019.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and update, as deemed necessary, the Second Edition of the MID Air Navigation Report, at **Appendix D**; and
- b) endorse the proposed Draft MSG Conclusions.

APPENDIX A

Table B0-ACDM 3-1

EXPLANATION OF THE TABLE

Column:

1- Name of the State

2- Aerodrome and Location Indicator

3 & 4 Fundamental ACDM Elements

3-Information Sharing:

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 1- Information Sharing is essential since it forms the foundation for all the other subsequent elements.

4-The Milestones Approach (Turn- Round Process)

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 2- The Milestones Approach (Turn- Round Process) aims to achieve common situational awareness by tracking the progress of a flight from the initial planning to the take off.

5 – 8 Other ACDM Elements

5- Variable Taxi Time

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 3- Variable Taxi Time is the key to predictability of accurate take-off in block times especially at complex airports.

6-Collaborative Management of Flight Updates

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 4- Collaborative Management of Flight Updates enhances the quality of arrival and departure information exchanges between the Network Operations and the CDM airports.

7-Collaborative Pre-departure Sequence

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 5- (Collaborative) Pre-departure Sequence establishes an off-block sequence taking into account operators preferences and operational constraints.

8-ACDM in Adverse Conditions

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 6- ACDM in Adverse Conditions achieves collaborative management of a ACDM during periods of predicted or unpredicted reductions of capacity.

9- Action Plan — short description of the State’s Action Plan with regard to ACDM Implementation, especially for items with a “PI” or “NI” status, including planned date(s) of full compliance, as appropriate.

10- Remarks — additional information, including detail of “PI” or “N”, as appropriate.

Table B0-ACDM 3-1

State	Aerodrome Location Indicator	ACDM IMPLEMENTATION ELEMENTS							
		Fundamental ACDM Elements		Other ACDM Elements				Action Plan	Remarks
		Information Sharing	Milestones Approach	Variable Taxi Time	Collaborative Management of Flight Updates	Collaborative Pre-departure Sequence	ACDM in Adverse Conditions		
1	2	3	4	5	6	7	8	9	10
Bahrain	OBBI								
Egypt	HECA								
Iran	OIII								
Kuwait	OKBK								
Oman	OOMS								
Qatar	OTBD								
	OTHH								
Saudi Arabia	OEJN								
	OERK								
UAE	OMDB								
	OMAA								

TABLE B0-FICE
EXPLANATION OF THE TABLE

Column	
1	Name of the State
2,3,4	Status of AMHS Capability and Interconnection and AIDC/OLDI Capability, where: Y – Fully Implemented N – Not Implemented
5	~~Status—Number of required AIDC/OLDI Interconnections implementation, where: Y—If AIDC/OLDI is implemented at least with one neighbouring ACC N—Not Implemented~~
6	~~Number of implemented AIDC/OLDI Interconnection Action plan—short description of the State's Action Plan with regard to the implementation of B0-FICE.~~
7	Remarks

State	AMHS Capability	AMHS Interconnection	AIDC/OLDI Capability	~~Required AIDC/OLDI Interconnections Implementation~~	~~Action Plan AIDC/OLDI Implementation~~	Remarks
1	2	3	4	5*	6	7
Bahrain	Y	Y	Y	~~5Y~~	<u>1</u>	connection with ABU Dhabi
Egypt	Y	Y	Y	~~4Y~~	<u>1</u>	
Iran	N	N	Y	~~4N~~	<u>0</u>	Contract signed for AMHS
Iraq	N	N	N	~~2N~~	<u>0</u>	Thales Topsky ATM system
Jordan	Y	Y	Y	~~2N~~	<u>0</u>	
Kuwait	Y	Y	Y	~~2N~~	<u>0</u>	
Lebanon	Y	Y	Y	~~1Y~~	<u>0</u>	
Libya	Y	N	Y	~~0N~~	<u>0</u>	<u>0</u> Contract signed for AMHS
Oman	Y	Y	Y	~~4N~~	<u>1</u>	
Qatar	Y	Y	Y	~~2Y~~	<u>1</u>	local implementation for OLDI
Saudi Arabia	Y	Y	Y	~~7Y~~	<u>2</u>	local implementation for AIDC
Sudan	Y	Y	Y	~~4N~~	<u>0</u>	

Syria	N	N	N	~~0~~ <u>N</u>	~~0~~	
UAE	Y	Y	Y	~~4~~ <u>Y</u>	~~3~~	
Yemen	N	N	N	~~0~~ <u>N</u>	~~0~~	Contract signed for AMHS
Total Percentage/ <u>Number</u>	73%	67%	80%	~~41~~ <u>40%</u>	~~2~~ <u>(22%)</u>	

B0-DATM Enablers/Tables

In order to assist States in the planning for the transition from AIS to AIM in an expeditious manner, the following Tables, which provide more details than the standard ANRF, should be used:

- 1- **Table B0-DATM 3-1** sets out the requirements for the Provision of AIS/AIM products and services based on the Integrated Aeronautical Information Database (IAID). It reflects the transition from the current product centric AIS to data centric AIM. For the future digital environment it is important that the authoritative databases are clearly designated and such designation must be published for the users. This is achieved with the concept of the Integrated Aeronautical Information Database (IAID), a single access point for one or more authoritative databases (~~AIS~~AIP, Terrain, Obstacles, AMDB, etc) for which the State is responsible. This Table will be used for the monitoring of the Key Performance Indicators (KPIs) related to elements Nr. 1 and 2 of the Module B0-DATM.
- 2- **Table B0-DATM 3-2** sets out the requirements for aeronautical data quality. It will be used for the monitoring of the Key Performance Indicators (KPIs) related to the element Nr. 3 of the Module B0-DATM.
- 3- **Table B0-DATM 3-3** sets out the requirements for the implementation of the World Geodetic System – 1984 (WGS-84). The requirement to use a common geodetic system remains essential to facilitate the exchange of data between different systems. The expression of all coordinates in the AIP and charts using WGS-84 is an important first step for the transition to AIM. This Table will be used for the monitoring of the Key Performance Indicators (KPIs) related to the element Nr. 4 of the Module B0-DATM.
- 4- **Table B0-DATM 3-4-1** sets out the requirements for the provision of Terrain and Obstacle data sets for Area 1 and Area 4. It will be used for the monitoring of the Key Performance Indicators (KPIs) related to the element Nr. 5 of the Module B0-DATM.
- 5- **Table B0-DATM 3-4-2** sets out the requirements for the provision of Terrain and Obstacle data sets for Area 2. It will be used for the monitoring of the Key Performance Indicators (KPIs) related to the element Nr. 5 of the Module B0-DATM.
- 6- **Table B0-DATM 3-4-3** sets out the requirements for the provision of Terrain and Obstacle data sets for Area 3 and implementation of Airport Mapping Databases (AMDB). It will be used for the monitoring of the Key Performance Indicators (KPIs) related to the element Nr. 5 of the Module B0-DATM.

Table B0-DATM 3-1

Provision of AIS/AIM products and services based on the Integrated Aeronautical Information Database (IAID)

EXPLANATION OF THE TABLE

Column:

- 1 Name of the State or territory for which the provision of AIS/AIM products and services based on the IAID is required.
- 2 Requirement for the implementation and designation of the authoritative IAID, shown by:
 FI – Fully Implemented
~~PI – Partially Implemented~~
 NI – Not Implemented
Note 1 — The IAID of a State is a single access point for one or more databases (~~AISAIP~~, Terrain, Obstacles, AMDB, etc). The minimum set of databases which should be integrated is defined in Annex 15.
~~*Note 2 — Information providing detail of “PI” should be given in the Remarks column (the implemented components of the IAID).*~~
~~*Note 3-2 — The information related to the designation of the authoritative IAID should be published in the AIP (GEN 3.1)*~~
- 3 Requirement for an IAID driven AIP production, shown by:
 FI – Fully Implemented (eAIP: Text, Tables and Charts)
 PI – Partially Implemented
 NI – Not Implemented
Note 4-3 — AIP production includes, production of AIP, AIP Amendments and AIP Supplements
~~*Note 4 — Charts’ GIS-based database should be interoperable with AIP database*~~
- 4 Requirement for an IAID driven NOTAM production, shown by:
 FC – Fully Compliant
 NC – Not Compliant
- 5 Requirement for an IAID driven SNOWTAM ~~production~~processing, shown by:
~~FC-FI~~ – Fully Implemented~~Compliant~~
~~NC-NI~~ – Not Implemented~~compliant~~
- 6 Requirement for an IAID driven PIB production, shown by:
 FC – Fully Compliant
~~PC~~ – Partially Compliant
 NC – Not Compliant
- ~~7 — Requirement for Charting systems to be interoperable with the IAID, shown by:
 FC — Fully compliant
 PC — Partially compliant
 NC — Not compliant~~
- 87 Requirement for Procedure design systems to be interoperable with the IAID, shown by:
 FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

Note 5 — full implementation includes the use of the IAID for the design of the procedures and for the storage of the encoded procedures in the IAID

98 Requirement for ATS systems to be interoperable with the IAID, shown by:

FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

109 Action Plan — short description of the State’s Action Plan with regard to the provision of AIM products and services based on the IAID, especially for items with a “PC”, “PI”, “NC” or “NI” status, including planned date(s) of full compliance, as appropriate.

110 Remarks — additional information, including detail of “PC”, “NC”, “PI” and “NI”, as appropriate.

TABLE B0-DATM-3-1

Provision of AIS/AIM products and services based on the Integrated Aeronautical Information Database (IAID)

State	IAID	AIP	NOTAM	SNOWTAM	PIB	~~Charting~~	Procedure Design	ATS	Action Plan	Remarks
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>87</i>	<i>98</i>	<i>109</i>	<i>110</i>
BAHARAIN	~~PIFI~~	FI	FC	~~FCFI~~	FC	~~FC~~	PI	FI	National AIM Roadmap- ~~2015~~ 2016	~~AIXM: 4.5-5.1 by end 2015~~
EGYPT	FI	PI	~~NCFC~~	~~NCFI~~	FC	~~NC~~	NI	PI	National AIM Roadmap- ~~2015~~ 2017	~~AIXM: 5.1~~ 3 and 7 by 2015, 4-9 by 20162018
IRAN, ISLAMIC REPUBLIC OF	NI	NI	NC	~~NI~~	NC	~~NC~~	NI	NI	National AIM Roadmap- ~~2015~~ 2016	~~AIXM: NI~~ Separate semi-automated NOTAM/SNOWTAM system is operative
IRAQ	NI	NI	NC	~~NCNI~~	NC	~~NC~~	NI	NI	National AIM Roadmap- ~~2014~~ 2015	~~AIXM: NI~~
JORDAN	~~PINI~~	NI	FC	~~FCNI~~	FC	~~PC~~	NI	NI	National AIM Roadmap- ~~2014~~ 2017	~~AIXM: database through EAD~~
KUWAIT	~~PINI~~	NI	FC	~~NCNI~~	PC	~~NC~~	NI	NI	National AIM Roadmap- ~~2015~~ 2016	~~AIXM: NI (5.1 in progress)~~
LEBANON	NI	~~FI~~ NI	NC	~~NCNI~~	NC	~~NC~~	NI	NI	National AIM Roadmap- ~~2014~~ 2016	~~AIXM: 4.5~~
LIBYA	NI	NI	NC	~~NCNI~~	NC	~~NC~~	NI	NI	No Action Plan	~~AIXM: NI~~
OMAN	NI	NI	NC	~~NCNI~~	NC	~~NC~~	NI	NI	National AIM Roadmap- ~~2014~~ 2016	~~AIXM: NI (5.1 in progress)~~
QATAR	~~PINI~~	PI	FC	~~PCNI~~	FC	~~PC~~	PI	NI	National AIM Roadmap- ~~2015~~ 2016	~~AIXM: 5.1~~ Q4/2017 – Data Integration (AIP, Terrain, Obstacle, Procedure Design and AMDB datasets)
SAUDI ARABIA	FI	FI	~~FCNC~~	~~FCNI~~	~~FCP~~ C	~~FC~~	FI	FI	National AIM Roadmap- ~~2014~~ 2017	~~AIXM: 4.5~~
SUDAN	~~PINI~~	NI	FC	~~NI~~ ~~NC~~	FC	~~PC~~	PI	PI	National AIM Roadmap- ~~2015~~ 2017	~~1. AIS DB integrated with MET & ATM~~ ~~2. Contract Signed for eAIP;~~ ~~AIXM connected with Charting~~ ~~SYS.~~ ~~7. Contract signed.~~ ~~8. Ongoing project~~ ~~AIXM: NI (5.1 in progress)~~ ~~AIS Automation Project is~~

State	IAID	AIP	NOTAM	SNOWTAM	PIB	~~Charting~~	Procedure Design	ATS	Action Plan	Remarks
1	2	3	4	5	6	7	87	98	109	1110
										ongoing
SYRIAN ARAB REPUBLIC	NI	NI	NC	~~NC~~ NI	NC	~~NC~~	NI	NI	No Action Plan	<u>AIXM: NI</u>
UNITED ARAB EMIRATES	~~PI~~ NI	FI	NC	~~NC~~ NI	PC	~~PC~~	NI	PI	National AIM Roadmap- ~~2014~~ 2017	<u>AIXM: 5.1</u> <u>AMDB: 2016-2021; PIB: AVBL at OMAA, OMDb, OMDW, OMFJ, other ADs 2020; Charting system upgrade is planned for 2017; Procedure Design 2020; ATS: ACC AVBL, ADs 2020</u> <u>Digital NOTAM: 2016-2021</u> ~~AMDB: 2016-2021~~ ~~eTOD integration: 2016~~ ~~PIB: AVBL at OMMA, OMDb, OMDW; other ADs 2020~~ ~~Charting: 2016~~ ~~Procedure Design 2020~~ ~~ATS: ACC AVBL, ADs 2020~~ ~~Digital NOTAM 2016-2021~~
YEMEN	NI	NI	NC	~~NC~~ NI	NC	~~NC~~	NI	NI	No Action Plan	<u>AIXM: NI</u>

Table B0-DATM-3-2

Aeronautical Data Quality

EXPLANATION OF THE TABLE

Column:

- 1 Name of the State or territory.
- 2 Compliance with the requirement for implementation of QMS for Aeronautical Information Services including safety and security objectives, shown by:
FC – Fully compliant
NC – Not compliant
- 3 Compliance with the requirement for the establishment of formal arrangements with approved data originators concerning aeronautical data quality, shown by:
FC – Fully compliant
PC – Partially compliant
NC – Not compliant
- 4 Implementation of digital data exchange with originators, shown by:
FI – Implemented
PI – Partially Implemented
NI – Not implemented
Note 1 — Information providing detail of “PI” and “NI” should be given in the Remarks column (percentage of implementation).
- 5 Compliance with the requirement for metadata, shown by:
FC – Fully compliant
PC – Partially compliant
NC – Not compliant
- 6 Compliance with the requirements related to aeronautical data quality monitoring (accuracy, resolution, timeliness, completeness), shown by:
FC – Fully compliant
PC – Partially compliant
NC – Not compliant
- 7 Compliance with the requirements related to aeronautical data integrity monitoring, shown by:
FC – Fully compliant
PC – Partially compliant
NC – Not compliant
- 8 Compliance with the requirements related to the AIRAC adherence, shown by:
FC – Fully compliant
NC – Not compliant
- 9 Action Plan — short description of the State’s Action Plan with regard to aeronautical data quality requirements implementation, especially for items with a “PC”, “PI”, “NC” or “NI” status, including planned date(s) of full compliance, as appropriate.
- 10 Remarks — additional information, including detail of “PC”, “NC”, “PI” and “NI”, as appropriate.

TABLE B0-DATM-3-2
Aeronautical Data Quality

State	QMS	Establishment of formal agreements	Digital data exchange with originators	Metadata	Data quality monitoring	Data integrity monitoring	AIRAC adherence	Action Plan	Remarks
1	2	3	4	5	6	7	8	9	10
BAHARAIN	FC	~~FC~~ PC	PI	~~PC~~ FC	~~PC~~ FC	~~PC~~ FC	FC	National AIM Roadmap- ~~2015~~ 2016	
EGYPT	FC	PC	PI	FC	PC	PC	FC	National AIM Roadmap- ~~2015~~ 2017	3, 4, 6 and 7 by ~~2016~~ 2018
IRAN, ISLAMIC REPUBLIC OF	FC	PC	NI	NC	~~NC~~ FC	~~NC~~ FC	FC	National AIM Roadmap- ~~2015~~ 2016	
IRAQ	NC	NC	NI	NC	NC	NC	FC	National AIM Roadmap- ~~2014~~ 2015	
JORDAN	FC	~~NC~~ PC	NI	~~PC~~ FC	FC	FC	FC	National AIM Roadmap- ~~2014~~ 2017	
KUWAIT	FC	PC	NI	NC	NC	NC	FC	National AIM Roadmap- ~~2015~~ 2016	
LEBANON	NC	~~NC~~ PC	NI	~~NC~~ PC	~~NC~~ PC	~~NC~~ PC	FC	National AIM Roadmap- ~~2014~~ 2016	
LIBYA	NC	NC	NI	NC	NC	NC	NC	No Action Plan	
OMAN	NC	NC	NI	NC	~~NC~~ PC	~~NC~~ PC	FC	National AIM Roadmap- ~~2014~~ 2016	
QATAR	FC	~~FC~~ PC	PI	FC	PC	PC	FC	National AIM Roadmap- ~~2015~~ 2016	~~SLA with MIL in progress~~
SAUDI ARABIA	FC	~~PC~~ FC	NI	FC	FC	FC	FC	National AIM Roadmap- ~~2014~~ 2017	~~SLA will be completed end 2015~~
SUDAN	FC	FC	NI	NC	FC	FC	FC	National AIM Roadmap- ~~2015~~ 2017	
SYRIAN ARAB REPUBLIC	NC	NC	NI	NC	NC	NC	NC	No Action Plan	
UNITED ARAB EMIRATES	FC	PC	~~NI~~ PI	FC	FC	FC	FC	National AIM Roadmap- ~~2014~~ 2017	<u>SLA initiated with MIL-ongoing</u> Digital data exchange with originator: planned (2016-2021)

									CAAP 56 details of agreements
YEMEN	NC	NC	NI	PC	NC	NC	NC	No Action Plan	

Table B0-DATM-3-3

World Geodetic System-1984 (WGS-84)

EXPLANATION OF THE TABLE

Column:

- 1 Name of the State or territory for which implementation of WGS-84 is required.
- 2 Compliance with the requirements for implementation of WGS-84 for FIR and Enroute points, shown by:
 - FC – Fully compliant
 - PC – Partially compliant
 - NC – Not compliant
- 3 Compliance with the requirements for implementation of WGS-84 for Terminal Areas (arrival, departure and instrument approach procedures), shown by:
 - FC – Fully compliant
 - PC – Partially compliant
 - NC – Not compliant
- 4 Compliance with the requirements for implementation of WGS-84 for Aerodrome, shown by:
 - FC – Fully compliant
 - PC – Partially compliant
 - NC – Not compliant
- 5 Compliance with the requirements for implementation of Geoid Undulation, shown by:
 - FC – Fully compliant
 - PC – Partially compliant
 - NC – Not compliant
- 6 Action Plan — short description of the State's Action Plan with regard to WGS-84 implementation, especially for items with a "PC", "PI", "NC" or "NI" status, including planned date(s) of full compliance, as appropriate.
- 7 Remarks — additional information, including detail of "PC" and "NC", as appropriate.

TABLE B0-DATM-3-3
World Geodetic System-1984 (WGS-84)

State	FIR/ENR	Terminal	AD	GUND	Action Plan	Remarks
1	2	3	4	5	6	7
BAHARAIN	FC	FC	FC	FC		~~Plan to be updated by 2016~~
EGYPT	FC	FC	FC	FC		
IRAN, ISLAMIC REPUBLIC OF	FC	FC	FC	FC		
IRAQ	~~PCFC~~	~~PCFC~~	~~PCFC~~	NC	National AIM Roadmap ~~2014~~ 2015	
JORDAN	FC	FC	FC	FC		
KUWAIT	FC	FC	FC	FC		Last survey FEB 2015
LEBANON	FC	FC	FC	~~NCFC~~	~~National AIM Roadmap 2014~~	
LIBYA	PC	PC	NC	NC	No Action Plan	
OMAN	FC	FC	FC	FC		
QATAR	FC	FC	FC	FC		Annual Validation/Survey Updates planned up to 2017
SAUDI ARABIA	FC	FC	FC	FC		
SUDAN	FC	FC	FC	FC		
SYRIAN ARAB REPUBLIC	FC	FC	FC	NC	No Action Plan	
UNITED ARAB EMIRATES	FC	FC	FC	FC		
YEMEN	FC	FC	FC	FC		

Table B0-DATM-3-4-1
Provision of Terrain and Obstacle data sets for Areas 1 and 4

EXPLANATION OF THE TABLE

Column

1	Name of the State or territory for which Terrain and Obstacle data sets for Areas 1 and 4 are required.
2	Compliance with requirement for the provision of Terrain data sets for Area 1, shown by: FC – Fully Compliant PC – Partially Compliant NC – Not Compliant
3	Compliance with requirement for the provision of Terrain data sets for Area 4, shown by: FC – Fully Compliant PC – Partially Compliant NC – Not Compliant N/A – Not Applicable
4	Compliance with requirement for the provision of Obstacle data sets for Area 1, shown by: FC – Fully Compliant PC – Partially Compliant NC – Not Compliant
5	Compliance with requirement for the provision of Obstacle data sets for Area 4, shown by: FC – Fully Compliant PC – Partially Compliant NC – Not Compliant N/A – Not Applicable
6	Action plan — short description of the State’s Action Plan with regard to compliance with the requirements for provision of Terrain and Obstacle data sets for Areas 1 and 4, especially for items with a “PC” or “NC” status, including planned date(s) of full compliance, as appropriate.
7	Remarks— additional information, including detail of “PC” and “NC”, as appropriate.

TABLE B0-DATM-3-4-1

Provision of Terrain and Obstacle data sets for Areas 1 and 4

State	Terrain data sets		Obstacle data sets		Action Plan	Remarks
	Area 1	Area 4	Area 1	Area 4		
1	2	3	4	5	6	7
BAHARAIN	FC	FC	FC	FC		
EGYPT	FC	FC	~~PCNC~~	~~PCNC~~	National AIM Roadmap- ~~2015~~ 2017	<u>4 and 5 (HECA & HESH): 2019</u>
IRAN, ISLAMIC REPUBLIC OF	FC	FC	FC	FC		
IRAQ	NC	NC	NC	NC	National AIM Roadmap- ~~2014~~ 2015	
JORDAN	~~NCPC~~	~~NCFC~~	~~NCPC~~	~~NCFC~~	National AIM Roadmap- ~~2014~~ 2017	
KUWAIT	FC	FC	FC	FC		
LEBANON	NC	N/A	NC	N/A	National AIM Roadmap- ~~2014~~ 2016	
LIBYA	NC	N/A	NC	N/A	No Action Plan	
OMAN	NC	N/A	NC	N/A	National AIM Roadmap- ~~2014~~ 2016	
QATAR	FC	FC	FC	FC		
SAUDI ARABIA	FC	FC	FC	FC		
SUDAN	NC	N/A	NC	N/A	National AIM Roadmap- ~~2015~~ 2017	
SYRIAN ARAB REPUBLIC	NC	N/A	NC	N/A	No Action Plan	
UNITED ARAB EMIRATES	PC	FC	PC	FC	National AIM Roadmap- ~~2014~~ 2017	<u>A recurrent data acquisition eTOD Area 1 is planned</u>
YEMEN	NC	N/A	NC	N/A	No Action Plan	

Table B0-DATM-3-4-2
Provision of Terrain and Obstacle data sets for Area 2

EXPLANATION OF THE TABLE

Column

1	Name of the State or territory for which Terrain and Obstacle data sets for Area 2 are required.
2	Compliance with requirement for the provision of Terrain data sets for Area 2a, shown by: FC – Fully Compliant PC – Partially Compliant NC – Not Compliant
3	Compliance with requirement for the provision of Terrain data sets for Area 2b, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not implemented N/A – Not Applicable
4	Compliance with requirement for the provision of Terrain data sets for Area 2c, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
5	Compliance with requirement for the provision of Terrain data sets for Area 2d, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
6	Compliance with requirement for the provision of Obstacle data sets for Area 2a, shown by: FC – Fully Compliant PC – Partially Compliant NC – Not Compliant
7	Compliance with requirement for the provision of Obstacle data sets for Area 2b, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not implemented N/A – Not Applicable
8	Compliance with requirement for the provision of Obstacle data sets for Area 2c, shown by: FI – Fully Implemented

PI – Partially Implemented

NI – Not Implemented

N/A – Not Applicable

- 9 Compliance with requirement for the provision of Obstacle data sets for Area 2d, shown by:
- FI – Fully Implemented
 - PI – Partially Implemented
 - NI – Not Implemented
 - N/A – Not Applicable
- 10 Action plan — short description of the State’s Action Plan with regard to compliance with the requirements for provision of Terrain and Obstacle data sets for Area 2, especially for items with a “PC”, “PI”, “NC” or “NI” status.
- 11 Remarks— additional information, including detail of “PC”, “PI” and “NC”, “NI”, as appropriate.

TABLE B0-DATM-3-4-2

Provision of Terrain and Obstacle data sets for Area 2

State	Terrain data sets				Obstacle data sets				Action Plan	Remarks
	Area 2a	Area 2b	Area 2c	Area 2d	Area 2a	Area 2b	Area 2c	Area 2d		
1	2	3	4	5	6	7	8	9	10	11
BAHARAIN	NC	NI	NI	NI	~~NCFC~~	~~NIPI~~	~~NIPI~~	~~NIPI~~	National AIM Roadmap- ~~2015~~ 2016	
EGYPT	PC	PI	PI	PI	NC	NI	NI	NI	National AIM Roadmap- ~~2015~~ 2017	<u>To be completed by 2020</u>
IRAN, ISLAMIC REPUBLIC OF	~~NCFC~~	~~NIPI~~	~~NIPI~~	~~NIPI~~	~~NCFC~~	~~NIPI~~	~~NIPI~~	~~NIPI~~	~~National AIM Roadmap-2015~~	
IRAQ	NC	NI	NI	NI	NC	NI	NI	NI	National AIM Roadmap- ~~2014~~ 2015	
JORDAN	~~NCPC~~	~~NIPI~~	~~NIPI~~	NI	~~NCPC~~	~~NIPI~~	~~NIPI~~	NI	National AIM Roadmap- ~~2014~~ 2017	<u>Area 2a, 2b and 2c implemented for OJAI RWY 26R/08L</u>
KUWAIT	NC	NI	NI	NI	NC	NI	NI	NI	National AIM Roadmap- ~~2015~~ 2016	
LEBANON	NC	NI	NI	NI	NC	NI	NI	NI	National AIM Roadmap- ~~2014~~ 2016	
LIBYA	NC	NI	NI	NI	NC	NI	NI	NI	No Action Plan	
OMAN	NC	NI	NI	NI	NC	NI	NI	NI	National AIM Roadmap- ~~2014~~ 2016	
QATAR	FC	FI	FI	FI	FC	FI	FI	FI		
SAUDI ARABIA	NC	NI	NI	NI	NC	NI	NI	NI	National AIM Roadmap- ~~2014~~ 2017	
SUDAN	NC	NI	NI	NI	NC	NI	NI	NI	National AIM Roadmap- ~~2015~~ 2017	
SYRIAN ARAB REPUBLIC	NC	NI	NI	NI	NC	NI	NI	NI	No Action Plan	
UNITED ARAB EMIRATES	NC	NI	NI	~~NIPI~~	~~NCFC~~	~~NIPI~~	~~NIPI~~	~~NIPI~~	National AIM Roadmap- ~~2014~~ 2017	<u>eTOD Area 2 (all sub-areas) survey & data acquisition through international airport service providers</u>
YEMEN	NC	NI	NI	NI	NC	NI	NI	NI	No Action Plan	

Table B0-DATM-3-4-3 **Provision of Terrain and Obstacle data sets for Area 3 and Airport Mapping** **Databases (AMDB)** ---

EXPLANATION OF THE TABLE

Column

1	Name of the State or territory for which Terrain and Obstacle data sets for Area 3 and AMDB are required.
2	Compliance with requirement for the provision of Terrain data sets for Area 3, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
3	Compliance with requirement for the provision of Obstacle data sets for Area 3, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
4	Implementation of AMDB, shown by: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
5	Action plan — short description of the State’s Action Plan with regard to compliance with the requirements for provision of Terrain and Obstacle data sets for Area 3 and AMDB implementation, especially for items with a “PC”, “PI”, “NC” or “NI” status.
6	Remarks— additional information, including detail of “PI” and “NI”, as appropriate.

TABLE B0-DATM-3-4-3**Provision of Terrain and Obstacle data sets for Area 3 and Airport Mapping Databases (AMDB)**

State	Terrain data sets (Area 3)	Obstacle data sets (Area 3)	AMDB	Action Plan	Remarks
1	2	3	4	5	6
BAHARAIN	NI	~~NI~~ <u>FI</u>	NI	National AIM Roadmap- ~~2015~~ <u>2016</u>	
EGYPT	NI	NI	NI	National AIM Roadmap- ~~2015~~ <u>2017</u>	<u>A3: 2019; AMDB: 2020</u>
IRAN, ISLAMIC REPUBLIC OF	~~NI~~ <u>FI</u>	~~NI~~ <u>FI</u>	NI	National AIM Roadmap- ~~2015~~ <u>2016</u>	
IRAQ	NI	NI	NI	National AIM Roadmap- ~~2014~~ <u>2015</u>	
JORDAN	~~NI~~ <u>FI</u>	~~NI~~ <u>FI</u>	NI	National AIM Roadmap- ~~2014~~ <u>2017</u>	<u>Area 3 implemented for OJAI RWY 26R/08L</u>
KUWAIT	FI	FI	NI	National AIM Roadmap- ~~2015~~ <u>2016</u>	
LEBANON	NI	NI	NI	National AIM Roadmap- ~~2014~~ <u>2016</u>	
LIBYA	NI	NI	NI	No Action Plan	
OMAN	NI	NI	NI	National AIM Roadmap- ~~2014~~ <u>2016</u>	
QATAR	~~NI~~ <u>FI</u>	~~FI~~ <u>FI</u>	~~NI~~ <u>FI</u>	National AIM Roadmap- ~~2015~~ <u>2016</u>	<u>Q4/2017 AMDB implementation</u> ~~AMDB to be implemented last quarter of 2015~~
SAUDI ARABIA	NI	NI	NI	National AIM Roadmap- ~~2014~~ <u>2017</u>	
SUDAN	NI	NI	NI	National AIM Roadmap- ~~2015~~ <u>2017</u>	
SYRIAN ARAB REPUBLIC	NI	NI	NI	No Action Plan	
UNITED ARAB EMIRATES	~~NI~~ <u>FI</u>	~~NI~~ <u>FI</u>	NI	National AIM Roadmap- ~~2014~~ <u>2017</u>	<u>AMDB technical infrastructure (metadata, model) implemented in IAID, pending compatibility analysis AIXM 5.1 with revised AMDB model (RTCA DO-272D) when released.</u>
YEMEN	NI	NI	NI	No Action Plan	

Table B0-AMET 3-1

SADIS FTP

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
- 2 Status of implementation of SADIS FTP, where:
Y – Yes, implemented
N – No, not implemented

- 3 Action Plan
- 4 Remarks

State	Status	Action Plan	Remarks
1	2	3	4
BAHRAIN	Y		
EGYPT	Y		
IRAN (ISLAMIC REPUBLIC OF)	N	No Action Plan	
IRAQ	Y		
JORDAN	Y		
KUWAIT	Y		
LEBANON	N	No Action Plan	
LIBYA	Y		
OMAN	Y		
QATAR	Y		
SAUDI ARABIA	N	Coordinating with SADIS Provider	
SUDAN	Y		
SYRIAN ARAB REPUBLIC	N	No Action Plan	
UNITED ARAB EMIRATES	Y		
YEMEN	Y		

Table B0-AMET 3-2

Volcanic Ash Advisory Centers

Not Applicable

EXPLANATION OF THE TABLE

Column

- 1 Name of the State responsible for the provision of a volcanic ash advisory centre (VAAC)
- 2 Name of the VAAC
Note: The name is extracted from the ICAO Location Indicators (Doc 7910).
- 3 ICAO location indicator of the VAAC
- 4 Status of implementation of volcanic ash advisory information, where:
FC—Fully compliant
PC—Partially compliant
NC—Not compliant
- 5 Status of implementation of volcanic ash advisory information in graphical format, where:
FC—Fully compliant
PC—Partially compliant
NC—Not compliant

State	Volcanic Ash Advisory Centre (VAAC)	ICAO Location Indicator	Status of Implementation	
			VAA	VAG
1	2	3	4	5
FRANCE	Toulouse	LFPW	FC	FC

Table B0-AMET 3-3

Tropical Cyclone Advisory Centers

Not Applicable

EXPLANATION OF THE TABLE

Column

- 1 Name of the State responsible for the provision of a tropical cyclone advisory centre (TCAC)
- 2 Name of the TCAC
Note: The name is extracted from the ICAO Location Indicators (Doc 7910).
- 3 ICAO location indicator of the TCAC
- 4 Status of implementation of tropical cyclone advisory information, where:
FC—Fully compliant
PC—Partially compliant
NC—Not compliant
- 5 Status of implementation of tropical cyclone advisory information in graphical format, where:
FC—Fully compliant
PC—Partially compliant
NC—Not compliant

State	Tropical Cyclone Advisory Centre (TCAC)	ICAO Location Indicator	Status of Implementation	
			TCA	TCG
1	2	3	4	5
INDIA	New Delhi	VIDP	FC	FC

Table B0-AMET 3-4

Quality Management System

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
- 2, 3, 4, Status of implementation of Quality Management System of meteorological information –
- 5 QMS: not started/ planning, ongoing/ partially implemented, Implemented/ISO 9001 Certified, Date of Certification.
- 6 Action Plan
- 7 Remarks

State	Not started/ planning	Ongoing/ partially implemented	Implemented/ ISO 9001 Certified		Action Plan	Remarks
			Status	Date of Certification		
1	2	3	4	5	6	7
BAHARAIN			√	2008		
EGYPT			√	23 May 2012		Recertification: May 2015
IRAN, ISLAMIC REPUBLIC OF			√	Oct 2015		
IRAQ	√				No Action Plan	
JORDAN			√	2 Apr 2014		Recertification: 14 April 2017
KUWAIT			√	23 Aug 2013		Recertification: 22 Aug 2016
LEBANON	√				No Action Plan	
LIBYA	√				No Action Plan	
OMAN		√			TBD	
QATAR			√	Dec 2011		
SAUDI ARABIA			√	Aug 2014		
SUDAN			√	5 June 2014		
SYRIAN ARAB REPUBLIC	√				No Action Plan	
UNITED ARAB EMIRATES			√	19 Dec 2012		Recertification: 18 Dec 2015
YEMEN	√				No Action Plan	

Table B0-AMET 3-5
SIGMET Availability

EXPLANATION OF THE TABLE

Column

- 1** Name of the State
- 2** Status of implementation of SIGMET, where:
Y – Yes, implemented (at least one SIGMET received within a 5 month monitoring period, or as required)
N – No, not implemented (no SIGMET received within a 5 month monitoring period)
- 3** Status of implementation of SIGMET format, where:
Y – Yes, implemented (at least 95% of received SIGMET messages reveal the correct format (TTAAii CCCC in accordance to the MID SIGMET Guide; ATSU, MWO, FIR and FIR name in accordance to ICAO Doc 7910) for the first two lines of SIGMET)
N – No, not implemented (less than 95% of received SIGMET messages reveal the correct format for the first two lines of SIGMET)
- 4** Action Plan
- 5** Remarks

State	Implementation		Action Plan	Remarks
	SIGMET Reception	SIGMET Format		
1	2	3	4	5
BAHRAIN	Y	Y		
EGYPT	Y	Y		
IRAN, ISLAMIC REPUBLIC OF	Y	Y		
IRAQ	Y	Y		Verify the header for Iraq is WSIQ01 ORBI for FIR ORBB – if so, update to MID Doc 009
JORDAN	Y	Y		
KUWAIT	Y	Y		
LEBANON	Y	Y		
LIBYA	Y	N		Indicators HLMC for MWO and HLLL for FIR are not defined in ICAO Doc 7910
OMAN	Y	Y		
QATAR	N/A	N/A		These fields are not applicable to Qatar
SAUDI ARABIA	Y	Y		
SUDAN	Y	Y		
SYRIAN ARAB REPUBLIC	N	N	No Action Plan	
UNITED ARAB EMIRATES	Y	Y		
YEMEN	N	N	No Action Plan	

Table B0-AMET 3-6
WIND SHEAR Availability

TBD

Draft Table B0-AMET 3-7

OPMET Availability (METAR and TAF)

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
 2, 3 Status of availability of METAR and TAF for AOP aerodromes, where:
 Y – Yes, implemented (95% availability of required METAR within a State; 95% availability of required TAF within a State)
 N – No, not implemented
 4 Remarks

State	Implementation		Remarks
	METAR	TAF	
1	2	3	4
BAHRAIN	Y	Y	
EGYPT	Y	Y	
IRAN, ISLAMIC REPUBLIC OF	Y	Y	
IRAQ	N	N	METAR and TAF needed for ORBM
JORDAN	Y	Y	
KUWAIT	Y	Y	
LEBANON	Y	Y	
LIBYA	Y	Y	
OMAN	Y	Y	
QATAR	Y	Y	
SAUDI ARABIA	Y	Y	
SUDAN	Y	Y	
SYRIAN ARAB REPUBLIC	N	N	METAR & TAF needed for OSAP
UNITED ARAB EMIRATES	Y	Y	
YEMEN	N	N	METAR & TAF needed for OYAA, OYHD, OYRN, OYSN and OYTZ

- END -

Table B0-FRTO

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
 - 2 Status of implementation of Flexible Use of Airspace (FUA) Level 1-Strategic.
 - 3 Status of implementation of Flexible Use of Airspace (FUA) Level 2-Pre-tactical
 - 4 Status of implementation of Flexible Use of Airspace (FUA) Level 3-Tactical
- Implementation should be based on the published aeronautical information:
 FI – Fully Implemented
 PI – Partially Implemented
 NI – Not Implemented
- 5 Remarks

Applicability State	FUA Level 1	FUA Level 2	FUA Level 3	Remarks
1	2	3	4	5
Bahrain				
Egypt				
Iran				
Iraq				
Jordan				
Lebanon				
Libya				
Kuwait				
Oman				
Qatar				
Saudi Arabia				
Sudan				
Syria				
Unite Arab Emirates				
Yemen				
Total				
Percentage				

Table B0-NOPS

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
- 2 Mechanism for the implementation of ATFM Measures based on collaborative decision.
Reference to documentation related to the established mechanism for the implementation of
- 3 ATFM Measures based on collaborative decision
Status of the establishment of ATFM Structure
- 4
- 5 Reference to documentation reflecting the establishment of the ATFM Structure
- 6 Remarks

Applicability State	Mechanism for the implementation of ATFM Measures based on collaborative decision	Reference	ATFM Structure	Reference	Remarks
1	2	3	4	5	6
Bahrain					
Egypt					
Iran					
Iraq					
Jordan					
Lebanon					
Libya					
Kuwait					
Oman					
Qatar					
Saudi Arabia					
Sudan					
Syria					
UAE					
Yemen					
Total					
Percentage					

ACAS V7.1 Status and regulation reference

State	Status	Regulation Reference	Effective Date	Remarks
1	2	3	4	5
Bahrain	Y	Aeronautical Circular AC/OPS/05/2015 dated 10th of March 2015		Air Navigation Technical Regulations (ANTR) updated to reflect Annex 10 (Volume IV) Reference needs to be provided http://www.mtt.gov.bh/content/aa-laws-and-regulations
Egypt	Y	ECAR Part 121.356 & ECAR Part 91.221		Egyptian Civil Aviation Regulation (ECAR) Parts 121 and 91 have been updated in accordance with the relevant provisions of ICAO Annex 10, Volume IV, Ch.4 http://www.civilaviation.gov.eg/Regulations/regulation.html
Iran	Y	Aeronautical Telecommunications bylaw, articles 3 and 4		According to articles 3 and 4 of Iran aeronautical telecommunications by law, ratified by board of ministers, Airborne collision avoidance systems are categorized as aeronautical telecommunications systems and should be manufactured, installed and maintained according to standards of Annex 10. -Since no difference to ICAO annex 10 is notified, ACAS V 7.1 is mandatory according to provisions of annex 10 amendment 85. -Airworthiness directives issued by FAA and EASA shall to be implemented by Iranian AOC holders.
Iraq	N			
Jordan	Y	JCAR-OPS.1 (1.668 airborne collision avoidance system)		
Kuwait	Y	Kuwait Civil Aviation Safety Regulations – Part 6 – Operation of		

State	Status	Regulation Reference	Effective Date	Remarks
1	2	3	4	5
		Aircraft, Para. 6.20.4		
Lebanon	Y			Regulation reference needs to be provided
Libya	N			
Oman	Y			Regulation reference needs to be provided
Qatar	Y	QCAR – OPS 1, Subpart K, QCAR – OPS 1.668 – Airborne collision avoidance system QCAR Part 10 - Volume4 Chapter 4 Airborne Collision Avoidance System		References: http://www.caa.gov.qa/en/safety_regulations
Saudi Arabia	Y	GACAR PART 91 – Appendix C		
Sudan	Y	Amended Annex 10 (V4)- ANNEX 6 (V2)		According to adopted annexes to Sudan Regulations (SUCAR 10 V4 Par. 4.3.5.3.1 and SUCAR 6 V2 par 2.05.15)
Syria	N			
UAE	Y	CAR-OPS 1.668 Airborne Collision Avoidance System (See IEM OPS 1.668) and CAAP 29 and AIP 1.5.6.6		https://www.gcaa.gov.ae/en/ePublication/Pages/CARs.aspx?CertD=CARS
Yemen	Y			Reference need to be provided

TABLE B0-SNET

EXPLANATION OF THE TABLE

Column

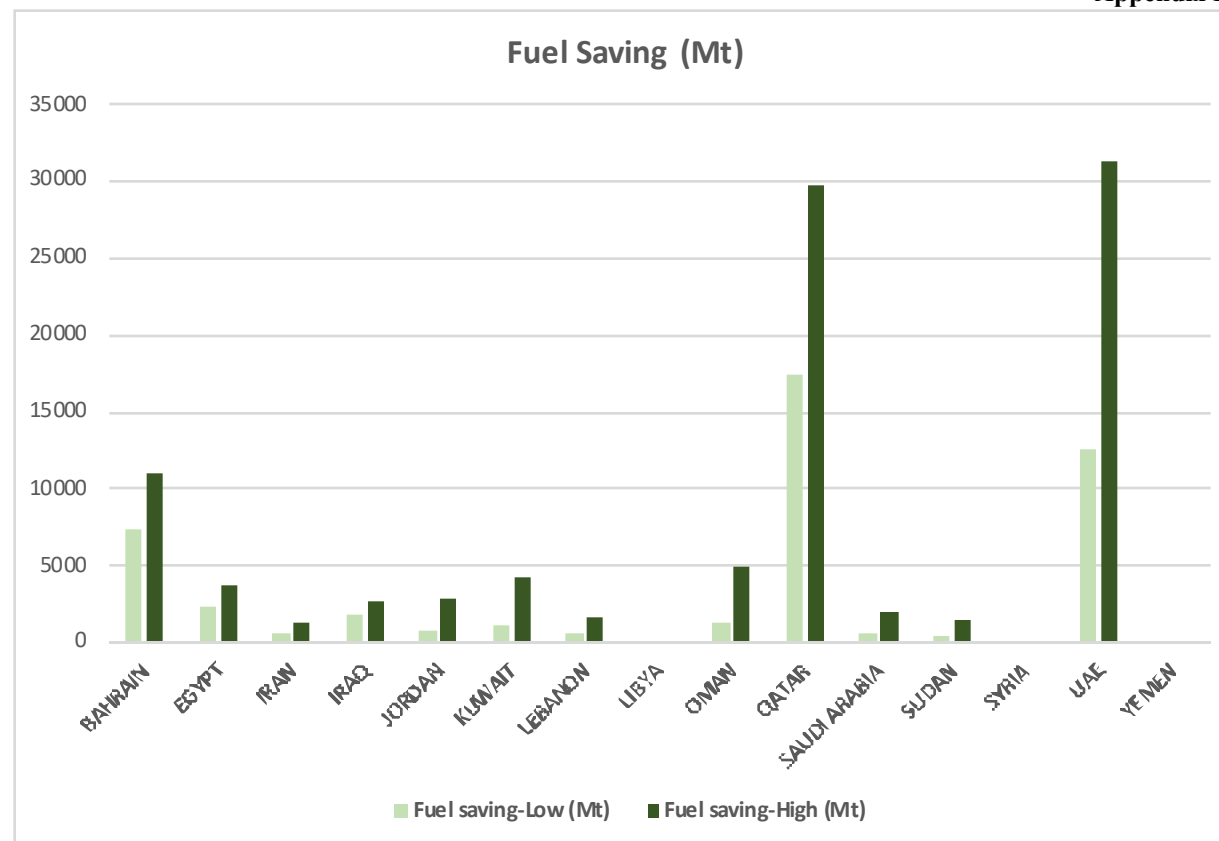
1	Name of the State and ATS Units within a State providing Enroute and Approach services
2	Enroute and Approach ATS Units providing Radar services “R”
3	Enroute and Approach ATS Units providing Procedural services “P”
4	Enroute and Approach ATS Units within a State providing radar services where Short-Term Conflict Alert (STCA) was implemented
5	Enroute and Approach ATS Units within a State providing radar services where Minimum Safe Altitude Warning (MSAW) was implemented
6	Action Plan for the implementation of STCA and MSAW
7	Status of implementation of STCA and MSAW (reference to column 2)

State/ ATS Units (ENR & APP)	ATS		STCA	MSAW	Action Plan	Status
	R	P				
1	2	3	4	5	6	7
Bahrain	2	0	2	2		STCA 100% MSAW 100%
Bahrain ACC	R		Y	Y		
Bahrain APP	R		Y	Y		
Egypt	7	1				STCA 100% MSAW 100%
Cairo ACC	R		Y	Y		
Alex APP	R		Y	Y		
Aswan APP	R		Y	Y		
Cairo APP	R		Y	Y		
Luxor APP	R		Y	Y		
Hurghada APP	R		Y	Y		
Marsa APP		P	N/A	N/A		
Sharm APP	R		Y	Y		
Iran	5	2				STCA 100% MSAW 100%
Tehran ACC	R		Y	Y		
Bandar Abbas APP		P	N/A	N/A		
Esfahan APP	R		Y	Y		
Mashhad APP	R		Y	Y		
Mehrabad APP	R		Y	Y		
Shiraz APP	R		Y	Y		
Tabriz APP		P	N/A	N/A		
Iraq	2	0				STCA 100% MSAW 100%
Baghdad ACC	R		Y	Y		
Baghdad APP	R		Y	Y		
Jordan	2	1				STCA 100%

State/ ATS Units (ENR & APP)	ATS		STCA	MSAW	Action Plan	Status
	R	P				
1	2	3	4	5	6	7
Amman ACC	R		Y	Y		MSAW 100%
Amman APP	R		Y	Y		
Aqaba APP		P	N/A	N/A		
Kuwait	2	0				STCA 100% MSAW 100%
Kuwait ACC	R		Y	Y		
Kuwait APP	R		Y	Y		
Lebanon	2	0				STCA 100% MSAW 100%
Beirut ACC	R		Y	Y		
Beirut APP	R		Y	Y		
Libya	0	4				STCA 0% MSAW 0%
Tripoli ACC		P	N/A	N/A		
Tripoli APP		P	N/A	N/A		
Benghazi Centre		P	N/A	N/A		
Benghazi APP		P	N/A	N/A		
Oman	3	0				STCA 100% MSAW 100%
Muscat ACC	R		Y	Y		
Seeb APP	R		Y	Y		
Salalah APP	R		Y	Y		
Qatar	1	0				STCA 100% MSAW 100%
Doha Radar	R		Y	Y		
Saudi Arabia	6	0				STCA 100% MSAW 100%
Jeddah ACC	R		Y	Y		
Riyadh ACC	R		Y	Y		
Jeddah APP	R		Y	Y		
Riyadh APP	R		Y	Y		
Madina APP	R		Y	Y		
Damam APP	R		Y	Y		
Sudan	2	3				STCA 100% MSAW 100%
Khartoum ACC	R		Y	Y		
Khartoum APP	R		Y	Y		
Elobeid APP		P	N/A	N/A		
Nyala APP		P	N/A	N/A		
Port Sudan APP		P	N/A	N/A		
Syria	0	4				STCA 0%

State/ ATS Units (ENR & APP)	ATS		STCA	MSAW	Action Plan	Status
	R	P				
1	2	3	4	5	6	7
Damascus ACC		P				MSAW 0%
Damascus ACC		P				
Aleppo APP		P				
Latakia APP		P				
UAE	7	0	6	6		STCA 86% MSAW 86%
SZC	R		Y	Y		
Al Ain APP	R		Y	Y		
Abu Dhabi Radar	R		Y	Y		
Al Maktoum APP	R		Y	Y		
Dubai Radar	R		Y	Y		
Fujairah APP	R		Y	Y		
RAS AL KHAIMAH	R		N	N		
Yemen		3				STCA 0% MSAW 0%
Sana'a ACC		P	N/A	N/A		
Aden APP		P	N/A	N/A		
Sana'a APP		P	N/A	N/A		
Total	41	18	40 Y	40 Y		STCA 97%
Percentage			18 N/A	18 N/A		MSAW 97%

State	Fuel saving-Low (Mt)	Fuel saving-High (Mt)
BAHRAIN	7332.8	10960.8
EGYPT	2220.3	3628.7
IRAN	525	1312.5
IRAQ	1761.6	2682.2
JORDAN	690.6	2762.3
KUWAIT	1053.6	4214.6
LEBANON	617.7	1544.2
LIBYA	0	0
OMAN	1236.1	4944.3
QATAR	17408.7	29697.2
SAUDI ARABIA	470.5	1881.9
SUDAN	365.2	1460.9
SYRIA	0	0
UAE	12515.9	31192.9
YEMEN	9.2	36.7
TOTAL	46207.2	96319.2



APPENDIX C

Description of the Methodology for the Estimation of environmental benefits accrued from the implementation of priority 1 Block 0 Modules in the MID Region

- 1 The methodology was developed based on the studies carried out by the Committee on Aviation Environmental Protection (CAEP) and the defined Rules of Thumb (RoTs) agreed and endorsed by CAEP.
- 2 The objective of the Methodology is to carry out estimation of the environmental benefits (fuel savings/CO₂) accrued from the implementation of priority 1 ASBU Block 0 Modules in the MID Region.
- 3 The Methodology is focused on the Block 0 Priority 1 Modules that have shown the highest contribution to the environmental benefits in the MID Region and the implementation data for them is available. Accordingly, three (3) Modules (five RoTs) have been selected: B0-APTA, B0-CDO and B0-CCO.

Note 1 – CAEP studies have determined the contribution of each studied Block 0 Module at the Global and Regional Level, including those of the MID Region.

Note 2 – additional information on CAEP studies could be found in CAEP/10-WP/39. A summary of the studies is reflected in the ANSIG/3-WP/14.

- 4 Number of Departures were received from the traffic data available to the ICAO ATB. However, the traffic data for some International Airports was missing.
- 5 Percentage of traffic using APTA, CDO and CCO procedures represents percentage of the implementation of those procedures.

Note 3 – based on traffic data, around 70% of the traffic operated in the MID States' International Airports are Medium and 30% Heavy.

- 6 Fuel saving for each of the RoTs (elements) is based on a minimum and maximum estimate of the fuel saving (low to high). The following ranges have been applied, based on the CAEP studies on RoTs:
 - APTA (APTA 1 – PBN-enabled Radius to Fix approach)
 - Light/Small Airplanes (7000kg or less): 11kg/flight
 - Medium Airplanes (7000kg to 136000kg): 62kg/flight
 - Heavy Airplanes (136000kg or more): 95kg/flight
 - CCO (CCO1 – CCO)
 - Minimum saving (Low): 90kg/Departure
 - Maximum saving (High): 150kg/Departure
 - CCO (CCO2 – PBN SIDs)
 - Minimum saving (Low): 0kg/Departure
 - Maximum saving (High): 30kg/Departure
 - CDO (CDO1 – CDO)
 - Saving (Low): 60kg/Arrival
 - CDO (CDO2 – PBN STARs)
 - Minimum saving (Low): 20kg/Arrival
 - Maximum saving (High): 50kg/Arrival



ICAO

CAPACITY & EFFICIENCY

MSG/6-WP/6
Appendix D

AIR NAVIGATION REPORT

ICAO Middle East Region



SECOND EDITION (REFERENCE PERIOD: January – December 2017)





ICAO

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A Coordinated Approach to Regional Air Navigation Systems Implementation

The air transport industry plays a major role in world economic activity. It directly and indirectly supports 67.3 million jobs by aviation worldwide, contributes over \$2.7 trillion to global Gross Domestic Product (GDP), and carries over 4.1 billion passengers and 53 million tonnes of freight annually.

This is illustrated by the fact that over half of the world's 1.2 billion tourists who travelled across international borders last year were transported by air, and that air transport now carries some 35% of world trade by value. Indeed, more than 90% of cross border Business-to-Consumer (B2C) e-commerce was carried by air transport.

Middle East has been the fastest growing Region for passenger and cargo traffic since 2011. In 2016, MID air carriers recorded 11.8% growth in Revenue Passenger-Kilometers (RPKs). Although this growth has declined to 6.9% in 2017, the Region carried 14% RPK share in the year 2017.

The continuing growth of traffic in the MID Region places increased demand on airspace capacity, which necessitates an optimum utilization of the available airspace and airports.

One of the key elements to maintaining the vitality of civil aviation is to ensure safe, secure, efficient and environmentally sustainable operations at the global, regional and national levels. In this respect, ICAO works constantly to address the expectations of the aviation community in all key performance areas through the following coordinated activities:

- Policy and Standardization initiatives;
- Implementing programmes to address performance issues;
- Monitoring of key performance trends and indicators; and
- Performance Analysis.

The GANP represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives.



Mohamed K. Rahma
Regional Director,
ICAO Middles East Office

Its structured approach, organized in blocks of upgrades in non-overlapping six-year time increments starting in 2013 and continuing through 2031 and beyond, provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers.

The GANP also explores the need for more integrated aviation planning at both regional and national level and addresses required solutions through the consensus-driven Aviation System Block Upgrade (ASBU) systems engineering modernization strategy.

In all of its coordinated activities, ICAO always strives to achieve a balance between the need for increased capacity and efficiency while maintaining aviation safety and the impact on climate change at an acceptable level.

The regular review of implementation progress and the analysis of potential impediments will ultimately ensure the harmonious transition from one region to another following major traffic flows, as well as ease the continuous evolution towards the GANP's performance targets.

MID Air Navigation Report is the main tool for monitoring and reporting on the status of air navigation systems implementation in the MID Region.

This second edition of the Report provides update on the status and progress of the Priority 1 ASBU Block 0 Modules within the ICAO MID Region during the reporting period of January 2017 to December 2017.

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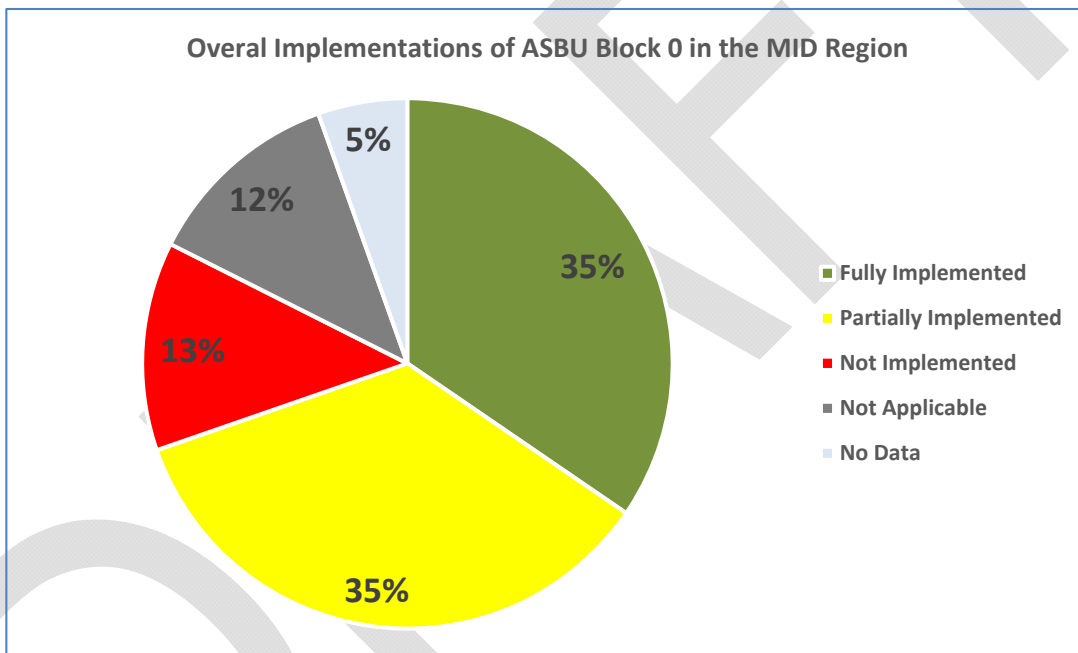
EXECUTIVE SUMMARY

The Second Edition of the ICAO MID Air Navigation Report (2017) provides an overview of the status of implementation of the Priority 1 ASBU Block 0 Modules in the MID Region as well as the progress achieved by MID States from the first edition of the MID Air Navigation Report (2016).

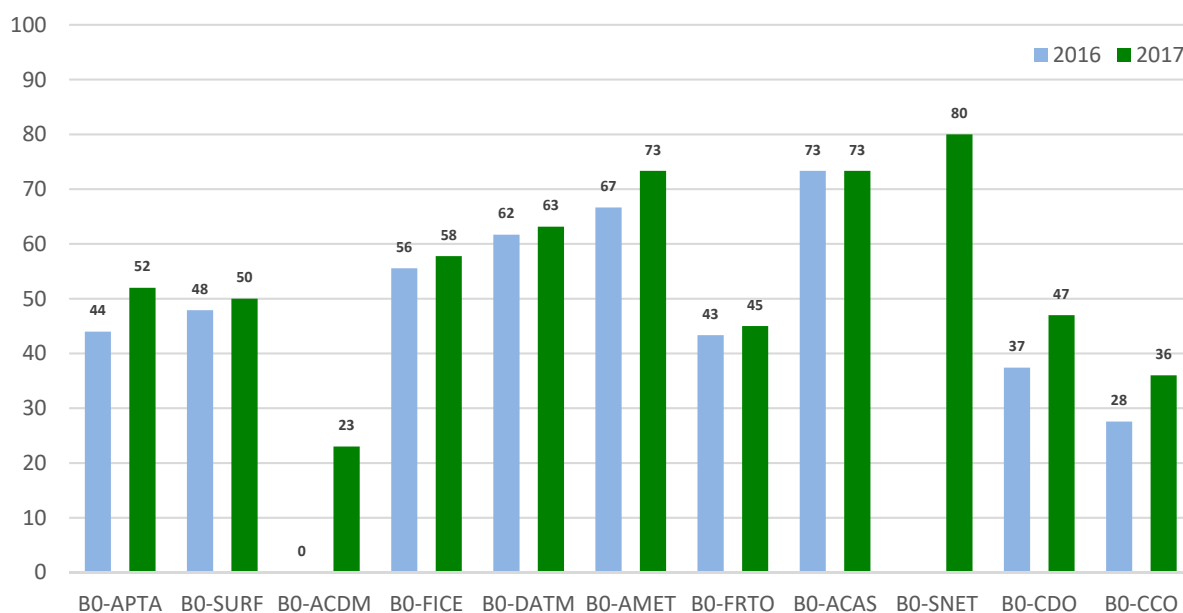
The main part of the document includes Section 2, which provides the status of implementation and the Regional Dashboard for the Priority 1 ASBU Block 0 Modules in the MID Region through different statistical maps and charts.

This Section will be complemented by providing the Outlook 2020 of the Region in Section 3 and environmental protection matters in Section 4. Section 5 provides some best practices/success stories of States in the implementation of ASBU Block 0 Modules.

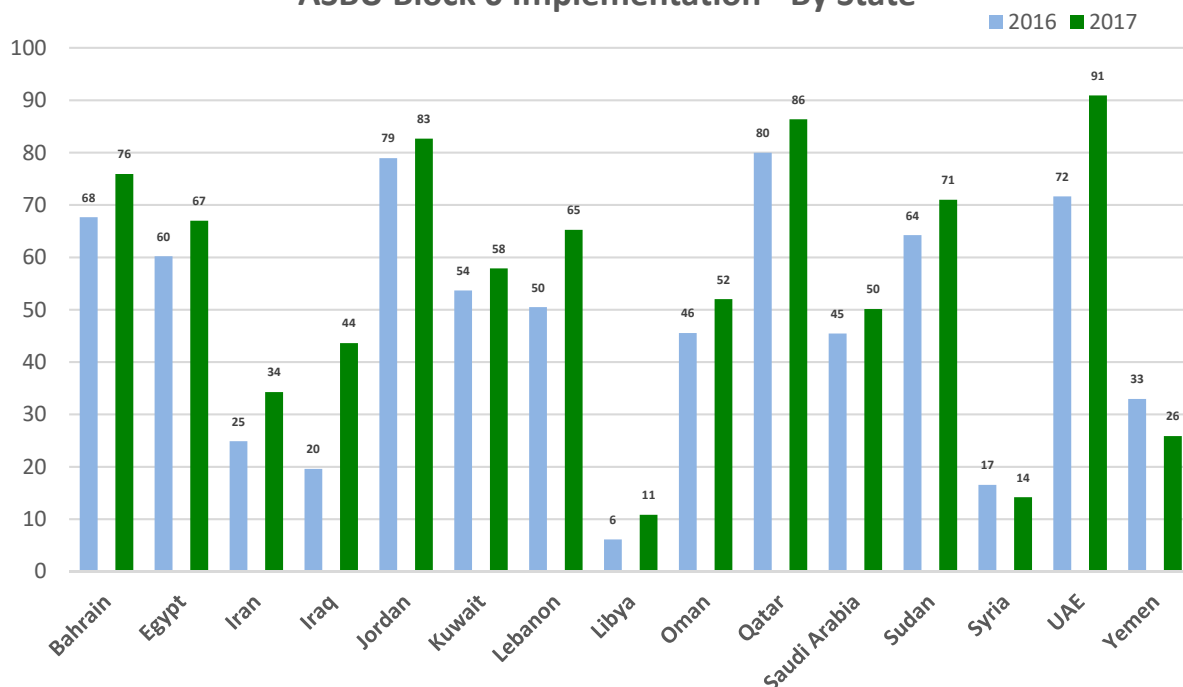
To summarize the implementation status and progress of ASBU Block 0 Modules, the following ASBU Block 0 Implementation Dashboards present status and progress achieved in the implementation of each Module and by State. Detailed status is provided in Section 2.



ASBU Block 0 Implementation - By Module



ASBU Block 0 Implementation - By State



Note 1 – utmost care was taken in the calculation of percentages, figures and numbers, however the statistics and graphs in this report should be considered as approximate amounts.

Note 2 – progress of States from 2016 to 2017 may be from the States implementation as well as some changes in the Modules structure (i.e. introduction of new element for BO-AMET, introduction of BO-SNET as a new Priority1 Module and definition of applicable aerodromes for BO-CDO and BO-CCO)

1. INTRODUCTION

1.1 Objectives

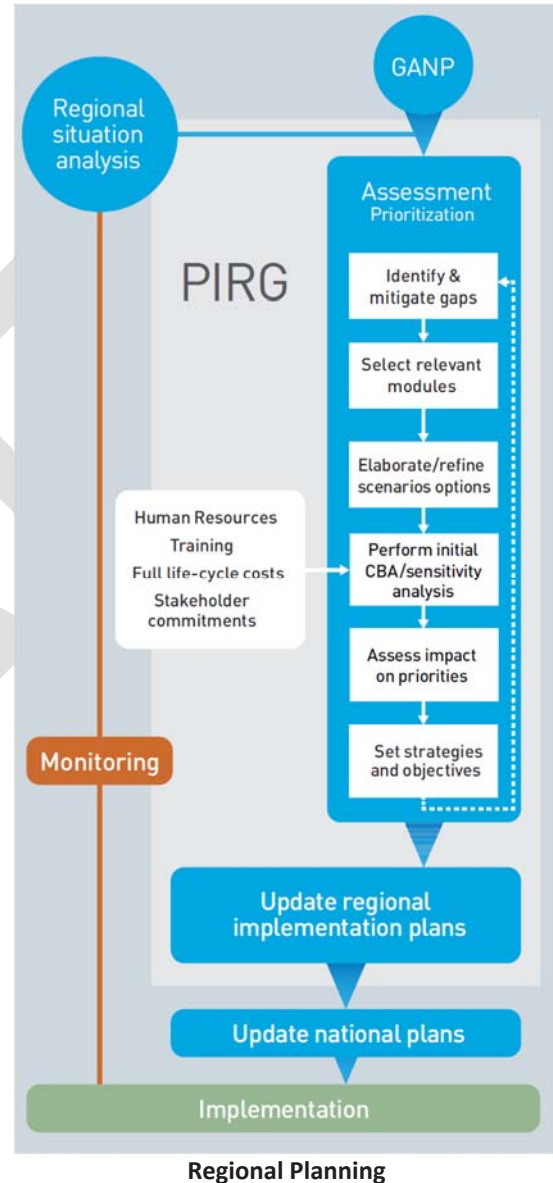
The second edition of the ICAO MID Region Air Navigation Report presents an overview of the planning and implementation progress for the Priority 1 ASBU Block 0 Modules (and its detailed elements) within the ICAO MID Region during the reporting period January 2017 till December 2017.

The implementation status data covers the fifteen (15) ICAO MID States.

GANP states that the regional national planning process should be aligned and used to identify those Modules which best provide solutions to the operational needs identified. Depending on implementation parameters such as the complexity of the operating environment, the constraints and the resources available, regional and national implementation plans will be developed in alignment with the GANP. Such planning requires interaction between stakeholders including regulators, users of the aviation system, the air navigation service providers (ANSPs), aerodrome operators and supply industry, in order to obtain commitments to implementation.

Accordingly, deployments on a global, regional and sub-regional basis and ultimately at State level should be considered as an integral part of the global and regional planning process through the Planning and Implementation Regional Groups (i.e. MIDANPIRG). The PIRG process will further ensure that all required supporting procedures, regulatory approvals and training capabilities are set in place. These supporting requirements will be reflected in regional online Air Navigation Plan (MID eANPs) developed by MIDANPIRG, ensuring strategic transparency, coordinated progress and certainty of investment. In this way, deployment arrangements including applicability dates can also be agreed and collectively applied by all stakeholders involved in the Region. The MID Region Air Navigation Report which contains all information on the implementation process of the

Priority 1 ASBU Modules of the MID Region Air Navigation Strategy (MID Doc 002) is the key document for MIDANPIRG and its Subsidiary Bodies to monitor and analyze the implementation within the MID Region.



1.2 Background

Following the discussions and recommendations from the Twelfth Air Navigation Conference (AN-Conf/12), the Fourth Edition of the Global Air Navigation Plan (GANP) based on the Aviation Systems Block Upgrades (ASBU) approach was endorsed by the 38th Assembly of ICAO in October 2013. The Assembly Resolution 38-02 which agreed, amongst others, to call upon States, planning and implementation regional groups (PIRGs), and the aviation industry to provide timely information to ICAO (and to

each other) regarding the implementation status of the GANP, including the lessons learned from the implementation of its provisions and to invite PIRGs to use ICAO standardized tools or adequate regional tools to monitor and (in collaboration with ICAO) analyze the implementation status of air navigation systems.

The Fourth meeting of the MIDANPIRG Steering Group (MSG/4) which was held in Cairo, Egypt from 24 to 26

November 2014 endorsed the MID Region Air Navigation Strategy. The Strategy was later updated by MIDANPIRG/15 and 16 and published as MID Doc 002. The Strategy includes 12 priority 1 Block 0 Modules and their associated performance indicators and targets.

MIDANPIRG and its Subsidiary Bodies (in particular ANSIG) monitor the progress and the status of implementation of the ASBU Block 0 Modules in the MID Region.

Doha Declaration, which was endorsed by the third meeting of Directors General of Civil Aviation (DGCA-MID/3) (Doha, Qatar, 27-29 April 2015), has set five Targets for the Air Navigation Capacity and Efficiency, as follows:

- 1- *Optimization of Approach Procedures including vertical guidance (PBN):* Implement PBN approach procedures with vertical guidance, for all runway ends at international aerodromes, either as the primary approach or as a back-up for the precision approaches by 2017
- 2- *Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration:* 11 States to implement AIDC/OLDI between their ACCs and at least one adjacent ACC by 2017
- 3- *Service Improvement through Digital Aeronautical Information Management:* All States to complete

implementation of Phase I of the transition from AIS to AIM by 2017

- 4- *Meteorological information supporting enhanced operational efficiency and safety:* 12 States to complete the implementation of QMS for MET by 2017
- 5- *ACAS Improvement:* All States require carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons by 2017

The MID Region Air Navigation Report is an integral part of the air navigation planning and implementation process in the MID Region; and the main tool for the monitoring and assessing the implementation of Air navigation Systems and ASBUs in the MID Region.

1.3 Scope

This MID Air Navigation Report addresses the implementation status of the priority 1 ASBU Block 0 Modules for the reference period January 2017 to December 2017.

The Report covers the fifteen (15) ICAO MID States:

Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates and Yemen.

ICAO MID Region



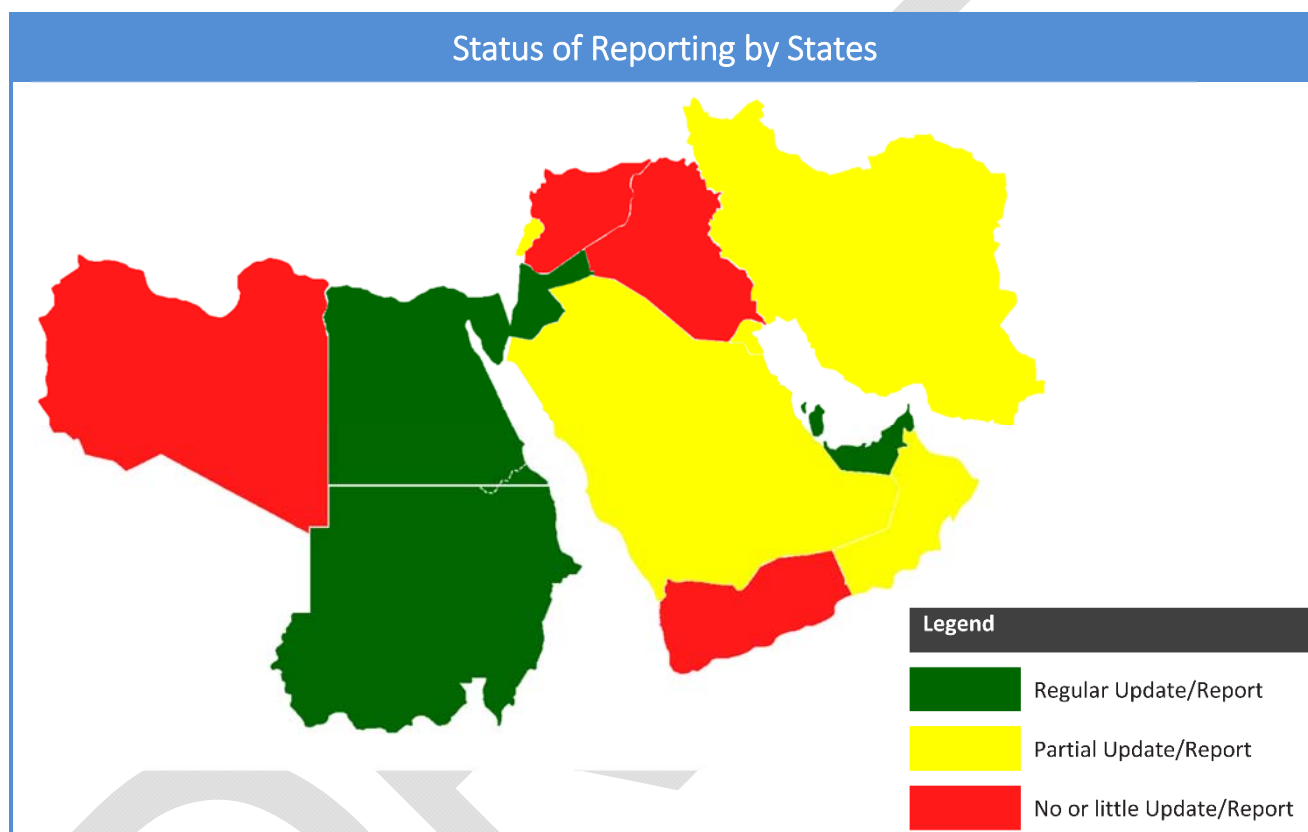
1.4 Collection of data

For the purpose of collecting necessary data for the MID Air Navigation Report-2017, a State Letter Ref.: AN 1/7 – 17/188 was issued on 2 July 2017, to follow-up on the MIDANPIRG Conclusion 16/8, which urged States to provide the relevant data necessary for the development of the MID Region Air Navigation Report-2017. However, some States did not respond to the

State Letter. Status of States providing update is shown in the following map.

Data collected from States was complemented by some updates provided mainly through the MIDANPIRG Subsidiary Bodies and the MID eANP Volume III.

Where the required data was not provided, it is indicated in the Report by color coding (Missing Data).



1.5 Structure of the Report

Executive Summary provides an overall review of the ASBU Block 0 implementation in the MID Region.

Section 1 (Introduction) presents the objective and background of the report as well as the scope covered and method of data collection.

Section 2 lists the priority 1 ASBU Block 0 Modules in the MID Region and presents the status of their implementation and their progress in graphical and numeric form.

Section 3 presents the ASBU Block 0 implementation outlook for 2020 in the MID Region.

Section 4 provides an update on the State's CO2 action plans and presents an estimation of environmental benefits, in terms of CO2 emissions reduction, accrued

from the implementation of some ASBU Block 0 Modules in the MID Region.

Section 5 includes some success stories related to the NCLB activities and implementation of ASBU Block 0 Modules, as well as their associated operational improvements and environmental benefits.

Section 6 concludes the Report by providing a brief analysis on the status of implementation and the progress of the different priority 1 ASBU Block 0 Modules.

Appendix A provides detailed status of the implementation of Priority 1 Block 0 Modules and their associated Elements for the MID States.

Appendix B illustrates the detailed status of implementation of ASBU Block 0 Modules in the MID States by 2020.



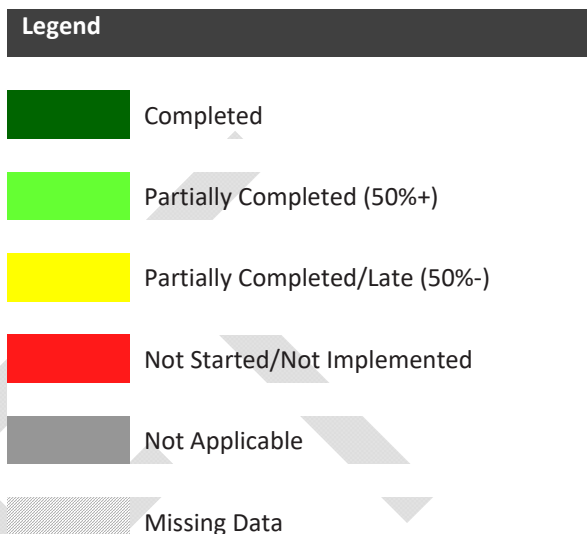
2. STATUS AND PROGRESS OF ASBU IMPLEMENTATION

The ICAO Block Upgrades refer to the target availability timelines for a group of operational improvements (technologies and procedures) that will eventually realize a fully-harmonized global Air Navigation System. The technologies and procedures for each Block have been organized into unique Modules which have been determined and cross-referenced based on the specific Performance Improvement Area to which they relate.

Block 0 Modules are characterized by operational improvements which have already been developed and implemented in many parts of the world. It therefore has a near-term implementation period of 2013–2018, whereby 2013 refers to the availability of all components of its particular performance modules and 2018 refers to the target implementation deadline. ICAO has been working with its Member States to help each determine exactly which capabilities they should have in place based on their unique operational requirements.

This chapter of the report gives an overview of the status of implementation for each of the Priority 1 ASBU Block 0 Modules for the MID States. The status of implementation of each Module versus its target(s) is also provided for each priority 1 ASBU Block 0 Module.

The following color scheme is used for illustrating the status of implementation:



Note – Missing data is excluded in the calculation of the average regional status of implementation.

2.1 MID Region ASBU Block 0 Modules Prioritization

This report covers twelve (out of eighteen) ASBU Block 0 Modules that have been determined by MIDANPIRG/MSG as priority 1 for the MID Region (MID Doc 002 Edition February 2017, refers).

Module Code	Module Title	Priority	Start Date	Monitoring		Remarks
				Main	Supporting	
Performance Improvement Areas (PIA) 1: Airport Operations						
B0-APTA	Optimization of Approach Procedures including vertical guidance	1	2014	PBN SG	ATM SG, AIM SG, CNS SG	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	2				
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	2				
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	1	2014	ANSIG	CNS SG	Coordination with RGS WG
B0-ACDM	Improved Airport Operations through Airport-CDM	1	2014	ANSIG	CNS SG, AIM SG, ATM SG	Coordination with RGS WG
Performance Improvement Areas (PIA) 2 Globally Interoperable Systems and Data Through Globally Interoperable System Wide Information Management						
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	1	2014	CNS SG	AIM SG, ATM SG	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	1	2014	AIM SG		
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	1	2014	MET SG		
Performance Improvement Areas (PIA) 3 Optimum Capacity and Flexible Flights – Through Global Collaborative ATM						
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	1	2014	ATM SG		
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	1	2014			
B0-ASUR	Initial capability for ground surveillance	2				
B0-ASEP	Air Traffic Situational Awareness (ATSA)	2				
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	2				
B0-ACAS	ACAS Improvements	1	2014	CNS SG		
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	1	2017	ATM SG		

Performance Improvement Areas (PIA) 4 Efficient Flight Path – Through Trajectory-based Operations

B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	1	2014	PBN SG		
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	2		ATM SG	CNS SG	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	1	2014	PBN SG		

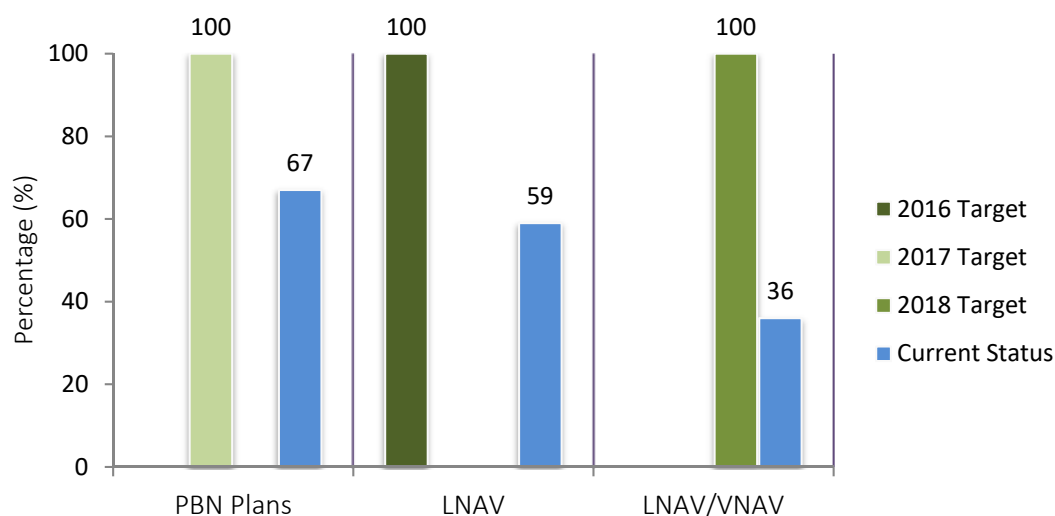
2.2 ASBU Implementation Status and Progress in the MID Region

2.2.1 B0-APTA

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.

B0 – APTA: Optimization of Approach Procedures including vertical guidance			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
States' PBN Implementation Plans	All States	Indicator: % of States that provided updated PBN implementation Plan Supporting metric: Number of States that provided updated PBN implementation Plan	100% by Dec. 2018
LNAV	All RWYs Ends at International Aerodromes	Indicator: % of runway ends at international aerodromes with RNAV(GNSS) Approach Procedures (LNAV) Supporting metric: Number of runway ends at international aerodromes with RNAV (GNSS) Approach Procedures (LNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2016
LNAV/VNAV	All RWYs ENDs at International Aerodromes	Indicator: % of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2017

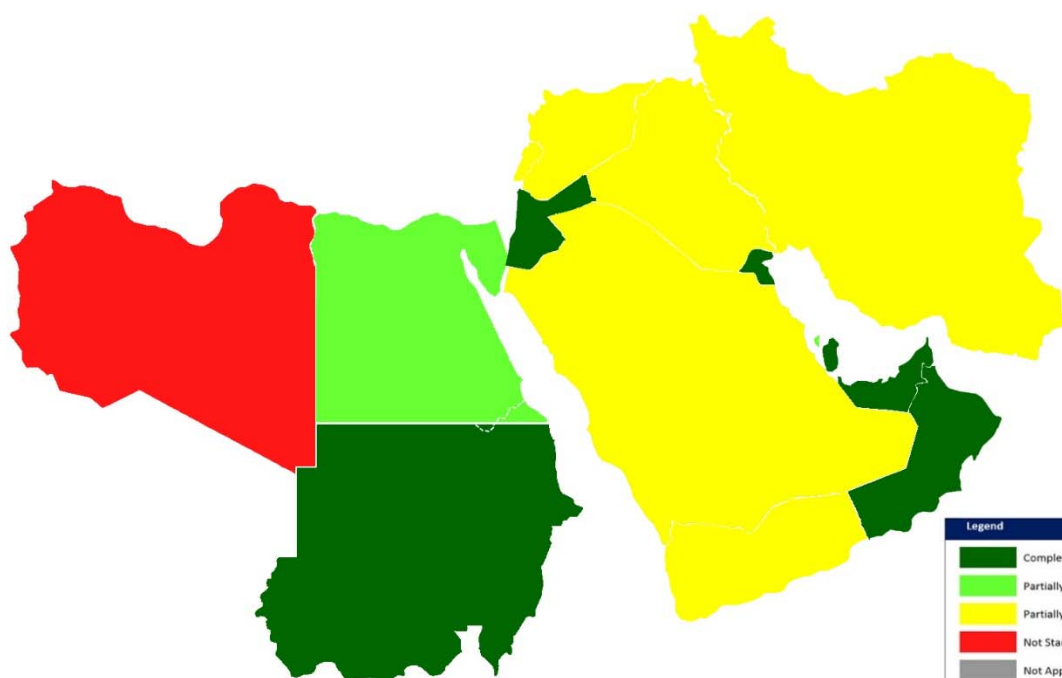
B0-APTA Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-APTA	PBN Plan															
	LNAV															
	LNAV/VNAV															

The progress for B0-APTA is good (with approximately 52% implementation).

B0-APTA Status of implementation in the MID Region

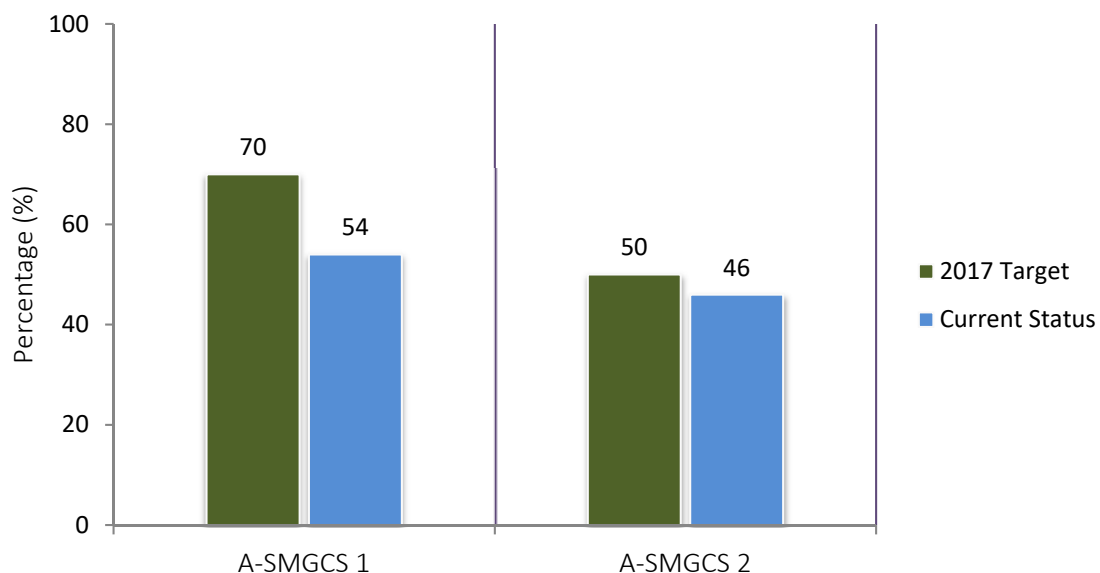


2.2.2 B0-SURF

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).

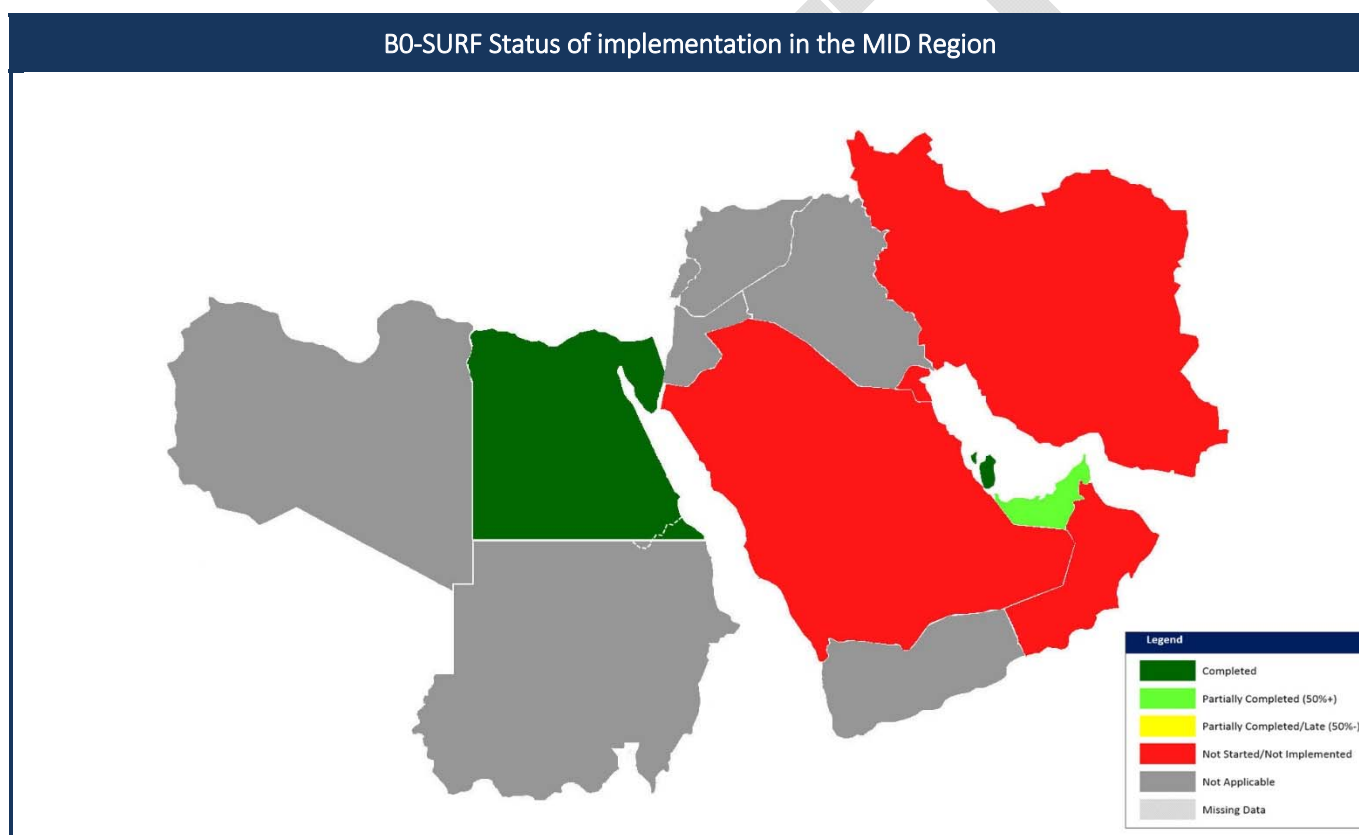
B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
A-SMGCS Level 1*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 1 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 1	70% by Dec. 2017
A-SMGCS Level 2*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 2 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 2	50% by Dec. 2017

B0-SURF Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-SURF	A-SMGCS Level 1															
	A-SMGCS Level 2															

The progress for B0-SURF is good (with approximately 50% implementation). B0-SURF is not applicable for 7 States.

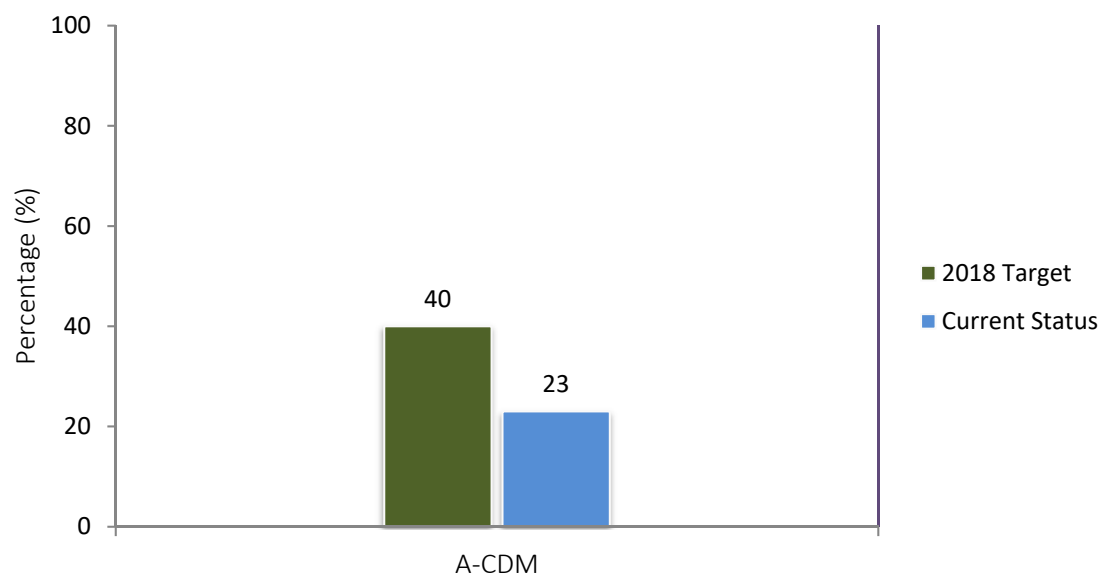


2.2.3 B0-ACDM

To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.

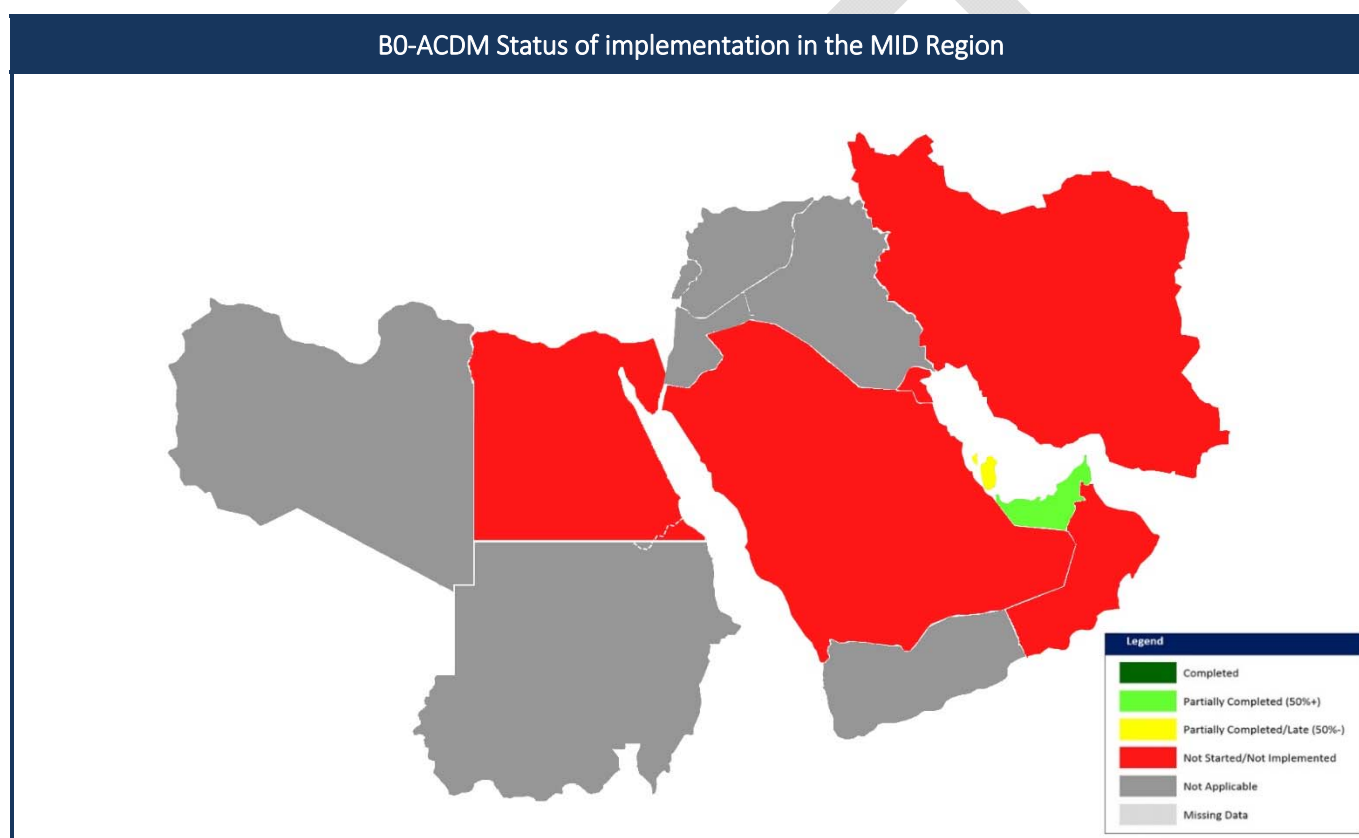
B0 – ACDM: Improved Airport Operations through Airport-CDM			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	50% by Dec. 2018

B0-ACDM Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-ACDM	A-CDM	Yellow	Red	Red	Grey	Grey	Red	Grey	Grey	Red	Yellow	Red	Grey	Grey	Green	Grey

The progress for B0-ACDM is very slow (with approximately 23% implementation. Nevertheless, implementation is ongoing in some States.



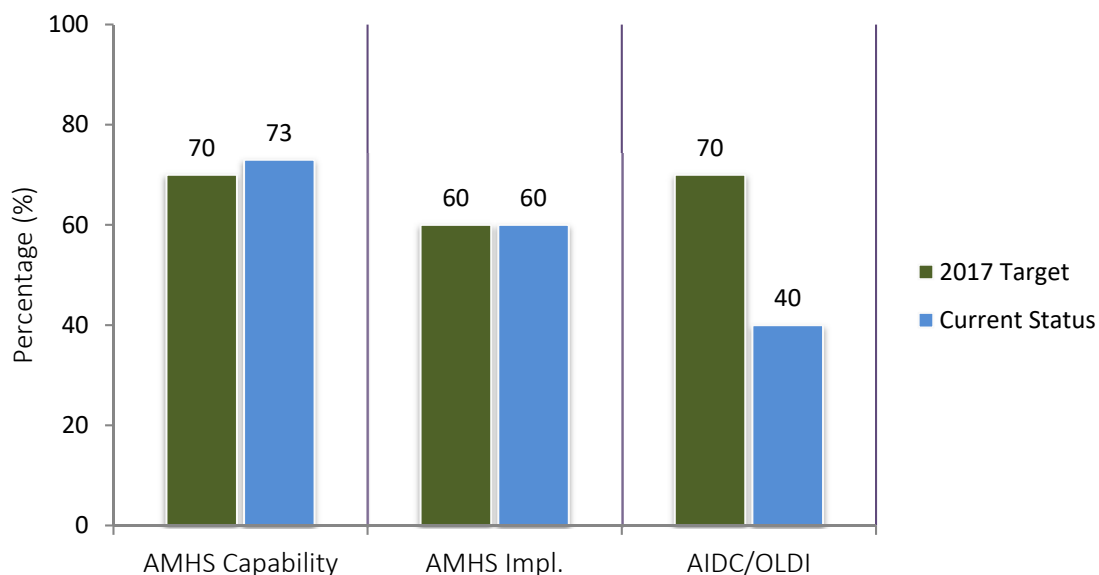
2.2.4

B0-FICE

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.

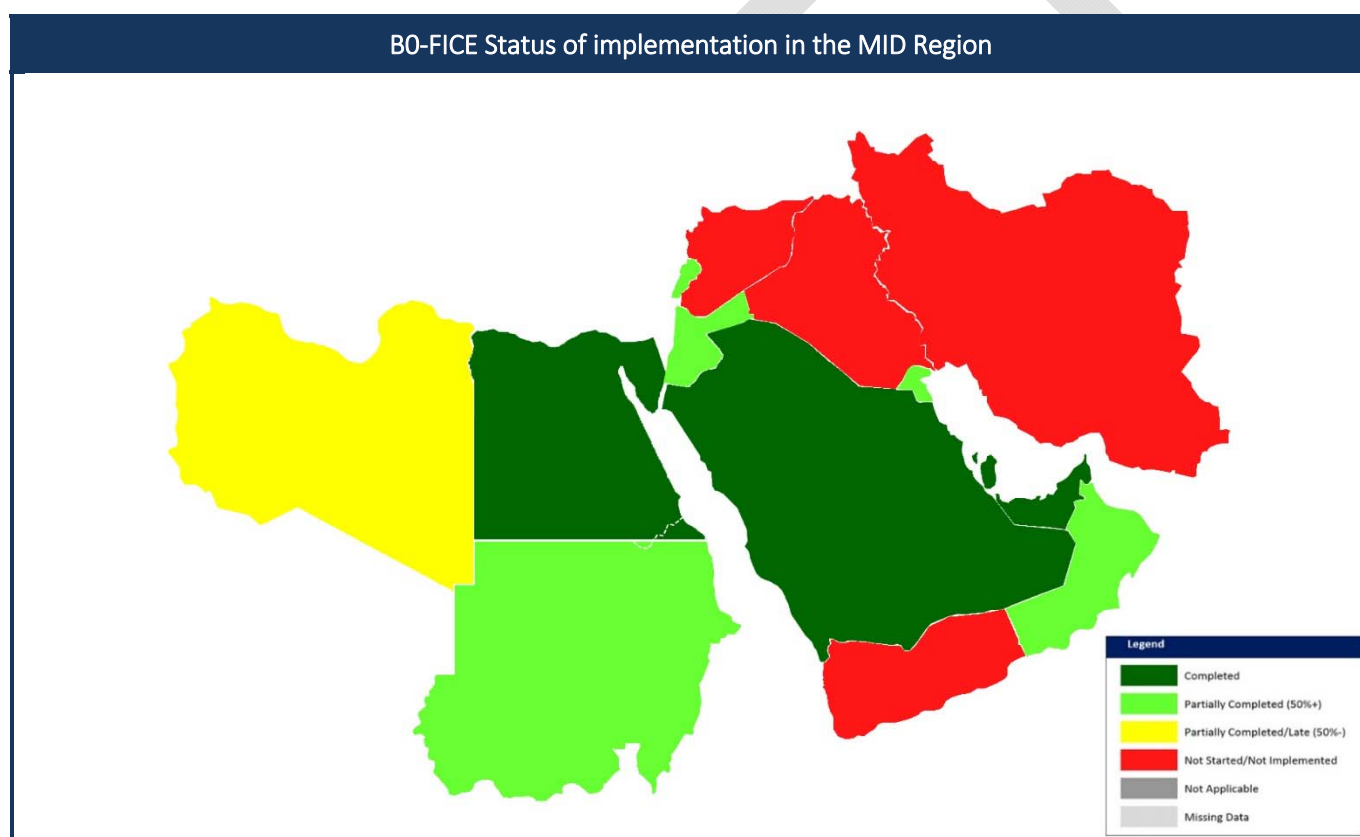
B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
AMHS capability	All States	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS capability	70% of States with AMHS capability by Dec. 2017
AMHS implementation /interconnection	All States	Indicator: % of States with AMHS implemented (interconnected with other States AMHS) Supporting metric: Number of States with AMHS implemented (interconnections with other States AMHS)	60% of States with AMHS interconnected by Dec. 2017
Implementation of AIDC/OLDI between adjacent ACCs	All ACCs	Indicator: % of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI with neighboring ACCs Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70% by Dec. 2017

B0-FICE Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-FICE	AMHS capability															
	AMHS impl. /interconnection															
	Implementation of AIDC/OLDI between adjacent ACCs															

The progress for B0-FICE is good (with approximately 58% implementation).



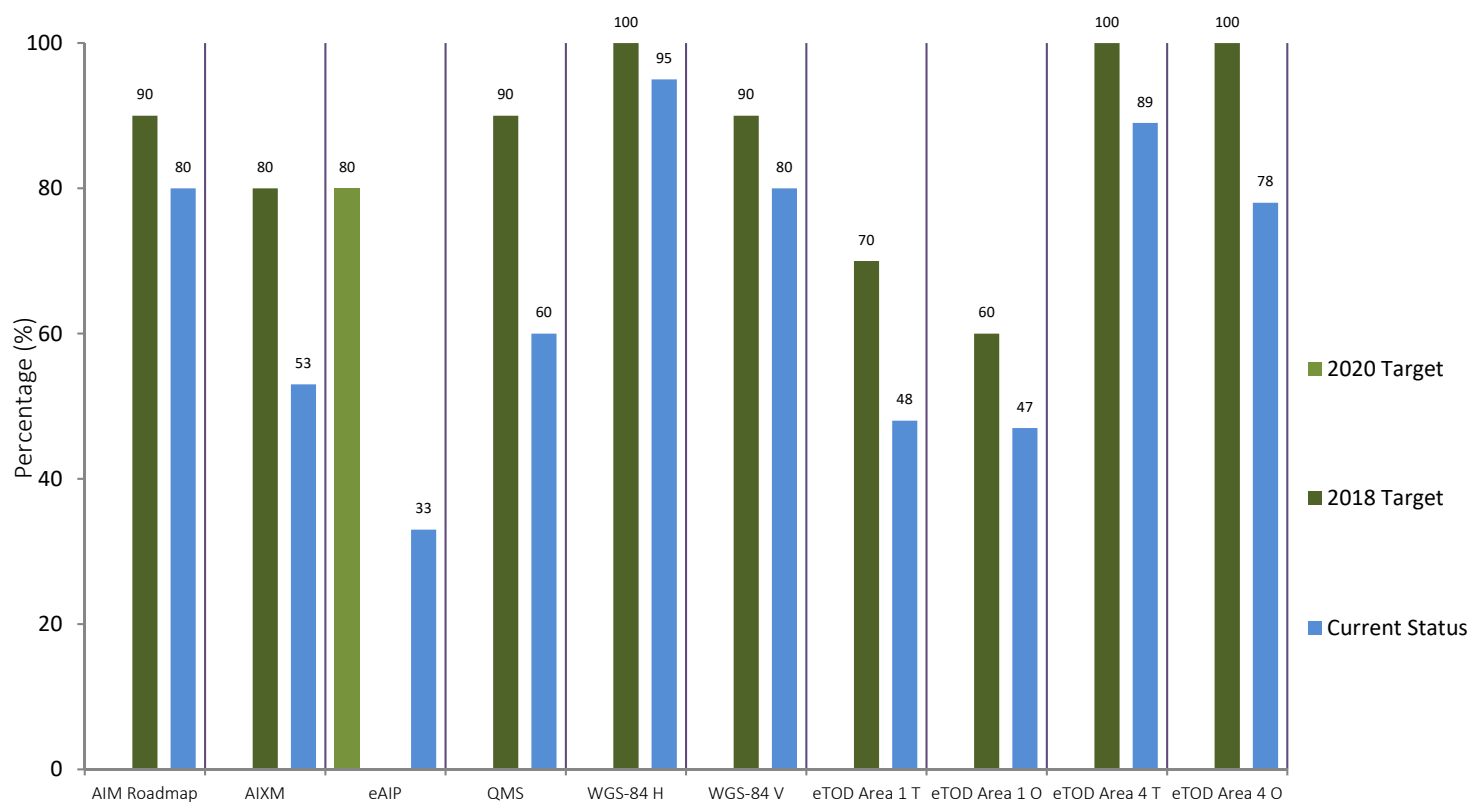
2.2.5

B0-DATM

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.

B0 – DATM: Service Improvement through Digital Aeronautical Information Management			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
National AIM Implementation Plan/Roadmap	All States	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	90% by Dec. 2018
AIXM	All States	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	80% by Dec. 2018
eAIP	All States	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)	80% by Dec. 2020
QMS	All States	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	90% by Dec. 2018
WGS-84	All States	Indicator: % of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Supporting Metric: Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Indicator: % of States that have implemented WGS-84 Geoid Undulation Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation	Horizontal: 100% by Dec. 2018 Vertical: 90% by Dec. 2018
eTOD	All States	Indicator: % of States that have implemented required Terrain datasets Supporting Metric: Number of States that have implemented required Terrain datasets Indicator: % of States that have implemented required Obstacle datasets Supporting Metric: Number of States that have implemented required Obstacle datasets	Area 1 : Terrain: 70% by Dec. 2018 Obstacles: 60% by Dec. 2018 Area 4: Terrain: 100% by Dec. 2018 Obstacles: 100% by Dec. 2018
Digital NOTAM*	All States	Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM	90% by Dec. 2020

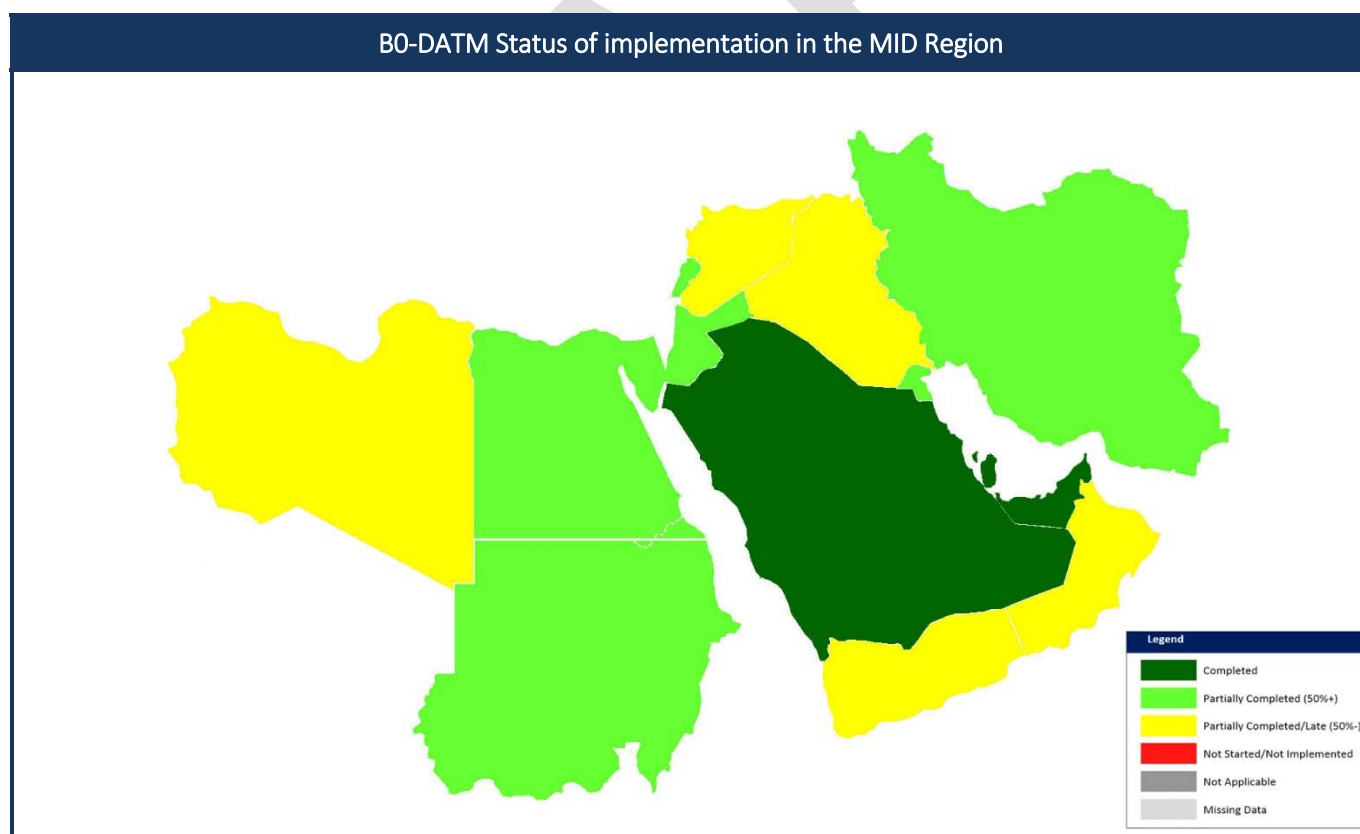
B0-DATM Status of implementation in the MID Region



OK

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-DATM	National AIM Roadmap															
	AIXM															
	eAIP															
	QMS															
	WGS-84 – H															
	WGS-84 – V															
	eTOD Area 1 Terrain															
	eTOD Area 1 Obstacles															
	eTOD Area 4 Terrain															
	eTOD Area 4 Obstacles															

The progress for B0-DATM is good (with approximately 63% implementation). eTOD Area 4 is not applicable in 6 States.



2.2.6

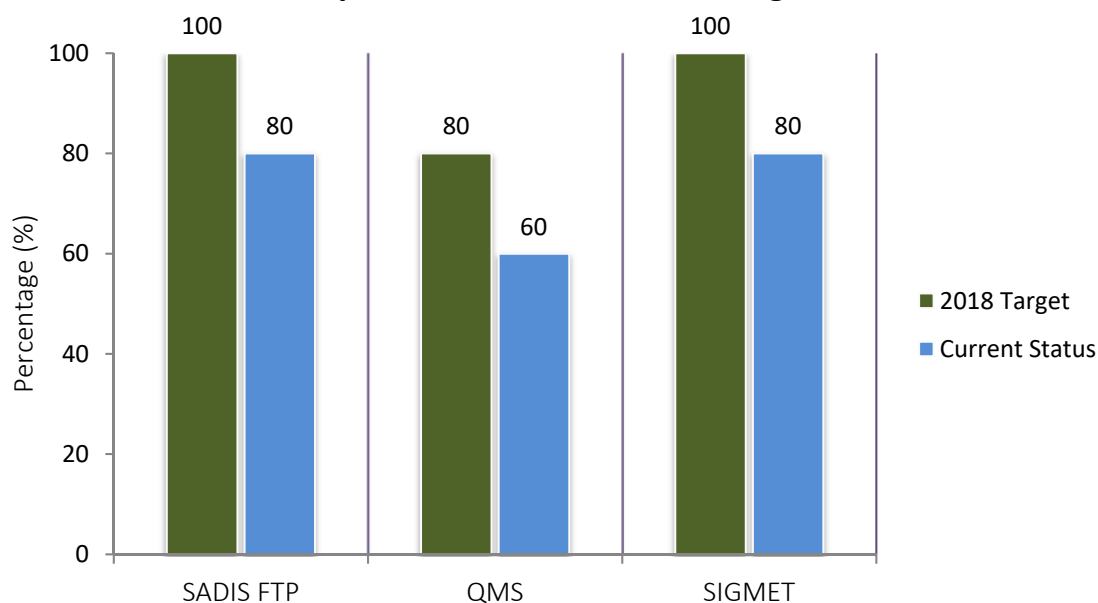
B0-AMET

Global, regional and local meteorological information:

- forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC);
- aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including wind shear; and
- 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.

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
SADIS FTP	All States	Indicator: % of States that have implemented SADIS FTP service Supporting Metric: Number of States that have implemented SADIS FTP service	100% by Dec. 2018
QMS	All States	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	80% by Dec. 2018
SIGMET	All MWOs in MID Region	Indicator: % of FIRs in which SIGMET is implemented Supporting metric: number of FIRs SIGMET is implemented	100% by Dec. 2018

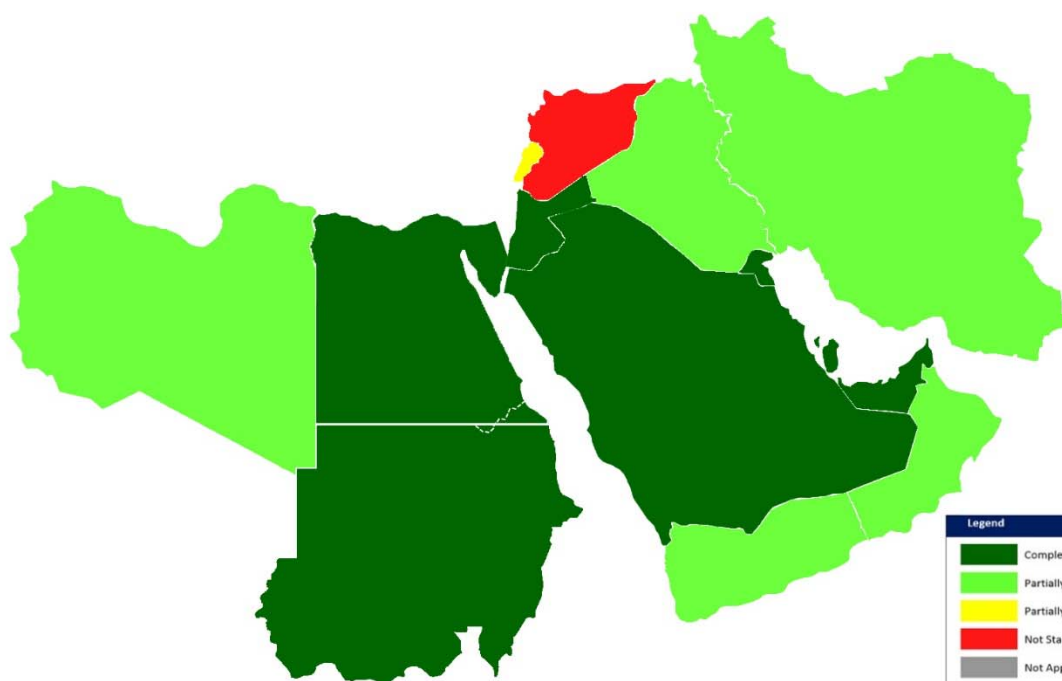
B0-AMET Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-AMET	SADIS FTP															
	QMS															
	SIGMET															

The progress for B0-AMET is good (with approximately 73% implementation).

B0-AMET Status of implementation in the MID Region



2.2.7

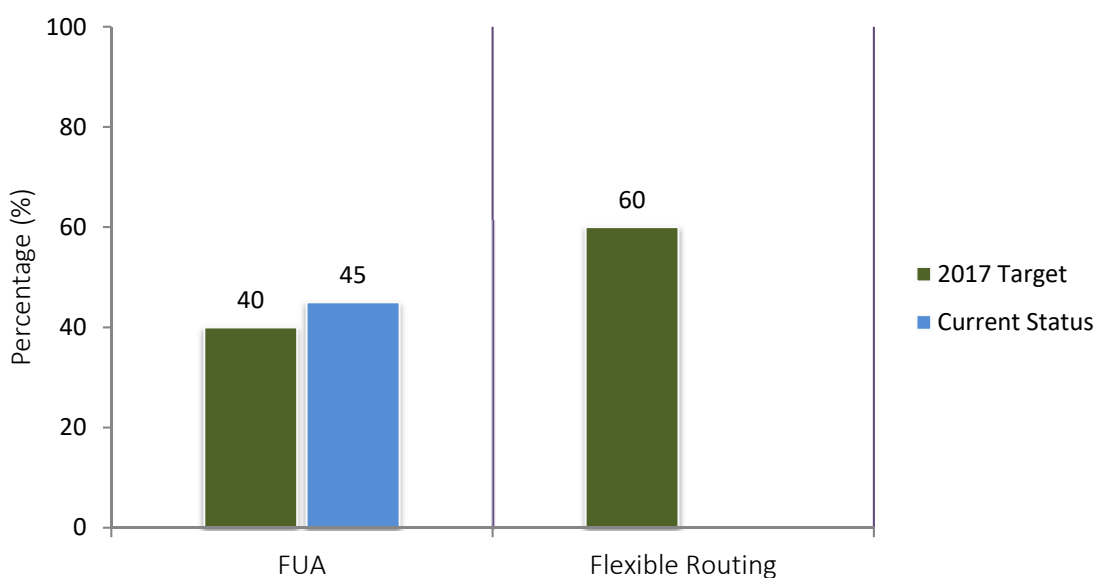
B0-FRTO

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.

B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Flexible use of airspace (FUA)	All States	Indicator: % of States that have implemented FUA Supporting metric*: number of States that have implemented FUA	40% by Dec. 2017
Flexible routing	All States	Indicator: % of required Routes that are not implemented due military restrictions (segregated areas) Supporting metric 1: total number of ATS Routes in the Mid Region Supporting metric 2*: number of required Routes that are not implemented due military restrictions (segregated areas)	60% by Dec. 2017

* Implementation should be based on the published aeronautical information

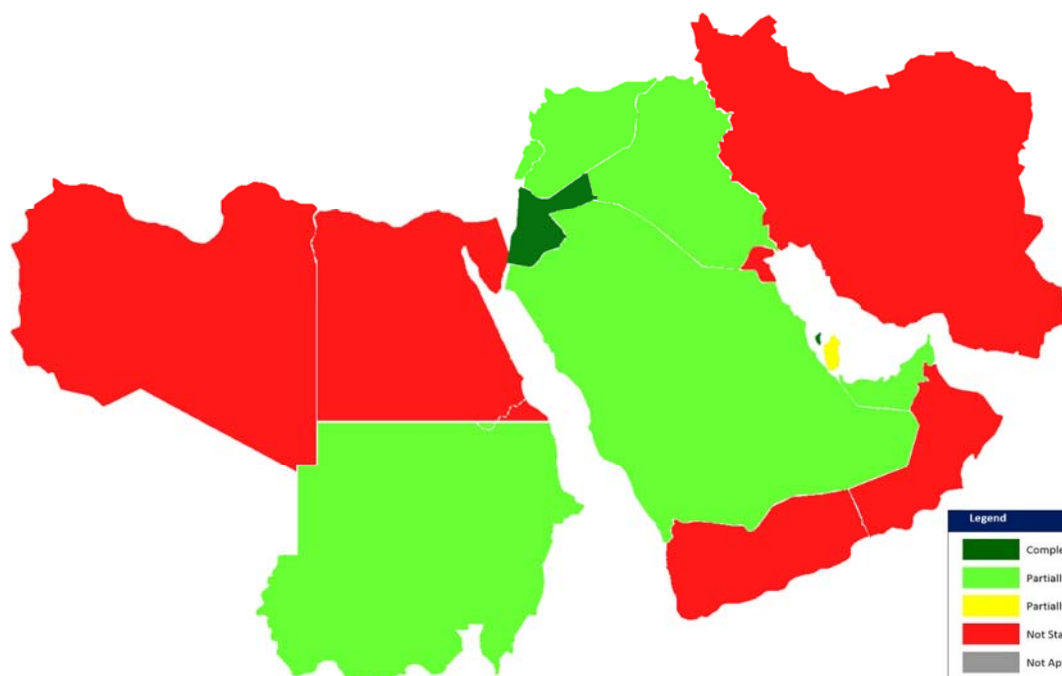
B0-FRTO Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-FRTO	Flexible use of airspace (FUA)	Completed	Not Started/Not Implemented	Not Started/Not Implemented	Partially Completed (50%+)	Completed	Not Started/Not Implemented	Partially Completed (50%+)	Not Started/Not Implemented	Not Started/Not Implemented	Partially Completed/Late (50%-)	Partially Completed (50%+)	Partially Completed (50%+)	Partially Completed (50%+)	Partially Completed (50%+)	Not Started/Not Implemented
	Flexible routing	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data

The progress for B0-FRTO (FUA) is acceptable (with approximately 45% implementation). The element “Flexible Routing” could not be monitored because of the lack of data.

B0-FRTO (FUA) Status of implementation in the MID Region



2.2.8

B0-NOPS

Air Traffic Flow Management (ATFM) is used to manage the flow of traffic in a way that minimizes delay and maximizes the use of the entire airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or Flight Information Region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including crisis caused by human or natural phenomena.

Experience clearly shows the benefits related to managing flows consistently and collaboratively over an area of a sufficient geographical size to take into account sufficiently well the network effects. The concept for ATFM and demand and capacity balancing (DCB) should be further exploited wherever possible. System improvements are also about better procedures in these domains, and creating instruments to allow collaboration among the different actors.

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
ATFM Measures implemented in collaborative manner	All States	Indicator: % of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision Supporting metric: number of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision	100% by Dec. 2017

Note – B0-NOPS could not be monitored because the elements and associated performance indicators and targets have not yet been agreed upon and are under development.

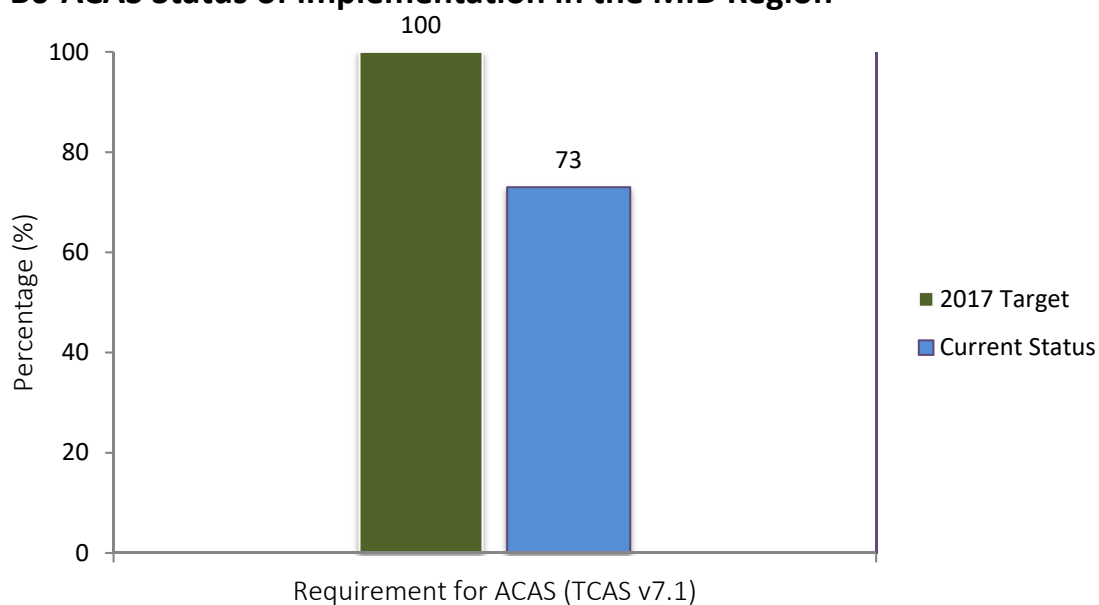
2.2.9

B0-ACAS

To provide short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation.

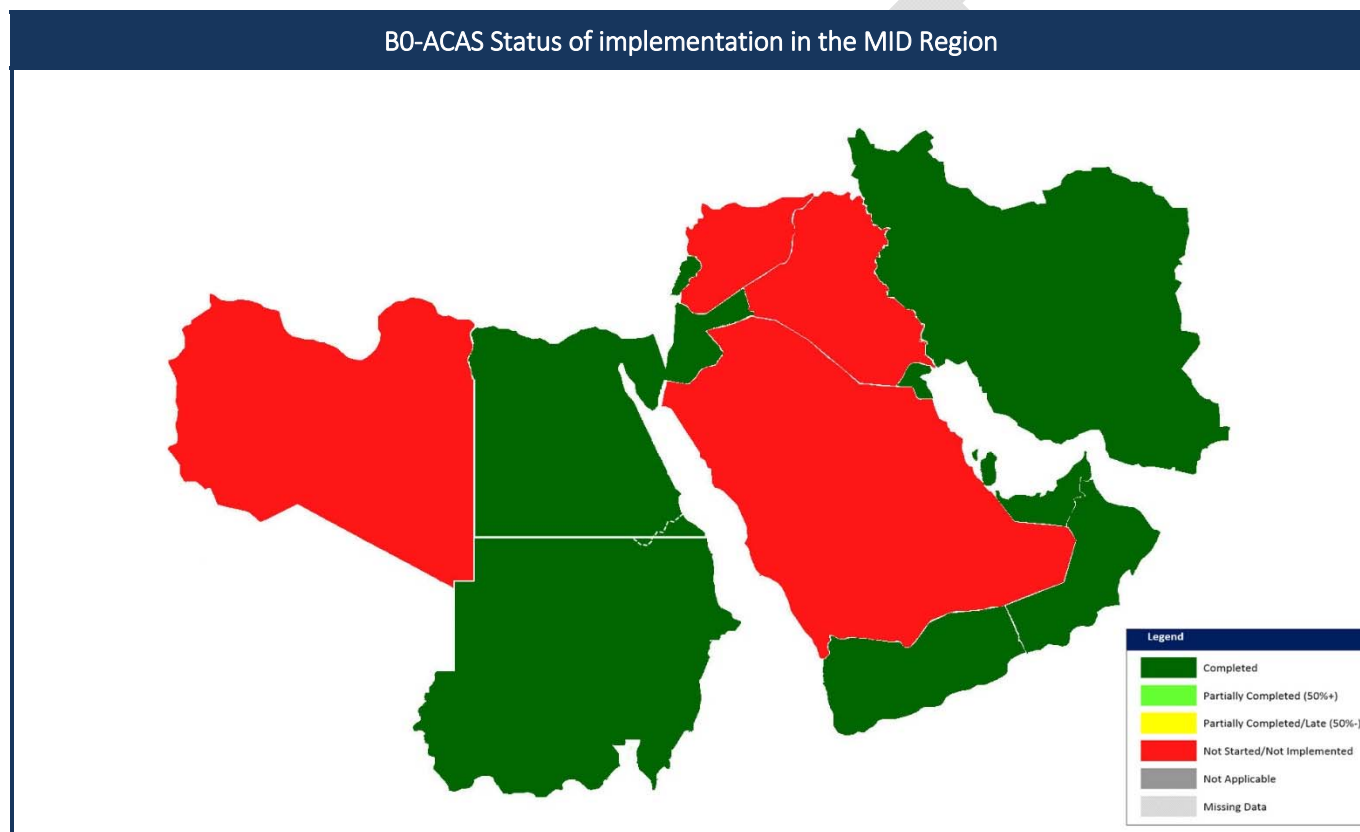
B0 – ACAS: ACAS Improvements			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Avionics (TCAS v7.1)	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	100% by Dec. 2017

B0-ACAS Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-ACAS	ACAS (TCAS V7.1)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

The progress for B0-ACAS is good (with approximately 73% implementation).



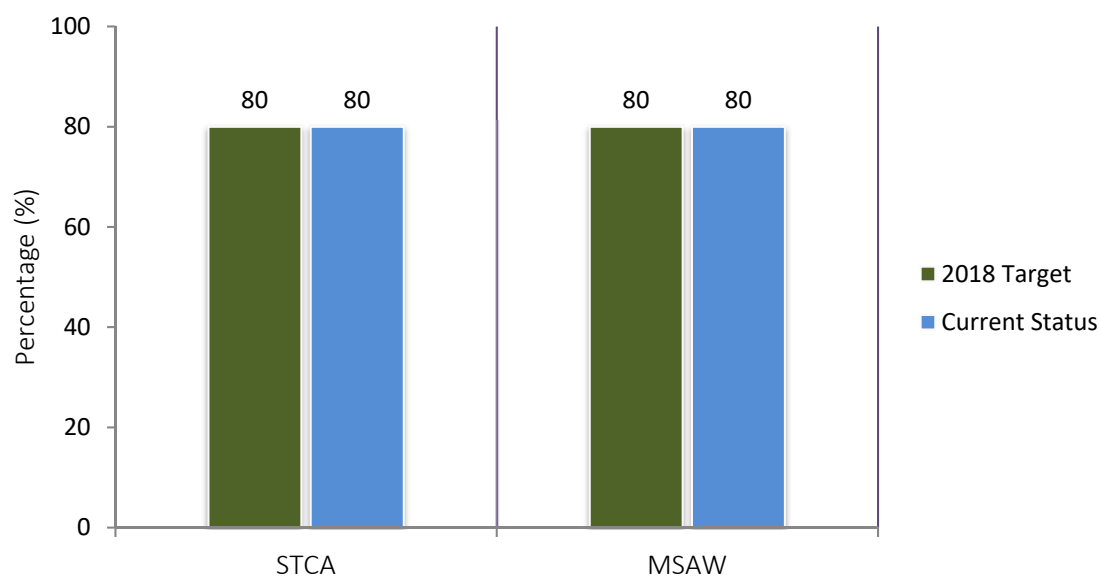
2.2.10

B0-SNET

To enable monitoring of flights while airborne to provide timely alerts to air traffic controllers of potential risks to flight safety. Alerts from short-term conflict alert (STCA), area proximity warnings (APW) and minimum safe altitude warnings (MSAW) are proposed. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centered.

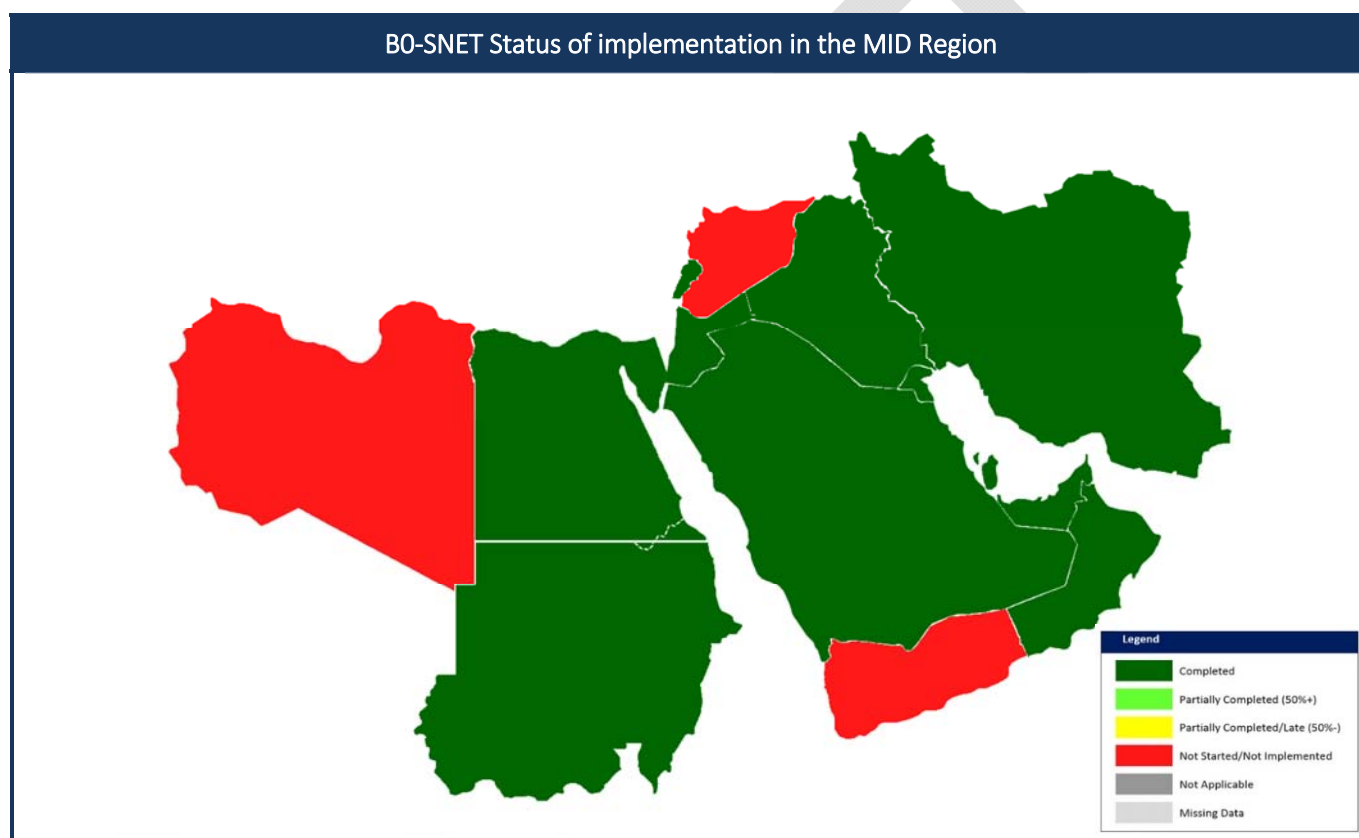
B0 – SNET: Increased Effectiveness of Ground-based Safety Nets			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Short-term conflict alert (STCA)	All States	Indicator: % of States that have implemented Short-term conflict alert (STCA) Supporting metric*: number of States that have implemented Short-term conflict alert (STCA)	80 % by 2018
Minimum safe altitude warning (MSAW)	All States	Indicator: % of States that have implemented Minimum safe altitude warning (MSAW) Supporting metric*: number of States that have implemented Minimum safe altitude warning (MSAW)	80 % by 2018

B0-SNET Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-SNET	Short-term conflict alert (STCA)															
	Minimum safe altitude warning (MSAW)															

The progress for B0-SNET is very good (with approximately 80% implementation).



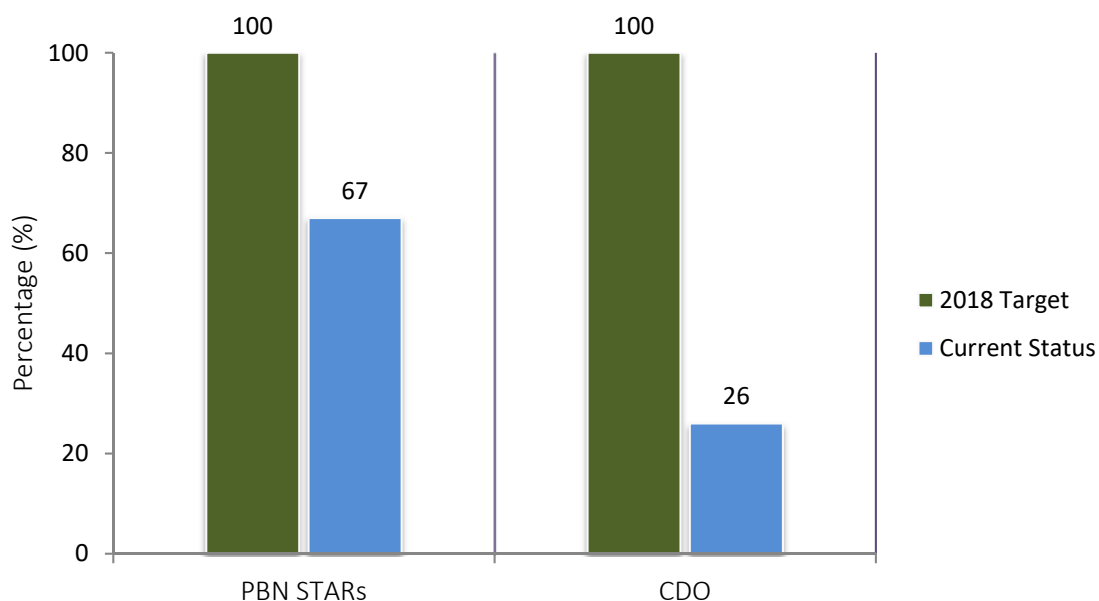
2.2.11

B0-CDO

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.

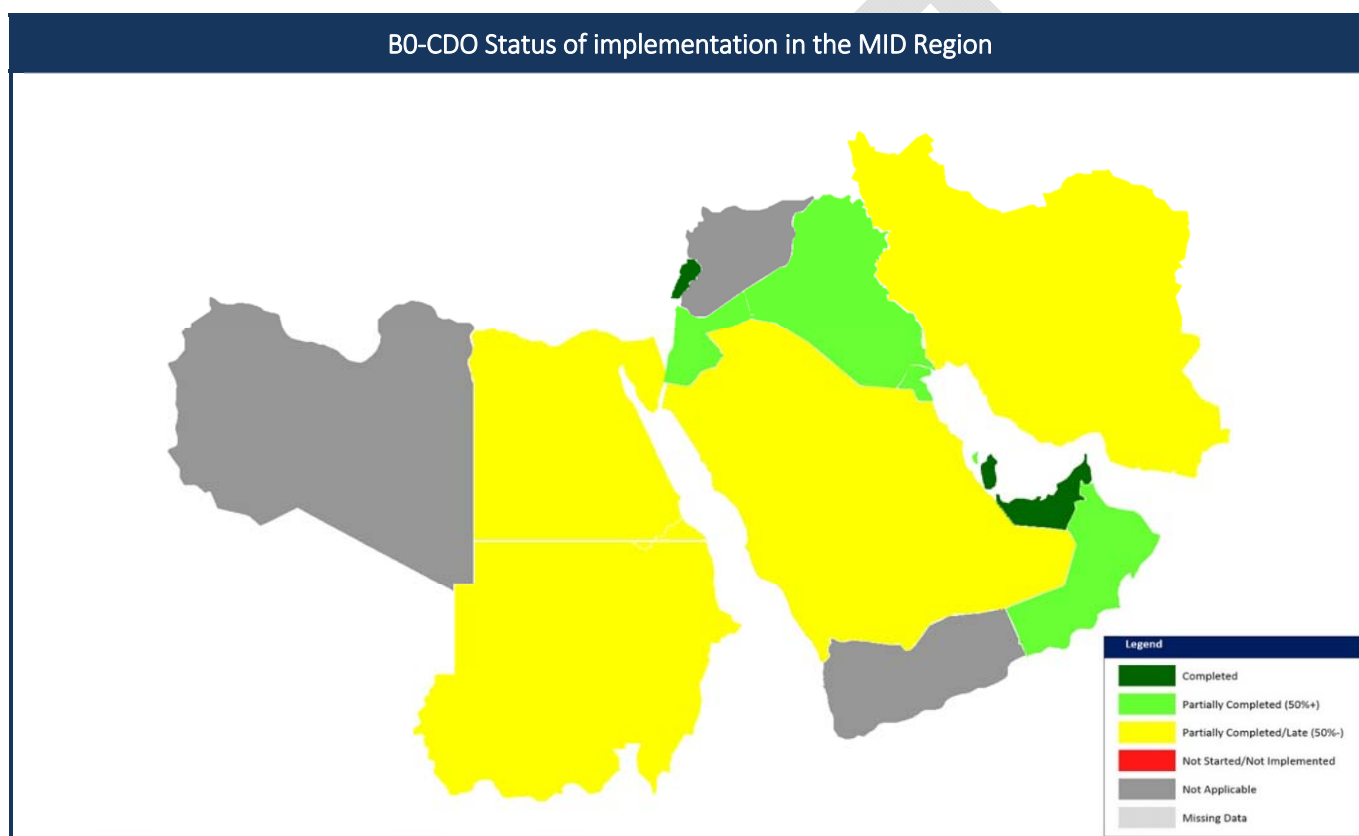
B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
PBN STARS	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with PBN STAR implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CDO	OBBI, HESH, HEMA, HEGN, OIIE, OIKB, OIFM, OJAI, OJAQ, OKBK, OLBA, OOMS, OTHH, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CDO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs

B0-CDO Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-CDO	PBN STARs	Completed	Partially Completed (50%+)	Partially Completed/Late (50%-)	Partially Completed (50%+)	Completed	Completed	Completed	Not Started/Not Implemented	Completed	Completed	Partially Completed (50%+)	Partially Completed/Late (50%-)	Not Started/Not Implemented	Completed	Not Started/Not Implemented
	International aerodromes/TMAs with CDO	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Completed	Not Started/Not Implemented	Not Started/Not Implemented	Completed	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Completed	Not Started/Not Implemented

The progress for B0-CDO is acceptable (with approximately 47% implementation).



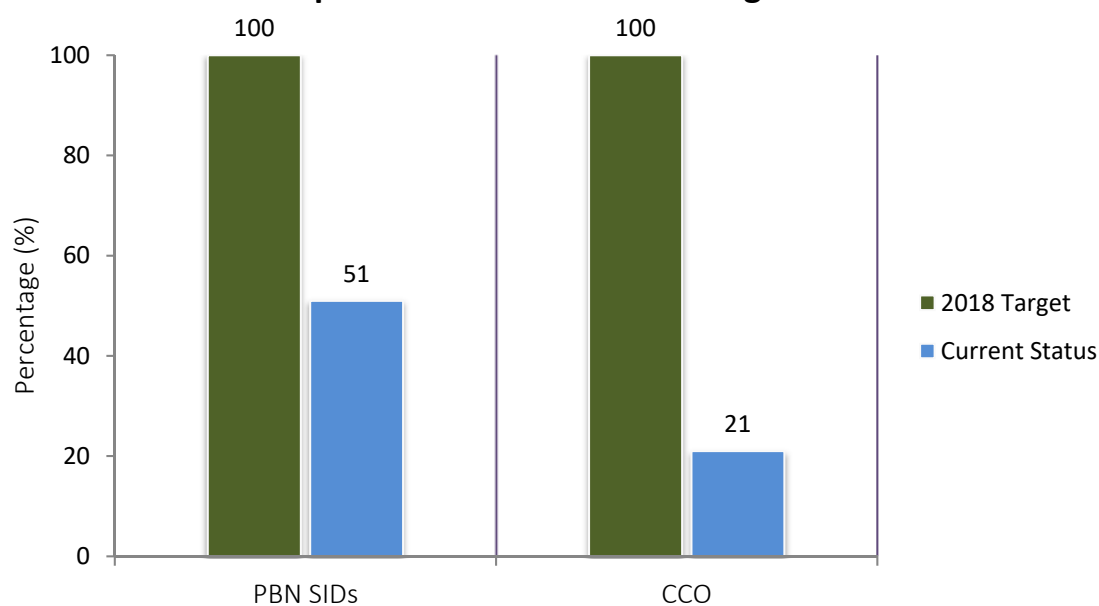
2.2.12

B0-CCO

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.

B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
PBN SIDs	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJQA, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNM, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with PBN SID implemented as required. Supporting Metric: Number of International Aerodromes/ TMAs with PBN SID implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CCO	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OIKB, OIFM, ORER, ORNI, OJAM, OJAI, OJQA, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNM, HSOB, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CCO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs

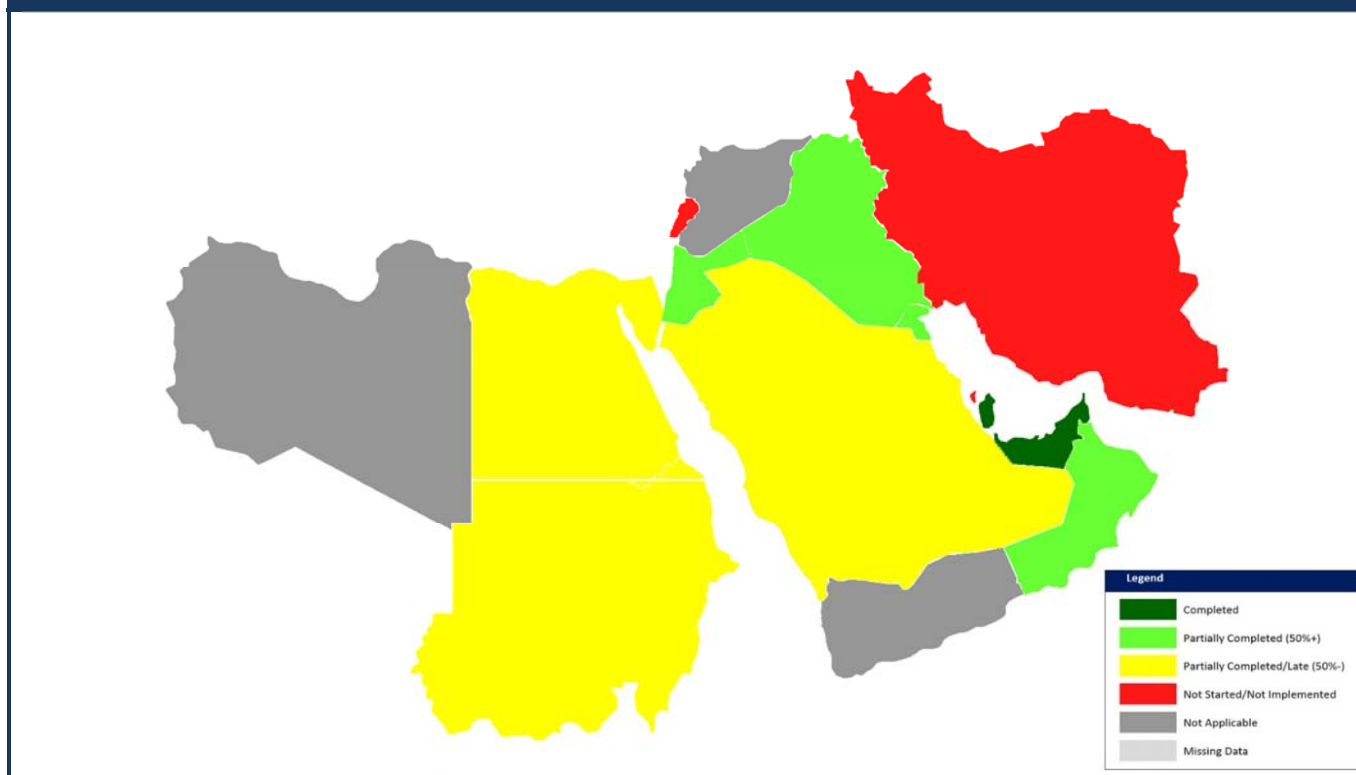
B0-CCO Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-CCO	PBN SIDs															
	Intl ADs/TMAs with CCO															

The progress for B0-CCO is acceptable (with approximately 36% implementation).

B0-CCO Status of implementation in the MID Region



3. ASBU BLOCK 0 IMPLEMENTATION OUTLOOK FOR 2020

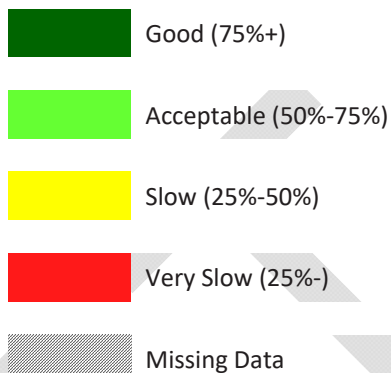
3.1 Status of Implementation-2020

This section consolidates the outlook of the Block 0 Modules implementation in the MID States, by 2020. The table below presents the status of implementation of the 18 ASBU Block 0 Modules foreseen to be achieved by the end of 2020, in accordance with the planning dates reported by States in the ICAO MID Region. This would provide a good basis/prerequisite for the planning of ASBU Block 1 implementation (2019-2025).

Detailed status of implementation of the 18 ASBU Block 0 Modules foreseen to be achieved by the end of 2020, for each State is provided at **Appendix B**.

The following color scheme is used for the projection of the outlook status:

Legend



Module	Status of implementation December 2016 (approximate rate)	Status of implementation December 2017 (approximate rate)	Projected Status of implementation by 2020* (approximate rate)
B0-APTA	44%	52%	96%
B0-WAKE	(Priority 2)	(Priority 2)	71%
B0-RSEQ	(Priority 2)	(Priority 2)	55%
B0-SURF	48%	50%	67%
B0-ACDM	0%	23%	50%
B0-FICE	56%	58%	83%
B0-DATM	62%	63%	87%
B0-AMET	67%	73%	92%
B0-FRTO	43%	45%	71%
B0-NOPS	(Priority 2)	(Priority 2)	46%
B0-ASUR	(Priority 2)	(Priority 2)	70%
B0-ASEP	(Priority 2)	(Priority 2)	69%
B0-OPFL	(Priority 2)	(Priority 2)	60%
B0-ACAS	73%	73%	100%
B0-SNET	(Priority 2)	80%	100%
B0-CDO	34%	47%	67%
B0-TBO	(Priority 2)	(Priority 2)	44%
B0-CCO	28%	36%	63%

Note – projected status for 2020 is calculated based on information received from 12 States (out of 15).

4. ENVIRONMENTAL PROTECTION

4.1 Introduction

Environmental Protection, to minimize the adverse environmental effects of civil aviation activities, is one of the five strategic objectives of ICAO. With a view to minimizing the adverse effects of international civil aviation on the environment, ICAO formulates policies, develops and updates Standards and Recommended Practices (SARPs) on aircraft noise and aircraft engine emissions, and conducts outreach activities. Information related to the ICAO activities on environmental protection is available on the ICAO website at: <https://www.icao.int/environmental-protection/Pages/default.aspx>

This section provides an update on the States' Action Plans on CO₂ Emissions Reduction; and presents an estimation of environmental benefits, in terms of fuel saving / CO₂ emissions reduction, accrued from the implementation of some ASBU Block 0 Modules in the MID Region.

4.2 States' Action Plans on CO₂ Emissions Reduction

The ICAO Assembly 38 (24 September to 4 October 2013) endorsed the Resolution 38-18 Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate Change which encouraged States to voluntarily prepare and submit Action Plans on CO₂ emission reduction to ICAO. An ambitious work programme was further laid down for capacity building and assistance to States in the development and

implementation of their Action Plans to reduce emissions, which States were initially invited to submit by the 37th Session of the ICAO Assembly in October 2010.

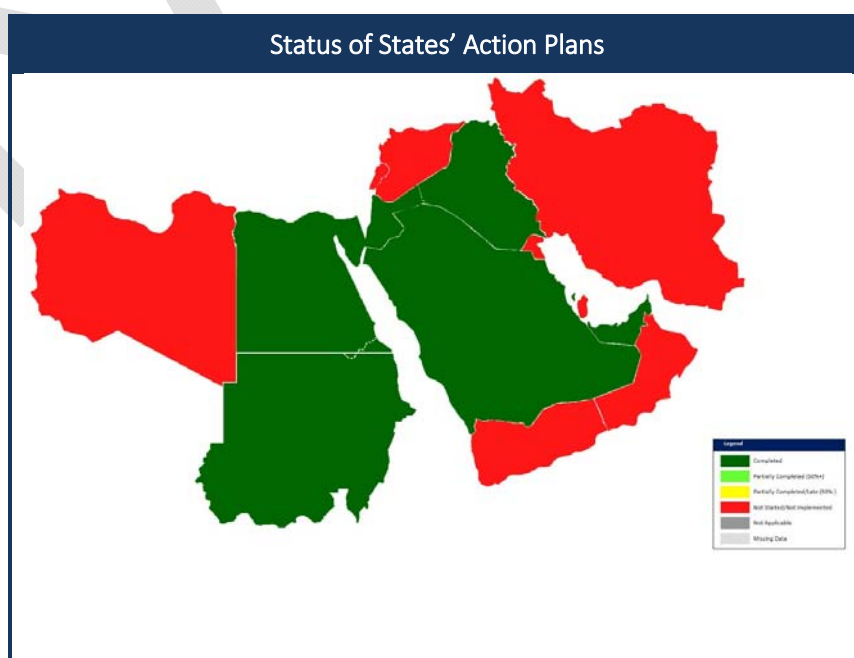
ICAO Assembly 39 (Montreal, Canada, 27 September – 6 October 2016) encouraged States, through Assembly Resolution 39-2 Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change, to submit voluntary Action Plans outlining respective policies and actions, and annual reporting on international aviation CO₂ emissions to ICAO.

The MIDANPIRG/16 meeting (Kuwait, 13 - 16 February 2017) invited States to develop/update their Action Plans for CO₂ emissions reduction and submit them to ICAO through the APER website or the ICAO MID Regional Office.

An Action Plan is a means for States to communicate to ICAO information on activities to address CO₂ emissions from international aviation. The level of information contained in an action plan should be sufficient to demonstrate the effectiveness of actions and to enable ICAO to measure progress towards meeting the global goals set by Assembly Resolution A38-18. Action plans give States the ability to: establish partnerships; promote cooperation and capacity building; facilitate technology transfer; and provide assistance.

The Status of the provision of Action Plans on CO₂ emission in the MID Region is as follows:

State	Action Plans
Bahrain	June 2015
Egypt	July 2016
Iran	-
Iraq	June 2012
Jordan	September 2013
Kuwait	-
Lebanon	-
Libya	-
Oman	-
Qatar	-
Saudi Arabia	April 2018
Sudan	January 2015
Syria	-
UAE	June 2012
Yemen	-



4.3 Estimation of the Environmental Benefits accrued from implementation of ASBU Block 0 Modules

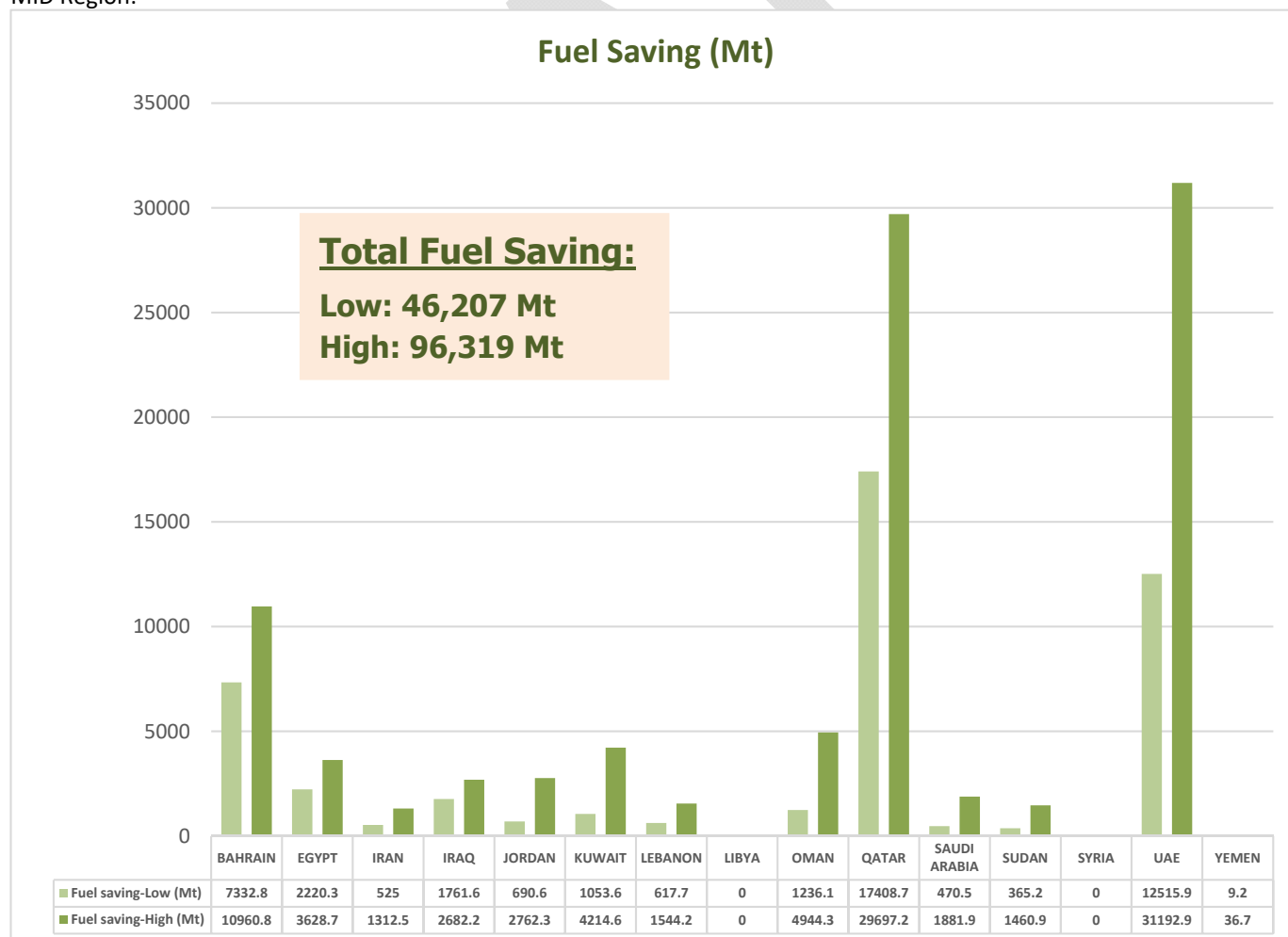
CAEP/10 conducted an assessment of the potential environmental benefits (fuel savings / CO₂) for the period between the start of implementation of ASBU Block 0 modules in 2013 and the planned implementation of such modules in 2018 (end of Block 0). In order to accomplish this task, CAEP developed sets of Rules-of-Thumb for each studied module with the overall intent to provide a conservative estimate of ASBU Block 0 fuel saving benefits. Rules-of-Thumb were developed using existing, publically available data, literature, and assumptions, together with the professional judgment of the analysts. A total of twenty three (23) rules of thumb have been developed for thirteen (13) ASBU Block 0 Modules.

The results of the ASBU Block 0 analysis conducted by CAEP highlight a potential reduction in fuel consumption by 2018 due to the implementation of ASBU Block 0 modules when compared to the 2013 baseline. The results show that the following Block 0 Modules (operational improvements) would have the biggest contribution to fuel saving in the MID Region:

- CCO 1 (CCO)
- CDO 1 (CDO)
- ACDM
- CDO 2 (PBN STARs)
- ASUR (ADS-B Surveillance)
- CCO 2 (PBN SIDs)
- APTA 1 (Radius to Fix)

As the status of implementation of B0-ACDM and B0-ASUR is still low in the MID Region, a Methodology for the Estimation of environmental benefits accrued from the implementation of priority 1 Block 0 Modules in the MID Region has been developed for B0-APTA, CCO and CDO, based on the Rules of Thumb and the available traffic data.

The estimation has shown a **total of 46,696 to 96,808 Mt** of fuel saving in the MID Region, as a result of the implementation of the selected Block 0 Modules (APTA, CDO and CCO), as shown below:



5. SUCCESS STORIES/BEST PRACTICES

5.1 NCLB ACTIVITIES IN THE MID REGION

I. Introduction

The ICAO Council identified that there is a large discrepancy among States in the implementation of ICAO Standards and Recommended Practices (SARPs). As a result, the ICAO “No Country Left Behind” (NCLB) Campaign was established by the Council to help ensure that SARPs implementation is better harmonized globally. To avoid this gap, ICAO should focus its activities on States lacking fundamental oversight capabilities for effective implementation of ICAO SARPs, particularly in the priority areas of safety, air navigation and efficiency, and security. Therefore, particular attention should be given to the assistance of those States with a higher safety and security risk.

In accordance with Assembly Resolution A39-23 “No Country Left Behind” (NCLB) Initiative, States should effectively implement ICAO’s Standards and Recommended Practices (SARPs) and policies so that all States have safe, secure, efficient, economically viable and environmentally sound air transport systems, which support sustainable development and socio-economic prosperity.

At the Regional Level; the MID Region NCLB Strategy supports the implementation of the Global Aviation Safety Plan (GASP) and its Roadmap as the basis to develop action plans that define the specific activities, which should take place in order to improve safety at the regional and national levels.

The MID Region NCLB Strategy is complemented by the MID Region NCLB Implementation Plan as a companion document. This Plan is a living document used for recording the NCLB activities in the MID Region (general and State-by-State), including the monitoring of the States’ NCLB Plan of Actions and States/Stakeholders’ contributions to support the NCLB initiative.



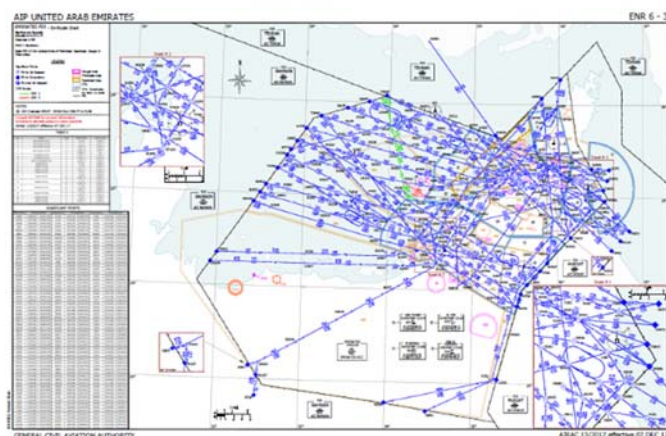
The Fourth meeting of the Directors General of Civil Aviation – Middle East Region (DGCA-MID/4), which was held in Muscat, Oman from 17 to 19 October 2017, through DGCA-MID/4 Conclusion 4/1, endorsed the NCLB Declaration (Muscat Declaration) in support of the ICAO NCLB Initiative; and invited States and Stakeholders to support the implementation of the MID Region NCLB Strategy.

It is to be highlighted that Kingdom of Saudi Arabia has kindly provided 400 K US\$ to support ICAO MID NCLB activities; and UAE provided 50 K US\$ to support the establishment of the MID Flight Procedure Programme (MID FPP). Other States and stakeholders, such as Egypt, Iran and EASA provided in-kind support to some MID States related to aviation safety and security, under the MID Region NCLB framework.

II. MID NCLB Activities related to Air Navigation

- 10 NCLB assistance missions in 2016 and 7 in 2017 (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Sudan)
- 6 NCLB Seminars/Workshops in 2016 and 6 in 2017
- 1 ATM Inspectors Course (GSI-ANS/ATM)

On December 7th 2017, the General Civil Aviation Authority (GCAA) completed the implementation of the UAE Airspace Restructuring Project – Integration & Implementation (UAE ARP3). This airspace change saw the Emirates Flight Information Region (FIR) transformed into an airspace structure completely based on Performance Based Navigation (PBN) with a Navigation Specification of RNAV-1 (GNSS).



UAE ARP (Integration & Implementation) was the culmination of years of extensive analysis, development, collaboration and cooperation across the UAE Aviation Community including the GCAA Sheikh Zayed Air Navigation Centre (SZC), Dubai Air Navigation Services, Abu Dhabi Airports Company, Ras Al Khaimah Department of Civil Aviation, Sharjah Department of Civil Aviation, Fujairah Department of Civil Aviation as well as more than twenty further aviation stakeholders.

The UAE ARP (Integration & Implementation) was designed to meet multiple objectives, all of which were achieved in line with global best practices. Primarily the airspace change was designed to increase UAE Airspace capacity to meet the forecasted air traffic demand for 2020, as well as increased access to all UAE airports, improve efficiency for both aviation system customers and Air Navigation Service Providers (ANSP) and reduce the environmental impact of the increasing traffic through more effective Air Traffic Management operations.

UAE ARP3 Facts:

- Capability to safely meet capacity requirements for the forecasted 2040 air traffic demand through the UAE ARP3 Integrated Airspace Master Plan (IAMP).
- Annual fuel savings exceeding \$15 million to the airlines customers within the first year after implementation.
- Annual environmental efficiency exceeding 100,000 Mt of CO₂, supporting a 'Greener' aviation.
- Project Implementation Duration – 18 months
- Number of project Deliverables - 50
- Number of Workshops / Meetings – over 200
- Actual Man hours for design development – over 120,000 hours
- Number of UAE Air Navigation Service Providers involved – 6
- Number of Emirates of the United Arab Emirates involved - 5
- Number of Aviation Stakeholder organizations collaboratively involved - 26
- Number of Project Representatives – over 150
- Number of Air Traffic Controllers trained for UAE ARP3 - 250

The project directly involved five of the seven Emirates within the UAE and required over 120,000 man-hours to develop the airspace design network. Multiple Fast Time and Real Time simulations in Italy, UK and in the UAE formed critical activities for the design validation and verification of the revised airspace network.

The UAE ARP (Integration & Implementation) also required over 250 Air Traffic Controllers to take simulation and theoretical training on the redesign for over two hundred Instrument Flight Procedures and thirty new airways.



In 2012, prior to the launch of the UAE ARP the GCAA, in collaboration with the local Departments of Civil Aviation and ANSPs, undertook a 'UAE Airspace Study' which, among other recommendations, identified a requirement to 'develop a comprehensive airspace design that will accommodate transition to a full PBN airspace environment to support the increasing demand' and this laid the foundations of the UAE ARP.

Accordingly, UAE ARP adopted an industry wide collaborative approach, encompassing a three phased project which kicked off in 2013. In July 2016, the ARP activated Phase 3 (Integration & Implementation) and with the support of globally recognised consultants ensured the successful transformation of the chosen conceptual designs were integrated into an implementable solution. The first iteration of the design network delivered on 7th December 2017 enabled the airspace within the Emirates FIR sufficient capacity, capability and efficiency to support the forecasted traffic growth to 2020.



Communication of such a large scale change is a vital change management activity to ensure a smooth and successful transition. UAE ARP (Integration & Implementation) undertook months of cross industry stakeholder workshops and events culminating in an awareness campaign at the Dubai Airshow between November 17-21st.

A Communication and Engagement document was also generated to ensure clear and consistent messages were relayed by all stakeholders, whilst also leaflets and briefing material generated across the six ANSPs, National carriers and IATA. AICs and NOTAMs were used to promulgate further Global awareness prior to the December 7th transition.

Implementing a new network for the entire Emirates FIR airspace change without generating disruption to the aviation customers was a major and critical challenge which required significant stakeholder collaboration. To do this, UAE ARP (Integration & Implementation) created a Transition Plan Development Team (TPDT) encompassing ANSPs, airlines, IATA, military, NCMS and other appropriate aviation stakeholders. The ultimate focus of the team was to develop a harmonised Transition Plan for all agencies involved to ensure a complete synchronised and seamless transition. One of the first hurdles for the team to overcome was as a result of the traffic patterns of the Emirates FIR and the unsuitable timing associated with the AIRAC effectiveness. Through the TPDT a bespoke collaborative solution was found to delay the 'Operational Effective' time of implementation to 03:30 UTC (07:30 UAE) and therefore not utilising the 0000UTC effective time associated with AIRAC 13/17. The rationale ensured that the major arrival flows into the UAE airfields which would be operating predominantly to old FMS network data would have landed prior to the operational airspace change. The new airspace would then become operationally effective prior to the major UAE departure flow materializing and would encompass a majority of aircraft operating to the new AIRAC 13/17 FMS network.



To ensure that a synchronised airspace transition was enabled across the six ANSPs, a Transition Team was created with representation of six Transition Coordinators (one per ANSP, with also a deputy allocation) coordinating through a Transition Manager based at SZC. These Transition Coordinators and Transition Manager operated to an Operational Transition Event Schedule, containing major 'Check-Points' confirming that each unit's activities were operating in sync, whilst also in parallel. To enable rapid decision making capability, the UAE ARP (Integration & Implementation) also formed a Transition & Contingency Cell at SZC. This cell contained PSG representation from the ANSPs, military and also representation from the UAE Airline community. The Transition & Contingency Cell was activated several hours prior to the Operational Transition of the new airspace and their role was to ensure that if any major decisions were required at either an ANSP or project level, a resolution could be sought and acted upon quickly to enable minimal disruption to the Transition Event.

As part of the Transition Plan, UAE ARP (Integration & Implementation) adopted varying Transition timelines to provide regulatory assurance that each ANSP had implemented the airspace change successfully. In preparation for the airspace implementation, the project carried out a Transition Readiness Review which was held on November 23rd. The purpose of this review was to ensure that all ANSPs had satisfied specific 'Entry Criteria' prior to the Transition Event (December 7th). In the five day build up to the Transition Event, NCMS provided a daily weather forecast for December 7th across the UAE which was disseminated to the PSG and Transition Coordinators via the Transition Manager. From December 5th, this information was also supplemented with a fog forecast for the UAE airfields.

During the Transition Event four appropriately scheduled teleconferences were also held to provide a status check on the progress of the transition to the airline community and allow an opportunity for the airlines to provide pertinent information back to the Transition Manager. A final teleconference was held at 13:30 UTC (17:30 UAE) which confirmed that each ANSP had satisfied the Transition Event 'Exit Criteria'. This information was then relayed to the PSG for their approval to exit the Transition Event. At this stage, the UAE ARP transition was transferred from the Transition Event to a 10 day Transition Period. Any observations or feedback from each of the six ANSPs or from the airline community would then be fed into a 10/30/60/90 day review, with the project then supporting a six month Post Implementation Maintenance & Support period.



The output of the extensive planning and preparation by the TPDT in the generation of a Transition Delivery Document (TDD) and associated Transition Plans for the Transition Event ensured that on December 7th 2017, a seamless transition took place with no disruption or delay to the aviation community and no issues reported from any of the six ANSPs involved.

Through the development of an Integrated Airspace Master Plan (IAMP), the project will also create a Roadmap to future-proof the UAE's airspace network for the forecasted traffic growth until 2040. Design elements will need to incorporate such major airport expansion projects for both Dubai World Central Al Maktoum International Airport, Abu Dhabi International Airport as well as meeting the anticipated capacity increases for Dubai's Expo 2020. Moreover, it will ensure that aviation will continue to provide a vital contribution to the UAE Gross Domestic Product.



Amman/Queen Alia International Airport (QAIA) completed the requirements of the final level (level 3+ Neutrality) of the Airport Carbon Accreditation (ACA) program, which is a carbon management program developed by Airport Council International (ACI). QAIA is the first airport in the Middle East to achieve this accomplishment.

QAIA has demonstrated commitment to the aviation environmental protection, by implementing a comprehensive Environment Management Plan (EMP), which was developed to assess the probability of a multitude of risks, related to airport operations and activities, on the surrounding environment. This plan is reviewed annually to comply with the latest changes in national and international standards and requirements. QAIA's EMP is developed to minimize and control sources of environmental pollution such as carbon emissions, in addition to the monitoring of several environmental elements, through an integrated waste management program, in addition to air quality, water and biodiversity management, as well as noise control.



QAIA completed the first level of ACA Programme (Mapping) in March 2013, helping to determine the sources of harmful emissions on Airport grounds. This was followed in March 2015, by reaching level 2 (Reduction), as a result of the continuous efforts to reduce Carbon emissions, making QAIA the first airport to achieve this level in the region.

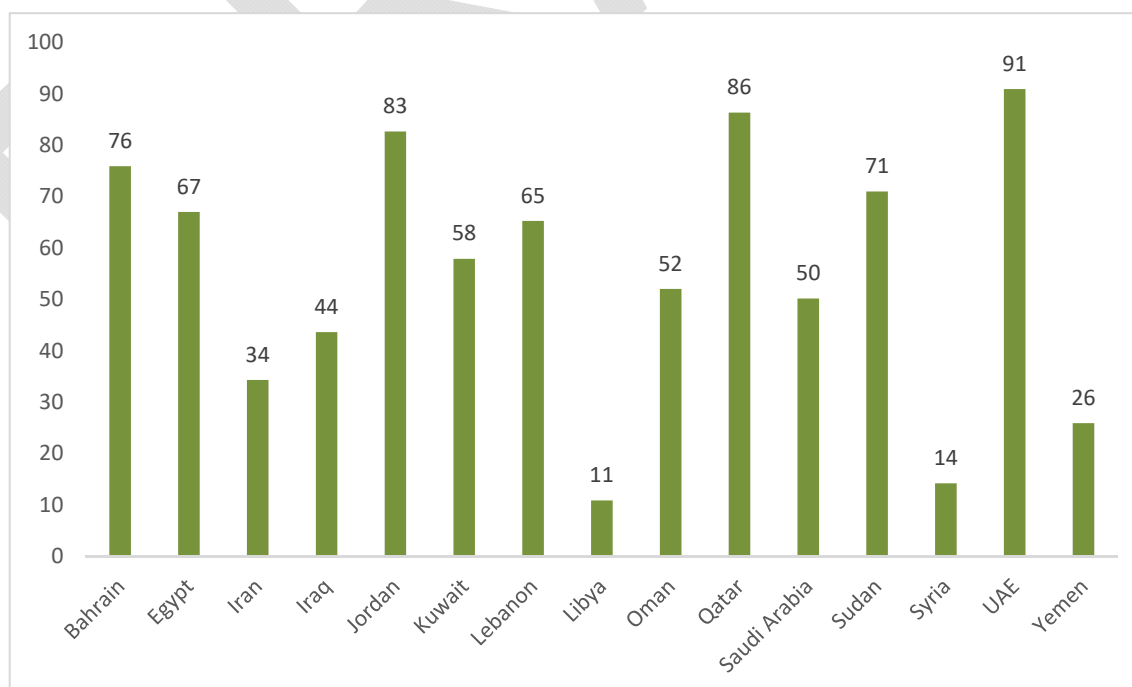
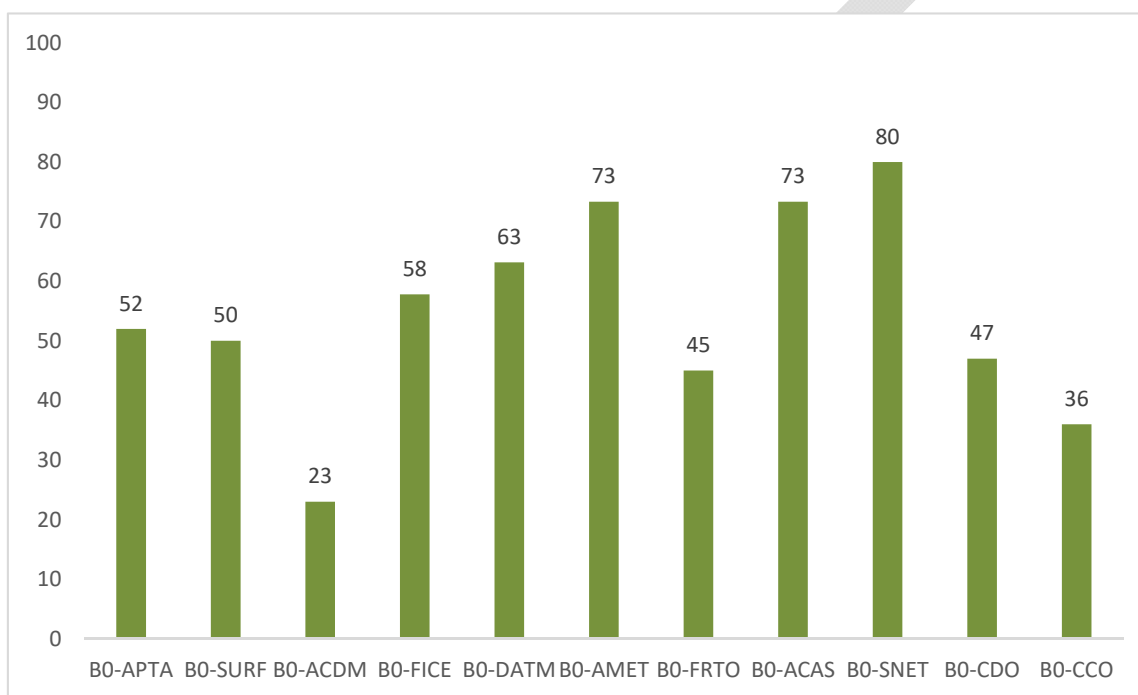
6. CONCLUSION

The progress for the implementation of some priority 1 Block0 Modules in the MID Region has been acceptable/good; such as B0-ACAS, B0-AMET and B0-DATM. Nevertheless, some States are still facing challenges to implement the majority of the Block 0 Modules.

The status of implementation of the ASBU Block 0 Modules also shows that Bahrain, Egypt, Jordan, Kuwait, Qatar, Saudi

Arabia and UAE made a good progress in the implementation of the priority 1 ASBU Block 0 Modules.

Looking into the States' plans for 2020 (outlook), the focus/priority of States is to complete the implementation of B0-APTA, B0-FICE, B0-DATM, B0-AMET, B0-CCO and B0-CDO.



Status of implementation of Doha Declaration Targets:

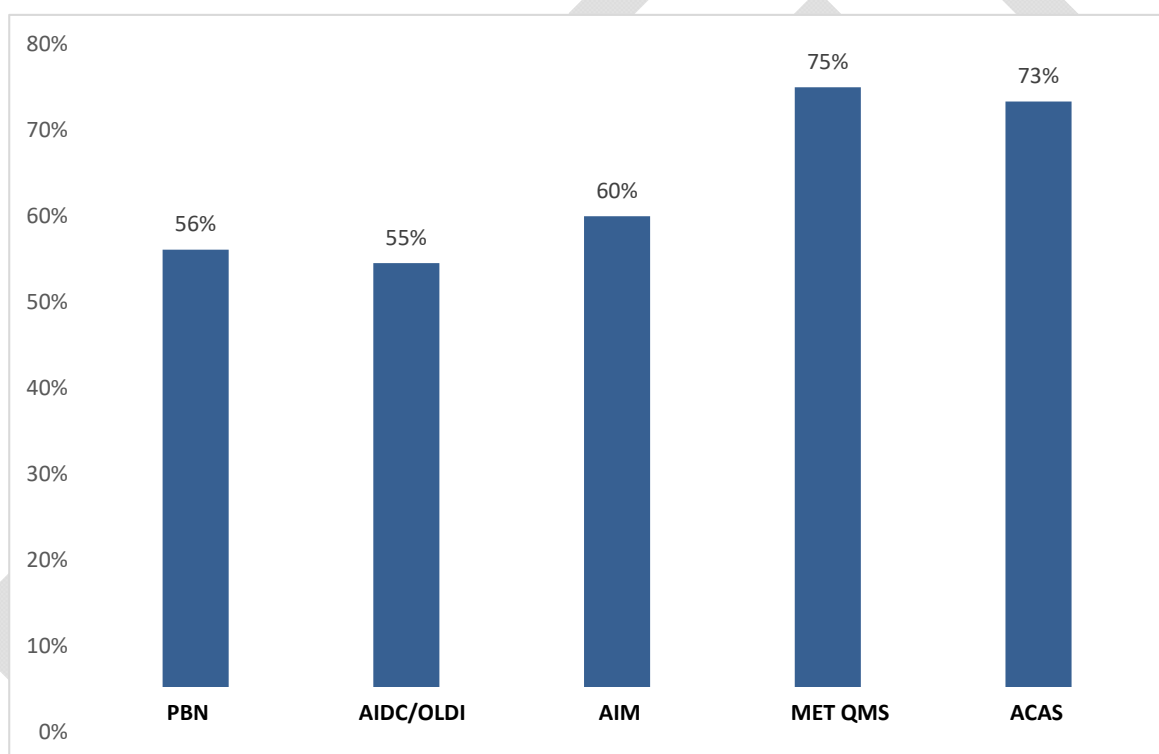
Doha Declaration was endorsed by the third meeting of Directors General of Civil Aviation (DGCA-MID/3) in Doha, Qatar from 27 to 29 April 2015. Doha Declaration set five Targets for the Air Navigation Capacity and Efficiency, as follows:

- 1- Optimization of Approach Procedures including vertical guidance (PBN): Implement PBN approach procedures with vertical guidance, for all runways ends at international aerodromes, either as the primary approach or as a back-up for the precision approaches by 2017
- 2- Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration: 11 States to implement AIDC/OLDI between their ACCs and at least one adjacent

ACC by 2017

- 3- Service Improvement through Digital Aeronautical Information Management: All States to complete implementation of Phase I of the transition from AIS to AIM by 2017
- 4- Meteorological information supporting enhanced operational efficiency and safety: 12 States to complete the implementation of QMS for MET by 2017
- 5- ACAS Improvement: All States require carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons by 2017

Status of implementation by States related to the Targets of the Doha Declaration is as follows:



APPENDIX A: STATUS OF ASBU BLOCK 0 MODULES

	APTA				SURF			ACDM	FICE			DATM										AMET				FRTO			NOPS	ACAS	SNET		CDO			CCO					
State	PBN Plan	LNAV	LNAV/ NAV	TOTAL	A-SMGCS 1	A-SMGCS 2	TOTAL	TOTAL	AMHS Cap	AMHS Impl.	AIDC/OLDI	TOTAL	AIM Plans	AIXM	eAIP	QMS	WGS-84 H	WGS-84 V	eTOD area 1 T	eTOD area 1 O	eTOD area 4 T	eTOD area 4 O	TOTAL	SADIS FTP	QMS	SIGMET	TOTAL	FUA	Flex Routing	TOTAL	TOTAL	TOTAL	STCA	MSAW	TOTAL	PBN STARS	CDO	TOTAL	PBN SIDs	CCO	TOTAL
Bahrain																																									
Egypt																																									
Iran																																									
Iraq																																									
Jordan																																									
Kuwait																																									
Lebanon																																									
Libya																																									
Oman																																									
Qatar																																									
Saudi Arabia																																									
Sudan																																									
Syria																																									
UAE																																									
Yemen																																									

APPENDIX B: ASBU BLOCK 0 STATUS OF IMPLEMENTATION OUTLOOK 2020

State	B0-APTA	B0-WAKE	B0-RSEQ	B0-SURF	B0-ACDM	B0-FICE	B0-DATM	B0-AMET	B0-FRTO	B0-NOPS	B0-ASUR	B0-ASEP	B0-OPFL	B0-ACAS	B0-SNET	B0-CDO	B0-TBO	B0-CCO
Bahrain	FI	N/A	PI	FI	PI	FI	FI	FI	PI	PI	FI	PI	N/A	FI	FI	FI	PI	FI
Egypt	FI	FI	N/A	FI	PI	FI	FI	FI	FI	FI	FI	N/A	N/A	FI	FI	PI	N/A	PI
Iran	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	N/A	FI
Iraq	PI	N/A	N/A	N/A	NI	FI	FI	PI	PI	NI	NI	NI	N/A	FI	FI	NI	NI	NI
Jordan	FI	N/A	NI	NI	PI	PI	PI	FI	NI	NI	FI	N/A	N/A	FI	FI	PI	NI	PI
Kuwait	FI	PI	PI	PI	PI	PI	PI	FI	PI	PI	PI	PI	PI	FI	FI	PI	PI	PI
Lebanon	FI	N/A	NI	N/A	PI	PI	FI	PI	PI	NI	NI	FI	NI	FI	FI	PI	PI	NI
Libya	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oman	FI	FI	FI	PI	PI	FI	FI	FI	FI	FI	PI	FI	N/A	FI	FI	PI	N/A	PI
Qatar	FI	NI	FI	FI	PI	FI	FI	FI	FI	PI	FI	N/A	N/A	FI	FI	FI	PI	FI
Saudi Arabia	FI	N/A	PI	PI	PI	FI	FI	FI	FI	N/A	FI	FI	FI	FI	FI	FI	FI	FI
Sudan	FI	N/A	PI	N/A	N/A	PI	PI	FI	PI	PI	PI	FI	PI	FI	FI	PI	PI	PI
Syria	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
UAE	FI	FI	PI	PI	PI	FI	FI	FI	FI	PI	FI	N/A	N/A	FI	FI	FI	PI	FI
Yemen	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	FI	N/A	N/A	N/A	N/A

Legend

FI	FI: Fully Implemented
PI	PI: Partially Implemented
NI	NI: Not Implemented
N/A	N/A: Not Applicable
	Missing Data



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ICAO

CAPACITY & EFFICIENCY

MSG/6-WP/6
Appendix D

AIR NAVIGATION REPORT

ICAO Middle East Region



SECOND EDITION (REFERENCE PERIOD: **January 2017 – June 2018**)





ICAO

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A Coordinated Approach to Regional Air Navigation Systems Implementation

The air transport industry plays a major role in world economic activity. It directly and indirectly supports 67.3 million jobs by aviation worldwide, contributes over \$2.7 trillion to global Gross Domestic Product (GDP), and carries over 4.1 billion passengers and 53 million tonnes of freight annually.

This is illustrated by the fact that over half of the world's 1.2 billion tourists who travelled across international borders last year were transported by air, and that air transport now carries some 35% of world trade by value. Indeed, more than 90% of cross border Business-to-Consumer (B2C) e-commerce was carried by air transport.

Middle East has been the fastest growing Region for passenger and cargo traffic since 2011. In 2016, MID air carriers recorded 11.8% growth in Revenue Passenger-Kilometers (RPKs). Although this growth has declined to 6.9% in 2017, the Region carried 14% RPK share in the year 2017.

The continuing growth of traffic in the MID Region places increased demand on airspace capacity, which necessitates an optimum utilization of the available airspace and airports.

One of the key elements to maintaining the vitality of civil aviation is to ensure safe, secure, efficient and environmentally sustainable operations at the global, regional and national levels. In this respect, ICAO works constantly to address the expectations of the aviation community in all key performance areas through the following coordinated activities:

- Policy and Standardization initiatives;
- Implementing programmes to address performance issues;
- Monitoring of key performance trends and indicators; and
- Performance Analysis.

The GANP represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives.



Mohamed K. Rahma
Regional Director,
ICAO Middles East Office

Its structured approach, organized in blocks of upgrades in non-overlapping six-year time increments starting in 2013 and continuing through 2031 and beyond, provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers.

The GANP also explores the need for more integrated aviation planning at both regional and national level and addresses required solutions through the consensus-driven Aviation System Block Upgrade (ASBU) systems engineering modernization strategy.

In all of its coordinated activities, ICAO always strives to achieve a balance between the need for increased capacity and efficiency while maintaining aviation safety and the impact on climate change at an acceptable level.

The regular review of implementation progress and the analysis of potential impediments will ultimately ensure the harmonious transition from one region to another following major traffic flows, as well as ease the continuous evolution towards the GANP's performance targets.

MID Air Navigation Report is the main tool for monitoring and reporting on the status of air navigation systems implementation in the MID Region.

This second edition of the Report provides update on the status and progress of the Priority 1 ASBU Block 0 Modules within the ICAO MID Region during the reporting period of January 2017 to June 2018.

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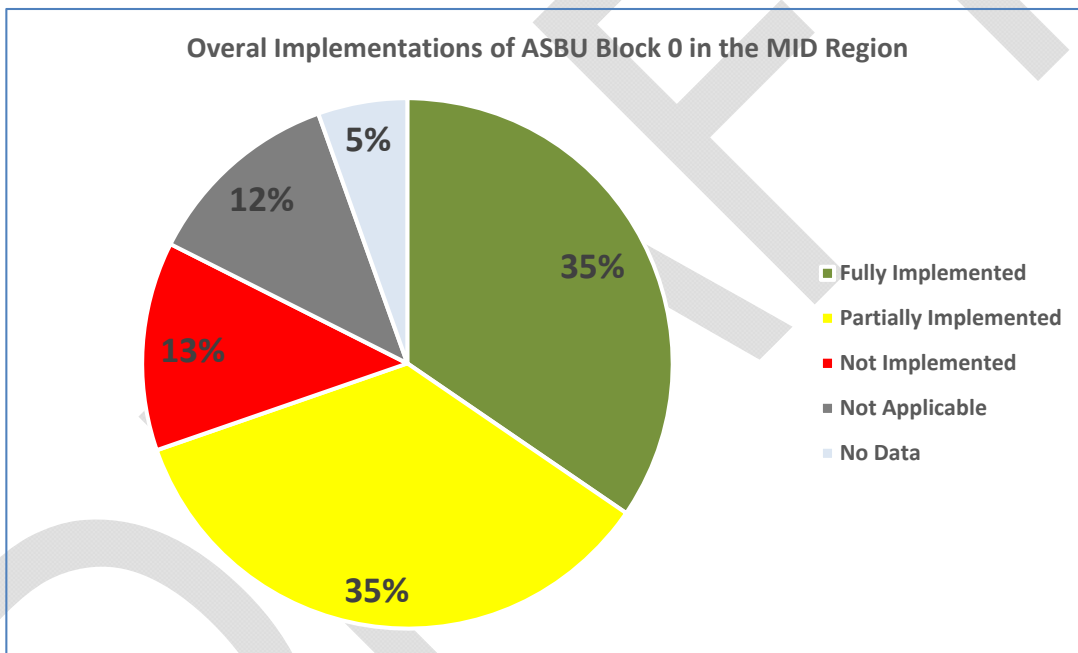
EXECUTIVE SUMMARY

The second edition of the ICAO MID Air Navigation Report (2017-18) provides an overview of the status of implementation of the Priority 1 ASBU Block 0 Modules in the MID Region as well as the progress achieved by MID States from the first edition of the MID Air Navigation Report (2016).

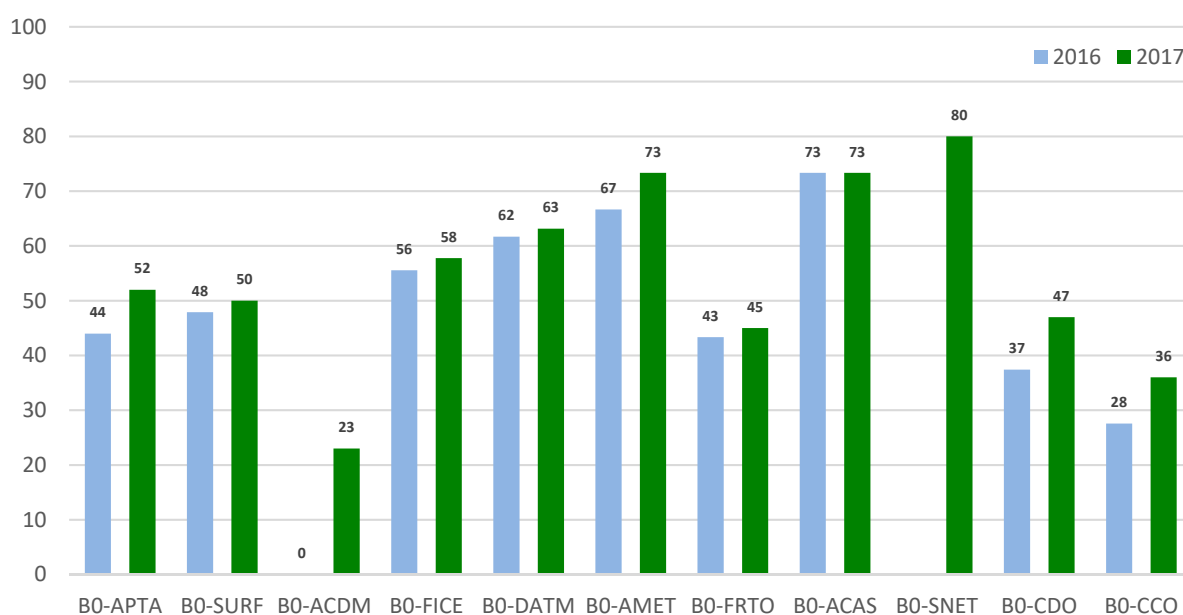
The main part of the document includes Section 2, which provides the status of implementation and the Regional Dashboard for the Priority 1 ASBU Block 0 Modules in the MID Region through different statistical maps and charts.

This Section will be complemented by providing the Outlook 2020 of the Region in Section 3 and environmental protection matters in Section 4. Section 5 provides some best practices/success stories of States in the implementation of ASBU Block 0 Modules.

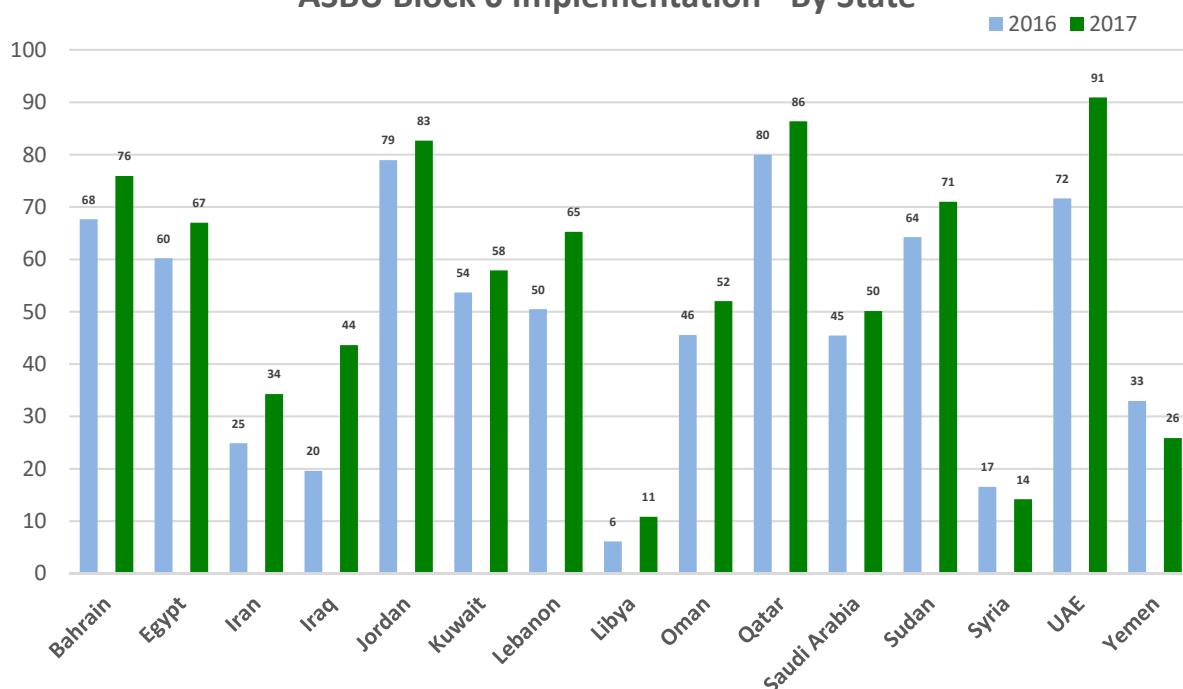
To summarize the implementation status and progress of ASBU Block 0 Modules, the following ASBU Block 0 Implementation Dashboards present status and progress achieved in the implementation of each Module and by State. Detailed status is provided in Section 2.



ASBU Block 0 Implementation - By Module



ASBU Block 0 Implementation - By State



Note 1 – utmost care was taken in the calculation of percentages, figures and numbers, however the statistics and graphs in this report should be considered as approximate amounts.

Note 2 – progress of States from 2016 to 2017 may be from the States implementation as well as some changes in the Modules structure (i.e. introduction of new element for BO-AMET, introduction of BO-SNET as a new Priority1 Module and definition of applicable aerodromes for BO-CDO and BO-CCO)

November 2014 endorsed the MID Region Air Navigation Strategy. The Strategy was later updated by MIDANPIRG/15 and 16 and published as MID Doc 002. The Strategy includes 12 priority 1 Block 0 Modules and their associated performance indicators and targets.

MIDANPIRG and its Subsidiary Bodies (in particular ANSIG) monitor the progress and the status of implementation of the ASBU Block 0 Modules in the MID Region.

Doha Declaration, which was endorsed by the third meeting of Directors General of Civil Aviation (DGCA-MID/3) (Doha, Qatar, 27-29 April 2015), has set five Targets for the Air Navigation Capacity and Efficiency, as follows:

- 1- *Optimization of Approach Procedures including vertical guidance (PBN)*: Implement PBN approach procedures with vertical guidance, for all runway ends at international aerodromes, either as the primary approach or as a back-up for the precision approaches by 2017
- 2- *Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration*: 11 States to implement AIDC/OLDI between their ACCs and at least one adjacent ACC by 2017
- 3- *Service Improvement through Digital Aeronautical Information Management*: All States to complete

implementation of Phase I of the transition from AIS to AIM by 2017

- 4- *Meteorological information supporting enhanced operational efficiency and safety*: 12 States to complete the implementation of QMS for MET by 2017
- 5- *ACAS Improvement*: All States require carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons by 2017

The MID Region Air Navigation Report is an integral part of the air navigation planning and implementation process in the MID Region; and the main tool for the monitoring and assessing the implementation of Air navigation Systems and ASBUs in the MID Region.

1.3 Scope

This MID Air Navigation Report addresses the implementation status of the priority 1 ASBU Block 0 Modules for the reference period January 2017 to June 2018.

The Report covers the fifteen (15) ICAO MID States:

Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates and Yemen.

ICAO MID Region



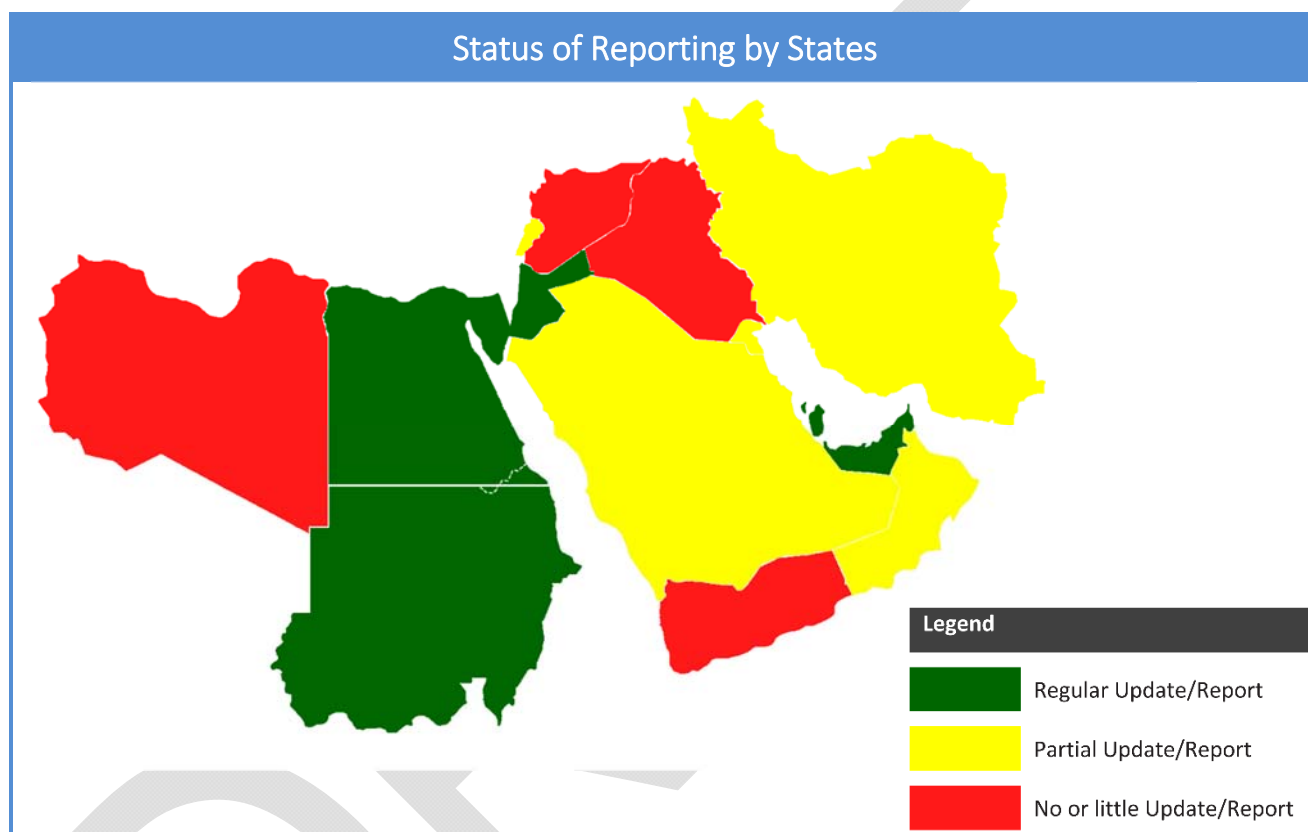
1.4 Collection of data

For the purpose of collecting necessary data for the MID Air Navigation Report-2017, a State Letter Ref.: AN 1/7 – 17/188 was issued on 2 July 2017, to follow-up on the MIDANPIRG Conclusion 16/8, which urged States to provide the relevant data necessary for the development of the MID Region Air Navigation Report-2017. However, some States did not respond to the

State Letter. Status of States providing update is shown in the following map.

Data collected from States was complemented by some updates provided mainly through the MIDANPIRG Subsidiary Bodies and the MID eANP Volume III.

Where the required data was not provided, it is indicated in the Report by color coding (Missing Data).



1.5 Structure of the Report

Executive Summary provides an overall review of the ASBU Block 0 implementation in the MID Region.

Section 1 (Introduction) presents the objective and background of the report as well as the scope covered and method of data collection.

Section 2 lists the priority 1 ASBU Block 0 Modules in the MID Region and presents the status of their implementation and their progress in graphical and numeric form.

Section 3 presents the ASBU Block 0 implementation outlook for 2020 in the MID Region.

Section 4 provides an update on the State's CO2 action plans and presents an estimation of environmental benefits, in terms of CO2 emissions reduction, accrued

from the implementation of some ASBU Block 0 Modules in the MID Region.

Section 5 includes some success stories related to the NCLB activities and implementation of ASBU Block 0 Modules, as well as their associated operational improvements and environmental benefits.

Section 6 concludes the Report by providing a brief analysis on the status of implementation and the progress of the different priority 1 ASBU Block 0 Modules.

Appendix A provides detailed status of the implementation of Priority 1 Block 0 Modules and their associated Elements for the MID States.

Appendix B illustrates the detailed status of implementation of ASBU Block 0 Modules in the MID States by 2020.



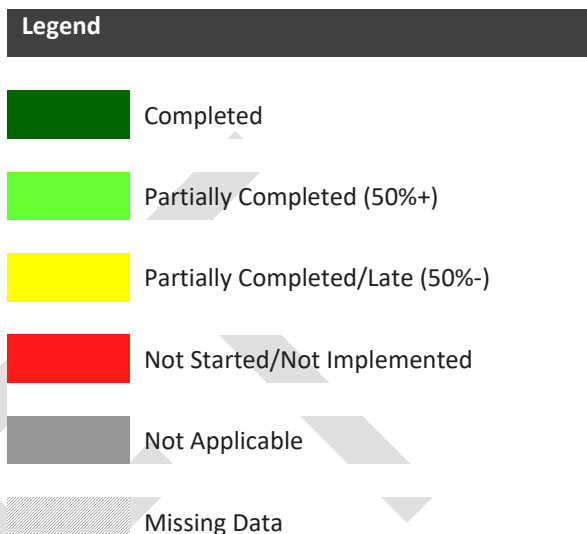
2. STATUS AND PROGRESS OF ASBU IMPLEMENTATION

The ICAO Block Upgrades refer to the target availability timelines for a group of operational improvements (technologies and procedures) that will eventually realize a fully-harmonized global Air Navigation System. The technologies and procedures for each Block have been organized into unique Modules which have been determined and cross-referenced based on the specific Performance Improvement Area to which they relate.

Block 0 Modules are characterized by operational improvements which have already been developed and implemented in many parts of the world. It therefore has a near-term implementation period of 2013–2018, whereby 2013 refers to the availability of all components of its particular performance modules and 2018 refers to the target implementation deadline. ICAO has been working with its Member States to help each determine exactly which capabilities they should have in place based on their unique operational requirements.

This chapter of the report gives an overview of the status of implementation for each of the Priority 1 ASBU Block 0 Modules for the MID States. The status of implementation of each Module versus its target(s) is also provided for each priority 1 ASBU Block 0 Module.

The following color scheme is used for illustrating the status of implementation:



Note – Missing data is excluded in the calculation of the average regional status of implementation.

2.1 MID Region ASBU Block 0 Modules Prioritization

This report covers twelve (out of eighteen) ASBU Block 0 Modules that have been determined by MIDANPIRG/MSG as priority 1 for the MID Region (MID Doc 002 Edition February 2017, refers).

Module Code	Module Title	Priority	Start Date	Monitoring		Remarks
				Main	Supporting	
Performance Improvement Areas (PIA) 1: Airport Operations						
B0-APTA	Optimization of Approach Procedures including vertical guidance	1	2014	PBN SG	ATM SG, AIM SG, CNS SG	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	2				
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	2				
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	1	2014	ANSIG	CNS SG	Coordination with RGS WG
B0-ACDM	Improved Airport Operations through Airport-CDM	1	2014	ANSIG	CNS SG, AIM SG, ATM SG	Coordination with RGS WG
Performance Improvement Areas (PIA) 2 Globally Interoperable Systems and Data Through Globally Interoperable System Wide Information Management						
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	1	2014	CNS SG	AIM SG, ATM SG	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	1	2014	AIM SG		
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	1	2014	MET SG		
Performance Improvement Areas (PIA) 3 Optimum Capacity and Flexible Flights – Through Global Collaborative ATM						
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	1	2014	ATM SG		
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	1	2014			
B0-ASUR	Initial capability for ground surveillance	2				
B0-ASEP	Air Traffic Situational Awareness (ATSA)	2				
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	2				
B0-ACAS	ACAS Improvements	1	2014	CNS SG		
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	1	2017	ATM SG		

Performance Improvement Areas (PIA) 4 Efficient Flight Path – Through Trajectory-based Operations

B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	1	2014	PBN SG		
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	2		ATM SG	CNS SG	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	1	2014	PBN SG		

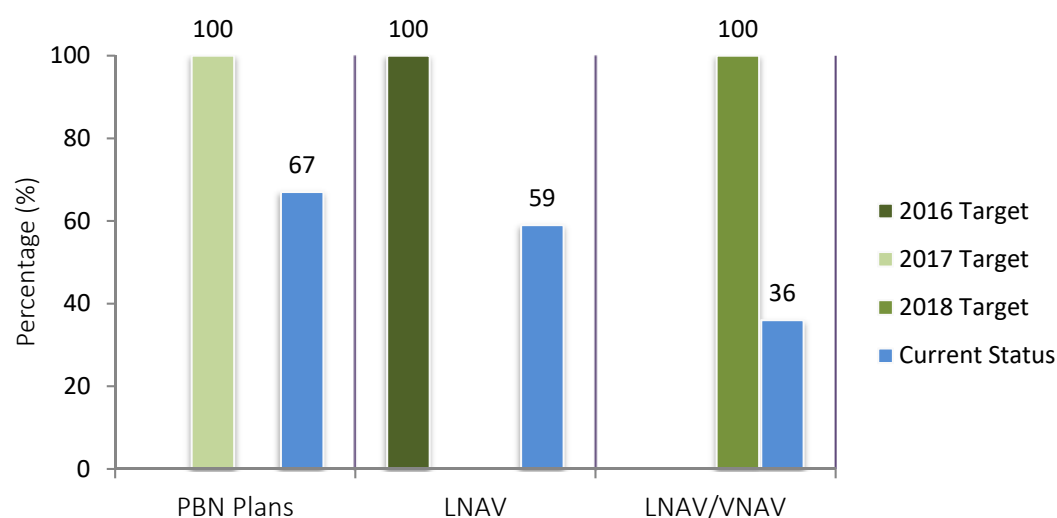
2.2 ASBU Implementation Status and Progress in the MID Region

2.2.1 B0-APTA

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.

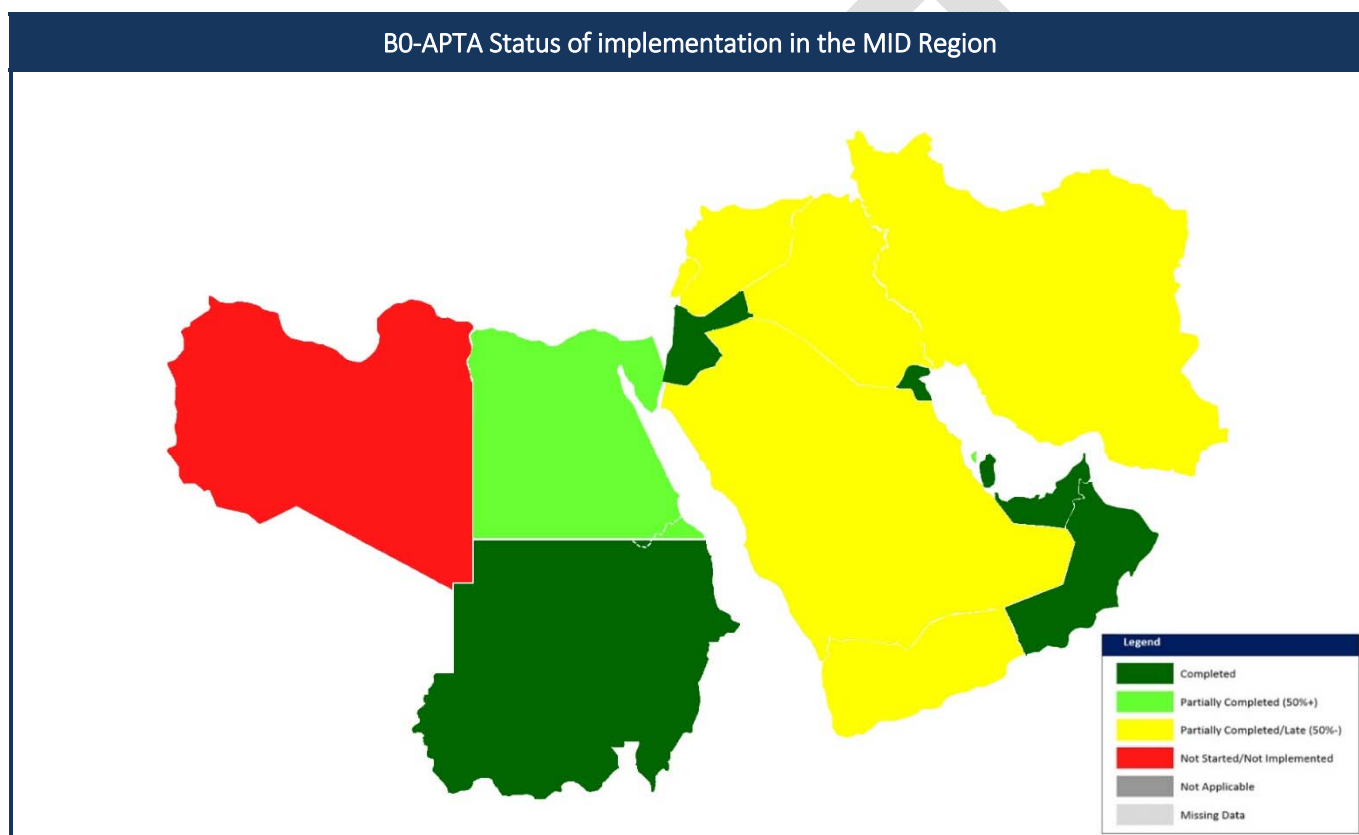
B0 – APTA: Optimization of Approach Procedures including vertical guidance			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
States' PBN Implementation Plans	All States	Indicator: % of States that provided updated PBN implementation Plan Supporting metric: Number of States that provided updated PBN implementation Plan	100% by Dec. 2018
LNAV	All RWYs Ends at International Aerodromes	Indicator: % of runway ends at international aerodromes with RNAV(GNSS) Approach Procedures (LNAV) Supporting metric: Number of runway ends at international aerodromes with RNAV (GNSS) Approach Procedures (LNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2016
LNAV/VNAV	All RWYs ENDs at International Aerodromes	Indicator: % of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2017

B0-APTA Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-APTA	PBN Plan															
	LNAV															
	LNAV/VNAV															

The progress for B0-APTA is good (with approximately 52% implementation).

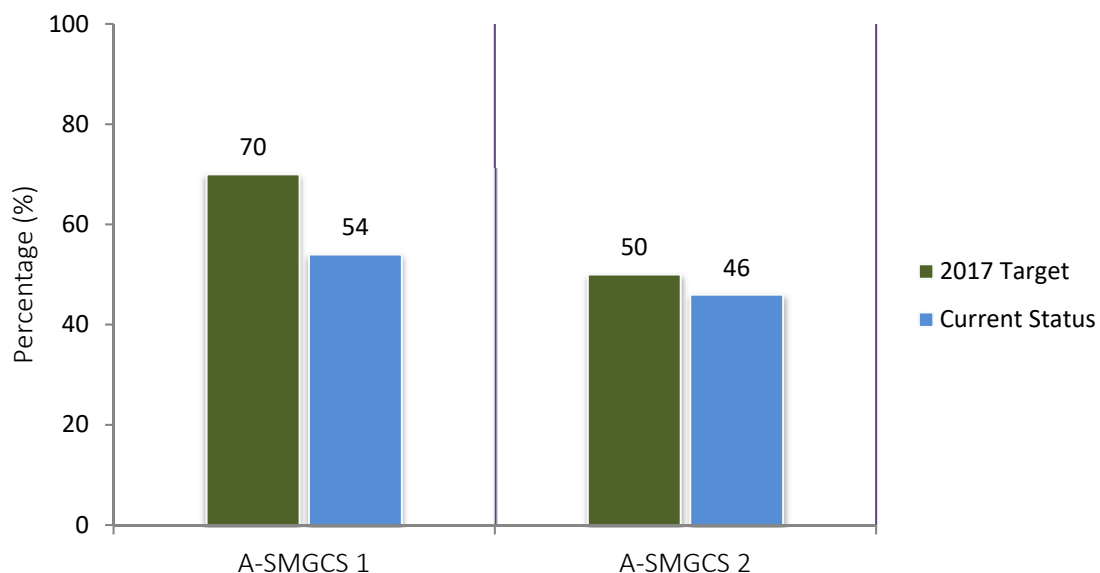


2.2.2 B0-SURF

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).

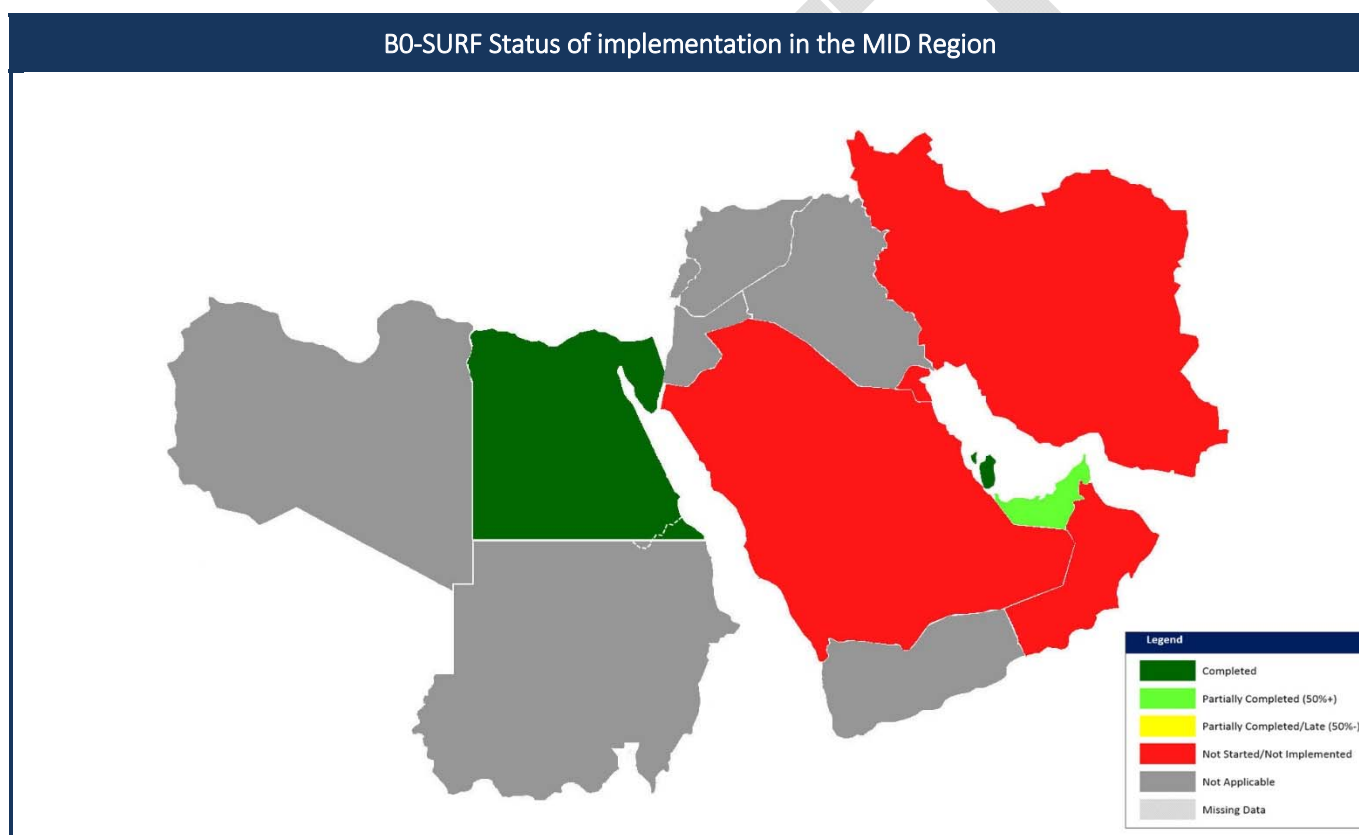
B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
A-SMGCS Level 1*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 1 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 1	70% by Dec. 2017
A-SMGCS Level 2*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 2 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 2	50% by Dec. 2017

B0-SURF Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-SURF	A-SMGCS Level 1															
	A-SMGCS Level 2															

The progress for B0-SURF is good (with approximately 50% implementation). B0-SURF is not applicable for 7 States.

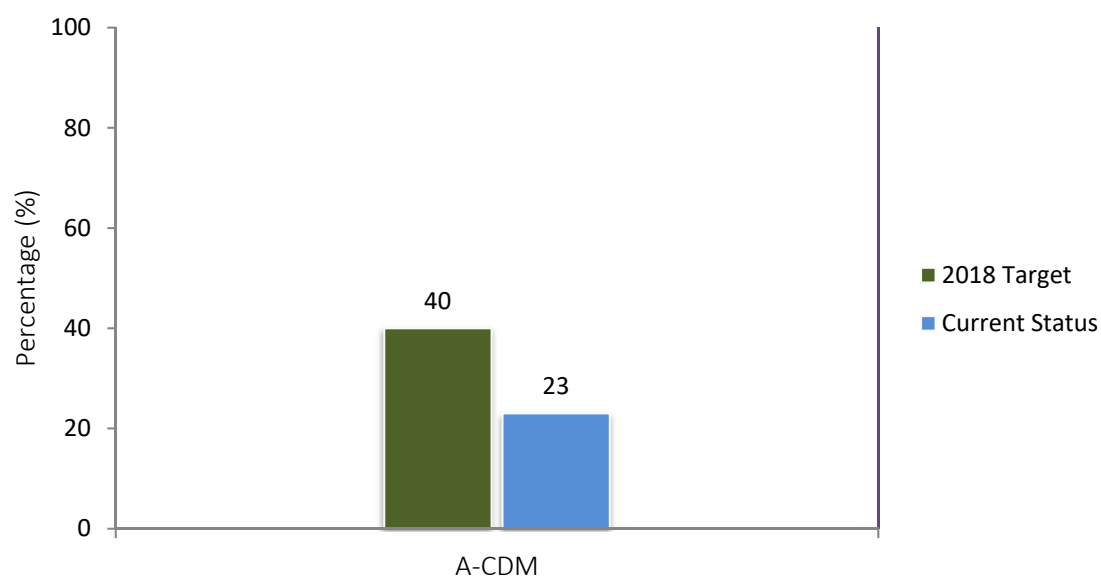


2.2.3 B0-ACDM

To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.

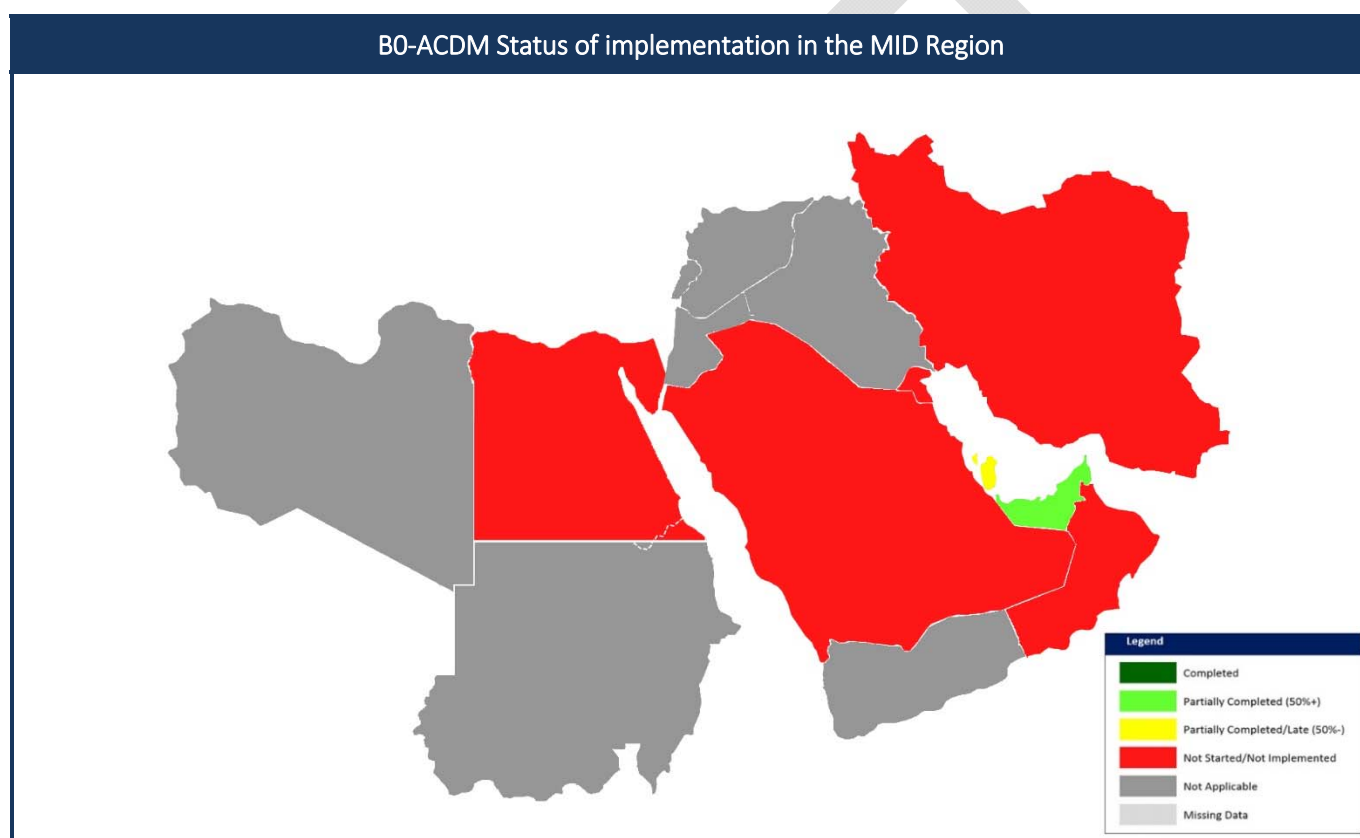
B0 – ACDM: Improved Airport Operations through Airport-CDM			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	50% by Dec. 2018

B0-ACDM Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-ACDM	A-CDM	Yellow	Red	Red	Grey	Grey	Red	Grey	Grey	Red	Yellow	Red	Grey	Grey	Green	Grey

The progress for B0-ACDM is very slow (with approximately 23% implementation. Nevertheless, implementation is ongoing in some States.



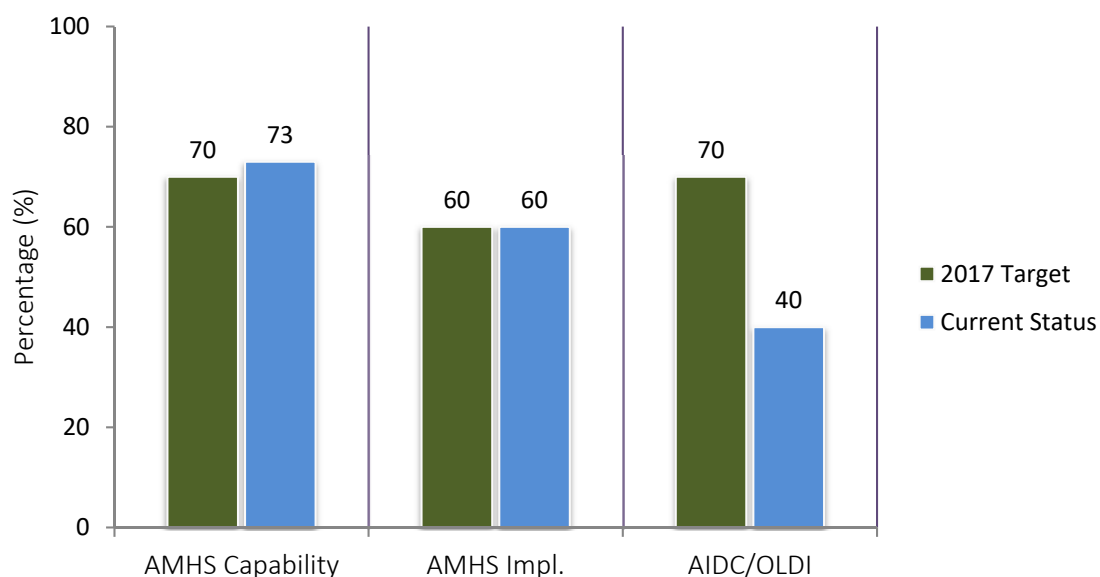
2.2.4

B0-FICE

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.

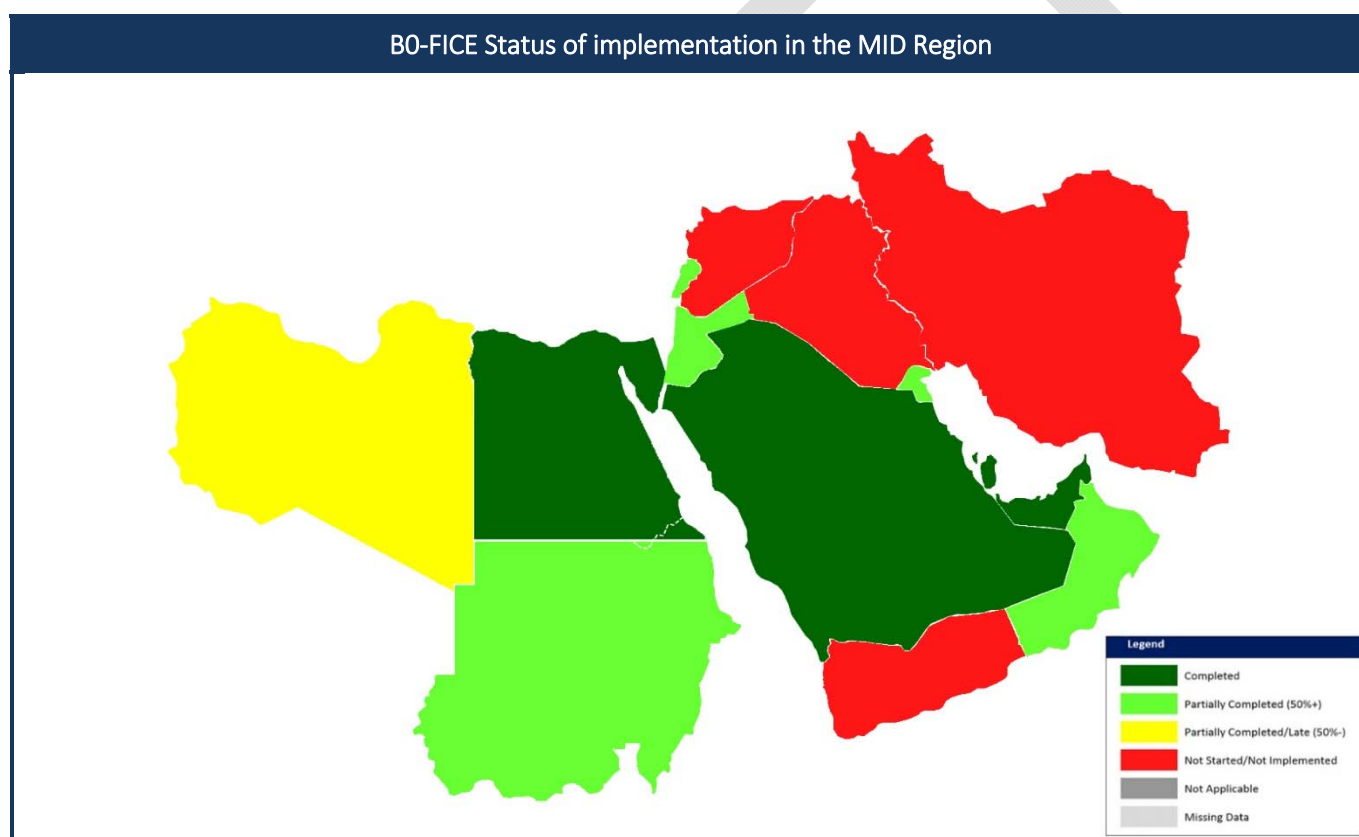
B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
AMHS capability	All States	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS capability	70% of States with AMHS capability by Dec. 2017
AMHS implementation /interconnection	All States	Indicator: % of States with AMHS implemented (interconnected with other States AMHS) Supporting metric: Number of States with AMHS implemented (interconnections with other States AMHS)	60% of States with AMHS interconnected by Dec. 2017
Implementation of AIDC/OLDI between adjacent ACCs	All ACCs	Indicator: % of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI with neighboring ACCs Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70% by Dec. 2017

B0-FICE Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-FICE	AMHS capability															
	AMHS impl. /interconnection															
	Implementation of AIDC/OLDI between adjacent ACCs															

The progress for B0-FICE is good (with approximately 58% implementation).



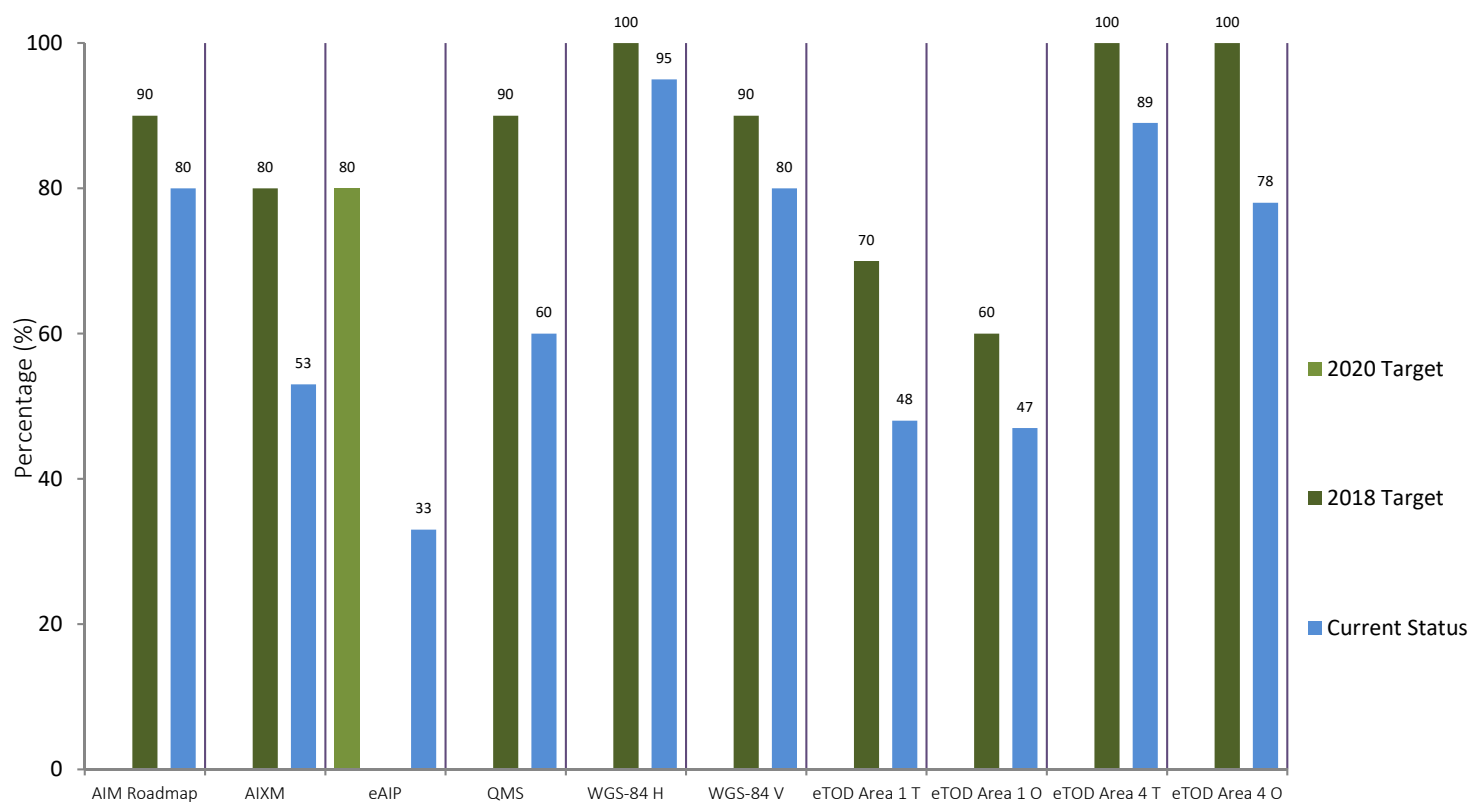
2.2.5

B0-DATM

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.

B0 – DATM: Service Improvement through Digital Aeronautical Information Management			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
National AIM Implementation Plan/Roadmap	All States	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	90% by Dec. 2018
AIXM	All States	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	80% by Dec. 2018
eAIP	All States	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)	80% by Dec. 2020
QMS	All States	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	90% by Dec. 2018
WGS-84	All States	Indicator: % of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Supporting Metric: Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Indicator: % of States that have implemented WGS-84 Geoid Undulation Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation	Horizontal: 100% by Dec. 2018 Vertical: 90% by Dec. 2018
eTOD	All States	Indicator: % of States that have implemented required Terrain datasets Supporting Metric: Number of States that have implemented required Terrain datasets Indicator: % of States that have implemented required Obstacle datasets Supporting Metric: Number of States that have implemented required Obstacle datasets	Area 1 : Terrain: 70% by Dec. 2018 Obstacles: 60% by Dec. 2018 Area 4: Terrain: 100% by Dec. 2018 Obstacles: 100% by Dec. 2018
Digital NOTAM*	All States	Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM	90% by Dec. 2020

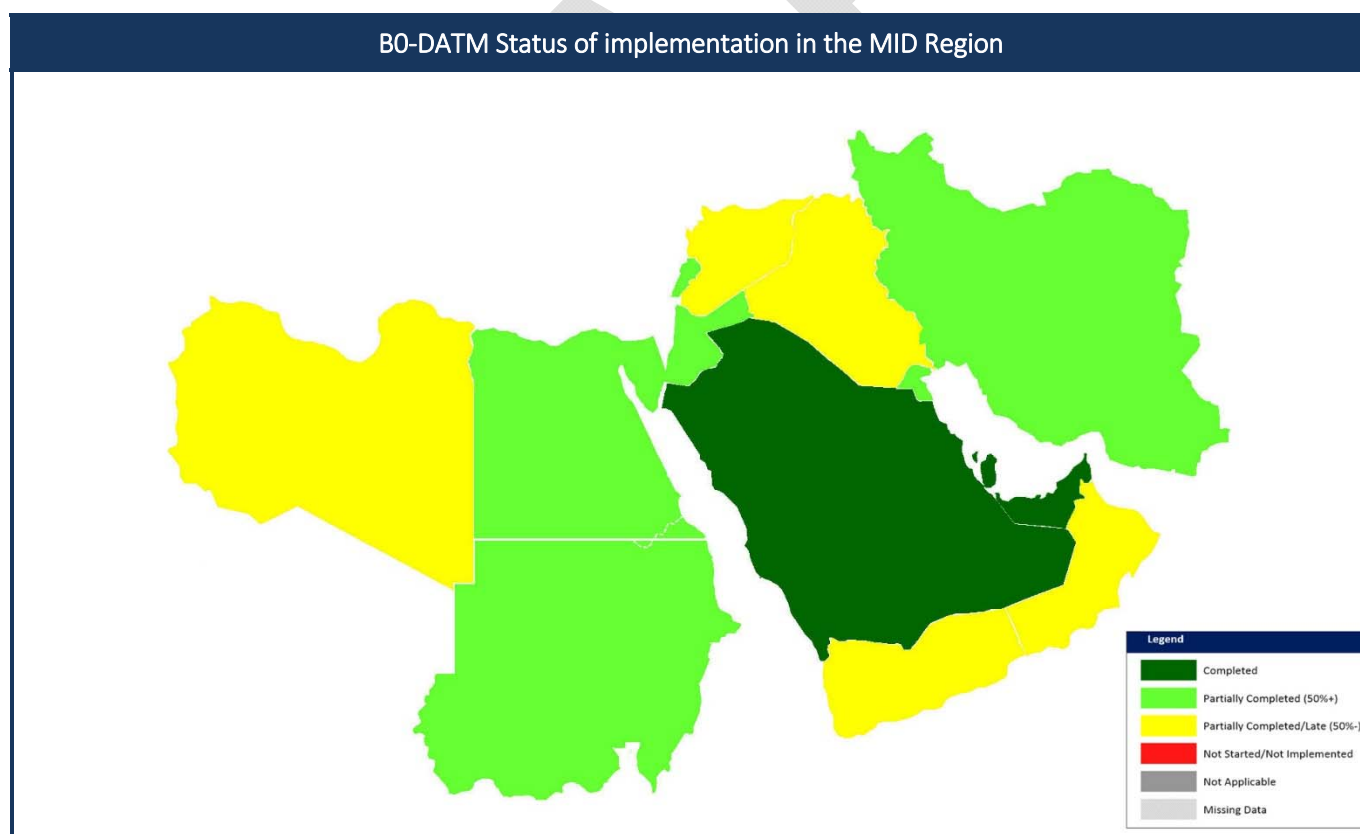
B0-DATM Status of implementation in the MID Region



OK

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-DATM	National AIM Roadmap															
	AIXM															
	eAIP															
	QMS															
	WGS-84 – H															
	WGS-84 – V															
	eTOD Area 1 Terrain															
	eTOD Area 1 Obstacles															
	eTOD Area 4 Terrain															
	eTOD Area 4 Obstacles															

The progress for B0-DATM is good (with approximately 63% implementation). eTOD Area 4 is not applicable in 6 States.



2.2.6

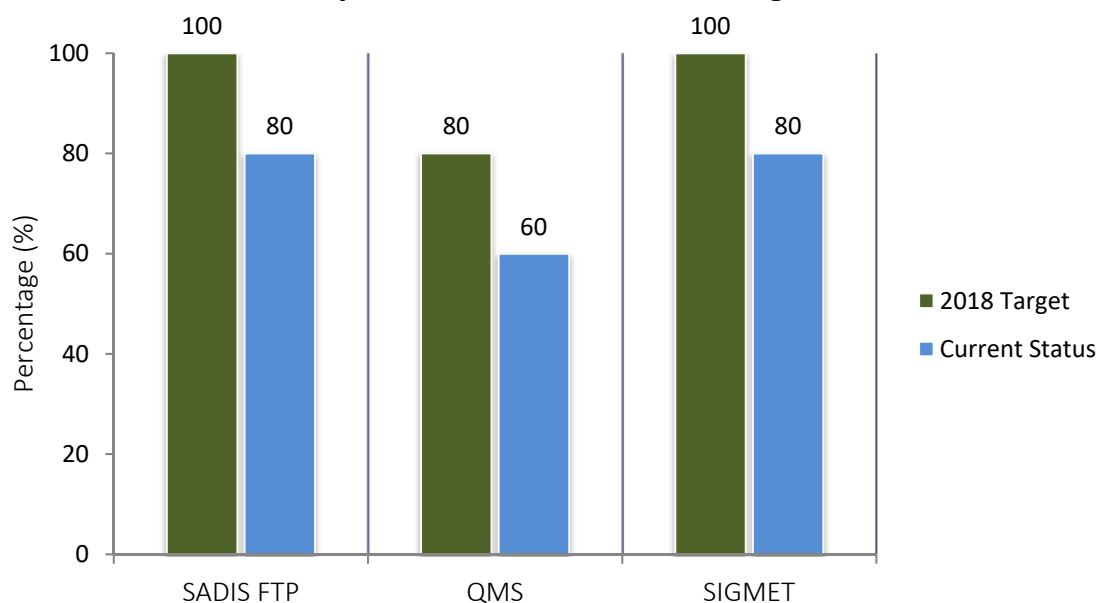
B0-AMET

Global, regional and local meteorological information:

- forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC);
- aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including wind shear; and
- 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.

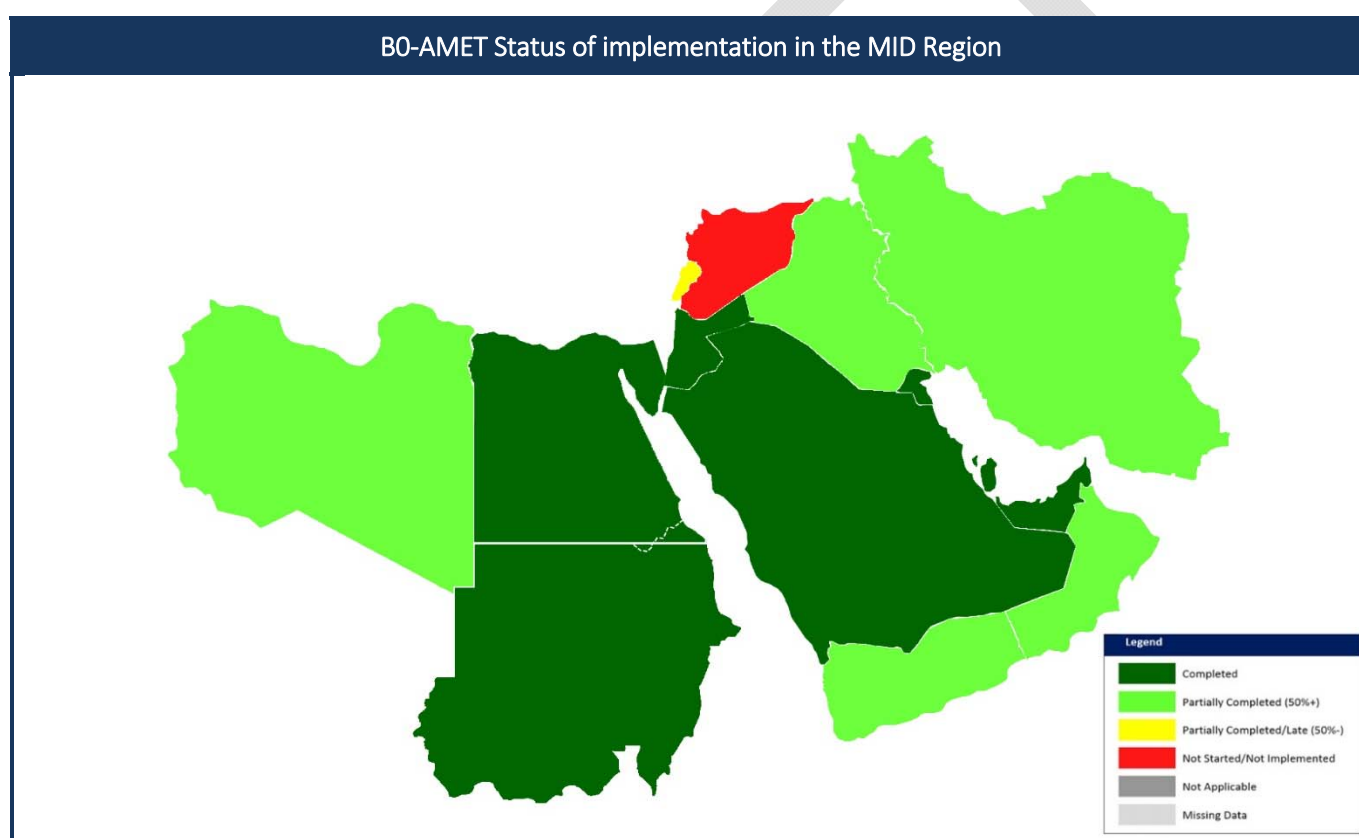
B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
SADIS FTP	All States	Indicator: % of States that have implemented SADIS FTP service Supporting Metric: Number of States that have implemented SADIS FTP service	100% by Dec. 2018
QMS	All States	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	80% by Dec. 2018
SIGMET	All MWOs in MID Region	Indicator: % of FIRs in which SIGMET is implemented Supporting metric: number of FIRs SIGMET is implemented	100% by Dec. 2018

B0-AMET Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-AMET	SADIS FTP															
	QMS															
	SIGMET															

The progress for B0-AMET is good (with approximately 73% implementation).



2.2.7

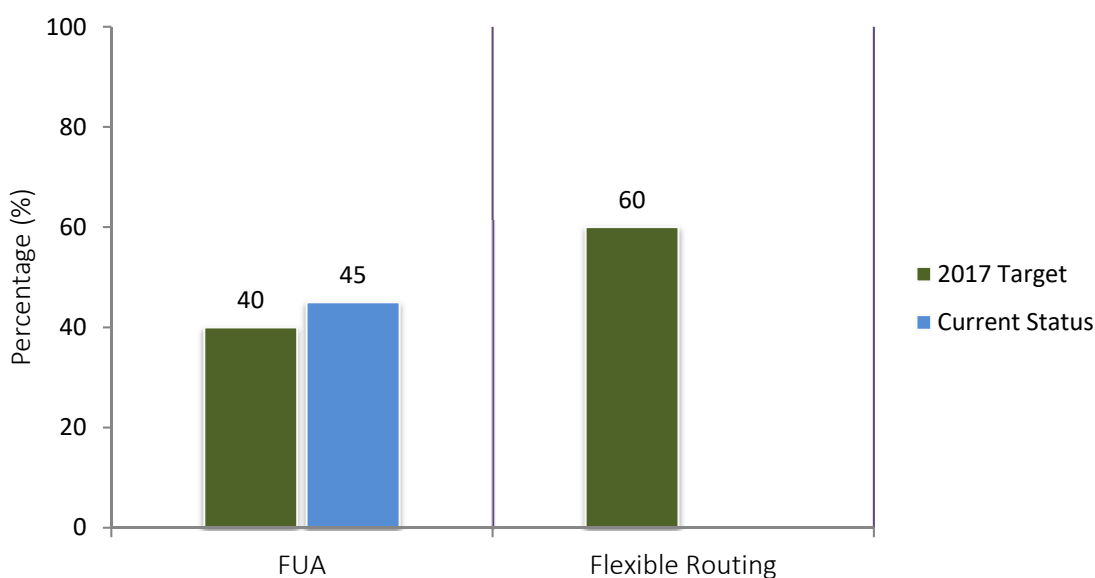
B0-FRTO

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.

B0 – FRTO: Improved Operations through Enhanced En-Route Trajectories			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Flexible use of airspace (FUA)	All States	Indicator: % of States that have implemented FUA Supporting metric*: number of States that have implemented FUA	40% by Dec. 2017
Flexible routing	All States	Indicator: % of required Routes that are not implemented due military restrictions (segregated areas) Supporting metric 1: total number of ATS Routes in the Mid Region Supporting metric 2*: number of required Routes that are not implemented due military restrictions (segregated areas)	60% by Dec. 2017

* Implementation should be based on the published aeronautical information

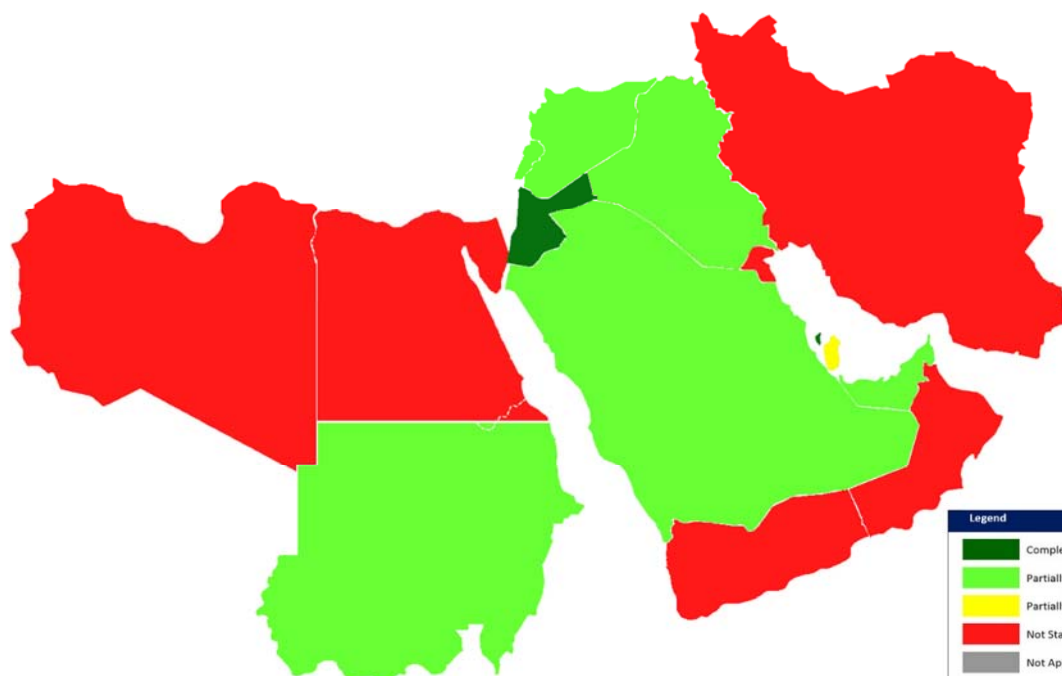
B0-FRTO Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-FRTO	Flexible use of airspace (FUA)	Completed	Not Started/Not Implemented	Not Started/Not Implemented	Partially Completed (50%+)	Completed	Not Started/Not Implemented	Partially Completed (50%+)	Not Started/Not Implemented	Not Started/Not Implemented	Partially Completed/Late (50%-)	Partially Completed (50%+)	Partially Completed (50%+)	Partially Completed (50%+)	Partially Completed (50%+)	Not Started/Not Implemented
	Flexible routing	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

The progress for B0-FRTO (FUA) is acceptable (with approximately 45% implementation). The element “Flexible Routing” could not be monitored because of the lack of data.

B0-FRTO (FUA) Status of implementation in the MID Region



2.2.8

B0-NOPS

Air Traffic Flow Management (ATFM) is used to manage the flow of traffic in a way that minimizes delay and maximizes the use of the entire airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or Flight Information Region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including crisis caused by human or natural phenomena.

Experience clearly shows the benefits related to managing flows consistently and collaboratively over an area of a sufficient geographical size to take into account sufficiently well the network effects. The concept for ATFM and demand and capacity balancing (DCB) should be further exploited wherever possible. System improvements are also about better procedures in these domains, and creating instruments to allow collaboration among the different actors.

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
ATFM Measures implemented in collaborative manner	All States	Indicator: % of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision Supporting metric: number of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision	100% by Dec. 2017

Note – B0-NOPS could not be monitored because the elements and associated performance indicators and targets have not yet been agreed upon and are under development.

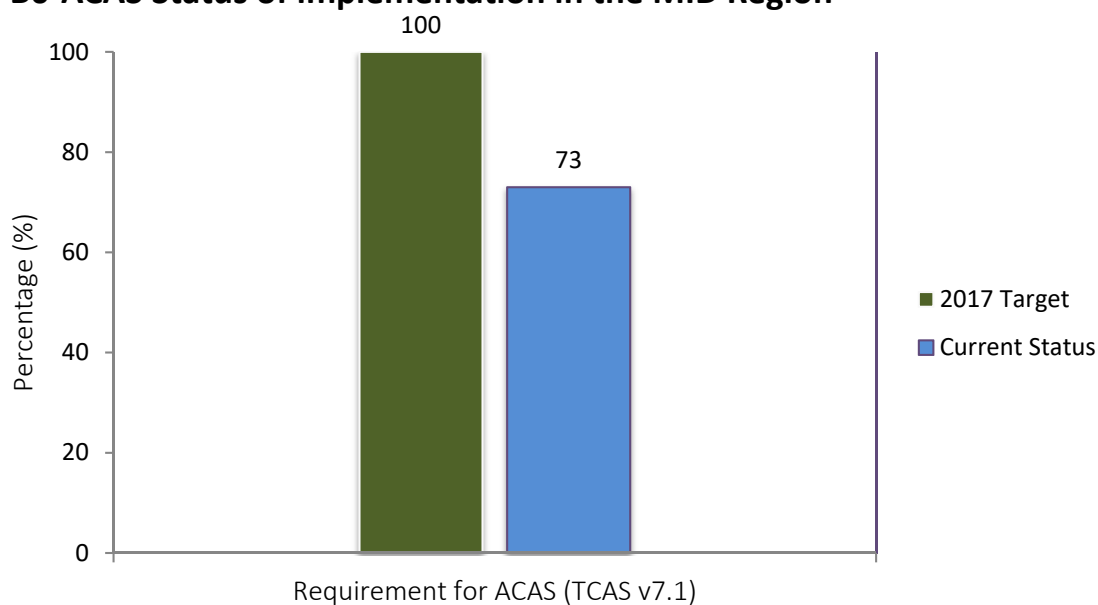
2.2.9

B0-ACAS

To provide short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation.

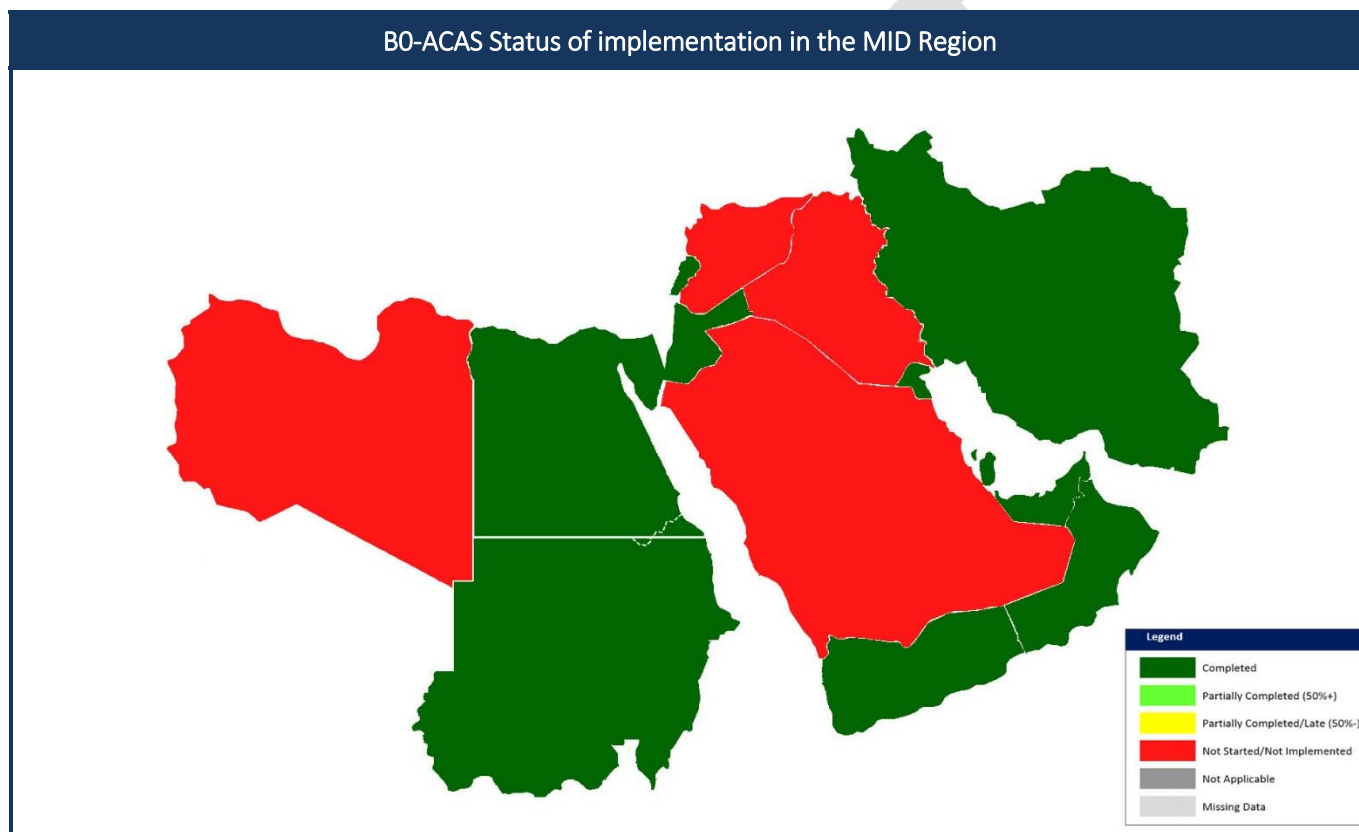
B0 – ACAS: ACAS Improvements			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Avionics (TCAS v7.1)	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	100% by Dec. 2017

B0-ACAS Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-ACAS	ACAS (TCAS V7.1)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

The progress for B0-ACAS is good (with approximately 73% implementation).



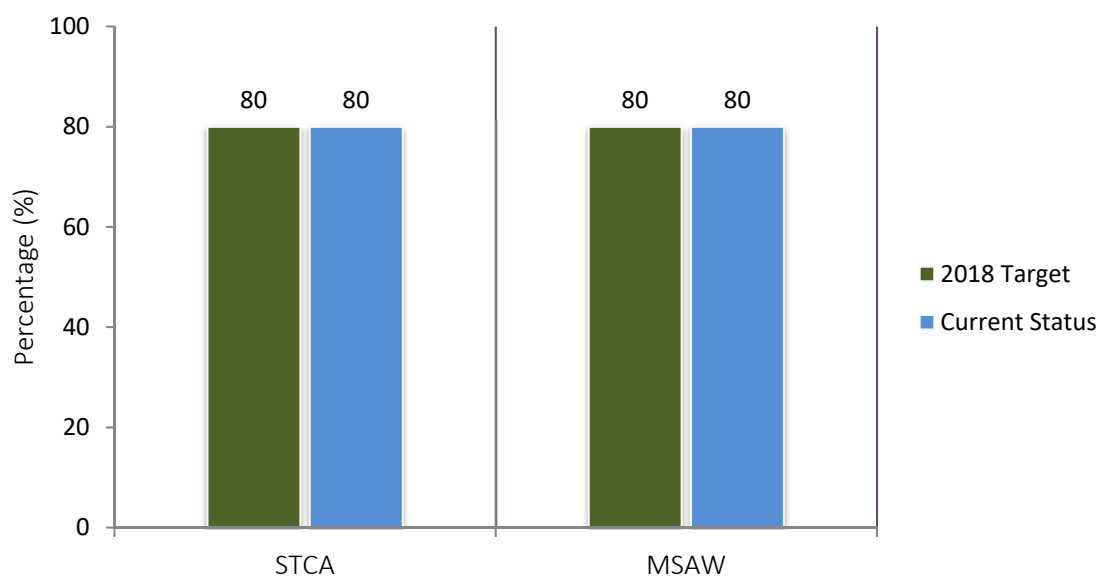
2.2.10

B0-SNET

To enable monitoring of flights while airborne to provide timely alerts to air traffic controllers of potential risks to flight safety. Alerts from short-term conflict alert (STCA), area proximity warnings (APW) and minimum safe altitude warnings (MSAW) are proposed. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centered.

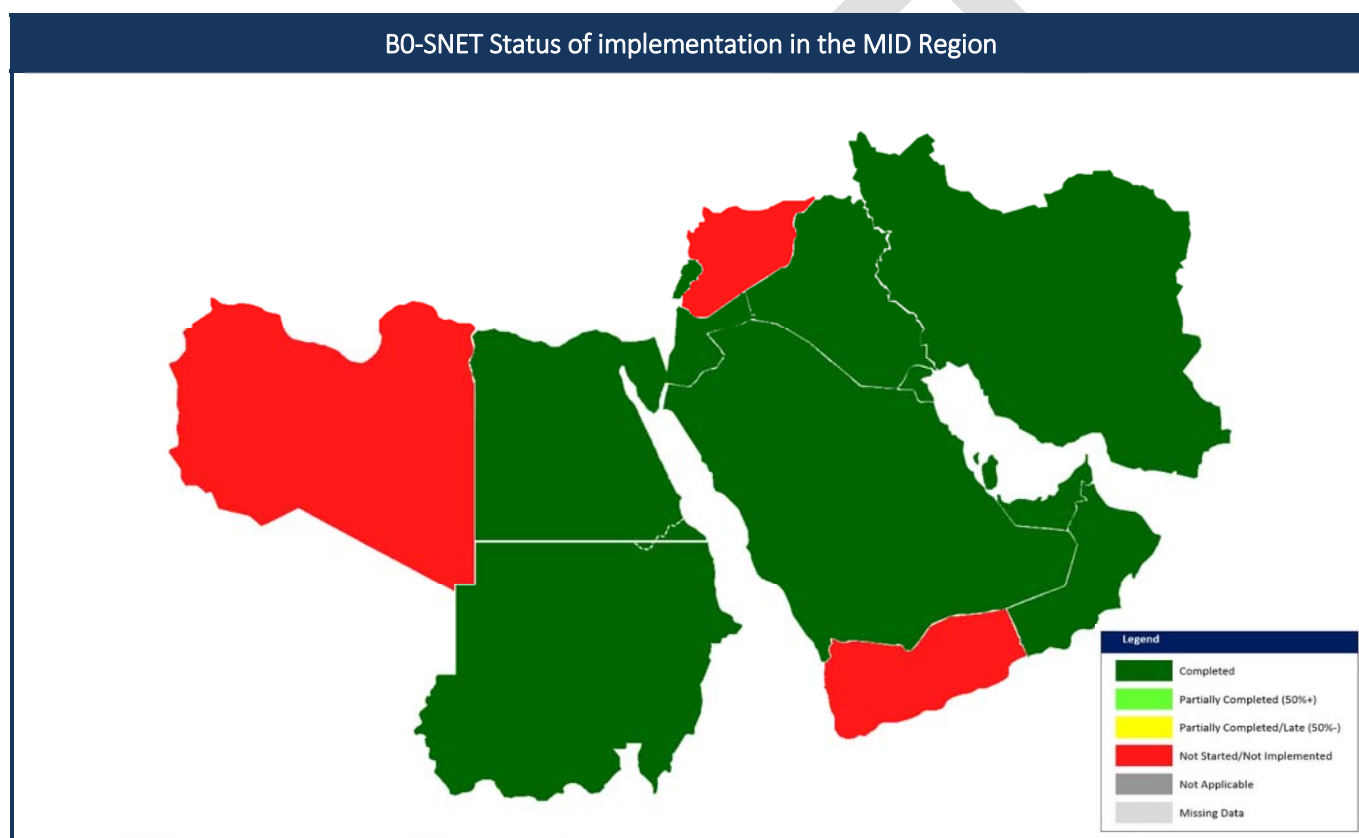
B0 – SNET: Increased Effectiveness of Ground-based Safety Nets			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Short-term conflict alert (STCA)	All States	Indicator: % of States that have implemented Short-term conflict alert (STCA) Supporting metric*: number of States that have implemented Short-term conflict alert (STCA)	80 % by 2018
Minimum safe altitude warning (MSAW)	All States	Indicator: % of States that have implemented Minimum safe altitude warning (MSAW) Supporting metric*: number of States that have implemented Minimum safe altitude warning (MSAW)	80 % by 2018

B0-SNET Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-SNET	Short-term conflict alert (STCA)															
	Minimum safe altitude warning (MSAW)															

The progress for B0-SNET is very good (with approximately 80% implementation).



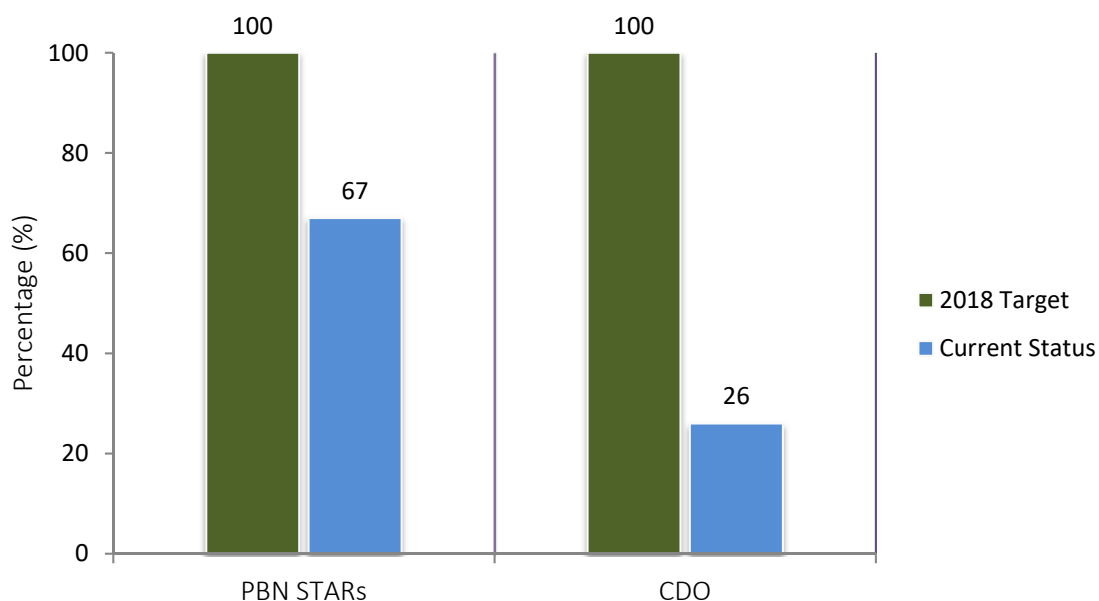
2.2.11

B0-CDO

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.

B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
PBN STARS	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with PBN STAR implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CDO	OBBI, HESH, HEMA, HEGN, OIIE, OIKB, OIFM, OJAI, OJAQ, OKBK, OLBA, OOMS, OTHH, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CDO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs

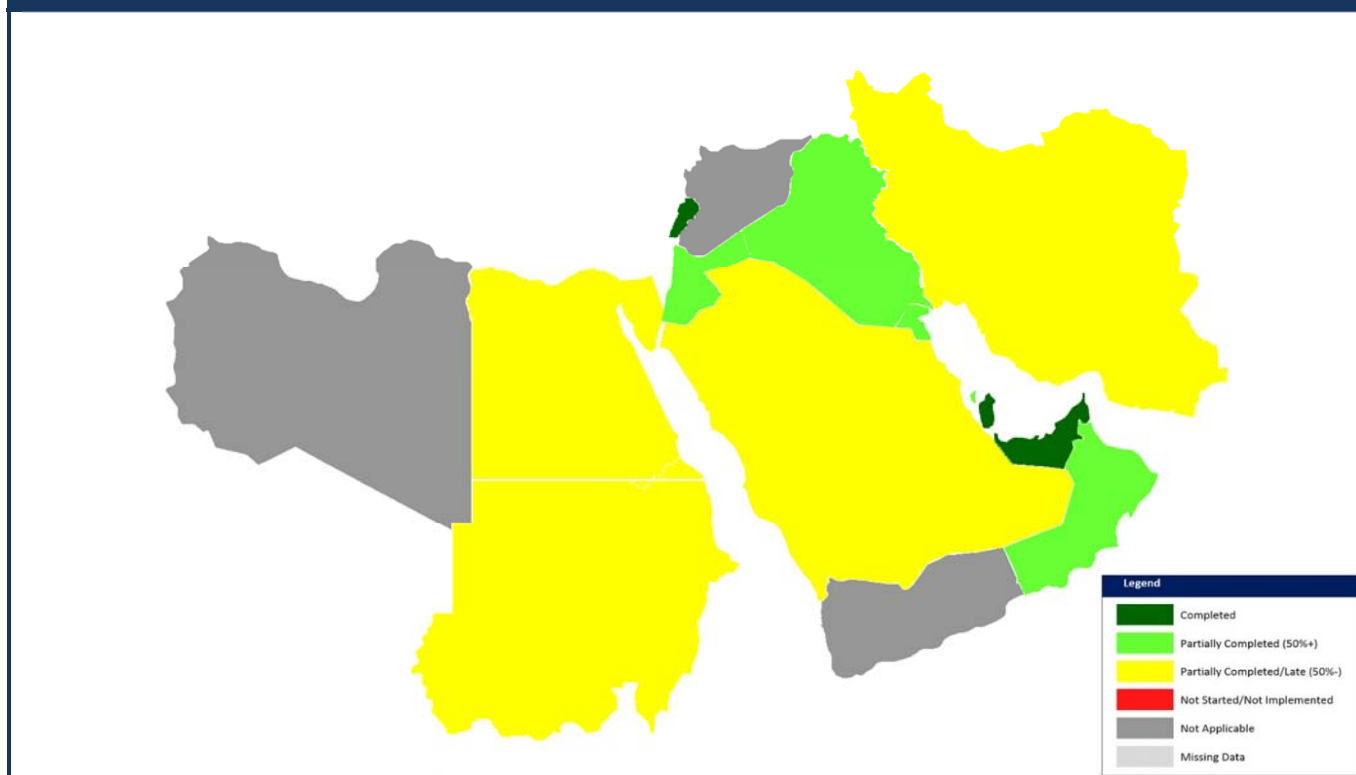
B0-CDO Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-CDO	PBN STARs	Completed	Partially Completed (50%+)	Partially Completed/Late (50%-)	Partially Completed (50%+)	Completed	Completed	Completed	Not Started/Not Implemented	Completed	Completed	Partially Completed (50%+)	Partially Completed/Late (50%-)	Not Started/Not Implemented	Completed	Not Started/Not Implemented
	International aerodromes/TMAs with CDO	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Completed	Not Started/Not Implemented	Not Started/Not Implemented	Completed	Not Started/Not Implemented	Not Started/Not Implemented	Not Started/Not Implemented	Completed	Not Started/Not Implemented

The progress for B0-CDO is acceptable (with approximately 47% implementation).

B0-CDO Status of implementation in the MID Region



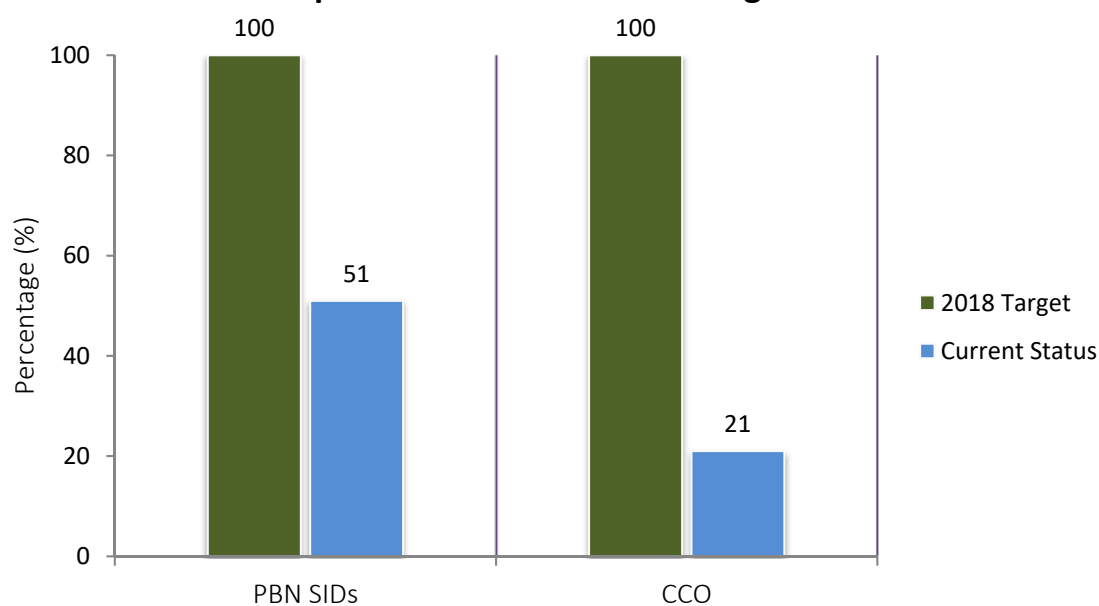
2.2.12

B0-CCO

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.

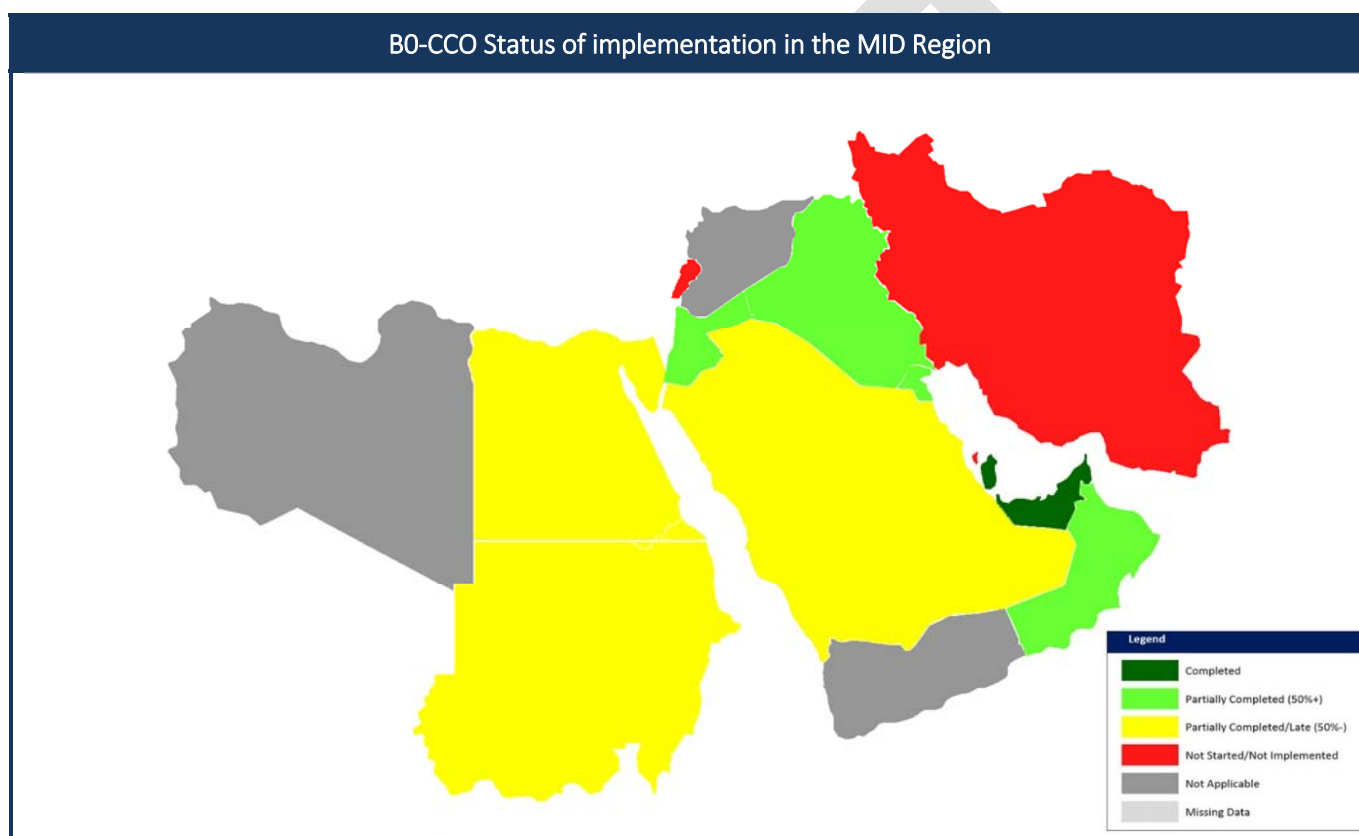
B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
PBN SIDs	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNM, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with PBN SID implemented as required. Supporting Metric: Number of International Aerodromes/ TMAs with PBN SID implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CCO	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OIKB, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNM, HSOB, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CCO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs

B0-CCO Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-CCO	PBN SIDs															
	Intl ADs/TMAs with CCO															

The progress for B0-CCO is acceptable (with approximately 36% implementation).



3. ASBU BLOCK 0 IMPLEMENTATION OUTLOOK FOR 2020

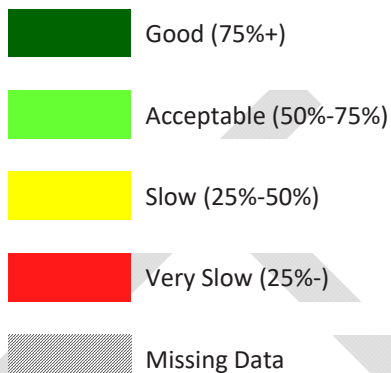
3.1 Status of Implementation-2020

This section consolidates the outlook of the Block 0 Modules implementation in the MID States, by 2020. The table below presents the status of implementation of the 18 ASBU Block 0 Modules foreseen to be achieved by the end of 2020, in accordance with the planning dates reported by States in the ICAO MID Region. This would provide a good basis/prerequisite for the planning of ASBU Block 1 implementation (2019-2025).

Detailed status of implementation of the 18 ASBU Block 0 Modules foreseen to be achieved by the end of 2020, for each State is provided at **Appendix B**.

The following color scheme is used for the projection of the outlook status:

Legend



Module	Status of implementation December 2016 (approximate rate)	Status of implementation June 2018 (approximate rate)	Projected Status of implementation by 2020* (approximate rate)
B0-APTA	44%	52%	96%
B0-WAKE	(Priority 2)	(Priority 2)	71%
B0-RSEQ	(Priority 2)	(Priority 2)	55%
B0-SURF	48%	50%	67%
B0-ACDM	0%	23%	50%
B0-FICE	56%	58%	83%
B0-DATM	62%	63%	87%
B0-AMET	67%	73%	92%
B0-FRTO	43%	45%	71%
B0-NOPS	(Priority 2)	(Priority 2)	46%
B0-ASUR	(Priority 2)	(Priority 2)	70%
B0-ASEP	(Priority 2)	(Priority 2)	69%
B0-OPFL	(Priority 2)	(Priority 2)	60%
B0-ACAS	73%	73%	100%
B0-SNET	(Priority 2)	80%	100%
B0-CDO	34%	47%	67%
B0-TBO	(Priority 2)	(Priority 2)	44%
B0-CCO	28%	36%	63%

Note – projected status for 2020 is calculated based on information received from 12 States (out of 15).

4. ENVIRONMENTAL PROTECTION

4.1 Introduction

Environmental Protection, to minimize the adverse environmental effects of civil aviation activities, is one of the five strategic objectives of ICAO. With a view to minimizing the adverse effects of international civil aviation on the environment, ICAO formulates policies, develops and updates Standards and Recommended Practices (SARPs) on aircraft noise and aircraft engine emissions, and conducts outreach activities. Information related to the ICAO activities on environmental protection is available on the ICAO website at: <https://www.icao.int/environmental-protection/Pages/default.aspx>

This section provides an update on the States' Action Plans on CO₂ Emissions Reduction; and presents an estimation of environmental benefits, in terms of fuel saving / CO₂ emissions reduction, accrued from the implementation of some ASBU Block 0 Modules in the MID Region.

4.2 States' Action Plans on CO₂ Emissions Reduction

The ICAO Assembly 38 (24 September to 4 October 2013) endorsed the Resolution 38-18 Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate Change which encouraged States to voluntarily prepare and submit Action Plans on CO₂ emission reduction to ICAO. An ambitious work programme was further laid down for capacity building and assistance to States in the development and

implementation of their Action Plans to reduce emissions, which States were initially invited to submit by the 37th Session of the ICAO Assembly in October 2010.

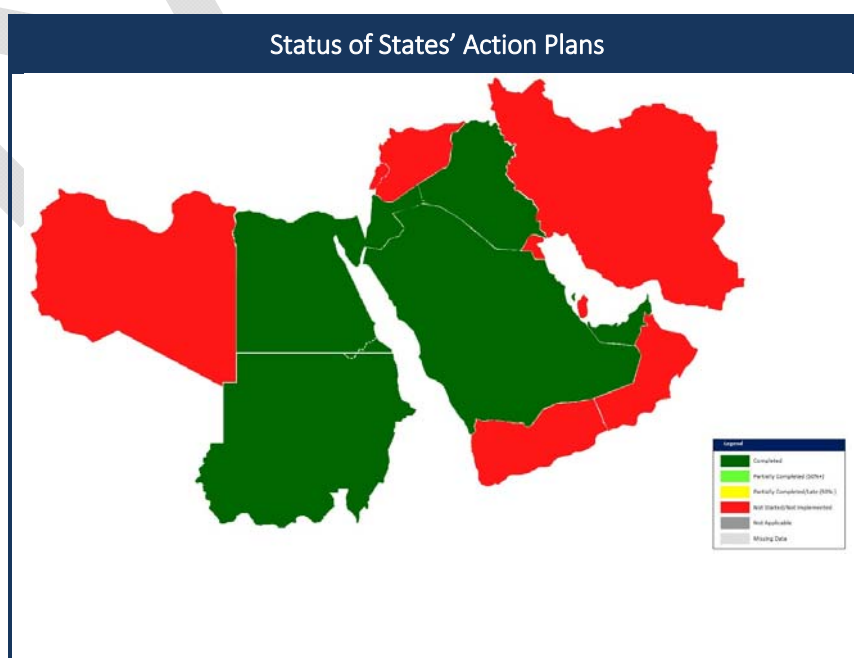
ICAO Assembly 39 (Montreal, Canada, 27 September – 6 October 2016) encouraged States, through Assembly Resolution 39-2 Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change, to submit voluntary Action Plans outlining respective policies and actions, and annual reporting on international aviation CO₂ emissions to ICAO.

The MIDANPIRG/16 meeting (Kuwait, 13 - 16 February 2017) invited States to develop/update their Action Plans for CO₂ emissions reduction and submit them to ICAO through the APER website or the ICAO MID Regional Office.

An Action Plan is a means for States to communicate to ICAO information on activities to address CO₂ emissions from international aviation. The level of information contained in an action plan should be sufficient to demonstrate the effectiveness of actions and to enable ICAO to measure progress towards meeting the global goals set by Assembly Resolution A38-18. Action plans give States the ability to: establish partnerships; promote cooperation and capacity building; facilitate technology transfer; and provide assistance.

The Status of the provision of Action Plans on CO₂ emission in the MID Region is as follows:

State	Action Plans
Bahrain	June 2015
Egypt	July 2016
Iran	-
Iraq	June 2012
Jordan	September 2013
Kuwait	-
Lebanon	-
Libya	-
Oman	-
Qatar	-
Saudi Arabia	April 2018
Sudan	January 2015
Syria	-
UAE	June 2012
Yemen	-



4.3 Estimation of the Environmental Benefits accrued from implementation of ASBU Block 0 Modules

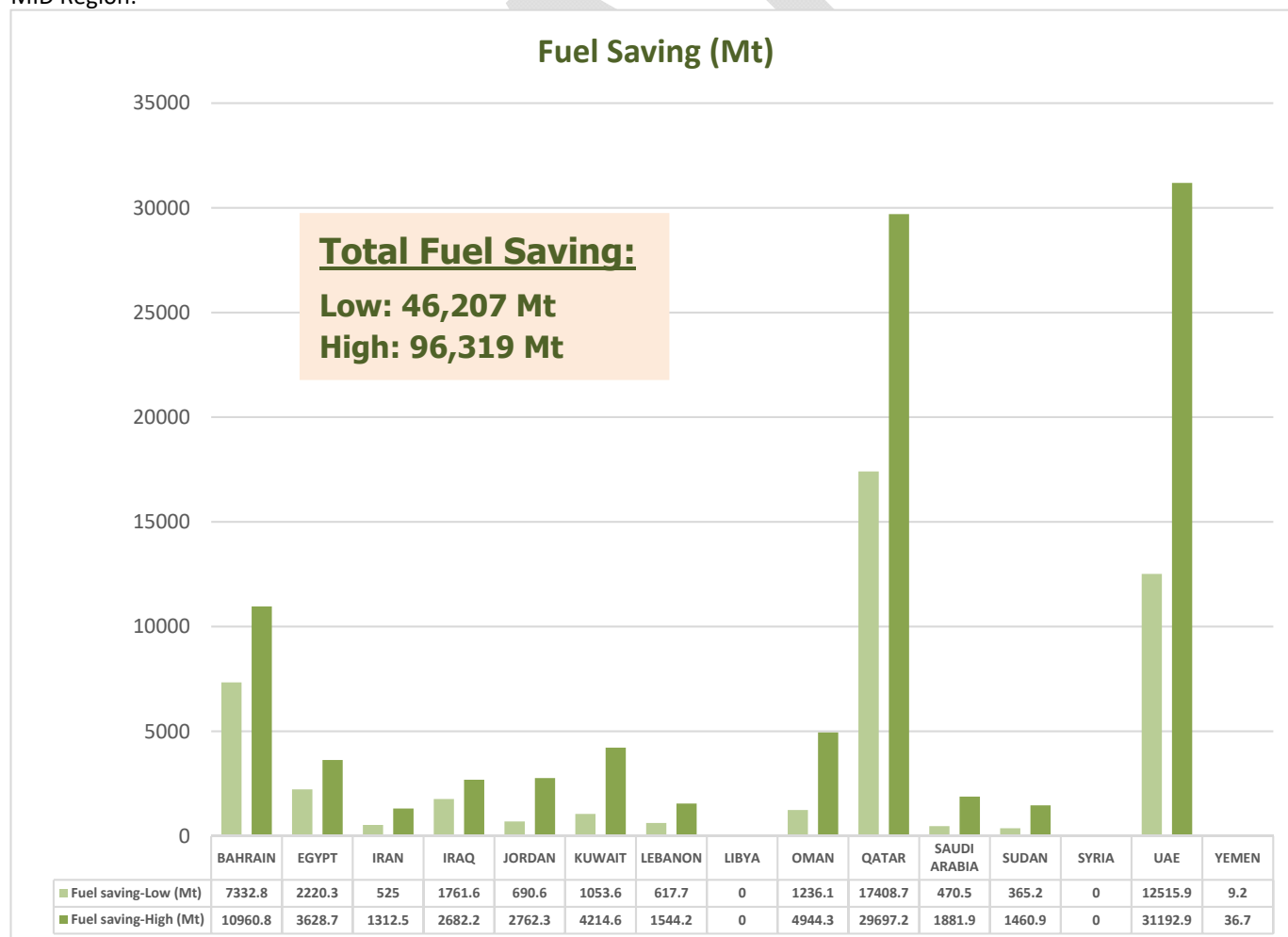
CAEP/10 conducted an assessment of the potential environmental benefits (fuel savings / CO₂) for the period between the start of implementation of ASBU Block 0 modules in 2013 and the planned implementation of such modules in 2018 (end of Block 0). In order to accomplish this task, CAEP developed sets of Rules-of-Thumb for each studied module with the overall intent to provide a conservative estimate of ASBU Block 0 fuel saving benefits. Rules-of-Thumb were developed using existing, publically available data, literature, and assumptions, together with the professional judgment of the analysts. A total of twenty three (23) rules of thumb have been developed for thirteen (13) ASBU Block 0 Modules.

The results of the ASBU Block 0 analysis conducted by CAEP highlight a potential reduction in fuel consumption by 2018 due to the implementation of ASBU Block 0 modules when compared to the 2013 baseline. The results show that the following Block 0 Modules (operational improvements) would have the biggest contribution to fuel saving in the MID Region:

- CCO 1 (CCO)
- CDO 1 (CDO)
- ACDM
- CDO 2 (PBN STARs)
- ASUR (ADS-B Surveillance)
- CCO 2 (PBN SIDs)
- APTA 1 (Radius to Fix)

As the status of implementation of B0-ACDM and B0-ASUR is still low in the MID Region, a Methodology for the Estimation of environmental benefits accrued from the implementation of priority 1 Block 0 Modules in the MID Region has been developed for B0-APTA, CCO and CDO, based on the Rules of Thumb and the available traffic data.

The estimation has shown a **total of 46,696 to 96,808 Mt** of fuel saving in the MID Region, as a result of the implementation of the selected Block 0 Modules (APTA, CDO and CCO), as shown below:



5. SUCCESS STORIES/BEST PRACTICES

5.1 NCLB ACTIVITIES IN THE MID REGION

I. Introduction

The ICAO Council identified that there is a large discrepancy among States in the implementation of ICAO Standards and Recommended Practices (SARPs). As a result, the ICAO “No Country Left Behind” (NCLB) Campaign was established by the Council to help ensure that SARPs implementation is better harmonized globally. To avoid this gap, ICAO should focus its activities on States lacking fundamental oversight capabilities for effective implementation of ICAO SARPs, particularly in the priority areas of safety, air navigation and efficiency, and security. Therefore, particular attention should be given to the assistance of those States with a higher safety and security risk.

In accordance with Assembly Resolution A39-23 “No Country Left Behind” (NCLB) Initiative, States should effectively implement ICAO’s Standards and Recommended Practices (SARPs) and policies so that all States have safe, secure, efficient, economically viable and environmentally sound air transport systems, which support sustainable development and socio-economic prosperity.

At the Regional Level; the MID Region NCLB Strategy supports the implementation of the Global Aviation Safety Plan (GASP) and its Roadmap as the basis to develop action plans that define the specific activities, which should take place in order to improve safety at the regional and national levels.

The MID Region NCLB Strategy is complemented by the MID Region NCLB Implementation Plan as a companion document. This Plan is a living document used for recording the NCLB activities in the MID Region (general and State-by-State), including the monitoring of the States’ NCLB Plan of Actions and States/Stakeholders’ contributions to support the NCLB initiative.



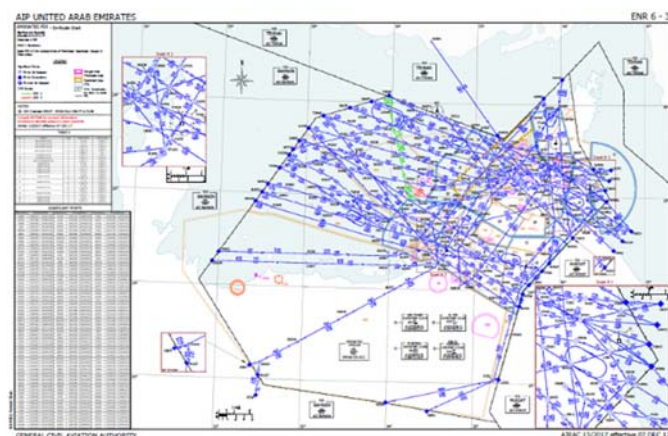
The Fourth meeting of the Directors General of Civil Aviation – Middle East Region (DGCA-MID/4), which was held in Muscat, Oman from 17 to 19 October 2017, through DGCA-MID/4 Conclusion 4/1, endorsed the NCLB Declaration (Muscat Declaration) in support of the ICAO NCLB Initiative; and invited States and Stakeholders to support the implementation of the MID Region NCLB Strategy.

It is to be highlighted that Kingdom of Saudi Arabia has kindly provided 400 K US\$ to support ICAO MID NCLB activities; and UAE provided 50 K US\$ to support the establishment of the MID Flight Procedure Programme (MID FPP). Other States and stakeholders, such as Egypt, Iran and EASA provided in-kind support to some MID States related to aviation safety and security, under the MID Region NCLB framework.

II. MID NCLB Activities related to Air Navigation

- 10 NCLB assistance missions in 2016 and 7 in 2017 (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Sudan)
- 6 NCLB Seminars/Workshops in 2016 and 6 in 2017
- 1 ATM Inspectors Course (GSI-ANS/ATM)

On December 7th 2017, the General Civil Aviation Authority (GCAA) completed the implementation of the UAE Airspace Restructuring Project – Integration & Implementation (UAE ARP3). This airspace change saw the Emirates Flight Information Region (FIR) transformed into an airspace structure completely based on Performance Based Navigation (PBN) with a Navigation Specification of RNAV-1 (GNSS).



UAE ARP (Integration & Implementation) was the culmination of years of extensive analysis, development, collaboration and cooperation across the UAE Aviation Community including the GCAA Sheikh Zayed Air Navigation Centre (SZC), Dubai Air Navigation Services, Abu Dhabi Airports Company, Ras Al Khaimah Department of Civil Aviation, Sharjah Department of Civil Aviation, Fujairah Department of Civil Aviation as well as more than twenty further aviation stakeholders.

The UAE ARP (Integration & Implementation) was designed to meet multiple objectives, all of which were achieved in line with global best practices. Primarily the airspace change was designed to increase UAE Airspace capacity to meet the forecasted air traffic demand for 2020, as well as increased access to all UAE airports, improve efficiency for both aviation system customers and Air Navigation Service Providers (ANSP) and reduce the environmental impact of the increasing traffic through more effective Air Traffic Management operations.

UAE ARP3 Facts:

- Capability to safely meet capacity requirements for the forecasted 2040 air traffic demand through the UAE ARP3 Integrated Airspace Master Plan (IAMP).
- Annual fuel savings exceeding \$15 million to the airlines customers within the first year after implementation.
- Annual environmental efficiency exceeding 100,000 Mt of CO₂, supporting a 'Greener' aviation.
- Project Implementation Duration – 18 months
- Number of project Deliverables - 50
- Number of Workshops / Meetings – over 200
- Actual Man hours for design development – over 120,000 hours
- Number of UAE Air Navigation Service Providers involved – 6
- Number of Emirates of the United Arab Emirates involved - 5
- Number of Aviation Stakeholder organizations collaboratively involved - 26
- Number of Project Representatives – over 150
- Number of Air Traffic Controllers trained for UAE ARP3 - 250

The project directly involved five of the seven Emirates within the UAE and required over 120,000 man-hours to develop the airspace design network. Multiple Fast Time and Real Time simulations in Italy, UK and in the UAE formed critical activities for the design validation and verification of the revised airspace network.

The UAE ARP (Integration & Implementation) also required over 250 Air Traffic Controllers to take simulation and theoretical training on the redesign for over two hundred Instrument Flight Procedures and thirty new airways.



In 2012, prior to the launch of the UAE ARP the GCAA, in collaboration with the local Departments of Civil Aviation and ANSPs, undertook a 'UAE Airspace Study' which, among other recommendations, identified a requirement to 'develop a comprehensive airspace design that will accommodate transition to a full PBN airspace environment to support the increasing demand' and this laid the foundations of the UAE ARP.

Accordingly, UAE ARP adopted an industry wide collaborative approach, encompassing a three phased project which kicked off in 2013. In July 2016, the ARP activated Phase 3 (Integration & Implementation) and with the support of globally recognised consultants ensured the successful transformation of the chosen conceptual designs were integrated into an implementable solution. The first iteration of the design network delivered on 7th December 2017 enabled the airspace within the Emirates FIR sufficient capacity, capability and efficiency to support the forecasted traffic growth to 2020.



Communication of such a large scale change is a vital change management activity to ensure a smooth and successful transition. UAE ARP (Integration & Implementation) undertook months of cross industry stakeholder workshops and events culminating in an awareness campaign at the Dubai Airshow between November 17-21st.

A Communication and Engagement document was also generated to ensure clear and consistent messages were relayed by all stakeholders, whilst also leaflets and briefing material generated across the six ANSPs, National carriers and IATA. AICs and NOTAMs were used to promulgate further Global awareness prior to the December 7th transition.

Implementing a new network for the entire Emirates FIR airspace change without generating disruption to the aviation customers was a major and critical challenge which required significant stakeholder collaboration. To do this, UAE ARP (Integration & Implementation) created a Transition Plan Development Team (TPDT) encompassing ANSPs, airlines, IATA, military, NCMS and other appropriate aviation stakeholders. The ultimate focus of the team was to develop a harmonised Transition Plan for all agencies involved to ensure a complete synchronised and seamless transition. One of the first hurdles for the team to overcome was as a result of the traffic patterns of the Emirates FIR and the unsuitable timing associated with the AIRAC effectiveness. Through the TPDT a bespoke collaborative solution was found to delay the 'Operational Effective' time of implementation to 03:30 UTC (07:30 UAE) and therefore not utilising the 0000UTC effective time associated with AIRAC 13/17. The rationale ensured that the major arrival flows into the UAE airfields which would be operating predominantly to old FMS network data would have landed prior to the operational airspace change. The new airspace would then become operationally effective prior to the major UAE departure flow materializing and would encompass a majority of aircraft operating to the new AIRAC 13/17 FMS network.



To ensure that a synchronised airspace transition was enabled across the six ANSPs, a Transition Team was created with representation of six Transition Coordinators (one per ANSP, with also a deputy allocation) coordinating through a Transition Manager based at SZC. These Transition Coordinators and Transition Manager operated to an Operational Transition Event Schedule, containing major 'Check-Points' confirming that each unit's activities were operating in sync, whilst also in parallel. To enable rapid decision making capability, the UAE ARP (Integration & Implementation) also formed a Transition & Contingency Cell at SZC. This cell contained PSG representation from the ANSPs, military and also representation from the UAE Airline community. The Transition & Contingency Cell was activated several hours prior to the Operational Transition of the new airspace and their role was to ensure that if any major decisions were required at either an ANSP or project level, a resolution could be sought and acted upon quickly to enable minimal disruption to the Transition Event.

As part of the Transition Plan, UAE ARP (Integration & Implementation) adopted varying Transition timelines to provide regulatory assurance that each ANSP had implemented the airspace change successfully. In preparation for the airspace implementation, the project carried out a Transition Readiness Review which was held on November 23rd. The purpose of this review was to ensure that all ANSPs had satisfied specific 'Entry Criteria' prior to the Transition Event (December 7th). In the five day build up to the Transition Event, NCMS provided a daily weather forecast for December 7th across the UAE which was disseminated to the PSG and Transition Coordinators via the Transition Manager. From December 5th, this information was also supplemented with a fog forecast for the UAE airfields.

During the Transition Event four appropriately scheduled teleconferences were also held to provide a status check on the progress of the transition to the airline community and allow an opportunity for the airlines to provide pertinent information back to the Transition Manager. A final teleconference was held at 13:30 UTC (17:30 UAE) which confirmed that each ANSP had satisfied the Transition Event 'Exit Criteria'. This information was then relayed to the PSG for their approval to exit the Transition Event. At this stage, the UAE ARP transition was transferred from the Transition Event to a 10 day Transition Period. Any observations or feedback from each of the six ANSPs or from the airline community would then be fed into a 10/30/60/90 day review, with the project then supporting a six month Post Implementation Maintenance & Support period.



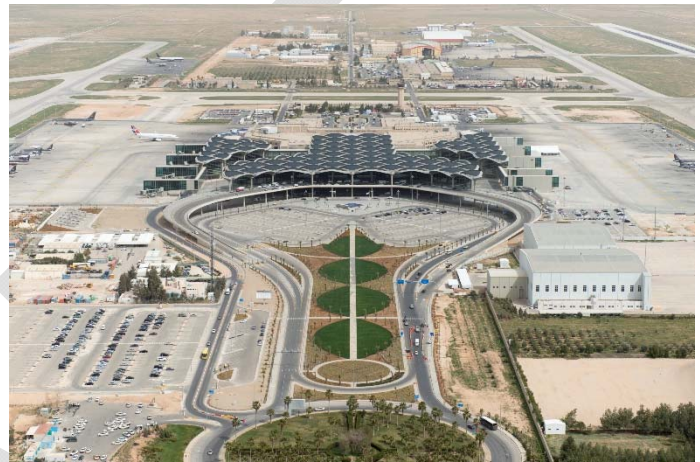
The output of the extensive planning and preparation by the TPDT in the generation of a Transition Delivery Document (TDD) and associated Transition Plans for the Transition Event ensured that on December 7th 2017, a seamless transition took place with no disruption or delay to the aviation community and no issues reported from any of the six ANSPs involved.

Through the development of an Integrated Airspace Master Plan (IAMP), the project will also create a Roadmap to future-proof the UAE's airspace network for the forecasted traffic growth until 2040. Design elements will need to incorporate such major airport expansion projects for both Dubai World Central Al Maktoum International Airport, Abu Dhabi International Airport as well as meeting the anticipated capacity increases for Dubai's Expo 2020. Moreover, it will ensure that aviation will continue to provide a vital contribution to the UAE Gross Domestic Product.



Amman/Queen Alia International Airport (QAIA) completed the requirements of the final level (level 3+ Neutrality) of the Airport Carbon Accreditation (ACA) program, which is a carbon management program developed by Airport Council International (ACI). QAIA is the first airport in the Middle East to achieve this accomplishment.

QAIA has demonstrated commitment to the aviation environmental protection, by implementing a comprehensive Environment Management Plan (EMP), which was developed to assess the probability of a multitude of risks, related to airport operations and activities, on the surrounding environment. This plan is reviewed annually to comply with the latest changes in national and international standards and requirements. QAIA's EMP is developed to minimize and control sources of environmental pollution such as carbon emissions, in addition to the monitoring of several environmental elements, through an integrated waste management program, in addition to air quality, water and biodiversity management, as well as noise control.



QAIA completed the first level of ACA Programme (Mapping) in March 2013, helping to determine the sources of harmful emissions on Airport grounds. This was followed in March 2015, by reaching level 2 (Reduction), as a result of the continuous efforts to reduce Carbon emissions, making QAIA the first airport to achieve this level in the region.

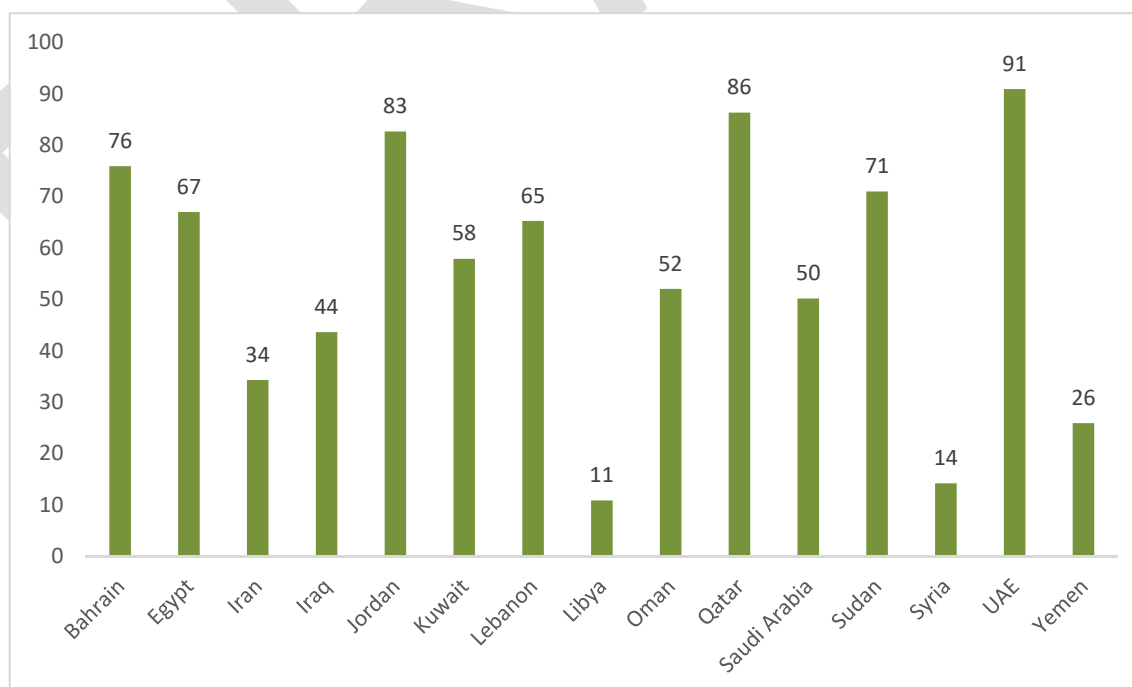
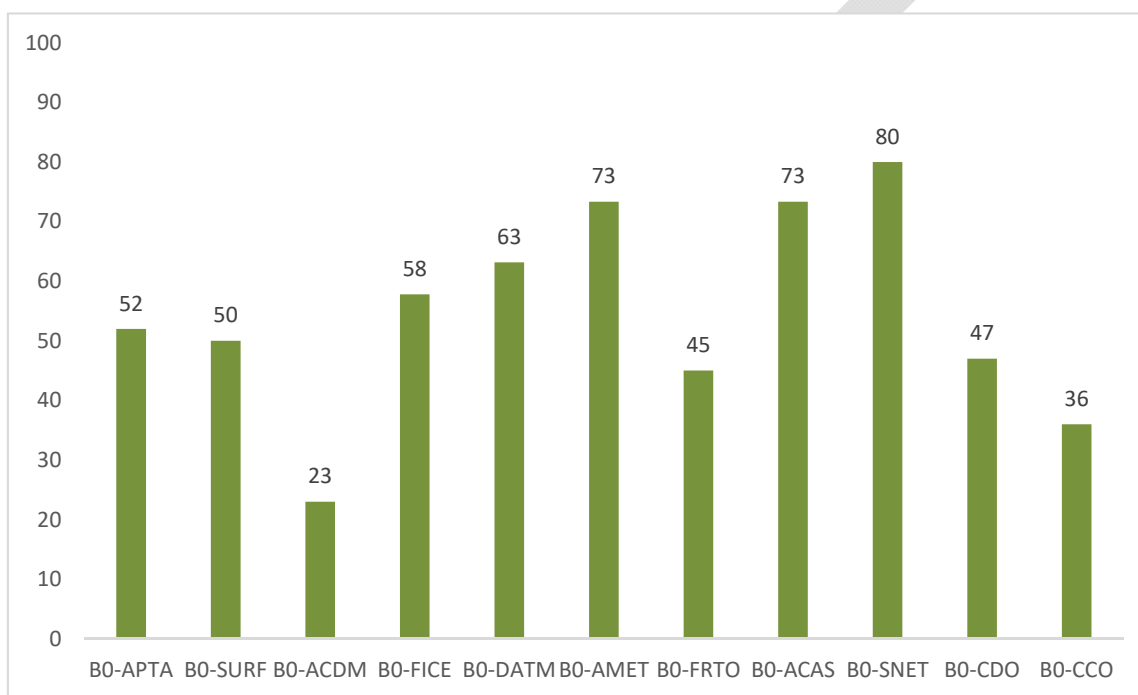
6. CONCLUSION

The progress for the implementation of some priority 1 Block0 Modules in the MID Region has been acceptable/good; such as B0-ACAS, B0-AMET and B0-DATM. Nevertheless, some States are still facing challenges to implement the majority of the Block 0 Modules.

The status of implementation of the ASBU Block 0 Modules also shows that Bahrain, Egypt, Jordan, Kuwait, Qatar, Saudi

Arabia and UAE made a good progress in the implementation of the priority 1 ASBU Block 0 Modules.

Looking into the States' plans for 2020 (outlook), the focus/priority of States is to complete the implementation of B0-APTA, B0-FICE, B0-DATM, B0-AMET, B0-CCO and B0-CDO.



Status of implementation of Doha Declaration Targets:

ACC by 2017

Doha Declaration was endorsed by the third meeting of Directors General of Civil Aviation (DGCA-MID/3) in Doha, Qatar from 27 to 29 April 2015. Doha Declaration set five Targets for the Air Navigation Capacity and Efficiency, as follows:

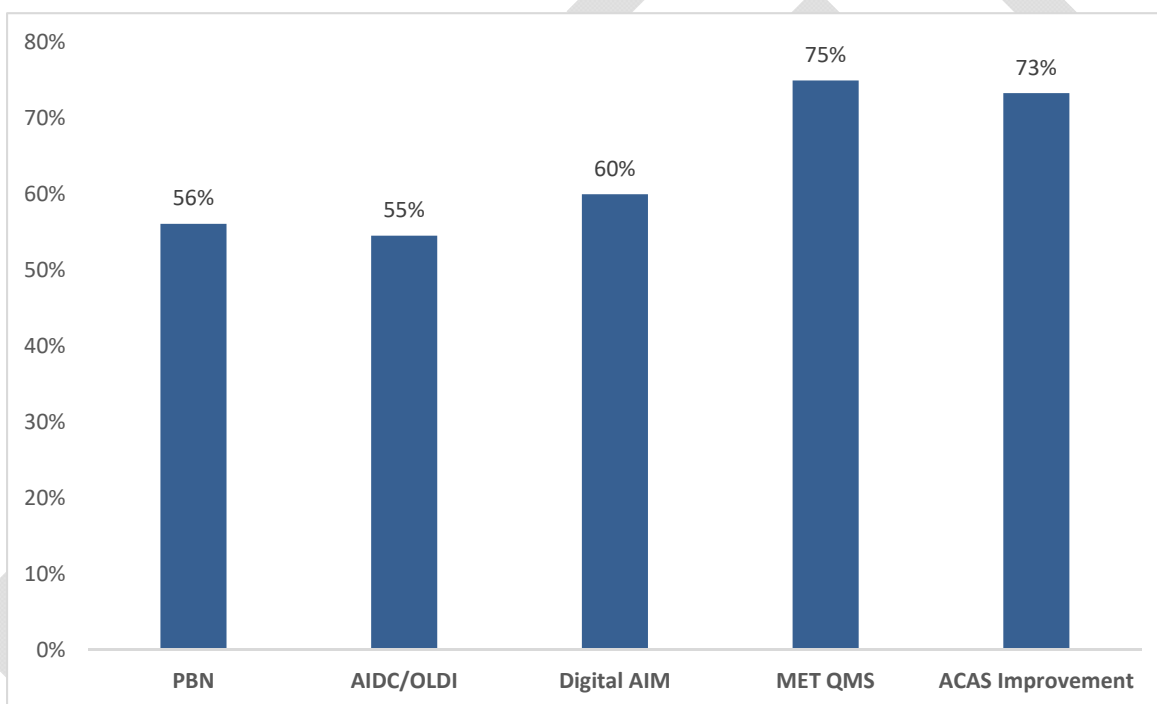
- 1- Optimization of Approach Procedures including vertical guidance (PBN): Implement PBN approach procedures with vertical guidance, for all runways ends at international aerodromes, either as the primary approach or as a back-up for the precision approaches by 2017
- 2- Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration: 11 States to implement AIDC/OLDI between their ACCs and at least one adjacent

3- Service Improvement through Digital Aeronautical Information Management: All States to complete implementation of Phase I of the transition from AIS to AIM by 2017

4- Meteorological information supporting enhanced operational efficiency and safety: 12 States to complete the implementation of QMS for MET by 2017

5- ACAS Improvement: All States require carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons by 2017

Status of implementation by States related to the Targets of the Doha Declaration is as follows:



APPENDIX A: STATUS OF ASBU BLOCK 0 MODULES

	APTA				SURF			ACDM	FICE			DATM										AMET			FRTO			NOPS	ACAS	SNET		CDO			CCO							
State	PBN Plan	LNAV	LNAV/ NAV	TOTAL	A-SMGCS 1	A-SMGCS 2	TOTAL	TOTAL	AMHS Cap	AMHS Impl.	AIDC/OLDI	TOTAL	AIM Plans	AIXM	eAIP	QMS	WGS-84 H	WGS-84 V	eTOD area 1 T	eTOD area 1 O	eTOD area 4 T	eTOD area 4 O	TOTAL	SADIS FTP	QMS	SIGMET	TOTAL	FUA	Flex Routing	TOTAL	TOTAL	TOTAL	STCA	MSAW	TOTAL	PBN STARS	CDO	TOTAL	PBN SIDs	CCO	TOTAL	
Bahrain																																										
Egypt																																										
Iran																																										
Iraq																																										
Jordan																																										
Kuwait																																										
Lebanon																																										
Libya																																										
Oman																																										
Qatar																																										
Saudi Arabia																																										
Sudan																																										
Syria																																										
UAE																																										
Yemen																																										

APPENDIX B: ASBU BLOCK 0 STATUS OF IMPLEMENTATION OUTLOOK 2020

State	B0-APTA	B0-WAKE	B0-RSEQ	B0-SURF	B0-ACDM	B0-FICE	B0-DATM	B0-AMET	B0-FRTO	B0-NOPS	B0-ASUR	B0-ASEP	B0-OPFL	B0-ACAS	B0-SNET	B0-CDO	B0-TBO	B0-CCO
Bahrain	FI	PI	PI	FI	PI	FI	FI	FI	PI	PI	FI	PI	PI	FI	FI	FI	PI	FI
Egypt	FI	FI	PI	FI	PI	FI	FI	FI	FI	FI	FI	PI	PI	FI	FI	PI	PI	PI
Iran	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	PI	FI
Iraq	PI	PI	PI	PI	NI	FI	FI	PI	PI	NI	NI	NI	PI	FI	FI	NI	NI	NI
Jordan	FI	PI	NI	NI	PI	PI	PI	FI	NI	NI	FI	PI	PI	FI	FI	PI	NI	PI
Kuwait	FI	PI	PI	PI	PI	PI	PI	FI	PI	PI	PI	PI	PI	FI	FI	PI	PI	PI
Lebanon	FI	PI	NI	PI	PI	PI	FI	PI	PI	NI	NI	FI	NI	FI	FI	PI	PI	NI
Libya	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD
Oman	FI	FI	FI	PI	PI	FI	FI	FI	FI	FI	PI	FI	PI	FI	FI	PI	PI	PI
Qatar	FI	NI	FI	FI	PI	FI	FI	FI	FI	PI	FI	PI	PI	FI	FI	FI	PI	FI
Saudi Arabia	FI	PI	PI	PI	PI	FI	FI	FI	FI	PI	FI	FI	FI	FI	FI	FI	FI	FI
Sudan	FI	PI	PI	PI	PI	PI	PI	FI	PI	PI	PI	FI	PI	FI	FI	PI	PI	PI
Syria	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD
UAE	FI	FI	PI	PI	PI	FI	FI	FI	FI	PI	FI	MD	PI	FI	FI	FI	PI	FI
Yemen	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	FI	MD	MD	MD	MD

Legend

FI	FI: Fully Implemented
PI	PI: Partially Implemented
NI	NI: Not Implemented
N/A	N/A: Not Applicable
MD	Missing Data



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International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.2: MID Region Air Navigation Priorities and Targets

MID AIR NAVIGATION STRATEGY

(Presented by the Secretariat)

SUMMARY

This paper presents an updated version of the MID Air Navigation Strategy (MID Doc 002) based on the ANSIG/3 meeting proposals, for endorsement by the MSG on behalf of MIDANPIRG.

Action by the meeting is at paragraph 3.

REFERENCES

- MID Region Air Navigation Strategy (MID Doc 002)
- MIDANPIRG/16 Report
- ANSIG/3 Report

1. INTRODUCTION

1.1 The MIDANPIRG/16 meeting (Kuwait, 13-16 February 2017), through Conclusion 16/3, updated and endorsed the MID Region Air Navigation Strategy (MID Doc 002).

2. DISCUSSION

2.1 The MID Region Air Navigation Strategy (MID Doc 002), endorsed by MIDANPIRG/16, was further reviewed by the MIDANPIRG subsidiary bodies and the following amendments have been proposed:

AIM SG/4 (Cairo, Egypt, 13-15 February 2018)

2.2 The ANSIG/3 agreed with the AIM SG/3 meeting proposal to delete the element "National AIM implementation plan/roadmap" from the list of Elements of B0-DATM in the MID Air Navigation Strategy.

2.3 The meeting reviewed B0-DATM elements and agreed that, for a simplified performance monitoring of the AIM implementation (B0-DATM), eTOD and Digital NOTAM should also be deleted from the list of Elements of B0-DATM. It was noted that eTOD will still be monitored through the MID eANP Volume III (Tables B0-DATM 3-4-1, 3-4-2 and 3-4-3).

2.4 The meeting agreed that the agreements with data originators is an important Step of the ICAO Roadmap for the transition from AIS to AIM. Accordingly, the meeting agreed to include this element in the MID Air Navigation Strategy (B0-DATM).

ATM SG/4 (Amman, Jordan, 29 April - 2 May 2018)

2.5 Based on the ATM SG/4 meeting outcome, the ANSIG/3 meeting reviewed and updated the MID Region Air Navigation Strategy, parts related to ATM: B0-FRTO, B0-NOPS, B0-FICE and B0-SNET.

CNS SG/8 (Cairo, Egypt, 26 - 28 February 2018)

2.6 Considering the progress related to ADS-B and MLAT implementation in the MID Region, the CNS SG/8 meeting proposed to change the B0-ASUR from priority 2 to priority 1. However, the ANSIG/3 meeting agreed that, prior to changing the priority of B0-ASUR from 2 to 1, it was necessary for the CNS SG to agree on the elements, applicability area, performance indicators/supporting metrics and their associated targets.

MET SG/7 (Cairo, Egypt, 14 - 16 November 2017)

2.7 The meeting reviewed the MID Air Navigation Strategy parts related to B0-AMET and agreed to the proposal to add a new element related to OPMET.

2.8 The meeting also noted that providing wind shear information was part of B0-AMET. The ANSIG/3 meeting agreed that the MET SG/8 meeting should consider the inclusion of the wind shear as an element of the B0-AMET in the MID Air Navigation Strategy with well identified applicability area (list of International Airports requiring implementation of wind shear systems).

PBN SG/3 (Cairo, Egypt, 11 – 13 February 2018)

2.9 Taking into consideration the expected significant changes to the GANP 2019 edition and the current MID Region status of implementation of the ASBU B0-APTA, B0-CCO and B0-CDO, the meeting agreed to maintain the current elements of the above ABSU Modules unchanged, with the exception of the “PBN Plans”, which would be removed.

2.10 Based on the inputs from AIM SG/4, ATM SG/4, CNS SG/8, MET SG/7 and PBN SG/3 meetings, the ANSIG/3 meeting reviewed and updated the MID Region Air Navigation Strategy (MID Doc 002), as at **Appendix A**.

2.11 Based on the above, the following Draft MSG Conclusion is proposed:

DRAFT MSG CONCLUSION 6/X: MID REGION AIR NAVIGATION STRATEGY

*That, the revised MID Region Air Navigation Strategy (MID Doc 002, Edition December 2018) at **Appendix A** is endorsed.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and update, as deemed necessary, the revised MID Region Air Navigation Strategy (MID Doc 2), at **Appendix A**; and
- b) endorse the proposed Draft MSG Conclusion.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**MIDDLE EAST AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP
(MIDANPIRG)**

**MID REGION
AIR NAVIGATION STRATEGY**

EDITION DECEMBER, 2018

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

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1. Introduction

1.1 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.

1.2 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.

1.3 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.

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

1.5 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.

1.6 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.

2. Strategic Air Navigation Capacity and Efficiency Objective

2.1 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 while minimizing the adverse environmental effects of civil aviation activities.

3. MID Air Navigation Objectives

3.1 The MID Region air navigation objectives are set 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).

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

3.2 ~~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. The MID Region near term priorities are based on the implementation of an agreed set of Block 0 Modules as reflected in Table 1 below.~~ Block ‘0’ features Modules are characterized by operational improvements, which have already been developed and implemented in many parts of the world. The MID Region priority 1 Block 0 Modules are reflected in Table 1 below.

3.3 ~~The MID Region Air Navigation Strategy aims to maintain regional harmonisation. The States should develop their national performance framework, including action plans for the implementation of relevant priority 1 ASBU Modules and other modules according to the State operational requirements.~~ The MID Region Air Navigation Strategy aims to maintain regional harmonisation. The States should develop their National ASBU Implementation Plan, including action plans for the implementation of relevant priority 1 ASBU Modules and other Modules according to the States’ operational requirements.

Mid-term Objective (2019–2024): ASBU Block 1

3.4 The implementation of the ASBU Block 0 Modules in the MID Region started in 2013 and is continuing.

3.5 ~~Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2019, 2025 and 2031, respectively. Associated timescales are intended to depict the initial deployment targets along with the readiness of all components needed for deployment.~~ Blocks 1 features Modules are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2019.

Long-term Objective (2025–2030): ASBU Block 2

3.6 The Block Upgrades incorporate a long-term perspective matching that of the Regional Air Navigation Plan (eANP). 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.

3.7 The implementation of Block 2 and Block 3 Modules is planned for 2025 and beyond.

4. MID Region ASBU Block 0 Modules Prioritization and Monitoring

4.1 On the basis of operational requirements and taking into consideration the associated benefits, **Table 1** below shows the priority for implementation of the 18 Block “0” Modules, as well as the MIDANPIRG subsidiary bodies that will be monitoring and supporting the implementation of the Modules:

Table 1. MID REGION ASBU BLOCK 0 MODULES PRIORITIZATION AND MONITORING

Module Code	Module Title	Priority	Start Date	Monitoring		Remarks
				Main	Supporting	
Performance Improvement Areas (PIA) 1: Airport Operations						
B0-APTA	Optimization of Approach Procedures including vertical guidance	1	2014	PBN SG	ATM SG, AIM SG, CNS SG	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	2				
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	2				
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	1	2014	ANSIG	CNS SG	Coordination with RGS WG
B0-ACDM	Improved Airport Operations through Airport-CDM	1	2014	ANSIG	CNS SG, AIM SG, ATM SG	Coordination with RGS WG
Performance Improvement Areas (PIA) 2 Globally Interoperable Systems and Data Through Globally Interoperable System Wide Information Management						
B0-FICE	Increased Interoperability, Efficiency and Capacity	1	2014	CNS SG	AIM SG, ATM SG	

	through Ground-Ground Integration					
B0-DATM	Service Improvement through Digital Aeronautical Information Management	1	2014	AIM SG		
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	1	2014	MET SG		
Performance Improvement Areas (PIA) 3 Optimum Capacity and Flexible Flights – Through Global Collaborative ATM						
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	1	2014	ATM SG		
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	1	2015			
B0-ASUR	Initial capability for ground surveillance	2				
B0-ASEP	Air Traffic Situational Awareness (ATSA)	2				
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	2				
B0-ACAS	ACAS Improvements	1	2014	CNS SG		
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	1	2017	ATM SG		
Performance Improvement Areas (PIA) 4 Efficient Flight Path – Through Trajectory-based Operations						
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	1	2014	PBN SG		
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	2		ATM SG	CNS SG	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	1	2014	PBN SG		

Priority 1: Modules that have the highest contribution to the improvement of air navigation safety and/or efficiency in the MID Region. These modules should be implemented where applicable and will be used for the purpose of regional air navigation monitoring and reporting for the period 2015-2018.

Priority 2: Modules recommended for implementation based on identified operational needs and benefits.

5. Measuring and monitoring air navigation performance

5.1 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 monitoring of the priority 1 ASBU modules is carried out through the MID eANP Volume III.

5.2 MIDANPIRG through its activities under the various subsidiary bodies will continue to update and monitor the implementation of the ASBU Modules to achieve the air navigation targets.

5.3 The priority 1 Modules along with the associated elements, applicability, performance Indicators, supporting Metrics, and performance Targets are shown in the **Table 2** below.

***Note:** The different elements supporting the implementation are explained in detail in the ASBU Document which is attached to the Global Plan (Doc 9750).*

6. Governance

6.1 Progress report on the status of implementation of the different priority 1 Modules and other Modules, as appropriate, should be developed by the Air Navigation System Implementation Group (ANSIG) and presented to the MIDANPIRG Steering Group (MSG) and/or MIDANPIRG on regular basis.

6.2 The MIDANPIRG and its Steering Group (MSG) will be the governing body responsible for the review and update of the MID Region Air Navigation Strategy.

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

6.4 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, MID Air navigation Report, etc.; and to the stakeholders in the Region within the framework of MIDANPIRG.

**Table 2. MONITORING THE IMPLEMENTATION OF THE ASBU BLOCK 0 MODULES
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.

<i>B0 – APTA: Optimization of Approach Procedures including vertical guidance</i>			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
~~States' PBN Implementation Plans~~	~~All States~~	~~Indicator: % of States that provided updated PBN implementation Plan~~ ~~Supporting metric: Number of States that provided updated PBN implementation Plan~~	~~100% by Dec. 2018~~
LNAV	All RWYs Ends at International Aerodromes	Indicator: % of runway ends at international aerodromes with RNAV(GNSS) Approach Procedures (LNAV) Supporting metric: Number of runway ends at international aerodromes with RNAV (GNSS) Approach Procedures (LNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2016
LNAV/VNAV	All RWYs ENDS at International Aerodromes	Indicator: % of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	All runway ends at Int'l Aerodromes, either as the primary approach or as a back-up for precision approaches by Dec. 2017

Module 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
A-SMGCS Level 1*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OMDW, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 1 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 1	70% by Dec. 2017
A-SMGCS Level 2*	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDW, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented A-SMGCS Level 2 Supporting Metric: Number of applicable international aerodromes having implemented A-SMGCS Level 2	50% by Dec. 2017

*Reference: Eurocontrol Document – “Definition of A-SMGCS Implementation Levels, Edition 1.2, 2010”.

B0 – ACDM: Improved Airport Operations through Airport-CDM

Description and purpose:

To implement collaborative applications that will allow the sharing of surface operations data among the different stakeholders on the airport. This will improve surface traffic management reducing delays on movement and manoeuvring areas and enhance safety, efficiency and situational awareness.

Main performance impact:

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

Applicability consideration:

Local for equipped/capable fleets and already established airport surface infrastructure.

B0 – ACDM: Improved Airport Operations through Airport-CDM

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	50% by Dec. 2018

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 Inter-facility 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
AMHS capability	All States	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS capability	70% of States with AMHS capability by Dec. 2017
AMHS implementation /interconnection	All States	Indicator: % of States with AMHS implemented (interconnected with other States AMHS) Supporting metric: Number of States with AMHS implemented (interconnections with other States AMHS)	60% of States with AMHS interconnected by Dec. 2017
Implementation of AIDC/OLDI between adjacent ACCs	All ACCs as per the AIDC/OLDI Applicability Table*	Indicator: % of priority 1 FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI Interconnection have been implemented with neighboring ACCs Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70% by Dec. 2017/2020

* [Note – the required AIDC/OLDI connection is detailed in the MID eANP Volume II Part III-CNS under Specific Regional Requirements](#)

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			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
National AIM Implementation Plan/Roadmap	All States	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	90% by Dec. 2018
AIXM	All States	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	80% by Dec. 2018
eAIP	All States	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)	80% by Dec. 2020
QMS	All States	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	90% by Dec. 2018
WGS-84	All States	Indicator: % of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Supporting Metric: Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Indicator: % of States that have implemented WGS-84 Geoid Undulation Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation	Horizontal: 100% by Dec. 2018 Vertical: 90% by Dec. 2018
Agreement with data originators	All States	Indicator: % of States that have signed Service Level Agreements (SLA) with at least 50% of their AIS data originators Supporting Metric: Number of States that have signed Service Level Agreements (SLA) with at least 50% of	90% by Dec. 2020

		their AIS data originators	
eTOD	All States	Indicator: % of States that have implemented required Terrain datasets Supporting Metric: Number of States that have implemented required Terrain datasets Indicator: % of States that have implemented required Obstacle datasets Supporting Metric: Number of States that have implemented required Obstacle datasets	Area 1: Terrain: 70% by Dec. 2018 Obstacles: 60% by Dec. 2018 Area 4: Terrain: 100% by Dec. 2018 Obstacles: 100% by Dec. 2018
Digital NOTAM*	All States	Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM	90% by Dec. 2020

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			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
SADIS FTP	All States	Indicator: % of States ~~that have~~ having implemented SADIS FTP service Supporting Metric: Number of States ~~that have~~ having implemented SADIS FTP service	100% by Dec. 2018
QMS	All States	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	80% by Dec. 2018
SIGMET	All States with MWOs in MID Region	Indicator: % of States having implemented FIRs in which SIGMET ~~is implemented~~ Supporting metric: number of FIRs States having implemented SIGMET ~~is implemented~~	100% by Dec. 2018
WIND SHEAR	TBD	Indicator: TBD Supporting metric: TBD	TBD
OPMET	All States	Indicator: % of States having implemented METAR and TAF Supporting metric: number of States having implemented METAR and TAF	95% by Dec. 2018

B0 – FRT0: 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 – FRT0: Improved Operations through Enhanced En-Route Trajectories			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Flexible use of airspace (FUA)	All States	Indicator: % of States that have implemented FUA Supporting metric*: number of States that have implemented FUA	40% by Dec. 2017
Flexible routing	All States	Indicator: % of required Routes that are not implemented due military restrictions (segregated areas) Supporting metric 1: total number of ATS Routes in the Mid Region Supporting metric 2*: number of required Routes that are not implemented due military restrictions (segregated areas)	60% by Dec. 2017
Flexible Use of Airspace (FUA) Level 1 Strategic	All States	Indicator: % of States that have implemented FUA Level 1 Supporting metric*: number of States that have implemented FUA Level 1	50% by Dec. 2019
FUA Level 2 Pre-tactical	All States	Indicator: % of States that have implemented FUA Level 2 Supporting metric*: number of States that have implemented FUA Level 2	60% by Dec. 2020
FUA Level 3 Tactical	All States	Indicator: % of States that have implemented FUA Level 3 Supporting metric*: number of States that have implemented FUA Level 3	60% by Dec. 2022

* Implementation should be based on the published aeronautical information

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view

Description and purpose:

Air Traffic Flow Management (ATFM) is used to manage the flow of traffic in a way that minimizes delay and maximizes the use of the entire airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or Flight Information Region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including crisis caused by human or natural phenomena.

Experience clearly shows the benefits related to managing flows consistently and collaboratively over an area of a sufficient geographical size to take into account sufficiently well the network effects. The concept for ATFM and demand and capacity balancing (DCB) should be further exploited wherever possible. System improvements are also about better procedures in these domains, and creating instruments to allow collaboration among the different actors.

Guidance on the implementation of ATFM service are provided in the ICAO Doc 9971– Manual on Collaborative Air Traffic Flow Management

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. Application will naturally span over a long period as traffic develops.

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
ATFM Measures implemented in collaborative manner	All States	Indicator: % of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision Supporting metric: number of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision	100% by Dec. ~~2017~~ 2018
ATFM Structure	All States	Indicator: % of States that have established an ATFM Structure Supporting metric: number of States that have established an ATFM Structure	100 % by 2019

B0 – ACAS: ACAS Improvements

Description and purpose:

To provide short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation

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	N/A	Y

Applicability consideration:

Safety and operational benefits increase with the proportion of equipped aircraft.

<i>B0 – ACAS: ACAS Improvements</i>			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Avionics (TCAS v7.1)	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	100% by Dec. 2017

B0 – SNET: Increased Effectiveness of Ground-based Safety Nets

Description and purpose:

To enable monitoring of flights while airborne to provide timely alerts to air traffic controllers of potential risks to flight safety. Alerts from short-term conflict alert (STCA), area proximity warnings (APW) and minimum safe altitude warnings (MSAW) are proposed. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centered.

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	N/A	Y

Applicability consideration:

Benefits increase as traffic density and complexity increase. Not all ground-based safety nets are relevant for each environment. Deployment of this Module should be accelerated.

<i>B0 – SNET: Increased Effectiveness of Ground-based Safety Nets</i>			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
Short-Term Conflict Alert (STCA)	All States	Indicator: % of States that have implemented Short-term conflict alert (STCA) Supporting metric*: number of States that have implemented Short-term conflict alert (STCA)	80 % by 2018
Minimum Safe Altitude Warning (MSAW)	All States	Indicator: % of States that have implemented Minimum safe altitude warning (MSAW) Supporting metric*: number of States that have implemented Minimum safe altitude warning (MSAW)	80 % by 2018

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:

- 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.

<i>B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)</i>			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
PBN STARs	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNM, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with PBN STAR implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with PBN STAR implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CDO	OBBI, HESH, HEMA, HEGN, OIIE, OIKB, OIFM, OJAI, OJAQ, OKBK, OLBA, OOMS, OTHH, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CDO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs

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)			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
PBN SIDs	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMAD, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with PBN SID implemented as required. Supporting Metric: Number of International Aerodromes/ TMAs with PBN SID implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs
International aerodromes/TMAs with CCO	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OIKB, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CCO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented as required.	100% by Dec. 2018 for the identified Aerodromes/TMAs

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

AIM MATTERS

(Presented by the Secretariat)

SUMMARY
This paper presents an update on some important AIM Matters for consideration by the meeting.
Action by the meeting is at paragraph 3.

REFERENCES
- AIM SG/3 Report
- State Letter Ref.: AN 2/2.5-18/22 dated 3 April 2018
- State Letter Ref.: AN 2/33-18/85 dated 31 August 2018

1. INTRODUCTION

1.1 Adoption of Amendment 40 to Annex 15 and Approval of the First Edition of the PANS AIM (Doc 10066), were issued on 3 April 2018 and 31 August 2018, respectively, as at **Appendices A and B**.

2. DISCUSSION

16th Edition of Annex 15 and the new PANS AIM

2.1 The meeting may wish to recall that, taking into consideration the major changes introduced by the Amendment 16 to the Annex 15 and the new PANS AIM, an Interregional EUR/MID Workshop on PANS AIM was successfully conducted at the ICAO EUR/NAT Office in Paris, France, from 10 to 12 July 2018. The Workshop was attended by 101 Participants from 41 States and 9 International Organizations and Industry (5 States from MID: Egypt, Iran, Oman, Saudi Arabia and UAE)

2.2 The objectives of the Workshop were to introduce the new PANS-AIM (Doc 10066) and latest Amendments to Annex 15; and address associated challenges and share best practices for a timely implementation of the new provisions, including the implementation of digital datasets. The summary and recommendations of the Workshop is at **Appendix C**.

2.3 The meeting may wish to note that, in line with the Workshop Recommendations, the Secretariat has prepared analysis of changes (compliance checklist) of the 16th Edition of Annex 15, as at **Appendix D**. This spreadsheet is supposed to help States with transposition of requirements and identification of their differences with the Standards of Annex 15. A similar compliance checklist will be developed/distributed as soon as the final/official version of the PANS AIM is available.

2.4 Based on the above, the following Draft Conclusion is proposed:

DRAFT CONCLUSION 6/X: IMPLEMENTATION OF THE 16TH EDITION OF ANNEX 15 AND THE PANS AIM

That, States be urged to:

- a) take necessary actions on the implementation of the 16th Edition of Annex 15 and the PANS AIM, including:
 - updating AIS/AIM National Regulations;
 - identification and notification of differences (EFOD and AIP GEN 1.7), if any;
 - coordination with their AISPs to develop necessary operational procedures/practices in order to implement the provisions of Annex 15 and the PANS AIM;
- b) provide feedback to the ICAO MID Office on the implementation of the 16th Edition of Annex 15 and the PANS AIM (Implementation Plan, difficulties/challenges, need for assistance, etc).

2.5 It is to be highlighted that a Regional Workshop on the implementation of 16th Edition of Annex 15 and PANS AIM is scheduled to be held in Cairo, concurrently with the AIM SG/5 meeting, 22-24 January 2019.

MID Region AIM Implementation Roadmap

2.6 The meeting may wish to recall that the AIM SG/3 meeting updated the MID Region AIM Roadmap and agreed that some AIM Phase 3 steps should be included in the Roadmap. The meeting also updated timelines of the Roadmap, as at **Appendix E**.

2.7 The meeting may wish to note that, with the introduction of new provisions of Annex 15 and the PANS AIM, there would be a need to adjust the Roadmap with those provisions, in particular the digital datasets.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) endorse the proposed Draft Conclusion;
- b) urge States to actively participate in the Workshop for implementation of Annex 15 (16th Edition) and PANS AIM (Cairo, Egypt, 22-24 January 2019); and
- c) task the AIM SG to update the MID Region AIM Implementation Roadmap to include the provisions of the 16th edition of Annex 15 and the PANS AIM.



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Ref.: AN 2/2.5-18/22

3 April 2018

Subject: Adoption of Amendment 40 to Annex 15

Action required: a) Notify any disapproval before 16 July 2018; b) Notify any differences and compliance before 8 October 2018¹; c) Consider the use of the Electronic Filing of Differences (EFOD) System for notification of differences and compliance

Sir/Madam,

1. I have the honour to inform you that Amendment 40 to the *International Standards and Recommended Practices, Aeronautical Information Services* (Annex 15 to the Convention on International Civil Aviation) was adopted by the Council at the sixth meeting of its 213th Session on 9 March 2018. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>) where you can access all other relevant documentation.

2. When adopting the amendment, the Council prescribed 16 July 2018 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 40, to the extent it becomes effective, will become applicable on 8 November 2018.

3. Amendment 40 arises from:

- a) recommendations of the twelfth meeting of the Aeronautical Information Services (AIS)-Aeronautical Information Management (AIM) Study Group (AIS-AIMSG/12) regarding the restructure of Annex 15 to facilitate incorporation of AIM requirements and changes to the technical content of Annex 15 to facilitate the transition from AIS to AIM environments; and
- b) recommendations of the second meeting of the Meteorology Panel (METP/2) regarding a consequential amendment in support of space weather information.

¹ 5 October 2020 for provisions indicating applicability as of 5 November 2020.

4. The amendment presents a major restructuring of Annex 15 in order to facilitate the incorporation of new technical requirements and provisions. The changes are aimed at reorganizing the AIM documentation to ensure high-level requirements are embodied in Annex 15, technical specifications and operating procedures are incorporated into the new *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM, Doc 10066) and guidance material is developed to support implementation.

5. The technical component of the amendment incorporates the AIM focus into Annex 15 which includes the scope, role and functions of AIM, the products and services within an AIM environment and the associated update mechanisms. The amendment generally encourages the transition from a product-centric AIS to the broader concept of a data-centric and service-oriented management of the aeronautical information. It also provides a revised terminology that better explains the aeronautical data chain and clearly identifies the main functions, the associated responsibilities, accountabilities and formal relations between different identities undertaking activities relating to the provision of aeronautical information in the context of the transition from AIS to AIM.

6. The consequential amendment has been introduced to support the initial implementation of the provision of space weather information in Annex 3— *Meteorological Service for International Air Navigation* to enhance the safety and efficiency of international air navigation consistent with the Global Air Navigation Plan.

7. The subjects are given in the amendment to the Foreword of Annex 15, a copy of which is in Attachment A.

8. In conformity with the Resolution of Adoption, may I request:

- a) that before 16 July 2018 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 40 concerning which your Government wishes to register disapproval, using the form in Attachment B for this purpose. Please note that only statements of disapproval need be registered and if you do not reply it will be assumed that you do not disapprove of the amendment; and
- b) that before 8 October 2018² you inform me of the following, using the Electronic Filing of Differences (EFOD) System or the form in Attachment C for this purpose:
 - 1) any differences that will exist on 8 November 2018 between the national regulations or practices of your Government and the provisions of the whole of Annex 15, as amended by all amendments up to and including Amendment 40, and thereafter of any further differences that may arise; and
 - 2) the date or dates by which your Government will have complied with the provisions of the whole of Annex 15 as amended by all amendments up to and including Amendment 40.

9. With reference to the request in paragraph 8 a) above, it should be noted that a registration of disapproval of Amendment 40 or any part of it in accordance with Article 90 of the Convention does not constitute a notification of differences under Article 38 of the Convention. To comply with the latter provision, a separate statement is necessary if any differences do exist, as requested in paragraph 8 b) 1). It is recalled in this respect that international Standards in Annexes have a conditional binding force, to the extent that the State or States concerned have not notified any difference thereto under Article 38 of the Convention.

² 5 October 2020 for provisions indicating applicability as of 5 November 2020.

10. With reference to the request in paragraph 8 b) above, it should be also noted that the ICAO Assembly, at its 38th Session (24 September to 4 October 2013), resolved that Member States should be encouraged to use the EFOD System when notifying differences (Resolution A38-11 refers). The EFOD System is currently available on the Universal Safety Oversight Audit Programme (USOAP) restricted website (<http://www.icao.int/usoap>) which is accessible by all Member States. You are invited to consider using this for notification of compliance and differences.

11. Guidance on the determination and reporting of differences is given in the Note on the Notification of Differences in Attachment D. Please note that a detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

12. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 8 b) above, to the ICAO Regional Office accredited to your Government.

13. At the fifth meeting of its 204th Session, the Council requested that States, when being advised of the adoption of an Annex amendment, be provided with information on implementation and available guidance material, as well as an impact assessment. This is presented for your information in Attachments E and F, respectively.

Editorial adjustment and comprehensive new edition of Annex 15

14. In order to maintain a comprehensive edition of Annex 15, definitions related to provisions with delayed applicability dates are identified by a footnote indicating the date of applicability.

15. In addition, Amendment 39-B (adopted by the Council on 22 February 2016 and applicable 5 November 2020) will be consolidated with Amendment 40 in a new edition of the Annex and will feature the 2020 applicability date at the beginning of each affected provision. Further information relating to the new editorial adjustment is available at <https://www.icao.int/2018-amendments>. As soon as practicable after the amendment becomes effective, on 16 July 2018, a new edition of Annex 15 incorporating Amendment 40 as well as the adopted amendment mentioned above will be forwarded to you.

Accept, Sir/Madam, the assurances of my highest consideration.



Fang Liu
Secretary General

Enclosures:

- A — Amendment to the Foreword of Annex 15
- B — Form on notification of disapproval of all or part of Amendment 40 to Annex 15
- C — Form on notification of compliance with or differences from Annex 15
- D — Note on the Notification of Differences
- E — Implementation task list and outline of guidance material in relation to Amendment 40 to Annex 15
- F — Impact assessment in relation to Amendment 40 to Annex 15

ATTACHMENT A to State letter AN 2/2.5-18/22

AMENDMENT TO THE FOREWORD OF ANNEX 15

Add the following element at the end of Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>
40	Twelfth meeting of the AIS-AIM Study Group (AIS-AIMSG/12); and second meeting of the Meteorology Panel (METP/2)	Amendment concerning: a) restructure of Annex 15 to facilitate incorporation of aeronautical information management (AIM) requirements; b) changes to the technical content of Annex 15 to facilitate the transition from AIS to AIM; and c) a consequential amendment in support of space weather information.	9 March 2018 16 July 2018 8 November 2018

ATTACHMENT B to State letter AN 2/2.5-18/22

NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF
AMENDMENT 40 TO ANNEX 15

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Quebec
Canada H3C 5H7

(State) _____ hereby wishes to disapprove the following parts of
Amendment 40 to Annex 15:

Signature _____

Date _____

NOTES

- 1) If you wish to disapprove all or part of Amendment 40 to Annex 15, please dispatch this notification of disapproval to reach ICAO Headquarters by 16 July 2018. If it has not been received by that date it will be assumed that you do not disapprove of the amendment. **If you approve of all parts of Amendment 40, it is not necessary to return this notification of disapproval.**
- 2) This notification should not be considered a notification of compliance with or differences from Annex 15. Separate notifications on this are necessary. (See Attachment C.)
- 3) Please use extra sheets as required.

ATTACHMENT C to State letter AN 2/2.5-18/22

**NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES FROM ANNEX 15
(including all amendments up to and including Amendment 40)**

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montréal, Quebec
Canada H3C 5H7

1. No differences will exist on _____ between the national regulations and/or practices of **(State)** _____ and the provisions of Annex 15, including all amendments up to and including Amendment 40.

2. The following differences will exist on _____ between the regulations and/or practices of **(State)** _____ and the provisions of Annex 15, including Amendment 40 (Please see Note 2) below.)

a) Annex Provision (Please give exact paragraph reference)	b) Details of Difference (Please describe the difference clearly and concisely)	c) Remarks (Please indicate reasons for the difference)

(Please use extra sheets as required)

3. By the dates indicated below, **(State)** _____ will have complied with the provisions of Annex 15, including all amendments up to and including Amendment 40 for which differences have been notified in 2 above.

a)	Annex Provision	b)	Date	c)	Comments
	(Please give exact paragraph reference)				

(Please use extra sheets as required)

Signature _____

Date _____

NOTES

- 1) If paragraph 1 above is applicable to your State, please complete paragraph 1 and return this form to ICAO Headquarters. If paragraph 2 is applicable to you, please complete paragraphs 2 and 3 and return the form to ICAO Headquarters.
- 2) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.
- 3) Guidance on the notification of differences is provided in the Note on the Notification of Differences and in the *Manual on Notification and Publication of Differences* (Doc 10055).
- 4) Please send a copy of this notification to the ICAO Regional Office accredited to your Government.

NOTE ON THE NOTIFICATION OF DIFFERENCES
(Prepared and issued in accordance with instructions of the Council)

1. *Introduction*

1.1 Article 38 of the Convention on International Civil Aviation (“Convention”) requires that a Contracting State notify ICAO any time it does not comply with a Standard in all respects, it does not bring its regulations or practices into full accord with any Standard, or it adopts regulations or practices differing in any particular respect from the Standard.

1.2 The Assembly and the Council, when reviewing the notification of differences by Contracting States in compliance with Article 38 of the Convention, have repeatedly noted that the timeliness and currency of such notifications is not entirely satisfactory. Therefore, this note is issued to reiterate the primary purpose of Article 38 of the Convention and to facilitate the determination and notification of differences.

1.3 The primary purpose of the notification of differences is to promote safety, regularity and efficiency in air navigation by ensuring that governmental and other agencies, including operators and service providers, concerned with international civil aviation are made aware of all national regulations and practices in so far as they differ from those prescribed in the Standards contained in Annexes to the Convention.

1.4 Contracting States are, therefore, requested to give particular attention to the notification of differences with respect to Standards in all Annexes, as described in paragraph 4 b) 1) of the Resolution of Adoption.

1.5 Although differences from Recommended Practices are not notifiable under Article 38 of the Convention, the Assembly has urged Contracting States to extend the above considerations to Recommended Practices contained in Annexes to the Convention, as well.

2. *Notification of differences from Standards and Recommended Practices (SARPs)*

2.1 Guidance to Contracting States in the notification of differences to Standards and Recommended Practices (SARPs) can only be given in very general terms. Contracting States are further reminded that compliance with SARPs generally extends beyond the issuance of national regulations and requires establishment of practical arrangements for implementation, such as the provision of facilities, personnel and equipment and effective enforcement mechanisms. Contracting States should take those elements into account when determining their compliance and differences. The following categories of differences are provided as a guide in determining whether a notifiable difference exists:

- a) ***A Contracting State’s requirement is more exacting or exceeds a SARP (Category A).*** This category applies when the national regulation and practices are more demanding than the corresponding SARP, or impose an obligation within the scope of the Annex which is not covered by the SARP. This is of particular importance where a Contracting State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;

- b) *A Contracting State's requirement is different in character or the Contracting State has established other means of compliance (Category B)**. This category applies, in particular, when the national regulation and practices are different in character from the corresponding SARP, or when the national regulation and practices differ in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and
- c) *A Contracting State's requirement is less protective, partially implemented or not implemented (Category C)*. This category applies when the national regulation and practices are less protective than the corresponding SARP; when no national regulation has been promulgated to address the corresponding SARP, in whole or in part; or when the Contracting State has not brought its practices into full accord with the corresponding SARP.

These categories do not apply to Not Applicable SARP. Please see the paragraph below.

2.2 **Not Applicable SARP.** When a Contracting State deems a SARP concerning aircraft, operations, equipment, personnel, or air navigation facilities or services to be not applicable to the existing aviation activities of the State, notification of a difference is not required. For example, a Contracting State that is not a State of Design or Manufacture and that does not have any national regulations on the subject, would not be required to notify differences from Annex 8 provisions related to the design and construction of an aircraft.

2.3 **Differences from appendices, tables and figures.** The material comprising a SARP includes not only the SARP itself, but also the appendices, tables and figures associated with the SARP. Therefore, differences from appendices, tables and figures are notifiable under Article 38. In order to file a difference against an appendix, table or figure, States should file a difference against the SARP that makes reference to the appendix, table or figure.

2.4 **Differences from definitions.** Contracting States should notify differences from definitions. The definition of a term used in a SARP does not have independent status but is an essential part of each SARP in which the term is used. Therefore, a difference from the definition of the term may result in there being a difference from any SARP in which the term is used. To this end, Contracting States should take into consideration differences from definitions when determining compliance or differences to SARPs in which the terms are used.

2.5 The notification of differences should be not only to the latest amendment but to the whole Annex, including the amendment. In other words, Contracting States that have already notified differences are requested to provide regular updates of the differences previously notified until the difference no longer exists.

2.6 Further guidance on the identification and notification of differences, examples of well-defined differences and examples of model processes and procedures for management of the notification of differences can be found in the *Manual on Notification and Publication of Differences* (Doc 10055).

* The expression "different in character or other means of compliance" in b) would be applied to a national regulation and practice which achieve, by other means, the same objective as that of the corresponding SARPs or for other substantive reasons so cannot be classified under a) or c).

3. *Form of notification of differences*

3.1 Differences can be notified:

- a) by sending to ICAO Headquarters a form on notification of compliance or differences; or
- b) through the Electronic Filing of Differences (EFOD) System at www.icao.int/usoap.

3.2 When notifying differences, the following information should be provided:

- a) the number of the paragraph or subparagraph which contains the SARP to which the difference relates*;
- b) the reasons why the State does not comply with the SARP, or considers it necessary to adopt different regulations or practices;
- c) a clear and concise description of the difference; and
- d) intentions for future compliance and any date by which your Government plans to confirm compliance with and remove its difference from the SARP for which the difference has been notified.

3.3 The differences notified will be made available to other Contracting States, normally in the terms used by the Contracting State when making the notification. In the interest of making the information as useful as possible, Contracting States are requested to ensure that:

- a) statements be as clear and concise as possible and be confined to essential points;
- b) the provision of extracts from national regulations not be considered as sufficient to satisfy the obligation to notify differences; and
- c) general comments, unclear acronyms and references be avoided.

— — — — —

* This applies only when the notification is made under 3.1 a).

**IMPLEMENTATION TASK LIST AND OUTLINE OF GUIDANCE MATERIAL
IN RELATION TO AMENDMENT 40 TO ANNEX 15**

1. IMPLEMENTATION TASK LIST

- 1.1 Essential steps to be followed by a State to implement the amendment to Annex 15:
- a) identification of the rule-making process necessary to transpose the new and modified ICAO provisions into national regulations taking into consideration the applicability date;
 - b) establishment of a national implementation plan that takes into account the new and modified ICAO provisions;
 - c) drafting of the modification(s) to the national regulations and means of compliance;
 - d) official adoption of the national regulations and means of compliance;
 - e) filing of State differences with ICAO, if necessary; and
 - f) training of operational staff in the use of new provisions.

2. STANDARDIZATION PROCESS

- 2.1 Effective date: 16 July 2018
- 2.2 Applicability date: 8 November 2018
- 2.3 Embedded applicability date: 5 November 2020 for those parts of the amendment concerning the SNOWTAM format.

3. SUPPORTING DOCUMENTATION

3.1 ICAO documentation

Title	Type (PANS/TI/Manual/Circ)	Planned publication date
<i>Procedures for Air Navigation Services — Aeronautical Information Management</i> (PANS-AIM, Doc 10066)	PANS (new)	2018
<i>Aeronautical Information Services Manual</i> (Doc 8126)	Manual (update)	2018

3.2 External documentation

Title	External Organization	Publication date
None		

4. IMPLEMENTATION ASSISTANCE TASKS

Type	Global	Regional
Workshop/Seminar		AIM regional conferences

5. UNIVERSAL SAFETY OVERSIGHT AUDIT PROGRAMME (USOAP)

5.1 The content of this amendment may require an amendment of the USOAP CMA protocol questions (PQs) due to the new technical requirements and change of references. This will be assessed during the next amendment cycle of the PQs.

— — — — —

IMPACT ASSESSMENT IN RELATION TO AMENDMENT 40 TO ANNEX 15

1. INTRODUCTION

1.1 Amendment 40 to Annex 15 presents a major restructuring of the Annex in order to facilitate the incorporation of new technical requirements and provisions which include the definition of the scope of AIM, the role of AIM, the functions of AIM, the products and services within an AIM environment and the associated update mechanisms. The amendment also provides a revised terminology that better explains the aeronautical data chain and clearly identifies the main functions, the associated responsibilities, accountabilities and formal relations between different entities undertaking activities relating to the provision of aeronautical information in the context of the transition from AIS to AIM. Several other updates are provided to the technical requirements including NOTAM distribution improvements to make NOTAM more “fit for purpose”, performance-based data error detection requirements, and data quality characteristics.

1.2 In the new structure of Annex 15, requirements are organized in a way that allows the data collection activity to be decoupled from the definition of the end-products. This approach has been taken to facilitate the transition to a full AIM environment under the all-embracing system-wide information management (SWIM) principles. Furthermore, material that is too prescriptive, detailed or procedural in nature has been relocated to the PANS-AIM or a guidance document.

2. IMPACT ASSESSMENT

2.1 Amendment concerning the restructure of Annex 15 to facilitate incorporation of AIM requirements

2.1.1 *Safety impact:* Positive safety impact with the implementation of this amendment. The provision of quality-assured, timely and reliable information is becoming crucial for the safety of operations and transitioning to a full AIM environment is an essential enabler to achieve this goal. The restructuring of the AIM provisions ensures that requirements are properly explained and promotes a better understanding of the AIM principles.

2.1.2 *Financial impact:* This amendment will result in minimal overall costs to States and industry. Several requirements currently contained in Annex 15 are moved to the proposed new PANS-AIM and this will imply the need to modify the State regulatory framework in order to properly account for the new references. Additionally the PANS do not carry the status of the Standards and therefore do not come with the obligation imposed by Article 38 of the Convention on International Civil Aviation concerning the notification to ICAO of differences in the event of non-implementation. However, in accordance with the provisions of Annex 15, States are expected to publish in their AIPs up-to-date lists of significant differences between their procedures and the related PANS. This implies the need to update processes to notify or stop notifying differences to ICAO and make sure that significant differences are published in the State AIP.

2.1.3 *Security impact:* No security impact is expected with this amendment.

2.1.4 *Environmental impact:* No environmental impact is expected with this amendment.

2.1.5 *Efficiency impact:* There will be a positive change as the restructuring of the AIM documentation will ensure that requirements are better organized and that provisions properly address the needs of different audiences (e.g. States, service delivery organizations, etc.). This will facilitate the process of retrieving specifications and result in a more efficient application of the requirements and have an indirect positive impact on efficiency in flight.

2.1.6 *Expected implementation time:* The expected implementation time depends on the need to modify the State regulatory framework properly to account for the new Annex 15 and PANS-AIM references and to update processes to notify or stop notifying differences to ICAO and make sure that significant differences are published in the State AIP. Overall, the expected implementation time will be less than one year from the applicability date of the amendment.

2.2 **Amendment concerning changes to the technical content of Annex 15 to facilitate the transition from AIS to AIM**

2.2.1 *Safety impact:* Aeronautical data and information are necessary to ensure the safety, regularity and efficiency of air navigation. The role and importance of complete, timely, and accurate aeronautical data and information has changed significantly with the implementation of area navigation (RNAV), required navigation performance (RNP), airborne computer-based navigation systems, and data link systems. Transitioning to a full AIM environment involves encompassing improved data quality by ensuring that information is provided by accountable and qualified sources. It implies a standard digital data exchange and processing of information and it allows for a timely and accurate distribution of information. Overall, this is reflected in an increased level of safety.

2.2.2 In addition, several operational conditions have been included in Annex 15 to identify when a NOTAM shall or shall not be generated. These inclusions and refinements will promote consistency and serve to refine NOTAM output, thereby increasing the overall level of safety.

2.2.3 *Financial impact:* Transitioning to a full AIM environment may require large investments in equipment and resources, depending on the State's and industry's status of implementation. However, this can be done through a phased approach that facilitates returns of investment, allows lessons learned in early phases to be incorporated in the processes in later phases, and ensures that a solid foundation is available prior to rolling-up more advanced techniques. Additionally, the transition will result in overall economic gains by improving aeronautical information management through a faster, quality-controlled and cost-effective exchange of aeronautical data.

2.2.4 *Security impact:* The existing prescriptive specifications have been amended to introduce more performance-based requirements to maintain data integrity along the data chain. The current stipulation of cyclic redundancy checks is too prescriptive and there have been numerous cases where this has proven to be difficult to demonstrate compliance. Performance-based requirements should facilitate implementation by allowing for use of more modern technology to detect errors in digital data introduced during transmission or storage.

2.2.5 *Environmental impact:* Transitioning from a paper-based to a digital environment will certainly bring environmental benefits.

2.2.6 *Efficiency impact:* Moving towards an AIM environment implies overall benefits in terms of efficiency. For instance, providing data in digital form and complying with digital data exchange requirements represents a paradigm shift in the way information is transmitted and handled along its life

cycle: management, processing, verification, usage, quality control and exchange of information is done in a structured, automatic manner thereby minimizing human intervention and reducing errors.

2.2.7 *Expected implementation time:* The expected implementation time varies depending on the States' current status of implementation. Some States have already implemented part of the requirements and taken actions accordingly. For States that have not implemented the requirements, the implementation time may take two to five years. Most of industry has already implemented many requirements to support the transition to AIM, therefore the expected implementation time would be up to one year depending on the status of implementation.

2.3 **Consequential amendment concerning space weather information**

2.3.1 *Safety impact:* The safety of aircraft operations is enhanced with access to improved information on space weather events.

2.3.2 *Financial impact:* Minimal as it will require minor costs to upgrade software in order to issue NOTAM for space weather events.

2.3.3 *Security impact:* None identified.

2.3.4 *Environmental impact:* None identified.

2.3.5 *Efficiency impact:* The efficiency of aircraft operations is enhanced with improved information about space weather events.

2.3.6 *Expected implementation time:* None. The revised SARP is believed to be consistent with existing State requirements.

— END —

AMENDMENT No. 40

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

**AERONAUTICAL
INFORMATION SERVICES**

ANNEX 15

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

The amendment to Annex 15, contained in this document was adopted by the Council of ICAO on **9 March 2018**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **16 July 2018** will become effective on that date and will become applicable on **8 November 2018** as specified in the Resolution of Adoption. (State letter AN 2/2.5-18/22 refers.)

MARCH 2018

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 40 TO THE INTERNATIONAL STANDARDS AND
RECOMMENDED PRACTICES**

ANNEX 15 — AERONAUTICAL INFORMATION SERVICES

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 9 March 2018 Amendment 40 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Aeronautical Information Services* which for convenience is designated Annex 15 to the Convention;
2. *Prescribes* 16 July 2018 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;
3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 8 November 2018;
4. *Requests the Secretary General:*
 - a) to notify each Contracting State immediately of the above action and immediately after 16 July 2018 of those parts of the amendment which have become effective;
 - b) to request each Contracting State:
 - 1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 8 November 2018 between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 8 October 2018¹, and thereafter to notify the Organization of any further differences that arise;
 - 2) to notify the Organization before 8 October 2018 of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;
 - c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, when the notification of such differences is important for the safety of air navigation, following the procedure specified in subparagraph b) above with respect to differences from Standards.

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¹ 5 October 2020 for provisions indicating applicability as of 5 November 2020.

NOTES ON THE PRESENTATION OF THE AMENDMENT TO ANNEX 15

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. New text to be inserted is highlighted with grey shading. new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

TEXT OF AMENDMENT 40

TO THE

INTERNATIONAL STANDARDS

AND RECOMMENDED PRACTICES

AERONAUTICAL INFORMATION SERVICES

ANNEX 15

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

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FOREWORD

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Historical background

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Applicability

The Standards and Recommended Practices in this document govern the application of the *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM, Doc 10066) and the *Regional Supplementary Procedures — Aeronautical Information Services*, contained in Doc 7030, in which the latter document will be found subsidiary procedures of regional application.

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CHAPTER 1. GENERAL

Note 1.— The object of the aeronautical information service (AIS) is to ensure the flow of aeronautical data and aeronautical information necessary for global air traffic management (ATM) system safety, regularity, economy and efficiency in an environmentally sustainable manner. The role and importance of aeronautical data and aeronautical information changed significantly with the implementation of area navigation (RNAV), performance-based navigation (PBN), airborne computer-based navigation systems, performance-based communication (PBC), performance-based surveillance (PBS), data link systems and satellite voice communications (SATVOICE). Corrupt, erroneous, late, or missing aeronautical data and aeronautical information can potentially affect the safety of air navigation.

Note 2.— These Standards and Recommended Practices are to be used in conjunction with the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Note 3.— These Standards and Recommended Practices are to be used in conjunction with the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066).

Note 34.— Guidance material on the organization and operation of aeronautical information services is contained in the Aeronautical Information Services Manual (Doc 8126).

1.1 Definitions

When the following terms are used in the Standards and Recommended Practices for aeronautical information services, they have the following meanings:

Accuracy. ~~A degree of conformance between the estimated or measured value and the true value.~~

Note.— For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome mapping data (AMD). Data collected for the purpose of compiling aerodrome mapping information.

Note.— Aerodrome mapping data are collected for purposes that include the improvement of the user's situational awareness, surface navigation operations, training, charting and planning.

Aerodrome mapping database (AMDB). A collection of aerodrome mapping data organized and arranged as a structured data set.

Aeronautical chart. A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

Aeronautical data. A representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.

Aeronautical fixed service (AFS). A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

Aeronautical information. Information resulting from the assembly, analysis and formatting of aeronautical data.

Aeronautical Information Circular (AIC). A notice containing information that does not qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.

Aeronautical information management (AIM). The dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

Aeronautical information product. Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation in paper or electronic media. Aeronautical information products include:

- Aeronautical Information Publication (AIP), including Amendments and Supplements;
- Aeronautical Information Circulars (AIC);
- Aeronautical charts;
- NOTAM; and
- Digital data sets.

Note.—Aeronautical information products are intended primarily to satisfy international requirements for the exchange of aeronautical information.

Aeronautical Information Publication (AIP). A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Aeronautical information service (AIS). A service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

AIP Amendment. Permanent changes to the information contained in the AIP.

AIP Supplement. Temporary changes to the information contained in the AIP which are published provided by means of special pages.

AIRAC. An acronym (aeronautical information regulation and control) signifying a system aimed at advance notification, based on common effective dates, of circumstances that necessitate significant changes in operating practices.

Air defence identification zone (ADIZ). Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).

Air traffic management (ATM). The dynamic, integrated management of air traffic and airspace (including air traffic services, airspace management and air traffic flow management) — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

~~**AIS product.** Aeronautical data and aeronautical information provided in the form of the elements of the Integrated Aeronautical Information Package (except NOTAM and PIB), including aeronautical charts, or in the form of suitable electronic media.~~

Application. Manipulation and processing of data in support of user requirements (ISO 19104*).

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Note.— Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

ASHTAM. A special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations.

Assemble. A process of merging data from multiple sources into a database and establishing a baseline for subsequent processing.

Note.— The assemble phase includes checking the data and ensuring that detected errors and omissions are rectified.

ATS surveillance service. Term used to indicate a service provided directly by means of an ATS surveillance system.

ATS surveillance system. A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

Note.— A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

Automatic dependent surveillance — broadcast (ADS-B). A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

Automatic dependent surveillance — contract (ADS-C). A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link,

* All ISO Standards are listed at the end of this chapter.

specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

Note.— The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

Automatic terminal information service (ATIS). The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link.

Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

Bare Earth. Surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects.

Calendar. Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (ISO 19108*).

Canopy. Bare Earth supplemented by vegetation height.

Confidence level. The probability that the true value of a parameter is within a certain interval around the estimate of its value.

Note.— The interval is usually referred to as the accuracy of the estimate.

Controller-pilot data link communications (CPDLC). A means of communication between controller and pilot, using data link for ATC communications.

Culture. All man-made features constructed on the surface of the Earth, such as cities, railways and canals.

Cyclic redundancy check (CRC). A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

Danger area. An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Data Accuracy. A degree of conformance between the estimated or measured value and the true value.

Note.— For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.

Data completeness. The degree of confidence that all of the data needed to support the intended use is provided.

Data format. A structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.

Data Integrity (aeronautical data assurance level). A degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment.

Data product. Data set or data set series that conforms to a data product specification (ISO 19131*).

Data product specification. Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131*).

Note.— A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.

Data quality. A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution, integrity-(or equivalent assurance level), traceability, timeliness, completeness and format.

Data Resolution. A number of units or digits to which a measured or calculated value is expressed and used.

Data set. Identifiable collection of data (ISO 19101*).

Data set series. Collection of data sets sharing the same product specification (ISO 19115*).

Data timeliness. The degree of confidence that the data is applicable to the period of its intended use.

Data traceability. The degree that a system or a data product can provide a record of the changes made to that product and thereby enable an audit trail to be followed from the end-user to the originator.

Datum. Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104*).

Digital Elevation Model (DEM). The representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum.

Note.— Digital Terrain Model (DTM) is sometimes referred to as DEM.

Direct transit arrangements. Special arrangements approved by the public authorities concerned by which traffic which is pausing briefly in its passage through the Contracting State may remain under their direct control.

Ellipsoid height (Geodetic height). The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

Feature. Abstraction of real world phenomena (ISO 19101*).

Feature attribute. Characteristic of a feature (ISO 19101*).

Note.— A feature attribute has a name, a data type and a value domain associated with it.

Feature operation. Operation that every instance of a feature type may perform (ISO 19110*).

Note.— An operation upon the feature type dam is to raise the dam. The result of this operation is to raise the level of water in the reservoir.

Feature relationship. Relationship that links instances of one feature type with instances of the same or a different feature type (ISO 19101*).

Feature type. Class of real world phenomena with common properties (ISO 19110*).

Note.— In a feature catalogue, the basic level of classification is the feature type.

Geodesic distance. The shortest distance between any two points on a mathematically defined ellipsoidal surface.

Geodetic datum. A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

Geoid. The equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.

Note.— The geoid is irregular in shape because of local gravitational disturbances (wind tides, salinity, current, etc.) and the direction of gravity is perpendicular to the geoid at every point.

Geoid undulation. The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

Note.— In respect to the World Geodetic System — 1984 (WGS-84) defined ellipsoid, the difference between the WGS-84 ellipsoidal height and orthometric height represents WGS-84 geoid undulation.

Gregorian calendar. Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108*).

Note.— In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.

Height. The vertical distance of a level, point or an object considered as a point, measured from a specific datum.

Heliport. An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Human Factors principles. Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

~~**Integrated Aeronautical Information Package.** A package in paper, or electronic media which consists of the following elements:~~

~~—— AIP, including amendment service;~~

~~—— Supplements to the AIP;~~

~~—— NOTAM and PIB;~~

~~—— AIC; and~~

~~—— checklists and lists of valid NOTAM.~~

Integrity classification (aeronautical data). Classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data are classified as:

a) *routine data*: there is a very low probability when using corrupted routine data that the

continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;

- b) *essential data*: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) *critical data*: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

International airport. Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

International NOTAM office (NOF). An office designated by a State for the exchange of NOTAM internationally.

Logon address. A specified code used for data link logon to an ATS unit.

Manoeuvring area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Metadata. Data about data (ISO 19115*).

Note.— A structured description of the content, quality, condition or other characteristics of data.

Minimum en-route altitude (MEA). The altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron.

Navigation specification. A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note 1.— The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.

Note 2.— The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this Annex as the concept

of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

Next intended user. The entity that receives the aeronautical data or information from the Aeronautical Information Service.

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or
- b) extend above a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

Obstacle/terrain data collection surface. A defined surface intended for the purpose of collecting obstacle/terrain data.

Origination (aeronautical data or aeronautical information). The creation of the value associated with new data or information or the modification of the value of an existing data or information.

Originator (aeronautical data or aeronautical information). An entity that is accountable for data or information origination and/or from which the AIS organization receives aeronautical data and information.

Orthometric height. Height of a point related to the geoid, generally presented as an MSL elevation.

Performance-based communication (PBC). Communication based on performance specifications applied to the provision of air traffic services.

Note.— An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.— Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note.— An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data

delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Portrayal. Presentation of information to humans (ISO 19117*).

Position (geographical). Set of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth.

Post spacing. Angular or linear distance between two adjacent elevation points.

Precision. The smallest difference that can be reliably distinguished by a measurement process.

Note.— In reference to geodetic surveys, precision is a degree of refinement in performance of an operation or a degree of perfection in the instruments and methods used when taking measurements.

Pre-flight information bulletin (PIB). A presentation of current NOTAM information of operational significance, prepared prior to flight.

Prohibited area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Quality. Degree to which a set of inherent characteristics fulfils requirements (ISO 9000*).

Note 1.— The term “quality” can be used with adjectives such as poor, good or excellent.

Note 2.— “Inherent”, as opposed to “assigned”, means existing in something, especially as a permanent characteristic.

Quality assurance. Part of quality management focused on providing confidence that quality requirements will be fulfilled (ISO 9000*).

Quality control. Part of quality management focused on fulfilling quality requirements (ISO 9000*).

Quality management. Coordinated activities to direct and control an organization with regard to quality (ISO 9000*).

Radio navigation service. A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

Required communication performance (RCP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

Requirement. Need or expectation that is stated, generally implied or obligatory (ISO 9000*).

Note 1.— “Generally implied” means that it is custom or common practice for the organization, its customers and other interested parties, that the need or expectation under consideration is implied.

Note 2.— A qualifier can be used to denote a specific type of requirement, e.g. product requirement, quality management requirement, customer requirement.

Note 3.— A specified requirement is one which is stated, for example, in a document.

Note 4.— Requirements can be generated by different interested parties.

Restricted area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Route stage. A route or portion of a route flown without an intermediate landing.

SNOWTAM.[†] A special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format.

SNOWTAM.^{††} A special series NOTAM given in a standard format providing a surface condition report notifying the presence or cessation of hazardous conditions due to snow, ice, slush, frost, standing water or water associated with snow, slush, ice, or frost on the movement area.

Station declination. An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

Terrain. The surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.

~~*Note.— In practical terms, depending on the method of data collection used, terrain represents the continuous surface that exists at the bare Earth, the top of the canopy or something in between, also known as “first reflective surface”.*~~

Traceability. Ability to trace the history, application or location of that which is under consideration (ISO 9000*).

Note.— When considering product, traceability can relate to:

— the origin of materials and parts;

— the processing history; and

— the distribution and location of the product after delivery.

Validation. Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (ISO 9000*).

Verification. Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled (ISO 9000*).

Note 1.— The term “verified” is used to designate the corresponding status.

~~*Note 2.— Confirmation can comprise activities such as:*~~

~~*— performing alternative calculations;*~~

~~*— comparing a new design specification with a similar proven design specification;*~~

[†] Applicable until 4 November 2020.

^{††} Applicable as of 5 November 2020.

~~—undertaking tests and demonstrations; and~~

~~—reviewing documents prior to issue.~~

VOLMET. Meteorological information for aircraft in flight.

Data link-VOLMET (D-VOLMET). Provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link.

VOLMET broadcast. Provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

1.2 Common reference systems for air navigation

1.2.1 Horizontal reference system

1.2.1.1 World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

Note 1.— Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System — 1984 (WGS-84) Manual (Doc 9674).

~~*Note 2.— Specifications governing the determination and reporting (accuracy of field work and data integrity) of WGS-84 related aeronautical coordinates for geographical positions established by air traffic services are given in Annex 11, Chapter 2, and Appendix 5, Table 1, and for aerodrome/heliport related positions, in Annex 14, Volumes I and II, Chapter 2, and Table A5-1 and Table 1 of Appendices 5 and 1, respectively.*~~

1.2.1.2 **Recommendation.**— In precise geodetic applications and some air navigation applications, temporal changes in the tectonic plate motion and tidal effects on the Earth's crust should be modelled and estimated. To reflect the temporal effect, an epoch should be included with any set of absolute station coordinates.

Note 1.— The epoch of the WGS-84 (G873) reference frame is 1997.0 while the epoch of the latest updated WGS-84 (G1150) reference frame, which includes a plate motion model, is 2001.0. (G indicates that the coordinates were obtained through Global Positioning System (GPS) techniques, and the number following G indicates the GPS week when these coordinates were implemented in the United States' National Geospatial-Intelligence Agency's precise ephemeris estimation process.)

Note 2.— The set of geodetic coordinates of globally distributed permanent GPS tracking stations for the most recent realization of the WGS-84 reference frame (WGS-84 (G1150)) is provided in Doc 9674. For each permanent GPS tracking station, the accuracy of an individually estimated position in WGS-84 (G1150) has been in the order of 1 cm (1 σ).

Note 3.— Another precise worldwide terrestrial coordinate system is the International Earth Rotation Service (IERS) Terrestrial Reference System (ITRS), and the realization of ITRS is the IERS Terrestrial Reference Frame (ITRF). Guidance material regarding the ITRS is provided in Appendix C of Doc 9674. The most current realization of WGS-84 (G1150) is referenced to the ITRF 2000 epoch. WGS-84 (G1150) is consistent with ITRF 2000 and in practical realization the difference

between these two systems is in the one to two centimetre range worldwide, meaning WGS-84 (G1150) and ITRF 2000 are essentially identical.

~~1.2.1.3 Geographical coordinates that have been transformed into WGS 84 coordinates but whose accuracy of original field work does not meet the requirements in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2, shall be identified by an asterisk.~~

~~1.2.1.4 The order of publication resolution of geographical coordinates shall be that specified in Table A7-1 of Appendix 7 while the order of chart resolution of geographical coordinates shall be that specified in Annex 4, Appendix 6, Table 1.~~

1.2.2 Vertical reference system

~~1.2.2.1 Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, shall be used as the vertical reference system for international air navigation.~~

Note 1.— The geoid globally most closely approximates MSL. It is defined as the equipotential surface in the gravity field of the Earth which coincides with the undisturbed MSL extended continuously through the continents.

Note 2.— Gravity-related heights (elevations) are also referred to as orthometric heights while distances of points above the ellipsoid are referred to as ellipsoidal heights.

~~1.2.2.2 The Earth Gravitational Model — 1996 (EGM-96), containing long wavelength gravity field data to degree and order 360, shall be used by international air navigation as the global gravity model.~~

1.2.2.3 At those geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation ~~specified in Annex 14, Volumes I and II,~~ on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data shall be developed and used. When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96, shall be provided in the Aeronautical Information Publication (AIP).

Note.— Specifications governing determination and reporting (accuracy of field work and data integrity) of elevation and geoid undulation at specific positions at aerodromes/heliports are given in PANS-AIM (Doc 10066), Appendix 1 ~~Annex 14, Volumes I and II, Chapter 2, and Table A5-2 and Table 2 of Appendices 5 and 1, respectively.~~

~~1.2.2.4 In addition to elevation referenced to the MSL (geoid), for the specific surveyed ground positions, geoid undulation (referenced to the WGS 84 ellipsoid) for those positions specified in Appendix 1 shall also be published.~~

~~1.2.2.5 The order of publication resolution of elevation and geoid undulation shall be that specified in Table A7-2 of Appendix 7 while the order of chart resolution of elevation and geoid undulation shall be that specified in Annex 4, Appendix 6, Table 2.~~

1.2.3 Temporal reference system

1.2.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system for international air navigation.

Note 1.— A value in the time domain is a temporal position measured relative to a temporal reference system.

Note 2.— UTC is a time scale maintained by the Bureau International de l'Heure and the IERS and forms the basis of a coordinated dissemination of standard frequencies and time signals.

Note 3.— See Attachment D of Annex 5 for guidance material relating to UTC.

Note 4.— ISO Standard 8601 specifies the use of the Gregorian calendar and 24-hour local or UTC for information interchange while ISO Standard 19108 prescribes the Gregorian calendar and UTC as the primary temporal reference system for use with geographic information.*

1.2.3.2 When a different temporal reference system is used for some applications, the feature catalogue, or the metadata associated with an application schema or a data set, as appropriate, shall include either a description of that system or a citation for a document that describes that temporal reference system.

Note.— ISO Standard 19108, Annex D, describes some aspects of calendars that may have to be considered in such a description.*

1.3 Miscellaneous specifications

1.3.1 ~~Each element of the Integrated Aeronautical Information Package for~~ **Aeronautical information products intended** for international distribution shall include English text for those parts expressed in plain language.

1.3.2 Place names shall be spelt in conformity with local usage, transliterated, when necessary, into the **ISO-Basic** Latin alphabet.

1.3.3 **Recommendation.**— *Units of measurement used in the origination, processing and distribution of aeronautical data and aeronautical information should be consistent with the decision taken by the State in respect of the use of the tables contained in Annex 5.*

1.3.4 ICAO abbreviations shall be used in the **AIS aeronautical information products** whenever they are appropriate and their use will facilitate distribution of aeronautical data and aeronautical information.

* ISO Standard
 8601 — Data elements and interchange formats — Information interchange — Representation of dates and times
 9000 — Quality Management Systems — Fundamentals and Vocabulary
 19101 — Geographic information — Reference model
 19104 — Geographic information — Terminology
 19108 — Geographic information — Temporal schema
 19109 — Geographic information — Rules for application schema
 19110 — Geographic information — Feature cataloguing schema
 19115 — Geographic information — Metadata
 19117 — Geographic information — Portrayal
 19131 — Geographic information — Data product specification

CHAPTER 2. RESPONSIBILITIES AND FUNCTIONS

2.1 State responsibilities

2.1.1 Each Contracting State shall:

- a) provide an aeronautical information service (AIS); or
- b) agree with one or more other Contracting State(s) for the provision of a joint service; or
- c) delegate the authority for the provision of the service to a non-governmental agency, provided the Standards and Recommended Practices of this Annex are adequately met.

2.1.2 Each Contracting State shall ensure that the provision of aeronautical data and aeronautical information covers its own territory and those areas over the high seas for which it is responsible for the provision of air traffic services.

2.1.3 The State concerned shall remain responsible for the aeronautical data and aeronautical information provided in accordance with 2.1.2. Aeronautical data and aeronautical information provided for and on behalf of a State shall clearly indicate that they are provided under the authority of that State, ~~irrespective of the format in which they are provided.~~

2.1.4 Each Contracting State shall ensure that the aeronautical data and aeronautical information provided are ~~complete, timely and~~ of required quality in accordance with 3.3.

2.1.5 Each Contracting State shall ensure that formal arrangements are established between originators of aeronautical data and aeronautical information and the AIS in relation to the timely and complete provision of aeronautical data and aeronautical information.

Note.— The scope of aeronautical data and aeronautical information that would be the subject of formal arrangements is specified in Chapter 4.

2.2 AIS responsibilities and functions

2.2.1 An AIS shall ensure that aeronautical data and aeronautical information necessary for the safety, regularity ~~or~~ and efficiency of air navigation are made available in a form suitable for the operational requirements of the air traffic management (ATM) community, including:

- a) those involved in flight operations, including flight crews, flight planning and flight simulators; and
- b) the air traffic services unit responsible for flight information service and the services responsible for pre-flight information.

Note.— A description of the ATM community is contained in the Global Air Traffic Management Operational Concept (Doc 9854).

2.2.2 An AIS shall receive, collate or assemble, edit, format, publish/store and distribute aeronautical data and aeronautical information concerning the entire territory of the State as well as those areas over the high seas in which the State is responsible for the provision of air traffic services.

Aeronautical data and aeronautical information shall be provided as ~~an Integrated Aeronautical Information Package~~ aeronautical information products.

Note.— *An AIS may include origination functions.*

2.2.3 Where 24-hour service is not provided, service shall be available during the whole period an aircraft is in flight in the area of responsibility of AIS, plus a period of at least two hours before and after such a period. Service shall also be available at such other time as may be requested by an appropriate ground organization.

2.2.4 An AIS shall, in addition, obtain aeronautical data and aeronautical information to enable it to provide pre-flight information service and to meet the need for in-flight information:

- a) from the AIS of other States;
- b) from other sources that may be available.

Note.— *One such source is the subject of a provision in 8.3.5.6.*

2.2.5 Aeronautical data and aeronautical information obtained under 2.2.4 a) shall, when distributed, be clearly identified as having the authority of the originating State.

2.2.6 Aeronautical data and aeronautical information obtained under 2.2.4 b) shall, if possible, be verified before distribution and if not verified shall, when distributed, be clearly identified as such.

2.2.7 An AIS shall promptly make available to the AIS of other States any aeronautical data and aeronautical information necessary for the safety, regularity or efficiency of air navigation required by them, to enable them to comply with 2.2.1.

2.3 Exchange of aeronautical data and aeronautical information

2.3.1 Each Contracting State shall designate the office to which all elements of the ~~Integrated Aeronautical Information Package~~ originated aeronautical information products provided by other States shall be addressed. Such an office shall be qualified to deal with requests for aeronautical data and aeronautical information ~~originated~~ provided by other States.

~~2.3.2 Where more than one international NOTAM office is designated within a State, the extent of responsibility and the territory covered by each office shall be defined.~~

Editorial Note.— 2.3.2 is relocated to the new edition of Annex 15, 2.3.3.

2.3.2 ~~Where more than one international NOTAM office is designated within a State, the extent of responsibility and the territory covered by each office shall be defined.~~ **Recommendation.**— *Formal arrangements should be established between those parties providing aeronautical data and aeronautical information on behalf of the States and their users in relation to the provision of the service.*

Note.— *Guidance material on such formal arrangements is contained in Doc 8126.*

~~2.3.3 An AIS shall arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication.~~

Editorial Note.— 2.3.3 is relocated both to the new edition of Annex 15, 2.3.4, and the new PANS-AIM, 5.4.2.1.

~~2.3.2~~ 2.3.3 Where more than one international NOTAM office is designated within a State, the extent of responsibility and the territory covered by each office shall be defined.

Editorial Note.— New 2.3.3 is relocated text from 2.3.2.

~~2.3.4~~ Wherever practicable, direct contact between AIS shall be established in order to facilitate the international exchange of aeronautical data and aeronautical information.

Editorial Note.— 2.3.4 is relocated to the new edition of Annex 15, 2.3.5.

~~2.3.3~~ 2.3.4 An AIS shall arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication.

Editorial Note.— New 2.3.4 is relocated text from 2.3.3.

~~2.3.5~~ One copy of each of the elements of the Integrated Aeronautical Information Package that have been requested by the AIS of a Contracting State shall be made available by the originating State in the mutually agreed form(s), without charge, even where authority for publication/storage and distribution has been delegated to a non-governmental agency.

Editorial Note.— 2.3.5 is relocated to the new edition of Annex 15, 2.3.6.

~~2.3.4~~ 2.3.5 Wherever practicable, direct contact between AIS shall be established in order to facilitate the international exchange of aeronautical data and aeronautical information.

Editorial Note.— New 2.3.5 is relocated text from 2.3.4.

~~2.3.6~~ **Recommendation.** ~~The exchange of more than one copy of the elements of the Integrated Aeronautical Information Package and other air navigation documents, including those containing air navigation legislation and regulations, should be subject to bilateral agreement between ICAO Contracting States.~~

Editorial Note.— 2.3.6 is relocated to the new edition of Annex 15, 2.3.7.

~~2.3.5~~ 2.3.6 Except as provided in 2.3.8, One copy of each of the elements of the Integrated Aeronautical Information Package following aeronautical information products (where available) that have been requested by the AIS of a Contracting State shall be made available by the originating State and provided in the mutually-agreed form(s), without charge, even where authority for publication/storage and distribution has been delegated to a non-governmental agency.

- a) Aeronautical Information Publication (AIP), including Amendments and Supplements;

- b) Aeronautical Information Circulars (AIC);
- c) NOTAM; and
- d) Aeronautical Charts.

Editorial Note.— New 2.3.6 is relocated text from 2.3.5.

~~2.3.7~~ **Recommendation.**— ~~The procurement of aeronautical data and aeronautical information, including the elements of the Integrated Aeronautical Information Package, and other air navigation documents, including those containing air navigation legislation and regulations, by States other than Contracting States and by other entities should be subject to separate agreement with the originating State.~~

Editorial Note.— 2.3.7 is relocated to the new edition of Annex 15, 2.3.9.

~~2.3.6~~ **2.3.7 Recommendation.**— ~~The exchange of more than one copy of the elements of the Integrated Aeronautical Information Package~~ aeronautical information products and other air navigation documents, including those containing air navigation legislation and regulations, should be subject to bilateral agreement between the participating Contracting States and entities.

Editorial Note.— New 2.3.7 is relocated text from 2.3.6.

2.3.8 Where aeronautical information and aeronautical data is provided in the form of digital data sets to be used by the AIS, it shall be provided on the basis of agreement between the Contracting States concerned.

Note.— The intention is that States are able to access foreign data for the purposes specified in 2.2.4.

~~2.3.7~~ **2.3.9 Recommendation.**— ~~The procurement of aeronautical data and aeronautical information, including the elements of the Integrated Aeronautical Information Package~~ aeronautical information products, and other air navigation documents, including those containing air navigation legislation and regulations, by States other than Contracting States and by other entities should be subject to separate agreement ~~with the originating State~~ between the participating States and entities.

Editorial Note.— New 2.3.9 is relocated text from 2.3.7.

2.3.10 Globally interoperable aeronautical data and information exchange models shall be used for the provision of data sets.

Note 1.— Specifications concerning the globally interoperable aeronautical information and data exchange models are contained in the PANS-AIM (Doc 10066).

Note 2.— Guidance on the globally interoperable aeronautical information and data exchange models may be found in Doc 8126.

Editorial Note.— New Note 2 is relocated text from Note to 3.6.3.

2.4 Copyright

Note.— In order to protect the investment in the products of a State's AIS as well as to ensure better control of their use, States may wish to apply copyright to those products in accordance with their national laws.

2.4.1 Any aeronautical information product of a State's AIS which has been granted copyright protection by that the originating State and provided to another State in accordance with 2.3 shall only be made available to a third party on the condition that the third party is made aware that the product is copyright protected and provided that it is appropriately annotated that the product is subject to copyright by the originating State.

Editorial Note.— New 2.4.1 is relocated text from 2.4.

2.4.2 When aeronautical information and aeronautical data is provided to a State in accordance with 2.3.8, the receiving State shall not provide digital data sets of the providing State to any third party without the consent of the providing State.

2.5 Cost recovery

2.5.1 **Recommendation.**— *The overhead cost of collecting and compiling aeronautical data and aeronautical information should be included in the cost basis for airport and air navigation services charges, as appropriate, in accordance with the principles contained in ICAO's Policies on Charges for Airports and Air Navigation Services (Doc 9082).*

Note.— When costs of collection and compilation of aeronautical data and aeronautical information are recovered through airport and air navigation services charges, the charge to an individual customer for the supply of a particular AIS aeronautical information product may be based on the costs of printing paper copies, production of electronic media and distribution.

CHAPTER 3. AERONAUTICAL INFORMATION MANAGEMENT

3.1 Information management requirements

The information management resources and processes established by an aeronautical information service (AIS) shall be adequate to ensure the timely collection, processing, storing, integration, exchange and delivery of quality-assured aeronautical data and aeronautical information within the air traffic management (ATM) system.

~~3.3~~ 3.2 Data quality specifications

~~3.2.1~~ Material to be issued as part of the Integrated Aeronautical Information Package shall be thoroughly checked before it is submitted to the AIS, in order to make certain that all necessary information has been included and that it is correct in detail prior to distribution.

Editorial Note.— 3.2.1 is relocated to the new edition of Annex 15, 3.3.1.

~~3.3.1~~ 3.2.1 Data Accuracy

The order of accuracy for aeronautical data shall be in accordance with its intended use as specified in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2. In that respect, three types of positional data shall be identified: surveyed points (runway thresholds, navigation aid positions, etc.), calculated points (mathematical calculations from the known surveyed points of points in space/fixes) and declared points (e.g. flight information region boundary points).

Note.— ~~The accuracy requirements for electronic terrain and obstacle data are specified in Appendix 8. Specifications concerning the order of accuracy (including confidence level) for aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.~~

Editorial Note.— New 3.2.1 is relocated text from 3.3.1.

~~3.2.2~~ An AIS shall establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements (accuracy, resolution, integrity and traceability) are met.

Note 1.— ~~Guidance material on liaison with other related services is contained in the Aeronautical Information Services Manual (Doc 8126).~~

Editorial Note.— 3.2.2 and Note 1 are relocated to the new edition of Annex 15, 3.3.2.

Note 2.— ~~Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, and traceability and protection requirements) may be found in the World Geodetic System—1984 (WGS-84) Manual (Doc 9674). Supporting data quality material in respect of data accuracy, publication resolution, and integrity of aeronautical data, together with guidance material in respect to the rounding convention for aeronautical data, is contained in Radio Technical Commission for Aeronautics (RTCA) Document DO-201A and European Organization for Civil~~

Aviation Equipment (EUROCAE) Document ED-77—Standards for Aeronautical Information (or equivalent).

Note 3.— Guidance material on the management of aeronautical data quality is included in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839)(to be developed).

Editorial Note.— Notes 2 (initial part) and 3 are relocated to the new PANS-AIM, Notes 2 and 4 to 2.1.2.1.

~~3.3.2~~ 3.2.2 Data Resolution

~~3.3.2.1~~ 3.2.2.1 The order of ~~publication~~ resolution of aeronautical data shall be ~~as specified in Appendix 7~~ commensurate with the actual data accuracy.

Editorial Note.— New 3.2.2 is relocated text from 3.3.2.1.

Note 1.— Specifications concerning the resolution of the aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

Note 2.— The resolution of the data ~~features~~ contained in the database may be the same or finer than the publication resolution.

Editorial Note.— Note 2 is relocated text from Note to 3.3.2.2.

~~3.3.3~~ 3.2.3 Data Integrity

~~3.3.3.1~~ 3.2.3.1 The integrity of ~~classification~~ for aeronautical data shall be maintained throughout the data process from origination to distribution to the next intended user, ~~as specified in Tables A7-1 to A7-5 of Appendix 7.~~

Note .— Specifications concerning the integrity classification related to aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

Editorial Note.— New 3.2.3.1 and the Note is relocated text from 3.3.3.1 and 3.3.3.2.

~~3.3.3.2~~ 3.2.3.2 The integrity of aeronautical data shall be maintained throughout the data process from ~~survey/origin~~ to distribution to the next intended user (the entity that receives the aeronautical information from the AIS provider). Based on the applicable integrity classification, the ~~validation and verification procedures shall~~ procedures shall be put in place in order to:

- a) for routine data: avoid corruption throughout the processing of the data;
- b) for essential data: assure corruption does not occur at any stage of the entire process and include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

- c) for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

Editorial Note.— New 3.2.3.2 is relocated text from 3.3.3.2.

3.2.4 Data Traceability

3.2.4.1 Traceability of aeronautical data shall be ensured and retained as long as the data is in use.

3.2.5 Data Timeliness

3.2.5.1 Timeliness shall be ensured by including limits on the effective period of the data elements.

Note 1.— These limits may be associated with individual data elements or data sets.

Note 2.— If the effective period is defined for a data set, it will account for the effective dates of all of the individual data elements.

3.2.6 Data Completeness

3.2.6.1 Completeness of the aeronautical data shall be ensured in order to support the intended use.

3.2.7 Data Format

3.2.7.1 The format of delivered data shall be adequate to ensure that the data is interpreted in a manner that is consistent with its intended use.

3.3 Aeronautical data and aeronautical information validation and verification

3.3.1 Accuracy

~~The order of accuracy for aeronautical data shall be as specified in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2. In that respect, three types of positional data shall be identified: surveyed points (runway thresholds, navigation aid positions, etc.), calculated points (mathematical calculations from the known surveyed points of points in space/fixes) and declared points (e.g. flight information region boundary points).~~

~~*Note.*— The accuracy requirements for electronic terrain and obstacle data are specified in Appendix 8.~~

Editorial Note.— 3.3.1 and Note are relocated to the new edition of Annex 15, 3.2.1 and the new PANS-AIM, 4.1.2.

~~3.2.1~~ **3.3.1** Material to be issued as part of the Integrated Aeronautical Information Package an aeronautical information product shall be thoroughly checked before it is submitted to the AIS, in order to ~~make certain~~ ensure that all necessary information has been included and that it is correct in detail prior to distribution.

Editorial Note.— New 3.3.1 is relocated text from 3.2.1.

~~3.3.2~~ Resolution

~~3.3.2.1~~ The order of publication resolution of aeronautical data shall be as specified in Appendix 7.

~~3.3.2.2~~ **Recommendation.**— *The resolution of the data features contained in the database should be commensurate with the data accuracy requirements.*

Note.— *The resolution of the data features contained in the database may be the same or finer than the publication resolution.*

Editorial Note.— 3.3.2.1, 3.3.2.2 and the Note are relocated to the new edition of Annex 15, 3.2.2, Notes 1 and 2.

~~3.2.2~~ **3.3.2** An AIS shall establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements (~~accuracy, resolution, integrity and traceability~~) are met.

Note 1.— *Guidance material on liaison with other related services is contained in the Aeronautical Information Services Manual (Doc 8126).*

Editorial Note.— New 3.3.2 is relocated text from 3.2.2.

~~3.3.3~~ Integrity

~~3.3.3.1~~ The integrity classification for aeronautical data shall be as specified in Tables A7-1 to A7-5 of Appendix 7.

~~3.3.3.2~~ The integrity of aeronautical data shall be maintained throughout the data process from survey/origin to distribution to the next intended user (the entity that receives the aeronautical information from the AIS provider). Based on the applicable integrity classification, the validation and verification procedures shall:

- ~~a) for routine data: avoid corruption throughout the processing of the data;~~
- ~~b) for essential data: assure corruption does not occur at any stage of the entire process and include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and~~
- ~~c) for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.~~

Editorial Note.— 3.3.3.1 and 3.3.3.2 are relocated to the new edition of Annex 15, 3.2.3.1 and 3.2.3.2.

~~Note 1. Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 Standards for Processing Aeronautical Data.~~

~~Note 2. Error producing faults in the entire process may be mitigated by additional data quality assurance techniques as may be required. These could include application tests for critical data (for example, by flight check); the use of security, logic, semantic, comparison, and redundancy checks; digital error detection; and the qualification of human resources and process tools such as hardware and software.~~

~~Note 3. Distribution to the next intended user will differ in the delivery method applied which may either be:~~

~~Physical distribution. The means by which aeronautical data and aeronautical information distribution is achieved through the delivery of a physical package, such as postal services; or~~

~~Direct electronic distribution. The means by which aeronautical data and aeronautical information distribution is achieved automatically through the use of a direct electronic connection between the AIS and the next intended user.~~

~~Note 4. Different delivery methods and data media may require different procedures to ensure the required data quality.~~

Editorial Note.— Notes 1 to 4 are relocated to the new PANS-AIM as follows: Note 1 to Note to 2.2.1; Note 2 to Note to 2.1.3; Note 3 to 5.4.1.1; and Note 4 to 5.4.1.2.

3.4 Data error detection

3.4.1 Metadata shall be collected for aeronautical data processes and exchange points. This metadata collection shall be applied throughout the aeronautical information data chain, from survey/origin to distribution to the next intended user.

Editorial Note.— 3.4.1 is relocated to the new edition of Annex 15, 4.2.1 and 4.2.2.

~~Note. ISO Standard 19115 specifies requirements for geographic information metadata.~~

Editorial Note.— Note to 3.4.1 is relocated to the new PANS-AIM, Note to 4.2.1.

3.5.1 **3.4.1** Aeronautical data and data sets shall be protected in accordance with data error detection, security, and authentication techniques. Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

~~Note. Doc 8126 contains guidance material on data error detection, security and authentication techniques~~

3.4.2 The metadata to be collected shall include, as a minimum:

- a) ~~the name of the organizations or entities performing any action of originating, transmitting or manipulating the data;~~
- b) ~~the action performed; and~~
- e) ~~the date and time the action was performed.~~

Editorial Note.— 3.4.2 is relocated to the new PANS-AIM, 4.2.1.

~~3.5.2 3.4.2~~ Electronic aeronautical data sets shall be protected by the inclusion in the data sets of a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. This shall apply to the protection of the integrity classification of data sets as specified in 3.3.3. Digital data error detection techniques shall be used in order to maintain the integrity levels as specified in 3.2.3.

Note.— Detailed specifications concerning digital data error detection techniques are contained in the PANS-AIM (Doc 10066).

Note 1.— ~~This requirement does not apply to the communications systems used for the transfer of data sets.~~

Note 2.— ~~Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in Doc 8126.~~

3.6 3.5 Use of automation

~~3.5.1~~ Aeronautical data and data sets shall be protected in accordance with data error detection, security, and authentication techniques.

Note.— ~~The Aeronautical Information Services Manual (Doc 8126) contains guidance material on data error detection, security and authentication techniques.~~

Editorial Note.— 3.5.1 and Note are relocated to new edition of Annex 15, 3.4.1.

~~3.6.1 3.5.1~~ Automation shall be introduced ~~applied~~ with the objective of improving in order to ensure the timeliness, quality, efficiency and cost-effectiveness of aeronautical information services.

Note.— ~~Guidance material on the development of databases and the establishment of data exchange services is contained in the Aeronautical Information Services Manual (Doc 8126).~~

Editorial Note.— New 3.5.1 and Note are relocated text from 3.6.1 and Note.

~~3.5.2~~ Electronic aeronautical data sets shall be protected by the inclusion in the data sets of a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. This shall apply to the protection of the integrity classification of data sets as specified in 3.3.3.

Note 1.— ~~This requirement does not apply to the communications systems used for the transfer of data sets.~~

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in Doc 8126.

Editorial Note.— 3.5.2 and Notes 1 and 2 are relocated to the new edition of Annex 15, 3.4.2.

3.5.2 Due consideration to the integrity of data and information shall be given when automated processes are implemented and mitigating steps taken where risks are identified.

Note.— Risks of altering the integrity of data and information may be introduced by automated processes in case of unexpected systems behaviours.

~~3.6.3~~ 3.5.3 In order to meet the data quality requirements, automation shall:

- a) enable digital aeronautical data exchange between the parties involved in the data processing chain; and
- b) use aeronautical information exchange models and data exchange models designed to be globally interoperable.

Editorial Note.— New 3.5.3 is relocated text from 3.6.3.

3.7 3.6 Quality management system

~~3.6.1~~ Automation shall be introduced with the objective of improving the timeliness, quality, efficiency and cost effectiveness of aeronautical information services.

Note.— Guidance on the development of databases and the establishment of data exchange services may be found in the Aeronautical Information Services Manual (Doc 8126).

Editorial Note.— 3.6.1 and Note are relocated to the new edition of Annex 15, 3.5.1.

~~3.7.1~~ 3.6.1 Quality management systems shall be implemented and maintained encompassing all functions of an AIS, as outlined in 2.2. The execution of such quality management systems shall be made demonstrable for each function stage.

Note.— Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839)(to be developed planned for development by November 2019).

Editorial Note.— New 3.6.1 is relocated text from 3.7.1.

~~3.6.2~~ Where aeronautical data and aeronautical information are provided in multiple formats, processes shall be implemented to ensure data and information consistency between formats.

Editorial Note.— 3.6.2 is relocated to the new edition of Annex 15, 5.1.2.

~~3.7.2~~ **3.6.2 Recommendation.**— *Quality management should be applicable to the whole aeronautical information data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.*

Editorial Note.— New 3.6.2 is relocated text from 3.7.2.

~~3.6.3~~— *In order to meet the data quality requirements, automation shall:*

- ~~a) enable digital aeronautical data exchange between the parties involved in the data processing chain; and~~
- ~~b) use aeronautical information exchange models and data exchange models designed to be globally interoperable.~~

Editorial Note.— 3.6.3 is relocated to the new edition of Annex 15, 3.5.2.

Note.— *Guidance on the aeronautical information and data exchange models may be found in (Doc 8126).*

Editorial Note.— Note to 3.6.3 is relocated to the new edition of Annex 15, Note to 2.3.10.

~~3.7.3~~ **3.6.3 Recommendation.**— *The quality management system established in accordance with 3.7.6.1 should follow the ISO 9000 series of quality assurance standards, and be certified by an ~~approved organization~~ accredited certification body.*

Editorial Note.— New 3.6.3 is relocated text from 3.7.3.

~~3.6.4~~ **Recommendation.**— *The aeronautical information model used should encompass the aeronautical data and aeronautical information to be exchanged.*

Editorial Note.— 3.6.4 is relocated to the new PANS-AIM, 5.3.1.3.

~~3.7.4~~ **3.6.4** Within the context of the established quality management system, the competencies and the associated knowledge, skills and abilities required for each function shall be identified, and personnel assigned to perform those functions shall be appropriately trained. Processes shall be in place to ensure that personnel possess the competencies required to perform specific assigned functions. Appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls in knowledge, skills and abilities.

Editorial Note.— New 3.6.4 is relocated text from 3.7.4.

~~3.6.5~~ **Recommendation.**— *The aeronautical information model used should:*

- ~~a) use the Unified Modelling Language (UML) to describe the aeronautical information features and their properties, associations and data types;~~

- ~~b) include data value constraints and data verification rules;~~
- ~~c) include provisions for metadata as specified in 3.4.2; and~~
- ~~d) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.~~

Editorial Note.— 3.6.5 is relocated to the new PANS-AIM, 5.3.1.4.

~~3.7.5~~ **3.6.5** Each quality management system shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data ~~are~~ **is** traceable throughout the aeronautical information data chain so as to allow any data anomalies or errors detected in use to be identified by root cause, corrected and communicated to affected users.

Editorial Note.— New 3.6.5 is relocated text from 3.7.5.

~~3.6.6~~ **Recommendation.**— ~~The aeronautical data exchange model used should:~~

- ~~a) apply a commonly used data encoding format;~~
- ~~b) cover all the classes, attributes, data types and associations of the aeronautical information model detailed in 3.6.5; and~~
- ~~c) provide an extension mechanism by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardization.~~

~~Note 1. The intent of using a commonly used data encoding format is to ensure interoperability of aeronautical data exchange between agencies and organizations involved in the data processing chain.~~

~~Note 2. Examples of commonly used data encoding formats include Extensible Markup Language (XML), Geography Markup Language (GML), and JavaScript Object Notation (JSON).~~

Editorial Note.— 3.6.6 is relocated to the new PANS-AIM, 5.3.1.5.

~~3.7.6~~ **3.6.6** The established quality management system shall provide users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements ~~for accuracy, resolution and integrity as specified in 3.2 and 3.3 and that the data traceability requirements are met through the provision of appropriate metadata as specified in 3.4. The system shall also provide assurance of the applicability period of intended use of aeronautical data and aeronautical information as well as that the agreed distribution dates will be met.~~

Editorial Note.— New 3.6.6 is relocated text from 3.7.6.

~~3.7.7~~ **3.6.7** All necessary measures shall be taken to monitor compliance with the quality management system in place.

Editorial Note.— New 3.6.7 is relocated text from 3.7.7.

~~3.7.8~~ **3.6.8** Demonstration of compliance of the quality management system applied shall be by audit. If nonconformity is identified, initiating action to correct its cause shall be determined and taken without undue delay. All audit observations and remedial actions shall be evidenced and properly documented.

Editorial Note.— New 3.6.8 is relocated text from 3.7.8.

3.8 3.7 Human factors considerations

~~3.7.1~~ Quality management systems shall be implemented and maintained encompassing all functions of an AIS, as outlined in 2.2. The execution of such quality management systems shall be made demonstrable for each function stage.

Note.— *Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839)(to be developed).*

Editorial Note.— 3.7.1 is relocated to the new edition of Annex 15, 3.6.1.

~~3.8.1~~ **3.7.1** The organization of an AIS as well as the design, contents, processing and distribution of aeronautical data and aeronautical information shall take into consideration human factors principles which facilitate their optimum utilization.

Editorial Note.— New 3.7.1 is relocated text from 3.8.1.

~~3.7.2~~ **Recommendation.**— *Quality management should be applicable to the whole aeronautical information data chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.*

Editorial Note.— 3.7.2 is relocated to the new edition of Annex 15, 3.6.2.

Note 1.— *Quality management may be provided by a single quality management system or serial quality management systems.*

Note 2.— *Letters of agreement concerning data quality between originator and distributor and between distributor and next intended user may be used to manage the aeronautical information data chain.*

Editorial Note.— Notes 1 and 2 to 3.7.2 are relocated to the new PANS-AIM, Notes 1 and 3 to 3.1.3.

~~3.8.2~~ **3.7.2** Due consideration shall be given to the integrity of information where human interaction is required and mitigating steps taken where risks are identified.

Note.— *This may be accomplished through the design of systems, operating procedures or improvements in the operating environment.*

Editorial Note.— New 3.7.2 and Note are relocated text from 3.8.2

~~3.7.3 — **Recommendation.** — The quality management system established in accordance with 3.7.1 should follow the ISO 9000 series of quality assurance standards, and be certified by an approved organization.~~

Editorial Note.— 3.7.3 is relocated to the new edition of Annex 15, 3.6.3.

~~Note 1. — An ISO 9000 certificate issued by an accredited certification body would be considered an acceptable means of compliance.~~

~~Note 2. — International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme and define the term “accredited certification body”. The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization.~~

Editorial Note.— Notes 1 and 2 to 3.7.3 are relocated to the new PANS-AIM, Note 2 to 3.1.3.

~~Note 3. — Supporting material in respect of the processing of aeronautical data is contained in RTCA Document DO 200A and EUROCAE Document ED 76 — Standards for Processing Aeronautical Data. These standards support the development and application of aeronautical databases.~~

Editorial Note.— Note 3 to 3.7.3 is deleted.

~~3.7.4 — Within the context of the established quality management system, the competencies and the associated knowledge, skills and abilities required for each function shall be identified, and personnel assigned to perform those functions shall be appropriately trained. Processes shall be in place to ensure that personnel possess the competencies required to perform specific assigned functions. Appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.~~

Editorial Note.— 3.7.4 is relocated to the new edition of Annex 15, 3.6.4.

~~Note. — Guidance material concerning training methodology to ensure the competency of personnel is contained in the Aeronautical Information Management Training Development Manual (Doc 9991).~~

Editorial Note.— Note to 3.7.4 is relocated to the new PANS-AIM, Note 4 to 3.1.3.

~~3.7.5 — Each quality management system shall include the necessary policies, processes and procedures, including those for the use of metadata, to ensure and verify that aeronautical data are traceable throughout the aeronautical information data chain so as to allow any data anomalies or errors detected in use to be identified by root cause, corrected and communicated to affected users.~~

~~3.7.6 — The established quality management system shall provide users with the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements for accuracy, resolution and integrity as specified in 3.2 and 3.3~~

~~and that the data traceability requirements are met through the provision of appropriate metadata as specified in 3.4. The system shall also provide assurance of the applicability period of intended use of aeronautical data and aeronautical information as well as that the agreed distribution dates will be met.~~

~~3.7.7 All necessary measures shall be taken to monitor compliance with the quality management system in place.~~

~~3.7.8 Demonstration of compliance of the quality management system applied shall be by audit. If nonconformity is identified, initiating action to correct its cause shall be determined and taken without undue delay. All audit observations and remedial actions shall be evidenced and properly documented.~~

Editorial Note.— 3.7.5 to 3.7.8 are relocated to the new edition of Annex 15, 3.6.5 to 3.6.8.

CHAPTER 4. AERONAUTICAL INFORMATION PUBLICATIONS (AIP)

SCOPE OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION

Note 1.— AIP are intended primarily to satisfy international requirements for the exchange of aeronautical information of a lasting character essential to air navigation. When practicable, the form of presentation is designed to facilitate their use in flight.

Note 2.— AIP constitute the basic information source for permanent information and long duration temporary changes.

Editorial Note.— Notes 1 and 2 are relocated to the new edition of Annex 15, 5.2.2.

Note.— The scope of aeronautical data and aeronautical information provides the minimum requirement to support aeronautical information products and services, aeronautical navigation data bases, air navigation applications and ATM systems.

4.1 ~~Contents~~ Scope of aeronautical data and aeronautical information

4.1.1 ~~An AIP shall contain, in three parts, sections and subsections uniformly referenced to allow for standardized electronic data storage and retrieval, current information relating to, and arranged under, those subjects enumerated in Appendix 1 that appear in roman type, except that when the AIP, or volume of the AIP, is designed basically to facilitate operational use in flight, the precise format and arrangement may be left to the discretion of the State provided that an adequate table of contents is included.~~

Editorial Note.— 4.1.1 is relocated to the new PANS-AIM, 5.2.1.2.5.

4.1.1 The aeronautical data and aeronautical information to be received and managed by the AIS shall include at least the following sub-domains:

- a) national regulations, rules and procedures;
- b) aerodromes and heliports;
- c) airspace;
- d) ATS routes;
- e) instrument flight procedures;
- f) radio navigation aids/systems;
- g) obstacles;
- h) terrain; and

- i) geographic information.

Note 1.— Detailed specifications concerning the content of each sub-domain are contained in the PANS-AIM (Doc 10066), Appendix 1.

Note 2.— Aeronautical data and aeronautical information in each sub-domain may be originated by more than one organization or authority.

4.1.1.1—Recommendation.—*AIP should, in addition, contain current information relating to those subjects enumerated in Appendix 1 that appear in italic type.*

Editorial Note.— 4.1.1.1 is deleted.

~~4.1.2—AIP shall include in Part 1—General (GEN):~~

- ~~a) a statement of the competent authority responsible for the air navigation facilities, services or procedures covered by the AIP;~~
- ~~b) the general conditions under which the services or facilities are available for international use;~~
- ~~c) a list of significant differences between the national regulations and practices of the State and the related ICAO Standards, Recommended Practices and Procedures, given in a form that would enable a user to differentiate readily between the requirements of the State and the related ICAO provisions;~~
- ~~d) the choice made by a State in each significant case where an alternative course of action is provided for in ICAO Standards, Recommended Practices and Procedures.~~

Editorial Note.— 4.1.2 is relocated to the new edition of Annex 15, 5.2.2.1.

4.1.2 Determination and reporting of aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end-user of aeronautical data.

Note.— Specifications concerning the accuracy and integrity classification related to aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.

~~4.1.3 The aeronautical charts listed alphabetically below shall, when available for designated international aerodromes/ heliports, form part of the AIP, or be distributed separately to recipients of the AIP:~~

- ~~a) Aerodrome/Heliport Chart ICAO;~~
- ~~b) Aerodrome Ground Movement Chart ICAO;~~
- ~~c) Aerodrome Obstacle Chart ICAO Type A;~~
- ~~d) Aerodrome Terrain and Obstacle Chart ICAO (Electronic);~~
- ~~e) Aircraft Parking/Docking Chart ICAO;~~
- ~~f) Area Chart ICAO;~~
- ~~g) ATC Surveillance Minimum Altitude Chart ICAO;~~

- h) Instrument Approach Chart ICAO;
- i) Precision Approach Terrain Chart ICAO;
- j) Standard Arrival Chart Instrument (STAR) ICAO;
- k) Standard Departure Chart Instrument (SID) ICAO;
- l) Visual Approach Chart ICAO.

Note.— *A page pocket may be used in the AIP to include the Aerodrome Terrain and Obstacle Chart ICAO (Electronic) on appropriate electronic media.*

Editorial Note.— 4.1.3 and Note are relocated to the new edition of Annex 15, 5.2.5.1.

4.1.4 Charts, maps or diagrams shall be used, when appropriate, to complement or as a substitute for the tabulations or text of AIP.

Note.— *Where appropriate, charts produced in conformity with Annex 4, may be used to fulfil this requirement. Guidance material as to the specifications of index maps and diagrams included in AIP is contained in the Aeronautical Information Services Manual (Doc 8126).*

Editorial Note.— 4.1.4 is relocated to the new PANS-AIM, 5.2.1.2.7.

4.2 General specifications Metadata

4.2.1 Each AIP shall be self contained and shall include a table of contents.

Note.— *If it is necessary by reason of bulk or for convenience, to publish an AIP in two or more parts or volumes, each of them will indicate that the remainder of the information is to be found in the other part(s) or volume(s).*

Editorial Note.— 4.2.1 and Note are relocated to the new PANS-AIM, 5.2.1.2.3.

~~3.4.1~~ 4.2.1 Metadata shall be collected for aeronautical data processes and exchange points.

Editorial Note.— New 4.2.1 is relocated text from 3.4.1 partially.

4.2.1.1 Each AIP shall not duplicate information within itself or from other sources.

4.2.1.2 When two or more States combine to issue a joint AIP, this shall be made clear both on the cover and in the table of contents.

4.2.2 **Recommendation.**— *AIP should be published in loose leaf form unless the complete publication is reissued at frequent intervals.*

Editorial Note.— 4.2.1.1 to 4.2.2 are relocated to the new PANS-AIM, 5.2.1.2.4, 5.2.1.2.2 and 5.2.3.1.1.

~~3.4.1 4.2.2~~ This ~~Metadata~~ collection shall be applied throughout the aeronautical information data chain, from ~~survey/origination~~ to distribution to the next intended user.

Note.— Detailed specifications concerning metadata are contained in the PANS-AIM (Doc 10066).

Editorial Note.— New 4.2.2 is relocated text from 3.4.1 partially.

~~4.2.3~~ Each AIP shall be dated. In the case of AIP issued in loose leaf form, each page shall be dated. The date, consisting of the day, month (by name) and year, shall be the publication date or the effective date of the information.

~~4.2.4~~ A checklist giving the current date of each page in the AIP series shall be reissued frequently to assist the user in maintaining a current publication. The page number/chart title and date of the checklist shall appear on the checklist itself.

~~4.2.5~~ Each AIP issued as a bound volume and each page of an AIP issued in loose leaf form shall be so annotated as to indicate clearly:

- ~~a) the identity of the AIP;~~
- ~~b) the territory covered and subdivisions when necessary;~~
- ~~c) the identification of the issuing State and producing organization (authority);~~
- ~~d) page numbers/chart titles;~~
- ~~e) the degree of reliability if the information is doubtful.~~

~~4.2.6~~ **Recommendation.**— The sheet size should be no larger than 210 × 297 mm, except that larger sheets may be used provided they are folded to the same size.

Editorial Note.— 4.2.3 to 4.2.6 are relocated to the new PANS-AIM, 5.2.1.2.6 and 5.2.1.2.6.1; 5.2.3.1.10; 5.2.3.1.2; 5.2.3.1.11.

~~4.2.7~~ All changes to the AIP, or new information on a republished page, shall be identified by a distinctive symbol or annotation.

Editorial Note.— 4.2.7 is deleted.

~~4.2.8~~ Operationally significant changes to the AIP shall be published in accordance with Aeronautical Information Regulation and Control (AIRAC) procedures and shall be clearly identified by the acronym AIRAC.

Editorial Note.— 4.2.8 is relocated to the new PANS-AIM, 5.2.1.3.2.

~~4.2.9~~ AIP shall be amended or reissued at such regular intervals as may be necessary to keep them up to date. Recourse to hand amendments or annotations shall be kept to the minimum. The normal method of amendment shall be by means of replacement sheets.

~~4.2.9.1 The regular interval referred to in 4.2.9 shall be specified in the AIP, Part 1 — General (GEN).~~

~~Note.— Guidance material on the establishment of intervals between publication dates of AIP Amendments is contained in Doc 8126.~~

Editorial Note.— 4.2.9 and 4.2.9.1 and Note are relocated to the new PANS-AIM, 5.2.1.3.1 and 6.1.2.1.

~~4.3 Specifications for AIP Amendments~~

~~4.3.1 Permanent changes to the AIP shall be published as AIP Amendments.~~

Editorial Note.— 4.3.1 is relocated to the new edition of Annex 15, 6.3.1.2.

~~4.3.2 Each AIP Amendment shall be allocated a serial number, which shall be consecutive.~~

~~4.3.3 Each AIP Amendment page, including the cover sheet, shall display a publication date.~~

~~4.3.4 Each AIRAC AIP Amendment page, including the cover sheet, shall display an effective date. When an effective time other than 0000 UTC is used, the effective time shall also be displayed on the cover sheet.~~

~~4.3.5 When an AIP Amendment is issued, it shall include references to the serial number of those elements, if any, of the Integrated Aeronautical Information Package which have been incorporated into the amendment.~~

~~4.3.6 A brief indication of the subjects affected by the amendment shall be given on the AIP Amendment cover sheet.~~

~~4.3.7 When an AIP Amendment will not be published at the established interval or publication date, a NIL notification shall be originated and distributed by the monthly plain language list of valid NOTAM required by 5.2.13.3.~~

Editorial Note.— 4.3.2 to 4.3.7 are relocated to the new PANS-AIM, 5.2.1.3.5; 5.2.1.3.6; 5.2.1.3.7 and 5.2.1.3.7.1; 5.2.1.3.8; 5.2.1.3.9; 6.1.2.2.

~~4.4 Specifications for AIP Supplements~~

~~4.4.1 Temporary changes of long duration (three months or longer) and information of short duration which contains extensive text and/or graphics shall be published as AIP Supplements.~~

Editorial Note.— 4.4.1 is relocated to the new edition of Annex 15, 6.3.1.3.

~~Note.— Guidance material on the use of AIP Supplements together with examples of such use is contained in Doc 8126.~~

Editorial Note.— Note to 4.4.1 is relocated to the new PANS-AIM, Note to 5.2.1.4.1.

~~4.4.2 Each AIP Supplement shall be allocated a serial number which shall be consecutive and based on the calendar year.~~

Editorial Note.— 4.4.2 is relocated to the new PANS-AIM, 5.2.1.4.1.

~~4.4.3 AIP Supplement pages shall be kept in the AIP as long as all or some of their contents remain valid.~~

Editorial Note.— 4.4.3 is relocated to new PANS-AIM, 5.2.3.1.16.

~~4.4.4 When an error occurs in an AIP Supplement or when the period of validity of an AIP Supplement is changed, a new AIP Supplement shall be published as a replacement.~~

~~*Note.*— The requirements for NOTAM apply when time constraints do not allow sufficient time for the distribution of an AIP Supplement.~~

~~4.4.5 When an AIP Supplement is sent in replacement of a NOTAM, it shall include a reference to the serial number of the NOTAM.~~

Editorial Note.— 4.4.4 and Note and 4.4.5 are relocated to new PANS-AIM, 6.1.3.1 and 5.2.1.4.3.

~~4.4.6 A checklist of valid AIP Supplements shall be issued at intervals of not more than one month. This information shall be issued through the medium of the monthly plain language list of valid NOTAM required by 5.2.13.3.~~

Editorial Note.— 4.4.6 is relocated to both the new edition of Annex 15, 5.2.3.2 and the new PANS-AIM, 5.2.1.4.4.

~~4.4.7 **Recommendation.**— AIP Supplement pages should be coloured in order to be conspicuous, preferably in yellow.~~

~~4.4.8 **Recommendation.**— AIP Supplement pages should be kept as the first item in the AIP parts.~~

Editorial Note.— 4.4.7 and 4.4.8 are relocated to the new PANS-AIM, 5.2.3.1.14 and 5.2.3.1.15.

4.5—Distribution

~~AIP, AIP Amendments and AIP Supplements shall be made available by the most expeditious means.~~

Editorial Note.— 4.5 is relocated to the new edition of Annex 15, 5.4.1.2.

~~4.6—Electronic AIP (eAIP)~~

~~4.6.1 **Recommendation.**— The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for displaying on a computer screen and printing on paper.~~

Note 1.—This composite electronic document is named “Electronic AIP” (eAIP) and may be based on a format that allows for digital data exchange.

Note 2.—Guidance material for the production and provision of the eAIP is contained in Doc 8126.

~~4.6.2—When provided, the information content of the eAIP and the structure of chapters, sections and sub-sections shall follow the content and structure of the paper AIP. The eAIP shall include files that allow for printing a paper AIP.~~

~~4.6.3—**Recommendation.**—When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the Internet.~~

Note.—Guidance material on the use of the Internet is contained in Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).

Editorial Note.— 4.6.1 is relocated to Annex 15, 5.2.1.2; Notes to 4.6.1, paragraphs 4.6.2 and 4.6.3 are relocated to the new PANS-AIM, 5.2.4, 5.2.4.1 and 5.2.4.3, respectively.

CHAPTER 5. NOTAM AERONAUTICAL INFORMATION PRODUCTS AND SERVICES

5.1 Origination General

~~5.1.1 A NOTAM shall be originated and issued promptly whenever the information to be distributed is of a temporary nature and of short duration or when operationally significant permanent changes, or temporary changes of long duration are made at short notice, except for extensive text and/or graphics.~~

~~Note 1.— Operationally significant changes concerning circumstances listed in Appendix 4, Part 1, are issued under the Aeronautical Information Regulation and Control (AIRAC) system specified in Chapter 6.~~

~~Note 2.— Information of short duration containing extensive text and/or graphics is published as an AIP Supplement (see Chapter 4, 4.4).~~

Editorial Note.— 5.1.1, Notes 1 and 2 are relocated to the new edition of Annex 15, 6.3.2.2.

5.1.1 Aeronautical information shall be provided in the form of aeronautical information products and associated services.

Note.— Specifications concerning the order of resolution of aeronautical data provided for each aeronautical information product are contained in the PANS-AIM (Doc 10066), Appendix 1.

~~5.1.1.1 A NOTAM shall be originated and issued concerning the following information:~~

- ~~a) establishment, closure or significant changes in operation of aerodrome(s)/heliport(s) or runways;~~
- ~~b) establishment, withdrawal and significant changes in operation of aeronautical services (AGA, AIS, ATS, CNS, MET, SAR, etc.);~~
- ~~c) establishment, withdrawal and significant changes in operational capability of radio navigation and air ground communication services. This includes: interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation (directional aids), change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any radio navigation and air ground communication services;~~
- ~~d) establishment, withdrawal or significant changes made to visual aids;~~
- ~~e) interruption of or return to operation of major components of aerodrome lighting systems;~~
- ~~f) establishment, withdrawal or significant changes made to procedures for air navigation services;~~
- ~~g) occurrence or correction of major defects or impediments in the manoeuvring area;~~
- ~~h) changes to and limitations on availability of fuel, oil and oxygen;~~

- i) ~~major changes to search and rescue facilities and services available;~~
- j) ~~establishment, withdrawal or return to operation of hazard beacons marking obstacles to air navigation;~~
- k) ~~changes in regulations requiring immediate action, e.g. prohibited areas for SAR action;~~
- l) ~~presence of hazards which affect air navigation (including obstacles, military exercises, displays, races and major parachuting events outside promulgated sites);~~
- m) ~~erecting or removal of, or changes to, obstacles to air navigation in the take off/climb, missed approach, approach areas and runway strip;~~
- n) ~~establishment or discontinuance (including activation or deactivation) as applicable, or changes in the status of prohibited, restricted or danger areas;~~
- o) ~~establishment or discontinuance of areas or routes or portions thereof where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;~~
- p) ~~allocation, cancellation or change of location indicators;~~
- q) ~~significant changes in the level of protection normally available at an aerodrome/heliport for rescue and fire fighting purposes. NOTAM shall be originated only when a change of category is involved and such change of category shall be clearly stated (see Annex 14, Volume I, Chapter 9, and Attachment A, Section 18);~~
- r) ~~presence or removal of, or significant changes in, hazardous conditions due to snow, slush, ice, radioactive material, toxic chemicals, volcanic ash deposition or water on the movement area;~~
- s) ~~outbreaks of epidemics necessitating changes in notified requirements for inoculations and quarantine measures;~~
- t) ~~forecasts of solar cosmic radiation, where provided;~~
- u) ~~an operationally significant change in volcanic activity, the location, date and time of volcanic eruptions and/or horizontal and vertical extent of volcanic ash cloud, including direction of movement, flight levels and routes or portions of routes which could be affected;~~
- v) ~~release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical incident, the location, date and time of the incident, the flight levels and routes or portions thereof which could be affected and the direction of movement;~~
- w) ~~establishment of operations of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with procedures and/or limitations which affect air navigation; and~~
- x) ~~implementation of short term contingency measures in cases of disruption, or partial disruption, of air traffic services and related supporting services.~~

Note.— See Annex 11, 2.31 and Attachment C to that Annex.

Editorial Note.— 5.1.1.1 and Note are relocated to the new edition of Annex 15, 6.3.2.3.

~~5.1.1.2 **Recommendation.**— The need for origination of a NOTAM should be considered in any other circumstance which may affect the operation of aircraft.~~

Editorial Note.— 5.1.1.2 is deleted.

~~5.1.1.3 The following information shall not be notified by NOTAM:~~

- ~~a) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;~~
- ~~b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;~~
- ~~c) temporary obstructions in the vicinity of aerodromes/heliports that do not affect the safe operation of aircraft;~~
- ~~d) partial failure of aerodrome/heliport lighting facilities where such failure does not directly affect aircraft operations;~~
- ~~e) partial temporary failure of air ground communications when suitable alternative frequencies are known to be available and are operative;~~
- ~~f) the lack of apron marshalling services and road traffic control;~~
- ~~g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area;~~
- ~~h) parachuting when in uncontrolled airspace under VFR (see 5.1.1.1 l)), when controlled, at promulgated sites or within danger or prohibited areas;~~
- ~~i) other information of a similar temporary nature.~~

Editorial Note.— 5.1.1.3 is relocated to the new edition of Annex 15, 6.3.2.4.

~~5.1.1.4 At least seven days' advance notice shall be given of the activation of established danger, restricted or prohibited areas and of activities requiring temporary airspace restrictions other than for emergency operations.~~

~~5.1.1.4.1 Recommendation.— Notice of any subsequent cancellation of the activities or any reduction of the hours of activity or the dimensions of the airspace should be given as soon as possible.~~

~~Note.— Whenever possible, at least 24 hours' advance notice is desirable, to permit timely completion of the notification process and to facilitate airspace utilization planning.~~

~~5.1.1.5 NOTAM notifying unserviceability of aids to air navigation, facilities or communication services shall give an estimate of the period of unserviceability or the time at which restoration of service is expected.~~

Editorial Note.— 5.1.1.4 to 5.1.1.5 are relocated to the new PANS-AIM, 6.1.4.3, 6.1.4.4 and 6.1.4.2.

~~5.1.1.6 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a NOTAM shall be originated giving a brief description of the contents, the effective date and time, and the reference number of the amendment or supplement. This NOTAM shall come into force on the same effective date and time as the amendment or supplement and shall remain valid in the pre-flight information bulletin for a period of fourteen days.~~

~~Note.— Guidance material for the origination of NOTAM announcing the existence of AIRAC AIP Amendments or AIP Supplements (“Trigger NOTAM”) is contained in the Aeronautical Information Services Manual (Doc 8126).~~

Editorial Note.— The first sentence of paragraph 5.1.1.6 is relocated to the new edition of Annex 15, 6.3.2.1; the first sentence is also relocated to the new PANS-AIM, 6.1.4.8 and the second sentence and Note are relocated to the new PANS-AIM, 6.1.4.9 and Note to 6.1.4.12.

~~3.6.2~~ **5.1.2** Where aeronautical data and aeronautical information are provided in multiple formats, processes shall be implemented to ensure data and information consistency between formats.

Editorial Note.— New 5.1.2 is relocated text from paragraph 3.6.2.

5.2 General specifications Aeronautical information in a standardized presentation

~~5.2.1 Except as otherwise provided in 5.2.3 and 5.2.4, each NOTAM shall contain the information in the order shown in the NOTAM Format in Appendix 6.~~

Editorial Note.— 5.2.1 is relocated to the new PANS-AIM, 5.2.5.1.1.

5.2.1 Aeronautical information provided in a standardized presentation shall include the AIP, AIP Amendments, AIP Supplements, AICs, NOTAMs and Aeronautical Charts.

Note 1.— Detailed specifications about AIP, AIP Amendments, AIP Supplements, AICs and NOTAMs are contained in the PANS-AIM (Doc 10066).

Note 2.— Cases where digital data sets may replace the corresponding elements of the standardized presentation are detailed in the PANS-AIM (Doc 10066).

5.2.1.1 The AIP, AIP Amendment, AIP Supplement and AIC shall be provided on paper and/or as an electronic document.

~~4.6.4~~ **5.2.1.2 Recommendation.**— ~~The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for~~ provided as an electronic document (eAIP) ~~should allow for both displaying on a computer screen electronic devices and printing on paper.~~

Editorial Note.— New 5.2.1.2 is relocated from 4.6.1

~~5.2.2 Text of NOTAM shall be composed of the significations/uniform abbreviated phraseology assigned to the ICAO NOTAM Code complemented by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language.~~

~~Note.— Detailed guidance material covering NOTAM, SNOWTAM, ASHTAM and pre-flight information bulletin (PIB) production is contained in Doc 8126.~~

Editorial Note.— 5.2.2 and Note are relocated to the new PANS-AIM, 5.2.5.1.2 and Note to 5.2.5.1.1.

5.2.2 Aeronautical Information Publication (AIP)

Note 1.— AIP are intended primarily to satisfy international requirements for the exchange of aeronautical information of a lasting character essential to air navigation.

Note 2.— AIP constitute the basic information source for permanent information and long duration temporary changes.

Editorial Note.— Notes 1 and 2 are relocated text from Notes 1 and 2 to Chapter 4.

~~5.2.2.1 When NOTAM are selected for international distribution, English text shall be included for those parts expressed in plain language.~~

~~Note.— The ICAO NOTAM Code together with significations/uniform abbreviated phraseology, and ICAO Abbreviations are those contained in the Procedures for Air Navigation Services—ICAO Abbreviations and Codes (PANS ABC, Doc 8400).~~

Editorial Note.— 5.2.2.1 and Note are relocated to the new PANS-AIM, 5.2.5.1.3 and Note to 5.2.5.1.2.

~~4.1.2~~ **5.2.2.1** AIP shall include in Part 1—General (GEN):

- a) a statement of the competent authority responsible for the air navigation facilities, services or procedures covered by the AIP;
- b) the general conditions under which the services or facilities are available for international use;
- c) a list of significant differences between the national regulations and practices of the State and the related ICAO Standards, Recommended Practices and Procedures, given in a form that would enable a user to differentiate readily between the requirements of the State and the related ICAO provisions;
- d) the choice made by a State in each significant case where an alternative course of action is provided for in ICAO Standards, Recommended Practices and Procedures.

Editorial Note.— New 5.2.2.1 is relocated text from 4.1.2.

~~5.2.3—Information concerning snow, slush, ice and standing water on aerodrome/heliport pavements shall, when reported by means of a SNOWTAM, contain the information in the order shown in the SNOWTAM Format in Appendix 2.~~

Editorial Note.— 5.2.3 is relocated to the new PANS-AIM, 5.2.5.1.4.

5.2.3 AIP Supplement

~~4.4.6 5.2.3.1~~ A checklist of valid AIP Supplements shall be regularly provided issued at intervals of not more than one month. This information shall be issued through the medium of the monthly plain language list of valid NOTAM required by 5.2.13.3.

Note.— Detailed specifications concerning the frequency for providing checklists of valid AIP Supplements are contained in the PANS-AIM (Doc 10066).

Editorial Note.— New 5.2.3.1 relocated text from 4.4.6.

~~5.2.4—Information concerning an operationally significant change in volcanic activity, a volcanic eruption and/or volcanic ash cloud shall, when reported by means of an ASHTAM, contain the information in the order shown in the ASHTAM Format in Appendix 3.~~

Editorial Note.— 5.2.4 is relocated to the new PANS-AIM, 5.2.5.1.6.

5.2.4 Aeronautical Information Circulars (AIC)

~~7.1.1.1 5.2.4.1~~ An AIC shall be originated whenever it is desirable to promulgate used to provide:

- a) a long-term forecast of any major change in legislation, regulations, procedures or facilities; or
- b) information of a purely explanatory or advisory nature liable to affect flight safety; or
- c) information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters.

Editorial Note.— New 5.2.4.1 relocated text from 7.1.1.1.

~~7.1.1 5.2.4.2~~ An AIC shall be originated whenever it is necessary to promulgate aeronautical information which does not qualify: not be used for information that qualifies for inclusion in AIP or NOTAM.

- a) under the specifications in 4.1 for inclusion in an AIP; or
- b) under the specifications in 5.1 for the origination of a NOTAM.

Editorial Note.— New 5.2.4.2 is relocated text from 7.1.1.

5.2.4.3 The validity of AIC currently in force shall be reviewed at least once a year.

~~7.2.5~~ 5.2.4.4 A checklist of currently valid AIC ~~currently in force~~ shall be issued at least once a year, with distribution as for the AIC regularly provided.

Note.— Detailed specifications concerning the frequency for providing checklists of valid AIC are contained in the PANS-AIM (Doc 10066).

Editorial Note.— New 5.2.4.4 is relocated text from 7.2.5.

~~5.2.5~~ The NOTAM originator shall allocate to each NOTAM a series identified by a letter and a four-digit number followed by a stroke and a two-digit number for the year. The four-digit number shall be consecutive and based on the calendar year.

Note.— Letters A to Z, with the exception of S and T, may be used to identify a NOTAM series.

Editorial Note.— 5.2.5 and Note are relocated to the new PANS-AIM, 5.2.5.2.1 and 5.2.5.2.2.

5.2.5 Aeronautical Charts

Note.— Annex 4 provides Standards and Recommended Practices including provision requirements for each chart type.

~~4.1.3~~ 5.2.5.1 The aeronautical charts listed alphabetically below shall, when available for designated international aerodromes/heliports, form part of the AIP, or be distributed provided separately to recipients of the AIP:

- a) Aerodrome/Heliport Chart — ICAO;
- b) Aerodrome Ground Movement Chart — ICAO;
- c) Aerodrome Obstacle Chart — ICAO Type A;
- d) Aerodrome Obstacle Chart — ICAO Type B (when available)
- ~~de~~ e) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
- ~~ef~~ f) Aircraft Parking/Docking Chart — ICAO;
- ~~fg~~ g) Area Chart — ICAO;
- ~~gh~~ h) ATC Surveillance Minimum Altitude Chart — ICAO;
- ~~hi~~ i) Instrument Approach Chart — ICAO;
- ~~ij~~ j) Precision Approach Terrain Chart — ICAO;
- ~~jk~~ k) Standard Arrival Chart — Instrument (STAR) — ICAO;
- ~~kl~~ l) Standard Departure Chart — Instrument (SID) — ICAO;

4m) Visual Approach Chart — ICAO.

Note.— A page pocket may be used in the AIP to include the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) on appropriate electronic media.

Editorial Note.— New 5.2.5.1 is relocated text from 4.1.3.

5.2.5.2 The “Enroute Chart — ICAO” shall, when available, form part of the AIP, or be provided separately to recipients of the AIP.

5.2.5.3 The aeronautical charts listed alphabetically below shall, when available, be provided as aeronautical information products:

- a) World Aeronautical Chart — ICAO 1:1 000 000;
- b) Aeronautical Chart — ICAO 1:500 000;
- c) Aeronautical Navigation Chart — ICAO Small Scale;
- d) Plotting Chart — ICAO chart; and
- e) ATC Surveillance Minimum Altitude Chart — ICAO.

5.2.5.4 **Recommendation.**— *Electronic aeronautical charts should be provided based on digital databases and the use of geographic information systems.*

~~1.2.1.4~~ 5.2.5.5 ~~The order of publication resolution of geographical coordinates shall be that specified in Table A7-1 of Appendix 7 while the order of chart resolution of geographical coordinates shall be that specified in Annex 4, Appendix 6, Table 1. The chart resolution of aeronautical data shall be that as specified for a particular chart.~~

Note.— *Specifications concerning the chart resolution for aeronautical data are contained in the PANS-AIM (Doc 10066), Appendix 1.*

~~5.2.5.6 The order of publication resolution of elevation and geoid undulation shall be that specified in Table A7-2 of Appendix 7 while the order of chart resolution of elevation and geoid undulation shall be that specified in Annex 4, Appendix 6, Table 2.~~

Editorial Note.— New 5.2.5.5 is relocated text from 1.2.1.4. 5.2.5.6 is deleted.

~~5.2.6 When errors occur in a NOTAM, a NOTAM with a new number to replace the erroneous NOTAM shall be issued or the erroneous NOTAM shall be cancelled and a new NOTAM issued.~~

Editorial Note.— 5.2.6 is relocated to the new PANS-AIM, 5.2.5.1.6.

5.2.6 NOTAM

Note.— *Detailed specifications for NOTAM, including formats for SNOWTAM and ASHTAM, are contained in the PANS-AIM (Doc 10066).*

~~5.2.13~~ **5.2.6.1** A checklist of valid NOTAM shall be **regularly provided** issued as a NOTAM over the aeronautical fixed service (AFS) at intervals of not more than one month using the NOTAM Format specified in Appendix 6. One NOTAM shall be issued for each series.

Note.— Detailed specifications concerning the frequency for providing checklists of valid NOTAM are contained in the PANS-AIM (Doc 10066).

Editorial Note. — New 5.2.6.1 is relocated text from 5.2.13.

~~5.2.7~~ When a NOTAM is issued which cancels or replaces a previous NOTAM, the series and number of the previous NOTAM shall be indicated. The series, location indicator and subject of both NOTAM shall be the same. Only one NOTAM shall be cancelled or replaced by a NOTAM.

~~5.2.8~~ Each NOTAM shall deal with only one subject and one condition of the subject.

Note.— Guidance material concerning the combination of a subject and a condition of the subject in accordance with the NOTAM Selection Criteria is contained in Doc 8126.

~~5.2.9~~ Each NOTAM shall be as brief as possible and so compiled that its meaning is clear without the need to refer to another document.

~~5.2.10~~ Each NOTAM shall be transmitted as a single telecommunication message.

~~5.2.11~~ A NOTAM containing permanent or temporary information of long duration shall carry appropriate AIP or AIP Supplement references.

~~5.2.12~~ Location indicators included in the text of a NOTAM shall be those contained in Location Indicators (Doc 7910).

~~5.2.12.1~~ In no case shall a curtailed form of such indicators be used.

~~5.2.12.2~~ Where no ICAO location indicator is assigned to the location, its place name spelt in accordance with 1.3.2 shall be entered in plain language.

~~5.2.13~~ A checklist of valid NOTAM shall be issued as a NOTAM over the aeronautical fixed service (AFS) at intervals of not more than one month using the NOTAM Format specified in Appendix 6. One NOTAM shall be issued for each series.

Note.— Omitting a NOTAM from the checklist does not serve to cancel a NOTAM.

~~5.2.13.1~~ A checklist of NOTAM shall refer to the latest AIP Amendments, AIP Supplements and at least the internationally distributed AIC.

~~5.2.13.2~~ A checklist of NOTAM shall have the same distribution as the actual message series to which they refer and shall be clearly identified as a checklist.

Editorial Note.— 5.2.7 to 5.2.13.2 are relocated to the new PANS-AIM, 5.2.5.1.7 to 5.2.5.1.14; and 5.2.5.3.1 to 5.2.5.3.4.

~~5.2.13.3~~ A monthly plain language list of valid NOTAM, including indications of the latest AIP Amendments, AIC issued and a checklist of AIP Supplements, shall be prepared with a minimum of delay and forwarded by the most expeditious means to recipients of the Integrated Aeronautical Information Package.

Editorial Note.— 5.2.13.3 is deleted.

5.3 Digital data sets

~~5.3.1 NOTAM shall be distributed on the basis of a request.~~

Editorial Note.— 5.3.1 is relocated to the new edition of Annex 15, 5.4.1.1 and 5.4.2.1.

5.3.1 General

5.3.1.1 Digital data shall be in the form of the following data sets:

- a) AIP data set;
- b) terrain data sets;
- c) obstacle data sets;
- d) aerodrome mapping data sets; and
- e) instrument flight procedure data sets.

Note.— Detailed specifications concerning the content of the digital data sets are contained in the PANS-AIM (Doc 10066).

5.3.1.2 Each data set shall be provided to the next intended user together with at least the minimum set of metadata that ensures traceability.

Note.— Detailed specifications concerning metadata are contained in the PANS-AIM (Doc 10066).

5.3.1.3 A checklist of valid data sets shall be regularly provided.

~~5.3.2 NOTAM shall be prepared in conformity with the relevant provisions of the ICAO communication procedures.~~

Editorial Note.— 5.3.2 is relocated to the new edition of Annex 15, 5.4.2.2.

5.3.2 AIP data set

~~5.3.2.1 The AFS shall, whenever practicable, be employed for NOTAM distribution.~~

Editorial Note.— 5.3.2.1 is relocated to the new edition of Annex 15, 5.4.2.3.

5.3.2.1 Recommendation.— An AIP data set should be provided covering the extent of information as provided in the AIP.

~~5.3.2.2 When a NOTAM exchanged as specified in 5.3.4 is sent by means other than the AFS, a six digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator shall be used, preceding the text.~~

Editorial Note.— 5.3.2.2 is relocated to the new edition of Annex 15, 5.4.2.4.

5.3.2.2 Recommendation.— *When it is not possible to provide a complete AIP data set, the data subset(s) that are available should be provided.*

5.3.2.3 The AIP data set shall contain the digital representation of aeronautical information of lasting character (permanent information and long duration temporary changes) essential to air navigation.

~~5.3.3 The originating State shall select the NOTAM that are to be given international distribution.~~

Editorial Note.— 5.3.3 is relocated to both the new edition of Annex 15, 5.4.2.4 and the new PANS-AIM.

5.3.3 Terrain and obstacle data sets

Note 1.— *Numerical requirements for terrain and obstacle data sets are contained in the PANS-AIM (Doc 10066), Appendices 1 and 8.*

Note 2.— *Requirements for terrain and obstacle data collection surfaces are contained in the PANS-AIM (Doc 10066), Appendix 8.*

~~5.3.3.1 Recommendation.~~— ~~Selective distribution lists should be used when practicable.~~

~~*Note.*— *These lists are intended to obviate superfluous distribution of information. Guidance material relating to this is contained in the Aeronautical Information Services Manual (Doc 8126).*~~

Editorial Note.— 5.3.3.1 and Note are relocated to the new edition of Annex 15, 5.4.2.7.

~~10.1.1~~ **5.3.3.1** The coverage areas for sets of ~~electronic~~ terrain and obstacle data shall be specified as:

— Area 1: the entire territory of a State;

— Area 2: within the vicinity of an aerodrome, subdivided as follows;

— Area 2a: a rectangular area around a runway that comprises the runway strip plus any clearway that exists.

Note.— *See Annex 14, Volume I, Chapter 3, for dimensions for runway strip.*

— Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a length of 10 km and a splay of 15 per cent to each side;

— Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a; and

— Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing terminal control area (TMA) boundary, whichever is nearest;

— Area 3: the area bordering an aerodrome movement area that extends horizontally from the edge of a runway to 90 m from the runway centre line and 50 m from the edge of all other parts of the aerodrome movement area.

— Area 4: The area extending 900 m prior to the runway threshold and 60 m each side of the extended runway centre line in the direction of the approach on a precision approach runway, Category II or III.

Note.— See Appendix 8 for descriptions and graphical illustrations of the coverage areas.

Editorial Note.— 5.3.3 is relocated text from 10.1.1 and 10.1.2.

~~10.1.2~~ **5.3.3.2 Recommendation.**— *Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant, the length of Area 4 should be extended to a distance not exceeding 2 000 m (6 500 ft) from the runway threshold.*

5.3.3.3 Terrain data sets

~~10.2.1~~ **5.3.3.3.1** ~~A t~~ Terrain data sets shall contain digital sets of data representing the digital representation of the terrain surface in the form of continuous elevation values at all intersections (points) of a defined grid, referenced to common datum. ~~A terrain grid shall be angular or linear and shall be of regular or irregular shape.~~

Editorial Note.— New 5.3.3.3.1 is relocated text from 10.2.1.

~~10.1.3~~ **5.3.3.3.2** ~~Electronic t~~ Terrain data shall be provided for Area 1. ~~The obstacle data shall be provided for obstacles in Area 1 higher than 100 m above ground.~~

Editorial Note.— New 5.3.3.3.2 is relocated text from 10.1.3.

~~10.1.5~~ **5.3.3.3.3** ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic~~ terrain data shall be provided for:

- a) Area 2a;
- b) the take-off flight path area; and
- c) an area bounded by the lateral extent of the aerodrome obstacle limitation surfaces.

Editorial Note.— New 5.3.3.3.3 is relocated text from 10.1.5.

~~10.1.7~~ **5.3.3.3.4 Recommendation.**— ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic additional terrain and obstacle data should be provided within Area 2 as follows: for Areas 2b, 2c and 2d for obstacles and terrain that penetrate the relevant terrain and obstacle data collection surface specified in Appendix 8, except that data need not be collected for obstacles less than a height of 3 m above ground in Area 2b and less than a height of 15 m above ground in Area 2c.~~

Editorial Note.— New 5.3.3.3.4 is relocated text from 10.1.7.

- a) ~~Within~~ in the area ~~covered by a~~ extending to 10 km from the ARP, ~~terrain data shall comply with the Area 2 numerical requirements;~~ and
- b) ~~In~~ within the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller) ~~data on~~ where terrain ~~that~~ penetrates ~~the~~ a horizontal plane terrain data collection surface specified as 120 m above the lowest runway elevation ~~shall comply with the Area 2 numerical requirements.~~

Editorial Note.— Subparagraphs a) and b) are relocated text from Appendix 8, Figure A8-1.

~~10.1.11~~ **5.3.3.3.5 Recommendation.**— Arrangements should be made for the coordination of providing ~~Area 2 electronic terrain and obstacle data~~ for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same ~~obstacle or terrain~~ are correct.

Editorial Note.— New 5.3.3.3.5 is relocated text from 10.1.11.

~~10.1.12~~ **5.3.3.3.6 Recommendation.**— ~~At For~~ those aerodromes located near territorial boundaries, arrangements should be made among States concerned to share ~~Area 2 electronic terrain and obstacle data.~~

Editorial Note.— New 5.3.3.3.6 is relocated text from 10.1.12.

~~10.1.8~~ **5.3.3.3.7 Recommendation.**— ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic terrain and obstacle data~~ should be provided for Area 3 ~~for terrain and obstacles that penetrate the relevant obstacle data collection surface specified in Appendix 8, Figure A8-3.~~

Editorial Note.— New 5.3.3.3.7 is relocated text from 10.1.8.

~~10.1.9~~ **5.3.3.3.8** ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic terrain and obstacle data~~ shall be provided for Area 4 ~~for terrain and obstacles that penetrate the relevant obstacle data collection surface specified in Appendix 8,~~ for all runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on decision height determination by use of radio altimeters.

Editorial Note.— New 5.3.3.3.8 is relocated text from 10.1.9.

~~10.1.10~~ **5.3.3.3.9 Recommendation.**— Where additional ~~electronic obstacle or terrain data~~ ~~are~~ ~~is~~ collected to meet other aeronautical requirements, the ~~obstacle and terrain data sets~~ should be expanded to include ~~these~~ ~~this~~ additional data.

Editorial Note.— New 5.3.3.3.9 is relocated text from 10.1.10.

5.3.3.4 Obstacle data sets

5.3.3.4.1 Obstacle data sets shall contain ~~comprise~~ the digital representation of the vertical and horizontal extent of the obstacles.

Editorial Note.— New 5.3.3.4.1 is relocated text from 10.3.1 partially.

5.3.3.4.2 Obstacles data shall not be included in terrain data sets. ~~Obstacle data elements are features that shall be represented in the data sets by points, lines or polygons.~~

Editorial Note.— New 5.3.3.4.2 is relocated text from 10.3.1 partially.

~~10.1.3~~ **5.3.3.4.3** ~~Electronic terrain data shall be provided for Area 1.~~ The obstacle data shall be provided for obstacles in Area 1 ~~higher than whose height is 100 m or higher~~ above ground.

Editorial Note.— New 5.3.3.4.3 is relocated text from para 10.1.3.

~~10.1.4~~ **5.3.3.4.4** ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic~~ obstacle data shall be provided for all obstacles within Area 2 that are assessed as being a hazard to air navigation.

Editorial Note.— New 5.3.3.4.4 is relocated text from 10.1.4.

~~10.1.6~~ **5.3.3.4.5** ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic~~ obstacle data shall be provided for:

- a) Area 2a for those obstacles that penetrate ~~the relevant an~~ obstacle data collection surface ~~specified in Appendix 8~~ outlined by a rectangular area around a runway that comprises the runway strip plus any clearway that exists. The Area 2a obstacle collection surface shall have height of 3 m above the nearest runway elevation measured along the runway centre line, and for those portions related to a clearway, if one exists, at the elevation of the nearest runway end;
- b) objects in the take-off flight path area which project above a plane surface having a 1.2 per cent slope and having a common origin with the take-off flight path area; and
- c) penetrations of the aerodrome obstacle limitation surfaces.

Note.— Take-off flight path areas are specified in Annex 4, 3.8.2. Aerodrome obstacle limitation surfaces are specified in Annex 14, Volume 1, Chapter 4.

Editorial Note.— New 5.3.3.4.5 is relocated text from 10.1.6. Specifically subparagraph a) is relocated text from Appendix 8.

~~10.1.7~~ **5.3.3.4.6 Recommendation.**— ~~At For~~ aerodromes regularly used by international civil aviation, ~~electronic terrain and~~ obstacle data should be provided for Areas 2b, 2c and 2d for obstacles ~~and terrain that~~ penetrate the relevant ~~terrain and~~ obstacle data collection surface specified as follows: ~~in Appendix 8,~~

- a) Area 2b: an area extending from the ends of Area 2a in the direction of departure, with a

length of 10 km and a splay of 15% to each side. The Area 2b obstacle collection surface has a 1.2% slope extending from the ends of Area 2a at the elevation of the runway end in the direction of departure, with a length of 10 km and a splay of 15% to each side;

- b) Area 2c: an area extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The Area 2c obstacle collection surface has a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km from the boundary of Area 2a. The initial elevation of Area 2c shall be the elevation of the point of Area 2a at which it commences; and
- c) Area 2d: an area outside the Areas 2a, 2b and 2c up to a distance of 45 km from the aerodrome reference point, or to an existing TMA boundary, whichever is nearest. The Area 2d obstacle collection surface has a height of 100 m above ground;

except that data need not be collected for obstacles less than a height of 3 m above ground in Area 2b and less than a height of 15 m above ground in Area 2c.

Editorial Note.— New 5.3.3.4.6 is relocated text from 10.1.7. Specifically subparagraphs a), b) and c) are relocated text from Appendix 8.

~~10.1.11~~ **5.3.3.4.7 Recommendation.**— Arrangements should be made for the coordination of providing ~~Area 2 electronic terrain and~~ obstacle data for adjacent aerodromes where their respective coverage areas overlap to assure that the data for the same obstacle ~~or terrain~~ are correct.

Editorial Note.— New 5.3.3.4.7 is relocated text from 10.1.11.

~~10.1.12~~ **5.3.3.4.8 Recommendation.**— ~~At~~For those aerodromes located near territorial boundaries, arrangements should be made among States concerned to share ~~Area 2 electronic terrain and~~ obstacle data.

Editorial Note.— New 5.3.3.4.8 is relocated text from 10.1.12.

~~10.1.8~~ **5.3.3.4.9 Recommendation.**— ~~At~~For aerodromes regularly used by international civil aviation, ~~electronic terrain and~~ obstacle data should be provided for Area 3 for ~~terrain and~~ obstacles that penetrate the relevant obstacle data collection surface ~~specified in Appendix 8, Figure A8-3. The data collection surface for terrain and obstacles extends~~ extending a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome movement area.

Editorial Note.— New 5.3.3.4.9 is relocated text from 10.1.8 and Appendix 8.

~~10.1.9~~ **5.3.3.4.10** ~~At~~For aerodromes regularly used by international civil aviation, ~~electronic terrain and~~ obstacle data shall be provided for Area 4 for ~~terrain and~~ obstacles that penetrate the relevant obstacle data collection surface ~~specified in Appendix 8, for all runways where precision approach Category II or III operations have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on decision height determination by use of radio altimeters.~~

Editorial Note.— New 5.3.3.4.10 is relocated text from 10.1.9.

~~10.1.10~~ **5.3.3.4.11 Recommendation.**— *Where additional ~~electronic obstacle or terrain~~ data are collected to meet other aeronautical requirements, the obstacle ~~and terrain~~ data sets should be expanded to include these additional data.*

Editorial Note.— New 5.3.3.4.11 is relocated text from 10.1.10.

~~5.3.4~~ International exchange of NOTAM shall take place only as mutually agreed between the international NOTAM offices concerned. The international exchange of ASHTAM (see 5.2.4), and NOTAM where States continue to use NOTAM for distribution of information on volcanic activity, shall include volcanic ash advisory centres and the centres designated by regional air navigation agreement for the operation of AFS satellite distribution systems (satellite distribution system for information relating to air navigation (SADIS) and international satellite communications system (ISCS)), and shall take account of the requirements of long-range operations.

Note.— ~~Arrangements may be made for direct exchange of SNOWTAM (see Appendix 2) between aerodromes/heliports.~~

Editorial Note.— The first sentence of 5.3.4 is relocated to Annex 15, 5.4.2.5. The rest of the paragraph is relocated to the new PANS-AIM, 5.4.2.2 and the Note to 5.4.2.1.

5.3.4 Aerodrome mapping data sets

~~5.3.4.1~~ These exchanges of NOTAM between international NOTAM offices shall, as far as practicable, be limited to the requirements of the receiving States concerned by means of separate series providing for at least international and domestic flights.

Editorial Note.— 5.3.4.1 is relocated to the new PANS-AIM, 5.4.2.3.

~~11.3.2~~ **5.3.4.1** Aerodrome mapping data sets shall contain the digital representation of aerodrome mapping data consisting of aerodrome features.

Note 1.— Aerodrome features consist of attributes and geometries, which are characterized as points, lines or polygons. Examples include runway thresholds, taxiway guidance lines and parking stand areas.

Note 2.— ~~Aerodrome mapping data feature definitions, constraints and rules applicable to aerodrome mapping data are contained in RTCA Document DO-272C and EUROCAE Document ED-99C—User Requirements for Aerodrome Mapping Information. These constraints ensure the connectivity between features on a spatial and functional level in accordance with the connections observed in the real world.~~

Note 3.— ~~An application schema applicable to aerodrome mapping data feature definitions may be found in RTCA Document DO-291B and EUROCAE Document ED-119B—Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data. This application schema contains a feature catalogue which specifies the feature types and associated attribute~~

Editorial Note.— New 5.3.4.1 and Notes 1, 2 and 3 are relocated text from 11.3.2 and Notes 1, 2 and 3.

~~5.3.4.2~~ A predetermined distribution system for NOTAM transmitted on the AFS in accordance with Appendix 5 shall be used whenever possible, subject to the requirements of 5.3.4.

Editorial Note.— 5.3.4.2 is relocated to the new PANS-AIM, 5.4.2.4.

5.3.4.2 Recommendation.— *Aerodrome mapping data sets should be made available for aerodromes regularly used by international civil aviation.*

5.3.5 Instrument flight procedure data sets

5.3.5.1 Instrument flight procedure data sets shall contain the digital representation of instrument flight procedures.

5.3.5.2 Recommendation.— *Instrument flight procedures data sets should be made available for aerodromes regularly used by international civil aviation.*

5.4 Distribution services

5.4.1 General

~~5.3.1~~ **5.4.1.1** NOTAM-Aeronautical information products shall be distributed to authorized users on the basis of a request who request them.

Editorial Note.— New 5.4.1.1 is relocated text from 5.3.1.

~~4.5~~ **5.4.1.2** AIP, AIP Amendments, and AIP Supplements and AIC shall be made available by the most expeditious means.

Editorial Note.— New 5.4.1.2 is relocated text from 4.5.

5.4.1.3 Recommendation.— *Global communication networks such as the Internet should, whenever practicable, be employed for the provision of aeronautical information products.*

5.4.2 NOTAM distribution

~~5.3.1~~ **5.4.2.1** NOTAM shall be distributed on the basis of a request.

Editorial Note.— New 5.4.2.1 is relocated text from 5.3.1

~~5.3.2~~ **5.4.2.2** NOTAM shall be prepared in conformity with the relevant provisions of the ICAO communication procedures.

Editorial Note.— New 5.4.2.2 is relocated text from 5.3.2.

~~5.3.2.1~~ 5.4.2.3 The Aeronautical Fixed Service (AFS) shall, whenever practicable, be employed for NOTAM distribution.

Editorial Note.— 5.4.2.3 is relocated text from 5.3.2.1.

~~5.3.2.2~~ 5.4.2.4 When a NOTAM ~~exchanged as specified in 5.3.4~~ is sent by means other than the AFS, a six-digit date-time group indicating the date and time of NOTAM origination, and the identification of the originator shall be used, preceding the text. ~~5.3.3~~ The originating State shall select the NOTAM that are to be given international distribution.

Editorial Note.— New 5.4.2.4 is relocated text from 5.3.2.2 and 5.3.3.

~~5.3.4~~ 5.4.2.5 International exchange of NOTAM shall take place only as mutually agreed between the international NOTAM offices concerned and between the NOTAM offices and multinational NOTAM Processing Units.

Editorial Note.— New 5.4.2.5 is relocated text from 5.3.4.

5.4.2.6 The originating State shall upon request grant distribution of NOTAM series other than those distributed internationally.

~~5.3.3.1~~ 5.4.2.7 **Recommendation.**— *Selective distribution lists should be used when practicable.*

Note.— ~~These lists are intended to obviate superfluous distribution of information. Guidance material relating to this selective distribution lists~~ is contained in the Aeronautical Information Services Manual (Doc 8126).

Editorial Note.— New 5.4.2.7 is relocated text from 5.3.3.1.

5.5 Pre-Flight Information Service

~~8.1.1~~ 5.5.1 ~~At For~~ any aerodrome/heliport ~~normally~~ used for international air operations, aeronautical information ~~essential for the safety, regularity and efficiency of air navigation and~~ relative to the route stages originating at the aerodrome/heliport shall be made available to flight operations personnel, including flight crews and services responsible for pre-flight information.

Editorial Note.— New 5.5.1 is relocated text from 8.1.1.

~~8.1.2~~ 5.5.2 Aeronautical information provided for pre-flight planning purposes ~~at the aerodromes/heliports referred to in 8.1.1 shall include relevant:~~ shall include information of operational significance from the elements of the aeronautical information products.

a) ~~elements of the Integrated Aeronautical Information Package;~~

b) ~~maps and charts.~~

Note: 1.— ~~The documentation listed in a) and b)~~ elements of the aeronautical information products may be limited to national publications and when practicable, those of immediately adjacent

States, provided a complete library of aeronautical information is available at a central location and means of direct communications are available with ~~between the aerodrome AIS unit and that library.~~

Editorial Note.— New 5.5.2 is relocated text from 8.1.2.

~~8.1.3~~ **Note 2.**— A recapitulation of valid NOTAM of operational significance and other information of urgent character ~~shall~~ may be made available to flight crews in the form of plain-language pre-flight information bulletins (PIB). **Note.**— Guidance material on the preparation of PIB is contained in the Aeronautical Information Services Manual (Doc 8126).

Editorial Note.— New Note 2 to 5.5.2 is relocated text from 8.1.3.

5.6. Post-flight information Service

~~8.3.1~~ **5.6.1** For any aerodrome/heliport used for international air operations, ~~A~~arrangements shall be made to receive ~~at aerodromes/heliports~~ information concerning the state and operation of air navigation facilities or services noted by aircrews ~~and shall ensure that such information is made available to the aeronautical information service for such distribution as the circumstances necessitate.~~

Editorial Note.— New 5.6.1 is relocated text from 8.3.1.

~~8.3.1~~ **5.6.2** Arrangements shall be made to receive ~~at aerodromes/heliports~~ information concerning the state and operation of air navigation facilities or services noted by aircrews and ~~The arrangements specified in 5.6.1 shall ensure that such information is made available to the aeronautical information service for such distribution as the circumstances necessitate.~~

Editorial Note.— New 5.6.2 is relocated text from 8.3.1.

~~8.3.2~~ **5.6.3** For any aerodrome/heliport used for international air operations, ~~A~~arrangements shall be made to receive ~~at aerodromes/heliports~~ information concerning the presence of ~~birds~~ wildlife hazard observed by aircrews ~~and shall ensure that such information is made available to the aeronautical information service for such distribution as the circumstances necessitate.~~

Editorial Note.— New 5.6.3 is relocated text from 8.3.2.

~~8.3.2~~ **5.6.4** Arrangements shall be made to receive ~~at aerodromes/heliports~~ information concerning the presence of birds observed by aircrews and shall ensure that such information is ~~The information about presence of wildlife hazard shall be made available to the aeronautical information service for such distribution as the circumstances necessitate.~~

Note.— See Annex 14, Volume I, Chapter 9, Section 9.4.

Editorial Note.— New 5.6.4 is relocated text from 8.3.2.

CHAPTER 6. ~~AERONAUTICAL INFORMATION REGULATION AND CONTROL (AIRAC)~~ AERONAUTICAL INFORMATION UPDATES

6.1 General specifications

~~6.1.1 Information concerning the circumstances listed in Appendix 4, Part 1, shall be distributed under the regulated system (AIRAC), i.e. basing establishment, withdrawal or significant changes upon a series of common effective dates at intervals of 28 days, including 14 January 2010. The information notified therein shall not be changed further for at least another 28 days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.~~

Editorial Note.— 6.1.1 is relocated to the new edition of Annex 15, 6.2.1.

Note.— ~~Guidance material on the procedures applicable to the AIRAC system is contained in the Aeronautical Information Services Manual (Doc 8126).~~

Editorial Note.— Note to 6.1.1 is relocated to the new edition of Annex 15, 6.2.1.

~~4.2.9~~ 6.1.1 AIP Aeronautical data and aeronautical information shall be amended or reissued at such regular intervals as may be necessary to keep them kept up to date.

Editorial Note.— New 6.1.1 is retained text from 4.2.9 partially.

~~6.1.2 **Recommendation.**— The regulated system (AIRAC) should also be used for the provision of information relating to the establishment and withdrawal of, and premeditated significant changes in, the circumstances listed in Appendix 4, Part 2.~~

Editorial Note.— 6.1.2 is relocated to the new edition of Annex 15, 6.2.6.

~~6.1.3 When information has not been submitted by the AIRAC date, a NIL notification shall be originated and distributed by NOTAM or other suitable means, not later than one cycle before the AIRAC effective date concerned.~~

Editorial Note.— 6.1.3 is relocated to the new edition of Annex 15, 6.2.4 and to the new PANS-AIM 6.1.2.2.

~~6.1.4 Implementation dates other than AIRAC effective dates shall not be used for pre-planned operationally significant changes requiring cartographic work and/or for updating of navigation databases.~~

Editorial Note.— 6.1.4 is relocated to the new edition of Annex 15, 6.2.5.

~~6.1.5 **Recommendation.**— The use of the date in the AIRAC cycle which occurs between 21 December and 17 January inclusive should be avoided as an effective date for the introduction of significant changes under the AIRAC system.~~

Editorial Note.— 6.1.5 is relocated to the new edition of Annex 15, 6.2.6.

6.2 Provision of information in paper copy form Aeronautical Information Regulation and Control (AIRAC)

~~6.2.1 Information provided under the AIRAC system in paper copy form shall be distributed by the AIS unit at least 42 days in advance of the effective date with the objective of reaching recipients at least 28 days in advance of the effective date.~~

Editorial Note.— 6.2.1 is relocated to new edition of Annex 15, 6.2.3 and Note.

~~6.1.1 6.2.1 Information concerning the following circumstances listed in Appendix 4, Part 1, shall be distributed under the regulated system (AIRAC), i.e. basing establishment, withdrawal or significant changes upon a series of common effective dates at intervals of 28 days, including 14 8 January–November 20108: . The information notified therein shall not be changed further for at least another 28 days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.~~

Note.— *Guidance material on the procedures applicable to the AIRAC system is contained in the Aeronautical Information Services Manual (Doc 8126).*

Editorial Note.— New 6.2.1 is relocated text from 6.1.1.

~~1. The establishment and withdrawal of, and premeditated significant changes (including operational trials) to:~~

~~1.1a) Limits (horizontal and vertical), regulations and procedures applicable to:~~

- ~~a)1) flight information regions;~~
- ~~b)2) control areas;~~
- ~~c)3) control zones;~~
- ~~d)4) advisory areas;~~
- ~~e)5) ATS routes;~~
- ~~f)6) permanent danger, prohibited and restricted areas (including type and periods of activity when known) and ADIZ;~~
- ~~g)7) permanent areas or routes or portions thereof where the possibility of interception exists.~~

~~1.2b) Positions, frequencies, call signs, identifiers, known irregularities and maintenance periods of radio navigation aids, and communication and surveillance facilities.~~

- 1.3c) Holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures.
- 1.4d) Transition levels, transition altitudes and minimum sector altitudes.
- 1.5e) Meteorological facilities (including broadcasts) and procedures.
- 1.6 f) Runways and stopways
- 1.7g) Taxiways and aprons.
- 1.8h) Aerodrome ground operating procedures (including low visibility procedures).
- 1.9i) Approach and runway lighting.
- 1.10j) Aerodrome operating minima if published by a State.

Editorial Note.— 6.2.1 subparagraphs are retained text from Appendix 4, Part 1.

~~6.2.2 **Recommendation.**— Whenever major changes are planned and where advance notice is desirable and practicable, information provided in paper copy form should be distributed by the AIS unit at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed in Appendix 4, Part 3, and other major changes if deemed necessary.~~

~~Note.— Guidance material on what constitutes a major change is included in Doc 8126.~~

Editorial Note.— 6.2.2 and Note are relocated to the new edition of Annex 15, 6.2.7.

~~6.1.1~~ 6.2.2 The information notified ~~therein~~ under the AIRAC system shall not be changed further for at least another 28 days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.

Editorial Note.— New 6.2.2 is relocated text from 6.1.1.

~~6.2.1~~ 6.2.3 Information provided under the AIRAC system ~~in paper copy form~~ shall be distributed made available by the AIS unit at least 42 days in advance of the effective date with the objective of reaching so as to reach recipients at least 28 days in advance of the effective date.

~~Note.— AIRAC information provided under the AIRAC system in paper copy form shall be distributed by the AIS unit at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.~~

Editorial Note.— New 6.2.3 and Note is relocated text from 6.2.1.

~~6.1.3~~ 6.2.4 When information has not been submitted by the AIRAC date, a NIL notification shall be ~~originated and distributed by NOTAM or other suitable means~~, not later than one cycle before the AIRAC effective date concerned.

Editorial Note.— New 6.2.4 is relocated text from 6.1.3.

~~6.1.4~~ **6.2.5** Implementation dates other than AIRAC effective dates shall not be used for pre-planned operationally significant changes requiring cartographic work and/or for updating of navigation databases.

Editorial Note.— New 6.2.5 is relocated text from 6.1.4.

~~6.1.2~~ **6.2.6 Recommendation.**— *The use of the date in the AIRAC cycle which occurs between 21 December and 17 January inclusive should be avoided as an effective date for the introduction of significant changes under the AIRAC system. The regulated system (AIRAC) should also be used for the provision of information relating to the establishment and withdrawal of, and premeditated significant changes in, the circumstances listed in Appendix 4, Part 2, below:*

~~The establishment and withdrawal of, and premeditated significant changes to:~~

- a) Position, height and lighting of navigational obstacles.
- b) Hours of service of aerodromes, facilities and services.
- c) Customs, immigration and health services.
- d) Temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft.
- e) Temporary areas or routes or portions thereof where the possibility of interception exists.

Editorial Note.— New 6.2.6 is retained text from 6.1.2, 6.1.5 and Appendix 4, Part 2.

~~6.2.2~~ **6.2.7 Recommendation.**— *Whenever major changes are planned and where advance notice is desirable and practicable, information provided in paper copy form should be distributed made available by the AIS so as to reach recipients ~~unit~~ at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed in Appendix 4, Part 3, below, and other major changes if deemed necessary.*

Editorial Note.— New 6.2.7 is relocated text from 6.2.2.

~~3. The establishment of, and premeditated major changes to:~~

- ~~3.1~~ a) New aerodromes for international IFR operations.
- ~~3.2~~ b) New runways for IFR operations at international aerodromes.
- ~~3.3~~ c) Design and structure of the air traffic services route network.
- ~~3.4~~ d) Design and structure of a set of terminal procedures (including change of procedure bearings due to magnetic variation change).
- ~~3.5~~ e) Circumstances listed in ~~Part 1~~ **6.2.1** if the entire State or any significant portion thereof is affected or if cross-border coordination is required.

Editorial Note.— 6.2.7 subparagraphs are retained text from Appendix 4, Part 3.

Note.— Guidance on what constitutes a major change is included in Doc 8126.

Editorial Note.— Note to 6.2.7 is retained text from 6.2.2.

6.3 ~~Provision of information as electronic media~~ Aeronautical Information Product updates

~~6.3.1 States that have established an aeronautical database shall, when updating its contents concerning the circumstances listed in Appendix 4, Part 1, ensure that the effective dates of data coincide with the established AIRAC effective dates.~~

Editorial Note.— 6.3.1 is deleted.

6.3.1 AIP updates

~~4.2.9~~ **6.3.1.1** AIP shall be amended or reissued at such regular intervals as may be necessary to keep them up to date.

Editorial Note.— New 6.3.1.1 is relocated text from 4.2.9 partially.

~~4.3.1~~ **6.3.1.2** Permanent changes to the AIP shall be published as AIP Amendments.

Editorial Note.— New 6.3.1.2 is relocated text from 4.3.1.

~~4.4.1~~ **6.3.1.3** Temporary changes of long duration (three months or longer) and information of short duration which contains extensive text and/or graphics shall be published as AIP Supplements.

Editorial Note.— New 6.3.1.3 is relocated text from 4.4.1.

~~6.3.2 Information provided as electronic media, concerning the circumstances listed in Appendix 4, Part 1, shall be distributed/made available by the AIS unit so as to reach recipients at least 28 days in advance of the AIRAC effective date.~~

Editorial Note.— 6.3.2 is deleted.

6.3.2 NOTAM

~~5.1.1.6~~ **6.3.2.1** When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a “Trigger” NOTAM shall be originated giving a brief description of the contents, the effective date and time, and the reference number of the amendment or supplement. This NOTAM shall come into force on the same effective date and time as the amendment or supplement and shall remain valid in the pre-flight information bulletin for a period of fourteen days.

Note.— Guidance material for the origination of NOTAM announcing the existence of AIRAC AIP Amendments or AIP Supplements (“Trigger NOTAM”) is contained in the Aeronautical Information Services Manual (Doc 8126). Detailed specifications concerning the Trigger NOTAM are contained in the PANS-AIM (Doc 10066).

Editorial Note.— New 6.3.2.1 is relocated text from 5.1.1.6.

~~5.1.1.4~~ **6.3.2.2** A NOTAM shall be originated and issued promptly whenever the information to be distributed is of a temporary nature and of short duration or when operationally significant permanent changes, or temporary changes of long duration are made at short notice, except for extensive text and/or graphics.

Note 1.— ~~Operationally significant changes concerning circumstances listed in Appendix 4, Part 1, are issued under the Aeronautical Information Regulation and Control (AIRAC) system specified in Chapter 6.~~

Note 2.— ~~Information of short duration containing extensive text and/or graphics is published as an AIP Supplement (see Chapter 4, 4.4).~~

Editorial Note.— New 6.3.2.2 is relocated text from 5.1.1.

~~5.1.1.4~~ **6.3.2.3** A NOTAM shall be originated and issued concerning the following information:

- a) establishment, closure or significant changes in operation of aerodrome(s) ~~or~~ heliport(s) or runways;
- b) establishment, withdrawal and significant changes in operation of aeronautical services (AGA, AIS, ATS, CNS, MET, SAR, etc.);
- c) establishment, withdrawal and significant changes in operational capability of radio navigation and air-ground communication services. This includes: interruption or return to operation, change of frequencies, change in notified hours of service, change of identification, change of orientation (directional aids), change of location, power increase or decrease amounting to 50 per cent or more, change in broadcast schedules or contents, or irregularity or unreliability of operation of any radio navigation and air-ground communication services or limitations of relay stations including operational impact, affected service, frequency and area;
- d) unavailability of back-up and secondary systems, having a direct operational impact;
- ~~e~~e) establishment, withdrawal or significant changes made to visual aids;
- ~~e~~f) interruption of or return to operation of major components of aerodrome lighting systems;
- ~~f~~g) establishment, withdrawal or significant changes made to procedures for air navigation services;
- ~~g~~h) occurrence or correction of major defects or impediments in the manoeuvring area;
- ~~h~~i) changes to and limitations on availability of fuel, oil and oxygen;
- ~~i~~j) major changes to search and rescue facilities and services available;
- ~~j~~k) establishment, withdrawal or return to operation of hazard beacons marking obstacles to air navigation;

- kl) changes in regulations requiring immediate action, e.g. prohibited areas for SAR action;
- lm) presence of hazards which affect air navigation (including obstacles, military exercises, displays, fireworks, sky lanterns, rocket debris, races and major parachuting events outside promulgated sites);
- n) planned laser emissions, laser displays and search lights if pilots' night vision is likely to be impaired;
- no) erecting or removal of, or changes to, obstacles to air navigation in the take-off/climb, missed approach, approach areas and runway strip;
- np) establishment or discontinuance (including activation or deactivation) as applicable, or changes in the status of prohibited, restricted or danger areas;
- eq) establishment or discontinuance of areas or routes or portions thereof where the possibility of interception exists and where the maintenance of guard on the VHF emergency frequency 121.5 MHz is required;
- pr) allocation, cancellation or change of location indicators;
- qs) ~~significant changes in aerodrome/heliport rescue and fire fighting category provided changes in the level of protection normally available at an aerodrome/heliport for rescue and fire fighting purposes. NOTAM shall be originated only when a change of category is involved and such change of category shall be clearly stated~~ (see Annex 14, Volume I, Chapter 9, and Attachment A, Section 187);
- rt) presence or removal of, or significant changes in, hazardous conditions due to snow, slush, ice, radioactive material, toxic chemicals, volcanic ash deposition or water on the movement area;
- su) outbreaks of epidemics necessitating changes in notified requirements for inoculations and quarantine measures;
- tv) ~~observations or forecasts of solar cosmic radiation, where provided~~ space weather phenomena, the date and time of their occurrence, the flight levels where provided, and portions of the airspace which may be affected by the phenomena;
- uw) an operationally significant change in volcanic activity, the location, date and time of volcanic eruptions and/or horizontal and vertical extent of volcanic ash cloud, including direction of movement, flight levels and routes or portions of routes which could be affected;
- vx) release into the atmosphere of radioactive materials or toxic chemicals following a nuclear or chemical incident, the location, date and time of the incident, the flight levels and routes or portions thereof which could be affected and the direction of movement;
- wy) establishment of operations of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with procedures and/or limitations which affect air navigation;-and
- xz) implementation of short-term contingency measures in cases of disruption, or partial disruption, of air traffic services and related supporting services.

Note.— See Annex 11, 2.31 and Attachment C to that Annex.

Editorial Note.— New 6.3.2.3 is relocated text from 5.1.1.1.

~~5.1.1.3~~ 6.3.2.4 The following information shall not be notified by NOTAM:

- a) routine maintenance work on aprons and taxiways which does not affect the safe movement of aircraft;
- b) runway marking work, when aircraft operations can safely be conducted on other available runways, or the equipment used can be removed when necessary;
- c) temporary obstructions in the vicinity of aerodromes/heliports that do not affect the safe operation of aircraft;
- d) partial failure of aerodrome/heliport lighting facilities where such failure does not directly affect aircraft operations;
- e) partial temporary failure of air-ground communications when suitable alternative frequencies are known to be available and are operative;
- f) the lack of apron marshalling services and road traffic control;
- g) the unserviceability of location, destination or other instruction signs on the aerodrome movement area;
- h) parachuting when in uncontrolled airspace under VFR (see ~~5.1.1.1.4~~ 6.3.2.3 m)), when controlled, at promulgated sites or within danger or prohibited areas;
- i) training activities by ground units;
- j) unavailability of back-up and secondary systems if these do not have an operational impact;
- k) limitations to airport facilities or general services with no operational impact;
- l) national regulations not affecting general aviation;
- m) announcement or warnings about possible/potential limitations, without any operational impact;
- n) general reminders on already published information;
- o) availability of equipment for ground units without containing information on the operational impact for airspace and facility users;
- p) information about laser emissions without any operational impact and fireworks below minimum flying heights;
- q) closure of movement area parts in connection with planned work locally coordinated of duration of less than one hour;
- r) closure, changes, unavailability in operation of aerodrome(s)/heliport(s) outside the aerodrome(s)/heliport(s) operational hours;

is) other non-operational information of a similar temporary nature.

Note.— Information which relates to an aerodrome and its vicinity and does not affect its operational status may be distributed locally during pre-flight or in-flight briefing or other local contact with flight crew members.

Editorial Note.— New 6.3.2.4 is relocated text from 5.1.1.3.

~~6.3.3 **Recommendation.**— Whenever major changes are planned and where advance notice is desirable and practicable, information provided as electronic media should be distributed/made available at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed in Appendix 4, Part 3, and other major changes if deemed necessary.~~

~~*Note.— Guidance material on what constitutes a major change is included in Doc 8126.*~~

Editorial Note.— 6.3.3 and the Note are relocated to the new edition of Annex 15, 6.2.7

6.3.3 Data set updates

6.3.3.1 Data sets shall be amended or reissued at such regular intervals as may be necessary to keep them up to date.

6.3.3.2 Permanent changes and temporary changes of long duration (three months or longer) made available as digital data shall be issued in the form of a complete data set or a sub-set that includes only the differences from the previously issued complete data set.

6.3.3.3 **Recommendation.**— *When made available as a completely re-issued data set, the differences from the previously issued complete data set should be indicated.*

6.3.3.4 **Recommendation.**— *When temporary changes of short duration are made available as digital data (Digital NOTAM), they should use the same aeronautical information model as the complete data set.*

6.3.3.5 Updates to AIP and the digital data sets shall be synchronized.

...

Editorial Note.— Those parts of Chapter 7 which have not been relocated in Annex 15 or new PANS-AIM are deleted.

...

Editorial Note.— The following text shown in its original location in Annex 15 is deleted.

8.1 Pre-flight information

...

~~8.1.2.1 Additional current information relating to the aerodrome of departure shall be provided concerning the following:~~

- ~~a) construction or maintenance work on or immediately adjacent to the manoeuvring area;~~
- ~~b) rough portions of any part of the manoeuvring area, whether marked or not, e.g. broken parts of the surface of runways and taxiways;~~
- ~~c) presence and depth of snow, ice or water on runways and taxiways, including their effect on surface friction;~~
- ~~d) snow drifted or piled on or adjacent to runways or taxiways;~~
- ~~e) parked aircraft or other objects on or immediately adjacent to taxiways;~~
- ~~f) presence of other temporary hazards;~~
- ~~g) presence of birds constituting a potential hazard to aircraft operations;~~
- ~~h) failure or irregular operation of part or all of the aerodrome lighting system including approach, threshold, runway, taxiway, obstruction and manoeuvring area unserviceability lights and aerodrome power supply;~~
- ~~i) failure, irregular operation and changes in the operational status of SSR, ADS-B, ADS-C, CPDLC, D-ATIS, D-VOLMET, radio navigation services, VHF aeromobile channels, RVR observing system, and secondary power supply; and~~
- ~~j) presence and operation of humanitarian relief missions, such as those undertaken under the auspices of the United Nations, together with any associated procedures and/or limitations applied thereof.~~

...

Editorial Note.— Those parts of Chapter 8 which do not appear here are relocated to the new edition of Annex 15 or to the new PANS-AIM.

...

Editorial Note.— The following text shown in its original location in Annex 15 is deleted.

~~CHAPTER 9. TELECOMMUNICATION REQUIREMENTS~~

~~9.1 International NOTAM offices shall be connected to the aeronautical fixed service (AFS).~~

~~9.1.1 The connections shall provide for printed communications.~~

~~9.2 Each international NOTAM office shall be connected, through the aeronautical fixed service (AFS), to the following points within the territory for which it provides service:~~

- ~~a) area control centres and flight information centres;~~
- ~~b) aerodromes/heliports at which an information service is established in accordance with Chapter 8.~~

~~9.3 Recommendation.— Subject to availability, satisfactory operation and bilateral/multilateral and/or regional air navigation agreements, the use of the public Internet should be permitted for exchange of non-time critical types of aeronautical information.~~

~~Note.— Guidance material on non-time critical types of aeronautical information and relevant aspects of the public Internet is provided in the Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).~~

...

Editorial Note.— Those parts of Chapter 9 which do not appear here have been relocated to the new edition of Annex 15 or to the new PANS-AIM .

...

Editorial Note.— The following text shown in its initial location in Annex 15 is deleted.

10.4 Terrain and obstacle data product specifications

~~10.4.1— To allow and support the interchange and use of sets of electronic terrain and obstacle data among different data providers and data users, the ISO 19100 series of standards for geographic information shall be used as a general data modelling framework.~~

~~10.4.2— A comprehensive statement of available electronic terrain and obstacle data sets shall be provided in the form of terrain data product specifications as well as obstacle data product specifications on which basis air navigation users will be able to evaluate the products and determine whether they fulfil the requirements for their intended use (application).~~

~~Note.— ISO Standard 19131 specifies the requirements and outline of data product specifications for geographic information.~~

~~10.4.3— Each terrain data product specification shall include an overview, a specification scope, data product identification, data content and structure, reference system, data quality, data capture, data maintenance, data portrayal, data product delivery, additional information, and metadata.~~

~~10.4.4— The overview of terrain data product specifications or obstacle data product specifications shall provide an informal description of the product and shall contain general information about the data product. Specification of terrain data may not be homogenous across the whole data product but may vary for different parts of the data sets. For each such subset of data, a specification scope shall be identified. Identification information concerning both terrain and obstacle data products shall include the title of the product; a brief narrative summary of the content, purpose, and spatial resolution if appropriate (a general statement about the density of spatial data); the geographic area covered by the data product; and supplemental information.~~

~~10.4.5— Content information of feature-based terrain data sets or of feature-based obstacle data sets shall each be described in terms of an application schema and a feature catalogue. Application schema shall provide a formal description of the data structure and content of data sets while the feature catalogue shall provide the semantics of all feature types together with their attributes and attribute value domains, association types between feature types and feature operations, inheritance relations and constraints. Coverage is considered a subtype of a feature and can be derived from a collection of features that have common attributes. Both terrain and obstacle data product specifications shall identify clearly the coverage and/or imagery they include and shall provide a narrative description of each of them.~~

Note 1.— ISO Standard 19109 contains rules for application schema while ISO Standard 19110 describes feature cataloguing methodology for geographic information.

Note 2.— ISO Standard 19123 contains schema for coverage geometry and functions.

10.4.6 — Both terrain data product specifications and obstacle data product specifications shall include information that identifies the reference system used in the data product. This shall include the spatial reference system and temporal reference system. Additionally, both data product specifications shall identify the data quality requirements for each data product. This shall include a statement on acceptable conformance quality levels and corresponding data quality measures. This statement shall cover all the data quality elements and data quality sub-elements, even if only to state that a specific data quality element or sub-element is not applicable.

Note.— ISO Standard 19113 contains quality principles for geographic information while ISO Standard 19114 covers quality evaluation procedures.

10.4.7 — Terrain data product specifications shall include a data capture statement which shall be a general description of the sources and of processes applied for the capture of terrain data. The principles and criteria applied in the maintenance of terrain data sets and obstacle data sets shall also be provided with the data specifications, including the frequency with which data products are updated. Of particular importance shall be the maintenance information of obstacle data sets and an indication of the principles, methods and criteria applied for obstacle data maintenance.

10.4.8 — Terrain data product specifications shall contain information on how data held with data sets are presented, i.e. as a graphic output, as a plot or as an image. The product specifications for both terrain and obstacles shall also contain data product delivery information which shall include delivery formats and delivery medium information.

Note.— ISO Standard 19117 contains a definition of the schema describing the portrayal of geographic information including the methodology for describing symbols and mapping of the schema to an application schema.

10.4.9 — The core terrain and obstacle metadata elements shall be included in the data product specifications. Any additional metadata items required to be supplied shall be stated in each product specification together with the format and encoding of the metadata.

Note.— ISO Standard 19115 specifies requirements for geographic information metadata.

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Editorial Note.— Those parts of Chapter 10 which do not appear here have been relocated to the new edition of Annex 15 or to the new PANS-AIM .

...

Editorial Note.— The following text shown in its original location in Annex 15 is deleted.

11.3 Aerodrome mapping database — data set content and structure

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Note 2.— Aerodrome mapping data feature definitions, constraints and rules applicable to aerodrome mapping data are contained in RTCA Document DO-272C/European Organization for Civil Aviation Equipment (EUROCAE) Document ED-99C — User Requirements for Aerodrome

~~Mapping Information. These constraints ensure the connectivity between features on a spatial and functional level in accordance with the connections observed in the real world.~~

~~Note 3.— An application schema applicable to aerodrome mapping data feature definitions may be found in RTCA Document DO-291B and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-119B—Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data. This application schema contains a feature catalogue which specifies the feature types and associated attributes.~~

...

Editorial Note.— Those parts of Chapter 11 which do not appear here have been relocated to the new edition of Annex 15 or to the new PANS-AIM.

...

Editorial Note.— Those parts of Appendices 1 to 8 which have not been relocated in Annex 15 or new PANS-AIM have been deleted.

— END —



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Ref.: AN 2/33-18/85

31 August 2018

Subject: Approval of the first edition of the Procedures for Air Navigation Services (PANS) – Aeronautical Information Management (PANS-AIM, Doc 10066)

Action Required: a) Implementation of the first edition of the PANS-AIM on 8 November 2018¹ and on 5 November 2020²;
b) Publication of any differences as of 8 November 2018 and as of 5 November 2020

Sir/Madam,

1. I have the honour to inform you that the Air Navigation Commission, acting under delegated authority, on 15 June 2018, approved the first edition of the *Procedures for Air Navigation Services (PANS) — Aeronautical Information Management* (PANS-AIM, Doc 10066) for applicability on 8 November 2018 for the harmonization of AIS/AIM procedures and for applicability on 5 November 2020 for the element concerning SNOWTAM formats. The amendment was approved on 28 August 2018 by the President of the Council on behalf of the Council in accordance with established procedure. A copy of the amendment is available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>) where you can access all other relevant documentation.

2. The first edition of the PANS-AIM stems from proposals arising from the twelfth meeting of the Aeronautical Information Service (AIS) Aeronautical Information Management (AIM) Study Group (AIS-AIMSG/12).

3. An implementation task list, including an outline of guidance material, and an impact assessment for first edition of the PANS-AIM are presented in Attachments B and C, respectively.

4. Your Government is invited by the Council to implement the provisions of the PANS-AIM. In this connection, I draw your attention to the decision taken by the Council, on 1 October 1973, to discontinue the publication of differences in Supplements to PANS documents and, instead, to request States to publish up-to-date lists of significant differences from PANS documents in their Aeronautical Information Publications (AIPs).

¹ 8 November 2018 for the harmonization of AIS/AIM procedures.

² 5 November 2020 for the element concerning the SNOWTAM format.

5. May I, therefore, invite your Government to publish in your AIP a list of any significant differences which will exist on 8 November 2018 for the harmonization of AIS/AIM procedures and on 5 November 2020 for the element concerning SNOWTAM format between the provisions of the PANS-AIM and your national regulations and practices.

Accept, Sir/Madam, the assurances of my highest consideration.



Fang Liu
Secretary General

Enclosures:

- A — the Foreword of the PANS-AIM
- B — Implementation task list and outline of guidance material in relation to the first edition of the PANS-AIM
- C — Impact assessment in relation to the first edition of the PANS-AIM

ATTACHMENT A to State letter AN 2/33-18/85

**FOREWORD OF THE FIRST EDITION
OF THE PANS-AIM (DOC 10066)**

Insert the following in Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Approved Applicable</i>
First edition	Twelfth meeting of the AIS-AIM Study Group (AIS-AIMSG/12)	Amendment concerning: a) harmonization of AIS/AIM procedures; and b) SNOWTAM format.	28 August 2018 8 November 2018 5 November 2020

**IMPLEMENTATION TASK LIST AND OUTLINE OF GUIDANCE MATERIAL
IN RELATION TO THE FIRST EDITION OF THE PANS-AIM (DOC 10066)**

1. IMPLEMENTATION TASK LIST

1.1 Essential steps to be followed by a State in order to implement the proposed first edition of the PANS-AIM:

- a) identification of the rule-making process necessary to transpose the modified ICAO provisions into the national regulations;
- b) conduct a gap analysis between the new ICAO provisions and national regulatory framework;
- c) drafting of the necessary modifications to the national regulations;
- d) official adoption of the national regulations and/or means of compliance;
- e) establishment of a national implementation plan that takes into account the new ICAO provisions;
- f) training of operational staff in the use of new provisions;
- g) oversight by the State of the implementation of the regulations; and
- h) publication of significant differences, if any, in the State's AIP.

2. STANDARDIZATION PROCESS

2.1 Approval date: 28 August 2018.

2.2 Applicability date: 8 November 2018.

2.3 Embedded applicability date: 5 November 2020 for the element concerning the SNOWTAM format.

3. SUPPORTING DOCUMENTATION

3.1 ICAO documentation

Title	Type (PANS/TI/Manual/Circ)	Planned publication date
<i>Aeronautical Information Services Manual</i> (Doc 8126)	Manual (update)	2018
<i>Manual of the QMS for Aeronautical Information Management</i> (Doc 9839)	Manual (update)	2019
<i>AIM Training Development Manual</i> (Doc 9991)	Manual (update)	2019

3.2 External documentation

Title	External Organization	Publication date
None		

4. IMPLEMENTATION ASSISTANCE TASKS

Type	Global	Regional
Seminars and workshops		AIM regional conferences

5. UNIVERSAL SAFETY OVERSIGHT AUDIT PROGRAMME (USOAP)

The existing protocol questions (PQs) may need to be amended or new PQs may be required due to new technical requirements and change of references. This will be assessed during the next amendment cycle of the PQs.

**IMPACT ASSESSMENT IN RELATION TO
THE FIRST EDITION OF THE PANS-AIM (DOC 10066)**

1. INTRODUCTION

1.1 The first edition of the PANS-AIM incorporates the existing specifications in Annex 15 which are too detailed and more appropriate for a PANS document as well as material from the *Aeronautical Information Services Manual* (Doc 8126) to allow for a higher level of harmonization. The specifications published in the PANS-AIM provide a means for increased harmonization within the AIM domain as well as a vehicle for the emerging technical requirements of AIM.

2. IMPACT ASSESSMENT

2.1 *Safety impact:* Positive. The restructuring of the AIM provisions and the consequent introduction of the PANS-AIM ensure that requirements are properly explained and promote a better understanding of the AIM principles. Aeronautical data and information are necessary to ensure the safety, regularity and efficiency of air navigation. The role and importance of complete, timely, and accurate aeronautical data and information has changed significantly with the implementation of area navigation (RNAV), required navigation performance (RNP), airborne computer-based navigation systems, and data link systems. Transitioning to a full AIM environment involves encompassing improved data quality by ensuring that information is provided by accountable and qualified sources. It implies a standard digital data exchange and processing of information and it allows for a timely and accurate distribution of information. Overall, this is reflected in an increased level of safety.

2.2 *Financial impact:* Minimal impact for States and industry. Transitioning to a full AIM environment may require large investments in equipment and resources, depending on States' and industry's status of implementation. However, this can be done through a phased approach and an evolutionary process. Additionally the transition will result in overall economic gains by improving aeronautical information management through a faster, quality-controlled and cost-effective exchange of aeronautical data.

2.3 *Security impact:* Positive. The existing prescriptive specifications have been amended to introduce more performance-based requirements to maintain data integrity along the data chain. The current stipulation of cyclic redundancy checks is too prescriptive and there have been numerous cases where this has proven to be difficult to demonstrate compliance. Performance-based requirements should facilitate implementation by allowing for use of more modern technology to detect errors in digital data introduced during transmission or storage.

2.4 *Environmental impact:* Positive. Transitioning from a paper-based to a digital environment will certainly bring environmental benefits.

2.5 *Efficiency impact:* Positive. Moving towards an AIM environment implies overall benefits in terms of efficiency. For instance, providing data in digital form and complying with digital data exchange requirements represents a paradigm shift in the way information is transmitted and handled along its life cycle: management, processing, verification, usage, quality control and exchange of information is done in a structured, automatic manner thereby minimizing human intervention and reducing errors.

2.6 *Expected implementation time:* With respect to the restructuring of the AIM provisions and the move of various requirements from Annex 15 to the new PANS-AIM, the expected implementation time will depend on the need to modify the State regulatory framework in order to properly account for the new references, to update processes to notify or stop notifying differences to ICAO and make sure that significant differences are published in the State AIP. In regard to the updated technical requirements, implementation may take two to five years for those States that have not already transitioned to Aeronautical Information Management (AIM).

— END —

**PROCEDURES
FOR
AIR NAVIGATION SERVICES**

**AERONAUTICAL INFORMATION
MANAGEMENT**

(Doc 10066)

INTERIM EDITION

The first edition of the PANS-AIM (Doc 10066) was approved by the President of the Council on behalf of the Council on **28 August 2018** for applicability on **8 November 2018 for the harmonization of AIS/AIM procedures** and for applicability on **5 November 2020 for the element concerning the SNOWTAM format**. This interim edition is distributed to facilitate its implementation by States. The first edition is expected to be distributed in October 2018 and 2020, respectively. (State letter AN 2/33-18/85 refers.)

AUGUST 2018

INTERNATIONAL CIVIL AVIATION ORGANIZATION

NOTES ON THE PRESENTATION OF THE AMENDMENT

1. The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

~~Text to be deleted is shown with a line through it.~~

text to be deleted

New text to be inserted is highlighted with grey shading.

new text to be inserted

~~Text to be deleted is shown with a line through it~~ followed
by the replacement text which is highlighted with grey
shading.

new text to replace existing text

TEXT OF THE FIRST EDITION OF THE
PROCEDURES FOR AIR NAVIGATION SERVICES — AERONAUTICAL INFORMATION
MANAGEMENT (DOC 10066)

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Appendix 6. Terrain and Obstacle Attributes Provision Requirements	X
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Appendix 8. Terrain and Obstacle Data Requirements.....	X

Editorial Note.— Insert new text as follows:

FOREWORD

1. HISTORICAL BACKGROUND

1.1 The Air Navigation Commission, at the eleventh meeting of its 177th Session on 20 March 2008, agreed to the establishment of an Aeronautical Information Services to Aeronautical Information Management (AIS - AIM) study group in order to assist the Secretariat with the development of:

- a) a global strategy/roadmap for the transition from Aeronautical Information Services (AIS) to Aeronautical Information Management (AIM);
- b) Standards and Recommended Practices (SARPs) and guidance material related to the provision of a standard aeronautical information conceptual model and standard aeronautical information exchange model to enable the global exchange of data in digital format; and
- c) other SARPs, guidance material and training material necessary to support AIM implementation.

1.2 Following an assessment of Annex 15 — *Aeronautical Information Services* and the *Aeronautical Information Services Manual* (Doc 8126), it was proposed by the study group and accepted by the Air Navigation Commission that specifications published as Procedures for Air Navigation Services (PANS) would provide a more appropriate means for increased standardization and harmonization within the domain of AIS/AIM as well as provide a vehicle for the emerging technical requirements of AIM. Consequently, the study group proceeded with development of the PANS-AIM using material currently contained in Annex 15 and Doc 8126.

1.3 The *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM) contains several provisions in support to the transition from the product-based Aeronautical Information Services (AIS) to the data centric Aeronautical Information Management (AIM). This edition includes detailed requirements for the collection, management and provision of aeronautical data and aeronautical information as well as aeronautical information products and services specifications.

2. SCOPE AND PURPOSE

2.1 The *Procedures for Air Navigation Services — Aeronautical Information Management* (PANS-AIM) are complementary to the Standards and Recommended Practices contained in Annex 15 — *Aeronautical Information Services* and in Annex 4 — *Aeronautical Charts*. They are supplemented when necessary by regional procedures contained in the *Regional Supplementary Procedures* (Doc 7030).

Note 1.— Although the provisions and procedures are mainly directed to States (including AIS), data originators, commercial data houses of aeronautical data and aeronautical information and users should be familiar with the procedures contained in this document.

Note 2.— One of the objectives of AIM is to ensure integrity of aeronautical data is maintained through the data process from survey/origination to distribution to the next intended user. The provisions and procedures in this document do not relieve the end users of aeronautical data and aeronautical information of their responsibility to ensure accuracy and integrity of aeronautical data and information received.

2.2 The PANS-AIM specify, in greater detail than the Standards and Recommended Practices, the actual procedures to be applied by aeronautical information management units in providing the various

aeronautical information services to other States and aviation stakeholders.

2.3 The PANS-AIM include topics that are relevant to the provision of harmonized procedures in the AIS/AIM domain, provide a framework for the delivery of uniform aeronautical information services in future AIM environments as well as represent a vehicle for emerging technical requirements.

3. STATUS

3.1 The Procedures for Air Navigation Services (PANS) do not have the same status as the Standards and Recommended Practices. While the latter are adopted by Council in pursuance of Article 37 of the Convention on International Civil Aviation, subject to the full procedure of Article 90, the PANS are approved by the Council and recommended to Contracting States for worldwide application.

3.2 While the PANS may contain material which may eventually become Standards or Recommended Practices (SARPs) when it has reached the maturity and stability necessary for adoption as such, they may also comprise material prepared as an amplification of the basic principles in the corresponding SARPs, and designed particularly to assist the user in the application of those SARPs.

4. IMPLEMENTATION

4.1 The implementation of procedures is the responsibility of Contracting States; they are applied in actual operations only after, and in so far as, States have enforced them. However, with a view to facilitating their processing towards implementation by States, they have been prepared in language which will permit direct use by the air navigation community.

5. PUBLICATION OF DIFFERENCES

5.1 The PANS do not carry the status afforded to Standards adopted by the Council as Annexes to the Convention and, therefore, do not come within the obligation imposed by Article 38 of the Convention to notify differences in the event of non-implementation.

5.2 However, attention of States is drawn to the provision of Annex 15 related to the publication in their Aeronautical Information Publication of lists of significant differences between their procedures and the related ICAO procedures.

6. PROMULGATION OF INFORMATION

Information relating to the establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations provided according to the Procedures specified in this document should be notified and take effect in accordance with Annex 15.

7. CONTENTS OF THE DOCUMENT

7.1 Chapter 1 – Definitions

Chapter 1 contains a list of terms and their technical meanings as used in this document.

7.2 Chapter 2 – Aeronautical Information Management

7.2.1 Chapter 2 describes the main aeronautical information management functions that include the collection, processing, quality control and distribution of data and information, as well as data integrity monitoring and assurance.

7.2.2 Appendix 1 (Aeronautical Data Catalogue) presents the scope of data and information that can be collected and maintained by an AIS organization. The Aeronautical Data Catalogue symbolizes the shift from product-centric to data centric environments, is considered the point of reference for all provisions related to aeronautical data origination and publication and represents the common language for data originators and AIS organizations.

7.3 Chapter 3 – Quality Management

Chapter 3 focuses on the quality management aspect of AIM. It explains the general requirements of the quality management system related to AIM processes.

7.4 Chapter 4 – Aeronautical Data Requirements

7.4.1 Chapter 4 outlines the data origination requirements and how data shall be collected and transmitted to the AIS in accordance with accuracy requirements and integrity classification as specified in Appendix 1.

7.4.2 The chapter also deals with the minimum metadata requirements.

7.5 Chapter 5 – Aeronautical Information Products and Services

7.5.1 Chapter 5 outlines the specifications regarding the provision of aeronautical information products (in printed or electronic form) and services. This includes the Aeronautical Information Publication (AIP), AIP amendments and supplements and Aeronautical Information Circulars (AIC).

7.5.2 The chapter also provides general specifications on NOTAM, number and series allocation, NOTAM checklist and distribution. The chapter includes also specifications on pre-flight information services.

7.5.3 General provisions for digital data are also explained as well as specific details on the various data sets – AIP data sets, terrain and obstacle data sets, aerodrome mapping data sets and instrument flight procedure data sets.

7.5.4 Data element properties, sub-properties and descriptions and quality requirements (accuracy, resolution, integrity) are contained in Appendix 1.

7.5.5 Contents of the Aeronautical Information Publication are contained in Appendix 2.

7.5.6 Format and instructions for completion of NOTAM, SNOWTAM and ASHTAM are found in Appendices 3, 4 and 5, respectively.

7.5.7 Terrain and obstacle attributes provision requirements are detailed in Appendix 6.

7.5.8 Predetermined distribution of NOTAM is detailed in Appendix 7.

7.6 Chapter 6 – Aeronautical Information Updates

Chapter 6 details how to update aeronautical information products and services.

Table A. Amendments to PANS-AIM

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>

CHAPTER 1. DEFINITIONS

Editorial Note.— Relocated from Annex 15, 1.1

When the following terms are used in the ~~Standards and Recommended Practices for aeronautical information services~~ present document, they have the following meanings:

Accuracy. ~~A degree of conformance between the estimated or measured value and the true value.~~

Note.— ~~For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.~~

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome mapping data (AMD). Data collected for the purpose of compiling aerodrome mapping information.

Note.— *Aerodrome mapping data are collected for purposes that include the improvement of the user's situational awareness, surface navigation operations, training, charting and planning.*

Aerodrome mapping database (AMDB). A collection of aerodrome mapping data organized and arranged as a structured data set.

Aeronautical chart. A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

Aeronautical data. A representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.

Aeronautical information. Information resulting from the assembly, analysis and formatting of aeronautical data.

Aeronautical Information Circular (AIC). A notice containing information that does not qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.

Aeronautical information management (AIM). The dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

Aeronautical information product. Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation in paper or electronic media. Aeronautical information products include:

- Aeronautical Information Publication (AIP), including Amendments and Supplements;
- Aeronautical Information Circulars (AIC);
- Aeronautical charts;
- NOTAM; and
- Digital data sets.

Note.— Aeronautical information products are intended primarily to satisfy international requirements for the exchange of aeronautical information.

Aeronautical Information Publication (AIP). A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Aeronautical information service (AIS). A service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

AIP Amendment. Permanent changes to the information contained in the AIP.

AIP Supplement. Temporary changes to the information contained in the AIP which are published provided by means of special pages.

AIRAC. An acronym (aeronautical information regulation and control) signifying a system aimed at advance notification, based on common effective dates, of circumstances that necessitate significant changes in operating practices.

Air defence identification zone (ADIZ). Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).

Air traffic management (ATM). The dynamic, integrated management of air traffic and airspace (including air traffic services, airspace management and air traffic flow management) — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

~~**AIS product.** Aeronautical data and aeronautical information provided in the form of the elements of the Integrated Aeronautical Information Package (except NOTAM and PIB), including aeronautical charts, or in the form of suitable electronic media.~~

Application. Manipulation and processing of data in support of user requirements (ISO 19104*).

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Note.— Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

ASHTAM. A special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations.

Assemble. A process of merging data from multiple sources into a database and establishing a baseline for subsequent processing.

Note.— The assemble phase includes checking the data and ensuring that detected errors and omissions are rectified.

ATS surveillance service. Term used to indicate a service provided directly by means of an ATS surveillance system.

ATS surveillance system. A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

* All ISO Standards are listed at the end of this chapter.

Note.— A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

Automatic dependent surveillance — broadcast (ADS-B). A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

Automatic dependent surveillance — contract (ADS-C). A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

Note.— The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

Automatic terminal information service (ATIS). The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link.

Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

Bare Earth. Surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects.

Calendar. Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (ISO 19108*).

Canopy. Bare Earth supplemented by vegetation height.

Confidence level. The probability that the true value of a parameter is within a certain interval around the estimate of its value.

Note.— The interval is usually referred to as the accuracy of the estimate.

Controller-pilot data link communications (CPDLC). A means of communication between controller and pilot, using data link for ATC communications.

Culture. All man-made features constructed on the surface of the Earth, such as cities, railways and canals.

Cyclic redundancy check (CRC). A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

Danger area. An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Data Accuracy. A degree of conformance between the estimated or measured value and the true value.

Note.— ~~For measured positional data the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.~~

Data completeness. The degree of confidence that all of the data needed to support the intended use is provided.

Data format. A structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.

Data product. Data set or data set series that conforms to a data product specification (ISO 19131*).

Data product specification. Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131*).

Note.— A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.

Data quality. A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution, integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

Data set. Identifiable collection of data (ISO 19101*).

Data set series. Collection of data sets sharing the same product specification (ISO 19115*).

Data timeliness. The degree of confidence that the data is applicable to the period of its intended use.

Data traceability. The degree that a system or a data product can provide a record of the changes made to that product and thereby enable an audit trail to be followed from the end-user to the originator.

Datum. Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104*).

Digital Elevation Model (DEM). The representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum.

Note.— Digital Terrain Model (DTM) is sometimes referred to as DEM.

Direct transit arrangements. Special arrangements approved by the public authorities concerned by which traffic which is pausing briefly in its passage through the Contracting State may remain under their direct control.

Ellipsoid height (Geodetic height). The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

Feature. Abstraction of real world phenomena (ISO 19101*).

Feature attribute. Characteristic of a feature (ISO 19101*).

Note.— A feature attribute has a name, a data type and a value domain associated with it.

Feature operation. Operation that every instance of a feature type may perform (ISO 19110*).

Note.— An operation upon the feature type dam is to raise the dam. The result of this operation is to raise the level of water in the reservoir.

Feature relationship. Relationship that links instances of one feature type with instances of the same or a different feature type (ISO 19101*).

Feature type. Class of real world phenomena with common properties (ISO 19110*).

Note.— *In a feature catalogue, the basic level of classification is the feature type.*

Geodesic distance. The shortest distance between any two points on a mathematically defined ellipsoidal surface.

Geodetic datum. A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

Geoid. The equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.

Note.— *The geoid is irregular in shape because of local gravitational disturbances (wind tides, salinity, current, etc.) and the direction of gravity is perpendicular to the geoid at every point.*

Geoid undulation. The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

Note.— *In respect to the World Geodetic System — 1984 (WGS-84) defined ellipsoid, the difference between the WGS-84 ellipsoidal height and orthometric height represents WGS-84 geoid undulation.*

Gregorian calendar. Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108*).

Note.— *In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.*

Height. The vertical distance of a level, point or an object considered as a point, measured from a specific datum.

Heliport. An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Human Factors principles. Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

~~Integrated Aeronautical Information Package.~~ ~~A package in paper, or electronic media which consists of the following elements:~~

- ~~—— AIP, including amendment service;~~
- ~~—— Supplements to the AIP;~~
- ~~—— NOTAM and PIB;~~
- ~~—— AIC; and~~
- ~~—— checklists and lists of valid NOTAM.~~

Data Integrity (aeronautical data assurance level). A degree of assurance that an aeronautical data and its value has not been lost or altered since the data origination or authorized amendment.

Integrity classification (aeronautical data). Classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data are classified as:

- a) *routine data*: there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- b) *essential data*: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) *critical data*: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

International airport. Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

International NOTAM office (NOF). An office designated by a State for the exchange of NOTAM internationally.

Logon address. A specified code used for data link logon to an ATS unit.

Manoeuvring area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Metadata. Data about data (ISO 19115*).

Note.— A structured description of the content, quality, condition or other characteristics of data.

Minimum en-route altitude (MEA). The altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

Minimum obstacle clearance altitude (MOCA). The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron

Navigation specification. A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note 1.— The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.

Note 2.— The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this Annex as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers

to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

Next intended user. The entity that receives the aeronautical data or information from the Aeronautical Information Service.

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or
- b) extend above a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

Obstacle/terrain data collection surface. A defined surface intended for the purpose of collecting obstacle/terrain data.

Origination (aeronautical data or aeronautical information). The creation of the value associated with new data or information or the modification of the value of an existing data or information.

Originator (aeronautical data or aeronautical information). An entity that is accountable for data or information origination and/or from which the AIS organization receives aeronautical data and information.

Orthometric height. Height of a point related to the geoid, generally presented as an MSL elevation.

Performance-based communication (PBC). Communication based on performance specifications applied to the provision of air traffic services.

Note.— An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.— Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note.— An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Portrayal. Presentation of information to humans (ISO 19117*).

Position (geographical). Set of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid which define the position of a point on the surface of the Earth.

Post spacing. Angular or linear distance between two adjacent elevation points.

Precision. The smallest difference that can be reliably distinguished by a measurement process.

Note.— In reference to geodetic surveys, precision is a degree of refinement in performance of an operation or a degree of perfection in the instruments and methods used when taking measurements.

Pre-flight information bulletin (PIB). A presentation of current NOTAM information of operational significance, prepared prior to flight.

Prohibited area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Quality. Degree to which a set of inherent characteristics fulfils requirements (ISO 9000*).

Note 1.— The term “quality” can be used with adjectives such as poor, good or excellent.

Note 2.— “Inherent”, as opposed to “assigned”, means existing in something, especially as a permanent characteristic.

Quality assurance. Part of quality management focused on providing confidence that quality requirements will be fulfilled (ISO 9000*).

Quality control. Part of quality management focused on fulfilling quality requirements (ISO 9000*).

Quality management. Coordinated activities to direct and control an organization with regard to quality (ISO 9000*).

Radio navigation service. A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

Required communication performance (RCP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

Requirement. Need or expectation that is stated, generally implied or obligatory (ISO 9000*).

Note 1.— “Generally implied” means that it is custom or common practice for the organization, its customers and other interested parties, that the need or expectation under consideration is implied.

Note 2.— A qualifier can be used to denote a specific type of requirement, e.g. product requirement, quality management requirement, customer requirement.

Note 3.— A specified requirement is one which is stated, for example, in a document.

Note 4.— Requirements can be generated by different interested parties.

Data Resolution. A number of units or digits to which a measured or calculated value is expressed and used.

Restricted area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Route stage. A route or portion of a route flown without an intermediate landing.

SNOWTAM.[†] A special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format.

SNOWTAM.^{††} A special series NOTAM given in a standard format providing a surface condition report notifying the presence or cessation of hazardous conditions due to snow, ice, slush, frost, standing water or water associated with snow, slush, ice, or frost on the movement area.

Station declination. An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

Terrain. The surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.

Note.— ~~In practical terms, depending on the method of data collection used, terrain represents the continuous surface that exists at the bare Earth, the top of the canopy or something in between, also known as “first reflective surface”.~~

Traceability. Ability to trace the history, application or location of that which is under consideration (ISO 9000*).

Note.— When considering product, traceability can relate to:

- the origin of materials and parts;
- the processing history; and
- the distribution and location of the product after delivery.

Validation. Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (ISO 9000*).

Verification. Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled (ISO 9000*).

Note 1.— The term “verified” is used to designate the corresponding status.

Note 2.— ~~Confirmation can comprise activities such as:~~

- ~~performing alternative calculations;~~
- ~~comparing a new design specification with a similar proven design specification;~~
- ~~undertaking tests and demonstrations; and~~
- ~~reviewing documents prior to issue.~~

VOLMET. Meteorological information for aircraft in flight.

[†] Applicable until 4 November 2020.

^{††} Applicable as of 5 November 2020.

Data link-VOLMET (D-VOLMET). Provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link.

VOLMET broadcast. Provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

CHAPTER 2. AERONAUTICAL INFORMATION MANAGEMENT

2.1 Information management requirements

Management of aeronautical data and aeronautical information shall include the following processes:

- collection
- processing
- quality control
- distribution

2.1.1 Collection

2.1.1.1 The identification of data originators shall be documented based on the scope of aeronautical data and aeronautical information to be collected.

2.1.1.2 A record of data originators should be maintained.

Note. — *Metadata requirements in Chapter 4 specify which information is to be recorded for each originator.*

2.1.1.3 Each data element to be collected should be mapped to an identified data originator, in accordance with the formal arrangements established between data originators and the AIS.

2.1.1.4 The list of aeronautical information subjects and their properties, as contained in Appendix 1, should be used to establish formal arrangements between the originators and the AIS.

2.1.1.5 Valid codes for the code lists of the aeronautical data properties and sub-properties, as contained in Appendix 1, should be defined in the formal arrangements between the originators and the AIS.

2.1.1.6 Appendix 1 shall be considered as a reference for aeronautical data and aeronautical information origination and publication requirements.

Note 1.— *Appendix 1 presents the scope of data and information that can be collected and maintained by the AIS.*

Note 2.— *Appendix 1 provides a common language that can be used by data originators and the AIS.*

2.1.2 Processing

2.1.2.1 Collected data shall be verified and validated for compliance with data quality requirements.

Note 1.— *Appendix 1 contains aeronautical data attributes and quality requirements (accuracy,*

resolution, integrity).

Editorial Note.— Note 2 is relocated text from Annex 15, 3.2.2. – Note 2 (initial part).

Note 2.— *Guidance material on the aeronautical data quality requirements (accuracy, resolution, integrity, and traceability and protection requirements) may be found in the World Geodetic System — 1984 (WGS-84) Manual (Doc 9674).*

Editorial Note.— Note 3 is relocated text from Annex 15, 3.2.2. – Note 2 (last part).

Note 3.— *Supporting data quality material in respect of data accuracy, publication resolution, and integrity of aeronautical data, together with guidance material in respect to the rounding convention for aeronautical data, is contained in Radio Technical Commission for Aeronautics (RTCA) Document DO-201A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-77 — Standards for Aeronautical Information (or equivalent).*

Editorial Note.— Note 4 is relocated text from Annex 15, Note 3 to 3.2.2.

Note 34.— *Guidance material on the management of aeronautical data quality is included in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839) ~~(to be developed)~~.*

Note 5.— *Verification activities may include:*

- a) comparison processes in which data and information are compared with an independent source;*
- b) feedback processes in which data and information are compared between their input and output state;*
- c) processing through multiple independent and different systems, comparing the output of each; this includes performing alternative calculations; and*
- d) processes in which data and information are compared to the originator's request.*

Note 6.— *Validation activities may include:*

- a) application processes in which data and information are tested;*
- b) processes in which data and information are compared between two different outputs; and*
- c) processes in which data and information are compared to an expected range, value or other business rules.*

2.1.2.2 Automation systems implemented for processing aeronautical data and aeronautical information should ensure traceability of the performed actions.

2.1.3 Quality control

Editorial Note.— Note is relocated text from Annex 15, Note 2 to 3.3.3.2.

Note 2.— *Error-producing faults in the entire process may be mitigated by additional data quality assurance techniques as may be required. These could include application tests for critical data (for example, by flight check); the use of security, logic, semantic, comparison, and redundancy checks; digital error detection; and the qualification of human resources and process tools such as hardware and software.*

2.1.3.1 Quality checks should be implemented to ensure compliance with product specifications contained in Chapter 5 of PANS-AIM.

2.1.3.2 When the same data is duplicated in different aeronautical information products, consistency checks should be undertaken.

2.1.4 Distribution

(To be developed.)

2.2 Data integrity monitoring and assurance

2.2.1 Data integrity should be assured by employing cryptographic technologies (e.g. hash functions, message authentication codes, asymmetric and symmetric encryption, and digital certificates).

Editorial Note.— Note is relocated text from Annex 15, Note 1 to 3.3.3.2.

Note 4.— *Guidance material in respect to the processing of aeronautical data and aeronautical information is contained in RTCA Document DO-200AB and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76A — Standards for Processing Aeronautical Data.*

2.2.2 The technical means used for data error detection should be based on the use of systematic cycling codes.

Note.— *The means to implement systematic cycling codes include the use of hash functions and cyclic redundancy check (CRC).*

Editorial Note.— Insert new text as follows:

CHAPTER 3. QUALITY MANAGEMENT

3.1 Quality management system

Note 1.— This chapter provides general requirements on the quality management system related to AIM processes.

Note 2.— Detailed guidance can be found in the Manual on the Quality Management System for Aeronautical Information Management (Doc 9839).

3.1.1 The general requirements for a QMS shall be to:

- a) develop a quality manual that includes the scope of a quality management system as applied to AIM processes;
- b) identify the processes needed for the QMS;
- c) determine the sequence and interaction of these processes;
- d) determine criteria and methods required to ensure the effective operation and control of these processes;
- e) ensure the availability of information necessary to support the operation and monitoring of these processes;
- f) measure, monitor and analyse these processes, and implement action necessary to achieve planned results and continual improvement; and
- g) maintain appropriate records that are necessary to provide confidence of conformity of the processes and resulting product.

3.1.2 In the framework of the quality management system, a user feedback system shall be defined and implemented.

Editorial Note.— Notes 1 and 3 are relocated text from Annex 15, Notes to 3.7.2; Note 2 from Annex 15, Note 2 to 3.7.3; and Note 4 from Annex 15, Note to 3.7.4.

Note 1.— Quality management may be provided by a single quality management system or ~~serial~~ a series of quality management systems.

Note 2.— International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme ~~and define the term “accredited certification body”. The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization. An ISO 9000 certificate issued by an accredited certification body would be considered an acceptable means of compliance.~~

Note 23.— ~~Letters of agreement~~ Formal arrangements concerning data quality between originator and ~~distributor~~ the AIS and between ~~distributor~~ the AIS and the next intended user may be used to manage the aeronautical information data chain.

Note 4.— Guidance material concerning training methodology to ensure the competency of personnel is contained in the Aeronautical Information Management Training Development Manual (Doc 9991) ~~(to be developed)~~.

CHAPTER 4. AERONAUTICAL DATA REQUIREMENTS

4.1 Data Origination Requirements

4.1.1 Data shall be collected and transmitted to the AIS in accordance with the accuracy requirements and integrity classification specified in Appendix 1.

Editorial Note.— 4.1.2 is relocated text from Annex 15, 3.3.1.

~~3.3.1~~ **4.1.2** ~~The order of accuracy for aeronautical data shall be as specified in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2. In that respect, three types of positional data shall be identified: surveyed points (runway thresholds, navigation aid positions, etc.), calculated points (mathematical calculations from the known surveyed points of points in space/fixes) and declared points (e.g. flight information region boundary points). Positional data shall be classified as: surveyed points (e.g. navigation aid positions, runway threshold), calculated points (mathematical calculations from the known surveyed points of points in space, fixes) or declared points (e.g. flight information region boundary points).~~

Editorial Note.— 4.1.3 is relocated text from Annex 15, 1.2.1.1.

~~1.2.1.1~~ **4.1.3** ~~World Geodetic System — 1984 (WGS 84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum. Geographical coordinates indicating latitude and longitude shall be determined and reported to the AIS in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum.~~

Editorial Note.— 4.1.4 is relocated text from Annex 15, 1.2.1.3.

~~1.2.1.3~~ **4.1.4** ~~Geographical coordinates that have been transformed into WGS-84 coordinates but whose accuracy of original field work does not meet the requirements in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2, shall be identified by an asterisk. Geographical coordinates that have been transformed into WGS-84 coordinates by mathematical means and whose accuracy of original field work does not meet the applicable requirements contained in Appendix 1 shall be identified.~~

Editorial Note.— 4.1.5 is relocated text from Annex 15, 1.2.2.3.

~~1.2.2.4~~ **4.1.5** ~~In addition to elevation referenced to the MSL (geoid), for the specific surveyed ground positions, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions specified in Appendix 4.2 shall also be published.~~

4.2 Metadata Requirements

Editorial Note.— 4.2.1 is relocated text from Annex 15, 3.4.2.

~~3.4.2~~ **4.2.1** The metadata to be collected shall include, as a minimum:

- a) the name of the organizations or entities performing any action of originating, transmitting or

manipulating the data;

b) the action performed; and

c) the date and time the action was performed.

Editorial Note.— Note is relocated text from the Note associated with Annex 15, 3.4.1.

Note.— ISO Standard 19115 specifies requirements for geographic information metadata.

CHAPTER 5. AERONAUTICAL INFORMATION PRODUCTS AND SERVICES

5.1 General

5.1.1 Aeronautical data shall be provided in accordance with the resolution requirements contained in Appendix 1.

5.1.2 Geographical coordinates whose accuracy does not meet the requirements specified in Appendix 1 shall be identified.

5.1.3 The identification of geographical coordinates whose accuracy does not meet the requirements may be made either with an annotation or by explicitly providing the actual accuracy value.

5.1.3.1 In aeronautical information products that are distributed on paper, the identification should be done with an asterisk following the coordinate value concerned.

5.2 Aeronautical information in a standardized presentation

5.2.1 Aeronautical Information Publication (AIP)

5.2.1.1 Contents

Editorial Note.— 5.2.1.1.1 is relocated text from Doc 8126, 5.1.3 (initial part).

~~5.1.3~~ **5.2.1.1.1** The AIP ~~must~~ **shall** contain concise, current information relating to, and arranged under, the subject headings listed in ~~Annex 15, Appendix 42~~. This facilitates both the locating of information under a specific heading and the storage/retrieval of the information using automated processing.

Editorial Note.— 5.2.1.1.2 is relocated text from Doc 8126, 5.1.3 (last part).

5.2.1.1.2 If no facilities or services are provided or no information is available for publication in respect of one of the categories of information specified in ~~Annex 15, Appendix 42~~, an indication should be given as to which of these circumstances applies (e.g. “NIL” or “Not AVBL”).

5.2.1.1.3 When the AIP Data Set (as specified in 5.3.3.1) is provided, the following sections of the AIP may be left blank and reference to the data set availability shall be provided:

- 1. GEN 2.5 List of radio navigation aids**
- 2. ENR 2.1 FIR, UIR, TMA**
- 3. ENR 3.1 Lower ATS routes**
- 4. ENR 3.2 Upper ATS routes**
- 5. ENR 3.3 Area navigation (RNAV) routes**

6. ENR 3.4 Helicopter routes

7. ENR 3.5 Other routes

8. ENR 3.6 En-route holding

9. ENR 4.1 Radio navigation aids – en-route

10. ENR 4.4 Name-code designators for significant points

11. ENR 4.5 Aeronautical ground lights – en-route

12. ENR 5.1 Prohibited, restricted and danger areas

13. ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ)

14. ENR 5.3.1 Other activities of a dangerous nature

15. ENR 5.5 Aerial sporting and recreational activities

16. **** AD 2.17 ATS airspace

17. **** AD 2.19 Radio navigation and landing aids

18. **** AD 3.16 ATS airspace

19. **** AD 3.18 Radio navigation and landing aids

5.2.1.1.4 When the Obstacle Data Set (as specified in 5.3.3.2.2) is provided, the following sections of the AIP may be left blank and a reference to the data set availability shall be provided:

1. ENR 5.4 Air Navigation obstacles

2. **** AD 2.10 Aerodrome obstacles

3. **** AD 3.10 Heliport obstacles

5.2.1.2 General Specification

Editorial Note.— 5.2.1.2.1 is relocated text from Doc 8126, 5.2.7 (initial part).

~~5.2.7~~ 5.2.1.2.1 The issuing State and publishing authority ~~must~~ shall be clearly indicated ~~on the cover.~~

Editorial Note.— 5.2.1.2.2 is relocated text from Annex 15, 4.2.1.2.

~~4.2.1.2~~ 5.2.1.2.2 When two or more States ~~combine to issue a joint~~ jointly provide an AIP, these States shall be ~~this shall be made clear both on the cover and in the table of contents~~ clearly indicated.

Editorial Note.— 5.2.1.2.3 and the Note is relocated text from Annex 15, 4.2.1 and Note.

~~4.2.1~~ 5.2.1.2.3 Each AIP shall be self-contained and shall include a table of contents.

Note.— If it is necessary by reason of bulk or for convenience, to publish an AIP in two or more parts or volumes, each of them will indicate that the remainder of the information is to be found in the other part(s) or volume(s).

Editorial Note.— 5.2.1.2.4 is relocated text from Annex 15, 4.2.1.1.

~~4.2.1.1~~ 5.2.1.2.4 Each AIP shall not duplicate information within itself or from other sources.

Editorial Note.— 5.2.1.2.5 is relocated text from Annex 15, 4.1.1.

~~4.1.1~~ 5.2.1.2.5 An AIP shall ~~contain~~, be organized in three parts (GEN, ENR and AD), sections and subsections ~~uniformly referenced to allow for standardized electronic data storage and retrieval, current information relating to, and arranged under, those subjects enumerated in Appendix 1 that appear in roman type, except that~~ when the AIP, or a volume of the AIP, is designed ~~basically~~ to facilitate operational use in flight, in which case the precise format and arrangement may be left to the discretion of the State provided that an adequate table of contents is included.

Editorial Note.— 5.2.1.2.6 is relocated text from Annex 15, 4.2.3 (first part).

~~4.2.3~~ 5.2.1.2.6 Each AIP shall be dated.

Editorial Note.— 5.2.1.2.6.1 is relocated text from Annex 15, 4.2.3 (last part).

5.2.1.2.6.1 The date, consisting of the day, month (by name) and year, shall be the publication date or the effective date (AIRAC) of the information.

Editorial Note.— 5.2.1.2.7 and Note is relocated text from Annex 15, 4.1.4.

~~4.1.4~~ 5.2.1.2.7 Charts, maps or diagrams ~~shall~~ **should** be used, ~~when appropriate,~~ to complement or as a substitute for the tabulations or text of AIP.

Note.— Where appropriate, charts produced in conformity with Annex 4, may be used to fulfil this requirement. Guidance material as to the specifications of index maps and diagrams included in AIP is contained in the Aeronautical Information Services Manual (Doc 8126).

Editorial Note.— 5.2.1.2.8 is relocated text from Doc 8126, 5.5.2 b).

~~b)~~ 5.2.1.2.8 When listing locations, the city or town should be given in capital letters followed, where the facility is an aerodrome/heliport or is located at an aerodrome/heliport, by an oblique stroke and the name of the aerodrome/heliport in smaller capital letters or lower case type. Unless otherwise indicated, the list should be in alphabetical order.

Editorial Note.— 5.2.1.2.9 is relocated text from Annex 15, 1.3.2.

~~1.3.2~~ 5.2.1.2.9 Place names shall be spelt in conformity with local usage, ~~transliterated, when necessary, into the Latin alphabet.~~ The spelling of place names shall conform with local usage, transliterated where necessary into the ISO basic Latin alphabet.

Editorial Note.— 5.2.1.2.10 is relocated text from Doc 8126, 5.5.2 d).

~~d)~~ 5.2.1.2.10 In the indication of the geographical coordinates of a location:

- the latitude should be given first;
- symbols for degrees, minutes or seconds should be omitted;
- two digits should always be used in expressing values of less than 10 degrees of latitude; and
- three digits should always be used in expressing values of less than 100 degrees of longitude; and
- the letters N, S, E, W to indicate the cardinal points of the compass to the latitude and longitude as appropriate.

Editorial Note.— 5.2.1.2.11 is relocated text from Doc 8126, 5.5.2 f).

✘ 5.2.1.2.11 When describing periods of activity, availability or operation, ~~use of the term “weekday” should be avoided and the day or days in question should be specified~~ the applicable days and times shall be specified.

5.2.1.2.12 The units of measurement selected for use in the AIP, e.g. dimensions on aerodromes, distances, elevations or altitudes, should be consistently followed and should adhere to Annex 5.

Editorial Note.— 5.2.1.2.13 is relocated text from Doc 8126, 5.6.

5.2.1.2.13 Index maps and diagrams included in the AIP should comply with the following specifications:

- a) *Base map:* The base map should be an outline map of the area adapted from existing material with general details. Graticules, topography and other details should be as simple as possible ~~to permit rapid reproduction and amendment~~. Political subdivisions should be shown and identified. It should be produced in one colour.
- b) *Sheet size and scale:* The overall dimensions should be 210 mm × 297 mm. If a larger map is required, it should be folded to conform to this size. A uniform scale should be used for all charts produced as a series and other charts where practicable.
- c) *Title and marginal Notes:* The title should be shown on the top border and should be as short and simple as possible.
- d) *Colours:* The number of colours used should be kept to a minimum. If more than one colour is used, the colours should offer adequate contrast.
- e) *Symbols:* Symbols should conform, where practicable, to the ICAO Chart symbols shown in Annex 4, Appendix 2. The basic, general purpose symbols for AIP index maps are a ~~closed~~ filled circle ● and an ~~open~~ empty circle ○. Except when the symbols used are self-explanatory, a legend should be provided. For details for which no ICAO symbol has been provided, any appropriate symbol may be chosen provided it does not conflict with an ICAO symbol.

5.2.1.3 Specifications for AIP Amendments

Editorial Note.— 5.2.1.3.1 is relocated text from Annex15, 4.2.8.

~~4.2.8~~ 5.2.1.3.1 Operationally significant changes to the AIP shall be published in accordance with Aeronautical Information Regulation and Control (AIRAC) procedures and shall be clearly identified by the acronym — AIRAC.

Editorial Note.— 5.2.1.3.2 is relocated text from Doc 8126, 5.9.7 (initial part).

~~5.9.7~~ 5.2.1.3.2 When a State has established the regular interval or publication dates for its AIP Amendments, these intervals or publication dates ~~must be published~~ shall be included in the AIP, Part 1 — General (GEN).

5.2.1.3.3 New or revised information contained in the AIP shall be identified.

Editorial Note.— 5.2.1.3.4 is relocated text from Annex15, 4.3.2.

~~4.3.2~~ 5.2.1.3.4 Each AIP Amendment shall be allocated a serial number, which shall be consecutive.

Editorial Note.— 5.2.1.3.5 is relocated text from Annex15, 4.3.3.

~~4.3.3~~ 5.2.1.3.5 Each AIP Amendment ~~page, including the cover sheet,~~ shall ~~display~~ **contain** a publication date.

Editorial Note.— 5.2.1.3.6 is relocated text from Annex15, first sentence of 4.3.4.

~~4.3.4~~ 5.2.1.3.6 Each AIRAC AIP Amendment ~~page, including the cover sheet,~~ shall ~~display~~ **contain** an effective date.

Editorial Note.— 5.2.1.3.6.1 is relocated text from Annex15, second sentence of 4.3.4.

5.2.1.3.6.1 When an effective time other than 0000 UTC is used, the effective time shall also be ~~displayed on the cover sheet~~ **indicated**.

Editorial Note.— 5.2.1.3.7 is relocated text from Annex15, 4.3.5.

~~4.3.5~~ 5.2.1.3.7 When an AIP Amendment is issued, it shall include references to the serial number of ~~those elements, if any, of the Integrated Aeronautical Information Package~~ the AIP Supplement or NOTAM which have been incorporated into the amendment.

Editorial Note.— 5.2.1.3.8 is relocated text from Annex15, 4.3.6.

~~4.3.6~~ 5.2.1.3.8 A brief indication of the subjects affected by the amendment shall be given on the AIP Amendment cover sheet.

Editorial Note.— 5.2.1.3.9 is relocated text from Doc 8126, 5.9.13.

~~5.9.13~~ 5.2.1.3.9 Each amendment ~~must~~ **shall** include a checklist giving the current date of each loose-leaf page in the AIP, ~~unless there are only two or three replacement sheets involved,~~ and ~~must~~ **shall** provide a recapitulation of any outstanding manuscript corrections. The checklist ~~must~~ **shall** carry both the page number and date.

5.2.1.4 Specifications for AIP Supplements

Editorial Note.—Note is relocated text from Doc 8126, 5.10.1.

~~5.10.1 Note.~~ Since the AIP is ~~an operational document and therefore~~ subject to frequent change, provisions exist for its continual updating. In addition, changes of a temporary nature affecting the contents of an AIP are often required to cater for unexpected circumstances or, in some cases, planned modifications to a service/facility. ~~The purpose of an AIP Supplement is to bring to the attention of users both temporary changes of long duration (three months or longer) and information of short duration containing extensive text or graphics which affect one or more parts of the AIP.~~

Editorial Note.— 5.2.1.4.1 is relocated text from Annex15, 4.4.2.

~~4.4.2~~ 5.2.1.4.1 Each AIP Supplement shall be allocated a serial number which shall be consecutive and based on the calendar year.

Editorial Note.— Note is relocated text from Annex15, Note to 4.4.1.

Note.— Guidance material on the use of AIP Supplements together with examples of such use is contained in Doc 8126.

5.2.1.4.2 Each AIP Supplement shall be provided on distinctive pages allowing for easy identification from the regular AIP content.

Editorial Note.— 5.2.1.4.3 is relocated text from Annex 15, 4.4.5.

~~4.4.5~~ 5.2.1.4.3 ~~When~~ Whenever an AIP Supplement is ~~sent~~ issued in as a replacement of a NOTAM, it ~~shall include~~ a reference to the ~~serial~~ series and number of the NOTAM ~~shall be included~~.

Editorial Note.— 5.2.1.4.4 is relocated text from Annex 15, 4.4.6.

~~4.4.6~~ 5.2.1.4.4 A checklist of valid AIP Supplements shall be issued at intervals of not more than one month as part of the checklist of NOTAM required at 5.2.5.3 and with distribution as for the AIP Supplements. ~~This information shall be issued through the medium of the monthly plain language list of valid NOTAM required by 5.2.13.3.~~

Editorial Note.—5.2.1.4.5 is relocated text from Doc 8126, penultimate sentence of 5.10.2.

5.2.1.4.5 Each AIP Supplement page ~~must~~ ~~shall~~ show a publication date.

Editorial Note.— 5.2.1.4.6 is relocated text from Doc 8126, last sentence of 5.10.2.

5.2.1.4.6 Each AIRAC AIP Supplement page ~~must~~ ~~shall~~ show a publication date and an effective date.

5.2.2 Aeronautical Information Circulars (AIC)

Editorial Note.— 5.2.2.1 is relocated text from Annex 15, 7.1.1.1

~~7.1.1.1~~ 5.2.2.1 An AIC shall be ~~originated~~ provided whenever it is desirable to promulgate:

- ~~a) a long term forecast of any major change in legislation, regulations procedures, or facilities;~~
- ~~b) information of a purely explanatory or advisory nature liable to affect flight safety;~~
- ~~c) information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters.~~

This shall include:

- ~~1)~~a) forecasts of important changes in the air navigation procedures, services and facilities provided;
- ~~2)~~b) forecasts of implementation of new navigation systems;
- ~~3)~~c) significant information arising from aircraft accident/incident investigation which has a bearing on flight safety;
- ~~4)~~d) information on regulations relating to the safeguarding of international civil aviation against acts of unlawful interference;
- ~~5)~~e) advice on medical matters of special interest to pilots;
- ~~6)~~f) warnings to pilots concerning the avoidance of physical hazards;
- ~~7)~~g) effect of certain weather phenomena on aircraft operations;
- ~~8)~~h) information on new hazards affecting aircraft handling techniques;
- ~~9)~~i) regulations relating to the carriage of restricted articles by air;
- ~~10)~~j) reference to the requirements of, and publication of changes in, national legislation;
- ~~11)~~k) aircrew licensing arrangements;
- ~~12)~~l) training of aviation personnel;
- ~~13)~~m) application of, or exemption from, requirements in national legislation;
- ~~14)~~n) advice on the use and maintenance of specific types of equipment;
- ~~15)~~o) actual or planned availability of new or revised editions of aeronautical charts;
- ~~16)~~p) carriage of communication equipment;
- ~~17)~~q) explanatory information relating to noise abatement;
- ~~18)~~r) selected airworthiness directives;
- ~~19)~~s) changes in NOTAM series or distribution, new editions of AIP or major changes in their contents, coverage or format;
- ~~20)~~t) advance information on the snow plan (see 5.2.2.2 ~~7.1.1.2~~);

24)u) other information of a similar nature.

Editorial Note.— 5.2.2.2 is relocated text from Annex 15, 7.1.1.2.

~~7.1.1.2~~ 5.2.2.2 The snow plan ~~published~~ issued under AD 1.2.2 of the AIP ~~Appendix 4~~ shall be supplemented by seasonal information, to be issued well in advance of the beginning of each winter — not less than one month before the normal onset of winter conditions — and shall contain information such as that listed below:

- a) until 4 November 2020 a list of aerodromes/heliports where snow clearance is expected to be performed during the coming winter:
- a) as of 5 November 2020 a list of aerodromes/heliports where snow, slush, ice or frost clearance is expected to be performed during the coming winter:
 - *1) in accordance with the runway and taxiway systems; or
 - *2) planned snow clearing, deviating from the runway system (length, width and number of runways, affected taxiways and aprons or portions thereof);
- *b) information concerning any centre designated to coordinate information on the current state of progress of clearance and on the current state of runways, taxiways and aprons;
- c) a division of the aerodromes/heliports into SNOWTAM distribution lists in order to avoid excessive NOTAM distribution;
- *d) an indication, as necessary, of minor changes to the standing snow plan;
- *e) a descriptive list of clearance equipment;
- *f) a listing of what will be considered as the minimum critical snow bank to be reported at each aerodrome/heliport at which reporting will commence.

Editorial Note.—5.2.2.3 is relocated text from Annex 15, 7.2.1.

~~7.2.1~~ 5.2.2.3 The originating ~~aeronautical information service~~ State shall select the AIC that are to be given international distribution.

Editorial Note.— 5.2.2.4 is relocated text from Annex 15, 7.3.

~~7.3~~ 5.2.2.4 States shall give AIC selected for international distribution the same distribution as for the AIP.

5.2.2.5 Distribution of AIC on a national basis is left to the discretion of the originating State concerned.

Editorial Note.—5.2.2.6 is relocated text from Annex 15, 7.2.2.

~~7.2.2~~ 5.2.2.6 Each AIC shall be allocated a serial number which shall be consecutive and based on the calendar year.

* This information, or any part of it, may be included in the AIP, if so desired.

Editorial Note.— *Note.* is relocated text from Doc 8126, second sentence of 7.2.

Note.— Since AIC information is often effective for long periods and requires little amendment, it will usually be found that AIC can, if necessary, remain outstanding for several years without inconvenience. A review and re-issue on a yearly basis is however advisable.

Editorial Note.— 5.2.2.7 is relocated text from Annex 15, 7.2.3.

~~7.2.3~~ 5.2.2.7 When In the event that AIC are distributed provided in more than one series, each series shall be separately identified by a letter (A 2/02, B 4/02, etc.).

Editorial Note.— 5.2.2.8 is relocated text from Annex 15, 7.2.5.

~~7.2.5~~ 5.2.2.8 A checklist of AIC currently in force shall be issued at least once a year, with distribution as for the AIC.

Editorial Note.— 5.2.2.9 is relocated text from Annex 15, 5.2.13.1.

~~5.2.13.1~~ 5.2.2.9 A checklist of NOTAM shall refer to the latest AIP Amendments, AIP Supplements and at least the internationally distributed AIC provided internationally shall be included in the NOTAM checklist.

5.2.3 Printed products

5.2.3.1 Printed AIP

Editorial Note.—5.2.3.1.1 is relocated text from Annex 15, 4.2.2.

~~4.2.2~~ 5.2.3.1.1 AIP should be published in loose leaf form unless the complete publication is reissued at frequent intervals. When the AIP is issued as a printed volume, it should be published in loose-leaf form unless the complete publication is reissued at frequent intervals.

Editorial Note.— 5.2.3.1.2 is relocated text from Annex 15, 4.2.5.

~~4.2.5~~ 5.2.3.1.2 Each AIP issued as a bound printed volume and each page of an AIP issued in loose-leaf form shall be so annotated as to indicate clearly:

- a) the identity of the AIP;
- b) the territory covered and subdivisions when necessary;
- c) the identification of the issuing State and producing organization (authority); and
- d) page numbers/chart titles;
- ~~e) the degree of reliability if the information is doubtful.~~

Editorial Note.—5.2.3.1.3 is relocated text from Doc 8126, 5.2.7.

~~5.2.7~~ 5.2.3.1.3 The issuing State and the publishing authority or the joint issuing States shall

~~must~~ be clearly indicated on the cover and in the table of contents. When two or more States publish an AIP jointly, this ~~must also be clearly indicated both on the cover and in the table of contents.~~

Editorial Note.—5.2.3.1.4 is relocated text from Annex 15, 4.2.9 (last part).

5.2.3.1.4 The normal method of amendment of the printed volume AIP shall be by means of replacement sheets.

Editorial Note.—5.2.3.1.5 is relocated text from Doc 8126, 5.9.10.

~~5.9.10~~ 5.2.3.1.5 New or revised information ~~contained in the AIP replacement pages~~ shall ~~must~~ be identified by an annotation against it in the margin. A thick black vertical line or, where the change incorporated covers one line only or a part of a line, a thick black horizontal arrow, is sufficient to identify the change.

Editorial Note.—5.2.3.1.6 is relocated text from Doc 8126, 5.9.11.

~~5.9.11~~ 5.2.3.1.6 Each AIP Amendment page, including the cover sheet, shall ~~must~~ contain show a publication date and, when applicable, an effective date. ~~Each AIRAC AIP Amendment page, including the cover sheet must show a publication date and an effective date.~~

Editorial Note.—5.2.3.1.7 is relocated text from Doc 8126, 5.2.3.

~~5.2.3~~ 5.2.3.1.7 Many States will be able to produce the AIP in one volume. Where this is not practicable and the AIP is produced and made available in more than one volume, each volume must include a separate amendment and supplement service, and the following separate sections must be included in each volume. When the AIP is provided in more than one volume, each volume shall include:

- Preface
- Record of AIP Amendments
- Record of AIP Supplements
- Checklist of AIP pages
- List of current hand amendments.

Editorial Note.—5.2.3.1.8 is relocated text from Doc 8126, 5.2.4.

~~5.2.4~~ 5.2.3.1.8 When the AIP is published as one volume, the above-mentioned subsections appear only in Part 1 — GEN and the annotation “not applicable” ~~must~~ shall be entered against each of these subsections in Parts 2 and 3.

Editorial Note.— 5.2.3.1.9 is relocated text from Doc 8126, 5.5.1.

~~5.5.1~~ 5.2.3.1.9 A system of page numbering adaptable to the addition or deletion of sheets should be adopted. The page number should include:

- an identification of the part of the AIP;
- the section; and
- subsection, as applicable;

thus creating a separate set of numbers for each subject (e.g. GEN 2.1-3, ENR 4.1-1 or AD 2.2-3).

Editorial Note.— 5.2.3.1.10 is relocated text from Annex 15, 4.2.4.

~~4.2.4~~ 5.2.3.1.10 A checklist giving the current date of each page in the AIP ~~series~~ shall be reissued frequently to assist the user in maintaining a current publication.

Editorial Note.— 5.2.3.1.11 is relocated text from Annex 15, 4.2.6.

~~4.2.6~~ 5.2.3.1.11 The sheet size should be no larger than 210 × 297 mm, except that larger sheets may be used provided they are folded to the same size.

Editorial Note.— 5.2.3.1.12 is relocated text from Doc 8126, 5.2.6.

~~5.2.6~~ 5.2.3.1.12 When a small number of charts are to be included and chart size is not larger than 210 mm × 297 mm or allows for folding to these dimensions, they should be contained in the AIP. If, on the other hand, there are many charts and they are frequently amended, it may be convenient to place them in a separate volume with a separate subscription service.

Editorial Note.— 5.2.3.1.13 is relocated text from Doc 8126, 5.5.1 (last part).

5.2.3.1.13 Maps and charts included in the AIP should be paginated in the same manner as other material.

Editorial Note.— 5.2.3.1.14 is relocated text from Annex 15, 4.4.7.

~~4.4.7~~ 5.2.3.1.14 AIP Supplement pages should be coloured in order to be conspicuous, preferably in yellow.

Editorial Note.— 5.2.3.1.15 is relocated text from Annex 15, 4.4.8.

~~4.4.8~~ 5.2.3.1.15 AIP Supplement pages should be kept as the first item in the AIP parts.

Note.— As alternate to eliminate the need to continuously refer to the front of the AIP for the required information, the Supplements may be divided into specific parts (e.g GEN, ENR, AD) for insertion in each AIP part, as necessary.

Editorial Note.— 5.2.3.1.16 is relocated text from Annex 15, 4.4.3.

~~4.4.3~~ 5.2.3.1.16 AIP Supplement pages shall be kept in the AIP as long as all or some of their contents remain valid.

5.2.3.2 Printed AIC

Editorial Note.— 5.2.3.2.1 is relocated text from Annex 15, 7.2.4.

~~7.2.4~~ 5.2.3.2.1 **Recommendation.**—Differentiation and identification of AIC topics according to subjects using colour coding should be practised where the numbers of AIC in force are sufficient to make identification in this form necessary.

Editorial Note.— 5.2.3.2.2 is relocated text from Doc 8126, second sentence of 7.3.1.

5.2.3.2.2 ~~In addition,~~ It is highly recommended that AIC be colour coded by subject where there are sufficient circulars in force to warrant such identification, e.g.:

- a) white — administrative;
- b) yellow — ATC;
- c) pink — safety;
- d) mauve — danger area map; and
- e) green — maps/charts.

5.2.4 Electronic AIP (eAIP)

Editorial Note.— Note is relocated text from Annex 15, Notes to 4.6.1.

Note.— *Guidance material for the production and provision of the eAIP is contained in Doc 8126.*

Editorial Note.— 5.2.4.1 is relocated text from Annex 15, 4.6.2.

~~4.6.2~~ **5.2.4.1** When provided, the information content of the eAIP and the structure of chapters, sections and sub-sections shall follow the content and structure of the paper AIP. The eAIP shall include files that allow for printing a paper AIP.

5.2.4.2 New or revised information shall be identified either by an annotation against it in the margin or by a mechanism that allows comparing the new/revised information with the previous one.

Editorial Note.— 5.2.4.3 and Note are relocated text from Annex 15, 4.6.3.

~~4.6.3~~ **5.2.4.3** When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the Internet.

Note.— *Guidance material on the use of the Internet is contained in Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).*

5.2.5 NOTAM

5.2.5.1 General specifications

Editorial Note.— 5.2.5.1.1 is relocated text from Annex 15, 5.2.1.

~~5.2.1~~ **5.2.5.1.1** Except as otherwise provided in ~~5.2.3~~ **5.2.5.1.4** and ~~5.2.4~~ **5.2.5.1.5**, each NOTAM shall contain the information in the order shown in the NOTAM Format in Appendix ~~3~~ **6**.

Editorial Note.— The Note is relocated text from Annex 15, Note to 5.2.2.

Note.— *Detailed guidance material covering NOTAM, SNOWTAM, ASHTAM and pre-flight information bulletin (PIB) production is contained in Doc 8126.*

Editorial Note.— 5.2.5.1.2 is relocated text from Annex 15, 5.2.2

~~5.2.2~~ 5.2.5.1.2 Text of NOTAM text shall be composed of the significations/uniform abbreviated phraseology assigned to the ICAO NOTAM Code complemented by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language.

Editorial Note.— Note is relocated text from Annex 15, Note to 5.2.2.1.

Note3. — The ICAO NOTAM Code together with significations/uniform abbreviated phraseology, and ICAO Abbreviations are those contained in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Note 14. — The ICAO NOTAM Code together with significations/uniform abbreviated phraseology, and ICAO Abbreviations are those contained in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

Note 2.— Additional procedures covering the reporting of runway surface conditions is contained in the Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes, Doc 9981).

Editorial Note.— 5.2.5.1.3 is relocated text from Annex 15, 5.2.2.1.

~~5.2.2.1~~ 5.2.5.1.3 When NOTAM are selected for international distribution, English text shall be included for those parts expressed in plain language. All NOTAM shall be issued in the English language.

Note.— If necessary for domestic users, NOTAM may additionally be issued in a national language.

Editorial Note.— 5.2.5.1.4 is relocated text from Annex 15, 5.2.3.

~~5.2.3~~ 5.2.5.1.4 Until 4 November 2020, information concerning snow, slush, ice and standing water on aerodrome/heliport pavements shall, when reported by means of a SNOWTAM, contain the information in the order shown in the SNOWTAM Format in Appendix 24.

5.2.5.1.4 As of 5 November 2020, information concerning snow, slush, ice and standing water on aerodrome/heliport pavements shall, when reported, frost, standing water, or water associated with snow, slush, ice or frost on the movement area shall be disseminated by means of a SNOWTAM, and shall contain the information in the order shown in the SNOWTAM Format in Appendix 24.

Note.— The origin and order of the information is a result of assessment processes and procedures prescribed in the PANS-Aerodromes (Doc 9981).

Editorial Note.— 5.2.5.1.5 is relocated text from Annex 15, 5.2.4.

~~5.2.4~~ 5.2.5.1.5 Information concerning an operationally significant change in volcanic activity, a volcanic eruption and/or volcanic ash cloud shall, when reported by means of an ASHTAM, contain the information in the order shown in the ASHTAM Format in Appendix 35.

Editorial Note.— 5.2.5.1.6 is relocated text from Annex 15, 5.2.6.

~~5.2.6~~ 5.2.5.1.6 When errors occur in a NOTAM, a NOTAM with a new number to replace the erroneous NOTAM shall be issued or the erroneous NOTAM shall be cancelled and a new NOTAM issued.

3 Applicable until 4 November 2020.

4 Applicable as of 5 November 2020.

Editorial Note.— 5.2.5.1.7; 5.2.5.1.7.1; 5.2.5.1.8 are relocated text from Annex 15, 5.2.7.

~~5.2.7~~ 5.2.5.1.7 When a NOTAM is issued which cancels or replaces a previous NOTAM, the series and number of the previous NOTAM shall be indicated.

5.2.5.1.7.1 The series, location indicator and subject of both NOTAM shall be the same.

5.2.5.1.8 Only one NOTAM shall be cancelled or replaced by a NOTAM.

Editorial Note.— 5.2.5.1.9 and Note are relocated text from Annex 15, 5.2.8.

~~5.2.8~~ 5.2.5.1.9 Each NOTAM shall deal with only one subject and one condition of the subject.

Note.— *Guidance material concerning the combination of a subject and a condition of the subject in accordance with the NOTAM Selection Criteria is contained in Doc 8126.*

Editorial Note.— 5.2.5.1.10 is relocated text from Annex 15, 5.2.9.

~~5.2.9~~ 5.2.5.1.10 Each NOTAM shall be as brief as possible and so compiled that its meaning is clear without the need to refer to another document.

Editorial Note.— 5.2.5.1.11 is relocated text from Annex 15, 5.2.10.

~~5.2.10~~ 5.2.5.1.11 Each NOTAM shall be transmitted as a single telecommunication message.

Editorial Note.— 5.2.5.1.12 is relocated text from Annex 15, 5.2.11.

~~5.2.11~~ 5.2.5.1.12 A NOTAM containing permanent or temporary information of long duration shall carry appropriate AIP or AIP Supplement references.

Editorial Note.— 5.2.5.1.13 is relocated text from Annex 15, 5.2.12.

~~5.2.12~~ 5.2.5.1.13 Location indicators included in the text of a NOTAM shall be those contained in *Location Indicators* (Doc 7910).

Editorial Note.— 5.2.5.1.13.1 is relocated text from Annex 15, 5.2.12.1.

~~5.2.12.1~~ 5.2.5.1.13.1 In no case shall a curtailed form of such indicators be used.

Editorial Note.— 5.2.5.1.14 is relocated text from Annex 15, 5.2.12.2.

~~5.2.12.2~~ 5.2.5.1.14 Where no ICAO location indicator is assigned to the location, its place name ~~spelt in accordance with 4.3.2~~ shall be entered in plain language, spelt in conformity with local usage, transliterated, when necessary, into the ISO Basic-Latin alphabet.

5.2.5.2 NOTAM number and series allocation

Editorial Note.— 5.2.5.2.1 is relocated text from Annex 15, 5.2.5.

~~5.2.5~~ 5.2.5.2.1 The International NOTAM ~~originator~~ Office shall allocate to each NOTAM a

series identified by a letter and a four-digit number followed by a stroke and a two-digit number for the year. The four-digit number shall be consecutive and based on the calendar year.

Editorial Note.— 5.2.5.2.2 is relocated text from Annex 15, Note to 5.2.5.

Note.— 5.2.5.2.2 Letters ~~A to Z, with the exception of S and T, may~~ shall not be used to identify a NOTAM series.

5.2.5.2.3 All NOTAM shall be divided in series based on subject, traffic or location or a combination thereof, depending on end-user needs. NOTAM for aerodromes allowing international air traffic shall be issued in international NOTAM series.

5.2.5.2.4 If NOTAM is issued in both English and a national language, the NOTAM series shall be organized so that the national language series are equivalent to the English language series in terms of content.

5.2.5.2.5 Whenever possible, the national language series should have the same numbering as the English language series to facilitate comparison.

5.2.5.2.6 The content and geographical coverage of each NOTAM series shall be stated in detail in the AIP, GEN 3.

5.2.5.2.7 Series allocation shall be monitored and, if required, appropriate measures shall be taken to assure that no series reach the maximum possible number of issued NOTAM before the end of the calendar year.

5.2.5.3 NOTAM checklist

Editorial Note.— 5.2.5.3.1 and Note are relocated text from Annex 15, 5.2.13.

~~5.2.13~~ 5.2.5.3.1 A checklist of valid NOTAM shall be issued as a NOTAM checklist ~~over the Aeronautical Fixed Service (AFS) at intervals of not more than one month using the NOTAM Format specified in Appendix 6.~~

Note.— Omitting a NOTAM from the checklist does not ~~serve to~~ cancel a NOTAM.

Editorial Note.— 5.2.5.3.2 is relocated text from Annex 15, second sentence of 5.2.13.

5.2.5.3.2 One NOTAM checklist shall be issued for each series.

Editorial Note.— 5.2.5.3.3 is relocated text from Annex 15, 5.2.13.1.

~~5.2.13.1~~ 5.2.5.3.3 A ~~checklist of~~ NOTAM checklist shall refer to the latest AIP Amendments, AIP Supplements, data sets and at least the internationally distributed AIC, and, when it is selected, include the checklist of AIP Supplements.

Editorial Note.— 5.2.5.3.4 is relocated text from Annex 15, 5.2.13.2.

~~5.2.13.2~~ 5.2.5.3.4 A ~~checklist of~~ NOTAM checklist shall have the same distribution as the actual message series to which they refer and shall be clearly identified as a checklist.

5.3 Digital Data

5.3.1 General provisions

Editorial Note.— 5.3.1.1 and Note is relocated text from Annex 15, 11.2.1

~~4.1.2.1~~ 5.3.1.1 To facilitate and support the use of exchange of digital data sets between data providers and data users, ~~t~~The ISO 19100 series of standards for geographic information ~~shall~~ should be used as a reference framework.

Note.— ~~This is intended to facilitate and support the use and exchange of aerodrome mapping data between data providers and data users~~ Guidance material concerning the use of ISO 19100 standards is contained in the AIS Manual.

Editorial Note.— 5.3.1.2 and Note 1 are relocated text from Annex 15, 10.4.2.

~~10.4.2~~ 5.3.1.2 A ~~comprehensive statement~~ description of available ~~electronic terrain and obstacle~~ digital data sets shall be provided in the form of ~~terrain~~ data product specifications as well as ~~obstacle data product specifications~~ on which basis air navigation users will be able to evaluate the products and determine whether they fulfil the requirements for their intended use (application).

Note 1.— ~~ISO Standard 19131 specifies the requirements and outline of data product specifications for geographic information~~ outlines the specifications of geographic data products.

Editorial Note.— Note 2 is relocated text from Annex 15, Note to 11.2.2.

Note 2.— This ~~may~~ includes an overview, specification scope, data product identification, data content and structure, reference system, data quality, data capture, data maintenance, data portrayal, data product delivery, additional information, and metadata.

Editorial Note.— 5.3.1.3 and Note are relocated text from Annex 15, 11.3.1.

~~4.1.3.1~~ 5.3.1.3 The content and structure of ~~aerodrome mapping~~ digital data sets shall be defined in terms of an application schema and a feature catalogue.

Note.— ~~ISO Standard 19109 contains rules for application schema while ISO Standard 19110 describes the feature cataloguing methodology for geographic information.~~

Editorial Note.— 5.3.1.4 is relocated text from Annex 15, 3.6.4.

~~3.6.4 Recommendation.~~— 5.3.1.4 The aeronautical information model used should encompass the aeronautical data and aeronautical information to be exchanged.

Editorial Note.— 5.3.1.5 is relocated text from Annex 15, 3.6.5.

~~3.6.5 Recommendation.~~— 5.3.1.5 The aeronautical information model used should:

- a) use the Unified Modelling Language (UML) to describe the aeronautical information features and their properties, associations and data types;
- b) include data value constraints and data verification rules;
- c) include provisions for metadata as specified in ~~3.4.2~~ 4.2.1 and 5.3.2; and

- d) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle.

Editorial Note.— 5.3.1.6, Notes 1 and 2 are relocated text from Annex 15, 3.6.6.

~~3.6.6 Recommendation.~~—5.3.1.6 The aeronautical data exchange model used should:

- a) apply a commonly used data encoding format;
- b) cover all the classes, attributes, data types and associations of the aeronautical information model detailed in ~~3.6.5~~ 5.3.1.5; and
- c) provide an extension mechanism by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardization.

Note 1.— *The intent of using a commonly used data encoding format is to ensure interoperability of aeronautical data exchange between agencies and organizations involved in the data processing chain.*

Note 2.— *Examples of commonly used data encoding formats include Extensible Markup Language (XML), Geography Markup Language (GML), and JavaScript Object Notation (JSON).*

5.3.1.7 Charts, maps or diagrams should be used to complement digital data sets.

5.3.2 Metadata

5.3.2.1 Each data set shall include the following minimum set of metadata:

- a) the name of the organization or entities providing the data set;
- b) the date and time when the data set was provided;
- c) period of validity of the data set; and
- d) any limitations with regard to the use of the data set.'

Note.— *ISO Standard 19115 specifies requirements for geographic information metadata.*

5.3.3 Data sets

Note.— *A data subject may appear in multiple data sets.*

5.3.3.1 AIP data set

Note.— *The purpose of the AIP data set is to support the initial transition of the ATM domain towards the use of digital data sets instead of paper products. Therefore, its scope is defined considering the likelihood that the data contained in this set is actually being used in digital format by service providers, ATC and IFR/VFR airspace users.*

5.3.3.1.1 The AIP data set shall include data about the following subjects, with the properties indicated in brackets being included as a minimum (if applicable):

- a) ATS airspace (type, name, lateral limits, vertical limits, class of airspace);
- b) Special activity airspace (type, name, lateral limits, vertical limits, restriction, activation);
- c) ATS Route and Other Route (designator, flight rules);
- d) Route segment (navigation specification, from point, to point, track, length, upper limit, lower limit, MEA, MOCA, direction of cruising level, required navigation performance);
- e) Waypoint – en-route (identification, location, formation);
- f) Aerodrome/Heliport (ICAO location indicator, name, designator IATA, served city, certified ICAO, certification date, certification expiration date, control type, field elevation, reference temperature, magnetic variation, reference point);
- g) Runway (designator, nominal length, nominal width, surface type, strength);
- h) Runway direction (designator, true bearing, threshold, TORA, TODA, ASDA, LDA);
- i) FATO (designation, length, width, threshold point);
- j) TLOF (designator, centre point, length, width, surface type);
- k) Radio navigation aid (type, identification, name, aerodrome served, hours of operation, magnetic variation, frequency/channel, position, elevation, magnetic bearing, true bearing, zero bearing direction);

Note 1.— The description of the data subjects, their properties, data type and applicable data quality requirements is provided in Appendix 1.

Note 2.— The AIP data set includes relevant AIP Amendment and SUPPs information.

5.3.3.1.2 When a property is not defined for a particular occurrence of the subjects listed in 5.3.3.1.1, the AIP data sub-set shall include an explicit “not applicable” indication.

5.3.3.2 Terrain and obstacle data sets

Editorial Note.— Note to 5.3.3.2 is relocated text from Annex 15, Chapter 10

Note.— ~~Electronic~~ Terrain and obstacle data are intended to be used in the following air navigation applications:

- a) ground proximity warning system with forward looking terrain avoidance function and minimum safe altitude warning (MSAW) system;
- b) determination of contingency procedures for use in the event of an emergency during a missed approach or take-off;
- c) aircraft operating limitations analysis;
- d) instrument procedure design (including circling procedure);

- e) determination of en-route “drift-down” procedure and en-route emergency landing location;
- f) advanced surface movement guidance and control system (A-SMGCS); and
- g) aeronautical chart production and on-board databases.

The data may also be used in other applications such as flight simulator and synthetic vision systems, and may assist in determining the height restriction or removal of obstacles that pose a hazard to air navigation.

5.3.3.2.1 Terrain data set

Editorial Note.— 5.3.3.2.1.1 and Note are relocated text from Annex 15, last part of 10.2.1.

5.3.3.2.1.1 A terrain grid shall be angular or linear and shall be of regular or irregular shape.

Note.— *In regions of higher latitudes, latitude grid spacing may be adjusted to maintain a constant linear density of measurement points.*

Editorial Note.— 5.3.3.2.1.2 is relocated text from Annex 15, 10.2.2.

~~10.2.2~~ 5.3.3.2.1.2 Sets of ~~electronic~~ terrain data shall include spatial (position and elevation), thematic and temporal aspects for the surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles. ~~In practical terms, and~~ Depending on the acquisition method used, this shall represent the continuous surface that exists at the bare Earth, the top of the canopy or something in-between, also known as “first reflective surface”.

Editorial Note.— 5.3.3.2.1.3 is relocated text from Annex 15, 10.2.3.

~~10.2.3~~ 5.3.3.2.1.3 In terrain data sets, only one feature type, i.e. terrain, shall be provided. Feature attributes describing terrain shall be those listed in ~~Table A8-3~~ Appendix 6, Table A6-1. The terrain feature attributes listed in ~~Table A8-3~~ Appendix 6, Table A6-1 represent the minimum set of terrain attributes, and those annotated as mandatory shall be recorded in the terrain data set.

Editorial Note.— 5.3.3.2.1.4 is relocated text from Annex 15, 10.2.4.

~~10.2.4~~ 5.3.3.2.1.4 ~~Electronic~~ Terrain data for each area shall conform to the applicable numerical requirements in ~~Appendix 8, Table A8-1~~ Appendix 1.

5.3.3.2.2 Obstacle data set

Editorial Note.— 5.3.3.2.2.1 is relocated text from Annex 15, 10.3.1.

~~10.3.1~~ 5.3.3.2.2.1 Obstacle data elements are features that shall be represented in the data sets by points, lines or polygons.

Editorial Note.— 5.3.3.2.2.2 and Note are relocated text from Annex 15, 10.3.2.

~~10.3.2~~ 5.3.3.2.2.2 In an obstacle data set, all defined obstacle feature types shall be provided and

each of them shall be described according to the list of mandatory attributes provided in Appendix 86, Table A8-4 A6-2.

Note.— By definition, obstacles can be fixed (permanent or temporary) or mobile. Specific attributes associated with mobile (feature operations) and temporary types of obstacles are annotated in Appendix 86, Table A8-4 A6-2, as optional attributes. If these types of obstacles are to be provided in the data set, appropriate attributes describing such obstacles are also required.

Editorial Note.— 5.3.3.2.2.3 is relocated text from Annex 15, 10.3.3.

~~10.3.3~~ **5.3.3.2.2.3** ~~Electronic~~ Obstacle data for each area shall conform to the applicable numerical requirements contained in Appendix 81, Table A8-2.

Editorial Note.— 5.3.3.2.2.4 is relocated text from Annex 15, 10.4.10.

~~10.4.10~~ **5.3.3.2.2.4** The obstacle data product specification, supported by geographical coordinates for each aerodrome included within the data set, shall describe the following areas:

- Areas 2a, 2b, 2c, 2d;
- the take-off flight path area; and
- the obstacle limitation surfaces.

Editorial Note.— Note to 5.3.3.2.2.4 is relocated text from Annex 15, Note to 10.1.9.

Note.— Area 4 terrain data and Area 2 obstacle data are normally sufficient to support the production of the Precision Approach Terrain Chart — ICAO. When more detailed obstacle data are required for Area 4, these may be provided in accordance with the Area 4 obstacle data requirements specified in Appendix 86, Table A8-2 A6-2. Guidance on appropriate obstacles for this chart is given in the Aeronautical Chart Manual (Doc 8697).

5.3.3.3 Aerodrome mapping data sets

Editorial Note.— Notes 1 and 2 to 5.3.3.3 are relocated text from Annex 15, Chapter 11.

Note 1.— Aerodrome mapping data include aerodrome geographic information that supports applications which improve the user's situational awareness or supplements surface navigation, thereby increasing safety margins and operational efficiency. Aerodrome mapping data sets with appropriate data element accuracy support requirements for collaborative decision making, common situational awareness, and aerodrome guidance applications are intended to be used, among others, in the following air navigation applications:

- a) position and route awareness including moving maps with own ship position, surface guidance and navigation (such as A-SMGCS);
- b) traffic awareness including surveillance and runway incursion detection and alerting;
- c) facilitation of aerodrome-related aeronautical information, including NOTAM;
- d) resource and aerodrome facility management; and

- e) aeronautical chart production.

The data may also be used in other applications such as training/flight simulator and synthetic vision systems.

Note 2.— Aerodrome mapping data are organized and arranged in aerodrome mapping databases (AMDBs) for ease of electronic storage and usage by appropriate applications.

Note 3.— The content of the aerodrome mapping data sets is defined in EUROCAE ED99D / RTCA DO 272D

Editorial Note.— Note 4 to 5.3.3.3 is relocated text from Annex 15, Note to 11.3.3.

Note 4.— Metadata elements applicable to aerodrome mapping data are contained in RTCA Document DO-291B and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-119B — Interchange Standards for Terrain, Obstacle, and Aerodrome Mapping Data.

5.3.3.3.1 Aerodrome mapping data — requirements for provision

Editorial Note.— 5.3.3.3.1.1 and Notes are relocated text from Annex 15, 11.1.1

~~11.1.1 Recommendation.—~~ 5.3.3.3.1.1 Aerodrome mapping data should be supported by electronic terrain and obstacle data for Area 3 in order to ensure consistency and quality of all geographical data related to the aerodrome.

Note 1.— Accuracy and integrity requirements for aerodrome mapping data are contained in Annex 14, Volume I, Appendix 51.

Note 2.— Electronic terrain and obstacle data pertaining to Area 3 and aerodrome mapping data may be originated using common acquisition techniques and managed within a single geographic information system (GIS).

~~Note 3.— Supporting material with respect to the processing of electronic terrain and obstacle data and aerodrome mapping data is contained in RTCA Document DO 200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED 76 — Standards for Processing Aeronautical Data.~~ The content of the aerodrome mapping data sets is defined in EUROCAE ED99D / RTCA DO 272D.

5.3.3.4 Instrument flight procedure data set

Note.— The purpose of the instrument flight procedure data set is to support the initial transition of the ATM domain towards the use of digital data sets instead of paper products. Therefore, its scope is defined considering the likelihood that the data contained in this set is actually being used in digital format by service providers, ATC and IFR/VFR airspace users.

5.3.3.4.1 The instrument flight procedure data set shall include data about the following data subjects, with the properties indicated in brackets being included as a minimum (if applicable):

- a) Procedure (all properties);
- b) Procedure segment (all properties);
- c) Final approach segment (all properties);

- d) Procedure fix (all properties);
- e) Procedure holding (all properties);
- f) Helicopter procedure (all properties).

Note 1.— The description of the data subjects, their properties, data type and applicable data quality requirements is provided in Appendix 1.

Note 2.— The Instrument Flight Procedure data set should also cover the data publication requirements contained in PANS-OPS, Doc 8168, Volume II.

5.4 Distribution Services

5.4.1 General

Editorial Note.— 5.4.1.1 is relocated text from Annex 15, Note 3 to 3.3.3.2.

~~Note 3.~~ **5.4.1.1** Distribution to the next intended user will differ in the delivery method applied which may either be:

- a) Physical distribution. The means by which aeronautical data and aeronautical information distribution is achieved through the delivery of a physical package, such as postal services; or
- b) Direct electronic distribution. The means by which aeronautical data and aeronautical information distribution is achieved automatically through the use of a direct electronic connection between the AIS and the next intended user.

Editorial Note.—5.4.1.2 is relocated text from Annex 15, Note 4 to 3.3.3.2.

~~Note 4.~~ **5.4.1.2** Different delivery methods and data media may require different procedures to ensure the required data quality.

Note.— Further guidance on digital data set distribution can be found in the Manual on System Wide Information Management (SWIM) Concept (Doc 10039).

5.4.1.3 A checklist of the available data sets, including their effective and publication dates, shall be made available to allow the users to ensure that current data is being used.

5.4.1.4 The checklist of the data sets shall be made available through the same distribution mechanism as used for the data sets.

5.4.2 NOTAM distribution

Editorial Note.— 5.4.2.1 is relocated text from Annex 15, 2.3.3 and the Note is relocated text from Annex 15, Note to 5.3.4.

~~2.3.3~~ **5.4.2.1** An AIS aeronautical information service shall arrange, as necessary, to satisfy operational requirements for the issuance and receipt of NOTAM distributed by telecommunication.

Note.— Arrangements may be made for direct exchange of SNOWTAM (see Appendix 24) between aerodromes/heliports.

Editorial Note.— 5.4.2.2 is relocated text from Annex 15, 5.3.4.

~~5.3.4~~ 5.4.2.2 The international exchange of ASHTAM (see ~~5.2.4~~ 5.2.5.1.6), and NOTAM where States continue to use NOTAM for distribution of information on volcanic activity, shall include volcanic ash advisory centres and the centres designated by regional air navigation agreement for the operation of AFS ~~satellite distribution systems (satellite distribution system for information relating to air navigation Secure Aviation Data Information Service (SADIS) and international satellite communications system (ISCS))~~ the World Area Forecast System (WAFS) Internet file service (WIFS), and shall take account of the requirements of long-range operations.

Editorial Note.— 5.4.2.3 is relocated text from Annex 15, 5.3.4.1.

~~5.3.4.1~~ 5.4.2.3 ~~These~~ The exchanges of NOTAM between international NOTAM offices and between the international NOTAM offices and multinational NOTAM Processing Units shall, as far as practicable, ~~be limited to the requirements of the receiving States concerned by means of separate series providing for at least international and domestic flights~~ cover the needs of operations personnel including flight crew members.

Editorial Note.— 5.4.2.4 is relocated text from Annex 15, 5.3.4.2.

~~5.3.4.2~~ 5.4.2.4 A predetermined distribution system for NOTAM transmitted on the AFS in accordance with ~~Appendix 5~~ Annex 15, 6.3.2.3 shall be used whenever possible, subject to the requirements of ~~5.3.4~~ 5.4.2.3.

Editorial Note.— 5.4.2.5 is relocated text from Annex 15, 5.3.3.

~~5.3.3~~ 5.4.2.5 The originating State shall upon request grant distribution ~~select the~~ of NOTAM series ~~that are to be given international distribution~~ other than those distributed internationally.

5.5 Pre-flight information services

5.5.1 Geographic coverage for pre-flight information services should be determined and periodically reviewed. In general, the coverage zone should be limited to the FIR within which the aerodrome/heliport is located, the FIR(s) adjacent thereto, and all air route or portion of route flown without an intermediate landing, originating at the aerodrome/heliport and extending beyond the FIR(s) mentioned.

5.5.2 Although NOTAM with purpose “M” is regarded not subject for a briefing but available on request, all NOTAM shall be provided for briefing by default and that content reduction should be at user’s discretion.

Editorial Note.— 5.5.3 is relocated text from Annex 15, 8.2.1.

~~8.2.1~~ 5.5.3 Automated pre-flight information systems shall be used to make aeronautical data and aeronautical information available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes. The aeronautical data and aeronautical information made available shall comply with the provisions of ~~8.1.2 and 8.1.3~~ Annex 15.

Editorial Note.— 5.5.4 is relocated text from Annex 15, 8.2.2.

~~8.2.2~~ **5.5.4** Self-briefing facilities of an automated pre-flight information system shall provide access to operations personnel, including flight crew members and other aeronautical personnel concerned, for consultation as necessary with the aeronautical information service by telephone or other suitable telecommunications means. The human/machine interface of such facilities shall ensure easy access in a guided manner to all relevant information/data.

Editorial Note.— 5.5.5 is relocated text from Annex 15, 8.2.3 and Note to 8.2.3.

~~8.2.3~~ **5.5.5** Automated pre-flight information systems for the supply of aeronautical data and aeronautical information for self-briefing, flight planning and flight information service shall:

- a) provide for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical data stored;
- b) permit access to the system by operations personnel including flight crew members, aeronautical personnel concerned and other aeronautical users through suitable telecommunications means;
- c) ensure provision, in paper copy form, of the aeronautical data and aeronautical information accessed, as required;
- d) use access and interrogation procedures based on abbreviated plain language and ICAO location indicators, as appropriate, or based on a menu-driven user interface or other appropriate mechanism as agreed between the civil aviation authority and operator concerned; and
- e) provide for rapid response to a user request for information.

Note.— ICAO abbreviations and codes and location indicators are given respectively in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400) and Location Indicators (Doc 7910).

Editorial Note.— 5.5.6 is relocated text from Annex 15, 8.2.4.

~~8.2.4 Recommendation.~~— **5.5.6** Automated pre-flight information systems providing a harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information in accordance with **5.5.3** ~~8.2.4~~ and meteorological information in accordance with 9.4.1 of Annex 3 — *Meteorological Service for International Air Navigation*, should be established by an agreement between the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 2.1.1 c) and the relevant meteorological authority.

Editorial Note.— 5.5.7 is relocated text from Annex 15, 8.2.5 and Note to 8.2.5.

8.2.5 5.5.7 Where automated pre-flight information systems are used to provide the harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical data, aeronautical information and meteorological information, the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 2.1.1 c) shall remain responsible for the quality and timeliness of the aeronautical data

and aeronautical information provided by means of such a system.

Note.— The meteorological authority concerned remains responsible for the quality of the meteorological information provided by means of such a system in accordance with 9.4.3 of Annex 3.

Editorial Note.— Insert new text as follows:

Chapter 6

AERONAUTICAL INFORMATION UPDATES

6.1 Aeronautical information product updates

The same update cycle shall be applied to the AIP and the digital data sets in order to ensure the consistency of the data items that appear in multiple aeronautical information products.

6.1.2 Specifications for AIP amendments

Editorial Note.— 6.1.2.1 is relocated text from Annex 15, 4.2.9.1 and Note to 4.2.9.1.

~~4.2.9.1~~ 6.1.2.1 The AIP amendment regular interval referred to in 4.2.9 shall be specified in the AIP, Part 1 — General (GEN).

Note.— Guidance material on the establishment of intervals between publication dates of AIP Amendments is contained in Doc 8126.

Editorial Note.— 6.1.2.2 is relocated text from Annex 15, 4.3.7.

~~4.3.7~~ 6.1.2.2 When an AIP Amendment will not be published at the established interval or publication date, a NIL notification shall be originated and distributed by the ~~monthly plain language list of valid NOTAM checklist required by 5.2.13.3.~~

6.1.2.3 Recourse to hand amendments or annotations shall be kept to a minimum.

6.1.2.4 When the AIP is provided in more than one volume, each volume should include separate amendment services.

6.1.3 Specifications for AIP Supplements

Editorial Note.— 6.1.3.1 is relocated text from Annex 15, 4.4.4 and Note to 4.4.4.

~~4.4.4~~ 6.1.3.1 When an error occurs in an AIP Supplement or when the period of validity of an AIP Supplement is changed, a new AIP Supplement shall be published as a replacement.

Note 1.— The requirements for NOTAM apply when time constraints do not allow sufficient time for the distribution of an AIP Supplement.

Editorial Note.— Note 2 is relocated text from Annex 15, Note to 4.4.1.

Note 2.— Guidance material on the use of AIP Supplements together with examples of such use is contained in Doc 8126.

6.1.4 Specifications for NOTAM

6.1.4.1 NOTAM should be published with sufficient lead time for the affected parties to take any required action, except in the case of unserviceability, volcanic activity, release of radioactive material, toxic chemicals and other events that cannot be foreseen.

Editorial Note.— 6.1.4.2 is relocated text from Annex 15, 5.1.1.5.

~~5.1.1.5~~ 6.1.4.2 NOTAM notifying unserviceability of aids to air navigation, facilities or communication services shall give an estimate of the period of unserviceability or the time at which restoration of service is expected.

Editorial Note.— 6.1.4.3 is relocated text from Annex 15, 5.1.1.4.

~~5.1.1.4~~ 6.1.4.3 At least seven days' advance notice shall be given of the activation of established danger, restricted or prohibited areas and of activities requiring temporary airspace restrictions other than for emergency operations.

Editorial Note.— 6.1.4.4 is relocated text from Annex 15, 5.1.1.4.1 and Note to 5.1.1.4.1.

~~5.1.1.4.1 Recommendation.~~— 6.1.4.4 Notice of any subsequent cancellation of the activities or any reduction of the hours of activity or the dimensions of the airspace should be given as soon as possible.

Note.— *Whenever possible, at least 24 hours' advance notice is desirable, to permit timely completion of the notification process and to facilitate airspace utilization planning.*

6.1.4.5 Within three months from the issuing of a permanent NOTAM, the information contained in the NOTAM shall be included in the aeronautical information products affected.

6.1.4.6 Within three months from the issuing of a temporary NOTAM of long duration, the information contained in the NOTAM shall be included in the AIP Supplement.

6.1.4.7 When a NOTAM with estimated end of validity unexpectedly exceeds the three-month period, a replacement NOTAM shall be issued, unless the condition is expected to last for a further period of more than three months; in this case, an AIP Supplement shall be issued.

Editorial Note.— 6.1.4.8 is relocated text from Annex 15, first part of 5.1.1.6.

~~5.1.1.6~~ 6.1.4.8 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a so-called “Trigger” NOTAM shall be originated giving a brief description of the contents, the effective date and time, and the reference number of the amendment or supplement.

Editorial Note.— 6.1.4.9 is relocated text from Annex 15, last part of 5.1.1.6.

6.1.4.9 This NOTAM shall come into force on the same effective date and time as the amendment or supplement and shall remain valid in the pre-flight information bulletin for a period of fourteen days.

6.1.4.10 In the case of an AIP Supplement, a “Trigger ”NOTAM shall remain valid for a period of fourteen days.

6.1.4.11 In the case of an AIP Supplement that is valid for less than fourteen days, the “Trigger” NOTAM shall remain valid for the complete validity period of the AIP Supplement.

6.1.4.12 In the case of an AIP Supplement that is valid for fourteen days or more, the “Trigger” NOTAM shall remain valid for at least fourteen days.

Editorial Note.— Note to 6.1.4.12 is relocated text from Annex 15, Note to 5.1.1.6.

Note.— Guidance material for the origination of NOTAM announcing the existence of AIRAC AIP Amendments or AIP Supplements (“Trigger NOTAM”) is contained in the Aeronautical Information Services Manual (Doc 8126).

6.1.5 Specifications for digital data updates

6.1.5.1 The update interval for the digital data sets shall be specified in the data product specification.

6.1.5.2 Data sets that have been made available in advance (according to the AIRAC cycle) shall be updated with the non-AIRAC changes that occurred in between the publication and the effective date.

APPENDIX 1. AERONAUTICAL DATA CATALOGUE

Note 1.— The Aeronautical Data Catalogue is available electronically and will be provided as part of the PANS-AIM.

Note 2.— The Data Catalogue is a general description of the AIM data scope and consolidates all data that can be collected and maintained by the aeronautical information service. It provides a reference for aeronautical data origination and publication requirements.

Note 3.— The Data Catalogue provides a means for States to facilitate the identification of the organizations and authorities responsible for the origination of the aeronautical data and information. It is also providing a common list of terms and facilitating the formal arrangements between data originators and the aeronautical information service. It includes data quality requirements applicable from origination through to publication.

Note 4.— The Data Catalogue contains the aeronautical data subjects, properties and sub-properties organized in:

<i>Table A1-1</i>	<i>Aerodrome data;</i>
<i>Table A1-2</i>	<i>Airspace data;</i>
<i>Table A1-3</i>	<i>ATS and other routes data;</i>
<i>Table A1-4</i>	<i>Instrument flight procedure data;</i>
<i>Table A1-5</i>	<i>Radio navigation aids/systems data;</i>
<i>Table A1-6</i>	<i>Obstacle data;</i>
<i>Table A1-7</i>	<i>Geographic data;</i>
<i>Table A1-8</i>	<i>Terrain data;</i>
<i>Table A1-9</i>	<i>Data types; and</i>
<i>Table A1-10</i>	<i>Information about national and local regulation, services and procedures.</i>

Note 5.— The Data Catalogue provides detailed descriptions of all subjects, properties and sub-properties, the data quality requirements and the data types.

Note 6.— The data types describe the nature of the property and sub-property and specify the data elements to be collected.

Note 7.— The tables of the Data Catalogue are composed of the following columns:

(1) Subject for which data can be collected

(2)(3) Property is a an identifiable characteristic of a subject which can be further defined into sub-properties

The classification of a catalogue element as subject, property or sub-property does not impose a certain data model.

(4) The data is classified in different types. See Table A1-9 for more information on data types.

(5) A description of the data element

(6) Notes are additional information or conditions of the provision

(7) *Accuracy requirements for aeronautical data are based upon a 95 per cent confidence level.*

For those fixes and points that are serving a dual purpose, e.g. holding point and missed approach point, the higher accuracy applies.

Accuracy requirements for obstacle and terrain data are based upon a 90 per cent confidence level.

(8) *Integrity classification*

(9) *Origination type: positional data is identified as surveyed, calculated or declared*

(10) *Publication resolution*

The publication resolutions for geographical position data (latitude and longitude) are applicable to coordinates formatted in degrees, minutes, seconds. When a different format is used (such as degrees with decimals for digital data sets) or when the location is significantly further to the North/South, the publication resolution needs to be commensurate with the accuracy requirements.

(11) *Chart resolution*

Note 8.— The Data Catalogue contains quality requirements for aeronautical data as originally provided in Annex 4, Appendix 6, Annex 11, Appendix 5, Annex 14 Volume I, Appendix 4, Annex 14 Volume II, Appendix 1 and Annex 15 Appendices 7 and 8 and PANS-OPS Volume II. The framework of the Data Catalogue is designed to adapt to future quality requirements for the remaining aeronautical data properties and sub-properties.

Editorial Note.— Insert new text as follows:

APPENDIX 2. CONTENTS OF THE AERONAUTICAL INFORMATION PUBLICATION (AIP)

Note 1.— The information elements prefixed with “#AIP-DS#” may be left out when available through the AIP data set (as specified in Chapter 5, 5.2.1.1.3).

Note 2.— The information elements prefixed with “#OBS-DS#” may be left out when available through the Obstacle data set (as specified in Chapter 5, 5.3.3.2.2).

Editorial Note.— Appendix 2 text below is relocated text from Appendix 1 to Annex 15.

PART 1 — GENERAL (GEN)

When the AIP is produced as one volume, the preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments appear only in Part 1 — GEN, and the annotation “not applicable” ~~must~~ **shall** be entered against each of these subsections in Parts 2 and 3.

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments ~~must~~ **shall** be included in each volume.

GEN 0.1 Preface

Brief description of the Aeronautical Information Publication (AIP), including:

- 1) name of the publishing authority;
- 2) applicable ICAO documents;
- 3) publication media (i.e. printed, online or other electronic media);
- 4) the AIP structure and established regular amendment interval;
- 5) copyright policy, if applicable; and
- 6) service to contact in case of detected AIP errors or omissions.

GEN 0.2 Record of AIP Amendments

A record of AIP Amendments and AIRAC AIP Amendments (published in accordance with the AIRAC system) containing:

- 1) amendment number;
- 2) publication date;

- 3) date inserted (for the AIRAC AIP Amendments, effective date); and
- 4) initials of officer who inserted the amendment.

GEN 0.3 Record of AIP Supplements

A record of issued AIP Supplements containing:

- 1) Supplement number;
- 2) Supplement subject;
- 3) AIP section(s) affected;
- 4) period of validity; and
- 5) cancellation record.

GEN 0.4 Checklist of AIP pages

A checklist of AIP pages containing:

- 1) page number/chart title; and
- 2) publication or effective date (day, month by name and year) of the aeronautical information.

GEN 0.5 List of hand amendments to the AIP

A list of current hand amendments to the AIP containing:

- 1) AIP page(s) affected;
- 2) amendment text; and
- 3) AIP Amendment number by which a hand amendment was introduced.

GEN 0.6 Table of contents to Part 1

A list of sections and subsections contained in Part 1 — General (GEN).

Note.— Subsections may be listed alphabetically.

GEN 1. NATIONAL REGULATIONS AND REQUIREMENTS

GEN 1.1 Designated authorities

The addresses of designated authorities concerned with the facilitation of international air navigation (civil aviation, meteorology, customs, immigration, health, en-route and aerodrome/heliport charges, agricultural quarantine and aircraft accident investigation) containing, for each authority:

- 1) designated authority;
- 2) name of the authority;
- 3) postal address;
- 4) telephone number;
- 5) telefax number;
- 6) e-mail address;
- 7) aeronautical fixed service (AFS) address; and
- 8) website address, if available.

GEN 1.2 Entry, transit and departure of aircraft

Regulations and requirements for advance notification and applications for permission concerning entry, transit and departure of aircraft on international flights.

GEN 1.3 Entry, transit and departure of passengers and crew

Regulations (including customs, immigration and quarantine, and requirements for advance notification and applications for permission) concerning entry, transit and departure of non-immigrant passengers and crew.

GEN 1.4 Entry, transit and departure of cargo

Regulations (including customs, and requirements for advance notification and applications for permission) concerning entry, transit and departure of cargo.

Note.— Provisions for facilitating entry and departure for search, rescue, salvage, investigation, repair or salvage in connection with lost or damaged aircraft are detailed in section GEN 3.6, Search and rescue.

GEN 1.5 Aircraft instruments, equipment and flight documents

Brief description of aircraft instruments, equipment and flight documents, including:

- 1) instruments, equipment (including aircraft communication, navigation and surveillance equipment) and flight documents to be carried on aircraft, including any special requirement in addition to the provisions specified in Annex 6, Part I, Chapters 6 and 7; and
- 2) emergency locator transmitter (ELT), signalling devices and life-saving equipment as presented in Annex 6, Part I, 6.6 and Part II, 2.4.5, where so determined by regional air navigation meetings, for flights over designated land areas.

GEN 1.6 Summary of national regulations and international agreements/conventions

A list of titles and references and, where applicable, summaries of national regulations affecting air navigation, together with a list of international agreements/conventions ratified by State.

GEN 1.7 Differences from ICAO Standards, Recommended Practices and Procedures

A list of significant differences between national regulations and practices of the State and related ICAO provisions, including:

- 1) provision affected (Annex and edition number, paragraph); and
- 2) difference in full text.

All significant differences ~~must~~ **shall** be listed under this subsection. All Annexes ~~must~~ **shall** be listed in numerical order even if there is no difference to an Annex, in which case a NIL notification ~~must~~ **shall** be provided. National differences or the degree of non- application of the regional supplementary procedures (SUPPs) ~~must~~ **shall** be notified immediately following the Annex to which the supplementary procedure relates.

GEN 2. TABLES AND CODES

GEN 2.1 Measuring system, aircraft markings, holidays

GEN 2.1.1 Units of measurement

Description of units of measurement used including table of units of measurement.

GEN 2.1.2 Temporal reference system

Description of the temporal reference system (calendar and time system) employed, together with an indication of whether or not daylight saving hours are employed and how the temporal reference system is presented throughout the AIP.

GEN 2.1.3 Horizontal reference system

Brief description of the horizontal (geodetic) reference system used, including:

- 1) name/designation of the reference system;
- 2) identification and parameters of the projection;
- 3) identification of the ellipsoid used;
- 4) identification of the datum used;
- 5) area(s) of application; and
- 6) an explanation, if applicable, of the asterisk used to identify those coordinates that do not meet ~~Annex 11 and 14~~ the accuracy requirements.

GEN 2.1.4 Vertical reference system

Brief description of the vertical reference system used, including:

- 1) name/designation of the reference system;
- 2) description of the geoid model used including the parameters required for height transformation between the model used and EGM-96; and
- 3) an explanation, if applicable, of the asterisk used to identify those elevations/geoid undulations that do not meet ~~Annex 14~~ accuracy requirements.

GEN 2.1.5 Aircraft nationality and registration marks

Indication of aircraft nationality and registration marks adopted by the State.

GEN 2.1.6 Public holidays

A list of public holidays with indication of services being affected.

GEN 2.2 Abbreviations used in AIS publications

A list of alphabetically arranged abbreviations and their respective significations used by the State in its AIP and in the distribution of aeronautical data and aeronautical information with appropriate annotation for those national abbreviations that are different from those contained in the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400).

Note.— A list of alphabetically arranged definitions/glossary of terms may also be added.

GEN 2.3 Chart symbols

A list of chart symbols arranged according to the chart series where symbols are applied.

GEN 2.4 Location indicators

A list of alphabetically arranged location indicators assigned to the locations of aeronautical fixed stations to be used for encoding and decoding purposes. An annotation to locations not connected to the aeronautical fixed service (AFS) ~~must~~ **shall** be provided.

#AIP-DS# GEN 2.5 List of radio navigation aids

A list of radio navigation aids arranged alphabetically, containing:

- 1) identifier;
- 2) name of the station;
- 3) type of facility/aid; and
- 4) indication whether aid serves en-route (E), aerodrome (A) or dual (AE) purposes.

GEN 2.6 Conversion of units of measurement

Tables for conversion or, alternatively, conversion formulae between:

- 1) nautical miles and kilometres and vice versa;
- 2) feet and metres and vice versa;
- 3) decimal minutes of arc and seconds of arc and vice versa; and
- 4) other conversions as appropriate.

GEN 2.7 Sunrise/sunset

Information on the time of sunrise and sunset including a brief description of criteria used for determination of the times given and either a simple formulae or table from which times may be calculated for any location within its territory/area of responsibility, or an alphabetical list of locations for which the times are given in a table with a reference to the related page in the table and the sunrise/sunset tables for the selected stations/locations, including:

- 1) station name;
- 2) ICAO location indicator;
- 3) geographical coordinates in degrees and minutes;
- 4) date(s) for which times are given;
- 5) time for the beginning of morning civil twilight;
- 6) time for sunrise;
- 7) time for sunset; and
- 8) time for the end of evening civil twilight.

GEN 3. SERVICES

GEN 3.1 Aeronautical information services

GEN 3.1.1 Responsible service

Description of the Aeronautical Information Service (AIS) provided and its major components, including:

- 1) service/unit name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.1.2 Area of responsibility

The area of responsibility for the aeronautical information service.

GEN 3.1.3 Aeronautical publications

Description of the elements of the Integrated Aeronautical Information Package products, including:

- 1) AIP and related amendment service;
- 2) AIP Supplements;
- 3) AIC;
- 4) NOTAM and pre-flight information bulletins (PIB);
- 5) checklists and lists of valid NOTAM; and
- 6) how they may be obtained.

When an AIC is used to promulgate publication prices, that ~~must~~ shall be indicated in this section of the AIP.

GEN 3.1.4 AIRAC system

Brief description of the AIRAC system provided including a table of present and near future AIRAC dates.

GEN 3.1.5 Pre-flight information service at aerodromes/heliports

A list of aerodromes/heliports at which pre-flight information is routinely available, including an indication of relevant:

- 1) elements of the ~~Integrated Aeronautical Information Package~~ products held;
- 2) maps and charts held; and
- 3) general area of coverage of such data.

GEN 3.1.6 ~~Electronic terrain and obstacle data~~ Digital data sets

~~Details of how electronic terrain and obstacle data may be obtained, containing:~~

- 1) ~~name of the individual, service or organization responsible;~~ Description of the available data sets, including:

- a) data set title;
- b) short description;
- c) data subjects included;
- d) geographical scope; and
- e) if applicable, limitations related to its usage.

- 2) ~~street address and e-mail address of the individual, service or organization responsible;~~ Contact details of how data sets may be obtained, containing:

- a) name of the individual, service or organization responsible;
- b) street address and e-mail address of the individual, service or organization responsible;
- c) telefax number of the individual, service or organization responsible;
- d) contact telephone number of the individual, service or organization responsible;
- e) hours of service (time period including time zone when contact can be made);

- f) online information that can be used to contact the individual, service or organization; and
- g) supplemental information, if necessary, on how and when to contact the individual, service or organization.

- ~~3) telefax number of the individual, service or organization responsible;~~
- ~~4) contact telephone number of the individual, service or organization responsible;~~
- ~~5) hours of service (time period including time zone when contact can be made);~~
- ~~6) online information that can be used to contact the individual, service or organization; and~~
- ~~7) supplemental information, if necessary, on how and when to contact the individual, service or organization.~~

GEN 3.2 Aeronautical charts

GEN 3.2.1 Responsible service(s)

Description of service(s) responsible for the production of aeronautical charts, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.2.2 Maintenance of charts

Brief description of how aeronautical charts are revised and amended.

GEN 3.2.3 Purchase arrangements

Details of how charts may be obtained, containing:

- 1) service/sales agency(ies);
- 2) postal address;

- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address; and
- 7) website address, if available.

GEN 3.2.4 Aeronautical chart series available

A list of aeronautical chart series available followed by a general description of each series and an indication of the intended use.

GEN 3.2.5 List of aeronautical charts available

A list of aeronautical charts available, including:

- 1) title of series;
- 2) scale of series;
- 3) name and/or number of each chart or each sheet in a series;
- 4) price per sheet; and
- 5) date of latest revision.

GEN 3.2.6 Index to the World Aeronautical Chart (WAC) — ICAO 1:1 000 000

An index chart showing coverage and sheet layout for the WAC 1:1 000 000 produced by a State. If Aeronautical Chart — ICAO 1:500 000 is produced instead of WAC 1:1 000 000, index charts ~~must~~ shall be used to indicate coverage and sheet layout for the Aeronautical Chart — ICAO 1:500 000.

GEN 3.2.7 Topographical charts

Details of how topographical charts may be obtained, containing:

- 1) name of service/agency(ies);
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address; and
- 7) website address, if available.

GEN 3.2.8 Corrections to charts not contained in the AIP

A list of corrections to aeronautical charts not contained in the AIP, or an indication where such information can be obtained.

GEN 3.3 Air traffic services

GEN 3.3.1 Responsible service

Description of the air traffic service and its major components, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.3.2 Area of responsibility

Brief description of area of responsibility for which air traffic services are provided.

GEN 3.3.3 Types of services

Brief description of main types of air traffic services provided.

GEN 3.3.4 Coordination between the operator and ATS

General conditions under which coordination between the operator and air traffic services is effected.

GEN 3.3.5 Minimum flight altitude

The criteria used to determine minimum flight altitudes.

GEN 3.3.6 ATS units address list

A list of ATS units and their addresses arranged alphabetically, containing:

- 1) unit name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address; and
- 7) website address, if available.

GEN 3.4 Communication and navigation services

GEN 3.4.1 Responsible service

Description of the service responsible for the provision of telecommunication and navigation facilities, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;

- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.4.2 Area of responsibility

Brief description of area of responsibility for which telecommunication service is provided.

GEN 3.4.3 Types of service

Brief description of the main types of service and facilities provided, including:

- 1) radio navigation services;
- 2) voice and/or data link services;
- 3) broadcasting service;
- 4) language(s) used; and
- 5) an indication of where detailed information can be obtained.

GEN 3.4.4 Requirements and conditions

Brief description concerning the requirements and conditions under which the communication service is available.

GEN 3.4.5 Miscellaneous

Any additional information (e.g. selected radio broadcasting stations, telecommunications diagram).

GEN 3.5 Meteorological services

GEN 3.5.1 Responsible service

Brief description of the meteorological service responsible for the provision of meteorological information, including:

- 1) service name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available;
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed; and
- 9) an indication if service is not H24.

GEN 3.5.2 Area of responsibility

Brief description of area and/or air routes for which meteorological service is provided.

GEN 3.5.3 Meteorological observations and reports

Detailed description of the meteorological observations and reports provided for international air navigation, including:

- 1) name of the station and the ICAO location indicator;
- 2) type and frequency of observation including an indication of automatic observing equipment;
- 3) types of meteorological reports (e.g. METAR) and availability of a trend forecast;
- 4) specific type of observation system and number of observation sites used to observe and report surface wind, visibility, runway visual range, cloud base, temperature and, where applicable, wind shear (e.g. anemometer at intersection of runways, transmissometer next to touchdown zone, etc.);
- 5) hours of operation; and
- 6) indication of aeronautical climatological information available.

GEN 3.5.4 Types of services

Brief description of the main types of service provided, including details of briefing, consultation, display

of meteorological information, flight documentation available for operators and flight crew members, and of the methods and means used for supplying the meteorological information.

GEN 3.5.5 Notification required from operators

Minimum amount of advance notice required by the meteorological authority from operators in respect of briefing, consultation and flight documentation and other meteorological information they require or change.

GEN 3.5.6 Aircraft reports

As necessary, requirements of the meteorological authority for the making and transmission of aircraft reports.

GEN 3.5.7 VOLMET service

Description of VOLMET and/or D-VOLMET service, including:

- 1) name of transmitting station;
- 2) call sign or identification and abbreviation for the radio communication emission;
- 3) frequency or frequencies used for broadcast;
- 4) broadcasting period;
- 5) hours of service;
- 6) list of aerodromes/heliports for which reports and/or forecasts are included; and
- 7) reports, forecasts and SIGMET information included and remarks.

GEN 3.5.8 SIGMET and AIRMET service

Description of the meteorological watch provided within flight information regions or control areas for which air traffic services are provided, including a list of the meteorological watch offices with:

- 1) name of the meteorological watch office, ICAO location indicator;
- 2) hours of service;
- 3) flight information region(s) or control area(s) served;
- 4) SIGMET validity periods;
- 5) specific procedures applied to SIGMET information (e.g. for volcanic ash and tropical cyclones);
- 6) procedures applied to AIRMET information (in accordance with relevant regional air navigation agreements);
- 7) the air traffic services unit(s) provided with SIGMET and AIRMET information; and
- 8) additional information (e.g. concerning any limitation of service, etc.).

GEN 3.5.9 Other automated meteorological services

Description of available automated services for the provision of meteorological information (e.g. automated pre-flight information service accessible by telephone and/or computer modem) including:

- 1) service name;
- 2) information available;
- 3) areas, routes and aerodromes covered; and
- 4) telephone and telefax number(s), e-mail address, and, if available, website address.

GEN 3.6 Search and rescue

GEN 3.6.1 Responsible service(s)

Brief description of service(s) responsible for the provision of search and rescue (SAR), including:

- 1) service/unit name;
- 2) postal address;
- 3) telephone number;
- 4) telefax number;
- 5) e-mail address;
- 6) AFS address;
- 7) website address, if available; and
- 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed.

GEN 3.6.2 Area of responsibility

Brief description of area of responsibility within which search and rescue services are provided.

Note.— A chart may be included to supplement the description of the area.

GEN 3.6.3 Types of service

Brief description and geographical portrayal, where appropriate, of the type of service and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft.

GEN 3.6.4 SAR agreements

Brief description of SAR agreements in force, including provisions for facilitating entry and departure of other States' aircraft for search, rescue, salvage, repair or salvage in connection with lost or damaged aircraft, either with airborne notification only or after flight plan notification.

GEN 3.6.5 Conditions of availability

Brief description of provisions for search and rescue, including the general conditions under which the service and facilities are available for international use, including an indication of whether a facility available for search and rescue is specialized in SAR techniques and functions, or is specially used for other purposes but adapted for SAR purposes by training and equipment, or is only occasionally available and has no particular training or preparation for SAR work.

GEN 3.6.6 Procedures and signals used

Brief description of the procedures and signals employed by rescue aircraft and a table showing the signals to be used by survivors.

GEN 4. CHARGES FOR AERODROMES/HELIPORTS AND AIR NAVIGATION SERVICES

Reference may be made to where details of actual charges may be found, if not itemized in this chapter.

GEN 4.1 Aerodrome/heliport charges

Brief description of type of charges which may be applicable at aerodromes/heliports available for international use, including:

- 1) landing of aircraft;
- 2) parking, hangarage and long-term storage of aircraft;
- 3) passenger service;
- 4) security;
- 5) noise-related items;
- 6) other (customs, health, immigration, etc.);
- 7) exemptions/reductions; and
- 8) methods of payment.

GEN 4.2 Air navigation services charges

Brief description of charges which may be applicable to air navigation services provided for international use, including:

- 1) approach control;
- 2) route air navigation services;

- 3) cost basis for air navigation services and exemptions/reductions; and
- 4) methods of payment.

PART 2 — EN-ROUTE (ENR)

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments ~~must~~ **shall** be included in each volume. In the case of an AIP being published as one volume, the annotation “not applicable” ~~must~~ **shall** be entered against each of the above subsections.

ENR 0.61 Table of contents to Part 2

A list of sections and subsections contained in Part 2 — En-route.

Note.— Subsections may be listed alphabetically.

ENR 1. GENERAL RULES AND PROCEDURES

ENR 1.1 General rules

The requirement is for publication of the general rules as applied within the State.

ENR 1.2 Visual flight rules

The requirement is for publication of the visual flight rules as applied within the State.

ENR 1.3 Instrument flight rules

The requirement is for publication of the instrument flight rules as applied within the State.

ENR 1.4 ATS airspace classification and description

ENR 1.4.1 ATS airspace classification

The description of ATS airspace classes in the form of the ATS airspace classification table in Annex 11, Appendix 4, appropriately annotated to indicate those airspace classes not used by the State.

ENR 1.4.2 ATS airspace description

Other ATS airspace descriptions as applicable, including general textual descriptions.

ENR 1.5 Holding, approach and departure procedures

ENR 1.5.1 General

The requirement is for a statement concerning the criteria on which holding, approach and departure procedures are established. If different from ICAO provisions, the requirement is for presentation of criteria used in a tabular form.

ENR 1.5.2 Arriving flights

The requirement is to present procedures (conventional or area navigation or both) for arriving flights which are common to flights into or within the same type of airspace. If different procedures apply within a terminal airspace, a note to this effect ~~must~~ shall be given together with a reference to where the specific procedures can be found.

ENR 1.5.3 Departing flights

The requirement is to present procedures (conventional or area navigation or both) for departing flights which are common to flights departing from any aerodrome/heliport.

ENR 1.5.4 Other relevant information and procedures

Brief description of additional information, e.g. entry procedures, final approach alignment, holding procedures and patterns.

ENR 1.6 ATS surveillance services and procedures

ENR 1.6.1 Primary radar

Description of primary radar services and procedures, including:

- 1) supplementary services;
- 2) the application of radar control service;
- 3) radar and air-ground communication failure procedures;
- 4) voice and CPDLC position reporting requirements; and
- 5) graphic portrayal of area of radar coverage.

ENR 1.6.2 Secondary surveillance radar (SSR)

Description of secondary surveillance radar (SSR) operating procedures, including:

- 1) emergency procedures;
- 2) air-ground communication failure and unlawful interference procedures;
- 3) the system of SSR code assignment;

- 4) voice and CPDLC position reporting requirements; and
- 5) graphic portrayal of area of SSR coverage.

Note.— The SSR description is of particular importance in areas or routes where the possibility of interception exists.

ENR 1.6.3 Automatic dependent surveillance — broadcast (ADS-B)

Description of automatic dependent surveillance — broadcast (ADS-B) operating procedures, including:

- 1) emergency procedures;
- 2) air-ground communication failure and unlawful interference procedures;
- 3) aircraft identification requirements;
- 4) voice and CPDLC position reporting requirements; and
- 5) graphic portrayal of area of ADS-B coverage.

Note.— The ADS-B description is of particular importance in areas or routes where the possibility of interception exists.

ENR 1.6.4 Other relevant information and procedures

Brief description of additional information and procedures, e.g. radar failure procedures and transponder failure procedures.

ENR 1.7 Altimeter setting procedures

The requirement is for a statement of altimeter setting procedures in use, containing:

- 1) brief introduction with a statement concerning the ICAO documents on which the procedures are based together with differences to ICAO provisions, if any;
- 2) basic altimeter setting procedures;
- 3) description of altimeter setting region(s);
- 4) procedures applicable to operators (including pilots); and
- 5) table of cruising levels.

ENR 1.8 Regional supplementary procedures

The requirement is for presentation of regional supplementary procedures (SUPPs) affecting the entire area of responsibility.

ENR 1.9 Air traffic flow management and airspace management

Brief description of air traffic flow management (ATFM) system and airspace management, including:

- 1) ATFM structure, service area, service provided, location of unit(s) and hours of operation;
- 2) types of flow messages and descriptions of the formats; and
- 3) procedures applicable for departing flights, containing:
 - a) service responsible for provision of information on applied ATFM measures;
 - b) flight plan requirements; and
 - c) slot allocations.
- 4) *information on overall responsibility regarding airspace management within FIR(s), details of civil/military airspace allocation and management coordination, structure of manageable airspace (allocation and changes to allocation) and general operating procedures.*

ENR 1.10 Flight planning

The requirement is to indicate any restriction, limitation or advisory information related to the flight planning stage which may assist the user in the presentation of the intended flight operation, including:

- 1) procedures for the submission of a flight plan;
- 2) repetitive flight plan system; and
- 3) changes to the submitted flight plan.

ENR 1.11 Addressing of flight plan messages

The requirement is for an indication, in tabular form, of the addresses allocated to flight plans, showing:

- 1) category of flight (IFR, VFR or both);
- 2) route (into or via FIR and/or TMA); and
- 3) message address.

ENR 1.12 Interception of civil aircraft

The requirement is for a complete statement of interception procedures and visual signals to be used with a clear indication of whether ICAO provisions are applied and, if not, that differences exist.

Note.— A list of significant differences between national regulations and practices of the State and related ICAO provisions is found in Gen 1.7.

ENR 1.13 Unlawful interference

The requirement is for presentation of appropriate procedures to be applied in case of unlawful interference.

ENR 1.14 Air traffic incidents

Description of air traffic incidents reporting system, including:

- 1) definition of air traffic incidents;
- 2) use of the “Air Traffic Incident Reporting Form”;
- 3) reporting procedures (including in-flight procedures); and
- 4) purpose of reporting and handling of the form.

Note.— A copy of the “Air Traffic Incident Report Form” (PANS ATM, Doc 4444, Appendix 4) may be included for reference.

ENR 2. AIR TRAFFIC SERVICES AIRSPACE

ENR 2.1 FIR, UIR, TMA AND CTA

#AIP-DS# Detailed description of flight information regions (FIR), upper flight information regions (UIR), and control areas (CTA) (including specific CTA such as TMA), including:

- 1) name, geographical coordinates in degrees and minutes of the FIR/UIR lateral limits and in degrees, minutes and seconds of the CTA lateral limits, vertical limits and class of airspace;
- 2) identification of unit providing the service;

- 3) call sign of aeronautical station serving the unit and language(s) used, specifying the area and conditions, when and where to be used, if applicable;
- 4) frequencies, and if applicable SATVOICE number, supplemented by indications for specific purposes; and
- 5) remarks.

#AIP-DS# Control zones around military air bases not otherwise described in the AIP ~~must~~ **shall** be included in this subsection. Where the requirements of Annex 2 concerning flight plans, two-way communications and position reporting apply to all flights in order to eliminate or reduce the need for interceptions and/or where the possibility of interception exists and the maintenance of guard on the VHF emergency channel 121.5 MHz is required, a statement to this effect ~~must~~ **shall** be included for the relevant area(s) or portion(s) thereof.

A description of designated areas over which the carriage of an emergency locator transmitter (ELT) is required and where aircraft shall continuously guard the VHF emergency frequency 121.5 MHz, except for those periods when aircraft are carrying out communications on other VHF channels or when airborne equipment limitations or cockpit duties do not permit simultaneous guarding of two channels.

Note.— Other types of airspace around civil aerodromes/heliports such as control zones and aerodrome traffic zones are described in the relevant aerodrome or heliport section.

ENR 2.2 Other regulated airspace

Where established, a detailed description of other types of regulated airspace and airspace classification.

ENR 3. ATS ROUTES

Note 1.— Bearings, tracks and radials are normally magnetic. In areas of high latitude, where it is determined by the appropriate authority that reference to Magnetic North is impractical, another suitable reference, i.e. True North or Grid North, may be used.

Note 2.— Changeover points established at the midpoint between two radio navigation aids, or at the intersection of the two radials in the case of a route which changes direction between the navigation aids, need not be shown for each route segment if a general statement regarding their existence is made.

Note 3.— Guidance material on the organization of ATS Route publication is contained in the Aeronautical Information Services Manual (Doc 8126).

ENR 3.1 Lower ATS routes

#AIP-DS# Detailed description of lower ATS routes, including:

- 1) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;

- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits or minimum en-route altitudes, to the nearest higher 50 m or 100 ft, and airspace classification;
- 4) lateral limits and minimum obstacle clearance altitudes;
- 5) direction of cruising levels;
- 6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 7) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, the defined navigation specification is not considered to be an integral part of the route designator.

ENR 3.2 Upper ATS routes

#AIP-DS# Detailed description of upper ATS routes, including:

- 1) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits and airspace classification;
- 4) lateral limits;
- 5) direction of cruising levels;
- 6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 7) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, defined navigation specification is not considered to be an integral part of the route designator.

ENR 3.3 Area navigation routes

#AIP-DS# Detailed description of PBN (RNAV and RNP) routes, including:

- 1) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) in respect of waypoints defining an area navigation route, additionally as applicable:
 - a) station identification of the reference VOR/DME;
 - b) bearing to the nearest degree and the distance to the nearest tenth of a kilometre or tenth of a nautical mile from the reference VOR/DME, if the waypoint is not collocated with it; and
 - c) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft);
- 3) magnetic bearing to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between defined end-points and distance between each successive designated significant point;
- 4) upper and lower limits and airspace classification;
- 5) direction of cruising levels;
- 6) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 7) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, defined navigation specification is not considered to be an integral part of the route designator.

ENR 3.4 Helicopter routes

#AIP-DS# Detailed description of helicopter routes, including:

- 1) route designator, designation of the required communication performance (RCP) specification(s), navigation specification(s) and/or required surveillance performance (RSP) specification(s) applicable to a specified segment(s), names, coded designators or name-codes and the geographical coordinates in degrees, minutes and seconds of all significant points defining the route including “compulsory” or “on-request” reporting points;
- 2) tracks or VOR radials to the nearest degree, geodesic distance to the nearest tenth of a kilometre or tenth of a nautical mile between each successive designated significant point and, in the case of VOR radials, changeover points;
- 3) upper and lower limits and airspace classification;
- 4) minimum flight altitudes to the nearest higher 50 m or 100 ft;
- 5) the navigation accuracy requirement for each PBN (RNAV or RNP) route segment; and
- 6) remarks, including an indication of the controlling unit, its operating channel and, if applicable, its logon address, SATVOICE number, and any navigation, RCP and RSP specification(s) limitations.

Note.— In relation to Annex 11, Appendix 1, and for flight planning purposes, defined navigation specification is not considered to be an integral part of the route designator.

ENR 3.5 Other routes

#AIP-DS# The requirement is to describe other specifically designated routes which are compulsory within specified area(s).

Note.— Arrival, transit and departure routes which are specified in connection with procedures for traffic to and from aerodromes/heliports need not be described since they are described in the relevant section of Part 3 — Aerodromes.

ENR 3.6 En-route holding

#AIP-DS# The requirement is for a detailed description of en-route holding procedures, containing:

- 1) holding identification (if any) and holding fix (navigation aid) or waypoint with geographical coordinates in degrees, minutes and seconds;
- 2) inbound track;
- 3) direction of the procedure turn;
- 4) maximum indicated airspeed;
- 5) minimum and maximum holding level;
- 6) time/distance outbound; and
- 7) indication of the controlling unit and its operating frequency.

Note.— Obstacle clearance criteria related to holding procedures are contained in Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volumes I and II.

ENR 4. RADIO NAVIGATION AIDS/SYSTEMS

ENR 4.1 Radio navigation aids — en-route

#AIP-DS# A list of stations providing radio navigation services established for en-route purposes and arranged alphabetically by name of the station, including:

- 1) name of the station and magnetic variation to the nearest degree and for VOR, station declination to the nearest degree used for technical line-up of the aid;
- 2) identification;
- 3) frequency/channel for each element;
- 4) hours of operation;
- 5) geographical coordinates in degrees, minutes and seconds of the position of the transmitting antenna;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft); and
- 7) remarks.

If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority ~~must~~ **shall** be indicated in the remarks column. Facility coverage ~~must~~ **shall** be indicated in the remarks column.

ENR 4.2 Special navigation systems

#AIP-DS# Description of stations associated with special navigation systems (DECCA, LORAN, etc.), including:

- 1) name of station or chain;
- 2) type of service available (master signal, slave signal, colour);
- 3) frequency (channel number, basic pulse rate, recurrence rate, as applicable);
- 4) hours of operation;
- 5) geographical coordinates in degrees, minutes and seconds of the position of the transmitting station; and
- 6) remarks.

If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority ~~must~~ **shall** be indicated in the remarks column. Facility coverage ~~must~~ **shall** be indicated in the remarks column.

ENR 4.3 Global navigation satellite system (GNSS)

A list and description of elements of the global navigation satellite system (GNSS) providing the

navigation service established for en-route purposes and arranged alphabetically by name of the element, including:

- 1) the name of the GNSS element, e.g. (GPS, GLONASS, EGNOS, MSAS, WAAS, etc.);
- 2) frequency(ies), as appropriate;
- 3) geographical coordinates in degrees, minutes and seconds of the nominal service area and coverage area; and
- 4) remarks.

If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority ~~must~~ **shall** be indicated in the remarks column.

ENR 4.4 Name-code designators for significant points

#AIP-DS# An alphabetically arranged list of name-code designators (five-letter pronounceable “name-code”) established for significant points at positions not marked by the site of radio navigation aids, including:

- 1) name-code designator;
- 2) geographical coordinates in degrees, minutes and seconds of the position;
- 3) reference to ATS or other routes where the point is located; and
- 4) remarks, including supplementary definition of positions where required.

ENR 4.5 Aeronautical ground lights — en-route

#AIP-DS# A list of aeronautical ground lights and other light beacons designating geographical positions which are selected by the State as being significant, including:

- 1) name of the city or town or other identification of the beacon;
- 2) type of beacon and intensity of the light in thousands of candelas;
- 3) characteristics of the signal;
- 4) operational hours; and
- 5) remarks.

ENR 5. NAVIGATION WARNINGS

ENR 5.1 Prohibited, restricted and danger areas

#AIP-DS# Description, supplemented by graphic portrayal where appropriate, of prohibited, restricted and

danger areas together with information regarding their establishment and activation, including:

- 1) identification, name and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
- 2) upper and lower limits; and
- 3) remarks, including time of activity.

Type of restriction or nature of hazard and risk of interception in the event of penetration ~~must~~ shall be indicated in the remarks column.

ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ)

#AIP-DS# Description, supplemented by graphic portrayal where appropriate, of established military training areas and military exercises taking place at regular intervals, and established air defence identification zone (ADIZ), including:

- 1) geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
- 2) upper and lower limits and system and means of activation announcements together with information pertinent to civil flights and applicable ADIZ procedures; and
- 3) remarks, including time of activity and risk of interception in the event of penetration of ADIZ.

ENR 5.3 Other activities of a dangerous nature and other potential hazards

ENR 5.3.1 Other activities of a dangerous nature

#AIP-DS# Description, supplemented by charts where appropriate, of activities that constitute a specific or obvious danger to aircraft operation and could affect flights including:

- 1) geographical coordinates in degrees and minutes of centre of area and range of influence;
- 2) vertical limits;
- 3) advisory measures;
- 4) authority responsible for the provision of information; and
- 5) remarks, including time of activity.

ENR 5.3.2 Other potential hazards

#AIP-DS# Description, supplemented by charts where appropriate, of other potential hazards that could affect flights (e.g. active volcanoes, nuclear power stations, etc.) including:

- 1) geographical coordinates in degrees and minutes of location of potential hazard;

- 2) vertical limits;
- 3) advisory measures;
- 4) authority responsible for the provision of information; and
- 5) remarks.

ENR 5.4 Air navigation obstacles

#OBS-DS# The list of obstacles affecting air navigation in Area 1 (the entire State territory), including:

- 1) obstacle identification or designation;
- 2) type of obstacle;
- 3) obstacle position, represented by geographical coordinates in degrees, minutes and seconds;
- 4) obstacle elevation and height to the nearest metre or foot;
- 5) type and colour of obstacle lighting (if any); ~~and~~
- 6) ~~if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6.~~

Note 1.— An obstacle whose height above the ground is 100 m and higher is considered an obstacle for Area 1.

Note 2.— Specifications ~~governing~~ concerning the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations/heights for obstacles in Area 1 are given in ~~Annex 11, Appendix 5, Tables 1 and 2, respectively~~ Appendix 1.

ENR 5.5 Aerial sporting and recreational activities

#AIP-DS# Brief description, supplemented by graphic portrayal where appropriate, of intensive aerial sporting and recreational activities together with conditions under which they are carried out, including:

- 1) designation and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
- 2) vertical limits;
- 3) operator/user telephone number; and
- 4) remarks, including time of activity.

Note.— This paragraph may be subdivided into different sections for each different category of activity, giving the indicated details in each case.

ENR 5.6 Bird migration and areas with sensitive fauna

Description, supplemented by charts where practicable, of movements of birds associated with migration, including migration routes and permanent resting areas and areas with sensitive fauna.

ENR 6. EN-ROUTE CHARTS

The requirement is for the En-route Chart — ICAO and index charts to be included in this section.

PART 3 — AERODROMES (AD)

If an AIP is produced and made available in more than one volume with each having a separate amendment and supplement service, a separate preface, record of AIP Amendments, record of AIP Supplements, checklist of AIP pages and list of current hand amendments ~~must~~ **shall** be included in each volume. In the case of an AIP being published as one volume, the annotation “not applicable” ~~must~~ **shall** be entered against each of the above subsections.

AD 0.61 Table of contents to Part 3

A list of sections and subsections contained in Part 3 — Aerodromes (AD).

Note.— Subsections may be listed alphabetically.

AD 1. AERODROMES/HELIPORTS — INTRODUCTION

AD 1.1 Aerodrome/heliport availability and conditions of use

AD 1.1.1 General conditions

Brief description of the State’s designated authority responsible for aerodromes and heliports, including:

- 1) the general conditions under which aerodromes/heliports and associated facilities are available for use; and
- 2) a statement concerning the ICAO documents on which the services are based and a reference to the AIP location where differences, if any, are listed.

AD 1.1.2 Use of military air bases

Regulations and procedures, if any, concerning civil use of military air bases.

AD 1.1.3 Low visibility procedures (LVP)

The general conditions under which the low visibility procedures applicable to Cat II/III operations at aerodromes, if any, are applied.

AD 1.1.4 Aerodrome operating minima

Details of aerodrome operating minima applied by the State.

AD 1.1.5 Other information

If applicable, other information of a similar nature.

AD 1.2 Rescue and firefighting services and snow plan

AD 1.2.1 Rescue and firefighting services

Brief description of rules governing the establishment of rescue and firefighting services at aerodromes and heliports available for public use together with an indication of rescue and firefighting categories established by a State.

AD 1.2.2 Snow plan

Brief description of general snow plan considerations for aerodromes/heliports available for public use at which snow conditions are normally liable to occur, including:

- 1) organization of the winter service;
- 2) surveillance of movement areas;
- 3) measuring methods and measurements taken;
- 4) actions taken to maintain the usability of movement areas;
- 5) system and means of reporting;
- 6) the cases of runway closure; and
- 7) distribution of information about snow conditions.

Note.— Where different snow plan considerations apply at aerodromes/heliports, this subparagraph may be subdivided accordingly.

AD 1.3 Index to aerodromes and heliports

A list, supplemented by graphic portrayal, of aerodromes and heliports within a State, including:

- 1) aerodrome/heliport name and ICAO location indicator;
- 2) type of traffic permitted to use the aerodrome/heliport (international/national, IFR/VFR, scheduled/non-scheduled, general aviation, military and other); and
- 3) reference to AIP, Part 3 subsection in which aerodrome/heliport details are presented.

AD 1.4 Grouping of aerodromes/heliports

Brief description of the criteria applied by the State in grouping aerodromes/heliports for production/distribution/provision of information purposes (e.g. international/national; primary/secondary;

major/other; civil/military; etc.).

AD 1.5 Status of certification of aerodromes

A list of aerodromes in the State, indicating the status of certification, including:

- 1) aerodrome name and ICAO location indicator;
- 2) date and, if applicable, validity of certification; and
- 3) remarks, if any.

AD 2. AERODROMES

Note.— **** is to be replaced by the relevant ICAO location indicator.

****** AD 2.1 Aerodrome location indicator and name**

The requirement is for the ICAO location indicator allocated to the aerodrome and the name of aerodrome. An ICAO location indicator ~~must~~ **shall** be an integral part of the referencing system applicable to all subsections in section AD 2.

****** AD 2.2 Aerodrome geographical and administrative data**

The requirement is for aerodrome geographical and administrative data including:

- 1) aerodrome reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- 2) direction and distance of aerodrome reference point from centre of the city or town which the aerodrome serves;
- 3) aerodrome elevation to the nearest metre or foot, ~~and~~ reference temperature **and mean low temperature;**
- 4) where appropriate, geoid undulation at the aerodrome elevation position to the nearest metre or foot;
- 5) magnetic variation to the nearest degree, date of information and annual change;
- 6) name of aerodrome operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;
- 7) types of traffic permitted to use the aerodrome (IFR/VFR); and
- 8) remarks.

****** AD 2.3 Operational hours**

Detailed description of the hours of operation of services at the aerodrome, including:

- 1) aerodrome operator;
- 2) customs and immigration;
- 3) health and sanitation;
- 4) AIS briefing office;
- 5) ATS reporting office (ARO);
- 6) MET briefing office;
- 7) air traffic service;
- 8) fuelling;
- 9) handling;
- 10) security;
- 11) de-icing; and
- 12) remarks.

****** AD 2.4 Handling services and facilities**

Detailed description of the handling services and facilities available at the aerodrome, including:

- 1) cargo-handling facilities;
- 2) fuel and oil types;
- 3) fuelling facilities and capacity;
- 4) de-icing facilities;
- 5) hangar space for visiting aircraft;
- 6) repair facilities for visiting aircraft; and
- 7) remarks.

****** AD 2.5 Passenger facilities**

Passenger facilities available at the aerodrome, provided as a brief description or a reference to other information sources such as a website including:

- 1) *hotel(s) at or in the vicinity of aerodrome;*
- 2) *restaurant(s) at or in the vicinity of aerodrome;*
- 3) *transportation possibilities;*
- 4) medical facilities;

- 5) *bank and post office at or in the vicinity of aerodrome;*
- 6) *tourist office;* and
- 7) remarks.

**** AD 2.6 Rescue and firefighting services

Detailed description of the rescue and firefighting services and equipment available at the aerodrome, including:

- 1) aerodrome category for firefighting;
- 2) rescue equipment;
- 3) *capability for removal of disabled aircraft;* and
- 4) remarks.

**** AD 2.7 Seasonal availability — clearing

Detailed description of the equipment and operational priorities established for the clearance of aerodrome movement areas, including:

- 1) type(s) of clearing equipment;
- 2) clearance priorities; and
- 3) remarks.

**** AD 2.8 Aprons, taxiways and check locations/positions data

Details related to the physical characteristics of aprons, taxiways and locations/positions of designated checkpoints, including:

- 1) designation, surface and strength of aprons;
- 2) designation, width, surface and strength of taxiways;
- 3) location and elevation to the nearest metre or foot of altimeter checkpoints;
- 4) location of VOR checkpoints;
- 5) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- 6) remarks.

If check locations/positions are presented on an aerodrome chart, a note to that effect ~~must~~ **shall** be provided under this subsection.

**** AD 2.9 Surface movement guidance and control system and markings

Brief description of the surface movement guidance and control system and runway and taxiway markings, including:

- 1) use of aircraft stand identification signs, taxiway guide lines and visual docking/parking guidance system at aircraft stands;

- 2) runway and taxiway markings and lights;
- 3) stop bars and runway guard lights (if any); and
- 4) other runway protection measures; and
- 5) remarks.

**** AD 2.10 Aerodrome obstacles

Detailed description of obstacles, including:

- 1) obstacles in Area 2:
 - a) obstacle identification or designation;
 - b) type of obstacle;
 - c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
 - d) obstacle elevation and height to the nearest metre or foot;
 - e) obstacle marking, and type and colour of obstacle lighting (if any); and
 - f) ~~if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6; and~~
 - g) NIL indication, if appropriate.

Note 1.— ~~Chapter 10, 10.1.1~~ Annex 15, Appendix 1, provides a description of Area 2 while Annex 15, Appendix 8-1, Figure A81-2, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 2.

Note 2.— Specifications governing concerning the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations for obstacles in Area 2 are given in Annex 11, Appendix 5, Tables 1 and 2, and in Annex 14, Volume I, Appendix 5, Tables A5-1 and A5-2, respectively Appendix 1.

- 2) the absence of an Area 2 data set for the aerodrome is to be clearly stated and obstacle data are to be provided for:
 - a) obstacles that penetrate the obstacle limitation surfaces;
 - b) obstacles that penetrate the take-off flight path area obstacle identification surface; and
 - c) other obstacles assessed as being hazardous to air navigation.
- 3) indication that information on obstacles in Area 3 is not provided, or if provided:

- a) obstacle identification or designation;
- b) type of obstacle;
- c) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
- d) obstacle elevation and height to the nearest tenth of a metre or tenth of a foot;
- e) obstacle marking, and type and colour of obstacle lighting (if any);
- f) if appropriate, an indication that the list of obstacles is available in electronic form as digital data set, and a reference to GEN 3.1.6; and
- g) NIL indication, if appropriate.

Note 1.— ~~Chapter 10, 10.1.1~~ Annex 15, Appendix 1, provides a description of Area 3 while ~~Appendix 8, Figure A8-3~~ Annex 15, Appendix 8-1, Figure A81-3, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.

Note 2.— Specifications ~~governing~~ concerning the determination and reporting (accuracy of field work and data integrity) of positions (latitude and longitude) and elevations for obstacles in Area 3 are given in ~~Annex 14, Volume I, Appendix 5, Tables A5-1 and A5-2, respectively~~ Appendix 1.

****** AD 2.11 Meteorological information provided**

Detailed description of meteorological information provided at the aerodrome and an indication of which meteorological office is responsible for the service enumerated, including:

- 1) name of the associated meteorological office;
- 2) hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- 3) office responsible for preparation of TAFs and periods of validity and interval of issuance of the forecasts;
- 4) availability of the trend forecasts for the aerodrome, and interval of issuance;
- 5) information on how briefing and/or consultation is provided;
- 6) types of flight documentation supplied and language(s) used in flight documentation;
- 7) charts and other information displayed or available for briefing or consultation;
- 8) supplementary equipment available for providing information on meteorological conditions, e.g. weather radar and receiver for satellite images;
- 9) the air traffic services unit(s) provided with meteorological information; and
- 10) additional information (e.g. concerning any limitation of service, etc.).

****** AD 2.12 Runway physical characteristics**

Detailed description of runway physical characteristics, for each runway, including:

- 1) designations;
- 2) true bearings to one-hundredth of a degree;
- 3) dimensions of runways to the nearest metre or foot;
- 4) strength of pavement (PCN and associated data) and surface of each runway and associated stopways;
- 5) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end and, where appropriate, geoid undulation of:
 - thresholds of a non-precision approach runway to the nearest metre or foot; and
 - thresholds of a precision approach runway to the nearest tenth of a metre or tenth of a foot;
- 6) elevations of:
 - thresholds of a non-precision approach runway to the nearest metre or foot; and
 - thresholds and the highest elevation of the touchdown zone of a precision approach runway to the nearest tenth of a metre or tenth of a foot;
- 7) slope of each runway and associated stopways;
- 8) dimensions of stopway (if any) to the nearest metre or foot;
- 9) dimensions of clearway (if any) to the nearest metre or foot;
- 10) dimensions of strips;
- 11) dimensions of runway end safety areas;
- 12) location (which runway end) and description of arresting system (if any);
- 13) the existence of an obstacle-free zone; and
- 14) remarks.

****** AD 2.13 Declared distances**

Detailed description of declared distances to the nearest metre or foot for each direction of each runway, including:

- 1) runway designator;
- 2) take-off run available;
- 3) take-off distance available, and if applicable, alternative reduced declared distances;

- 4) accelerate-stop distance available;
- 5) landing distance available; and
- 6) remarks, including runway entry or start point where alternative reduced declared distances have been declared.

If a runway direction cannot be used for take-off or landing, or both, because it is operationally forbidden, then this ~~must~~ shall be declared and the words “not usable” or the abbreviation “NU” entered (Annex 14, Volume I, Attachment A, Section 3).

****** AD 2.14 Approach and runway lighting**

Detailed description of approach and runway lighting, including:

- 1) runway designator;
- 2) type, length and intensity of approach lighting system;
- 3) runway threshold lights, colour and wing bars;
- 4) type of visual approach slope indicator system;
- 5) length of runway touchdown zone lights;
- 6) length, spacing, colour and intensity of runway centre line lights;
- 7) length, spacing, colour and intensity of runway edge lights;
- 8) colour of runway end lights and wing bars;
- 9) length and colour of stopway lights; and
- 10) remarks.

****** AD 2.15 Other lighting, secondary power supply**

Description of other lighting and secondary power supply, including:

- 1) location, characteristics and hours of operation of aerodrome beacon/identification beacon (if any);
- 2) location and lighting (if any) of anemometer/landing direction indicator;
- 3) taxiway edge and taxiway centre line lights;
- 4) secondary power supply including switch-over time; and
- 5) remarks.

****** AD 2.16 Helicopter landing area**

Detailed description of helicopter landing area provided at the aerodrome, including:

- 1) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric centre of touchdown and lift-off (TLOF) or of each threshold of final approach and take-off (FATO) area:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- 2) TLOF and/or FATO area elevation:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- 3) TLOF and FATO area dimensions to the nearest metre or foot, surface type, bearing strength and marking;
- 4) true bearings to one-hundredth of a degree of FATO;
- 5) declared distances available, to the nearest metre or foot;
- 6) approach and FATO lighting; and
- 7) remarks.

****** AD 2.17 Air traffic services airspace**

Detailed description of air traffic services (ATS) airspace organized at the aerodrome, including:

- 1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- 2) vertical limits;
- 3) airspace classification;
- 4) call sign and language(s) of the ATS unit providing service;
- 5) transition altitude;
- 6) hours of applicability; and
- 7) remarks.

****** AD 2.18 Air traffic services communication facilities**

Detailed description of air traffic services communication facilities established at the aerodrome, including:

- 1) service designation;
- 2) call sign;
- 3) channel(s);
- 4) SATVOICE number(s), if available;

- 5) logon address, as appropriate;
- 6) hours of operation; and
- 7) remarks.

**** AD 2.19 Radio navigation and landing aids

#AIP-DS# Detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the aerodrome, including:

- 1) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS, and GBAS and for VOR/ILS/MLS also station declination to the nearest degree used for technical line-up of the aid;
- 2) identification, if required;
- 3) frequency(ies), channel number(s), service provider, and reference path identifier(s) (RPI), as appropriate;
- 4) hours of operation, as appropriate;
- 5) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft); elevation of GBAS reference point to the nearest metre or foot, and the ellipsoid height of the point to the nearest metre or foot. For SBAS, the ellipsoid height of the landing threshold point (LTP) or the fictitious threshold point (FTP) to the nearest metre or foot;
- 7) service volume radius from the GBAS reference point to the nearest kilometre or nautical mile; and
- 8) remarks.

When the same aid is used for both en-route and aerodrome purposes, a description ~~must~~ **shall** also be given in section ENR 4. If the ground-based augmentation system (GBAS) serves more than one aerodrome, description of the aid ~~must~~ **shall** be provided under each aerodrome. If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority ~~must~~ **shall** be indicated in the remarks column. Facility coverage ~~must~~ **shall** be indicated in the remarks column.

**** AD 2.20 Local aerodrome regulations

Detailed description of regulations applicable to the use of the aerodrome including the acceptability of training flights, non-radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

**** AD 2.21 Noise abatement procedures

Detailed description of noise abatement procedures established at the aerodrome.

**** AD 2.22 Flight procedures

Detailed description of the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organization at the aerodrome. When established, detailed description of the low visibility procedures at the aerodrome, including:

- 1) runway(s) and associated equipment authorized for use under low visibility procedures;
- 2) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made;
- 3) description of ground marking/lighting for use under low visibility procedures; and
- 4) remarks.

****** AD 2.23 Additional information**

Additional information at the aerodrome, such as an indication of bird concentrations at the aerodrome, together with an indication of significant daily movement between resting and feeding areas, to the extent practicable.

****** AD 2.24 Charts related to an aerodrome**

The requirement is for charts related to an aerodrome to be included in the following order:

- 1) Aerodrome/Heliport Chart — ICAO;
- 2) Aircraft Parking/Docking Chart — ICAO;
- 3) Aerodrome Ground Movement Chart — ICAO;
- 4) Aerodrome Obstacle Chart — ICAO Type A (for each runway);
- 5) Aerodrome Obstacle Chart — ICAO Type B (when available);
- 56) Aerodrome Terrain and Obstacle Chart — ICAO (Electronic);
- 67) Precision Approach Terrain Chart — ICAO (precision approach Cat II and III runways);
- 78) Area Chart — ICAO (departure and transit routes);
- 89) Standard Departure Chart — Instrument — ICAO;
- 910) Area Chart — ICAO (arrival and transit routes);
- 1011) Standard Arrival Chart — Instrument — ICAO;
- 1112) ATC Surveillance Minimum Altitude Chart — ICAO;
- 1213) Instrument Approach Chart — ICAO (for each runway and procedure type);
- 1314) Visual Approach Chart — ICAO; and
- 1415) bird concentrations in the vicinity of the aerodrome.

If some of the charts are not produced, a statement to this effect ~~must~~ shall be given in section GEN 3.2, Aeronautical charts.

Note.— A page pocket may be used in the AIP to include the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) on appropriate electronic media.

AD 3. HELIPORTS

When a helicopter landing area is provided at the aerodrome, associated data ~~must~~ shall be listed only under **** AD 2.16.

Note.— ** is to be replaced by the relevant ICAO location indicator.**

****** AD 3.1 Heliport location indicator and name**

The requirement is for the ICAO location indicator assigned to the heliport and the name of heliport. An ICAO location indicator ~~must~~ shall be an integral part of the referencing system applicable to all subsections in section AD 3.

****** AD 3.2 Heliport geographical and administrative data**

The requirement is for heliport geographical and administrative data, including:

- 1) heliport reference point (geographical coordinates in degrees, minutes and seconds) and its site;
- 2) direction and distance of heliport reference point from centre of the city or town which the heliport serves;
- 3) heliport elevation to the nearest metre or foot, ~~and~~ reference temperature and mean low temperature;
- 4) where appropriate, geoid undulation at the heliport elevation position to the nearest metre or foot;
- 5) magnetic variation to the nearest degree, date of information and annual change;
- 6) name of heliport operator, address, telephone and telefax numbers, e-mail address, AFS address and, if available, website address;
- 7) types of traffic permitted to use the heliport (IFR/VFR); and
- 8) remarks.

****** AD 3.3 Operational hours**

Detailed description of the hours of operation of services at the heliport, including:

- 1) heliport operator;
- 2) customs and immigration;
- 3) health and sanitation;

- 4) AIS briefing office;
- 5) ATS reporting office (ARO);
- 6) MET briefing office;
- 7) air traffic service;
- 8) fuelling;
- 9) handling;
- 10) security;
- 11) de-icing; and
- 12) remarks.

****** AD 3.4 Handling services and facilities**

Detailed description of the handling services and facilities available at the heliport, including:

- 1) cargo-handling facilities;
- 2) fuel and oil types;
- 3) fuelling facilities and capacity;
- 4) de-icing facilities;
- 5) hangar space for visiting helicopter;
- 6) repair facilities for visiting helicopter; and
- 7) remarks.

****** AD 3.5 Passenger facilities**

Passenger facilities available at the heliport, provided as a brief description or as a reference to other information sources such as a website, including:

- 1) *hotel(s) at or in the vicinity of the heliport;*
- 2) *restaurant(s) at or in the vicinity of the heliport;*
- 3) *transportation possibilities;*
- 4) medical facilities;
- 5) *bank and post office at or in the vicinity of the heliport;*
- 6) *tourist office;* and
- 7) remarks.

**** AD 3.6 Rescue and firefighting services

Detailed description of the rescue and firefighting services and equipment available at the heliport, including:

- 1) heliport category for firefighting;
- 2) rescue equipment;
- 3) *capability for removal of disabled helicopter; and*
- 4) remarks.

**** AD 3.7 Seasonal availability — clearing

Detailed description of the equipment and operational priorities established for the clearance of heliport movement areas, including:

- 1) type(s) of clearing equipment;
- 2) clearance priorities; and
- 3) remarks.

**** AD 3.8 Aprons, taxiways and check locations/positions data

Details related to the physical characteristics of aprons, taxiways and locations/positions of designated checkpoints, including:

- 1) designation, surface and strength of aprons, helicopter stands;
- 2) designation, width, and surface type of helicopter ground taxiways;
- 3) width and designation of helicopter air taxiway and air transit route;
- 4) location and elevation to the nearest metre or foot of altimeter checkpoints;
- 5) location of VOR checkpoints;
- 6) position of INS checkpoints in degrees, minutes, seconds and hundredths of seconds; and
- 7) remarks.

If check locations/positions are presented on a heliport chart, a note to that effect ~~must~~ **shall** be provided under this subsection.

**** AD 3.9 Markings and markers

Brief description of final approach and take-off area and taxiway markings and markers, including:

- 1) final approach and take-off markings;
- 2) taxiway markings, air taxiway markers and air transit route markers; and

3) remarks.

**** AD 3.10 Heliport obstacles

#OBS-DS# Detailed description of obstacles, including:

- 1) obstacle identification or designation;
- 2) type of obstacle;
- 3) obstacle position, represented by geographical coordinates in degrees, minutes, seconds and tenths of seconds;
- 4) obstacle elevation and height to the nearest metre or foot;
- 5) obstacle marking, and type and colour of obstacle lighting (if any); and
- 6) ~~if appropriate, an indication that the list of obstacles is available in electronic form, and a reference to GEN 3.1.6; and~~
- 7) NIL indication, if appropriate.

**** AD 3.11 Meteorological information provided

Detailed description of meteorological information provided at the heliport and an indication of which meteorological office is responsible for the service enumerated, including:

- 1) name of the associated meteorological office;
- 2) hours of service and, where applicable, the designation of the responsible meteorological office outside these hours;
- 3) office responsible for preparation of TAFs, and periods of validity of the forecasts;
- 4) availability of the trend forecasts for the heliport, and interval of issuance;
- 5) information on how briefing and/or consultation is provided;
- 6) type of flight documentation supplied and language(s) used in flight documentation;
- 7) charts and other information displayed or available for briefing or consultation;
- 8) supplementary equipment available for providing information on meteorological conditions, e.g. weather radar and receiver for satellite images;
- 9) the air traffic services unit(s) provided with meteorological information; and
- 10) additional information (e.g. concerning any limitation of service, etc.).

**** AD 3.12 Heliport data

Detailed description of heliport dimensions and related information, including:

- 1) heliport type — surface-level, elevated or helideck;
- 2) touchdown and lift-off (TLOF) area dimensions to the nearest metre or foot;
- 3) true bearings to one-hundredth of a degree of final approach and take-off (FATO) area;
- 4) dimensions to the nearest metre or foot of FATO, and surface type;
- 5) surface and bearing strength in tonnes (1 000 kg) of TLOF;
- 6) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and, where appropriate, geoid undulation of the geometric centre of TLOF or of each threshold of FATO:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- 7) TLOF and/or FATO slope and elevation:
 - for non-precision approaches, to the nearest metre or foot; and
 - for precision approaches, to the nearest tenth of a metre or tenth of a foot;
- 8) dimensions of safety area;
- 9) dimensions, to the nearest metre or foot, of helicopter clearway;
- 10) the existence of an obstacle-free sector; and
- 11) remarks.

****** AD 3.13 Declared distances**

Detailed description of declared distances to the nearest metre or foot, where relevant for a heliport, including:

- 1) take-off distance available, and if applicable, alternative reduced declared distances;
- 2) rejected take-off distance available;
- 3) landing distance available; and
- 4) remarks, including entry or start point where alternative reduced declared distances have been declared.

****** AD 3.14 Approach and FATO lighting**

Detailed description of approach and FATO lighting, including:

- 1) type, length and intensity of approach lighting system;
- 2) type of visual approach slope indicator system;

- 3) characteristics and location of FATO area lights;
- 4) characteristics and location of aiming point lights;
- 5) characteristics and location of TLOF lighting system; and
- 6) remarks.

****** AD 3.15 Other lighting, secondary power supply**

Description of other lighting and secondary power supply, including:

- 1) location, characteristics and hours of operation of heliport beacon;
- 2) location and lighting of wind direction indicator (WDI);
- 3) taxiway edge and taxiway centre line lights;
- 4) secondary power supply including switch-over time; and
- 5) remarks.

****** AD 3.16 Air traffic services airspace**

Detailed description of air traffic services (ATS) airspace organized at the heliport, including:

- 1) airspace designation and geographical coordinates in degrees, minutes and seconds of the lateral limits;
- 2) vertical limits;
- 3) airspace classification;
- 4) call sign and language(s) of ATS unit providing service;
- 5) transition altitude;
- 6) hours of applicability; and
- 7) remarks.

**** AD 3.17 Air traffic services communication facilities

Detailed description of air traffic services communication facilities established at the heliport, including:

- 1) service designation;
- 2) call sign;
- 3) ~~frequency(ies)~~ channels;
- 4) SATVOICE number(s), if available;
- 5) logon address, as appropriate;
- 46) hours of operation; and
- 57) remarks.

**** AD 3.18 Radio navigation and landing aids

Detailed description of radio navigation and landing aids associated with the instrument approach and the terminal area procedures at the heliport, including:

- 1) type of aids, magnetic variation to the nearest degree, as appropriate, and type of supported operation for ILS/MLS, basic GNSS, SBAS and GBAS, and for VOR/ILS/MLS ~~also~~ station declination to the nearest degree used for technical line-up of the aid;
- 2) identification, if required;
- 3) frequency(ies), channel number(s), service provider, and reference path identifier(s) (RPI), as appropriate;
- 4) hours of operation, as appropriate;
- 5) geographical coordinates in degrees, minutes, seconds and tenths of seconds of the position of the transmitting antenna, as appropriate;
- 6) elevation of the transmitting antenna of DME to the nearest 30 m (100 ft) and of DME/P to the nearest 3 m (10 ft), elevation of GBAS reference point to the nearest metre or foot, and the ellipsoid height of the point to the nearest metre or foot. For SBAS, the ellipsoid height of the landing threshold point (LTP) or the fictitious threshold point (FTP) to the nearest metre or foot; ~~and~~
- 7) service volume radius from the GBAS reference point to the nearest kilometre or nautical mile; and
- 78) remarks.

When the same aid is used for both en-route and heliport purposes, a description ~~must~~ shall also be given in section ENR 4. If the ground-based augmentation system (GBAS) serves more than one heliport, description of the aid ~~must~~ shall be provided under each heliport. If the operating authority of the facility is other than the designated governmental agency, the name of the operating authority ~~must~~ shall be indicated in the remarks column. Facility coverage ~~must~~ shall be indicated in the remarks column.

**** AD 3.19 Local heliport regulations

Detailed description of regulations applicable to the use of the heliport, including the acceptability of training flights, non-radio and microlight aircraft and similar, and to ground manoeuvring and parking but excluding flight procedures.

****** AD 3.20 Noise abatement procedures**

Detailed description of noise abatement procedures established at the heliport.

****** AD 3.21 Flight procedures**

Detailed description of the conditions and flight procedures, including radar and/or ADS-B procedures, established on the basis of airspace organization established at the heliport. When established, detailed description of the low visibility procedures at the heliport, including:

- 1) touchdown and lift-off (TLOF) area(s) and associated equipment authorized for use under low visibility procedures;
- 2) defined meteorological conditions under which initiation, use and termination of low visibility procedures would be made;
- 3) description of ground marking/lighting for use under low visibility procedures; and
- 4) remarks.

****** AD 3.22 Additional information**

Additional information about the heliport, such as an indication of bird concentrations at the heliport together with an indication of significant daily movement between resting and feeding areas, to the extent practicable.

****** AD 3.23 Charts related to a heliport**

The requirement is for charts related to a heliport to be included in the following order:

- 1) Aerodrome/Heliport Chart — ICAO;
- 2) Area Chart — ICAO (departure and transit routes);
- 3) Standard Departure Chart — Instrument — ICAO;
- 4) Area Chart — ICAO (arrival and transit routes);
- 5) Standard Arrival Chart — Instrument — ICAO;
- 6) ATC Surveillance Minimum Altitude Chart — ICAO;
- 7) Instrument Approach Chart — ICAO (for each procedure type);
- 8) Visual Approach Chart — ICAO; and

9) bird concentrations in the vicinity of heliport.

If some of the charts are not produced, a statement to this effect ~~must~~ shall be given in section GEN 3.2, Aeronautical charts.

Editorial Note.— Appendix 3 is relocated text from Appendix 6 to Annex 15.

APPENDIX 6 3. NOTAM FORMAT

(see Chapter 5, 5.2.1)

Priority Indicator											→	
Address												
≡≡≡												
Date and time of filing											→	
Originator's Indicator											≡≡≡(	
Message Series, Number and Identifier												
NOTAM containing new information			NOTAMN									
	(series and number/year)											
NOTAM replacing a previous NOTAM			NOTAMR									
	(series and number/year)		(series and number/year of NOTAM to be replaced)									
NOTAM cancelling a previous NOTAM			NOTAMC									
	(series and number/year)		(series and number/year of NOTAM to be cancelled) ≡≡≡									
Qualifiers												
	FIR	NOTAM Code	Traffic	Purpose	Scope	Lower Limit	Upper Limit	Coordinates, Radius				
Q)												≡≡≡
Identification of ICAO location indicator in which the facility, airspace or condition reported on is located								A)				→
Period of Validity												
From (date-time group)			B)									→
To (PERM or date-time group)			C)									EST* PERM* ≡≡≡
Time Schedule (if applicable)			D)								→	
											≡≡≡	
Text of NOTAM; Plain-language Entry (using ICAO Abbreviations)												
E)												≡≡≡
Lower Limit		F)										→
Upper Limit		G)										) ≡≡≡
Signature												

*Delete as appropriate

INSTRUCTIONS FOR THE COMPLETION OF THE NOTAM FORMAT

1. General

The qualifier line (Item Q) and all identifiers (Items A) to G) inclusive) each followed by a closing parenthesis, as shown in the format, shall be transmitted unless there is no entry to be made against a particular identifier.

2. NOTAM numbering

Each NOTAM shall be allocated a series identified by a letter and a four-digit number followed by a stroke and a two-digit number for the year (e.g. A0023/03). Each series shall start on 1 January with number 0001.

3. Qualifiers (Item Q)

Item Q) is divided into eight fields, each separated by a stroke. An entry shall be made in each field. Examples of how fields are to be filled are shown in the *Aeronautical Information Services Manual* (Doc 8126). The definition of the field is as follows:

1) FIR

- a) If the subject of the information is located geographically within one FIR, the ICAO location indicator shall be that of the FIR concerned. When an aerodrome is situated within the overlying FIR of another State, the first field of Item Q) shall contain the code for that overlying FIR (e.g. Q) LFRR/...A) EGJJ);

or,

if the subject of the information is located geographically within more than one FIR, the FIR field shall be composed of the ICAO nationality letters of the State originating the NOTAM followed by “XX”. (The location indicator of the overlying UIR shall not be used). The ICAO location indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or non-governmental agency which is responsible for provision of a navigation service in more than one State.

- b) If one State issues a NOTAM affecting FIRs in a group of States, the first two letters of the ICAO location indicator of the issuing State plus “XX” shall be included. The location indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or non-governmental agency which is responsible for provision of a navigation service in more than one State.

2) NOTAM CODE

All NOTAM Code groups contain a total of five letters and the first letter is always the letter Q. The second and third letters identify the subject, and the fourth and fifth letters denote the status or condition of the subject reported upon. The two-letter codes for subjects and conditions are those contained in the PANS-ABC (Doc 8400). For combinations of second and third, and fourth and fifth letters, refer to the NOTAM Selection Criteria contained in Doc 8126 or insert one of the following combinations, as appropriate:

- a) If the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM Selection Criteria (Doc 8126), insert “XX” as the second and third letters (e.g. QXXAK); If subject is “XX”, use “XX” also for condition (e.g. QXXXX).
- b) If the condition of the subject is not listed in the NOTAM Code (Doc 8400) or in the NOTAM

Selection Criteria (Doc 8126), insert “XX” as the fourth and fifth letters (e.g. QFAXX);

- c) When a NOTAM containing operationally significant information is issued in accordance with Appendix 4 and Chapter 6 and when it is used to announce the existence of AIRAC AIP Amendments or Supplements, insert “TT” as the fourth and fifth letters of the NOTAM Code;
- d) When a NOTAM is issued containing a checklist of valid NOTAM, insert “KKKK” as the second, third, fourth and fifth letters; and
- e) The following fourth and fifth letters of the NOTAM Code shall be used in NOTAM cancellations:

AK	=	RESUMED NORMAL OPERATION
AL	=	OPERATIVE (OR RE-OPERATIVE) SUBJECT TO PREVIOUSLY PUBLISHED LIMITATIONS/CONDITIONS
AO	=	OPERATIONAL
CC	=	COMPLETED
CN	=	CANCELLED
HV	=	WORK COMPLETED
XX	=	PLAIN LANGUAGE

Note 1.— As Q - - AO = Operational is used for NOTAM cancellation, NOTAM promulgating new equipment or services use the following fourth and fifth letters Q - - CS = Installed.

Note 2.— Q - - CN = CANCELLED shall be used to cancel planned activities, e.g. navigation warnings; Q - - HV = WORK COMPLETED is used to cancel work in progress.

3) TRAFFIC

I	=	IFR
V	=	VFR
K	=	NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field TRAFFIC may contain combined qualifiers. Guidance concerning the combination of TRAFFIC qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in Doc 8126.

4) PURPOSE

N	=	NOTAM selected for the immediate attention of flight crew members
B	=	NOTAM of operational significance selected for PIB entry
O	=	NOTAM concerning flight operations
M	=	Miscellaneous NOTAM; not subject for a briefing, but it is available on request
K	=	NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field PURPOSE may contain the combined qualifiers BO or NBO. Guidance concerning the combination of PURPOSE qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in Doc 8126.

5) SCOPE

A	=	Aerodrome
E	=	En-route

W	=	Nav Warning
K	=	NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field SCOPE may contain combined qualifiers. Guidance concerning the combination of SCOPE qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in Doc 8126. ~~If the subject is qualified AE, the aerodrome location indicator must be reported in Item A).~~

If the subject is qualified AE, the aerodrome location indicator shall be reported in Item A).

6) and 7) LOWER/UPPER

LOWER and UPPER limits shall only be expressed in flight levels (FL) and shall express the actual vertical limits of the area of influence without the addition of buffers. In the case of navigation warnings and airspace restrictions, values entered shall be consistent with those provided under Items F) and G).

If the subject does not contain specific height information, insert “000” for LOWER and “999” for UPPER as default values.

8) COORDINATES, RADIUS

The latitude and longitude accurate to one minute, as well as a three-digit distance figure giving the radius of influence in NM (e.g. 4700N01140E043). Coordinates present approximate centre of circle whose radius encompasses the whole area of influence, and if the NOTAM affects the entire FIR/UIR or more than one FIR/UIR, enter the default value “999” for radius.

4. Item A)

Insert the location indicator as contained in ICAO Doc 7910 of the aerodrome or FIR in which the facility, airspace, or condition being reported on is located. More than one FIR/UIR may be indicated when appropriate. If there is no available ICAO location indicator, use the ICAO nationality letter as given in ICAO Doc 7910, Part 2, plus “XX” and followed up in Item E) by the name, in plain language.

If information concerns GNSS, insert the appropriate ICAO location indicator allocated for a GNSS element or the common location indicator allocated for all elements of GNSS (except GBAS).

Note.— In the case of GNSS, the location indicator may be used when identifying a GNSS element outage (e.g. KNMH for a GPS satellite outage).

5. Item B)

For date-time group use a ten-figure group, giving year, month, day, hours and minutes in UTC. This entry is the date-time at which the NOTAMN comes into force. In the cases of NOTAMR and NOTAMC, the date-time group is the actual date and time of the NOTAM origination. The start of a day shall be indicated by “0000”.

6. Item C)

With the exception of NOTAMC, a date-time group (a ten-figure group giving year, month, day, hours and minutes in UTC) indicating duration of information shall be used unless the information is of a permanent nature in which case the abbreviation “PERM” is inserted instead. The end of a day shall be indicated by “2359” (i.e. do not use “2400”). If the information on timing is uncertain, the approximate duration shall be indicated using a date-time group followed by the abbreviation “EST”. Any NOTAM which includes an “EST” shall be cancelled or replaced before the date-time specified in Item C).

7. Item D)

If the hazard, status of operation or condition of facilities being reported on will be active in accordance with a specific time and date schedule between the dates-times indicated in Items B) and C), insert such information under Item D). If Item D) exceeds 200 characters, consideration shall be given to providing such information in a separate, consecutive NOTAM.

Note.— Guidance concerning a harmonized definition of Item D) content is provided in Doc 8126.

8. Item E)

Use decoded NOTAM Code, complemented where necessary by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language. When NOTAM is selected for international distribution, English text shall be included for those parts expressed in plain language. This entry shall be clear and concise in order to provide a suitable PIB entry. In the case of NOTAMC, a subject reference and status message shall be included to enable accurate plausibility checks.

9. Items F) and G)

These items are normally applicable to navigation warnings or airspace restrictions and are usually part of the PIB entry. Insert both lower and upper height limits of activities or restrictions, clearly indicating only one reference datum and unit of measurement. The abbreviations GND or SFC shall be used in Item F) to designate ground and surface respectively. The abbreviation UNL shall be used in Item G) to designate unlimited.

Note.— For NOTAM examples see Doc 8126 and the PANS-ABC (Doc 8400).

APPENDIX 2 4. SNOWTAM FORMAT

(see Chapter 5, 5.2.35)

(applicable until 4 November 2020)

(COM heading)	(PRIORITY INDICATOR)		(ADDRESSES)										<≡		
	(DATE AND TIME OF FILING)					(ORIGINATOR'S INDICATOR)								<≡	
(Abbreviated heading)	(SWAA* SERIAL NUMBER)					(LOCATION INDICATOR)	DATE-TIME OF OBSERVATION					(OPTIONAL GROUP)			
	S	W	*	*											<<≡(

SNOWTAM	(Serial number)	<≡
(AERODROME LOCATION INDICATOR)	A)	<≡
(DATE-TIME OF OBSERVATION (<i>Time of completion of measurement in UTC</i>))	B)	→
(RUNWAY DESIGNATOR)	C)	→
(CLEARED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (<i>m</i>))	D)	→
(CLEARED RUNWAY WIDTH, IF LESS THAN PUBLISHED WIDTH (<i>m</i> ; if offset left or right of centre line add "L" or "R"))	E)	→
(DEPOSITS OVER TOTAL RUNWAY LENGTH (<i>Observed on each third of the runway, starting from threshold having the lower runway designation number</i>) NIL — CLEAR AND DRY 1 — DAMP 2 — WET 3 — RIME OR FROST COVERED (<i>depth normally less than 1 mm</i>) 4 — DRY SNOW 5 — WET SNOW 6 — SLUSH 7 — ICE 8 — COMPACTED OR ROLLED SNOW 9 — FROZEN RUTS OR RIDGES)	F) .../.../...	→
(MEAN DEPTH (<i>mm</i>) FOR EACH THIRD OF TOTAL RUNWAY LENGTH)	G) .../.../...	→
(ESTIMATED SURFACE FRICTION ON EACH THIRD OF RUNWAY) ESTIMATED SURFACE FRICTION GOOD — 5 MEDIUM/GOOD — 4 MEDIUM — 3 MEDIUM/POOR — 2 POOR — 1 (<i>The intermediate values of "MEDIUM/GOOD" and "MEDIUM/POOR" provide for more precise information in the estimate when conditions are found to be between medium and either good or poor.</i>)	H) .../.../...	→
(CRITICAL SNOWBANKS (<i>If present, insert height (cm)/distance from the edge of runway (m) followed by "L", "R" or "LR" if applicable</i>))	J)	→
(RUNWAY LIGHTS (<i>If obscured, insert "YES" followed by "L", "R" or both "LR" if applicable</i>))	K)	→
(FURTHER CLEARANCE (<i>If planned, insert length (m)/width (m) to be cleared or if to full dimensions, insert "TOTAL"</i>))	L)	→
(FURTHER CLEARANCE EXPECTED TO BE COMPLETED BY . . . (<i>UTC</i>))	M)	→
(TAXIWAY (<i>If no appropriate taxiway is available, insert "NO"</i>))	N)	→
(TAXIWAY SNOWBANKS (<i>If higher than 60 cm, insert "YES" followed by the lateral distance apart, m</i>))	P)	<≡
(APRON (<i>If unusable insert "NO"</i>))	R)	→
(NEXT PLANNED OBSERVATION/MEASUREMENT IS FOR) (<i>month/day/hour in UTC</i>)	S)	→
(PLAIN-LANGUAGE REMARKS (<i>Including contaminant coverage and other operationally significant information, e.g. sanding, de-icing, chemicals</i>))	T)	) <≡
NOTES: 1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2. 2. Information on other runways, repeat from B to P. 3. Words in brackets () not to be transmitted.		

SIGNATURE OF ORIGINATOR (*not for transmission*)

INSTRUCTIONS FOR THE COMPLETION OF THE SNOWTAM FORMAT

1. General

- a) When reporting on more than one runway, repeat Items B to P inclusive.
- b) Items together with their indicator ~~must~~ shall be dropped completely, where no information is to be included.
- c) Metric units ~~must~~ shall be used and the unit of measurement not reported.
- d) The maximum validity of SNOWTAM is 8 hours. New SNOWTAM ~~must~~ shall be issued whenever a new runway condition report is received. The following changes relating to runway conditions are considered as significant:
 - 1) a change in the coefficient of friction of about 0.05;
 - 2) changes in depth of deposit greater than the following: 20 mm for dry snow, 10 mm for wet snow, 3 mm for slush;
 - 3) a change in the available length or width of a runway of 10 per cent or more;
 - 4) any change in the type of deposit or extent of coverage which requires reclassification in Items F or T of the SNOWTAM;
 - 5) when critical snow banks exist on one or both sides of the runway, any change in the height or distance from centre line;
 - 6) any change in the conspicuity of runway lighting caused by obscuring of the lights;
 - 7) any other conditions known to be significant according to experience or local circumstances.
- e) The abbreviated heading “TTAAiiii CCCC MMYGGgg (BBB)” is included to facilitate the automatic processing of SNOWTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for SNOWTAM = SW;

AA = geographical designator for States, e.g. LF = FRANCE, EG = United Kingdom (see *Location Indicators* (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);

iiii = SNOWTAM serial number in a four-digit group;

CCCC = four-letter location indicator of the aerodrome to which the SNOWTAM refers (see *Location Indicators* (Doc 7910));

MMYYGGgg = date/time of observation/measurement, whereby:

MM = month, e.g. January = 01, December = 12

YY = day of the month

GGgg = time in hours (GG) and minutes (gg) UTC;

(BBB) = optional group for:

Correction to SNOWTAM message previously disseminated with the same serial number = COR.

Note 1.— Brackets in (BBB) are used to indicate that this group is optional.

Note 2.— When reporting on more than one runway and individual dates/times of observation/measurement are indicated by repeated Item B, the latest date/time of observation/measuring is inserted in the abbreviated heading (MMYYGGgg).

Example: Abbreviated heading of SNOWTAM No. 149 from Zurich, measurement/observation of 7 November at 0620 UTC:

SWLS0149 LSZH 11070620

Note.— The information groups are separated by a space, as illustrated above.

- f) The text “SNOWTAM” in the SNOWTAM Format and the SNOWTAM serial number in a four-digit group shall be separated by a space, for example: SNOWTAM 0124.
 - g) For readability purposes for the SNOWTAM message, include a line feed after the SNOWTAM serial number, after Item A, after the last item referring to the runway (e.g. Item P) and after Item S.
2. *Item A* — Aerodrome location indicator (four-letter location indicator).
 3. *Item B* — Eight-figure date/time group — giving time of observation as month, day, hour and minute in UTC; this item ~~must~~ shall always be completed.
 4. *Item C* — Lower runway designator number.
 5. *Item D* — Cleared runway length in metres, if less than published length (see Item T on reporting on part of runway not cleared).
 6. *Item E* — Cleared runway width in metres, if less than published width; if offset left or right of centre line, add (without space) “L” or “R”, as viewed from the threshold having the lower runway designation number.
 7. *Item F* — Deposit over total runway length as explained in SNOWTAM Format. Suitable combinations of these numbers may be used to indicate varying conditions over runway segments. If more than one deposit is present on the same portion of the runway, they should be reported in sequence from the top (closest to the sky) to the bottom (closest to the runway). Drifts, depths of deposit appreciably greater than the average values or other significant characteristics of the deposits may be reported under Item T in plain language. The values for each third of the runway shall be separated by an oblique stroke (/), without space between the deposit values and the oblique stroke, for example: 47/47/47.

Note.— Definitions for the various types of snow are given at the end of this Appendix.

8. *Item G* — Mean depth in millimetres deposit for each third of total runway length, or “XX” if not measurable or operationally not significant; the assessment to be made to an accuracy of 20 mm for dry snow, 10 mm for wet snow and 3 mm for slush. The values for each third of the runway shall be separated by an oblique stroke (/), without space between the values and the oblique stroke, for example: 20/20/20.
9. *Item H* — Estimated surface friction on each third of the runway (single digit) in the order from the threshold having the lower runway designation number.

Friction measurement devices can be used as part of the overall runway surface assessment. Some States may have developed procedures for runway surface assessment which may include the use of information obtained from friction measuring devices and the reporting of quantitative values. In such cases, these procedures should be published in the AIP and the reporting made in Item (T) of the SNOWTAM format.

The values for each third of the runway are separated by an oblique stroke (/), without space between the values and the oblique stroke-, for example: 5/5/5.

10. *Item J* — Critical snow banks. If present insert height in centimetres and distance from edge of runway in metres, followed (without space) by left (“L”) or right (“R”) side or both sides (“LR”), as viewed from the threshold having the lower runway designation number.
11. *Item K* — If runway lights are obscured, insert “YES” followed (without space) by “L”, “R” or both “LR”, as viewed from the threshold having the lower runway designation number.
12. *Item L* — When further clearance will be undertaken, enter length and width of runway or “TOTAL” if runway will be cleared to full dimensions.
13. *Item M* — Enter the anticipated time of completion in UTC.
14. *Item N* — The code (and combination of codes) for Item F may be used to describe taxiway conditions; enter “NO” if no taxiways serving the associated runway are available.
15. *Item P* — If snow banks are higher than 60 cm, enter “YES” followed by the lateral distance parting the snow banks (the distance between) in metres.
16. *Item R* — The code (and combination of codes) for Item F may be used to describe apron conditions; enter “NO” if the apron is unusable.
17. *Item S* — Enter the anticipated time of next observation/measurement in UTC.
18. *Item T* — Describe in plain language any operationally significant information but always report on length of uncleared runway (Item D) and extent of runway contamination (Item F) for each third of the runway (if appropriate) in accordance with the following scale:

RWY CONTAMINATION 10 PER CENT — if 10% or less of runway contaminated
 RWY CONTAMINATION 25 PER CENT — if 11–25% of runway contaminated
 RWY CONTAMINATION 50 PER CENT — if 26–50% of runway contaminated
 RWY CONTAMINATION 100 PER CENT — if 51–100% of runway contaminated.

EXAMPLE OF COMPLETED SNOWTAM FORMAT

GG EHAMZQZX EDDFZQZX EKCHZQZX
 070645 LSZHNYX
 SWLS0149 LSZH 11070700
 (SNOWTAM 0149
 A) LSZH
 B) 11070620 C) 02 D)...P)
 B) 11070600 C) 09 D)...P)
 B) 11070700 C) 12 D)...P)
 R) NO S) 11070920
 T) DEICING

Note.— See the Aeronautical Information Services Manual (Doc 8126) for additional SNOWTAM examples incorporating different runway conditions.

Definitions of the various types of snow

Slush. Water-saturated snow which with a heel-and-toe slap-down motion against the ground will be displaced with a splatter; specific gravity: 0.5 up to 0.8.

Note.— Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, will have a transparent rather than a cloudy appearance and, at the higher specific gravities, will be readily distinguishable from slush.

Snow (on the ground).

- a) *Dry snow.* Snow which can be blown if loose or, if compacted by hand, will fall apart again upon release; specific gravity: up to but not including 0.35.
 - b) *Wet snow.* Snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.
 - c) *Compacted snow.* Snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.
-

APPENDIX 4. SNOWTAM FORMAT

(See Chapter 5, 5.2.5.1.5)

(applicable 5 November 2020)

(COM heading)	(PRIORITY INDICATOR)		(ADDRESSES)										<<<≡			
	(DATE AND TIME OF FILING)					(ORIGINATOR'S INDICATOR)					<<<≡					
(Abbreviated heading)	(SWAA* SERIAL NUMBER)					(LOCATION INDICATOR)			DATE/TIME OF ASSESMENT					(OPTIONAL GROUP)		
	S	W	*	*												
SNOWTAM →		(Serial number) → <<<≡														
Aeroplane performance calculation section																
(AERODROME LOCATION INDICATOR)										M	A)	<<<≡				
(DATE/TIME OF ASSESSMENT <i>(Time of completion of assessment in UTC)</i>)										M	B)	→				
(LOWER RUNWAY DESIGNATORS DESIGNATION NUMBER)										M	C)	→				
(RUNWAY CONDITION CODE (RWYCC) ON EACH THIRD OF RUNWAY THIRD) <i>(From Runway Condition Assessment Matrix (RCAM) 0, 1, 2, 3, 4, 5 or 6)</i>										M	D)	/ / →				
(PER CENT COVERAGE CONTAMINANT FOR EACH THIRD OF RUNWAY THIRD)										C	E)	/ / →				
(DEPTH (mm) OF LOOSE CONTAMINANT FOR EACH THIRD OF RUNWAY THIRD)										C	F)	/ / →				
(CONDITION DESCRIPTION OVER TOTAL RUNWAY LENGTH <i>(Observed on each third of runway third, starting from threshold having the lower runway designation number)</i>										M	G)	/ /				
COMPACTED SNOW DRY DRY SNOW DRY SNOW ON TOP OF COMPACTED SNOW DRY SNOW ON TOP OF ICE FROST ICE SLUSH STANDING WATER WATER ON TOP OF COMPACTED SNOW WET WET ICE WET SNOW WET SNOW ON TOP OF COMPACTED SNOW WET SNOW ON TOP OF ICE												→				
(WIDTH OF RUNWAY TO WHICH THE RWYCCs RUNWAY CONDITION CODES APPLY, IF LESS THAN PUBLISHED WIDTH)										O	H)	<<<≡				
Situational awareness section																
(REDUCED RUNWAY LENGTH, IF LESS THAN PUBLISHED LENGTH (m))										O	I)	→				
(DRIFTING SNOW ON THE RUNWAY)										O	J)	→				
(LOOSE SAND ON THE RUNWAY)										O	K)	→				
(CHEMICAL TREATMENT ON THE RUNWAY)										O	L)	→				
(SNOWBANKS ON THE RUNWAY <i>(If present, distance from runway centreline (m) followed by "L", "R" or "LR" as applicable)</i>)										O	M)	→				
SNOWBANKS ADJACENT TO THE RUNWAY (SNOWBANKS ON A TAXIWAY)										O	N)	→				
(SNOWBANKS ON THE TAXIWAY <i>(If present, distance from the edge of runway (m) followed by "L", "R" or "LR" as applicable)</i>) (SNOWBANKS ADJACENT TO THE RUNWAY)										O	O)	→				
(TAXIWAY CONDITIONS)										O	P)	→				
(APRON CONDITIONS)										O	R)	→				
(MEASURED FRICTION COEFFICIENT)										O	S)	→				
(PLAIN-LANGUAGE REMARKS)										O	T)	) <<<≡				
NOTES: 1. *Enter ICAO nationality letters as given in ICAO Doc 7910, Part 2 or otherwise applicable aerodrome identifier.																

2.	Information on other runways, repeat from B to H.	
3.	Information in the situational awareness section repeated for each runway, taxiway and apron. Repeat as applicable when reported.	
4.	Words in brackets () not to be transmitted.	
5.	For letters A) to T) refer to the <i>Instructions for the completion of the SNOWTAM format, paragraph 1, item b).</i>	

SIGNATURE OF ORIGINATOR (*not for transmission*)

INSTRUCTIONS FOR THE COMPLETION OF THE SNOWTAM FORMAT

Note.— *Origin of data, assessment process and the procedures linked to the surface conditions reporting system are prescribed in the Procedures for Air Navigation Services — Aerodromes (PANS-Aerodromes, Doc 9981).*

1. General

- a) When reporting on more than one runway, repeat Items B to H (aeroplane performance calculation section).
- b) The letters used to indicate items are only used for reference purpose and should not be included in the messages. The letters, M (mandatory), C (conditional) and O (optional) mark the usage and information and shall be included as explained below.
- c) Metric units shall be used and the unit of measurement not reported.
- d) The maximum validity of SNOWTAM is 8 hours. New SNOWTAM shall be issued whenever a new runway condition report is received.
- e) A SNOWTAM cancels the previous SNOWTAM.
- f) The abbreviated heading “TTAAiiii CCCC MMYYGggg (BBB)” is included to facilitate the automatic processing of SNOWTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for SNOWTAM = SW;

AA = geographical designator for States, e.g. LF = FRANCE, EG = United Kingdom (see *Location Indicators* (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);

iiii = SNOWTAM serial number in a four-digit group;

CCCC = four-letter location indicator of the aerodrome to which the SNOWTAM refers (see *Location Indicators* (Doc 7910));

MMYYGGgg = date/time of observation/measurement, whereby:

MM = month, e.g. January = 01, December = 12

YY = day of the month

GGgg = time in hours (GG) and minutes (gg) UTC;

(BBB) = optional group for:

Correction, in the case of an error, to a SNOWTAM message previously disseminated with the same serial number = COR.

Note 1.— *Brackets in (BBB) are used to indicate that this group is optional.*

Note 2.— *When reporting on more than one runway and individual dates/times of observation/~~measurement~~-assessment are indicated by repeated Item B, the latest date/time of observation/~~measuring~~-assessment is inserted in the abbreviated heading (MMYYGGgg).*

Example: Abbreviated heading of SNOWTAM No. 149 from Zurich, measurement/observation of 7 November at 0620 UTC:

SWLS0149 LSZH 11070620

Note.— The information groups are separated by a space, as illustrated above.

- g) The text “SNOWTAM” in the SNOWTAM Format and the SNOWTAM serial number in a four-digit group shall be separated by a space, for example: SNOWTAM 0124.
- h) For readability purposes for the SNOWTAM message, include a line feed after the SNOWTAM serial number, after Item A, and after the aeroplane performance calculation section.
- i) When reporting on more than one runway, repeat the information in the aeroplane performance calculation section from the date and time of assessment for each runway before the information in the situational awareness section.
- j) Mandatory information is:
 - 1) AERODROME LOCATION INDICATOR;
 - 2) DATE AND TIME OF ASSESSMENT;
 - 3) LOWER RUNWAY DESIGNATOR NUMBER;
 - 4) RUNWAY CONDITION CODE FOR EACH ~~THIRD OF RUNWAY~~ **THIRD**; and
 - 5) CONDITION DESCRIPTION FOR EACH ~~THIRD OF RUNWAY~~ **THIRD** (when runway condition code (RWYCC) is reported 1- 5)

2. Aeroplane performance **calculation** section

Item A — Aerodrome location indicator (four-letter location indicator).

Item B — Date and time of assessment (eight-figure date/time group giving time of observation as month, day, hour and minute in UTC).

Item C — Lower runway designator number (nn[L] or nn[C] or nn[R]).

Note.— Only one runway designator is inserted for each runway and always the ~~lowest~~ **lower** number.

Item D — Runway condition code for each ~~third of runway~~ **third**. Only one digit (0, 1, 2, 3, 4, 5 or 6) is inserted for each ~~third of runway~~ **third**, separated by an oblique stroke (n/n/n).

Item E — Per cent coverage for each ~~third of runway~~ **third**. When provided, insert 25, 50, 75 or 100 for each ~~third of runway~~ **third**, separated by an oblique stroke ([n]nn/[n]nn/[n]nn).

Note 1.— This information is provided only when the runway condition for each ~~third of runway~~ **third** (*Item D*) has been reported as other than 6 and there is a condition description for each ~~third of runway~~ **third** (*Item G*) that has been reported other than DRY.

Note 2.— When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate ~~third~~ of runway third(s).

Item F — Depth of loose contaminant for each ~~third~~ of runway third. When provided, insert in millimetres for each ~~third~~ of runway third, separated by an oblique stroke (nn/nn/nn or nnn/nnn/nnn).

Note 1.— This information is only provided for the following contamination types:

- standing water, values to be reported 04, then assessed value. Significant changes 3 mm up to and including 15 mm;
- slush, values to be reported 03, then assessed value. Significant changes 3 mm up to and including 15 mm;
- wet snow, values to be reported 03, then assessed value. Significant changes 5 mm; and
- dry snow, values to be reported 03, then assessed value. Significant changes 20 mm.

Note 2.— When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate ~~third~~ of runway third(s).

Item G — Condition description for each ~~third~~ of runway third. Insert any of the following condition descriptions for each ~~third~~ of runway third, separated by an oblique stroke.

COMPACTED SNOW
 DRY SNOW
 DRY SNOW ON TOP OF COMPACTED SNOW
 DRY SNOW ON TOP OF ICE
 FROST
 ICE
 SLUSH
 STANDING WATER
 WATER ON TOP OF COMPACTED SNOW
 WET
 WET ICE
 WET SNOW
 WET SNOW ON TOP OF COMPACTED SNOW
 WET SNOW ON TOP OF ICE

DRY (only reported when there is no contaminant)

Note.— When the conditions are not reported, this will be signified by the insertion of “NR” for the appropriate ~~third~~ of runway third(s).

Item H — Width of runway to which the runway condition codes apply. Insert the width in metres if less than the published runway width.

3. Situational awareness section

Note 1.— Elements in the situational awareness section end with a full stop.

Note 2.— Elements in the situational awareness section for which no information exists, or where the conditional circumstances for publication are not fulfilled, are left out completely.

Item I — Reduced runway length. Insert the applicable runway designator and available length in meters (example: RWY nn [L] or nn [C] or nn [R] REDUCED TO [n]nnn).

Note.— This information is conditional when a NOTAM has been published with a new set of declared distances.

Item J — Drifting snow on the runway. When reported, insert “DRIFTING SNOW”.

Item K — Loose sand on the runway. When loose sand is reported on the runway, insert the ~~lowest~~ lower runway designator and with a space “LOOSE SAND” (RWY nn or RWY nn[L] or nn[C] or nn[R] LOOSE SAND).

Item L — Chemical treatment on the runway. When chemical treatment has been reported applied, insert the ~~lowest~~ lower runway designator and with a space “CHEMICALLY TREATED” (RWY nn or RWY nn[L] or nn[C] or nn[R] CHEMICALLY TREATED).

Item M — Snow banks on the runway. When ~~critical~~ snow banks are reported present on the runway, insert the lower runway designator and with a space “SNOWBANK” and with a space left “L” or right “R” or both sides “LR”, followed by the distance in metres from centreline separated by a space FM CL (RWY nn or RWY nn[L] or nn[C] or nn[R] SNOWBANK Lnn or Rnn or LRnn FM CL).

Item ~~ON~~ — Snow banks on the a taxiway. When ~~critical~~ snow banks are present on a taxiway, insert the taxiway designator and with a space “SNOWBANK” ~~and with a space left “L” or right “R” or both sides “LR”, followed by the distance in metres from centreline separated by a space FM CL~~ (TWY [nn]n SNOWBANK Lnn or Rnn or LRnn FM CL).

Item ~~NO~~ — Snow banks adjacent to the runway. When snow banks are reported present penetrating the height profile in the aerodrome snow plan, insert the ~~lowest~~ lower runway designator and “ADJ SNOWBANKS” (RWY nn or RWY nn[L] or nn[C] or nn[R] ADJ SNOWBANKS).

Item P — Taxiway conditions. When taxiway conditions are reported ~~slippery or~~ as poor, insert the taxiway designator followed by a space “POOR” (TWY [n or nn] POOR or ALL TWYS POOR).

Item R — Apron conditions. When apron conditions are reported slippery or as poor, insert the apron designator followed by a space “POOR” (APRON [nnnn] POOR or ALL APRONS POOR).

Item S — Measured friction coefficient. Where reported, insert the measured friction coefficient and friction measuring device.

Note.— This will only be reported for States that have an established programme of runway friction measurement using State-approved friction measuring equipment device.

Item T — Plain language remarks.

EXAMPLE OF COMPLETED SNOWTAM FORMAT

Example SNOWTAM 1

GG EADBZQZX EADNZQZX EADSZQZX
~~070645~~ 170100 EADDYNYX
 SWEA0149 EADD 02170055
 (SNOWTAM 0149
 EADD
 02170055 09L 5/5/5 100/100/100 NR/NR/~~NR03~~ WET/WET/WET SNOW
)

Example SNOWTAM 2

GG EADBZQZX EADNZQZX EADSZQZX
~~070645~~ 170140 EADDYNYX
 SWEA0149 SWEA0150 EADD ~~02170055~~ 02170135
 (SNOWTAM 0150
 EADD
 02170055 09L 5/5/5 100/100/100 NR/NR/~~NR03~~ WET/WET/WET SNOW
 EADD 02170135 09R 5/4/3 2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH
)

Example SNOWTAM 3

GG EADBZQZX EADNZQZX EADSZQZX
~~070645~~ 170229 EADDYNYX
 SWEA0149 SWEA0151 EADD ~~02170055~~ 02170225
 (SNOWTAM 0151
 EADD
 02170055 09L 5/5/5 100/100/100 NR/NR/~~NR03~~ WET/WET/WET SNOW
 EADD 02170135 09R 5/4/3 2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH
 EADD 02170225 09C 3/2/4 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW

RWY 09L SNOWBANK R20 FM CL. RWY 09R ADJ SNOWBANKS. TWY B POOR. APRON NORTH POOR)

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Example SNOWTAM 4

GG EADBZQZX EADNZQZX EADSZQZX

~~070645~~ 170350 EADDYNYX

~~SWEA0149~~ SWEA0152 EADD ~~02170055~~ 02170345

(SNOWTAM 0152

EADD

02170345 09L 5/5/5 100/100/100 NR/NR/~~NR03~~ WET/WET/~~WET~~SLUSH

~~EADD~~ 02170134 09R 5/4/3 2/2 100/50/75 NR/06/06 WET/SLUSH/SLUSH

~~EADD~~ 02170225 09C 3/2/4 2/3/3 75/100/100 06/12/12 SLUSH/WET SNOW/WET SNOW 35

DRIFTING SNOW. RWY 09L LOOSE SAND. RWY 09R CHEMICALLY TREATED. RWY 09C
CHEMICALLY TREATED.)

Editorial Note.— Appendix 5 is relocated text from Appendix 3 to Annex 15.

APPENDIX 3 5. ASHTAM FORMAT

(See Chapter 5, 5.2.45)

(COM heading)	(PRIORITY INDICATOR)		(ADDRESSEE INDICATOR(S)) ¹															
	(DATE AND TIME OF FILING)						(ORIGINATOR'S INDICATOR)											
(Abbreviated heading)	(VA* ² SERIAL NUMBER)						(LOCATION INDICATOR)			DATE/TIME OF ISSUANCE						(OPTIONAL GROUP)		
	V	A	*2	*2														

ASHTAM	(SERIAL NUMBER)	
(FLIGHT INFORMATION REGION AFFECTED)		A)
(DATE/TIME (UTC) OF ERUPTION)		B)
(VOLCANO NAME AND NUMBER)		C)
(VOLCANO LATITUDE/LONGITUDE OR VOLCANO RADIAL AND DISTANCE FROM NAVAID)		D)
(VOLCANO LEVEL OF ALERT COLOUR CODE, INCLUDING ANY PRIOR LEVEL OF ALERT COLOUR CODE) ³		E)
(EXISTENCE AND HORIZONTAL/VERTICAL EXTENT OF VOLCANIC ASH CLOUD) ⁴		F)
(DIRECTION OF MOVEMENT OF ASH CLOUD) ⁴		G)
(AIR ROUTES OR PORTIONS OF AIR ROUTES AND FLIGHT LEVELS AFFECTED)		H)
(CLOSURE OF AIRSPACE AND/OR AIR ROUTES OR PORTIONS OF AIR ROUTES, AND ALTERNATIVE AIR ROUTES AVAILABLE)		I)
(SOURCE OF INFORMATION)		J)
(PLAIN-LANGUAGE REMARKS)		K)
NOTES: 1. See also Appendix 5 regarding addressee indicators used in predetermined distribution systems. 2. *Enter ICAO nationality letter as given in ICAO Doc 7910, Part 2. 3. See paragraph 3.5 below. 4. Advice on the existence, extent and movement of volcanic ash cloud G) and H) may be obtained from the Volcanic Ash Advisory Centre(s) responsible for the FIR concerned. 5. Item titles in brackets () not to be transmitted.		

SIGNATURE OF ORIGINATOR (*not for transmission*)

INSTRUCTIONS FOR THE COMPLETION OF THE ASHTAM FORMAT

1. General

1.1 The ASHTAM provides information on the status of activity of a volcano when a change in its activity is, or is expected to be of operational significance. This information is provided using the volcano level of alert colour code given in 3.5 below.

1.2 In the event of a volcanic eruption producing ash cloud of operational significance, the ASHTAM also provides information on the location, extent and movement of the ash cloud and the air routes and flight levels affected.

1.3 Issuance of an ASHTAM giving information on a volcanic eruption, in accordance with section 3 below, should **not** be delayed until complete information A) to K) is available but should be issued immediately following receipt of notification that an eruption has occurred or is expected to occur, or a change in the status of activity of a volcano of operational significance has occurred or is expected to occur, or an ash cloud is reported. In the case of an expected eruption, and hence no ash cloud evident at that time, items A) to E) should be completed and items F) to I) indicated as “not applicable”. Similarly, if a volcanic ash cloud is reported, e.g. by special air-report, but the source volcano is not known at that time, the ASHTAM should be issued initially with items A) to E) indicated as “unknown”, and items F) to K) completed, as necessary, based on the special air-report, pending receipt of further information. In other circumstances, if information for a specific field A) to K) is not available indicate “NIL”.

1.4 The maximum period of validity of ASHTAM is 24 hours. New ASHTAM ~~must~~ **shall** be issued whenever there is a change in the level of alert.

2. Abbreviated heading

2.1 Following the usual AFTN communications header, the abbreviated heading “TT AAiiii CCCC MMYYGggg (BBB)” is included to facilitate the automatic processing of ASHTAM messages in computer data banks. The explanation of these symbols is:

TT = data designator for ASHTAM = VA;

AA = geographical designator for States, e.g. NZ = New Zealand (see *Location Indicators* (Doc 7910), Part 2, Index to Nationality Letters for Location Indicators);

iiii = ASHTAM serial number in a four-figure group;

CCCC = four-letter location indicator of the flight information region concerned (see *Location Indicators* (Doc 7910), Part 5, addresses of centres in charge of FIR/UIR);

MMYYGggg = date/time of report, whereby:

MM = month, e.g. January = 01, December = 12

YY = day of the month

Gggg = time in hours (GG) and minutes (gg) UTC;

(BBB) = Optional group for correction to an ASHTAM message previously disseminated with the same serial number = COR.

Note.— Brackets in (BBB) are used to indicate that this group is optional.

Example: Abbreviated heading of ASHTAM for Auckland Oceanic FIR, report on 7 November at 0620 UTC:

VANZ0001 NZZO 11070620

3. Content of ASHTAM

3.1 *Item A* — Flight information region affected, plain-language equivalent of the location indicator

given in the abbreviated heading, in this example “Auckland Oceanic FIR”.

3.2 *Item B* — Date and time (UTC) of first eruption.

3.3 *Item C* — Name of volcano, and number of volcano as listed in the ICAO *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691), Appendix H, and on the World Map of Volcanoes and Principal Aeronautical Features.

3.4 *Item D* — Latitude/Longitude of the volcano in whole degrees or radial and distance of volcano from NAVAID (as listed in the ICAO *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds* (Doc 9691), Appendix H, and on the World Map of Volcanoes and Principal Aeronautical Features).

3.5 *Item E* — Colour code for level of alert indicating volcanic activity, including any previous level of alert colour code as follows:

Level of alert colour code	Status of activity of volcano
GREEN ALERT	Volcano is in normal, non-eruptive state. <i>or, after a change from a higher alert level:</i> Volcanic activity considered to have ceased, and volcano reverted to its normal, non-eruptive state.
YELLOW ALERT	Volcano is experiencing signs of elevated unrest above known background levels. <i>or, after a change from higher alert level:</i> Volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
ORANGE ALERT	Volcano is exhibiting heightened unrest with increased likelihood of eruption. <i>or,</i> Volcanic eruption is underway with no or minor ash emission [<i>specify ash-plume height if possible</i>].
RED ALERT	Eruption is forecasted to be imminent with significant emission of ash into the atmosphere likely. <i>or,</i> Eruption is underway with significant emission of ash into the atmosphere [<i>specify ash-plume height if possible</i>].

Note.— The colour code for the level of alert indicating the status of activity of the volcano and any change from a previous status of activity should be provided to the area control centre by the responsible vulcanological agency in the State concerned, e.g. “RED ALERT FOLLOWING YELLOW” OR “GREEN ALERT FOLLOWING ORANGE”.

3.6 *Item F* — If volcanic ash cloud of operational significance is reported, indicate the horizontal extent and base/top of the ash cloud using latitude/longitude (in whole degrees) and altitudes in thousands of metres (feet) and/or radial and distance from source volcano. Information initially may be based only on special air-report, but subsequent information may be more detailed based on advice from the responsible meteorological watch office and/or volcanic ash advisory centre.

3.7 *Item G* — Indicate forecast direction of movement of the ash cloud at selected levels based on

advice from the responsible meteorological watch office and/or volcanic ash advisory centre.

3.8 *Item H* — Indicate air routes and portions of air routes and flight levels affected, or expected to become affected.

3.9 *Item I* — Indicate closure of airspace, air routes or portions of air routes, and availability of alternative routes.

3.10 *Item J* — Source of the information, e.g. “special air-report” or “vulcanological agency”, etc. The source of information should always be indicated, whether an eruption has actually occurred or ash cloud reported, or not.

3.11 *Item K* — Include in plain language any operationally significant information additional to the foregoing.

APPENDIX 6. TERRAIN AND OBSTACLE ATTRIBUTES PROVISION REQUIREMENTS

Table A8-3 A6-1. Terrain attributes

Terrain attribute	Mandatory/Optional
Area of coverage	Mandatory
Data originator identifier	Mandatory
Data source identifier	Mandatory
Acquisition method	Mandatory
Post spacing	Mandatory
Horizontal reference system	Mandatory
Horizontal resolution	Mandatory
Horizontal accuracy	Mandatory
Horizontal confidence level	Mandatory
Horizontal position	Mandatory
Elevation	Mandatory
Elevation reference	Mandatory
Vertical reference system	Mandatory
Vertical resolution	Mandatory
Vertical accuracy	Mandatory
Vertical confidence level	Mandatory
Surface type	Optional
Recorded surface	Mandatory
Penetration level	Optional
Known variations	Optional
Integrity	Mandatory
Date and time stamp	Mandatory
Unit of measurement used	Mandatory

Table A8-4 A6-2. Obstacle attributes

Obstacle attribute	Mandatory/Optional

Area of coverage	Mandatory
Data originator identifier	Mandatory
Data source identifier	Mandatory
Obstacle identifier	Mandatory
Horizontal accuracy	Mandatory
Horizontal confidence level	Mandatory
Horizontal position	Mandatory
Horizontal resolution	Mandatory
Horizontal extent	Mandatory
Horizontal reference system	Mandatory
Elevation	Mandatory
Height	Optional
Vertical accuracy	Mandatory
Vertical confidence level	Mandatory
Vertical resolution	Mandatory
Vertical reference system	Mandatory
Obstacle type	Mandatory
Geometry type	Mandatory
Integrity	Mandatory
Date and time stamp	Mandatory
Unit of measurement used	Mandatory
Operations	Optional
Effectivity	Optional
Lighting	Mandatory

APPENDIX 5 7. PREDETERMINED DISTRIBUTION SYSTEM FOR NOTAM

(See Chapter 5, 5.3.4.2, and Annex 10, Volume II, Chapter 4, 4.4.14)

1. The predetermined distribution system provides for incoming NOTAM (including SNOWTAM and ASHTAM) to be channelled through the AFS direct to designated addressees predetermined by the receiving country concerned while concurrently being routed to the international NOTAM office for checking and control purposes.

2. The addressee indicators for those designated addressees are constituted as follows:

1) *First and second letters:*

The first two letters of the location indicator for the AFS communication centre associated with the relevant international NOTAM office of the receiving country.

2) *Third and fourth letters:*

The letters “ZZ” indicating a requirement for special distribution.

3) *Fifth letter:*

The fifth letter differentiating between NOTAM (letter “N”), SNOWTAM (letter “S”), and ASHTAM (letter “V”).

4) *Sixth and seventh letters:*

The sixth and seventh letters, each taken from the series A to Z and denoting the national and/or international distribution list(s) to be used by the receiving AFS centre.

Note.— *The fifth, sixth and seventh letters replace the three-letter designator YNY which, in the normal distribution system, denotes an international NOTAM office.*

5) *Eighth letter:*

The eighth position letter shall be the filler letter “X” to complete the eight-letter addressee indicator.

3. States are to inform the States from which they receive NOTAM of the sixth and seventh letters to be used under different circumstances to ensure proper routing.

APPENDIX 8. TERRAIN AND OBSTACLE DATA REQUIREMENTS

(See Annex 15, Chapter 5)

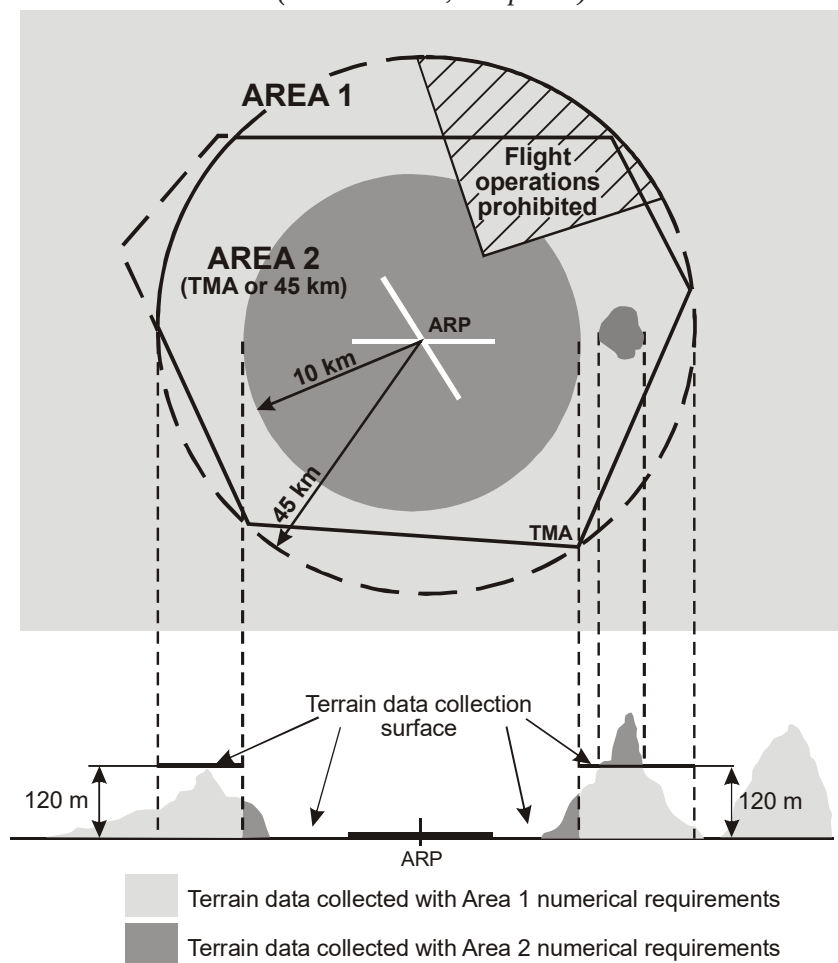


Figure A8-1. Terrain data collection surfaces — Area 1 and Area 2

1. Within the area covered by a 10-km radius from the ARP, terrain data shall comply with the Area 2 numerical requirements.
2. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that penetrates the horizontal plane 120 m above the lowest runway elevation shall comply with the Area 2 numerical requirements.
3. In the area between 10 km and the TMA boundary or 45-km radius (whichever is smaller), data on terrain that does not penetrate the horizontal plane 120 m above the lowest runway elevation shall comply with the Area 1 numerical requirements.
4. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, terrain data shall comply with the Area 1 numerical requirements.

Note.— Terrain data numerical requirements for Areas 1 and 2 are specified in [Appendix 1 Table A8-1](#).

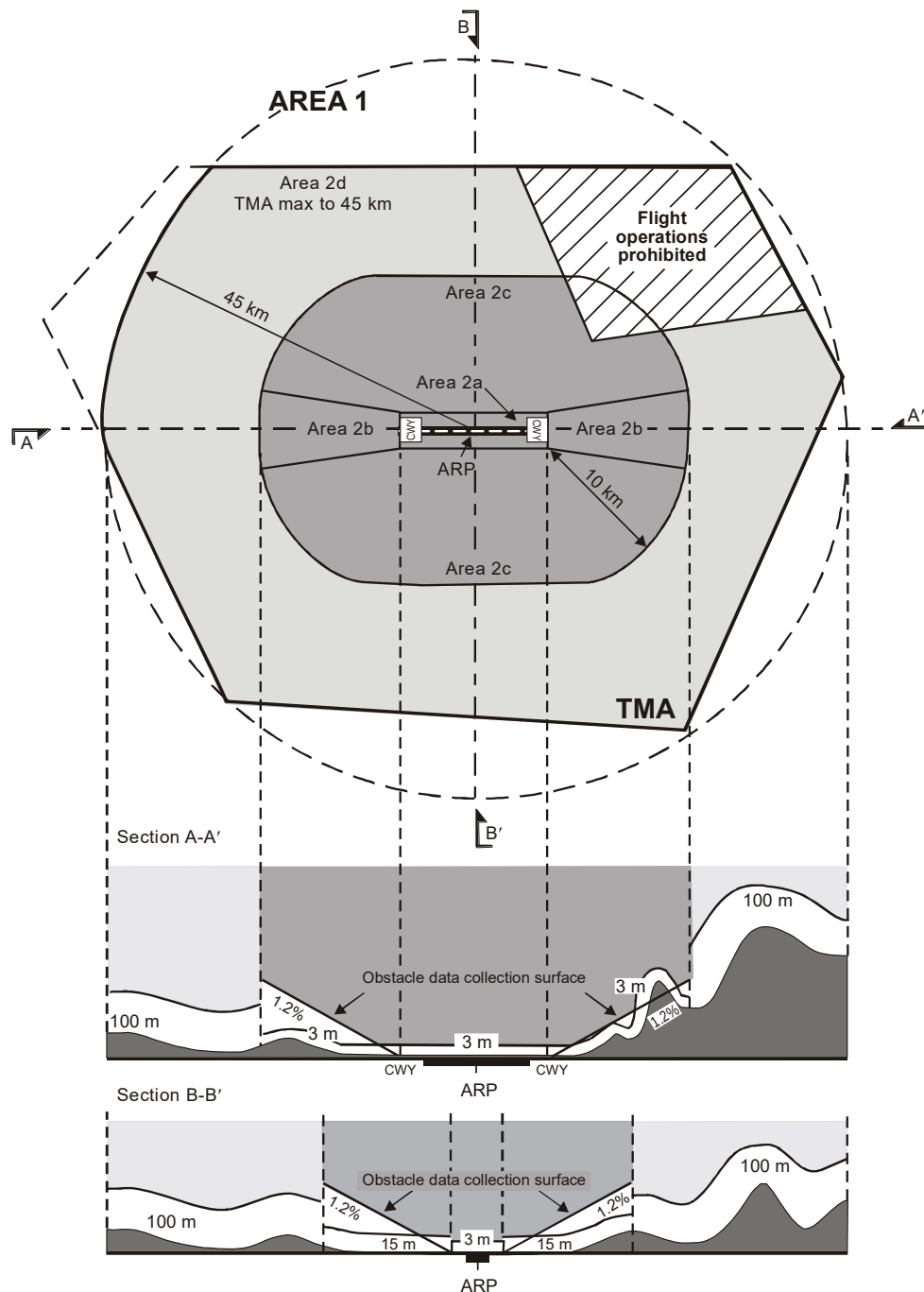


Figure A8-2. Obstacle data collection surfaces — Area 1 and Area 2

1. Obstacle data shall be collected and recorded in accordance with the Area 2 numerical requirements specified in [Appendix 1 Table A8-2](#).
2. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, obstacle data shall be collected and recorded in accordance with the Area 1 requirements.
3. Data on every obstacle within Area 1 whose height above the ground is 100 m or higher shall be collected and recorded in the database in accordance with the Area 1 numerical requirements specified in [Appendix 1 Table A8-2](#).

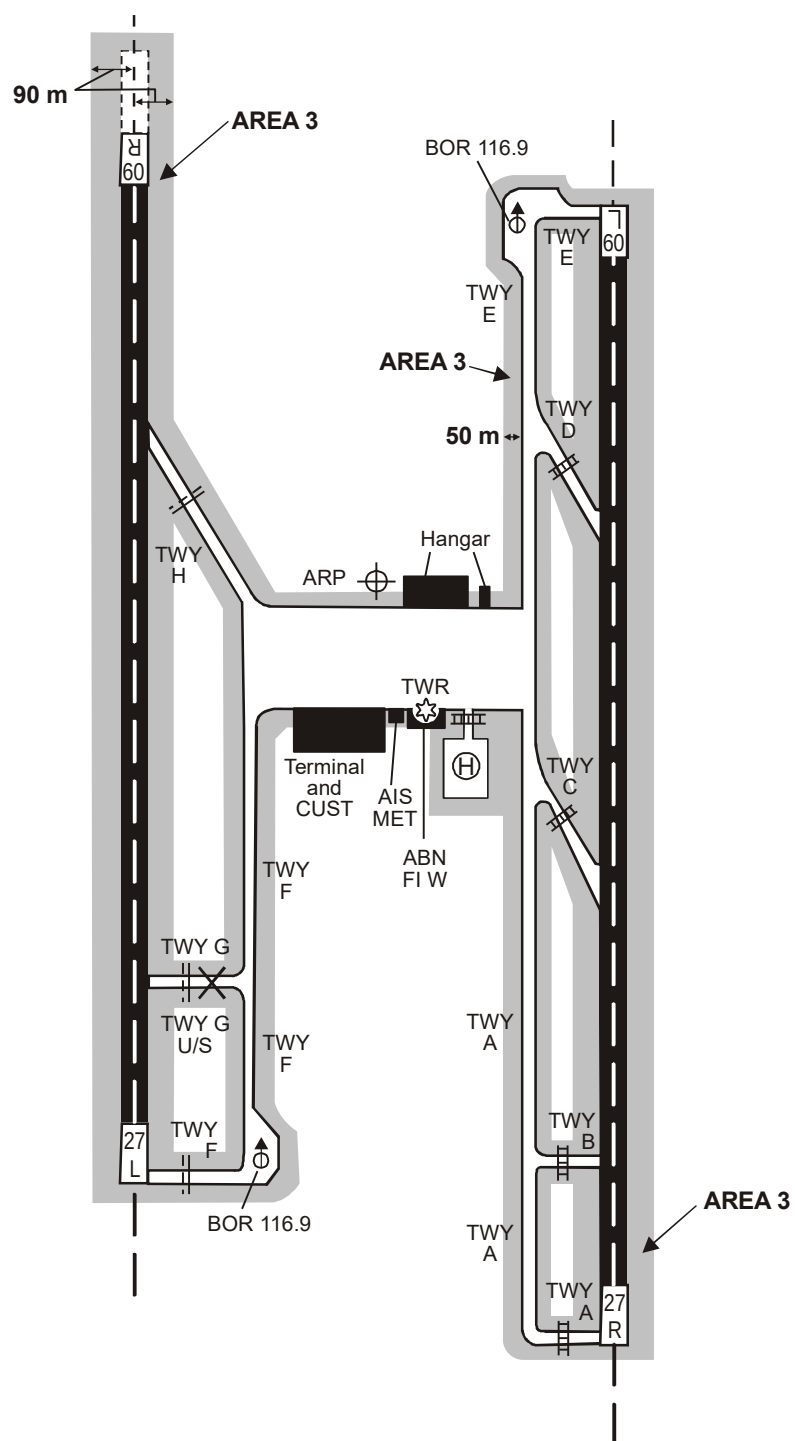


Figure A8-3. Terrain and obstacle data collection surface — Area 3

1. Terrain and obstacle data in Area 3 shall comply with the numerical requirements specified in Appendix 1 Table A8-1 and Table A8-2, respectively.

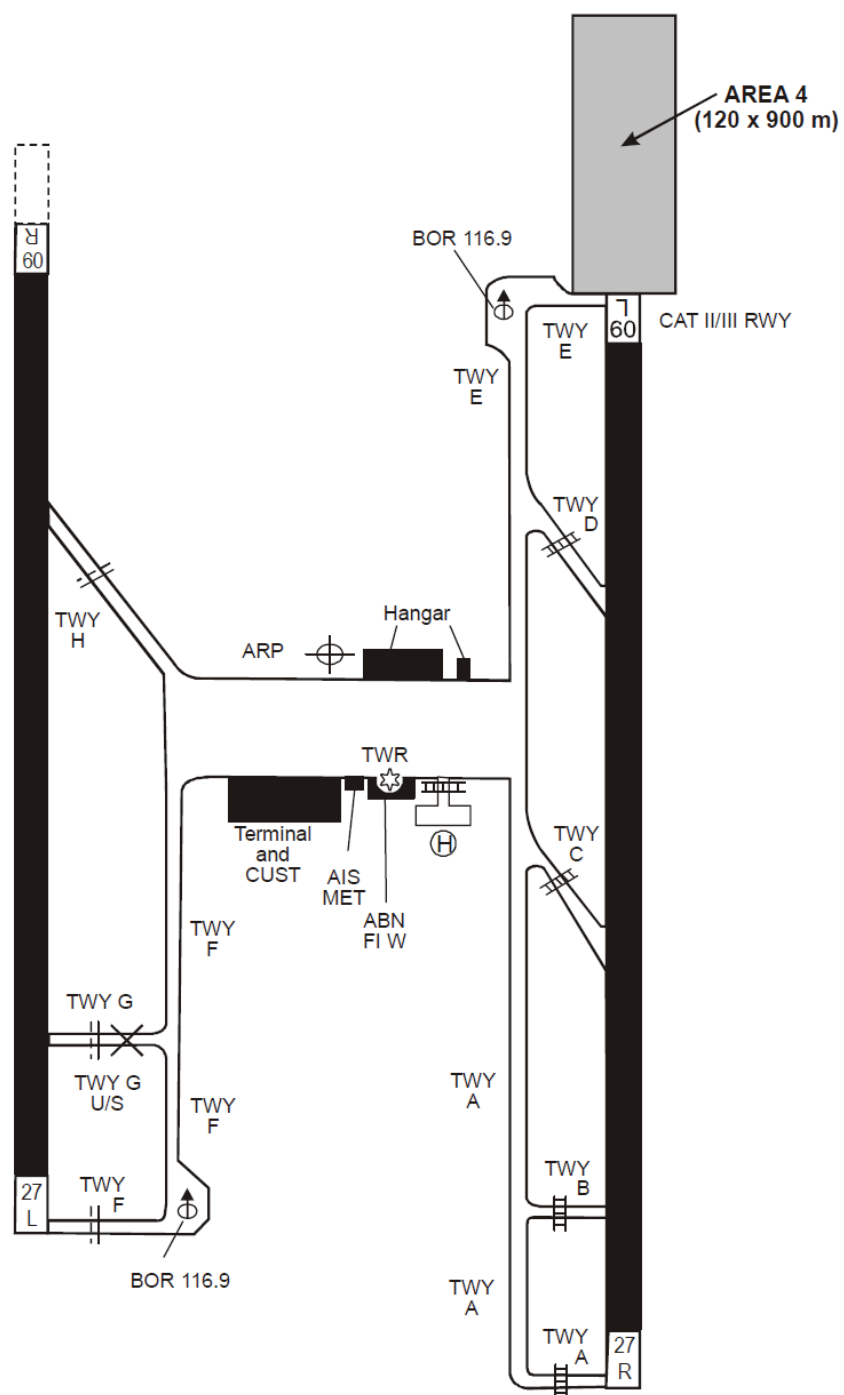


Figure A8-4. Terrain and obstacle data collection surface — Area 4

Terrain and obstacle data in Area 4 shall comply with the numerical requirements specified in **Appendix 1 Table A8-1** and **Table A8-2** respectively.

Note. — Area 4 may be extended in accordance with 10.1.2.

— END —



Interregional EUR/MID Workshop on PANS AIM

Summary and Conclusions

Paris, France, 10-12 July 2018



ICAO UNITING AVIATION

Introduction

- Attendance
 - 101 Participants
 - 41 States (EUR/NAT and MID)
 - 9 International Organizations & Industry





Workshop Objectives

The objective of the Workshop was to:

- introduce the new PANS-AIM (Doc 10066) and latest Amendments to Annex 15; and
- address associated challenges and share best practices for a timely implementation of the new provisions, including the implementation of datasets.



ICAO UNITING AVIATION

Agenda

- Agenda Item 1: Opening
- Agenda Item 2: Global AIM developments
- Agenda Item 3: Amendment 39 to Annex 15
 - Introduction of the Amendment 39 to Annex 15
 - New SNOWTAM Format
 - Main changes and implications on States and Stakeholders
- Agenda Item 4: Amendment 40 to Annex 15
 - Introduction of the Amendment 40 to Annex 15
 - Main changes and implications on States and Stakeholders
- Agenda Item 5: PANS AIM (Doc 10066)
 - Introduction of the new PANS AIM (Doc 10066)
 - Aeronautical Data Catalogue
 - Main changes and implications on States and Stakeholders
- Agenda Item 6: Planning and implementation
 - Development of Implementation Plan (Plan of Actions)
- Agenda Item 7: Wrap up and Conclusion



- Impact on States for the implementation of the new provisions (Amendment 40 to Annex 15 and PANS-AIM), including the transposition of the PANS-AIM provisions in National/Regional Regulations; and completion of the transition to digital AIM (including the implementation of datasets). The applicability date of the new provisions is 8 November 2018, and action should be taken to expedite implementation and change the current business models (business transformation).
- Readiness for change (availability of necessary human and financial resources, training, awareness, communication, etc)
- Need for additional guidance material from Global (ICAO HQ) and Regional levels (ROs/PIRGs, EUROCONTROL, EASA, etc)
- Interoperability issues
- More stringent need for cross-border data coordination, in a data-centric environment
- Difficulties that may be faced by Users, if digital datasets are implemented by States in different ways (no harmonization/standardization)



- A step-wise approach (balancing wins and efforts) should be followed for the implementation of the new AIM provisions (Amendment 40 to Annex 15 and PANS-AIM)
- All Stakeholders (ICAO HQ and ROs, International Organizations, States (regulators, Service Providers and Originators) and Industry) should joint efforts (coordinated approach) to support and expedite a harmonized implementation of the new AIM provisions to go fully digital, with three aligned parallel tracks: global, regional and national levels:

At the Global Level:

- ICAO HQ to expedite the establishment of a working structure/arrangement to:
 - address AIM domain-specific subjects (not only those SWIM-related), including AIM implementation issues
 - develop additional Guidance and/or update the current Manuals
 - develop an updated version of the Roadmap for the transition from AIS to AIM to support the transition for the upcoming 10 years
 - continue the enhancement of the AIM provisions,
 - Review of the ICAO provisions (other than Annex 15) to fully support the transition to digital AIM
 - provision of necessary assistance to States, such as conduct of Go-Team visits, organisation of global AIM events, etc.



Recommendations

At the Regional Level:

- Development/update of Regional Plans and Roadmaps
- Raise awareness about the new AIM provisions and identify associated difficulties and challenges, as well as the necessary resources and time to implement them and comply with the global and regional requirements (provide Forum for sharing information and best practices, e.g. Webinars)
- Development of necessary Regional Guidance
- Address Regional and Inter-regional issues, in particular interoperability and cross-border issues
- Provision of necessary assistance to States through the conduct of workshops/seminars, Go-Team visits, Assistance Missions to States, etc.
- Assess Stakeholders readiness for the transition from AIP tables to digital data sets and recommend necessary actions (transition period, visualization of data sets in tabular format or graphical viewer, etc.)
- ROs to establish ad-hoc group(s) composed of volunteers from States, International Organizations and other Stakeholders, to take necessary action(s) on the recommendations of the Workshop, in order to propose the needful to the relevant PIRGs.



At the National Level:

- Development/update of the National Plan/Roadmap for the transition to AIM and ensure alignment with Global and Regional Plans, including a step-wise approach (balancing wins and efforts) for the implementation of datasets
- Raise awareness about the importance of the new AIM provisions and associated difficulties and challenges, as well as the necessary resources and time to implement them and comply with the global and regional requirements
- Ensure the training of the AIM staff to support the implementation of digital AIM
- Assess the readiness of the different stakeholders (ANSP/AISP, data originators, end users, etc.) for the implementation of the new AIM provisions, in particular the datasets
- Ensure consistency between aeronautical information products, including digital datasets
- Support the global and regional AIM activities, through sharing of expertise and best practices



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Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU

16th Edition		15th Edition		Assessment
Para No.	Text of Standard	Para. No.	Text of Standard	
1.2.1.1	The World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.	1.2.1.1	World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.	No significant change / minor editorial amendment
1.2.2.1	Mean sea level (MSL) datum shall be used as the vertical reference system for international air navigation.	1.2.2.1	Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, shall be used as the vertical reference system for international air navigation.	No significant change / minor editorial amendment
1.2.2.2	The Earth Gravitational Model — 1996 (EGM-96) shall be used as the global gravity model for international air navigation.	1.2.2.2	The Earth Gravitational Model — 1996 (EGM-96), containing long wavelength gravity field data to degree and order 360, shall be used by international air navigation as the global gravity model.	No significant change / minor editorial amendment
1.2.2.3	At those geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data shall be developed and used. When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96, shall be provided in the Aeronautical Information Publication (AIP).	1.2.2.3	At those geographical positions where the accuracy of EGM-96 does not meet the accuracy requirements for elevation and geoid undulation specified in Annex 14, Volumes I and II, on the basis of EGM-96 data, regional, national or local geoid models containing high resolution (short wavelength) gravity field data shall be developed and used. When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96, shall be provided in the Aeronautical Information Publication (AIP).	No significant change / minor editorial amendment
1.2.3.1	The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system for international air navigation.	1.2.3.1	The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system for international air navigation.	No significant change / minor editorial amendment
1.2.3.2	When a different temporal reference system is used for some applications, the feature catalogue, or the metadata associated with an application schema or a data set, as appropriate, shall include either a description of that system or a citation for a document that describes that temporal reference system.	1.2.3.2	When a different temporal reference system is used for some applications, the feature catalogue, or the metadata associated with an application schema or a data set, as appropriate, shall include either a description of that system or a citation for a document that describes that temporal reference system.	No significant change / minor editorial amendment
1.3.1	Aeronautical information products intended for international distribution shall include English text for those parts expressed in plain language.	1.3.1	Each element of the Integrated Aeronautical Information Package for international distribution shall include English text for those parts expressed in plain language.	Replacement of IAIP with "Aeronautical Information Products"
1.3.2	Place names shall be spelt in conformity with local usage, transliterated, when necessary, into the ISO-Basic Latin alphabet.	1.3.2	Place names shall be spelt in conformity with local usage, transliterated, when necessary, into the Latin alphabet.	No significant change / minor editorial amendment
1.3.4	ICAO abbreviations shall be used in aeronautical information products whenever they are appropriate and their use will facilitate distribution of aeronautical data and aeronautical information.	1.3.4	ICAO abbreviations shall be used in the AIS whenever they are appropriate and their use will facilitate distribution of aeronautical data and aeronautical information.	Replacement of AIS with "Aeronautical Information Products"

MID REGION AIM IMPLEMENTATION ROADMAP FOR THE TRANSITION FROM AIS TO AIM

	Related Steps	2016		2017		2018		2019		2020		2021		2022		Priority	Remarks
		1	2	1	2	1	2	1	2	1	2	1	2	1	2		
AIXM	P07, P08															1	Target: 80% by 2018
eAIP	P11															1	Target: 80% by 2020
Integrated Aeronautical Information Database	P06															2	
Aeronautical Data Exchange	P09															2	
Interoperability with MET	P19															3	
Aeronautical Information Briefing	P12															3	
Agreement with data originators	P18															1	
Data Quality Monitoring	P01															1	
Data Integrity Monitoring	P02															1	
Terrain A-1	P13															2	Target: 70% by 2018
Obstacle A-1	P14															2	Target: 60% by 2018
Terrain A-4	P13															2	Target: 100% by 2018
Obstacle A-4	P14															2	Target: 100% by 2018
Terrain A-2a	P13															2	
Obstacle A-2a	P14															2	
Training	P16															1	Continuous
Communication networks	P10															3	
Digital NOTAM	P21															3	
Electronic Aeronautical Charts	P20															3	
Terrain and Obstacle for Areas 2b, 2c, 2d and 3	P13, P14															3	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs
Aerodrome Mapping	P15															3	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs

White: Planning

Light Green: Initial/On-going Implementation

Dark Green: Implemented (Performance Target achieved)



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Fifth Meeting (MSG/6)
(Cairo, Egypt, 2 - 4 November 2018)

Agenda Item 5.3: Specific Air Navigation Issues

AOP MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents the AOP matters for consideration of and/or endorsement by the MSG/6 meeting.

Action by the meeting is at paragraph 3.

REFERENCES

- ADOP/3 Report
- Annex 14 Volume I
- ICAO Airport Planning Manual Doc 9184 - Part 1-2nd Edition 1987

1. INTRODUCTION

1.1 The fifth meeting of the RASG-MID Runway and Ground Safety Working Group (RGS WG/5), was held in Cairo, Egypt, from 25 to 27 November 2018.

1.2 The Second Global Air Navigation Industry Symposium (GANIS/2) and Safety and Air Navigation Implementation Symposium (SANIS/1) were successfully held at ICAO HQ in Montreal, Canada in December 2017. A number of topics related to the Panel's job cards were featured in the symposium such as airport master planning and design, TAMs, obstacle management, runway safety, ground handling and aerodrome certification.

1.3 The third meeting of the Aerodrome Design and Operations Panel (ADOP) in Montréal, Canada, from 26 to 29 March 2018.

1.1 Third meeting of the Air Navigation System Implementation Group (ANSIG/3) was held in Cairo, Egypt from 2 to 4 July 2018.

2. DISCUSSION

Airport Master Plan

2.1 The Airport Master Plan is a document that presents the short-term (1-5 years), intermediate-term (6-10 years) and long-term (10-20 year) development goals of an airport and is typically evaluated and updated every 5 to 10 years.

2.2 The Airport Master Plan provides the following:

- A graphic presentation of the future development of the airport and anticipated land uses in the vicinity of the airport;
- A schedule for development;
- An achievable financial plan;
- Justification for the plan technically and procedurally; and
- An implementation plan that satisfies local, state, and federal regulations.

2.3 The Master Plan should be reviewed at least annually and adjusted as appropriate to reflect conditions at the time of review. It should be thoroughly evaluated and modified every five years or more often if changes in economic, operational, environmental and financial condition indicate an earlier need for such revision. It is recommended that the aerodrome operator should be proactively involved in the master planning to eliminate potential hazards being created by aerodrome infrastructure, such as the runway and taxiway layout, etc., and to accommodate future aircraft developments.

2.4 An example of an Airport Master planning process is provided as follows:



2.5 The ADOP meeting acknowledged that effective airport master planning is vital in building the airport capacity in a timely and phased approach, thus avoiding significant delays in the future due to capacity constraints. Airport capacity would be increased and airport delays would be reduced through more precise and up-to-date airport planning.

2.6 The need for new ICAO provisions for airport master planning was recognized by both the ADOP as well as states in the various ICAO regions. Accordingly, new SARPs on airport planning requirements have been proposed to be included in Annex 14, Volume I to support the provision of airport capacity enhancements in a timely manner to avoid airport congestion and delays.

2.7 Airport Master Plan Task Force (AMPTF) had been tasked with a complete rewrite of the obsolete guidance in the 30-year old Doc 9184, Airport Planning Manual, Part 1 — Master Planning that addressed airport master planning. Additionally, as part of the deliverables in the job card, the TF also found it necessary to propose new provisions germane to airport planning to support airport capacity enhancements which were currently non-existent save for those necessitating the integration of security considerations and land use and environmental planning in the design and construction of new facilities.

2.8 Accordingly, the ADOP meeting developed Proposals for Amendment of Standards,

Recommended Practices and Procedures for Air Navigation Services related to the Annex 14 Vol I, Annex 4 and Doc 9981–PANS-Aerodromes.

2.9 The RGS WG/5 meeting was apprised of the latest developments regarding airport master planning, including the outcome of the RGS WG/4 and the ADOP/3 meetings. Considering that the work related to the development of SARPs and Guidance material pertaining to airport master planning, has been already developed in ICAO headquarters, the meeting invited States to share with the RGS WG/6 meeting their experience with regard to the implementation of airport master planning and encourage their Airport Operators to develop a Master Plan for their International Airports.

Aerodrome Certification

2.10 Based on the latest feedback provided by States and the amended AOP table, the Aerodromes Certification implementation table has been updated, as at **Appendix A**. The table shows that 34 out of the 58 MID States international aerodromes have been certified. This number represents 59% of the international aerodromes listed in the MID ANP.

2.11 The current Aerodrome Certification percentage is 59%, which did not meet the MID Safety Strategy target of 75%. Accordingly, more efforts are needed to meet the Strategy target.

A-CDM Implementation

2.12 The meeting may wish to recall that B0-ACDM related to Improved Airport Operation through Airport Collaborative Decision Making (A-CDM) is a priority one ASBU module in the MID Air Navigation Strategy. A-CDM plays an important role in enhancing the utilization of existing infrastructure, through a coordinated effort among key players involved in airside operations at aerodromes, to proactively plan and manage the punctuality, efficiency and predictability of operations.

2.13 The meeting may wish to recall that the ANSIG/3 meeting (Cairo, Egypt, 3-5 July 2018), raised concern about the slow progress of implementation of the B0-ACDM and requested that an ACDM Workshop be organized by the ICAO MID Office in 2019.

2.14 The ANSIG/3 meeting agreed that concerned States (according to the B0-ACDM applicability area included in the MID Air Navigation Strategy) should provide the ICAO MID Office with the contact details of their designated ACDM Focal Points for an improved coordination of ACDM implementation, and that a Survey on ACDM implementation be carried out for the monitoring of ACDM implementation by the concerned international aerodromes (reference applicability area in the MID Air Navigation Strategy).

2.15 The ANSIG/3 meeting noted that ACDM Information Sharing and ACDM Milestones Approach (Turn-round Process) are considered as the main elements that should be assigned high priority (fundamental elements) for ACDM implementation.

2.16 Based on the above, the meeting may wish to agree to the following Draft Conclusions:

DRAFT MSG CONCLUSION 6/X: SURVEY ON ACDM IMPLEMENTATION

That,

- a) concerned States (according to the B0-ACDM applicability area included in the MID Air Navigation Strategy) be urged to provide the ICAO MID Office with the contact details of their designated ACDM Focal Points; and*
- b) a Survey on ACDM implementation be carried out for the monitoring of ACDM implementation, using the template at **Appendix B**.*

DRAFT MSG CONCLUSION 6/X: ACDM IMPLEMENTATION WORKSHOP

That, an ACDM Implementation Workshop be organized by the ICAO MID Office in 2019.

DRAFT MSG CONCLUSION 6/X: ACTION PLAN FOR A-CDM IMPLEMENTATION

That, States be urged to develop an action plan for A-CDM implementation in line with the MID Air Navigation Strategy.

B0-SURF (A-SMGCS)

2.17 The Advanced Surface Movement Guidance and Control Systems (A-SMGCS) is an expansion of the Surface Movement Guidance and Control Systems (SMGCS) to improve capacity and safety by making use of modern technologies and a higher level of integration between the various functionalities.

2.18 B0-SURF (A-SMGCS Level 1-2) is a priority 1 ASBU Module in the MID Air Navigation Strategy. The meeting may wish to note that the Status of implementation of B0-SURF is 54% (Level 1: OBBI, HECA, OTBD, OTHH, OMDB, OMAA, OMDW) and 46% (Level 2: OBBI, HECA, OTBD, OTHH, OMDB, OMAA).

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information and updates contained in this working paper and take action as appropriate;
- b) urge States to expedite the implementation of Aerodrome Certification in their International Aerodromes in order to achieve the MID Air Navigation Strategy targets; and
- c) endorse the proposed Draft Conclusions.

APPENDIX A

STATUS OF AERODROME CERTIFICATION IMPLEMENTATION IN MID REGION						
	State	Number of Intl Aerodromes (AOP Table 1-1 -MID ANP)	Number of Certified Intl Aerodromes	Percentage Certified	List of Intl Aerodromes having Certificates	Remarks
1	Bahrain	1	1	100%	BAHRAIN/Bahrain Intl (OBBI)	
2	Egypt	7	5	71%	- CAIRO/Cairo Intl (HECA) - SHARM EL-SHEIKH/Sharm El Sheikh Intl (HESH) - HURGADA/Hurghada Intl (HEGN) - MARSA ALAM /Marsa Alam Intl (HEMA) - ASWAN/Aswan Intl (HESN)	Certification of: - LUXER/Luxor Intl Airport (HELX) will be in Dec 2017 - ALEXANDRIA/Borg El-Arab Intl Airport (HEBA) will be in the first half of 2018
3	Iran	9	4	44%	- TEHRAN/Mehrabad Intl (OIII) - ZAHEDAN/Zahedan Intl (OIZH) - YAZD /Yazd Intl (OIYY) - ISFAHAN/Isfahan Int'l (OIFM)	Certification Status for: - TEHRAN/ IKIA Intl (OIIE) - BANDAR Abbas /Bandar Abbas Intl (OIKB) are waiting CAA final action for certification very soon
4	Iraq	6	2	33%	- BAGHDAD/Baghdad Intl (ORBI) - ERBIL/Erbil Intl (ORER)	

5	Jordan	2	2	100%	- AMMAN/Queen Alia Intl (OJAI) - AQABA/ King Hussein Intl (OJAQ)	
6	Kuwait	1	1	100%	KUWAIT/Kuwait Intl (OKBK)	
7	Lebanon	1	0	0%		
8	Libya	3	0	0%		
9	Oman	2	2	100%	- MUSCAT/Muscat Intl (OOMS) - SALALAH/Salalah (OOSA)	
10	Qatar	2	2	100%	- DOHA/Doha Intl (OTBD) - DOHA/Hamad Intl (OTHH)	
11	Saudi Arabia	4	4	100%	- DAMMAM/Kind Fahid Intl (OEDF) - JEDDAH/King Abdulaziz Intl (OEJN) - MADINAH/Prince Mohammad Bin Abdulaziz Intl (OEMA) - RIYADH/King Khalid Intl (OERK)	
12	Sudan	4	3	75%	- KHARTOUM/Khartoum (HSSS) - EL OBEID/EI Obeid (HSOB) - PORT SUDAN/Port Sudan	Certification of NYALA/Nyala (HSNN) by the end of 2019

					(HSPN)	
13	Syria	3	0	0%		
14	UAE	8	8	100%	- ABU DHABI/Abu -Dhabi Intl (OMAA) - ABU DHABI/Al Bateen Intl (OMAD) - DUBAI/Dubai Intl (OMDB) - DUBAi/Al Maktoum Intl (OMDW) - AL AIN/Al Ain Intl (OMAL) - FUJAIRAH/Fujairah Intl (OMFJ) - RAS AL KHAIMAH/Ras Al Khaimah Intl (OMRK) - SHARJAH/Sharjah Intl (OMSJ)	
15	Yemen	5	0	0%		
	Total Certified	58	34	59%		MID Region Safety Target 75% by end of 2017

APPENDIX B

MID Region Airport Collaborative Decision Making (MID A-CDM) Survey Questionnaire

Name of the State/Administration:

Approach to implementation

1. Is the A-CDM implementation a national program/project or a local airport by airport project?
(Please select the applicable box)

It is a national program where A-CDM is being implemented at several airports with one entity managing the overall program to facilitate common procedures and approach to the implementations	
It is an "airport-by-airport" approach where each project is managed at "local" level	
It is a combination of a national program and separate airport projects manager at "local" level	
There is not yet an implementation plan for A-CDM	

Please add free text comments if needed:

2. If A-CDM has been/is going to be implemented, please indicate at which airports and by what year:

Airport	Year

Add additional lines as needed

For EACH airport mentioned above, please provide separate responses to QUESTIONS 3 to 22:

Status of A-CDM implementation

3. In which of the following phases is the A-CDM implementation?
(Please select the box that is the most suitable option)

No planning, i.e. nothing in relation to A-CDM has started yet	
Initial planning, i.e. collecting information about guidance material etc. to set the scope of the projects	
Planning well underway, i.e. scope set, engaged with stakeholders etc.	
Ready to launch A-CDM implementation project	
A-CDM implemented, i.e. procedures are in place and used in the "day-to-day" operations (Please indicate number of years for A-CDM used in day-to-day operations.	

A-CDM Project Scope

4. Which one of the A-CDM conceptual elements are being implemented as part of the A-CDM project? *(Please select the applicable box(es))*

Information sharing	
Milestone Management	
Variable Taxi Times	
Collaborative Management of Flight Updates	
Pre Departure Sequencing	
A-CDM in adverse conditions	
Integration with Air Traffic Flow Management (ATFM)	

Please add free text comments if needed:

5. How is Information sharing implemented as par to the solution/planned A-CDM solution? *(Please select the applicable box(es))*

Via Information Sharing platform collecting data in real-time from various systems.	
Via manual interaction and information exchange	
A combination of the two alternatives above	

Please add free text comments if needed:

6. What Milestones (based on the Eurocontrol model) are captured/planned to be captured for the Milestone Management? *(Please select the applicable box(es) and please indicate if the implementation/planned implementation uses any other names for the milestones)*

Eurocontrol Milestones	Applied	Alternative name
Milestone 1 - ATC Flight Plan Activated		
Milestone 2 - CTOT Allocation/EOBT – 2 Hrs		
Milestone 3 - Take off from Outstation		
Milestone 4 - Local Radar Update/FIR Entry		
Milestone 5 - Final Approach		
Milestone 6 - Landed		
Milestone 7 - In Block		
Milestone 8 - Aircraft at Gate		
Milestone 9 - TOBT Entered		
Milestone 10 - TSAT Issued		
Milestone 11 - Boarding Starts		
Milestone 12 - Aircraft Ready		
Milestone 13 - Start-up Request		
Milestone 14 - Start-up Approved		
Milestone 15 - Off Block		
Milestone 16 - Take Off		

Please add free text comments if needed:

B-3

7. Are you planning to apply the concept of Target Off Block Times? *(Please select the applicable box)*

No	
Yes, and this will be the responsibility of the Airlines and/or appointed Ground Handlers to manage and update the Target Off Block Times (TOBT) in order to ensure that TOBT is accurate and reliable.	

a. If yes, will the project provide a solution that facilitates predictive TOBT calculations?
(Please select the applicable box)

No	
Yes	

8. What methodology is applied/going to be applied for calculating Variable Taxi Time? *(Please select the applicable box)*

"Table look up" utilizing fixed taxi time from gates to runways.	
Dynamic Variable Taxi Time using self-learning algorithms based on real-time and statistical surveillance data	

9. How is Target Start-Up Approval Time (TSAT) being calculated as part of Pre-Departure Sequencing? *(Please select the applicable box)*

Manual TSAT calculations	
Automatic TSAT calculations utilizing a Pre Departure Sequence or full Departure Management system/capability	

a. If TSAT Is calculated automatically, at what key milestones are the TSAT calculated/re-calculated? *(Please select the applicable box(es))*

Milestone 1 - ATC Flight Plan Activated	
Milestone 2 - CTOT Allocation/EOBT – 2 Hrs	
Milestone 3 - Take off from Outstation	
Milestone 4 - Local Radar Update/FIR Entry	
Milestone 5 - Final Approach	
Milestone 6 - Landed	
Milestone 7 - In Block	
Milestone 8 - Aircraft at Gate	
Milestone 9 - TOBT Entered	
Milestone 10 - TSAT Issued	
Milestone 11 - Boarding Starts	

10. How TSAT information is shared to Airlines operators/Ground Handling Agencies? *(Please select the applicable box(es))*

Via A-CDM portal/web interface/application	
Via mobile application	
Via Automatic Parking Aid displays at gate	
Data link	
Radio communication	

11. What are the key parameters for data exchange between ACDM and ATFM? *(Please specify in free text in the text box)*

12. To establish the A-CDM project, has any guidance material been used to facilitate the scope and objectives? *(Please select the applicable box)*

Yes	
No	

- a. If yes, please indicate what guidance material has been used. *(Please select the applicable box(es))*

ICAO Doc 9971	
Eurocontrol A-CDM Manual	
CANSO A-CDM Guidance Material	
FAA Surface CDM material	
IATA Guidance material	
Specific airport “operational guidelines” materials	
Other material like Eurocae or ETSI standards for A-CDM <i>(Please specify)</i>	

Please add free text comments if needed:

Local Concept of Operations

13. Has a “Local Concept of Operations” document for the A-CDM implementation been established? *(Please select the applicable box)*

Yes	
No	

- a. If yes, please indicate the scope of the document. *(Please select the applicable box(es))*

It sets out the objectives that A-CDM is aiming to achieve	
It provides a common vocabulary with all definitions for A-CDM	
It provides information about information sharing and the sources for the information collected	
It provides information about the milestones used in the A-CDM process	
It defines each participating stakeholder’s role and responsibilities as part of the A-CDM process	
It provides how A-CDM shall operate during irregular operations	
It provides descriptions of the process steps for various regular and irregular operations	
It includes how to measure the success of A-CDM once implemented, i.e. Key Performance Indicators (KPIs)	

Please add free text comments if needed:

B-5

Stakeholder Engagement

14. Which stakeholders are involved in the A-CDM implementation? *(Please select the applicable box(es))*

Airport operator	
Airline operators	
Ground handlers	
Air Navigation Service Provider	
Network Operations/ATFM unit	
Others <i>(Please specify)</i>	

15. Has a Memorandum of Understanding (MOU) been established between the stakeholders? *(Please select the applicable box)*

Yes	
No	

Please add free text comments if needed:

Project Implementation

16. Has a project group been established with all stakeholders involved? *(Please select the applicable box)*

Yes	
No	

Please add free text comments if needed:

17. Is there a shared leadership or is the project management led by one organization? *(Please select the applicable box)*

Shared leadership	
Leadership is appointed from one organization	

a. Please explain why one of the options is applied:

18. Is the project group meeting held on a regular basis or ad-hoc? *(Please select the applicable box)*

Regular	
Ad-hoc	

a. Please explain why one of the options is applied:

19. What are the objectives identified in the project that A-CDM is aiming to achieve?
(Please select the applicable box(es))

Increase predictability	
Increase on-time performance	
Improve resource utilization	
Reduce taxi times	
Increase airport efficiency	
Reduce environmental nuisance	
Optimise the use of available capacity	
Improved safety	
Other (please indicate what other objectives are identified in box below)	

Please add free text comments if needed:

20. Has the project identified a more detailed Key Performance Framework with Key Performance Indicators to facilitate the measurements of the A-CDM implementation? (Please select the applicable box)

Yes	
No	

- a. If yes, would the project team be willing to share this work with the ICAO Regional officer for Aerodromes and Ground Aids (AGA) to aid in its future work such as the establishment of more detailed A-CDM guidelines? (Please select the applicable box)

Yes	
No	

Please add free text comments if needed:

Training

21. Has the project established training in any of the following areas for the implementation of A-CDM? (Please select the applicable box(es))

Initial training for stakeholders to "what is A-CDM"	
Advanced training for stakeholders to "what is A-CDM"	
Training on how to operate under A-CDM procedures for all stakeholders	
Specialized/tailored training for each user in relation to "what do I need to do when A-CDM is operational at the airport"?	

Please add free text comments if needed:

B-7

Challenges

22. Please rank what hold most true in relation to your A-CDM implementation. (Please use 1-5 where 1 indicates “no, do not agree at all” and 5 is “yes, agree completely”).

A-CDM as a concept is too complicated and vague	
Developed guidelines are not enough to understand how A-CDM shall be implemented successfully	
It is challenging to understand what an A-CDM implementation is, i.e. what has to be achieved to say “yes, we have A-CDM at our airport”	
The challenge is to understand what system(s) is(are) and information are needed to implement A-CDM	
It is challenging to get all stakeholders engaged and committed to the A-CDM project	
It is challenging to manage the A-CDM project	
It is challenging to understand what value A-CDM will bring	
It is very complicated to establish how to measure the success of A-CDM	

Please add free text comments if needed:

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

ATM MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents some ATM matters through the review of ATM SG/3, ATM SG/4 and ANSIG/3 meetings outcomes, for consideration and/or endorsement by the meeting.

Action by the meeting is at paragraph 3.

REFERENCES

- ATM SG/3 Report
- ATM SG/4 Report
- ANSIG/3 Report

1. INTRODUCTION

1.1 The Third meeting of the the MIDANPIRG ATM Sub-Group (ATM SG/3) was held at the ICAO Middle East Office in Cairo, Egypt, from 22 to 25 May 2017.

1.2 The Fourth meeting of the MIDANPIRG ATM Sub-Group (ATM SG/4) was hosted by the Civil Aviation Regulatory Commission (CARC) - Jordan, in Amman from 29 April to 2 May 2018.

1.3 The Third meeting of the Air Navigation Systems Implementation Group (ANSIG/3) was held at the ICAO Middle East Office in Cairo, Egypt, from 2 to 4 July 2018.

2. DISCUSSION

ATS Route Network

2.1 The ATM SG/4 meeting commended States and stakeholders for the excellent cooperation and their commitment to improve the ATS route network in the MID Region.

2.2 The ATM SG/4 meeting congratulated UAE and Sudan for the successful implementation of the new airspace restructuring project on 7 December 2017 within Emirates FIR and 26 April 2018 within Khartoum FIR.

2.3 The ATM SG/4 meeting recalled that the ATM SG/3 meeting recognized that the prefix “U” (Routes in Upper Airspace) has been misused, which is leading to confusion. In most cases, the limits of Upper ATS Routes are beyond the limits of the upper Airspaces, which are not clearly defined by some States.

2.4 Based on the discussions and the European experience, the ATM SG/4 meeting agreed that the prefix “U” be removed from route designators providing that the limits of the ATS routes be clearly published in the AIPs. The meeting recognized the need for the optimization of the route designators in the MID Region. Accordingly, the meeting agreed to the following Draft Conclusion:

Why	To optimize the route designators in the MID Region
What	Removal of prefix “U” from Table ATM II-MID-1 — MID Region ATS Route Network and States AIPs.
Who	ICAO MID Office / States
When	Dec 2020

DRAFT CONCLUSION 4/2: REMOVAL OF PREFIX “U” WITH ROUTE DESIGNATORS

That,

- a) States take necessary measures to remove the prefix “U” from the route designators published in their AIPs; and*
- b) support the MID Office to optimize the use of route designators in the MID Region.*

ICAO International Codes and Route Designators (ICARD)

2.5 The meeting may wish to recall that the following issues related to ICARD/5LNCs were addressed by the ATM and AIM Sub-Groups:

- Publication in National AIPs of 5LNCs, which have not been registered in ICARD;
- 5LNCs duplicates (5LNCs used in more than one State);
- Sound-like proximity;
- 5LNCs registered in ICARD but not used;
- Increasing demand of 5LNCs for terminal use (SIDs, STARs, IAPs);
- Shortage of available 5LNCs for allocation;
- Coordination of 5LNCs used as FIR BDRY with the neighboring States; and
- ICARD system/platform issues.

2.6 The meeting may wish to note that ICAO has launched a new ICARD platform in March 2017 to resolve the issues faced with the old ICARD system. The meeting noted that the new system is more user-friendly with improved database, menus and functions, including the MAP function.

2.7 The ATM SG/3 meeting recalled that a Deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

2.8 The ATM SG/3 meeting underlined the need to use the alphanumeric codes for terminal airspace in accordance with PANS-OPS (Doc 8168) provisions and agreed to mandate the use of ICARD as the only mean for managing 5LNCs through the amendment of the MID eANP.

2.9 Based on the above, the ATM SG/3 meeting agreed to the following Draft Decision and Draft Conclusion that were supported by the AIM SG/4 and ATM SG/4 meetings:

Why	To mandate the use of ICARD as the only mean for managing 5LNCs in the MID Region
What	Amendment of the MID ANP Volume II-Part IV”
Who	ICAO MID Office / States
When	March 2019 (PfA)/Continuous

DRAFT DECISION 3/2: 5LNCs/ICARD REGIONAL REQUIREMENTS

That, the Secretariat develop a draft Proposal for Amendment to the MID eANP Volume II-Specific Regional Requirements to mandate the use of ICARD as the only means for managing 5LNCs; and the alphanumeric codes for terminal airspace, in accordance with PANS-OPS (Doc 8168) provisions.

Why	To resolve ICARD issues
What	Actions to be taken by States to address the issues in bullet a)
Who	ICAO MID Office/States/Users
When	Dec 2019

DRAFT CONCLUSION 3/3: ICARD ISSUES

That,

- a) *States be urged to take necessary actions on the resolution of the issues related to ICARD/5LNCs, including:*
 - i. *registration of all 5LNCs published in AIP into ICARD;*
 - ii. *5LNCs duplicates;*
 - iii. *Non-ICAO codes;*
 - iv. *sound-like proximity;*
 - v. *release of unused registered 5LNCs; and*
 - vi. *use of Alphanumeric codes for terminal airspace, in accordance with PANS-OPS (Doc 8168) provisions.*
- b) *Users (IATA, IFALPA, Jeppesen, etc.) are invited to report issues related to ICARD/5LNCs in the MID Region to the ICAO MID Office; and*
- c) *an air navigation deficiency be filed against those States that are not complying with Annex 11 and Doc 8168 provisions related to 5LNCs.*

MID Route Development Working Group (RDWG) Activities

2.10 The ATM SG/4 meeting recalled that MIDANPIRG/16, through Decision 16/17, established the MID RDWG. The Terms of Reference (ToRs) of the RDWG at **Appendix A** were developed by the ATM SG/3 meeting through the following Draft Decision:

Why	To enhance the regional ATS route network
What	Terms of Reference of RDWG
Who	MSG/6
When	Dec 2018

DRAFT DECISION 3/3: TERMS OF REFERENCE OF THE MID ROUTE DEVELOPMENT WORKING GROUP (MID RDWG)

*That, the MID RDWG Terms of Reference at **Appendix A** are endorsed.*

2.11 The ATM SG/4 meeting was apprised of the RDWG activities aiming to improve the ATS Route Network. The meeting commended the work of the RDWG in particular related to the development of the new MID Region ATS Route Catalogue, which was reviewed and endorsed by the meeting. Accordingly, the meeting agreed to the following Draft Conclusion:

Why	To improve the MID Region ATS Route Catalogue
What	Revised version of the MID Region ATS Route Catalogue
Who	MSG/6
When	Dec 2018

DRAFT CONCLUSION 4/4: MID REGION ATS ROUTE CATALOGUE

That,

- a) the MID Region ATS Route Catalogue at **Appendix B** is endorsed and to be published on the ICAO MID and IATA MENA websites; and*
- b) IATA is responsible to maintain the Catalogue up-to-date through the agreed process and the MID RDWG framework.*

2.12 Taking into consideration that several efforts are taking place to improve the ATS Route Network at national and cross-border levels, the ATM SG/4 meeting invited States to use the MID RDWG as a platform to facilitate coordination.

Contingency Planning

2.13 The ATM SG/4 meeting commended States and Stakeholders for their commitment and excellent cooperation that ensured the success of the CCT framework. The following challenges were highlighted:

- the MID Region ATM Contingency Plan was developed and has been implemented with very limited resources;
- coordination and sharing of information are carried out through emails, teleconferences, phone calls; etc.; an online tool/platform would be required; and
- budget and time constraints do not allow for required face-to-face meetings and in particular for the unplanned ones.

2.14 The ATM SG/4 meeting noted that some of the world's largest carriers along with many international carriers operating within close proximity to each other at international hubs in the MID Region, during periods of disruption, including weather or ATC capacity limitations often lead to significant delays, diversion and unprecedented levels of airborne holding. This would require the development of a Demand Versus Capacity management program during periods of disruption to be published by States, as applicable.

2.15 The ATM SG/4 meeting recalled the ATM SG/3 meeting Draft Decision 3/4 related to the establishment of MID ATM Contingency Plan Action Group to carry out a comprehensive review of the MID Region ATM Contingency Plan (MID Doc 003), taking into consideration the experience gained, the latest developments, and to include in the revised version measures and procedures enabling the CCTs to deal with airports and airspace disruptions due to weather or other factors in a timely and effective manner. The meeting agreed that the Action Group be composed of the ATM SG Chairpersons (Bahrain and Qatar), experts from Iran, Iraq, Kuwait, Saudi Arabia, UAE, AACO, IATA and ICAO.

2.16 Based on the above, the following Draft Decision is proposed for endorsement by the meeting replacing ATM SG/3 Decision 3/4

Why	To carry out a comprehensive review of the MID Region ATM Contingency Plan (MID Doc 003)
What	Establishment of the MID ATM Contingency Plan Action Group
Who	MSG/6
When	Dec 2018

Draft Decision 6/x: MID ATM Contingency Plan Action Group

That, the MID ATM Contingency Plan Action Group, composed of the ATM SG Chairpersons (Bahrain and Qatar), experts from Iran, Iraq, Kuwait, Saudi Arabia, UAE, AACO, IATA and ICAO, be established to carry out a comprehensive review of the MID Region ATM Contingency Plan (MID Doc 003).

2.17 Taking into consideration that the signature of contingency agreements is a regional requirement in the MID Region and it is not mandated in the adjacent Regions, the ATM SG/4 meeting agreed that the signature of the contingency agreements with ACCs of the States at the interfaces with the ICAO MID Region be considered as "recommended" and not mandatory. Therefore, the meeting agreed through ATM SG/4 Draft Conclusion 4/9 that the deficiencies reported against the States at the interfaces for non-signature of contingency agreements should be removed.

2.18 The meeting may wish to note that the above requirement should be reflected in the MID ANP, Volume II Part IV under Specific Regional Requirements. Accordingly, the meeting is invited to consider the following Draft Conclusion

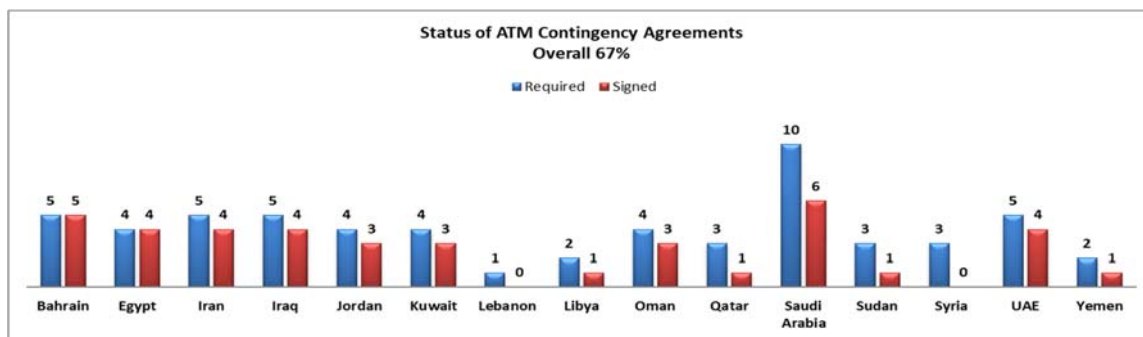
Why	To amend the regional requirements for Contingency Agreements and the reported deficiencies in MANDD
What	Amend the MID ANP and MANDD
Who	ICAO MID Office/States
When	March 2019

DRAFT CONCLUSION 6/X: DEFICIENCIES RELATED TO THE NON-SIGNATURE OF CONTINGENCY AGREEMENTS WITH STATES AT THE INTERFACE WITH ICAO MID REGION

That,

- the MID ANP Volume II-Part IV (ATM) be amended to reflect the regional requirements related to the signature of ATM Contingency Agreements; and
- the deficiencies related to the non-signature of contingency agreements with the States at the interfaces with the ICAO MID Region be removed.

2.19 Based on the above, the status of signed contingency agreements between adjacent ACCs is reflected in the **Graph** below:



AIDC/OLDI

2.20 The ATM SG/4 meeting reviewed the status of implementation of AIDC/OLDI in the MID Region and noted with concern that the level of implementation is still far beyond the acceptable level.

2.21 The ICAO MID Office circulated a Questionnaire to identify the challenges impeding the implementation. Based on the received replies, the following challenges have been identified:

- adjacent State(s) not ready to implement AIDC/OLDI;
- no response from adjacent State(s);
- ATM system does not support AIDC/OLDI as reported by two (2) States; and
- technical problems; and
- No common protocol supported by all ATM systems in the MID Region (Incompatibilities issues)

2.22 The ATM SG/4 meeting noted that, based on above challenges, the CNS SG/8 meeting agreed to the following actions/recommendations:

- ICAO MID Office to coordinate with Paris Office regarding Beirut – Nicosia and Cairo– Nicosia OLDI connections;
- States that do not have AIDC/OLDI capability are urged to plan for an upgrade of their systems as soon as possible; and
- States that need assistance (Jordan, Lebanon and Yemen) are invited to visit Muscat Centre (including Simulator) on 3-4 September 2018, as Oman offered to share their AIDC/OLDI experience with other States;

2.23 In connection with the above, Oman organized 2-day AIDC/OLDI familiarization workshop, from 4 to 5 September 2018 to assist Jordan establishing AIDC/OLDI connections.

2.24 It was recognized that the implementation of AIDC/OLDI would improve significantly the coordination process and would reduce the amount of coordination failures between ACCs, which has been identified as a major long-standing issue by the MIDRMA Board. Consequently, the implementation of AIDC/OLDI would enhance safety and reduce ATC workload.

2.25 The ATM SG/4 meeting noted with appreciation that Bahrain and UAE implemented OLDI on 2 July 2017 and Muscat and UAE on 12 March 2018. Bahrain and UAE shared their experience highlighting the advantages and the benefits gained from the OLDI connections. UAE informed the meeting that a reduction in coordination failures by 60% between 2010 and 2017 was achieved which directly contributes to the enhancement of safety.

2.26 The ATM SG/4 meeting urged States to initiate communication for AIDC/OLDI connections taking into consideration other States' experiences and use the guidance provided in the MID Doc 006 available on the ICAO MID Website.

2.27 Based on the above, the ATM SG/4 meeting discussed the Secretariat's proposal to mandate the implementation of AIDC/OLDI through the inclusion of the requirement in the MID ANP Volume II Part IV-ATM under Specific Regional Requirements, based on a phased approach taking into consideration the situation in some States (Applicability area should be defined). Moreover, the meeting agreed in principal with the proposal to amend the Indicator and Supporting Metric of the ASBU B0-FICE related to AIDC/OLDI. Accordingly, the meeting requested the Secretariat in consultation with the ATM SG Chairpersons to present the required changes to the ANSIG/3 meeting (Cairo, Egypt, 3-5 July 2018).

2.28 The ANSIG/3 meeting noted that, based on the recommendation from the ATM SG/4 meeting, the applicability area for the AIDC/OLDI has been defined as at **Appendix C**. The meeting agreed that a requirement for AIDC/OLDI implementation (priority 1 interconnections) should be included in the MID eANP Volume II Part IV-ATM, under Specific Regional Requirements.

2.29 Based on the above, the ANSIG/3 meeting agreed to following Draft Conclusion:

Why	To mandate AIDC/OLDI implementation as per applicability area (priority 1 interconnections)
What	PfA to the MID ANP Volume II - Part IV
Who	ICAO MID Office/States
When	March2019

DRAFT CONCLUSION 3/6: PFA TO THE MID eANP VOLUME II – ATM PART

That, a Proposal for Amendment to the MID eANP Volumes II – Part IV-ATM related to the requirement for AIDC/OLDI implementation (priority 1 interconnections) be processed in accordance with the standard procedure for amendment.

SSR Codes Issues at the EUR/MID Interface

2.30 The meeting may wish to recall that the Secondary Surveillance Radar (SSR) Code in the MID Region are managed through the MID SSR Code Management Plan (CMP), which was developed based on the study carried out by EUROCONTROL on the MID Regional traffic patterns for the month of June 2009. The meeting recognized the need to review the initial study from 2009 in the future, taking into consideration the expected traffic growth.

2.31 The ATM SG/3 meeting noted that the ICAO Paris Office and EUROCONTROL approached ICAO MID Office concerning the interference of SSR Codes used by States at the interface between the ICAO EUR and MID Regions, in particular the Codes Series used by Greece, Libya and Malta.

2.32 In order to resolve the issue, the meeting agreed to change the Transit SSR Series allocated to Libya from A2001-2077 to A7100-7177. The meeting also agreed to allocate the Domestic Code Series 2300-2377 to Qatar.

2.33 Based on the above, the meeting is invited to consider the following Draft Conclusion emanating from the ATM SG/3:

Why	To resolve SSR Codes interference at the interface with Europe
What	PfA to the MID ANP Volume II - Part IV and Revised version of the SSR CMP
Who	ICAO MID Office/States
When	March 2019 (PfA) / Dec 2018 (SSR CMP)

DRAFT CONCLUSION 6/8: AMENDMENT OF THE MID SSR CMP AND MID ANP VOLUME II –TABLE ATM II-MID-2

That,

- a) ICAO process a Proposal for Amendment of the MID ANP Volume II-Table ATM II-MID-2 — MID SSR Code Allocation List, to reflect the changes at **Appendix D**; and*
- b) the revised version of MID SSR CMP (MID Doc 005) at **Appendix E** is endorsed.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to endorse the proposed Draft Decisions and Conclusions.

APPENDIX A

MID RDWG Scope, Terms of Reference, Composition, and Working Procedures

SCOPE:

The MID Route Development Working Group (RDWG) works on matters related to ATS route planning and implementation in the Middle East Region.

In order to achieve its mandate, The RDWG builds on previous work aiming at enhancing the regional ATS route network, including but not limited to: MIDRAR, CNS/ATM study, work of the Advanced Inter-regional ATS Routes Development Task Force (AIRARD TF), work of the Middle East ATM Enhancement Programme (MAEP), work of ICAO ARN Task Force, etc.

TERMS OF REFERENCE:

1. Based on airspace users' needs and in coordination with stakeholders (States, Regional and International Organizations, and other ICAO Regions), identify requirements and improvements for achieving and maintaining an efficient ATS route network in the MID Region.
2. Recommend measures and support the ATM SG in the development and maintenance of working procedures to plan and implement requirements/improvements to the MID ATS route network.
3. Facilitate the implementation of agreed ATS routes by engaging concerned parties including the Military Authorities.
4. In coordination with the MIDRMA, carry out safety assessment of the proposed changes to the ATS route network.
5. Support the implementation of the approved amendments to the ATS route network and MID ANP;
6. Coordinate and support implementation of the ATS routes over the high seas;
7. Address inter-regional ATS routes improvements with adjacent ICAO Regions, through the AIRARD Task Force, RDGE, AAMA SCM etc.
8. Report, regularly, to the ATM Sub Group and to MAEP Board the work progress of the RDWG.

COMPOSITION:

The RDWG will be composed of:

- a) experts nominated by Middle East States from both Civil Aviation and Military Authorities;
- b) Concerned Regional and International Organizations; and
- c) Other representatives from adjacent States and Organizations as required.

In addition, the RDWG will have a core team composed of AACO, IATA and ICAO. The core team will be responsible for developing the activities of the RDWG through effective coordination between airspace users and RDWG members.

WORKING PROCEDURES:

The RDWG will meet as required and under the format of Task Forces gathering concerned States and stakeholders to carry its work, with the following work procedures:

- The Core Team will coordinate users' requirements based on trunk routes and city-pair priorities.
- For each set of requirements, concerned airspace users will submit proposals which will be communicated to the concerned States for review.
- Coordination will be carried out with concerned State(s) through correspondence and teleconferences and, if required, face-to-face meetings with stakeholders on case-by-case basis.
- The Core Team will continue to follow up with concerned States to ensure implementation of the agreed proposals and their migration to the MID ANP.
- The Core Team will follow-up with the concerned State(s) and air operators the conduct of post implementation review of the implemented ATS route improvements, to assess the impact and estimate the benefit accrued from the implementation.



**International Civil Aviation Organization
Middle East Region**

Route Catalogue

Edition May 2018

I. Introduction

1. The Middle East Route Catalogue was approved by MIDANPIRG/11 meeting (Cairo, Egypt 9-13 February 2009) developed within the context of the ARN TF, as an ATS route development/planning tool. It was agreed that the Catalogue should contain a list of ATS route proposals that have been agreed within the framework of the ATM SG that did not reach a level of maturity to be moved to the MID Air Navigation Plan.
2. The sixteenth meeting of the MID Air Navigation Planning and Implementation Regional Group (MIDANPIRG/16, Kuwait, 13-16 February 2016), under decision 16/17, established the ICAO MID ATS Route Development Working Group (RDWG) under the ICAO ATM Sub-Group. The RDWG mandate is to be a platform for all stakeholders to discuss and implement enhancements to the MID ATS Route Network.
3. Recognizing the value of a consolidated reference document for the regional ATS routes, the RDWG decided to maintain the Middle East Route Catalogue as the primary repository for proposals emanating from States and/or airspace users. The Route Catalogue will be maintained by IATA MENA in close collaboration with the RDWG Core Team.
4. Any State or airspace user which identifies a need for a new route requirement to be included in the catalogue or to change an existing route contained in the catalogue, may submit respectively an amendment proposal to the ICAO MID Office or IATA MENA. The RDWG will periodically survey concerned stakeholders for new/amended requirements to be added/amended in the Route Catalogue.
5. IATA MENA, will keep the Route Catalogue up-to date as proposals are added or amended. The Route Catalogue will be posted on IATA MENA and ICAO MID websites and presented to the ATM SG meeting or other relevant meetings.

II. Structure

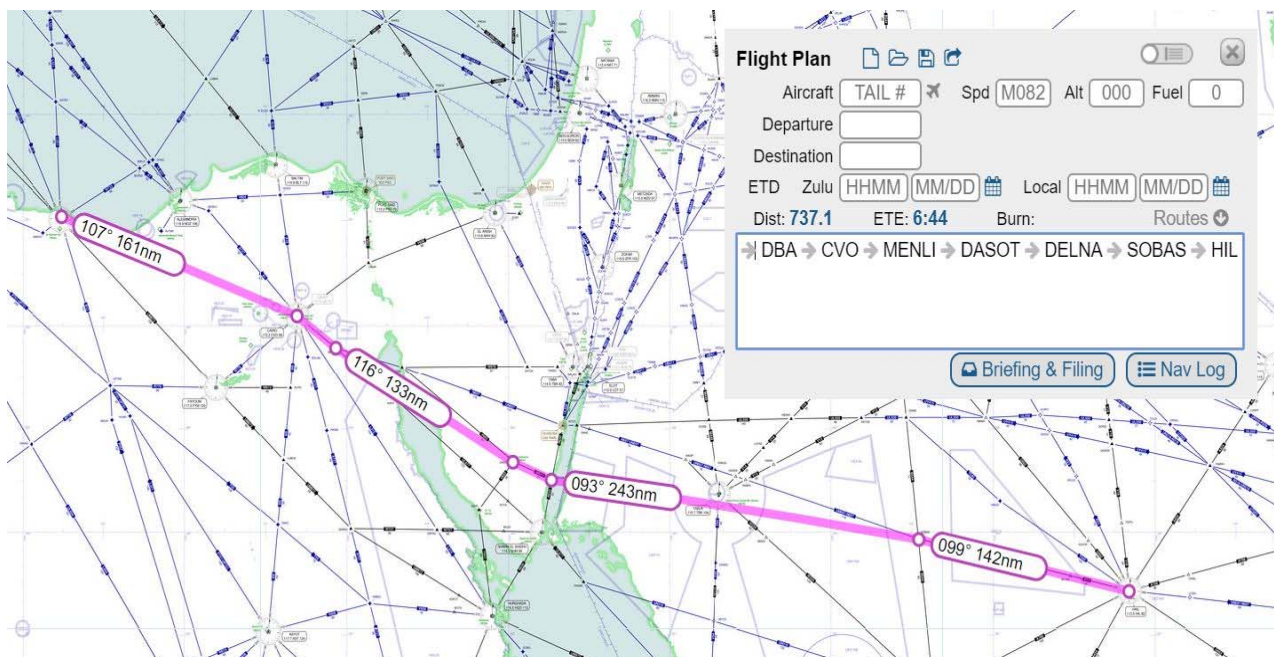
6. The Catalogue is divided into 2 elements:
 1. Current proposals for implementation
 2. Proposals on hold due to regional limitations on implementation

III. Processes

7. ICAO MID Office will send proposals included in the Catalogue to concerned States for their input:
 - If a proposal is accepted by all concerned States, it shall be moved to the MID ANP for implementation through the processing of Proposal for Amendment.
 - If any State has any comment on the proposal, a conference call or meeting (depending on the comments received) will be held with the concerned States and airspace users to reach a consensus on the proposal:
 - If a compromise is reached, the amended proposal will be moved to the ANP for implementation.
 - If a compromise was not possible, the proposal is returned to its originator for further study and removed from the Route Catalogue. The originator would then be able to review the proposal and submit a new one taking into consideration the limitations restricting the proposal from being implemented.

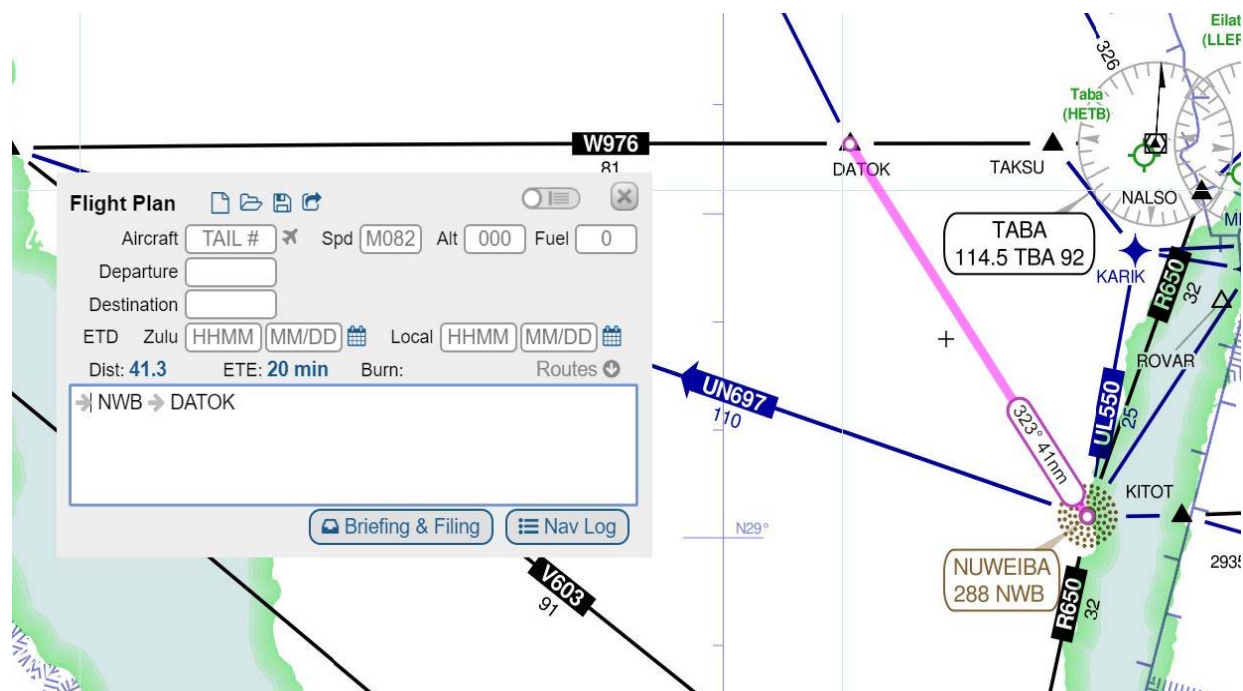
B-3

MID/RC-1	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
DBA-CVO-MENLI-DASOT-DELNA-SOBAS		Egypt Saudi Arabia	Not Implemented		Not in the Plan		To be addressed with Egypt and Saudi Arabia		- Quarter 4-2017
Flight Level Band: Eastbound									
Potential traffic flow: North Africa and South Europe to MID Region and beyond									
Justification									
Benefits									
Remarks									



B-5

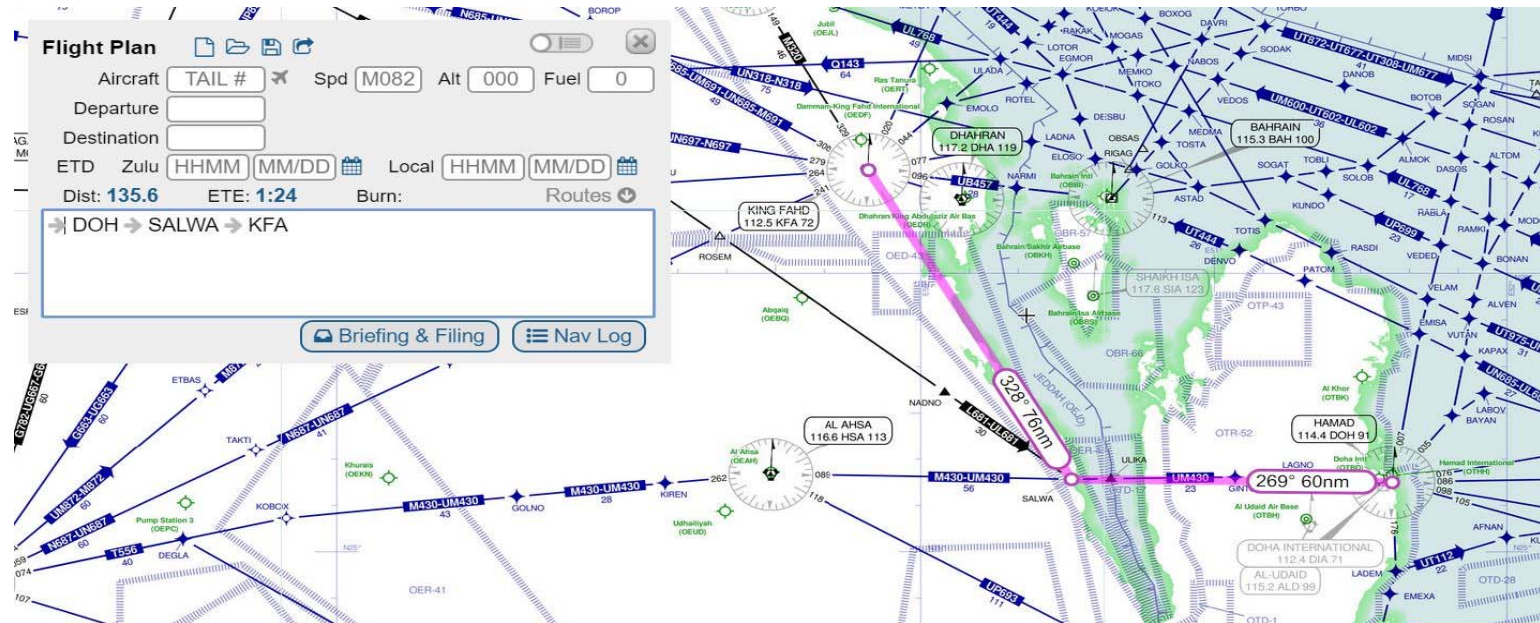
MID/RC-2	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
NWB-DATOK		Egypt	Not Implemented		Not in the Plan		To be addressed with Egypt		- Quarter 4-2017
Flight Level Band: Westbound									
Potential traffic flow: Asia and Middle East traffic to Europe									
Justification									
Benefits									
Remarks									



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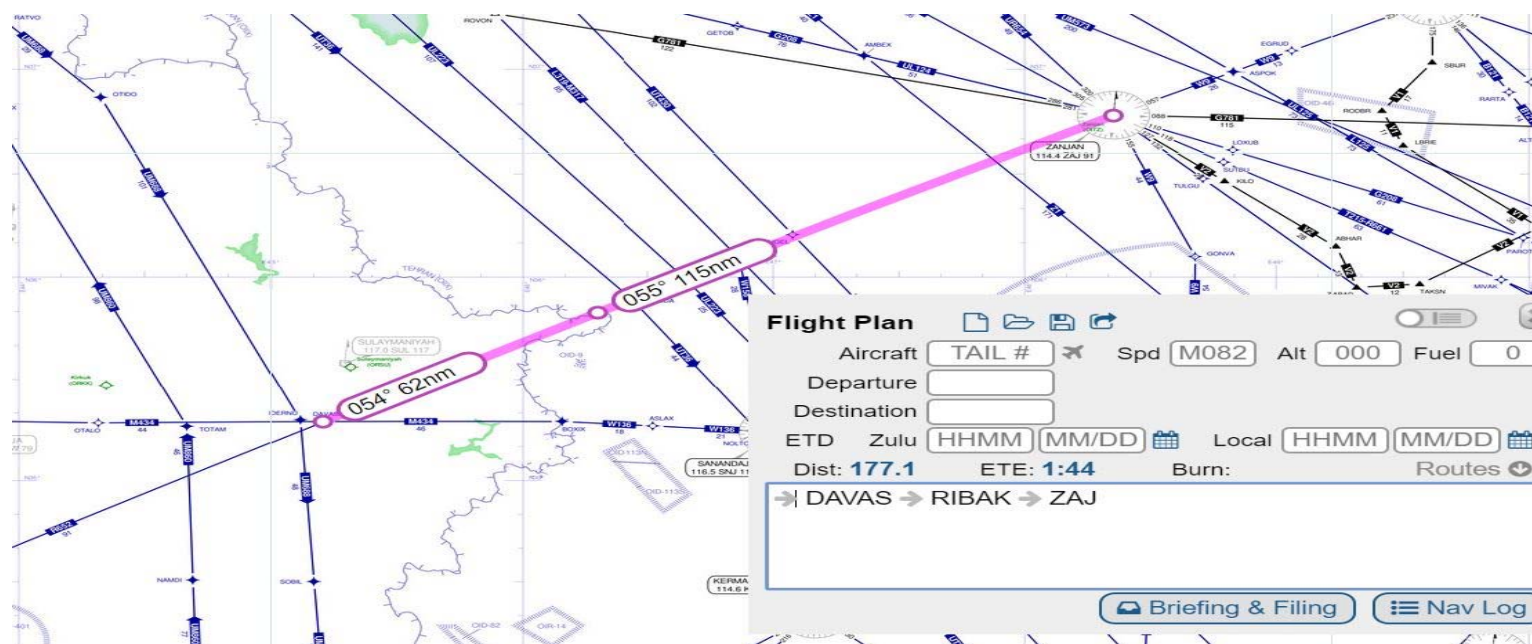
B-6

MID/RC-3	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
DOH-SALWA (M430)-KFA		Bahrain Qatar Saudi Arabia	Not Implemented		Not in the Plan		To be addressed with Bahrain, Qatar and Saudi Arabia		- Quarter 4-2017
Flight Level Band: Westbound									
Potential traffic flow: Doha Departures to North Africa and West Europe									
Justification									
Benefits									
Remarks		ON HOLD							



B-7

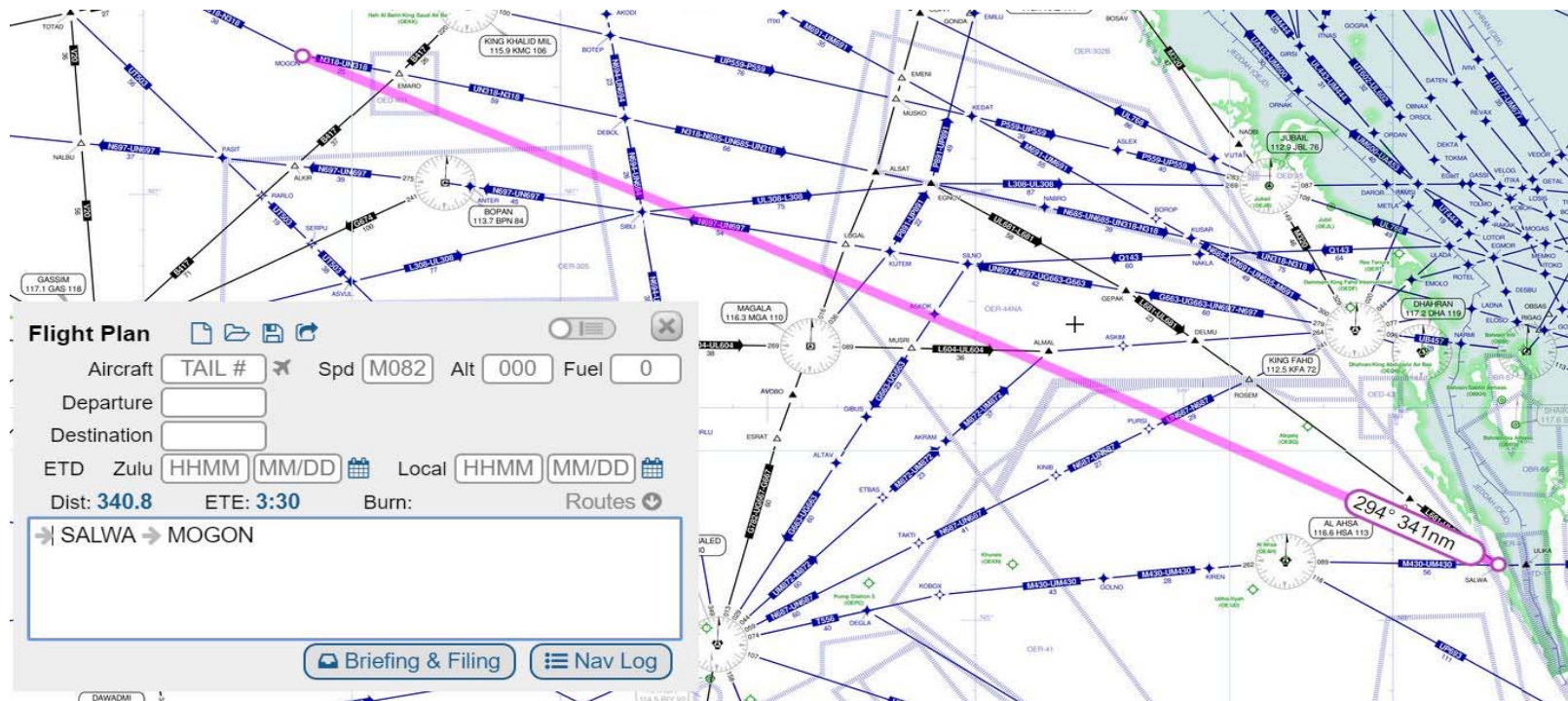
MID/RC-4	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
DAVAS-RIBAK-ZANJAN (ZAJ) extension to R652		Iran Iraq	Not Implemented		Not in the Plan		To be addressed with Iran and Iraq		- Quarter 4-2017
Flight Level Band: Westbound									
Potential traffic flow: traffic to/from Tehran FIR through Amman and Baghdad FIRs									
Justification									
Benefits									
Remarks									



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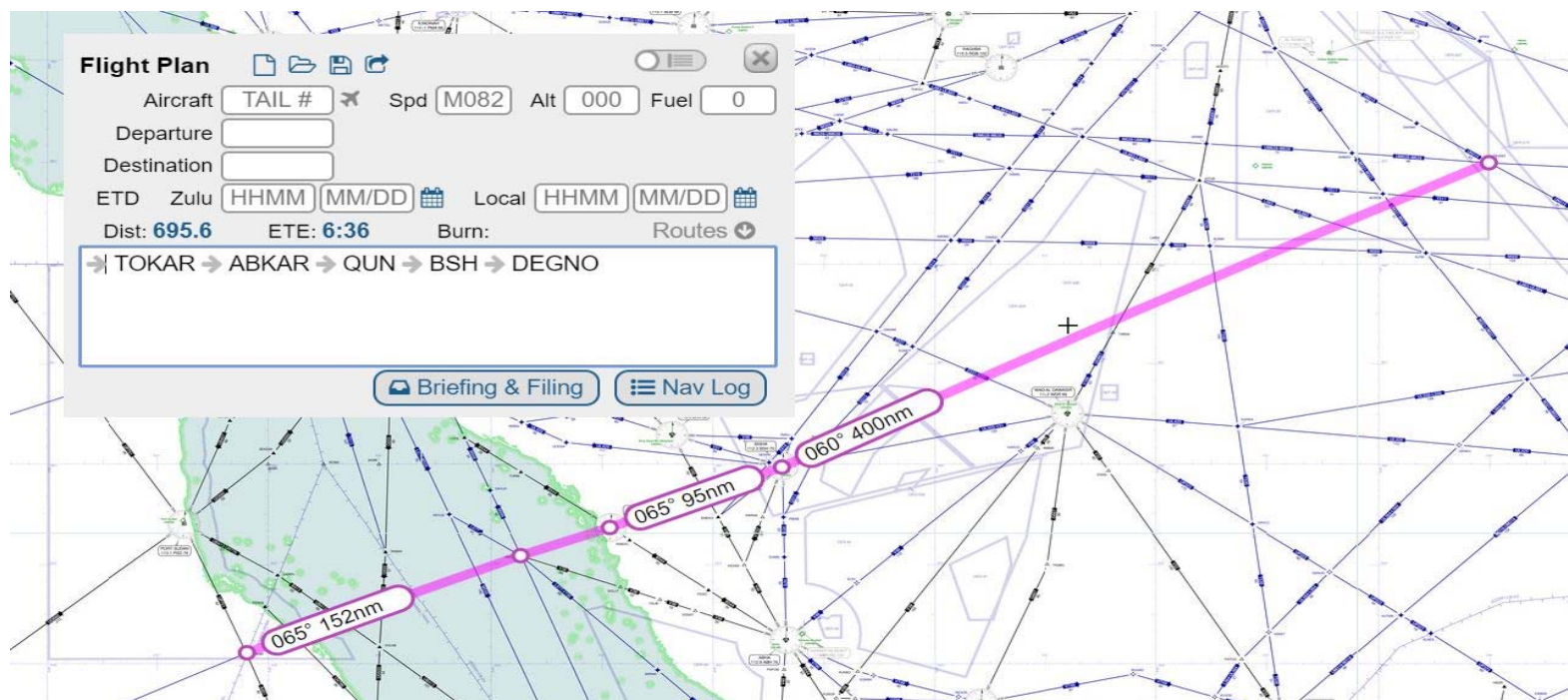
B-8

MID/RC-5	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
SALWA-MOGON		Bahrain Qatar Saudi Arabia	Not Implemented		Not in the Plan		To be addressed with Bahrain, Qatar and Saudi Arabia		- Quarter 4-2017
Flight Level Band: Westbound									
Potential traffic flow:									
Justification									
Benefits									
Remarks	ON HOLD								



B-9

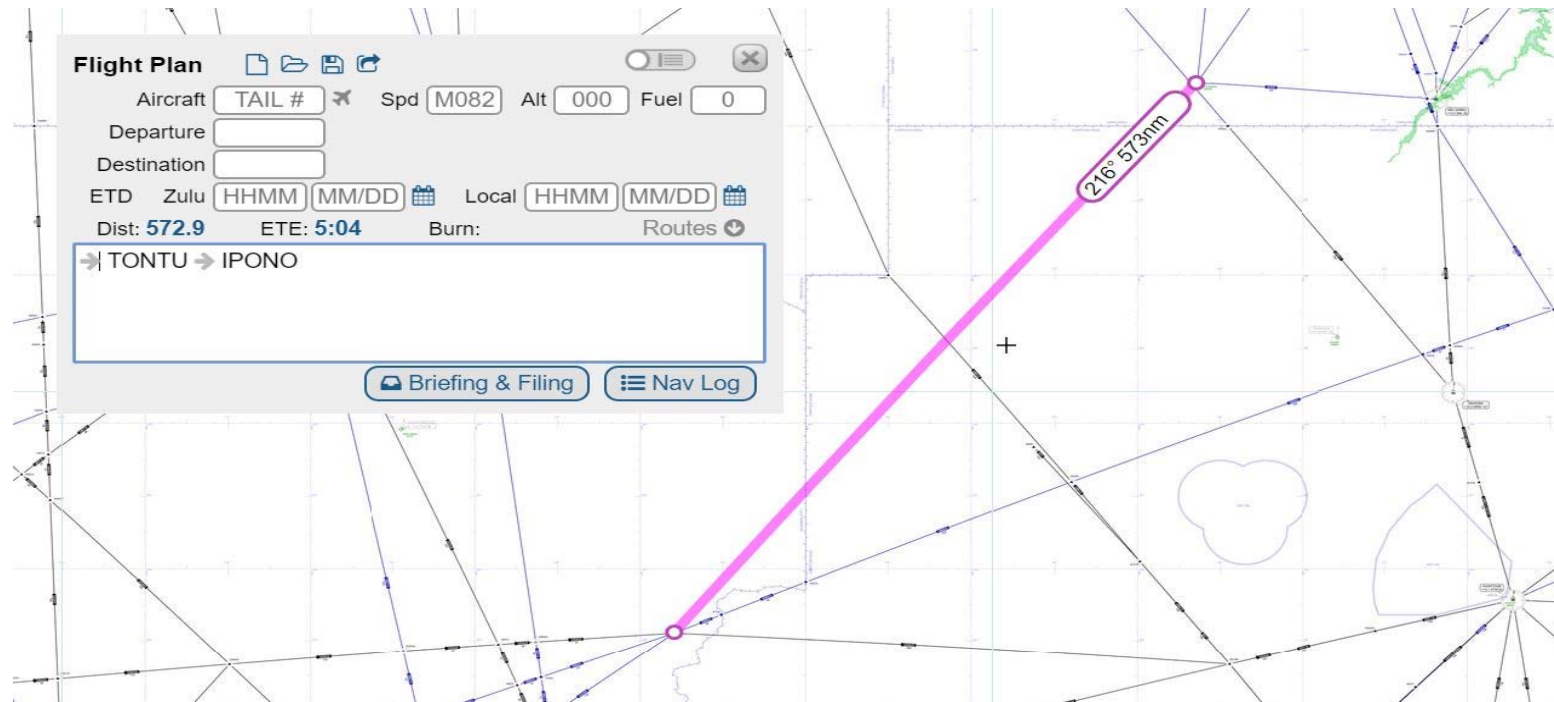
MID/RC-6	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
TOKAR-ABKAR-QUN-BSH-DEGNO		Eretria Saudi Arabia	Not Implemented		Not in the Plan		To be addressed with Eretria and Saudi Arabia		- Quarter 4-2017
Flight Level Band: Bidirectional									
Potential traffic flow:									
Justification									
Benefits									
Remarks									



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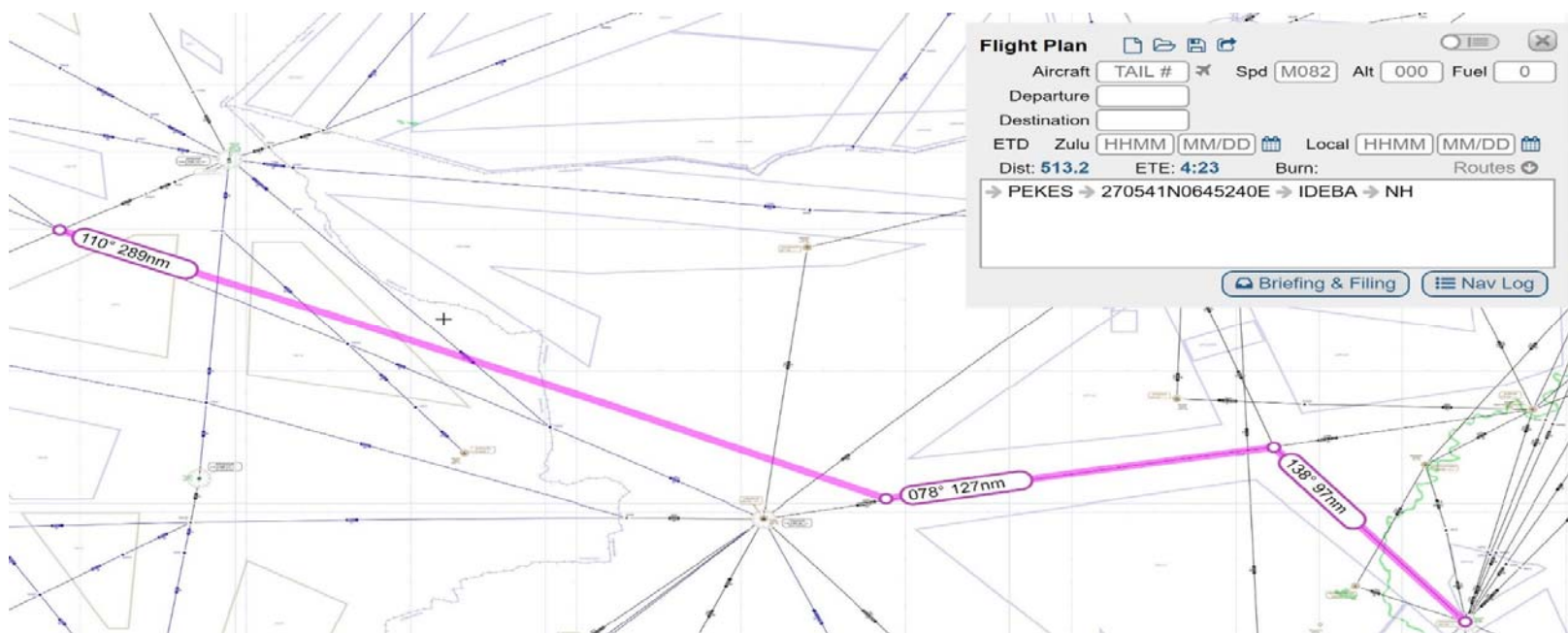
B-10

MID/RC-7	ATS Route Name: New Route	Inter-Regional Cross Reference if any	N/A	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
TONTU-IPONO		Egypt Sudan	Not Implemented		Not in the Plan		To be addressed with Egypt and Sudan		- Quarter 4-2017
Flight Level Band: Bidirectional									
Potential traffic flow: from Egypt, Jordan and Lebanon, etc. to Chad and west/south Africa									
Justification									
Benefits									
Remarks									



B-11

MID/RC-8	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
PEKES-NH		Iran Pakistan	Not Implemented		Not in the Plan		To be addressed with Iran and Pakistan To be addressed ta the AIRARD TF/2 meeting		- Quarter 4-2017
Flight Level Band: Bidirectional									
Potential traffic flow: Europe to East through Tehran FIR.									
Justification		Agreed upon during the Afghanistan Contingency Coordination meeting							
Benefits									
Remarks									

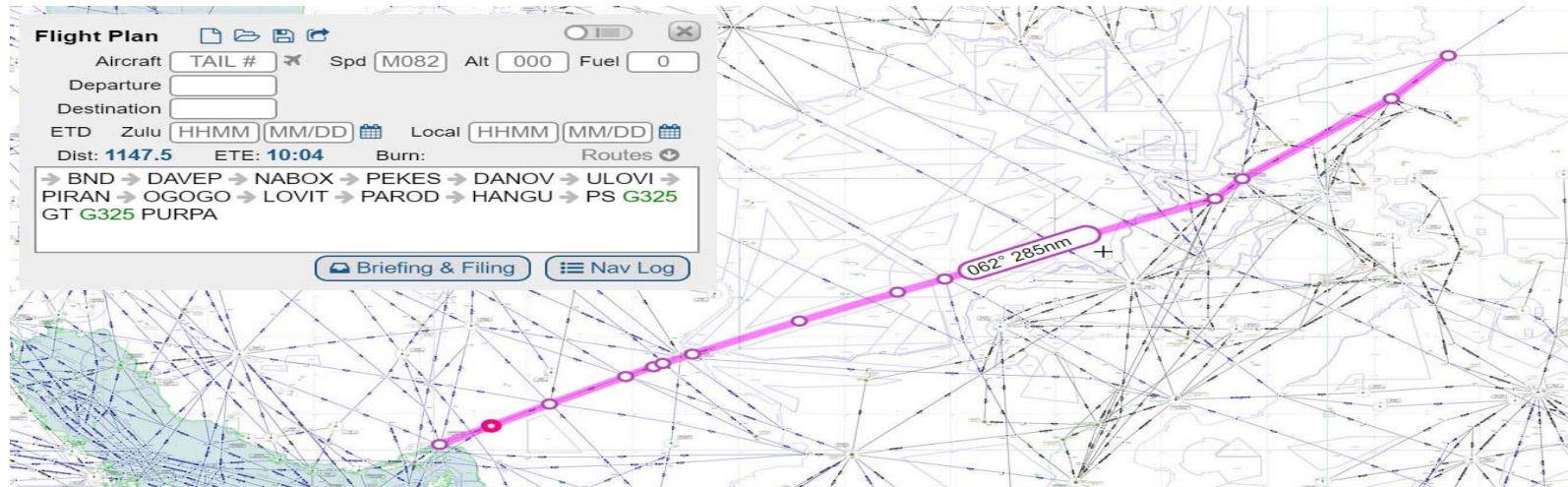


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MID/RC-9a	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
A453-PAROD-HANGU-G325-PURPA		Afghanistan	Not Implemented		Not in the Plan		To be addressed with Afghanistan. To be addressed to AIRARD TF/2 meeting		- Quarter 4-2017
Flight Level Band: FLAS TBD									
Potential traffic flow: Gulf Traffic from/to Fareast									
Justification									
Benefits									
Remarks		9a and 9b are high priority. However, in case only one option could be implemented 9a has preference							



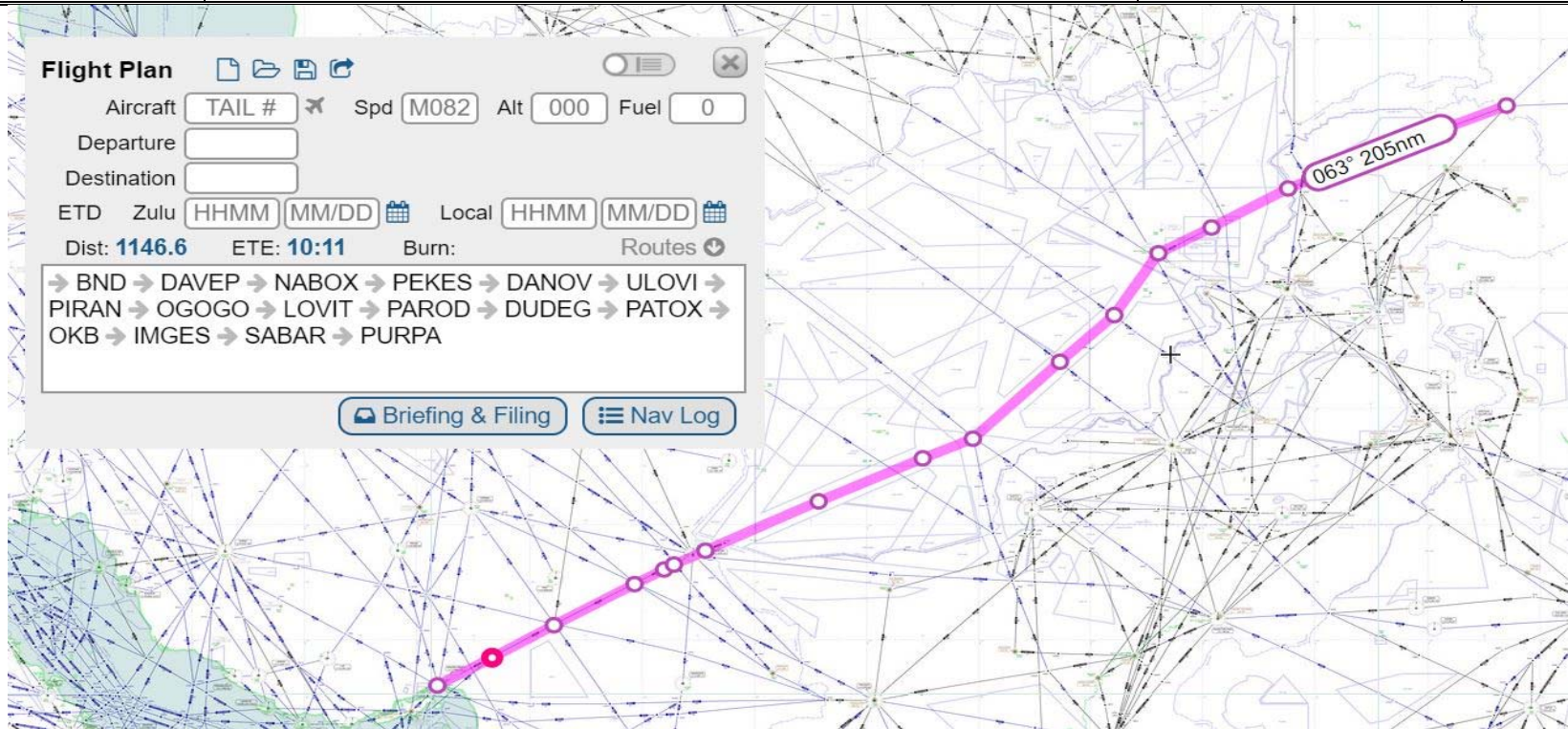
B-13

MID/RC-9b	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
A453-PAROD-DUDEG-PATOX-OKB-IMGES-SABAR then G206 to PURPA		Afghanistan	Not Implemented		Not in the Plan				- Quarter 4-2017

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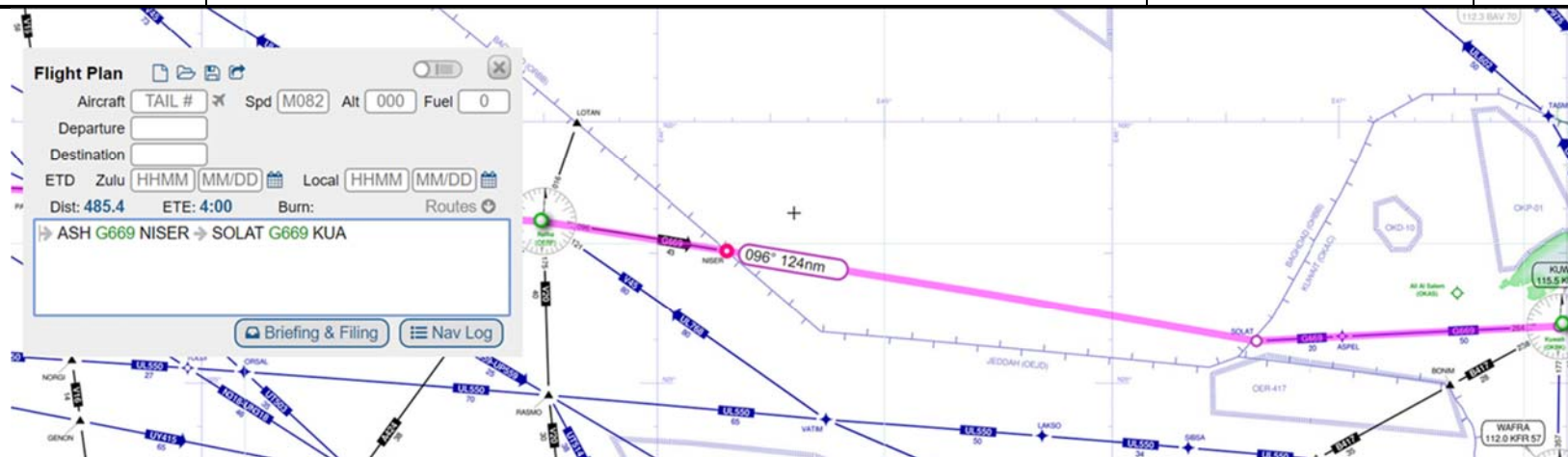
B-14

Flight Level Band: FLAS TBD				To be addressed with Afghanistan. To be addressed to the AIRARD TF/2 meeting	
Potential traffic flow: Gulf Traffic from/to Fareast					
Justification					
Benefits					
Remarks					



B-15

MID/RC-11	ATS Route Name: G669 New Route	Inter-Regional Cross Reference if any		Users Priority	MID	Originator/Date		Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
G669 between NISER and SOLAT		Saudi Arabia Iraq and Kuwait	Not Implemented		Not in the Plan		To be addressed with Saudi, Iraq and Kuwait		- Quarter 2-2018
Flight Level Band: FLAS TBD									
Potential traffic flow: Levant to/from North Gulf Levant to/from Iran/Far East									
Justification		Re-instate G669 as it used to be active for certain flows in certain periods of the year							
Benefits		Reduce track miles and air miles due to avoidance of seasonal jet-stream Enable optimum descents in Kuwait							
Remarks									



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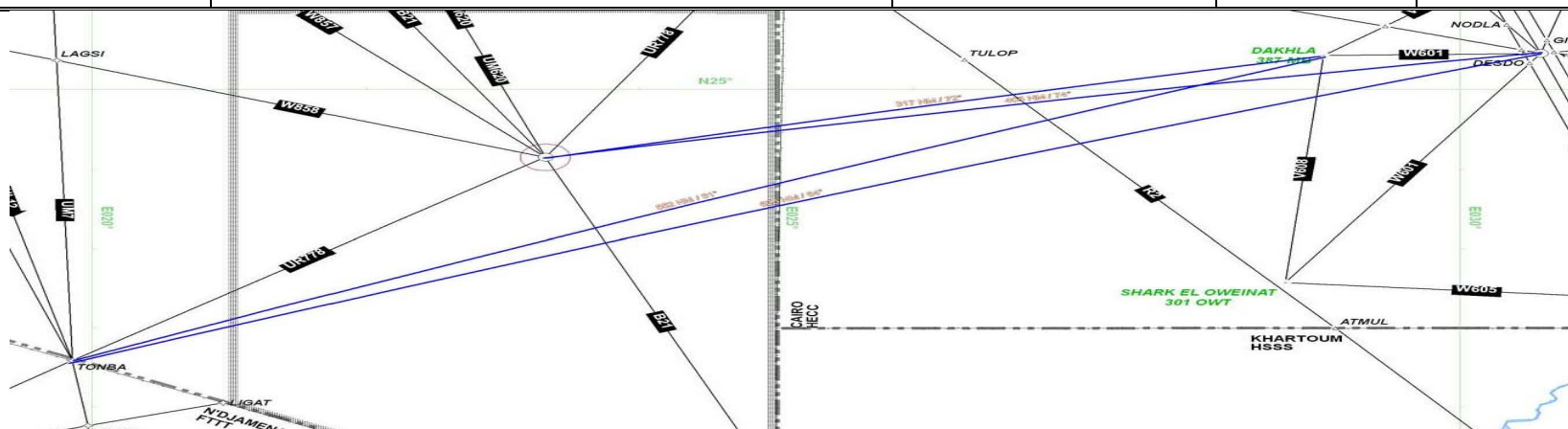
B-16

MID/RC-xx	ATS Route Name: New Route	Inter-Regional Cross Reference if any	APAC	Users Priority	High	Originator/Date	RDWG/1	Last updated	New Proposal
Route Description		States Concerned	Implementation Status		MID ANP Status		Action Taken / Required		Expected time frame for each Action
			Not Implemented		Not in the Plan		To be addressed with		- Quarter 4-2017
Flight Level Band: FLAS TBD									
Potential traffic flow: Gulf Traffic from/to Fareast									
Justification									
Benefits									
Remarks									

B-17

ATS Route proposals on hold**MID ATS ROUTES CATALOGUE**

MID/RC-002 (Option1,2 ,3)	ATS Route Name:	Entry-Exit:	Inter-Regional Cross Reference if any		Users Priority	Hold	Originator of Proposal	IATA	
	New AWY Proposed between TONBA-KHG and KFR to MB (Dakhla) Or KHG	TONBA to KHG (Dakhla) Libya to Egypt FIR					Date of Proposal	ARN TF/1	
Route Description		States Concerned	Expected Impl. date	Implementation Status		ANP Status		Action Taken/Required	Deadline for each Action
(Opt 1) TONBA N2135.3 E01951.2 KHG (N2526.9 E03035.4) (Opt 2) TONBA (N21 35.3 E 0-19 51.2) MB (N25 25.2 E029 00.1) (Opt 3) KFR (N24 09.2 E023 18.5) MB (N25 25.2 E029 00.1) Or KHG (N25 26.9 E030 35.4)		Libya Egypt		No Progress reported.				- Egypt highlighted that UM999 already exists and is used by 3 to 5 flights a day also that communication is being upgraded with a new station at Dakhla. - To be considered with and similarly to Proposal 2 & 4. - Egypt unable to accept route due to safety issues. - Differed for the future	TBD
Flight Level Band: FL290 – FL410									
Potential City Pairs: West Africa airports-Doha									
Expect 50 eastbound wkly flights, saving 91000Kg of fuel and 282T of CO2 wkly. The number may double if used westbound.									
Conclusions/Remarks		ON HOLD-RDWG-1					Last updated	ATM SG/1 June 2014	



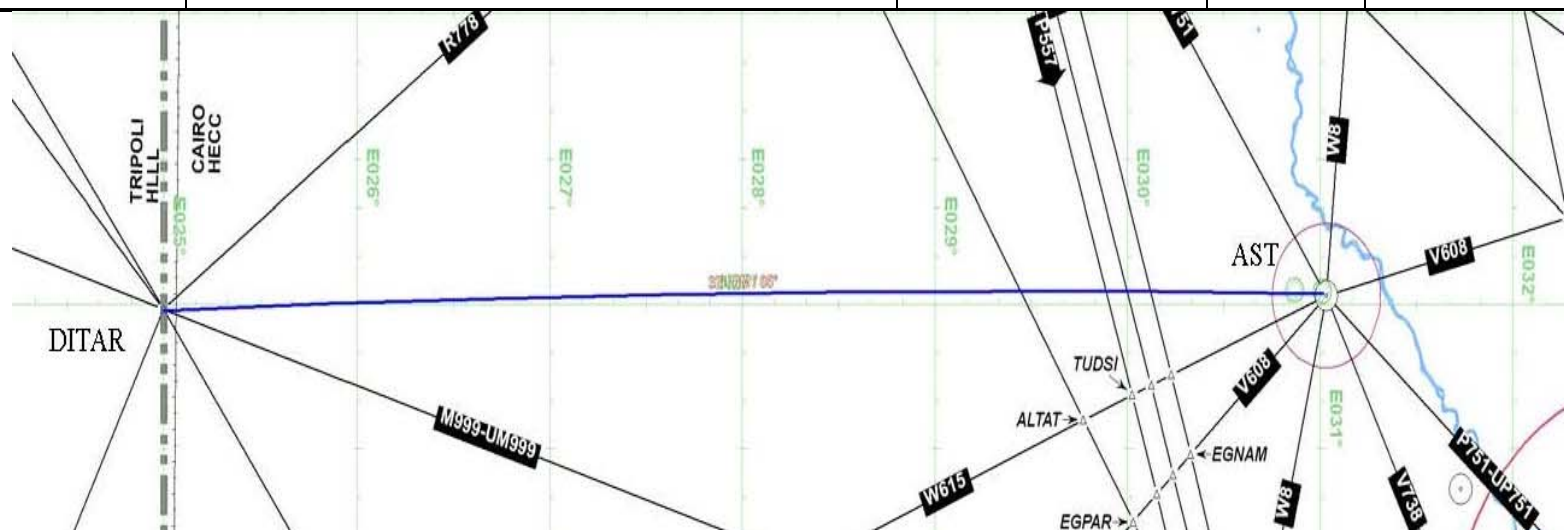
MID/RC-081	ATS Route Name: New Route UQ596	Entry-Exit: DAYFA – DANAD – IMRAD then A145 Eastbound Only	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA iFLEX Proposal	
							Date of Proposal	17 May 2011	
Route Description		States Concerned	Expected Impl. date	Implementation Status		ANP Status	Action Taken/Required		Deadline for each Action
SEB HORUJ DAYFA DANAD IMRAD ALMAL		Libya Egypt Saudi Arabia		No progress reported		Not in the ANP	Needs to be discussed with Libya Needs to be discussed with Egypt Needs to be discussed with Jeddah FIR if A145 can be bidirectional East of LXR Implement if possible Priority Routes		TBD
Flight Level Band:									
Potential City Pairs: Dakar FIR, Algiers FIR, Tripoli FIR, Cairo FIR, Jeddah FIR									
Conclusions/Remarks		Proposals agreed to by some State during the iFLEX workshop Dubai ON HOLD-RDWG-1					Last updated		ATM SG/1 June 2014



3. MID/RC-081-on hold

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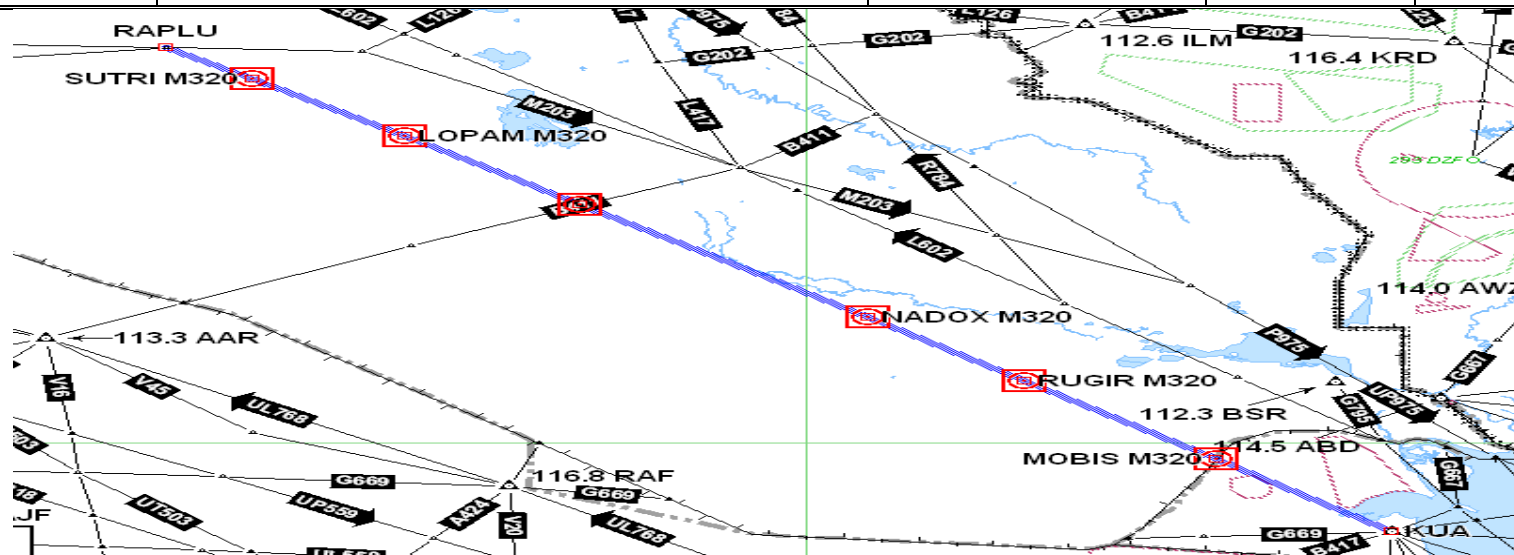
ID/RC-083	ATS Route Name: New Route UQ598 Westbound		Entry-Exit: DITAR – AST		Inter-Regional Cross Reference if any		TOP TEN	Users Priority		High	Originator of Proposal		IATA iFLEX Proposal				
											Date of Proposal		17 May 2011				
Route Description				States Concerned		Expected Impl. date		Implementation Status			ANP Status		Action Taken/Required			Deadline for each Action	
AST DITAR 26 59 03N 025 00 00E				Libya Egypt									Important Segment HGD-PASAM move d to ANP Egypt advised that DITAR-AST not possible currently.			TBD	
Flight Level Band:																	
Potential City Pairs:																	
Conclusions/Remarks		ON HOLD-RDWG-1										Last updated		ATM SG/1 June 2014			



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MID/RC-027	ATS Route Name: M320	Entry-Exit: KUA-RAPLU	Inter-Regional Cross Reference if any		Users Priority	URGENT	Originator of Proposal	Iraq
							Date of Proposal	RDGE/11 (Oct 2009)
Route Description		States Concerned	Expected Impl. date	Implementation Status	ANP Status	Action Taken / Required		Deadline for each Action
KUA MOBIS 295109N 0470457E RUGIR 303219N 0460618E NADOX 310505N 0451851E ELODI 320256N 0435126E LOPAM 323757N 0425806E SUTRI 330701N 0421128E RAPLU 332300N 0414530E		Kuwait		1. Existing RNAV designator M320 from Kuwait proposed). 2. Points highlighted in yellow are new. 3. Coordination with Kuwait required of continuation of route within their airspace.	Available in ATS.1 Table In Kuwait FIR	Not supported by Kuwait at present. Needs further studies. differed for the future KUA – RAPLU needs to be implemented		March 2010
Iraq								
Flight Level Band: FL200-FL410								
Potential City Pairs:								
Conclusions/Remarks		ON HOLD-RDWG-1					Last updated	ATM SG/1 June 2014



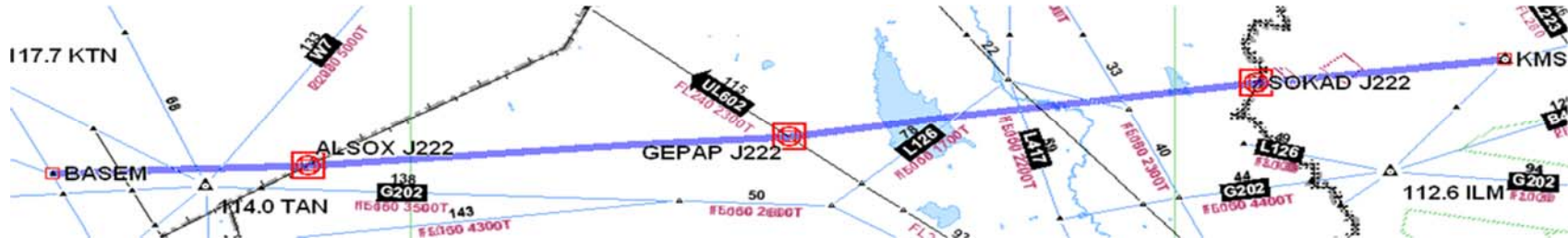
4. MID/RC-027-hold

B-21

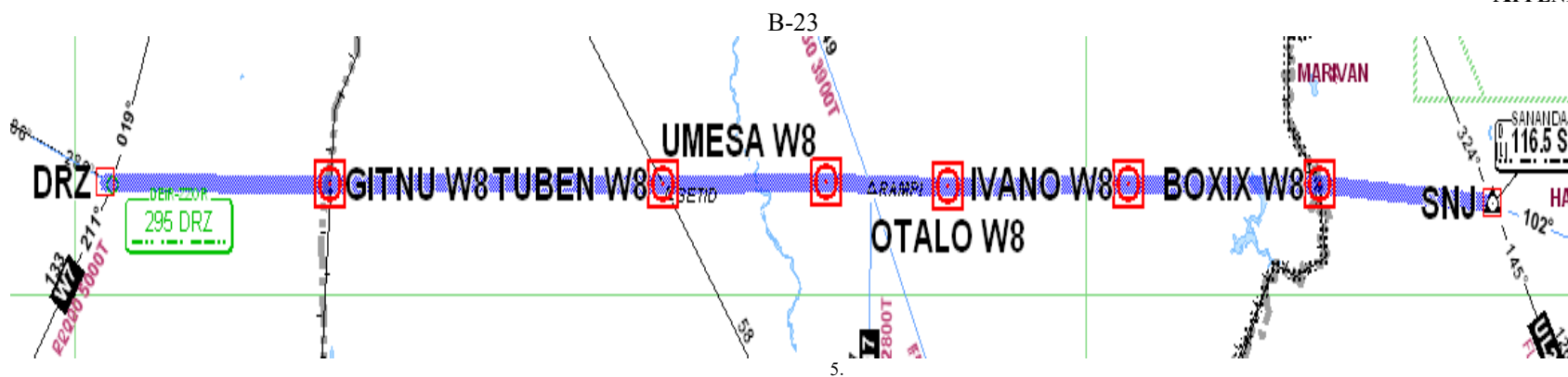
MID/RC-028	ATS Route Name: J222	Entry-Exit: BASEM-KMS	Inter-Regional Cross Reference if any		Users Priority	URGENT	Originator of Proposal	Iraq
							Date of Proposal	RDGE/11 (Oct 2009)
Route Description		States Concerned	Expected Impl. date	Implementation Status	ANP Status		Action Taken / Required	Deadline for each Action
BASEM 333318N 0373906E ALSOX 333700N 0392000N GEPAP 334906N 0422851E SOKAD 341051N 0453226E KMS KERMANSHAH		Syria Iraq Iran		1. Points highlighted in yellow are new. 2. Coordination with Syria and Iran required for the continuation of route within their airspace. 3. New route in the Baghdad (FIR)	Not available in ATS.1 Table. Implemented in Syria Change of Route Designator Required		Points highlighted in yellow are new. - Not supported by Syria - ATS route J222 is in close proximity with ATS route UR785 that would cause traffic conflict - Iraq was asked to reconsider to join the ATS route with G202 and change the route designator. - Syria to review the proposal and will inform ICAO.	TBD
Flight Level Band: FL200-FL410		No progress reported						
Potential City Pairs:								
Conclusions/Remarks		ON HOLD-RDWG-1					Last updated	ATM SG/1 June 2014

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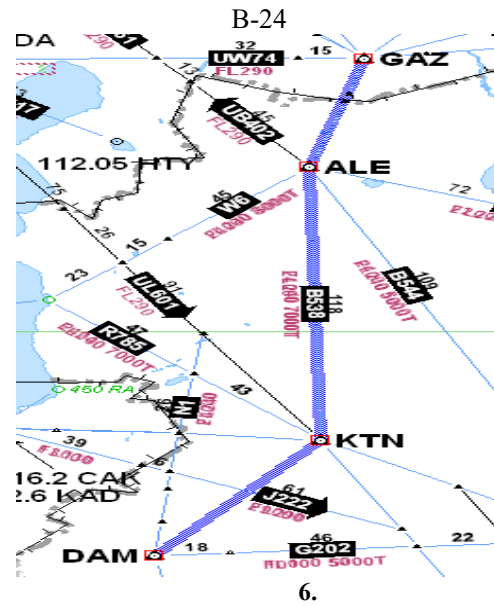
MID/RC-029	ATS Route Name: W8	Entry-Exit: GITNU-HAB	Inter-Regional Cross Reference if any		Users Priority	URGENT	Originator of Proposal	Iraq
							Date of Proposal	RDGE/11 (Oct 2009)
Route Description		States Concerned	Expected Impl. date	Implementation Status	ANP Status	Action Taken / Required		Deadline for each Action
DRZ GITNU 351724N 0411553E TUBEN 351724N 0425434E UMESA 351741N 0434307E OTALO 351700N 0441900E DAVAS 351724N 0451235E BOXIX 351724N 0460921E SNJ		Syria Iraq Iran		1. Change route designator to regional RNAV route designator (L, M, N or P requested). 2. Points highlighted in yellow are new. 3. Coordination with Syria and Iran required for the continuation of route within their airspace. 4. New route in the Baghdad (FIR)		Points highlighted in yellow are new. - Syria requested additional time to examine the proposal for the establishment of the ATS route.		TBD
Flight Level Band: FL200-FL410				No progress reported				
Potential City Pairs:								
Conclusions/Remarks		ON HOLD-RDWG-1				Last updated		ATM SG/1 June 2014



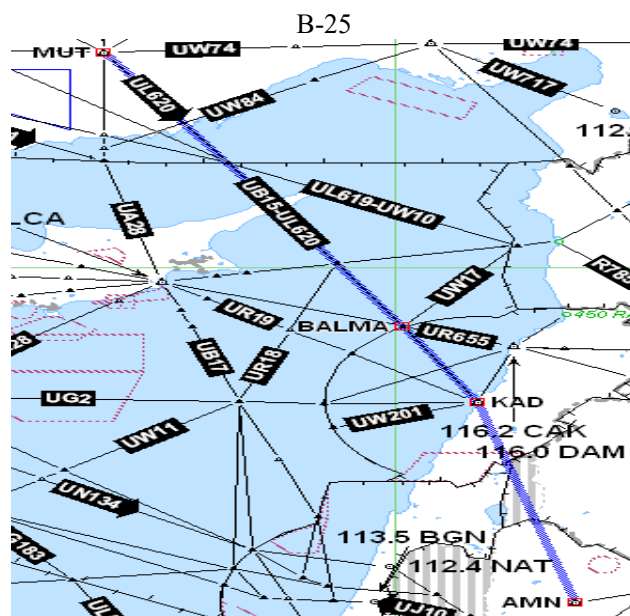
5.

MID/RC-062 <i>(ex B538)</i>	ATS Route Name: New Route	Entry-Exit: GAZIANTEP DAMASCUS	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA	
							Date of Proposal	MIDANPIRG/10	
Route Description		States Concerned	Expected Implemen- tation date	Implementation Status		ANP Status	Action Taken/Required		Deadline for each Action
(GAZIANTEP) ALEPPO KARIATAIN DAMASCUS		Syria		GAZIANTEP – ALEPPO Established as (B544) ALEPPO – KARIATAIN Established as (B538) KARIATAIN – DAMASCUS not established			No updates		
Flight Level Band:				No progress reported					
Potential City Pairs:									
Conclusions/Remarks		Segment GAZIANTEP-ALEPPO implemented (B544) ON HOLD-RDWG-1					Last updated		ATM SG/1 June 2014

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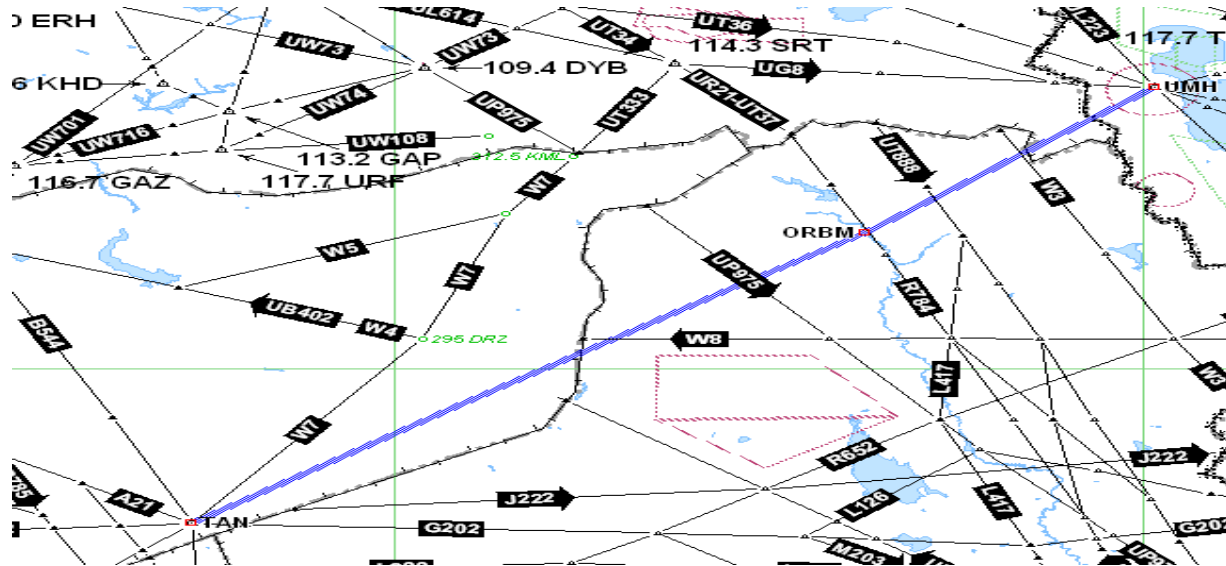
MID/RC-063 (ex B545)	ATS Route Name: New Route	Entry-Exit: BALMA-AMMAN	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA
							Date of Proposal	MIDANPIRG/10
Route Description		States Concerned	Expected Impl. date	Implementation Status		ANP Status	Action Taken/Required	Deadline for each Action
KHALDEH AMMAN		Jordan Lebanon Syria		MUT – BALMA – KAHLDE Implemented as (UB15/UL620)			Not feasible currently	
Flight Level Band:				KHALDE – AMMAN not implemented				
Potential City Pairs:				No progress reported				
Conclusions/Remarks		ON HOLD-RDWG-1					Last updated	ATM SG/1 June 2014



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MID/RC-067 (ex G671)	ATS Route Name:	Entry-Exit: TANF-UMH	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA
							Date of Proposal	MIDANPIRG/10
Route Description		States Concerned	Expected Impl. date	Implementation Status	ANP Status		Action Taken/Required	Deadline for each Action
TANF MOSUL UMH		Syria Iraq Iran		No progress reported			No update	
Flight Level Band:								
Potential City Pairs:								
Conclusions/Remarks	ON HOLD-RDWG-1					Last updated	ATM SG/1 June 2014	



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MID/RC-077	ATS Route Name: New route	Entry-Exit: BINKO - RASNO - LOSUL	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA	
							Date of Proposal	ARN TF/2	
Route Description		States Concerned	Expected Impl. date	Implementation Status		ANP Status		Action Taken/Required	Deadline for each Action
BINKO RASNO LOSUL		Egypt Lybia Malta						Egypt has no objection to establish the route as Uni- directional	
Flight Level Band: Upper Airspace				No progress reported					
Potential City Pairs:									
Conclusions/Remarks		ON HOLD-RDWG-1					Last updated	ATM SG/1 June 2014	

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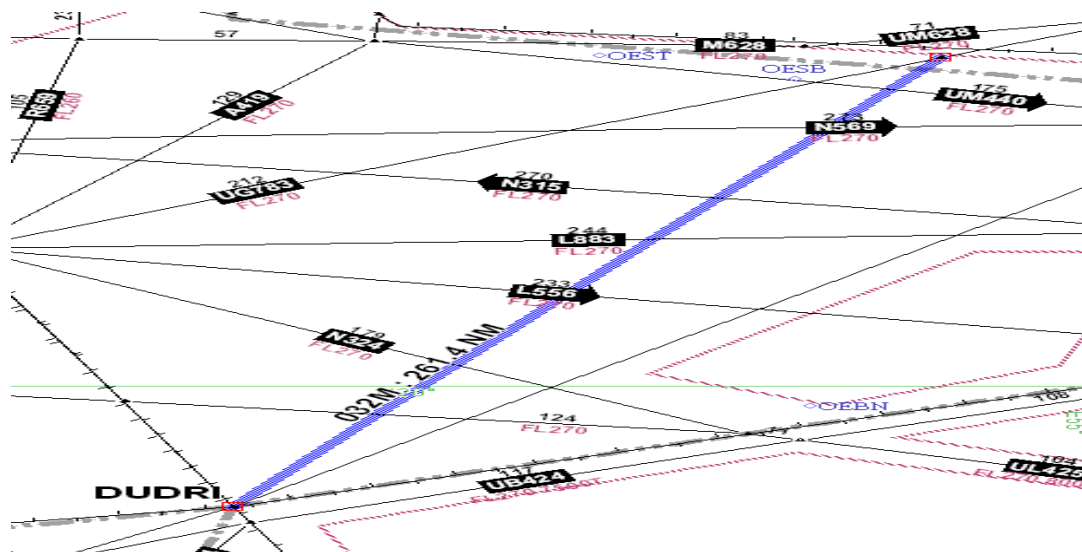
MID/RC-080	ATS Route Name: New Route	Entry-Exit: BUSRA - KTN	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	ICAO EUR/NAT	
							Date of Proposal	17 May 2011	
Route Description		States Concerned	Expected Implemen- tation date	Implementation Status		ANP Status	Action Taken/Required		Deadline for each Action
BUSRA 322000N 0363700E KARIATAIN (KTN)		Syria		No progress reported		Not in ANP	State letter to be sent to Syria for input.		
Flight Level Band:							Awaiting final approval for implementation		
Potential City Pairs: HEGN - UDD									
Conclusions/Remarks		Shortens the distance by 85NM. ON HOLD-RDWG-1						Last updated	ATM SG/1 June 2014



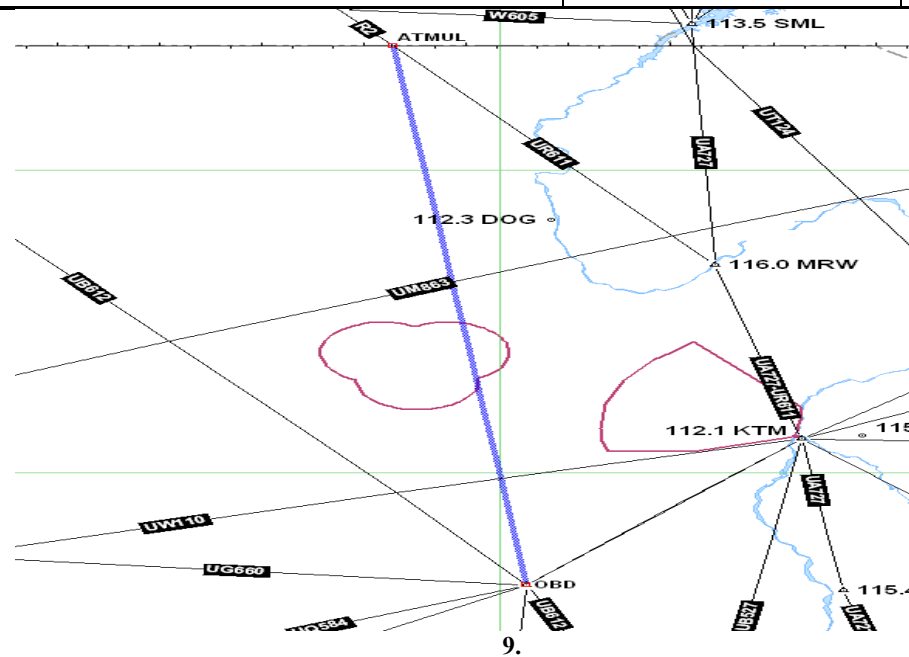
B-29

8.

MID/RC-096	ATS Route Name: New Route UQ578; Bidirectional		Entry-Exit: DUDRI - TANSU	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA iFLEX Proposal		
	Date of Proposal		17 May 2011								
Route Description			States Concerned	Expected Impl. date	Implementation Status		ANP Status		Action Taken/Required		Deadline for each Action
DUDRI 190000N 0520000E TANSU 224136N 0542828E		Bahrain UAE			No progress reported				Level Restriction FL300/320		TBD
Flight Level Band:											
Potential City Pairs:											
Conclusions/Remarks		ON HOLD-RDWG-1							Last updated		ATM SG/1 June 2014



MID/RC-099	ATS Route Name: New Route ATMUL-OBD		Entry-Exit: ATMUL-OBD	Inter-Regional Cross Reference if any		Users Priority	High	Originator of Proposal	IATA		
								Date of Proposal			
Route Description			States Concerned	Expected Implemen- tation date	Implementation Status		ANP Status		Action Taken/Required		Deadline for each Action
ATMUL		Egypt			No progress reported			ATS Route Segment from point ATMUL to OBD in the Khartoum FIR		TBD	
OBD		Sudan						Sudan has no objection			
Flight Level Band:											
Potential City Pairs:											
Conclusions/Remarks		ON HOLD-RDWG-1							Last updated		ATM SG/1 June 2014



APPENDIX C

MID Region AIDC/OLDI Applicability Area (Priority 1 and 2 for Implementation)

As of July 2018

ACC	Adjacent ACCs						
Amman	Cairo (1)	Baghdad (2)	Damascus (2)	Jeddah (1)	Tel Aviv (2)		
Baghdad	Amman (2)	Ankara (1)	Damascus (2)	Jeddah (2)	Tehran (2)	Kuwait (1)	
Bahrain	Doha (1)	Emirates (1)	Jeddah (1)	Kuwait (1)	Riyadh (1)	Tehran (2) AFTN MSG	Dammam (2)
Beirut	Damascus (2)		Nicosia (1)				
Cairo	Amman (1)	Athens (2)	Jeddah (1)	Khartoum (1)	Nicosia (1)	Tel Aviv (2)	Tripoli (2)
Damascus	Amman (2)	Ankara (2)	Bagdad (2)	Beirut (2)	Nicosia (2)		
Doha*	Bahrain (1)	Emirates (1)	Jeddah (2)	Riyadh (2)			
Emirates	Bahrain (1)	Doha (1)	Jeddah (1)	Muscat (1)	Tehran (2) AFTN MSG		
Jeddah	Amman (1)	Asmara (2)	Baghdad (2)	Bahrain (1)	Cairo (1)	Doha (2)	Emirates (1)
	Khartoum (1)	Kuwait (2)	Muscat (1)	Riyadh (1)		Sana'a (2)	
Riyadh	Bahrain (1)	Doha (2)	Kuwait (2)	Jeddah (1)			
Khartoum	Addis (1)	Asmara (2)	Brazzaville (2)	Cairo (1)	Entebbe (2)	Jeddah (1)	Juba (1)
	Kinshasa (2)	N'Djamena (2)	Nairobi (2)	Tripoli (2)			
Kuwait	Baghdad (1)	Bahrain (1)	Jeddah (2)	Tehran (2)			
Muscat	Emirates (1)	Jeddah (1)	Karachi (2)	Mumbai (1)	Sana'a (2)	Tehran (1)	
Sana'a	Djibouti (Addis Ababa) (2)	Asmara (2)	Jeddah (2)	Mogadishu (2)	Mumbai (2)	Muscat (2)	
Tehran	Ankara (1)	Ashgabat (2)	Baghdad (2)	Bahrain (1)	Baku (2)	Emirates (2) AFTN MSG	Kabul (2)
	Karachi (1)	Kuwait (2)	Muscat (1)	Yerevan (2)			
Tripoli	Algiers (2)	Cairo (2)	Khartoum (2)	Malta (2)	N'Djamena (2)	Niamey (2)	Tunis (2)

(1) = Priority 1 for implementation based on the number of traffic movements and/or operational needs (Green color means already implemented)

(2) = Priority 2 for implementation based on the number of traffic movements or if other solution is in place such as exchange of information via AFTN

APPENDIX D

MID Region SSR Codes Allocation

Code	AMMAN	BAGHDAD	BAHRAIN	BEIRUT	CAIRO	DAMASCUS	DOHA TMA	EMIRATES	JEDDAH	KHARTOUM	KUWAIT	MUSCAT	SANAA	TEHRAN	TRIPOLI
0001-0077 ²															
0101-0177 ¹										T					
0200-0277 ¹									D						
0300-0377 ²															
0400-0477 ²	D							D							
0500-0577 ¹								T							
0600-0677 ¹					D			D			D				
0700-0777 ¹	T														
1001-1077 ¹		T													
1101-1177 ¹	D							D						D	
1200-1277 ¹			D							D					
1300-1377 ¹		D						D							D
1400-1477 ¹											T				
1500-1577 ¹														D	
1600-1677 ¹					T										
1700-1777 ¹								T							
2001-2077 ³															
2100-2177 ¹			D												
2200-2277 ¹			T												
2300-2377 ¹					D		D								
2400-2477 ¹	D														
2500-2577 ¹				D					D						
2600-2677 ¹			T												
2700-2777 ¹			D		D										
3000-3077 ¹						D			D						
3100-3177 ¹									T						
3200-3277 ¹			T												
3300-3377 ¹					T										
3400-3477 ¹								T							
3500-3577 ¹									D						
3600-3677 ¹														T	
3700-3777 ¹											D		D		
4000-4077 ¹												T			
4100-4177 ¹									D					D	
4200-4277 ¹									T						

Code	AMMAN	BAGHDAD	BAHRAIN	BEIRUT	CAIRO	DAMASCUS	DOHA TMA	EMIRATES	JEDDAH	KHARTOUM	KUWAIT	MUSCAT	SANA'A	TEHRAN	TRIPOLI
4300-4377 ¹				T											
4400-4477 ¹			T												
4500-4577 ¹									T						
4600-4677 ¹										D		D			
4700-4777 ¹												T			
5000-5077 ¹									D						
5100-5177 ¹														T	
5200-5277 ¹									T						
5300-5377 ³															
5400-5477 ¹														T	
5500-5577 ³															
5600-5677 ¹									D					D	
5700-5777 ¹						T									
6000-6077 ¹								D		D					
6100-6177 ¹								D					D		
6200-6277 ¹								T							
6300-6377 ¹									D					D	
6400-6477 ³															
6500-6577 ¹												D			
6600-6677 ¹												D			
6700-6777 ²															
7001-7077 ¹													T		
7100-7177 ²															T
7200-7277 ¹		T													
7300-7377 ¹					T										
7400-7477 ¹		D													
7501-7577 ²															
7613-7677 ²															
7701-7775 ²															

T: codes allocated for Transit use

D: codes allocated for Domestic use

 ¹ Series allocated to the MID Region and Assigned to MID States

 ² MID Region SSR Reserve List for Domestic use

 ³ MID Region SSR Reserve List for Transit use



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**MIDDLE EAST AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP
(MIDANPIRG)**

**MIDDLE EAST SECONDARY SURVEILLANCE RADAR CODE
MANAGEMENT PLAN
(SSR CMP)**

EDITION ~~JUNE~~DECEMBER, 20158

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THE DESIGNATIONS AND THE PRESENTATION OF MATERIAL IN THIS PUBLICATION DO NOT IMPLY THE EXPRESSION OF ANY OPINION WHATSOEVER ON THE PART OF ICAO CONCERNING THE LEGAL STATUS OF ANY COUNTRY, TERRITORY, CITY OR AREA OF ITS AUTHORITIES, OR CONCERNING THE DELIMITATION OF ITS FRONTIERS OR BOUNDARIES.

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1 SCOPE

1.1 RELATIONSHIP TO MID AIR NAVIGATION PLAN (DOC 9708)

- 1.1.1 The *Middle East Secondary Surveillance Radar Code Management Plan* has been produced on behalf of the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG).
- 1.1.2 The purpose of MID CMP is to detail the requirements to be met by the MID States ~~of the ICAO Middle East (MID) Region in order~~ to comply with the provisions of the *Middle East Basic Air Navigation Plan* (MID ANP) (ICAO Doc 9708, ~~Volume I~~) and the *Middle East Facilities and Services Implementation Document* (MID FASID) (~~Doc 9708, Volume II~~) as ~~they it~~ pertains the management of Secondary Surveillance Radar (SSR) codes in the ICAO MID Region. ~~This document incorporates text that currently comprises Attachment B to the MID FASID along with new material to document the management of the regional SSR Code pool.~~
- 1.1.3 The technical requirements and associated procedures may also be adopted by States in adjoining ICAO Regions which elect to participate in the Originating Region Code Assignment Methodology (ORCAM) for the management of SSR codes.
- 1.1.4 All references to SSR Codes are confined to Mode 3/A.

2 DEFINITIONS AND ABBREVIATIONS

2.1 DEFINITIONS

Assigned Secondary Surveillance Radar code (ASSR)	The SSR code assigned by an ATS Unit (ATSU) to a departing aircraft or to an aircraft entering the airspace of the ATSU. <i>Note: In cases where the Previous Secondary Surveillance Radar code (PSSR) can be retained, PSSR and ASSR can be the same code</i>
(SSR) Code	The number assigned to a particular multiple pulse reply signal transmitted by a transponder in Mode A or Mode C.
Code allocation	The distribution of SSR Codes to a State, unit or service.
Code assignment	The distribution of SSR codes to aircraft.
Code block	A continuous series of four-digit codes from the same code series.
Code series	A group of 64 four-digit codes having the same first two digits.
Direction of flight	The direction shall be defined as a combination of one or more: a) exit points or receiving Areas of Responsibility (AOR); and b) destinations (defined by the first, the first two, the first three or all four letters of an ICAO location indicator).
Directional assignment	Assignment of an SSR code based on the direction of the flight.
Discrete code	A four-digit code with the last two digits not being “00”.
Domestic code	A code allocated to a specific AOR for use by designated ATC unit(s) within that AOR or, subject to certain conditions, across AOR boundaries.
Expectation window	A window of variable size around a 4D position, defined by flight plan information, at which a flight is expected to enter the AOR.
Four-digit code	An SSR identity code containing combinations of A, B, C and D pulses (any reply generated by a 4096-code transponder where the digits fall in the range 0-7).
Geographical correlation	Correlation of a flight with its flight plan using the geographical position of the flight by means of “Expectation Windows” in cases where the SSR code is already in use by one or more other flights within the same AOR.
Mode S Conspicuity Code	In order to maximise SSR code savings through Mode S Elementary Surveillance (ELS), all aircraft identified via the down linked Aircraft Identification (ACID) use the same SSR code, the Mode S Conspicuity Code A1000.
Octal block	A block of 8 four-digit codes from the Same Series and having the first three digits common. They may be identified by indicating their third digit when referring to the Code Series e.g. Codes 0010-0017 may be referred to as Codes 00(1).
Participating area (PA)	An area of specified dimensions comprising the areas of ATS unit responsibility of one or more States.
Previous Secondary Surveillance Radar code (PSSR)	The SSR code transmitted by an aircraft when entering the airspace of an ATSU or when being transferred by the transferring unit. <i>Note: In cases where the PSSR can be retained, PSSR and ASSR can be the same code.</i>

Simultaneous code use	Assignment of an SSR code, which is already in use within the same AOR, to an aircraft in accordance with procedures which ensure that the two aircraft will be exiting the AOR in opposite or nearly opposite directions.
Retention of an SSR code	Accepting an aircraft from the transferring unit without changing the SSR code. A code can be retained if no other aircraft within the AOR uses the same code and if the retention of the code is in accordance with the Code Allocation List (CAL).
Transit code	A code allocated to a State for a specified ACC for assignment to an aircraft engaged in transit flights within the originating PA or, subject to certain conditions, to specified locations in succeeding PAs.

2.2 ABBREVIATIONS

ABI	Advance Boundary Information
ACID	Aircraft Identification
ADEP	Aerodrome of Departure
ADES	Aerodrome of Destination
AOR	Area of Responsibility
ASSR	Assigned Secondary Surveillance Radar code
ATC	Air Traffic Control
ATS	Air Traffic Services
ATSU	Air Traffic Services Unit
CAL	Code Allocation List for the Middle East Region
CMP	Code Management Plan
COD	SSR Code Assignment Message
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
ELS	Elementary Surveillance
FDPS	Flight Data Processing System
FIR	Flight Information Region
NM	Nautical Mile
ORCAM	Originating Region Code Assignment Method
PA	Participating Area
PSSR	Previous Secondary Surveillance Radar code
RDPS	Radar Data Processing System
SSR	Secondary Surveillance Radar
VSP	Variable System Parameter

3 INTRODUCTION

3.1 OBJECTIVES OF THE MIDDLE EAST SSR CODE MANAGEMENT PLAN

- 3.1.1 The Middle East SSR Code Management Plan (MID SSR CMP) has been established to provide States in the ICAO MID Region with means to coordinate the use of SSR codes based on the principles of the Originating Region Code Assignment Method (ORCAM), which provides for the most efficient and economical use of codes.
- 3.1.2 The MID SSR CMP will foster the implementation of ORCAM which will ultimately allow for an assigned discrete code which would, whenever possible, be retained throughout the flight.
- 3.1.3 For the development of automated SSR code assignment systems, reference should be made to Paragraph [66](#) below.
- 3.1.4 On the basis of the above, a detailed Code Allocation List (CAL) for the MID Region Participating Area (PA) and certain adjacent areas was developed. The CAL is maintained by the ICAO MID Regional Office as a Supplement to MID Doc 9708.
- 3.1.5 The agreed allocation of SSR codes to States and ATS units are documented in Part A of the CAL. The detailed listing of codes serving both transit and domestic purposes is shown in Part B of the CAL. The CAL is ~~at Attachment B~~included in ~~to~~ the MID ~~FASIDeANP~~, Part ~~IV~~5.

3.2 GENERAL PRINCIPLES TO MEET THE OBJECTIVES

- 3.2.1 The detailed principles governing the use of SSR codes in the MID Region are based on the following general principles which are provided by or are complementary to the worldwide provisions detailed in *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), Chapter 8:
 - a) codes shall be allocated to States in accordance with regional air navigation agreements, taking into account overlapping radar coverage over adjacent airspace;
 - b) codes are allocated to Air Traffic Services Units (ATSU) on the basis of duly justified operational requirements; their number is primarily established by taking into account the number of aircraft to be handled simultaneously and the system capabilities;
 - c) the appropriate ATS authority shall establish a plan and procedures for the allocation of codes to ATSUs;
 - d) the plan and procedures for the allocation of codes to ATSUs shall be compatible with those practised in adjacent States;
 - e) codes shall be assigned to aircraft in accordance with the plan and procedures laid down by the appropriate ATS authority;
 - f) whenever there is a need for individual aircraft identification, each aircraft shall be assigned a discrete code which should, whenever possible, be retained throughout the flight;
 - g) the assignment of a code should preclude the use of this code for any other function within the area of coverage of the same SSR for a prescribed time period; and
 - h) to reduce pilot/controller workload and the need for communications, the number of code changes required shall be kept to the minimum.
- 3.2.2 SSR codes should be used for ATS purposes only.

- 3.2.3 Code allocations are expressed in terms of complete code series or specified parts thereof. In special cases, such requirements may even cover designated discrete codes.
- 3.2.4 Codes intended to be used for transit purposes are allocated to States for use by specified ATSUs within the MID PA. Where provided for in the *Middle East SSR Code Management Plan* and under clearly defined circumstances, such codes may also be designated for use across PA boundaries.
- 3.2.5 Codes intended to be used for domestic purposes are allocated to States for use by specified ATSUs requiring limited geographical protection for such codes. Where provided for in the MID SSR CMP and under clearly defined circumstances, such codes may also be designated for use across national boundaries.

3.3 MONITORING OF THE PLAN

- 3.3.1 Provisions regarding the progressive implementation and monitoring of the MID SSR CMP have been agreed by MIDANPIRG. In this connection, the management of the MID SSR CMP is exercised by the ICAO MID Regional Office. States expecting to introduce or change SSR facilities are requested to advise the ICAO MID Regional Office at least six months in advance, in order to provide sufficient time to carry out any necessary coordination.
- 3.3.2 To be effective, the MID SSR CMP must be kept up to date. While its contents will be reviewed regularly, it is the responsibility of all States to inform the ICAO MID Regional Office promptly of any variations proposed or considered necessary with respect to their code allocations, relevant to ATS infrastructure developments and/or the guidance material provided in the MID SSR CMP.
- 3.3.3 In order to serve their purposes it is imperative that the MID SSR CMP and the CAL are kept up to date. States are therefore required to inform the MID Office of ICAO promptly of any requests for changes, additions or deletions in regard to the use of specific codes, as follows:

ICAO MID Regional Office

Subject: SSR Code Management

E-mail:

icaomid@icao.int

Fax: +2 (02) 22674843

4 PERMANENT CODE DISTRIBUTION AND CATEGORIES

4.1 DISTRIBUTION OF CODES

- 4.1.1 Certain codes are reserved for special purposes on a worldwide scale or have been put in a common pool for use in the MID Region. The remaining code series for use in the ICAO MID Region are divided into two distinct types: transit codes and domestic codes. Both domestic and transit codes may be used as directionally assigned codes beyond their normal application under clearly defined and published circumstances, and appropriately coordinated through ORCAM.
- 4.1.2 The number of codes used for transit purposes has to take account of the extended geographical protection required, in order to reduce to a minimum the chances of confusion between the identities of two different aircraft assigned with the same discrete code. The MIDANPIRG has agreed that the retention time should normally be two hours.

4.1.3 The number of codes used for domestic purposes can be kept relatively small as they may be repeated within the same State or they can be used by other States provided a buffer is established. In some cases, by agreement, they can be used across national boundaries.

4.1.4 Furthermore, the allocation possibilities can be increased significantly by dividing specific code series into smaller contiguous codes. When this method is used for transit flights bilateral agreement may be required.

4.2 SPECIAL PURPOSE CODES

4.2.1 Specific codes in certain series are reserved for special purposes as follows:

Series 00	Code 0000 is available as a general purpose code for domestic use by any of the following States:

Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen.

Series 10	Code 1000 reserved for use as a conspicuity code for Mode S

Series 20	Code 2000 shall be used by flight crews in the absence of any Air Traffic Control (ATC) instructions or regional agreements unless the conditions for the use of codes: 7000, 7500, 7600 and 7700 apply.

Series 70	Code 7000 shall be used by flight crews not receiving ATS service in order to improve detection of suitably equipped aircraft in areas specified by States, unless otherwise instructed by ATS.

Series 75	Code 7500 is reserved for use in the event of unlawful interference.

Series 76	Code 7600 is reserved for use in the event of radio communications failure.

Series 77	Code 7700 is reserved for use in the event of emergencies and interception*. Code 7776 and Code 7777 are reserved for SSR ground transponder monitoring.

Codes 7601-7612	Are reserved for humanitarian flights.

Common SSR Code Pool	The following code blocks have been reserved for tactical allocation to States on a temporary basis to support large scale activities:

4.2.2 Discrete codes in the series 00 are allocated to States for use for domestic purposes. States in the MID Region are generally allocated two octal blocks of four-digit codes per State in such a manner that code duplication is avoided at FIR boundaries. The allocation of octal blocks is shown in the CAL.

**Note.— The word “interception” in this context does not include intercept and escort service provided, on request, to an aircraft in distress, in accordance with Volumes II and III of the International Aeronautical and Maritime Search and Rescue Manual (Doc 9731).*

4.3 TRANSIT CODES

4.3.1 Transit codes are allocated for assignment to transit flights. Aircraft will retain the assigned code within the geographical limits of the MID PA or, in the case of an agreement between States concerned, across the PA boundary.

4.3.2 The allocation of transit codes in the MID Region is based on one PA¹ which has been determined on the basis of the flow of air traffic in the region. It is shown on the Chart at **Appendix A** and includes the following States:

PA MID Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates and Yemen.

4.3.3 Transit codes shall be assigned in accordance with the following principles:

- a) when an aircraft enters the MID PA (either on departure or in flight), it will be assigned a discrete code by the first ATSU concerned at a Variable System Parameter (VSP) of not less than 30 minutes prior to activation of the flight entering the MID PA or when departing, upon ATC clearance delivery or at start up, whichever is later;
- b) each aircraft will keep the original code assigned on entering the MID PA for the entire flight within the PA. Appropriate code protection criteria have to be applied in order to avoid duplication by too early reassignment of the same code. Efforts should be made to reduce the “protection period” while retaining adequate protection. It has been agreed that the normal retention value shall be two hours; and
- c) a code change will be required at the time an aircraft crosses the MID PA boundary, unless special provision has been made for retention beyond the PA boundary.

4.3.4 In establishing the number and series of transit codes for both omni-directional and directional application, account is taken of the following factors:

- a) the air traffic flows and main sources of transit traffic in the MID Region and likely trends;
- b) the requirement for code series for a given ATC Unit. This requirement is derived from the total number of aircraft requiring assignment of a specific code during the busiest period of activity of that ATC Unit, taking into account a “protection period” after which any specific code assigned to an aircraft by an ATC Unit is normally available for reuse; and
- c) the assignment of a specific code to an aircraft is ideally made, as late as possible before take-off, normally on start up or upon ATC clearance delivery, whichever is later or, when an aircraft in flight is imminently due to come under control, normally a VSP value of not less than 30 minutes.

4.3.5 The distribution of the available code series for transit purposes is shown in the CAL.

4.3.6 Specific arrangements are required to ensure that no conflicting situations will arise in border areas.

4.4 DOMESTIC CODES

4.4.1 Domestic codes are allocated for use by aircraft remaining within the boundaries of the agreed Area Of Responsibility (AOR) (normally within one State) or, in the case of agreement between States concerned, across agreed AORs. Domestic codes can also be used

¹ The actual number of PAs to be established will depend on the results of the Secretariat study.

for transit aircraft entering the MID PA and landing at an aerodrome within the AOR of the ATSU that has assigned the SSR code. The relevant code series for domestic purposes are shown in the CAL.

- 4.4.2 Domestic codes should be used so that utmost economy in the number of codes required is achieved. Domestic codes used for terminal purposes or within specified portions of the airspace (sectors) or across national boundaries will be assured protection in these functions from other uses of the same code through suitable systematic or procedural methods.
- 4.4.3 More detailed information concerning the procedures to be used for SSR code assignment can be found in **Appendix B**.

5 ORCAM

5.1 OUTLINE OF ORCAM OBJECTIVES

- 5.1.1 The objectives of ORCAM are:
 - a) to ensure safety by uniqueness and continuity;
 - b) enhance safety;
 - c) reduce workload;
 - d) improve system capacity; and
 - e) increase efficiency.
- 5.1.2 Uniqueness and continuity criteria are intended to provide permanent perceptibility and identification of aircraft with a minimum of errors and interruptions.
- 5.1.3 *Uniqueness*. Depending on system functionality, only one aircraft should respond using a given code in any particular area and at any given time. This provides an unambiguous code/callsign correlation and consequently an easy identification of aircraft.
- 5.1.4 *Continuity*. A code assigned to an aircraft should, whenever possible, be retained throughout the flight. This secures permanent display of aircraft identification.
- 5.1.5 The uniqueness and continuity criteria of ORCAM enhance safety by limiting the likelihood of identification errors. They also assist traffic flows since radar identification and all aspects connected with transfers are facilitated. This results in a reduction of workload (radiotelephony, identification monitoring, etc.) and substantially improves the overall system capacity.
- 5.1.6 In some areas the number of flights could exceed the number of SSR codes available. Some rationalization according to the nature of the flight (short-, medium- or long-haul, domestic, international or transit) and of the capabilities of the system is necessary for the most intensive possible use of codes.
- 5.1.7 Permanent code assignments and allocations based on the aircraft callsign, control position or any other systematic distinguishing features cannot be accepted because of the wasteful effects on the efficiency in use of codes required.

6 ORCAM SYSTEM REQUIREMENTS

6.1 INTRODUCTION

- 6.1.1 Middle East States are relying on the extensive use of SSR in automated ATC ground systems to ensure uninterrupted aircraft identification and maintenance of radar/flight plan correlation.
- 6.1.2 They have recognized the common availability of specified capabilities in automated ATC ground systems as being essential for:
- a) participation of individual automated ATC units in a cooperative environment;
 - b) application of a common SSR Code assignment method in accordance with the ICAO principles;
 - c) efficient utilization of codes in automated ATC ground systems.
- 6.1.3 This “Statement of essential common capabilities for automated ATC ground systems in relation to the use of SSR” shown in paragraph ~~6.36.3~~ below, lists the capabilities concerned. It should be used by States as the basis to determine the minimum operational specifications for automated ground systems.

6.2 GENERAL SYSTEM CONSIDERATIONS

- 6.2.1 The application of automatic data processing in ATC ground systems allows for great freedom in the definition of system capabilities. This freedom should be exploited to:
- a) provide for all essential capabilities related to the use of SSR in the ~~most simple~~simplest manner having due regard to operational requirements; and
 - b) enable individual automated ATC ground systems to function as part of an inter-operable environment and to comply with agreed conventions facilitating such cooperation (e.g. principles and basic rules for code assignment, code assignment methods etc.).
- 6.2.2 Individual automated ATC ground systems should, as part of an inter-operable environment, be capable of making the maximum use of codes previously assigned by other units controlling the aircraft concerned; i.e. they should not introduce any code changes or if this is impossible in some circumstances, require only the minimum of changes.
- 6.2.3 Taking into account inter-operability of ATC ground systems within the MID Region with others outside that area and the range of codes which may be utilized under such arrangements, automated ATC ground systems should be capable of performing all system functions related to the use of SSR for any 4-digit identity code.
- 6.2.4 Automated ATC ground systems should be designed to allow the use of a minimum number of codes. The application of sophisticated code correlation methods may reduce the number of codes needed in comparison with those required when simpler methods are used.
- 6.2.5 The processing of SSR data in automated ATC ground systems should be aimed at reducing the need for controller intervention.
- 6.2.6 **Appendix C** and **Appendix D** provide greater detail regarding the implications for automation and the development of automated SSR code assignment systems respectively.

6.3 ESSENTIAL CAPABILITIES FOR AUTOMATED ATC GROUND SYSTEMS

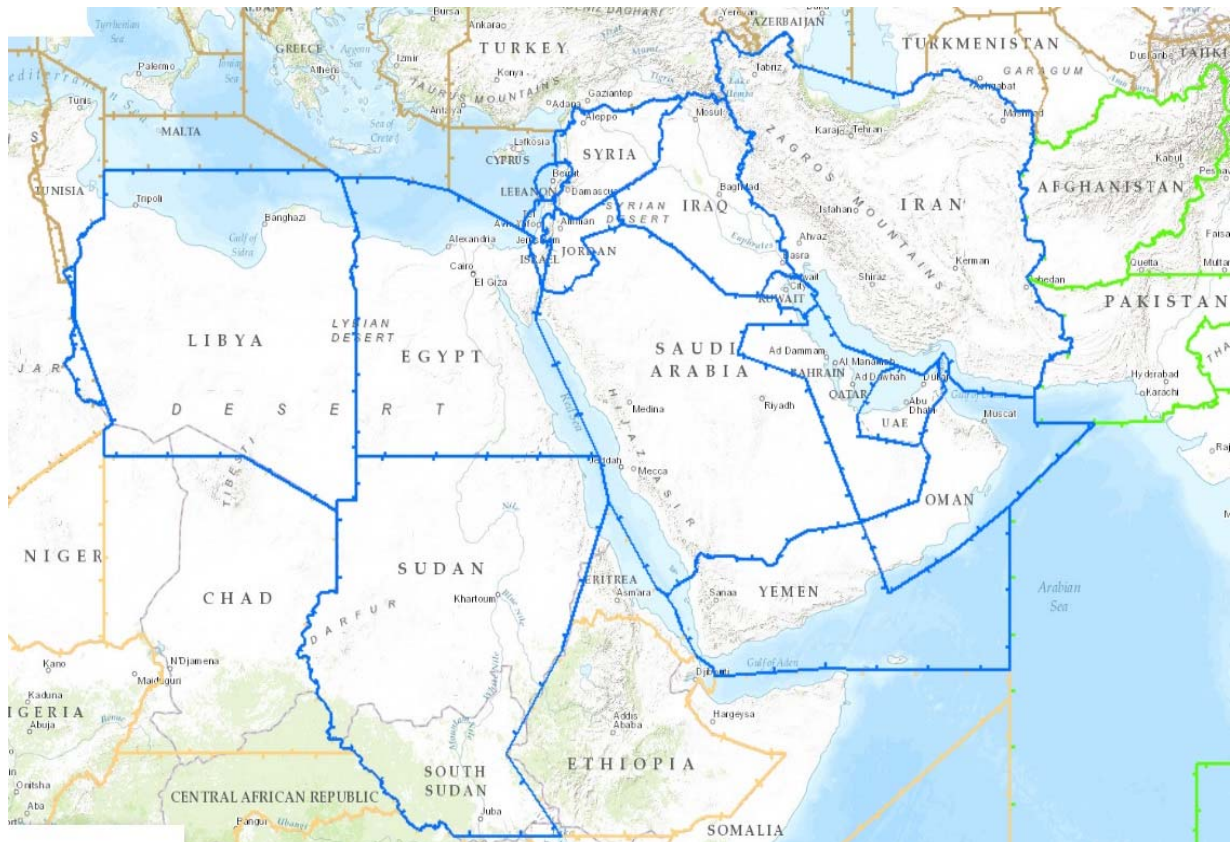
6.3.1 It is essential that automated ATC ground systems be designed to have certain capabilities in common, based on the assumption that:

- a) the maximum use will be made of previously assigned -codes;
- b) only where continuing use of previously assigned codes would give rise to ambiguity, new codes will be assigned in accordance with a suitable common SSR code assignment method;
- c) the prime use of codes will be to facilitate automatic identification, automatic tracking and automatic radar/flight plan data correlation; and
- d) the differentiation of aircraft essential for the execution of these functions can be achieved through the use of a single, adequately protected code per aircraft.

6.3.2 In detail, automated ATC ground systems should be capable of automatic:

- a) **Exchange of codes:** in particular of timely transmission to adjacent centres concerned of information on the code previously assigned to flights to be transferred.
- b) **Assignment of codes:** in all instances where no previous code assignment has been made or where previous assignments are found to be unsuitable.
- c) **Processing of SSR code information, including:**
 - i) initiation of automatic tracking of SSR responses;
Note.— This does not exclude tracking on the basis of primary radar returns in areas where adequate primary coverage is available;
 - ii) determination for each code whether it meets the criteria to be established for unambiguous correlation;
 - iii) recognition of any code duplications affecting correlation;
 - iv) proposing action to controllers to resolve code duplications affecting correlation;
 - v) establishment of initial correlation between real-time radar information and current flight plan information on the basis of decoded SSR replies (including Mode C information). Correlation should be achieved sufficiently in advance of the time at which an aircraft enters the area of responsibility of a centre;
 - vi) maintenance of correlation between real-time radar information and current flight plan information on the basis of decoded SSR replies and/or coincidence of flight plan information (route, heading, altitude) or other distinguishing criteria and radar information;
 - vii) storage of code information until a VSP time at which its activation and protection is desired; and
 - viii) activation of stored information for correlation at a given VSP time and/or within a given airspace.

- d) **Display of information including:**
 - i) presentation in a suitable manner of decoded SSR replies and/or correlated flight plan information;
 - ii) filtering of information to be displayed on the basis of SSR-derived data (Mode A/C); and
 - iii) indication of code duplications.
- e) **Special codes:** immediate recognition of special codes, as specified on a regional or world-wide basis, as well as maintenance of tracking and correlation of aircraft using these codes.
- f) **Recovery from ground system degradation:** in cases of ground system degradation (excluding display component failure) to the extent that essential SSR-derived information is not displayed, automated ATC ground systems should be capable of restoring all essential information within the shortest possible time. Until full serviceability can be restored, the above aim may necessitate suppression of functions of secondary importance.

APPENDIX A - PARTICIPATING AREAS

SSR Code Allocation List

STATE-FIR	Domestic Code	Domestic Code	Transit Code	Transit Code
Amman	~~0400—0477~~ ~~1101—1177~~	~~2400—2477~~	~~0700—0777~~	
Baghdad	~~1300—1377~~	~~7400—7477~~	~~1001—1077~~	~~7200—7277~~
Bahrain	~~1200—1277~~ ~~2100—2177~~	~~2700—2777~~	~~2200—2277~~ ~~2600—2677~~	~~3200—3277~~ ~~4400—4477~~
Beirut	~~2500—2577~~		~~4300—4377~~	
Cairo	~~0600—0677~~ ~~2300—2377~~	~~2700—2777~~	~~1600—1677~~ ~~3300—3377~~	~~7300—7377~~
Damascus	~~3000—3077~~		~~5700—5777~~	
Emirates	~~0400—0477~~ ~~0600—0677~~ ~~1101—1177~~	~~1300—1377~~ ~~6000—6077~~ ~~6100—6177~~	~~0500—0577~~ ~~1700—1777~~	~~3400—3477~~ ~~6200—6277~~
Jeddah	~~0200—0277~~ ~~2500—2577~~ ~~3000—3077~~ ~~3500—3577~~	~~4100—4177~~ ~~5000—5077~~ ~~5600—5677~~ ~~6300—6377~~	~~3100—3177~~ ~~4200—4277~~	~~4500—4577~~ ~~5200—5277~~
Khartoum	~~1200—1277~~ ~~4600—4677~~	~~6000—6077~~	~~0100—0177~~	
Kuwait	~~0600—0677~~	~~3700—3777~~	~~1400—1477~~	
Muscat	~~4600—4677~~ ~~6500—6577~~	~~6600—6677~~	~~4000—4077~~	~~4700—4777~~
Sana'a	~~3700—3777~~	~~6100—6177~~	~~7001—7077~~	
Tehran	~~1101—1177~~ ~~1500—1577~~ ~~4100—4177~~	~~5600—5677~~ ~~6300—6377~~	~~3600—3677~~ ~~5100—5177~~	~~5400—5177~~
Tripoli	~~1300—1377~~		~~2001—2077~~	

SSR Code Reserve list

Domestic	Transit
~~0001—0077~~	~~5300—5377~~
~~0300—0377~~	~~5500—5577~~
~~6700—6777~~	~~6400—6477~~
~~7100—7177~~	
~~7501—7577~~	
~~7601—7612 Red Cross/humanitarian~~	
~~7613—7677~~	
~~7701—7777~~	

<u>STATE FIR</u>	<u>Domestic Code</u>	<u>Domestic Code</u>	<u>Transit Code</u>	<u>Transit Code</u>
<u>Amman</u>	<u>0400 – 0477</u> <u>1101 – 1177</u>	<u>2400 – 2477</u>	<u>0700 – 0777</u>	
<u>Baghdad</u>	<u>7400 – 7477</u>	<u>1300 – 1377</u>	<u>1001 – 1077</u>	<u>7200 – 7277</u>
<u>Bahrain</u>	<u>2100 – 2177</u> <u>2700 – 2777</u>	<u>1200 – 1277</u>	<u>2200 – 2277</u> <u>4400 – 4477</u>	<u>2600 – 2677</u> <u>3200 – 3277</u>
<u>Beirut</u>	<u>2500 – 2577</u>		<u>4300 – 4377</u>	
<u>Cairo</u>	<u>0600 – 0677</u> <u>2700 – 2777</u>	<u>2300 – 2377</u>	<u>1600 – 1677</u> <u>7300 – 7377</u>	<u>3300 – 3377</u>
<u>Damascus</u>	<u>3000 – 3077</u>		<u>5700 – 5777</u>	
<u>Doha TMA</u>	<u>2300 – 2377</u>			
<u>Emirates</u>	<u>0400 – 0477</u> <u>6000 – 6077</u>	<u>0600 – 0677</u> <u>6100 – 6177</u>	<u>0500 – 0577</u> <u>3400 – 3477</u>	<u>1700 – 1777</u> <u>6200 – 6277</u>
<u>Jeddah</u>	<u>0100 – 0177</u> <u>3500 – 3577</u> <u>3000 – 3077</u>	<u>0200 – 0277</u> <u>5000 – 5077</u> <u>4100 – 4177</u>	<u>3100 – 3177</u> <u>5200 – 5277</u>	<u>4500 – 4577</u> <u>4200 – 4277</u>
<u>Khartoum</u>	<u>1200 – 1277</u> <u>5200 – 5277</u>	<u>5300 – 5377</u>	<u>0100 – 0177</u>	
<u>Kuwait</u>	<u>0600 – 0677</u>		<u>1400 – 1477</u>	
<u>Muscat</u>	<u>6600 – 6677</u> <u>4600 – 4677</u>	<u>6500 – 6577</u>	<u>4000 – 4077</u>	<u>4700 – 4777</u>
<u>Sana'a</u>	<u>3700 – 3777</u>		<u>7001 – 7077</u>	
<u>Tehran</u>	<u>1101 – 1177</u> <u>1500 – 1577</u> <u>5600 – 5677</u>	<u>4100 – 4177</u> <u>6300 – 6377</u>	<u>3600 – 3677</u> <u>5400 – 5477</u>	<u>5100 – 5177</u>
<u>Tripoli</u>	<u>1300 – 1377</u>		<u>4000 – 4077</u>	

SSR Code Reserve list

<u>Domestic</u>	<u>Transit</u>
<u>0001 – 0077</u>	<u>2001 – 2077</u>
<u>0300 – 0377</u>	<u>5300 – 5377</u>
<u>6700 – 6777</u>	<u>5500 – 5577</u>
<u>7100 – 7177</u>	<u>6400 – 6477</u>
<u>7501 – 7577</u>	
<u>7601 – 7612</u>	
<u>7613 – 7677</u>	
<u>7701 – 7777</u>	

APPENDIX B - GENERAL PROCEDURES FOR SSR CODE ASSIGNMENT

B.1 Retention of previous code

- B.1.1 Every endeavour shall be made to retain the code already assigned to the aircraft. This assumes that the code is known at the time of coordination (either by voice coordination or by transmission of an Air Traffic Services (ATS) Interfacility Data Communications (AIDC) message, or an On- Line Data-Interchange (OLDI) or via the pilot) and input into the system if automated. If a code is not already being used by another aircraft flying in an unprotected area and if the code assigned to the aircraft is acceptable for the flight category², the code shall be retained.

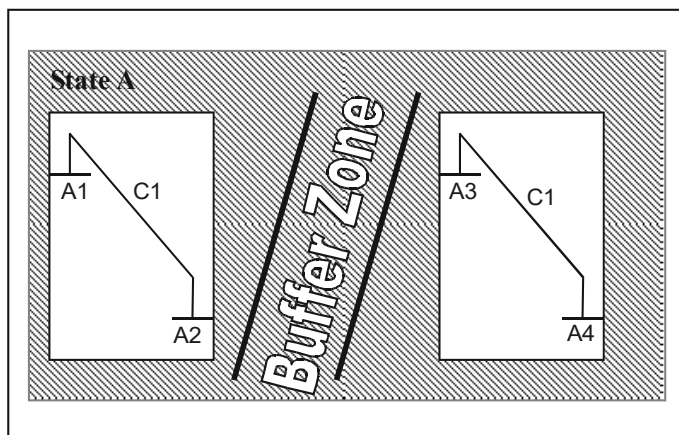
Note.— This should apply if the aircraft comes from an ATSU belonging to the same PA or a unit in another PA, but it may be retained in an area which has no conflicts with the other units in the area.

B.2 Code assignment or re-assignment

- B.2.1 The following rules will be applied to departing aircraft within the area of the control unit, or to aircraft whose previously assigned code failed to comply with the rules stated in B.1.1 above and consequently could not be retained:

- B.2.2 Where an aircraft remains inside a defined area of the AOR

Directional assignment of a domestic code - Code C1 can be assigned simultaneously to aircraft A1A2 and A3A4. C1 is protected for zone 1 and zone 2:

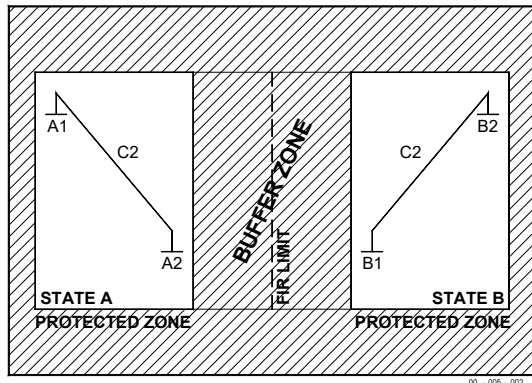


Note.— Domestic code allocation may be protected by buffer zones of at least 60 NM or separated by another unit. This rule is applicable within States, and also by arrangement between adjacent States. In order to make economic use of this type of allocation the same codes should preferably be disseminated (at most every 120 NM) in different small areas instead of having recourse to allocating codes belonging to an excessive number of different series.

² Flight category refers to transit, domestic or common pool codes.

B.2.3 Where an aircraft remains inside a State

Code C2 can be assigned simultaneously to aircraft A1A2 and B1B2 from different States A and B. C2 is protected for State A and State B:

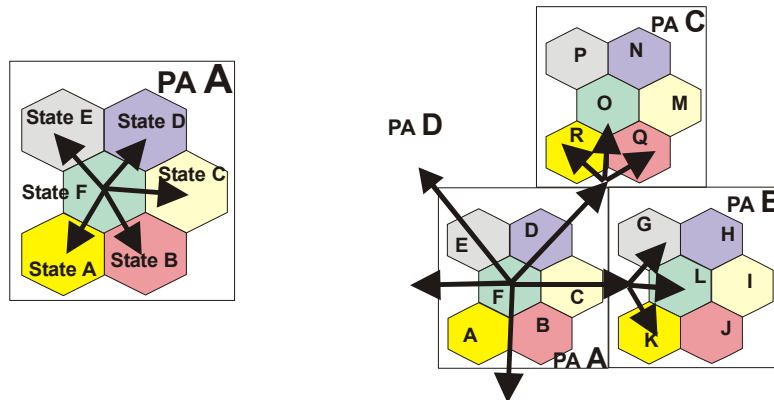


Note.— Domestic code allocation must be protected by buffer zones. Even more than in the case of B.2.2 above; consultation between adjacent States will be necessary to ensure such protection and rationalize excessive domestic code utilization as far as possible.

B.2.4 For an aircraft leaving a State

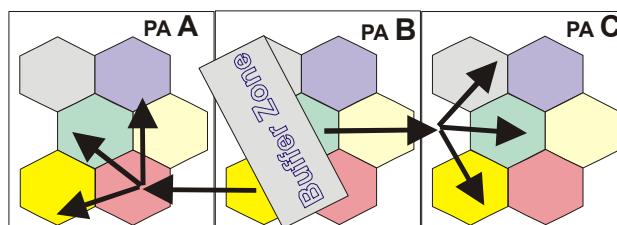
Transit codes are allocated by the Middle East SSR Code Management Plan to the various States for assignment to this flight category. Transit codes should be retained for the remainder of the flight in all States in the same PA and, if possible, other successive PAs, as agreed and reflected in Part B of the CAL. Transit codes received from a previous unit are maintained provided that they satisfy the assignment criteria.

B.2.4.1 *Omni-directional assignment of a transit code*



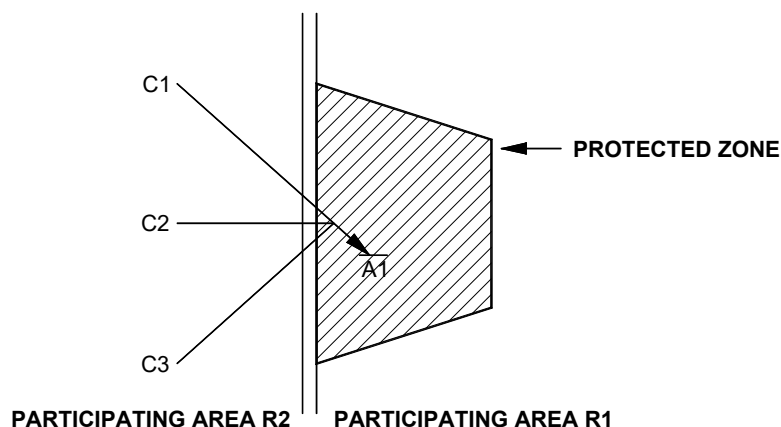
B.2.4.2 Directional assignment of a transit code

Allocated by the Middle East SSR Code Management Plan to the various States for assignment to aircraft under specific conditions: to specific destinations in the same PA or in different PAs; to specific directions of aircraft and/or via specific areas. Special attention shall be given in ensuring that when applying directional assignment of a transit code, no code conflict could occur.



B.2.4.3 Close to PA border, retention of transit codes of other PA

Codes C1, C2 and C3, which belong to R2 transit series are retained until landing at an airport A1 near the border between the two PAs, which is located in a protection area for the codes in question.



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B.3 Code occupancy times

B.3.1 In order to ensure uniqueness of the code in the systems concerned by an aircraft, the ICAO MID Regional Office based its calculations on a “protection period” of approximately two hours, when establishing the number and series of transit codes (please see paragraph [4.3.44.3.4](#)). At the same time, the protection period should be reduced when possible, while providing adequate protection (please see paragraph [4.3.34.3.3 b\)b](#)). Certain suggestions along these lines will be found below.

B.3.2 Point of time for code assignment to aircraft

In order to economize codes as much as possible, it is recommended that codes be assigned to flights which will be performed in the very near future (when ready for departure, or in flight, about to come under control).

Note.— The ideal moment is the flight activation point in the case of automated systems.

B.3.3 Assignment procedures

Codes are normally assigned according to the earliest time of release (a VSP). However, in units assigning codes manually such sophistication may be cumbersome. When sophisticated systems are not available, cyclical assignment of the codes released should be preferred instead of a systematic return to the beginning of the category.

B.3.4 Release of a code by an aircraft

When a system records an aircraft landing or passing a distant MID PA exit point, the code assigned to the aircraft may be regarded as released and be re-used. In the case of distant MID PA exit point, an additional VSP waiting time, normally thirty minutes, shall be added before re-use. In the event that a code has been assigned to flight that has been cancelled or which will not take place, the code assigned should be released for immediate re-use.

B.3.5 Saturation

When the traffic load is such that no code is available for a given flight category it may be necessary to assign codes in accordance with relaxed rules:

- a) reduced protection times –
(see B.3.4);
- b) using a different code category –
using an omni-directional assignment if no more codes for directional assignment

APPENDIX C - IMPLICATIONS FOR AUTOMATION

C.1 As stated in Appendix B, B.1.1, retention of the code assigned by the previous unit requires foreknowledge, implying capture of the data by the system in the event of automated assignment (direct capture by an AIDC or OLDI message, or indirect by manual input on coordination).

C.2 Assignment according to flight category implies that the system is capable of analysing the origin and destination of flights. If not, capture of units transferring and accepting, where applicable, may be used. For some cases one may need to process all four data items.

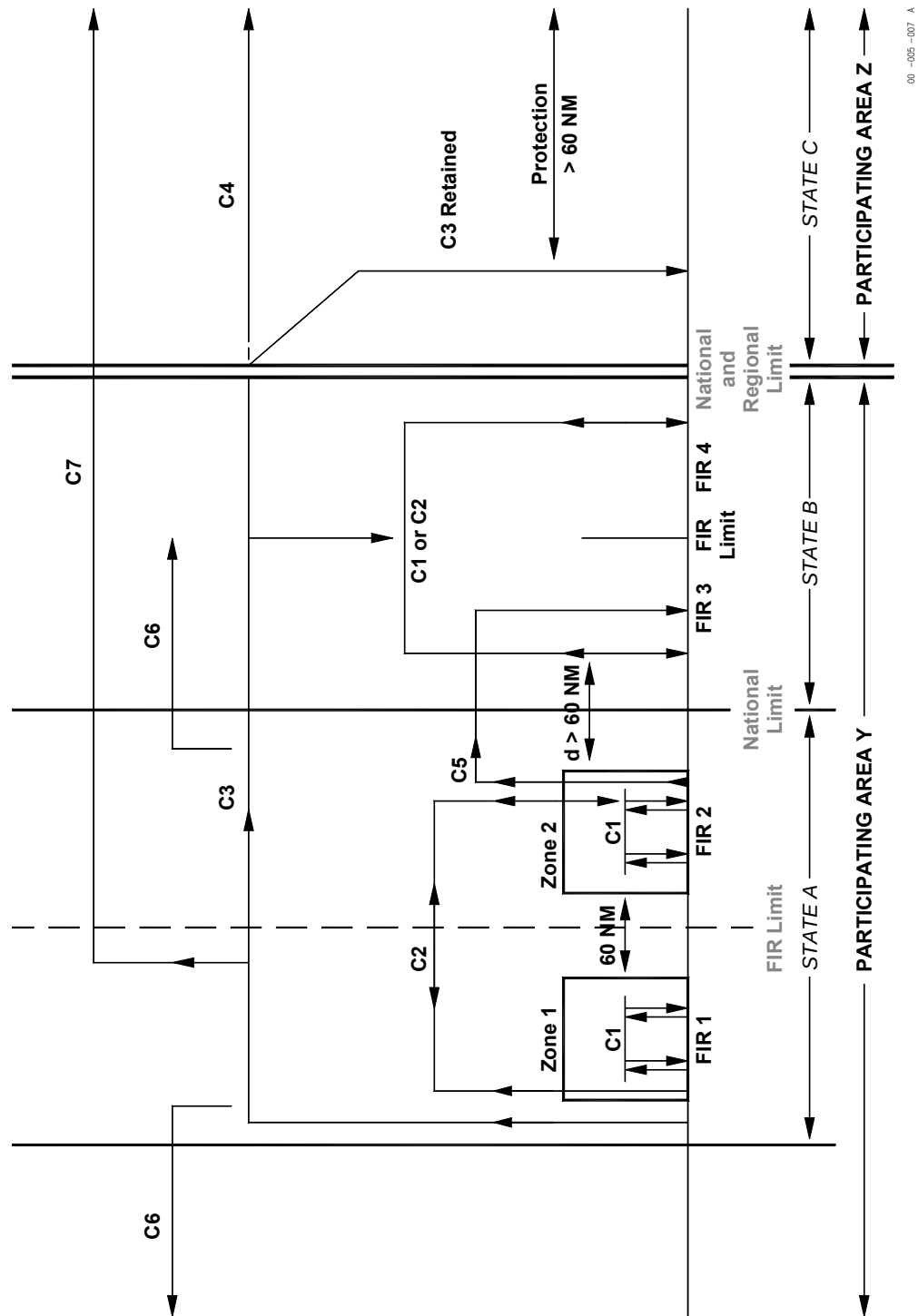
C.3 As in the case of any problem involving the “queuing management”, it is abundantly clear in the light of the previous remarks that the more centralized the allocation-assignment system, the more economical it will be. In other words, the less call there will be for allotment type solutions (provision of sub-banks to decentralized units), and the greater the use made of central assignment in accordance with overall criteria the more economical the system will be.

C.4 Likewise it has been seen that proper management of the assignment system presupposes knowledge of the actual traffic situation (entry into the system, route, exit from the system-landing etc.). Consequently, it is desirable that the assignment machinery should be linked with the real-time system.

C.5 A number of examples given in Appendix B show that despite the uniqueness by zone criterion, two codes may be found to be in use simultaneously in the same system (radar range is greater than the 60 NM buffer zone). Accordingly, the correlation systems should at least be capable of accommodating and unambiguously identifying two aircraft responding on the same code separated at the time of correlation by a designated geographical distance which will be a function of the automated system.

Note.— A geographical correlation filter should exist such that correlation will not be achieved if the calculated distance between the flight plan derived position based on estimate information and the SSR response corresponding to the SSR code in the flight plan is more than 30 NM.

C.6 Illustrative diagram for general code allocation and assignment



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The following notes relate to the diagram:

Code C1: Domestic code for PA Y (Domestic in STATE A Domestic in STATE B)

These codes can be used inside zone 1, inside zone 2, inside other zones of STATE B, and even inside the whole territory of STATE B if a buffer zone of 60 NM or a FIR separates them.

These codes could be used in PA Z under the same condition of protection against the allocation in STATE B.

Code C2: Domestic code for PA Y (Domestic in STATE A and STATE B)

Condition: a 60 NM buffer zone should be provided between these two assignments.

Code C3: Transit code for PA Y (STATE A)

In general such a code should be assigned to any aircraft originated in STATE A and leaving its boundaries, for overflying STATE B or landing in B.

In general this code may be changed at the entry in PA Z, but it could be retained for an arrival at an aerodrome close to the border and having a protection area of at least 60 NM against any other use in PA Z.

If C3 is planned for transit use from PA Y to PA Z it could be retained inside the whole PA Z.

Code C4: Transit code for PA Z (STATE C)

Such a code will be assigned to any flight whose code cannot be retained and overflying STATE C for a further destination in PA Z.

Code C5: Directional transit code between STATE A FIR2 and STATE B FIR3

C5 should be simultaneously protected in the two FIRs though domestic for PA Y. Such an allocation has the advantage of avoiding assignment of a transit code for such short middle-range flights.

Code C6: Transit code for PA Y

The example given with C6 is a duplication where the directional assignment by STATE A gives a guarantee of no conflicts occurring with the following units.

Code C7: Transit code for use for PA Y (STATE A) and PA Z

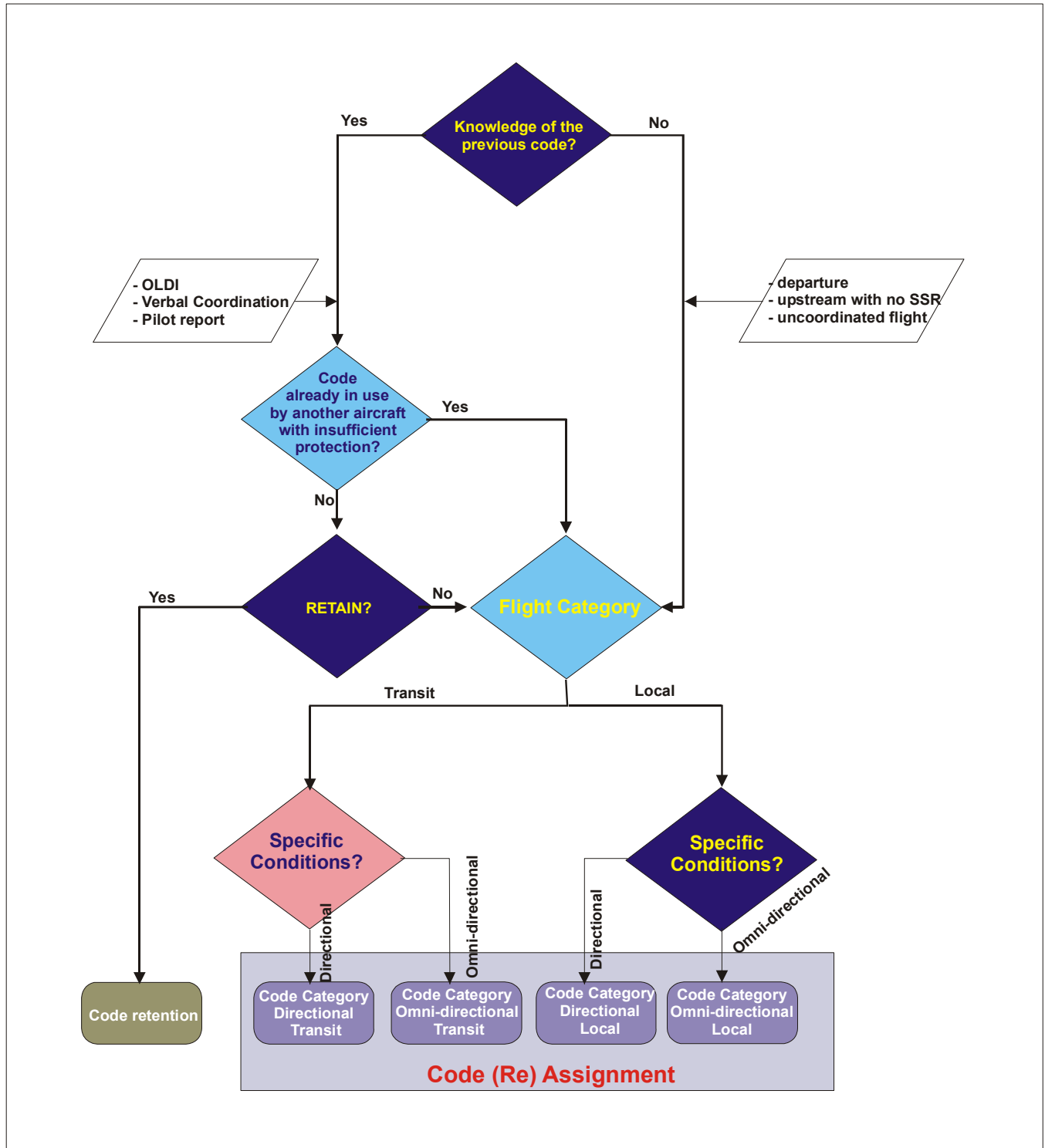
C7 which is at least transit in PA Y and having no domestic use in PA Z will be retained in the two areas.

Management of the code baskets for STATE A:

General:	Domestic basket				: C1, C2
	Transit basket				: C3, C6
Special:	Domestic State A	FIR 2	—	State B FIR 3	: C5
	Transit State A		—	PA Z	: C7
	Directional assignment	FIR 2	—	State B	
		FIR 1	—	Other State of PA Y	: C6

C.7 Flow Chart

The following chart outlines the retention/assignment procedures described above:



APPENDIX D - DEVELOPMENT OF AUTOMATED SSR CODE ASSIGNMENT SYSTEMS

D.1 As computer capabilities could be a limiting factor in code assignment and thus reflect on the code allocation, the following principles for the development of automated SSR code assignment systems should be observed:

- a) automated systems shall be capable of using code blocks (part of a code series) without getting confused if, in a neighbouring system, other blocks of the same code series (with the same first and second digits) are used;
- b) automated equipment shall be capable of coping with a limited number of code conflicts rather than preventing code duplications by means of more complicated and less economical code allocation and assignment methods;

Note.— It is expected that this feature will become even more important as traffic increases.

- c) automated systems shall be capable of assigning codes with reference to the category of a flight, i.e. transit codes shall be assigned to an aircraft engaged in transit flights and domestic codes to an aircraft confined within the smaller area of use reserved for such codes;
- d) automated systems shall permit the addition of a sophisticated capability of assigning codes with reference to the routing or special code protection required for specific aircraft, especially when this will permit economies in the number of codes required;
- e) the code assignment logic of an automated system shall not impose any restriction on the free choice of any specific additional codes if this is required to satisfy new requirements;
- f) automated code assignment systems shall be designed to conform to international cooperative principles and essential capabilities described in this Document.

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

Outcome of ATFM TF & World Cup 2022 TF
(Presented by the Secretariat)

SUMMARY This paper presents the Outcome of the ATFM TF/1 and World Cup 2022 TF/1 meetings for the meeting review and appropriate action. Action by the meeting is at paragraph 3.
REFERENCES - ATFM TF/1 SoD - World Cup 2022 TF/1/SoD

1. INTRODUCTION

1.1 The meeting may wish to recall that ATFM was endorsed as one of the high priority regional air navigation projects to be implemented under the framework of the MID Region ATM Enhancement Programme (MAEP).

2. DISCUSSION

First Meeting of the Air Traffic Flow Management Task Force (ATFM TF/1)

2.1 The ATFM TF was established by MIDANPIRG/16 (Kuwait, 13 – 16 February 2017) through MIDANPIRG Decision 16/16 below, based on the recommendation of the ATFM Seminar (Dubai, UAE, from 13 to 15 December 2016):

DECISIONS 16/16: ATFM TASK FORCE

That,

- a) an ATFM Task Force be established to develop an ATFM Concept of Operations for the MID Region;*
- b) the ATM SG/3 meeting develop the terms of reference of the ATFM Task Force; and*
- c) States support the ATFM Task Force through:*
 - i. assignment of ATFM Focal Point to contribute to the work of the Task Force; and*
 - ii. provision of required data in timely manner, and in particular to the survey that*

will be carried out related to the airspace and sectors capacity, hot-spots, ATFM measures/system, etc.

2.2 The MIDANPIRG ATFM TF/1 meeting was held in Muscat, Oman, from 23- to 25 September 2018. The Meeting was attended by a total of forty-one (41) participants from ten (10) States (Bahrain, Egypt, India, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, UAE and USA) and six (6) International Organizations/Industries (AEROTHAI, CANSO, EUROCONTROL, IATA, MAAR and MIDRMA). ACAO joined the meeting the last day and contributed to the meeting through correspondences.

2.3 The ATFM TF/1 meeting noted that the main task of the Task Force is the development of a CONOPS for the implementation of ATFM in the MID Region taking into consideration other experiences as well as the initiative carried out by ACAO.

2.4 The Summary of Discussions of the ATFM TF/1 meeting is at **Appendix A** and the meeting material are available on the ICAO MID Office website: <https://www.icao.int/MID/Pages/2018/ATFM%201-W2022.aspx>

2.5 The ATFM TF/1 meeting was supported by ATFM experts from India, FAA, AEROTHAI, CANSO and EUROCONTROL, who shared their experience and provided their views related to the implementation of ATFM in the MID Region. Qatar and UAE presented proposals related to ATFM implementation.

2.6 Taking into consideration the challenges, the work and resources required, and other experiences, the ATFM TF/1 meeting agreed that at this stage it would not be possible to develop an ATFM CONOPS without the assessment of the MID Region ATFM Capabilities. Accordingly, the meeting agreed to a roadmap for the development of the CONOPS.

2.7 The meeting agreed to a draft Questionnaire based on the one used in ASIA Pacific and the Americas, which was further improved and circulated by MID Office to States for inputs by 30 November 2018. The Questionnaire would be considered the basis for the actions that will be undertaken by the ATFM TF.

2.8 The ATFM TF/1 meeting established the ATFM Core Team composed of experts from; Bahrain, India, Oman, Qatar, Saudi Arabia, UAE, USA, AEROTHAI, ACAO, CANSO, EUROCONTROL, IATA and ICAO.

2.9 The Core Team will follow-up on the agreed actions by the ATFM TF, would conduct Teleconferences with some States based on the responses to the Questionnaire and develop a Draft CONOPS for ATFM. The first meeting of the Core Team will be hosted by UAE in Abu Dhabi, 22-24 January 2019.

2.10 The ATFM TF/1 meeting reviewed and update the Terms of Reference of the ATFM TF developed by the ATM SG/3 meeting as at **Appendix B**, which are presented for the meeting review and endorsement

First Meeting of the World Cup 2022 Task Force (W2022 TF/1)

2.11 The meeting may wish to recall that the subject was addressed by MIDANPIRG/16 (Kuwait, 13-16 February 2017). The meeting noted that Qatar will be hosting the World Cup tournament in 2022, which will have an impact on the airspace capacity in the MID Region. The meeting emphasized that the World Cup 2022 event will require the implementation of ATFM measures which will be based on a collaborative decision making that allows all members of the ATM Community to participate in the decision making process, in particular the adjacent States.

2.12 The MIDANPIRG/16 meeting recognized the need for a collaborative action plan to accommodate the expected significant increase in air traffic, in a safe and efficient manner, with the participation of all concerned States and stakeholders, taking into consideration similar experiences, such as Brazil and South Africa World Cups, Athena Olympic Games, Hajj, etc.

2.13 The MIDANPIRG/16 meeting noted also that other major events are planned to be held in the Region, such as, the EXPO 2020 in UAE.

2.14 Based on the above, the MIDANPIRG/16 meeting agreed to the following Decision:

DECISIONS 16/18: WORLD CUP 2022 TASK FORCE

That,

- a) a World Cup 2022 Task Force be established to develop and follow-up the implementation of a collaborative action plan to accommodate the expected high increase in traffic, in a safe and efficient manner, taking into consideration similar experiences;*
- b) the Task Force address other major events such as the EXPO 2020; and*
- c) the ATM SG develop the terms of reference of the Task Force*

2.15 The ATM SG/3 meeting through Draft Decision 3/7 established an Action Group composed of the ATM SG Chairpersons, Qatar (Champion), UAE, AACO, IATA and ICAO to develop the Terms of Reference (ToR) of the World Cup 2022 Task Force before 15 September 2017. The World Cup 2022 Task Force ToR were endorsed by the ATM SG/4 meeting (Amman, Jordan, 29 April – 2 May 2018) through ATM SG Draft Decision 4/6.

2.16 The W2022 TF/1 meeting was held in Muscat, Oman, on 26 September 2018, back-to-back with the ATFM TF/1 meeting. The Summary of Discussions of the W2022 TF/1 meeting is at **Appendix C**.

2.17 The W2022 TF/1 meeting was apprised of other similar experiences that took place in Europe, South Africa and USA. Qatar presented an update on the level of preparation highlighting some of the challenges that require the implementation of regional solution to enable the MID Region to accommodate safely and efficiently the increase of traffic during the World Cup 2022.

2.18 The W2022 TF/1 meeting recognized the need to establish regional collaborative mechanism to address the issues associated with expected increase of traffic during the World Cup 2022 and other major events, which would have major impact on the traffic within and outside the MID Region.

2.19 The W2022 TF/1 meeting agreed to following actions to be undertaken till the W2022 TF/2 meeting:

- a) Qatar to carry out a study and collect necessary information related to World Cup 2022 to be presented to the next meeting.
- b) Preparation of an overview/outline of the foreseen collaborative mechanism/common platform to support meeting the challenges for the Expo 2020 and World Cup 2022 events in coordination with ATFM TF, as required.

2.20 The meeting agreed that effective coordination should be carried out between the W2022 TF and ATFM TF. Accordingly, the meeting reviewed and updated the terms of reference of the W2022 TF as at **Appendix D**, which are presented for the meeting review and endorsement.

2.21 The meeting may wish to note that Qatar offered to host the ATFM TF/2 back-to-back with the World Cup 2022 TF/2 meetings in Doha from 24 to 27 February 2018.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and endorse the ToRs of the ATFM TF and W2022 TF at **Appendices B** and **D**, respectively;
- b) urge States, if not yet done so, to complete the Questionnaire and return back to ICAO MID Office not later than 15 December 2018;
- c) encourage States to support the work carried out by the ATFM TF and W2022 TF and actively participate in the ATFM TF/2 and W2022 TF/2 meetings.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST OFFICE

FIRST MEETING OF THE MIDANPIRG AIR TRAFFIC FLOW MANAGEMENT TASK FORCE

(ATFM TF/1)

(Muscat, Oman, 23 – 25 September 2018)

SUMMARY OF DISCUSSIONS

1. PLACE AND DURATION

1.1 The First Meeting of the Air Traffic Flow Management Task Force (ATFM TF/1) was successfully held in Muscat, Oman, 23 - 25 September 2018. The meeting was gratefully hosted by the Public Authority for Civil Aviation (PACA), Oman.

2. OPENING

1.2 The Meeting was attended by a total of forty one (41) participants from ten (10) States (Bahrain, Egypt, India, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, UAE and USA) and six (6) International Organizations/Industries (AEROTHAI, CANSO, EUROCONTROL, IATA, MAAR and MIDRMA). The list of participants is at **Attachment A**.

1.3 The meeting was opened by Mr. Anwar Al Raissi, Director General Civil Aviation Regulation, PACA, Oman, who extended a warm welcome to all participants to the ATFM TF/1 meeting and wished them a successful meeting and a pleasant stay in Muscat. Mr. Al Raissi thanked ICAO for organizing this meeting in Oman and re-stated Oman's commitment to support the ICAO MID Regional Office activities.

1.4 In his opening remarks, Mr. Elie El Khoury, Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR), ICAO Middle East Office, Cairo, welcomed the participants to Muscat. On behalf of the ICAO Middle East Office, Mr. El Khoury expressed ICAO's gratitude and appreciation to H.E. Dr. Mohammed Ben Nasser Ben Ali Al Za'abi, Chief Executive Officer of Public Authority for Civil Aviation (PACA) – Oman for hosting the ATFM TF/1 and World Cup 2022 TF/1 meetings in Oman. He extended special thanks to all the team who participated in the preparation and facilitation of this meeting for their good cooperation and for the excellent hospitality extended to the ICAO staff and all participants. Mr. El Khoury highlighted that Oman continuous support to the ICAO MID Office activities is an evidence of its active role and reflects Oman's commitment to enhance the overall safety and efficiency of air navigation in the Region, and to ensure the success of the regional projects/initiatives.

1.5 Mr. El Khoury highlighted that this meeting provides an opportunity to share experience and agree on the way forward with the implementation of a collaborative ATFM in the Region, which could not be achieved without collaboration, support and contribution from all stakeholders.

1.6 Mr. El Khoury extended ICAO appreciation to India, Thailand (AEROTHAI), USA, ACAO, CANSO, EUROCONTROL, IATA for being part of the ATFM Task Force and for accepting the invitation to actively participate in the meetings and share their experiences and views, which would support the achievement of the ATFM and World Cup 2022 Task Forces' objectives.

1.7 In closing, Mr. Elie thanked the participants for their presence and wished the meeting every success in its deliberations.

3. OFFICERS AND SECRETARIAT

1.8 Mr. Elie El Khoury, Regional Officer, Air Traffic Management/Search and Rescue (RO/ATM/SAR) was the Secretary of the meeting.

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

1.9 Mr. Hamad Rashid Al Belushi, Director Air Traffic Management, General Civil Aviation Authority, UAE, was unanimously elected as Chairman of the ATFM Task Force.

1.10 The meeting adopted the following Agenda:

- Agenda Item 1: Adoption of the Provisional Agenda and Election of Chairperson
- Agenda Item 2: Global and Regional Developments related to ATFM
- Agenda Item 3: Regional ATFM Framework
- Agenda Item 4: Plan of Actions
- Agenda Item 5: Future Work Programme
- Agenda Item 6: Any other Business

1.11 The documentation, working papers and Presentations delivered during the Meeting are available at the ICAO MID Regional Website: <https://www.icao.int/MID/Pages/2018/ATFM%201-W2022.aspx>.

AGENDA ITEM 2: GLOBAL AND REGIONAL DEVELOPMENTS RELATED TO ATFM

1.12 The subject was addressed in PPT/1 presented by ICAO, which provided an overview of the main objectives of the ATFM Task Force. The ATFM TF was established by MIDANPIRG/16 through Decisions 16/16 to develop a Concept of Operations (CONOPS) for the implementation of collaborative ATFM in the MID Region taking into consideration the existing initiatives and experiences from other regions. The ATFM Task Force would be the main collaborative platform to drive the implementation of ATFM in the MID Region.

1.13 The meeting was briefly apprised of the Third Edition -2018 of the ICAO Doc 9971 - *Manual on Collaborative Air Traffic Flow Management (ATFM)*, which would be use as the main guidance for the implementation of CDM/ATFM. The new Edition of the document is divided into three parts:

- Part I Collaborative Decision-Making (CDM)
- Part II ATFM
- Part III Airport Collaborative Decision-Making (A-CDM).

AGENDA ITEM 3: REGIONAL ATFM FRAMEWORK

C-ATFM - India

1.14 India provided an overview of the implementation of the Central Air Traffic Flow Management (C-ATFM), highlighting the objectives, the challenges and the lessons learned. It was noted that at the C-ATFM is being implemented into three (3) Phases:

Phase I (2015-2017):

- Airport (Ground Delay Program)
- Airport Arrival Constraints e.g. weather, runway outage
- Addressing constraints of Six Major Airports

Phase II (2017-2019):

- Ground Delay Program and Airspace Flow programs supporting Airspace Congestion & DCB at most airports across Country
- Interconnectivity among ATFM –ACDM systems
- Availability of WEB Services for all stakeholders

Phase III (2019-onwards):

- Ability to exchange information with adjacent ATFM Systems-communication Protocol
- Participation in Cross Border ATFM

1.15 The meeting noted that the Phase I and Phase II of the C-ATFM India applies to domestic traffic and starting from 2019, India would be ready to extend the system for cross border ATFM. It was noted with appreciation that India is willingness to support the MID Region with the implementation of ATFM to ensure inter-regional harmonization and optimization of the traffic flows at the interface between ICAO Asia Pacific (APAC) and MID Regions.

Distributed Multi-Nodal ATFM Project -AEROTHAI

1.16 The meeting was apprised of the implementation of the Distributed Multi-Nodal ATFM Project in APAC Region that has been operational since 2015. The membership to the projects is Tiered Participation:

- Level 3 ATFM Nodes (Generate, Distribute, Comply to CTOT):
China, Hong Kong-China, Singapore, Thailand, Cambodia
- Level 2 ATFM Nodes (Receive and Comply to CTOT Indonesia):
Malaysia, Myanmar, Philippines
- Level 1 ATFM Nodes (Observers; soon to upgrade):
Lao PDR, Viet Nam

1.17 The project is being implemented into three phases as follows:

Phase I (2015-2016): *Airport ATFM Programs*

Distributed GDP for Constrained/Congested Arrival Airports

Phase II (2016-20xx): *Airspace ATFM Programs*

Distributed GDP (+other measures) for Constrained/Congested Airspace Volume

Phase X:

Globally-interconnected ATFM network, enabled by SWIM infrastructure

CADENA-FAA

1.18 FAA presented the Caribbean experiences with the implementation of the CANSO ATFM Data Exchange Network for the Americas (CADENA) initiative and noted that FAA and CANSO are supporting the global implementation of ATFM/CDM and have been expanding the work being conducted by ICAO NACC and SAM Regions.

1.19 The meeting noted that CADENA initiative offers a regional, cross-border ATM communications protocol and a seamless operational atmosphere that incorporates operational procedures and practices. Implementing regional, networked ATFM requires the establishment of CDM practices among Members and regional and international stakeholders. These practices shall be inclusive and transparent and provide the opportunity for exchanging operational information to facilitate a shared situational awareness and promote sound strategic and tactical planning in a CDM environment of multilateral decision-making.

Network Manager - EUROCONTROL

1.20 The meeting was provided with a general overview of EUROCONTROL and the Network Manager (NM) activities. The NM main role is as follows:

- optimize European ATM Network's operations with ANSPs and airports;
- ensure that European ATM meets the performance targets set by European Community for Single European Sky.
- provide a consolidated and coordinated approach to all planning and operational activities of the Network
- enable and deliver added operational performance (capacity, delay reduction, environment, flight efficiency, minimum emissions, ops safety, cost-effectiveness)

What is needed for ATFM - CANSO

1.21 CANSO underlined what is needed for ATFM highlighting the key points to consider when planning for ATFM implementation. CANSO shared their experience and the support provided for the implementation of ATFM in AFI, APAC, NACC and SAM Regions. CANSO shared the questionnaire that was used in APAC and for CADENA for determining the State's capabilities related to ATFM.

1.22 The meeting reviewed and updated the questionnaire as at **Appendix A**. The main purpose of the survey is to solicit information and develop a regional baseline view of current ATFM initiatives within the MID Region. Additionally, the questionnaire will gather information on future ATFM planning activity and interoperability between ANSP's.

1.23 The meeting commended India, FAA and the Organizations for their willingness to support the MID Region with the implementation of a regional collaborative ATFM in the MID Region.

SWIM Gateway-UAE

1.24 The meeting noted that UAE ATM Community is collaboratively building a nationwide system architecture following the principles of System Wide Information Management (SWIM). As one of the first SWIM enabled services, the UAE SWIM Gateway will provide a major step towards a nationwide SWIM architecture. The UAE SWIM Gateway harmonises and consolidates in real-time flight related information originating from existing legacy systems and those of new SWIM enabled capabilities. The SWIM Gateway is prepared to become a core building block for ATFM services providing centralized flight plan validation and distribution service as well as a data exchange for all flight related information.

1.25 The meeting congratulated UAE for the start of operation of the SWIM Gateway on 25 September 2018.

1.26 Proposals for the way forward were presented by Qatar and UAE through WP/3 and WP/4, respectively.

1.27 Qatar proposed the implementation of ATFM in the Region on a phased approach basis. Starting with Multi-Nodal Concept that would be evolved to the establishment of a system-wide, centralized regional ATFM at later stage after the maturity of the multi-nodal ATFM concept.

1.28 UAE highlighted the importance of specified and aligned pre-requisites as basis for the implementation of a regional ATFM service. Such specified pre-requisites and a phased approach for the implementation of a regional Collaborative ATFM service are crucial for a successful implementation. UAE proposed the establishment of teams to support the implementation of each phase as follows:

Pre-requisites:

Pre-requisite 1: Common performance objectives for a regional ATFM service needs to be defined

Pre-requisite 2: A large percentage of traffic causing unbalanced demand and capacity is subject to the service

Pre-requisite 3: Uniformity of traffic flow characteristics of the managed flights

Phases

Phase 1: (Assessment and Evaluation Team) Perform a joint assessment and confirmation of the Pre-requisites for a regional ATFM

Phase 2: (Design and Implementation Team) Develop a Concept of Operations for a regional ATFM service

Phase 3: (Research and Technology Team) Design a Collaborative ATFM solution that facilitates the Concept of Operations of the regional ATFM service

Phase 4: (Research and Technology Team) Implementation and rollout of the ATFM system based on the consideration of the Concept of Operations.

Phase 5: (All Teams) Operational Phase that include constant performance assessments of the ATFM service together with continuous improvement planning

AGENDA ITEM 4: PLAN OF ACTIONS

1.29 Based on the discussions and the experience from other regions, the meeting agreed that it would not be feasible to define and develop a CONOPS for the implementation of ATFM during the meeting without assessment of the current ATM and ATFM States' capabilities. Accordingly, the meeting agreed to a set of actions to be undertaken till the ATFM TF/2 meeting, which are outlined in the Roadmap at **Appendix B**. With a view to facilitate the coordination and follow-up the implementation of the agreed actions, the meeting established the ATFM Core Team composed of volunteer experts from Bahrain, India, Oman, Qatar, Saudi Arabia, UAE (ATFM TF Chairman), USA, ACAO, AEROTHAI, CANSO, IATA and ICAO. The Core Team ToRs are at **Appendix C**.

1.30 The ATFM Core Team would be supported by experts from States and Organizations as required in performing its tasks.

AGENDA ITEM 5: FUTURE WORK PROGRAM

1.31 The meeting reviewed and proposed an update to the ATFM TF Terms of Reference as at **Appendix D** and agreed that the next ATFM TF/2 meeting be held from 24 to 26 February 2019. The venue will be the ICAO MID Regional Office in Cairo, unless a State is willing to host the meeting.

1.32 Qatar offered to host the ATFM TF/2, which would be held back-to-back with the World Cup 2022 TF/2 meetings in Doha on the agreed dates.

1.33 UAE offered to host a face-to-face meeting at Sheikh Zayed Centre in Abu Dhabi from 22 to 24 January 2019 for the ATFM Core Team.

AGENDA ITEM 6: ANY OTHER BUSINESS

1.34 Nothing has been discussed under this Agenda Item.

4. CLOSING

1.35 In closing, Mr. Elie El Khoury thanked the participants for their presence and excellent cooperation and contribution to the meeting.

1.36 The participants thanked ICAO for organizing such a fruitful Meeting as well as PACA – Oman for hosting, and commended the regional efforts exerted to make the CDM/ATFM regional project a success.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST OFFICE

AIR TRAFFIC FLOW MANAGEMENT (ATFM)

Questionnaire

The purpose of this questionnaire is to carry out a survey to solicit information and develop a regional baseline view of current Air Traffic Flow Management (ATFM) initiatives within the MID Region as well for the collection of information on future ATFM planning activity and interoperability between States.

ICAO Doc 9971, Manual on Collaborative Air Traffic Flow Management has been used to assist in formulating the questionnaire questions.

The questionnaire consists of the following topic areas:

- Air Traffic Flow Management (ATFM) Structure and Organization
- ATFM - Capacity, Demand, Balance
- Interoperability

Please include with the survey response any pertinent documentation and/or information which may assist in the understanding and development of baseline and planned initiatives. Pertinent documents may include:

- Letters of Agreement
- Airport Arrival Rate (AAR), Airport Departure Rate (ADR) charts
- Website(s)
- Etc.

Please mark an "X" to the corresponding answer. Please include comments, if you deem pertinent.

Send copies of completed questionnaire response and electronic documents to:

icaomid@icao.int and ekhoury@icao.int

In case clarification or support is required please contact Mr. Elie El Khoury Regional Officer ATM and SAR, ICAO Middle East Office (ekhoury@icao.int).

<u>State:</u>	<u>Point of Contact details</u>
<u>Date:</u>	Name: Email: Telephone/mobile:

Air Traffic Flow Management (ATFM) Structure and Organization

1. Does your State have a regulatory requirement for ATFM to be implemented in your Flight Information Region (FIR)?

Yes	No	Comments:

2. Does your State have an operational requirement (e.g. demand exceeding capacity) for ATFM in your FIR?

Yes	No	Comments:

3. Does your State have future plans or initiatives for ATFM in your FIR?

If yes, please include a copy of the Concept of Operations (CONOPS) or other documentation with the survey response.

Yes	No	Comments:

4. Does your State have an organizational structure including the following facilities and/or working positions? If future organizational structure is planned, please include date.

Current	Yes	No	Planned date	Comments
ATFM Services				
ATFM Operational Manager				
ATFM positions located in the following				
National ATFM center				

Area control center(s)				
Approach control(s)				
Control tower(s)				

5. If there is existing ATFM functions performed, are there dedicated resources for these ATFM functions/positions or are these functions provided by another operational position? If provided by another operational position, please identify in the comments section.

Dedicated resource	Another Operational Position	Comments

6. Does your State have Letters of Agreement (LOA) that include ATFM with any of the following stakeholders? If so, please provide a copy or relevant excerpt of the LOA(s) with the survey response:

Stakeholder	Yes	No	If yes, please list	LOA planned date
1. FIR(s)				
2. Stakeholders				
- Airport Operators				
- Aircraft Operators				
- Military				
- General Aviation				
- ATFM Units				
- National ATFM center				
- Area control center				
- Approach control				
- Control tower				

Comments

“Collaborative decision-making (CDM) is defined as a process focused on how to decide on a course of action articulated between two or more community members. Through this process, ATM community members share information related to that decision and agree on and apply the decision-making approach and principles. The overall objective of the process is to improve the performance of the ATM system as a whole while balancing the needs of individual ATM community members.”

7. Does your State have existing CDM procedures (planned or Ad-Hoc Teleconferences,) and/or tools with the following stakeholders? If future CDM procedures and/or tools are planned, please add the date.

Stakeholders	Yes	No	If yes, please list	LOA planned date
Airport Operators				
Aircraft Operators				
Military				
General Aviation				
Area control center				
Approach control				
Control tower				
Other ANSP ATFM Units				
Other ANSP ATC Units				

Comments

8. Does your State’s ATFM unit(s) perform the following tasks? If future implementation planned, please add the date.

Current	Yes	No	Planned date	Remarks
1. Create and distribute an ATFM daily plan				

2. Collect the following relevant information				
- meteorological conditions				
- capacity constraints				
- equipment outages				
- runway closures				
- procedural issues				
3. Analyze and distribute relevant information				
4.Coordination procedures with stakeholders (indicate method(e.g., voice meetings, email) and frequency) in the comments section				
5. Structured information dissemination process, i.e. website				

Comments

Note: Please include sample ATFM daily plan and/or other documentation examples with survey response.

9. Are the following CDM elements included as part of your stakeholder's participation in the ATFM process?

Current	Yes	No	If yes, please list
1.Provide updated flight plan intent information (e.g., plans, changes, delays) provided by:			
- Aircraft Operators			
- Military			
- General Aviation			
2.Telephone conferences			
- Airport			

- Military			
- Aircraft Operators			
- General Aviation			
- ATFM Units			
- Other FIR ANSP's			
3.Web based interfaces			
- Airport			
- Military			
- Aircraft Operators			
- General Aviation			
- ATFM Units			
- Other FIR ANSP's			

Comments

10. Does your State provide standardized and recurrent ATFM training for the following personnel and stakeholders? If standardized training is planned, please add date.

Current	Yes	No	Planned date	Remarks
1.Personnel performing ATFM functions				
- National ATFM center				
- Area control center				
- Approach control				
- Control tower				
2.Stakeholders				
- Airports				
- Aircraft Operators				

A-7

- Military				
- General Aviation				

Comments

11. Does your State have an electronic ATFM system that displays airborne traffic? Is this system shared? If not, what is the planned date (if any) for sharing this system?

	Yes	No	Planned date	Remarks
Electronic ATFM display system				
Shared with:				
1. FIR(s)				
2. Stakeholders				
- Airport Operators				
- Aircraft Operators				
- Military				
- General Aviation				

Comments

ATFM - Capacity, Demand, Balance

12. Does your State declare ATC strategic capacity values for the following resources? If capacity value declarations are planned to be completed, please add date.

Current	Yes	No	Planned date	Remarks
1. Airspace sectors				
2. Waypoint(s) or boundaries				

3.Airport acceptance rate(s) (arrival and departure)				

Comments

13. How are the declared capacity values determined?

14. Does your State have strategic airport arrival/departure slots? If planned, please indicate the dates:

Airport	Arrival	Departure	Planned date	Remarks

Comments

15. Does your State have a methodology to balance demand and capacity in the following time frames?

Timeframe	Yes	No
Strategic (more than 1 day before operation)		
Pre-tactical (1 day before operation)		
Tactical (day of operation)		

Comments

16. Has your administration (and/or State) implemented procedures, review, and tools to identify available capacity, compare capacity to forecast demand and establish performance targets including. If initiatives are planned, please add date.

Current	Yes	No	Planned date
1.Airspace design review			

2.ATFM support tools			
3.Procedures review			
4.Staffing resources to workload / traffic review			
5.ATFM Training completed			
6.Forecast demand			

Comments

Interoperability

17. Does your State complete automated exchange of ATS messages (e.g. FPL, CHG, CNL, DEP, DLA, EST, ARR, CPL) with any or all adjacent Flight Information Regions (FIRs) or other non-adjacent FIRs?

FIR	Yes	No	If yes, please identify data exchanged.

Comments

18. Does your State have plans to complete automated exchange of ATS messages with any or all adjacent Flight Information Regions (FIRs) or other non-adjacent FIRs?

FIR	Yes	Date	If yes, please identify data exchanged.

Comments

19. Does your State exchange Airport Acceptance Rate (AAR) information for primary airports with other FIRs? If there are plans to exchange AAR information, please provide date.

FIR	Yes	No	Planned date	Remarks

Comments

20. Does your State share adjacent sector capacity information with other FIRs? If there are plans to exchange sector capacity information, please provide date.

FIR	Yes	No	Planned date	Remarks

Comments

21. Does your State have automated Pre-tactical (day prior to the operation) demand monitoring capability? If yes, is the information shared with other FIRs?

	Yes	No	If yes, please list FIRs
Airport Demand			
Sector Demand			
Route/Airway Demand			

Comments

22. Does your State have automated Tactical (day of the operation) demand monitoring capability? If yes, is the information shared with other FIRs?

	Yes	No	If yes, please list FIRs
Airport Demand			
Sector Demand			
Route/Airway Demand			
Arrival Management			

Comments

23. Does your State have Strategic, Pre-tactical and Tactical planning agreements with other FIRs?

Yes	No	If yes, please explain

24. Are there plans to initiate these agreements?

Yes	No	If yes, please explain

Note: Please include any additional documents with the survey.

25. Has your State identified airports, sectors of airspace or routes which are regularly requiring ATFM Measures to balance demand and capacity? If yes, list them:

26. Does your State initiated/implemented the following Air Traffic Management Measures (ATFM Measures) internally?

ATFM Measures	Yes	No	Remarks
Miles-in-trail (MIT)			
Minutes-in-trail (MINIT)			
Speed restrictions			
Airborne Holding			
Fix balancing			
Altitude/Flight Level capping			
Tactical alternative routing options			
Fix crossing times			
Airport slot			
Minimum departure intervals (MDIs)			
Published, pre-defined alternative routes			
Ground delay program (GDP) – airport arrival constraint			
Ground stop (GSt)			

Ground delay program (GDP) – airspace constraint (also known as airspace flow program: AFP)			

Comments

27. When determining an ATFM Measure, are the following factors considered?

	Yes	No
Demand exceeds capacity		
Weather		
Military exercises		
Resources		
Maintenance / outages		
VIP movements		

Comments

28. Does military airspace/activity cause the use of ATFM Measures? If yes, please explain.

29. Is the military airspace/activity included in strategic planning?

30. How is the effectiveness of the ATFM Measure analyzed?

31. What are the primary demand- capacity imbalance reasons for the ATFM Measures?

	Please list airport/sector/route/airway
Airport capacity	
Sector capacity	

Route/Airway capacity	
Other	

Comments

32. Does your State initiate the following ATFM Measures with adjacent FIRs?

TMIs	Yes	No	If yes, please list FIRs.
Miles-in-trail (MIT)			
Minutes-in-trail (MINIT)			
Speed restrictions			
Airborne Holding			
Fix balancing			
Altitude capping			
Alternative routing options			
Fix crossing times			
Airport Slot			
Minimum departure intervals (MDIs)			
Published, pre-defined alternative routes			
Ground delay program (GDP) – airport arrival constraint			
Ground stop (GSt)			
Ground delay program (GDP) – airspace constraint (also known as airspace flow program : AFP)			

Comments

33. What is taken into consideration when an ATFM Measure is implemented.

34. How is the duration of the selected ATFM Measure determined?

35. Does your ANSP carry out any post-operations analysis?

36. How is the effectiveness of the ATFM Measure analyzed?

37. Are the ATFM Measures included in LOAs?

38. Does your State communicate ATFM Measures through automated or verbal communication with adjacent FIRs?

	Automated	Verbal	Please list FIRs
Miles in trail			
Speed restrictions			
Holding			
Altitude			
Fix crossing times			
Airport arrival times			
Ground delay programs – airport arrival constraint			
Ground stops			
Ground delay program – airspace constraint			

Comments

39. If your State have future ATFM initiatives planned **with other FIRs** please list them below.

Initiative Title	
Primary Functions	
Status (Planning, Approved, Implementation, Testing)	
Initial Operational Capability Date	
Full Operational capability Date	

Initiative Title	
Primary Functions	
Status (Planning, Approved, Implementation, Testing)	
Initial Operational Capability Date	
Full Operational capability Date	

Comments

Please include any related documents with the survey.

40. If your State have future ATFM initiatives planned, please list them below.

Initiative Title	
Primary Functions	
Status (Planning, Approved, Implementation, Testing)	
Initial Operational Capability Date	
Full Operational capability Date	

Initiative Title	
Primary Functions	
Status (Planning, Approved, Implementation, Testing)	
Initial Operational Capability Date	
Full Operational capability Date	

Comments

Please include any pertinent documents.

41. ICAO has identified various ATFM and CDM initiatives in the Aviation System Block Upgrades (ASBU) process (Block 0 and Block 1 to be implemented by 2018). Please identify which of the following have been implemented or are planned to be implemented:

ASBU Module	Implemented	Planned date	Comments
B0- A-CDM <i>Improved Airport Operations through Airport-CDM</i>			
B0-RSEQ <i>Improved Traffic Flow through Runway Sequencing (AMAN/DMAN)</i>			
B0-FICE <i>Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration</i>			
B0-DATM <i>Service Improvement through Digital Aeronautical Information Management</i>			
B0-FRTO <i>Improved Operations through Enhanced En-Route Trajectories</i>			
B0-NOPS <i>Improved Flow Performance through</i>			

<i>Planning based on a Network-Wide view</i>			
<i>B1- A-CDM Optimized Airport Operations through A-CDM Total Airport Management</i>			
<i>B1-RSEQ Improved Airport operations through Departure, Surface and Arrival Management</i>			
<i>B1-FICE Increased Interoperability, Efficiency and Capacity through FF-ICE/1 application before Departure</i>			
<i>B1-DATM Service Improvement through Integration of all Digital ATM Information</i>			
<i>B1-SWIM Performance Improvement through the application of System Wide Information Management (SWIM)</i>			
<i>B1-NOPS Enhanced Flow Performance through Network Operational Planning</i>			
<i>B1-AMET Enhanced Operational Decisions through Integrated Meteorological Information</i>			
<i>B1-TBO Improved Traffic Synchronization and Initial Trajectory-Based Operation</i>			

Note: For these items, please ensure they are included in the responses to previous questions about future plans.

TERMS OF REFERENCE (TOR) OF THE MIDANPIRG AIR TRAFFIC FLOW MANAGEMENT TASK FORCE (ATFM TF)

I. TERMS OF REFERENCE

- 1.1 *Perform a joint assessment and confirmation of the Pre-requisites for a regional ATFM. This shall include*
- 1.2 *Assessment of the performance objectives of the individual cooperating States and definition of common performance objectives for a regional ATFM service,*
- 1.3 *Perform a data collection and analysis to identify the hot-spot areas and critical times in a regional ATFM service area where demand consistently exceeds capacity. The reasons and contributing factors for unbalanced demand and capacity are to be identified.*
- 1.4 *Analysis of air traffic flows within the designated area of the regional ATFM service that is causing unbalanced demand and capacity. The analysis shall identify the traffic fractions that due to their uniformity are candidates for effective ATFM measures to increase the efficiency without violating the equity principle.*
- 1.5 Develop an ATFM Concept of Operations and a Framework which addresses ATFM minimum requirements for the implementation ~~of and~~ ATFM ~~operational issues~~ in the ICAO MID Region.
- ~~1.1~~1.6 Agree on a mechanism to support the phased implementation of ATFM measures in the MID Region, when and where required.
- ~~1.2~~1.7 Identify, research and recommend appropriate guidance regarding:
 - a) aerodromes and enroute capacities under the normal circumstances and adjustment factors affecting the capacity ~~assessment and adjustment mechanisms~~;
 - b) regular review for all aerodromes and ATC sectors where traffic demand is expected to reach capacity, or is resulting in traffic congestion;
 - c) mechanisms for ATFM data gathering, collation and sharing between States, Organizations and ICAO, which may include:
 - i. adjusted aerodromes and enroute capacity ~~assessments, including due to~~ factors affecting capacity such as special use airspace status, runway closures and weather information;
 - ii. traffic demand information which may include flight schedules, flight plan data, repetitive flight plan data as well as associated surveillance updates of flight status; and
 - iii. ATFM Daily Plan.
 - d) compliance by airspace users with ATFM measures; and
 - e) any other guidance relevant to the Regional ATFM Framework.
- ~~1.3~~1.8 ~~Review~~ Consider existing and planned ATFM initiative in the Region, and make specific recommendations to ensure their alignment.
- ~~1.4~~1.9 Ensure inter-regional ATFM harmonization with adjacent ICAO Regions.
- ~~1.5~~1.10 Recommend appropriate inputs to the ASBU Modules relevant to ATFM such as NOPS,

A-CDM, etc.

~~1.6~~1.11 Report to the ATM SG.

~~1.7~~1.12 Review periodically its Terms of Reference and propose amendments as necessary.

~~1.8~~1.13 Coordinate as deemed necessary with the Runway and Ground Safety Working Group (RGS WG) and the Meteorology Sub-Group (MET SG) the issues of mutual interest.

II. COMPOSITION

2.1 The Sub-Group is composed of MID ATFM focal points and experts from:

- a) MIDANPIRG Member States;
- b) India, FAA, AACO, ACAOC, AEROTHAI, CANSO, EUROCONTROL, FAA, IATA, and ICAO (Bangkok, Cairo, Paris Offices and HQ); and
- c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

2.2 The Task Force shall elect a Chairperson to act as the point of contact on behalf the Task Force.

2.3 The Task Force shall meet at least once a year and when deemed necessary.

2.22.4 ICAO MID Office will act as the Secretary of the ATFM Task Force meetings.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST OFFICE

FIRST MEETING OF THE MIDANPIRG World CUP 2022 TASK FORCE

(W2022 TF/1)

(Muscat, Oman, 26 September 2018)

SUMMARY OF DISCUSSIONS

1. PLACE AND DURATION

1.1 The First Meeting of the World Cup 2022 Task Force (W2022 TF/1) was successfully held back-to-back with the Air Traffic Flow Management Task Force (ATFM TF/1) in Muscat, Oman on 26 September 2018. The meeting was gratefully hosted by the Public Authority for Civil Aviation (PACA), Oman.

2. OPENING

1.2 The Meeting was attended by a total of forty-one (41) participants from ten (10) States (Bahrain, Egypt, India, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, UAE and USA) and seven (7) International Organizations/Industries (ACAO, AEROTHAI, CANSO, EUROCONTROL, IATA, MAAR and MIDRMA). The list of participants is at **Attachment A**.

1.3 The W2022 TF/1 and ATFM TF/1 meetings were opened by Mr. Anwar Al Raissi, Director General Civil Aviation Regulation, PACA, Oman, who extended a warm welcome to all participants to Oman and wished them successful meetings and a pleasant stay in Muscat. Mr. Al Raissi thanked ICAO for organizing these meetings in Oman and restated Oman's commitment to support the ICAO MID Regional Office activities.

1.4 In his opening remarks, Mr. Elie El Khoury, Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR), ICAO Middle East Office, Cairo, welcomed the participants to Muscat. On behalf of the ICAO Middle East Office, he expressed ICAO's gratitude and appreciation to H.E. Dr. Mohammed Ben Nasser Ben Ali Al Za'abi, Chief Executive Officer of Public Authority for Civil Aviation (PACA) – Oman for hosting the ATFM TF/1 and World Cup 2022 TF/1 meetings in Oman. He extended special thanks to all the team who participated in the preparation and facilitation of this meeting for their good cooperation and for the excellent hospitality extended to the ICAO staff and all participants. Mr. El Khoury highlighted that Oman continuous support to the ICAO MID Office activities is an evidence of its active role and reflects Oman's commitment to enhance the overall safety and efficiency of air navigation in the Region, and to ensure the success of the regional projects/initiatives.

1.5 Mr. El Khoury highlighted that this meeting provides an opportunity to share experience and agree on the way forward with the implementation of a collaborative ATFM in the Region, which could not be achieved without collaboration, support and contribution from all stakeholders.

1.6 Mr. El Khoury extended ICAO appreciation to India, Thailand (AEROTHAI), USA, ACAO, CANSO, EUROCONTROL and IATA for being part of the ATFM Task Force and for accepting the invitation to actively participate in the meetings and share their experiences and views, which would support in achieving the ATFM and World Cup 2022 Task Forces' objectives.

1.7 In closing, Mr. Elie thanked the participants for their presence and wished the meeting every success in its deliberations.

3. OFFICERS AND SECRETARIAT

1.8 Mr. Elie El Khoury, Regional Officer, RO/ATM/SAR was the Secretary of the meeting.

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

1.9 Capt. Abdulrahman Al-Hammadi, Director of Air Safety Department, Qatar Civil Aviation Authority, chaired the meeting.

1.10 ICAO provided an overview related to the establishment of the W2022 TF by MIDANPIRG through Decision 16/18. The meeting recalled that the main objective of the W2022 TF is to develop and follow-up the implementation of a collaborative action plan to accommodate the expected high increase in traffic, in a safe and efficient manner, taking into consideration similar experiences.

1.11 The meeting adopted the following Agenda:

- Agenda Item 1: Adoption of the Provisional Agenda
- Agenda Item 2: Overview of Similar Experience
- Agenda Item 3: Regional Framework
- Agenda Item 4: Plan of Actions
- Agenda Item 5: Future Work Programme
- Agenda Item 6: Any other Business

1.12 The documentation, working papers and Presentations delivered during the Meeting are available at the ICAO MID Regional Website:

<https://www.icao.int/MID/Pages/2018/World%20Cup2022.ASPX.aspx>

AGENDA ITEM 2: OVERVIEW OF SIMILAR EXPERIENCE

1.13 With respect to Europe experience, the meeting was apprised by EUROCONTROL of the procedures that ensure effective coordination between all stakeholders during special and major events. It was noted that even the events outside the EUR Region are taking into consideration due to their impact on the EUR traffic, this includes EXPO 2020 and World Cup 2022 events.

1.14 USA/FAA shared their experience related to the preparation and management of the traffic for the Super Bowl game planned for February 2019, highlighting the required pre-requisites, challenges as well as the key points for success.

1.15 CANSO provided an overview of South Africa experience with the FIFA World Cup 2010 highlighting the lessons learned and how they approached the events with effective advance planning and putting necessary procedures in place include training of personnel as well as the management of slot allocation.

1.16 The meeting recognized that some key points should be considered during the preparation for major events such as:

- Collaborative Decision-Making (CDM)
- Airport capacity
- Airspace capacity
- Slot allocation and adherence including reservation system
- Drop-and-Go procedures
- Security (Temporary Reserved Airspaces) procedures at and around the airports and the venues
- VIP/VVIP and State flights
- Controllers Staffing
- Management Staffing
- Technical Operations Staffing (equipment maintenance)
- Contingency/Emergency procedures
- Public Transportation options from all airports supporting event
- Forecasts of movement and passengers
- Designation of main airports for the event
- Airspace Review – Enroute/TMA
- Publication of procedures and rules (aeronautical publication)
- Training for Airport Authority, Handling Agents, ATC, etc.
- Weather
- Inter-regional coordination
- Etc.

AGENDA ITEM 3: REGIONAL FRAMEWORK

1.17 The subject was addressed in WP/2 and PPT/4 presented by Qatar. The meeting recognized the need to establish regional collaborative mechanism to address the issues associated with expected increase of traffic during the World Cup 2022 and other major events, which would have major impact on the traffic within and outside the MID Region. Qatar highlighted the following:

- Phased implementation of the Global ATM Operational Concept in the region aimed to achieve an interoperable global Air Traffic Management System, for all users during all phases of flight, that meets agreed levels of safety, provides for optimum economic operations, is environmentally sustainable and meets national security requirements is yet to be initiated.
- In addition, there is no established mechanism to give guidance on the seven interdependent concept components that will be integrated to form the future ATM system as follows:
 1. Airspace organization and management
 2. Aerodrome operations
 3. Demand and capacity balancing
 4. Traffic synchronization
 5. Conflict management
 6. Airspace user operations
 7. ATM service delivery management
- ATM service delivery management, ATM system design will have to be determined by collaborative decision making and system-wide safety and business case.

1.18 Qatar proposed the establishment of a collaborative mechanism that would:

- allow the concerned ANSPs to participate in ATM decisions that affect them during the preparation of the events;

- apply to all layers from long-term planning activities to real-time operations through collaboratively agreed procedures;
- enable any concerned party to propose a solution and will ensure that all concerned parties are included in all aspects of the airspace management; and
- support other demand/capacity balancing during the events.

1.19 The mechanism can be applied across the timeline of activities from strategic planning to real-time operations. This approach will enable the ATM community to reach the performance objectives of the processes it supports and are expected to be agreed upon collaboratively among the concerned ANSPs.

1.20 Although information sharing is an important enabler for the proposed mechanism, there is a need for predefined and agreed upon procedures and rules.

1.21 The development of the proposed concept will be in accordance with the following phases:

- The first phase is the identification of the need to apply collaborative mechanism to realize a performance improvement and should be applied and specify the current situation and the involved parties.
- The second phase will require further analysis from a collaborative mechanism perspective. The analysis should make clear what decisions are to be made, which parties are involved (or affected), which information is used and which process are followed, how such an improvement could contribute to better performance.

AGENDA ITEM 4: PLAN OF ACTIONS

1.22 Based on the discussions and the foregoing, the meeting agreed to following actions to be undertaken till the W2022 TF/2 meeting:

- a) Qatar to carry out a study and collect necessary information related to World Cup 2022 to be presented to the next meeting.
- b) Preparation of an overview/outline of the foreseen collaborative mechanism/common platform to support meeting the challenges for the Expo 2020 and World Cup 2022 events in coordination with ATFM TF as required.

AGENDA ITEM 5: FUTURE WORK PROGRAM

1.23 The meeting agreed that the World Cup 2022 TF/2 meeting to be held from 26 to 27 February 2019 back-to-back with the ATFM TF/2 meeting. The venue will be the ICAO MID Regional Office in Cairo, unless a State is willing to host the meeting.

1.24 The meeting recalled Qatar offer to host the ATFM TF/2 back-to-back with the World Cup 2022 TF/2 meetings in Doha on the agreed dates.

1.25 The meeting reviewed and updated the terms of reference of the W2022 TF as at **Appendix A**. The meeting agreed that effective coordination should be carry out between the W2022 TF and ATFM TF.

AGENDA ITEM 6: ANY OTHER BUSINESS

1.26 Nothing has been discussed under this Agenda Item.

4. CLOSING

1.27 In closing, Mr. Elie El Khoury, Regional Officer, ATM/SAR, thanked the participants for their presence and excellent cooperation and contribution to the meeting.

1.28 The participants thanked ICAO for organizing such an important Meeting as well as PACA – Oman for hosting, and commended the regional efforts exerted to make this meeting a success.

**TERMS OF REFERENCE (TOR) OF THE
MIDANPIRG WORLD CUP 2022 TASK FORCE
(W2022 TF)**

1. OBJECTIVES AND SCOPE

1.1 The Task Force will be expected to apply the performance-based approach through a collaborative manner to address the most strategic decisions to reach the following:

- a) A sufficient coordination between the Air Navigation Service Providers (ANSPs), airports, airspace users and regulators;
- b) A sufficient coordination at local, regional and inter-regional levels to accommodate safely and efficiently the expected significant increase of traffic; and
- c) A defragmented approach from an operational perspective to achieve (gate-to-gate, city pairs, and an oriented track system) which leads to more than optimum flight and airport operations efficiency.

1.2 The Task Force shall support the MID Region ATFM System once established.

2. TERMS OF REFERENCE OF THE TASKFORCE

2.1 Develop and follow-up the implementation of an action plan to accommodate the expected high increase of traffic, in a safe and efficient manner, taking into consideration similar experiences from other regions.

2.2 Address other major events such as the EXPO 2020 and develop action plan(s) to accommodate the changes in traffic flows as required.

2.3 Define explicit and implicit strategic objectives (e.g. improved safety, increased air traffic capacity, improved efficiency, and mitigation of airspace congestion impact).

2.4 Identify operational and technical requirements including proposals for airspace management changes and amendment to the MID ATS Route Network to accommodate the air traffic through the establishment of temporary routes as required.

2.5 Develop the concept of collaborative decision-making at the strategic, tactical and pre-tactical levels, which would be implemented before and during the World Cup event.

2.6 Suggest methods for increased interaction between airspace providers in order to make sure that the network effects of any trajectory selection are properly incorporated in the decisions.

2.7 Develop collaborative regional mechanism for the implementation of ATFM solutions/measures such as Ground Delay Program (RGDP), which would be implemented for departures from airports in the region.

2.8 Assess the operational performance of the ATM network by its capability to accommodate demand through realistically modeled network nodes, i.e. airports and airspace volumes.

2.82.9 The Task Force shall work in close coordination with the ATFM TF to avoid duplication of efforts.

3. COMPOSITION

- 3.1 The World Cup 2022 Task Force is composed of experts from:
- a) MIDANPIRG Member States;
 - b) India, FAA, AACO, ACAO, AEROTHAI, CANSO, EUROCONTROL and IATA;
and
 - c) other representatives from States, Organizations and Industry may be invited on ad-hoc basis, when required.
- 3.2 ICAO MID Office will act as the Secretary of the Task Force.

4. WORKING PROCEDURES

- 4.1 Qatar shall act as the Chairman of the Task Force.
- 4.2 In order to effectively perform its tasks and responsibilities, the Task Force will meet as required in order to achieve its objectives.
- 4.3 Coordination will be carried out among the Task Force members and with concerned State(s) through correspondence and teleconferences and, if required, face-to-face meetings with stakeholders on case-by-case basis.
- 4.4 A Core Team might be established to follow-up with the concerned State(s) and air operators the conduct of safety and operational assessments and provide support as appropriate.

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 – 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

COMMUNICATIONS MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents an update on several communications matters.

Action by the meeting is at paragraph 3.

1. INTRODUCTION

1.1 The Eighth meeting of the MIDANPIRG Communication, Navigation and Surveillance Sub-Group (CNS SG/8) was held at the ICAO MID Regional Office, Cairo, Egypt, 26-28 February 2018.

2. DISCUSSION

World Radiocommunication Conference (WRC-19)

2.1 The radio spectrum is a scarce natural resource with finite capacity for which demand is constantly increasing. Aeronautical radio services are recognized internationally to be prime users of radio frequencies, without which aircraft operation would not be capable of meeting the global demand for safe, efficient and cost-effective transport.

2.2 The Nineteenth Meeting of the World Radiocommunication Conference (WRC-19) will be held in Sharm El-Sheikh, 28 October to 22 November 2019. ICAO Position for WRC-19, has been coordinated with all ICAO member States and approved by ICAO Council in June 2016. Moreover, the CNS SG/8 urged States to work closely with their States Telecommunication Authorities to ensure that ICAO Position is suitably reflected in the national position of the State and in the regional position; and to support ICAO Position during the WRC-19 meeting. Accordingly, the meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 8/X: SUPPORT ICAO POSITION TO WRC-19

That, States be urged to:

- a) work closely with the States Telecommunication Authorities to support the ICAO Position to the WRC-19;*
- b) make necessary arrangements for the designated Civil Aviation Personnel to participate actively in the preparatory work for WRC-19 at the national level; and*
- c) attend the preparatory regional spectrum management groups meetings and WRC-19 to support and protect aviation interests*

Frequency Finder Tool

2.3 The meeting may recall that MIDANPIRG/16 urged States to use the Frequency Finder tool for requesting the assignment and deletion of frequencies from the COM list. In this regard, the meeting may wish to note that a new VHF Navigation frequency assignment (ILS/VOR) Module is under development.

2.4 With the introduction of new NAV module and to keep States abreast of the use of the Frequency finder tool, the CNS SG/8 meeting recognized the need to organize Frequency Management Workshop and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 8/2: FREQUENCY MANAGEMENT WORKSHOP

That, ICAO consider the organization of a Workshop on Frequency finder tool for States in the MID Region in 2019-2020.

2.5 The meeting may wish to note that the registered frequencies in the ICAO database (using the Frequency Finder tool) is not up-to-date, and that could result in incompatible frequency assignments. Therefore, the ANSIG/3 meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 3/10: REGISTERED FREQUENCY UPDATE

That, for an optimized frequency assignment process and in order to ensure that assigned frequencies to MID States are not interfering, States that have not yet done so, be urged to:

- a) verify and update existing registered frequencies in the COM list;*
- b) add any missing frequencies with the full details, where applicable;*
- c) delete unused frequencies;*
- d) send the changes in excel format generated by the FF export function; and*
- e) provide the ICAO MID Office with feedback before 15 August 2018.*

Harmful Interference

2.6 During the CNS SG/8 meeting, the issue of harmful interference was raised, it was highlighted that the removal of harmful interference requires coordination among States in close coordination with the ICAO MID Office. In order to improve the coordination and respond to the interference occurrences in timely manner, States should assign focal point for the frequency management issues. Furthermore, the CNS SG/8 meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 8/8: FREQUENCY MANAGEMENT FOCAL POINTS

That, States, that have not yet done so, be invited to assign Frequency Management Focal Points by ~~1 April 2018~~ 15 February 2019, for a better coordination of frequency management issues, including harmful interference.

2.7 In this connection, the ICAO MID Office issued Follow-up State Letter dated 19 March 2018. Nine (9) States (Bahrain, Egypt, Iran, Iraq, Jordan, Lebanon, Qatar, Saudi Arabia, and Sudan) assigned their frequency management focal points.

CRV Project

2.8 The CRV aims to help States achieve a safe, secure, reliable and economical backbone network to handle current and anticipated network traffic demand as well as enabling the new features enhancement in the APAC and MID Regions. MIDANPIRG/16 through Conclusion 16/15 invited States to engage with the recommended supplier to establish individual service contracts.

2.9 The meeting may wish to note that Eight (8) States (Bahrain, Iraq, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia and UAE) provided their network requirements through the completion of the high level questionnaire.

2.10 During the ANSIG/3 meeting, it was noted that States selected different packages for same connections; and in order to request price revision from CRV service provider, the Secretariat prepared consolidated proposal with unified package for all MID States.

2.11 Based on the above, the ANSIG/3 meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 3/9: MID CRV REQUIREMENTS

*That, in order to request price revision from the CRV's Service provider (PCCW Global) for the MID Region, States are urged to complete the MID CRV requirements at **Appendix 4F**, not later than **1 August 2018**.*

2.12 In this connection, the ICAO MID Office issued Follow-up State Letter. Six (6) States (Bahrain, Egypt, Jordan, Kuwait, Qatar, and UAE) provided their CRV requirements.

2.13 In the same vein, the CRV service provider (PCCW) offered a bundle discount with around 10-15% less if Six (6) States place order in a similar period.

2.14 The meeting may wish to note that the fifth meeting of the CRV Operation Group will be held in Bang Kong, from 23 to 25 2019. The meeting will review the progress of the CRV project and regional implementation plan. Also, States will be offered to visit the operation Centre of the PCCW. Moreover, the meeting will address the missing messages issue; by reviewing the current AFTN/AMHS routing table of the entry/exit points and the performance of inter-regional connections (Bahrain, Kuwait and Oman). States concerned are required to provide the serviceability report of the past 12 months. Therefore, States are strongly encouraged to participate in the CRV OG/5 meeting.

Missing Messages

2.15 The issue of missing flight plans has been raised several times in ICAO MID meetings. The meeting may wish to note that the following actions have been taken by the MID Office to resolve this problem:

- a) requested the ICAO EUR/NAT Office to consider the establishment of new European Gateway (Rome) with the MID Region;
- b) invited Egypt and Lebanon to establish AMHS inter-regional connection with the current European gateways (Athens and Cyprus);
- c) coordinated with ICAO ESAF Office to establish new inter-regional AMHS connection between Cairo and South Africa; and
- d) invited Bahrain – UAE to migrate their bilateral CIDIN connection to AMHS.

2.16 Furthermore, having additional entry/exit point between the AFI and MID Regions can offer more channel for the inter-regional communications and improve the availability. In this regard, during the CNS SG/8 meeting Sudan requested to consider Khartoum COM Centre as a Main COM Centre and gateway with AFI Region. Having in mind that the advanced technology in Khartoum COM Centre and geographical location of Sudan at the interface area, support Sudan's request.

2.17 Based on the above, the CNS SG/8 meeting requested Sudan to send an official letter to the ICAO MID Office with necessary justifications and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 8/5: KHARTOUM COM CENTRE

That, in order to establish a third Gateway to the AFI Region, Khartoum COM Centre be changed to a main Centre.

ROC and IWXXM Implementation

2.18 The meeting may wish to note that the CNS SG/8 reviewed the Communication requirements to establish ROC and enable OPMET data exchange in IWXXM format. Exchanging the IWXXM format in the current mixed environment (AFTN, Basic and Extended AMHS Connections) need a lot of preparation and monitoring, to ensure messages flow through consistent routes; main and backup routes to eliminate the generation of non-delivery reports (NDRs). Furthermore, the requirement that each State in the MID Region has direct connection with the Main and Backup ROCs, will impose additional cost on the ROCs and MID States. Moreover, the meeting reviewed and updated the ROC connectivity plan at **Appendix A**.

2.19 Based on the above, the CNS SG/8 meeting agreed to the following Draft Conclusions:

DRAFT CONCLUSION 8/3: IMPLEMENTATION OF FTBP

That, States are urged to:

- a) implement FTBP capability at National COM Centres (AMHS is a pre-requisite);*
- b) implement P3/P7 with FTBP capability at the National OPMET Centre (NOC);*
- and*
- c) set the maximum overall AMHS Message size to 4 MB.*

DRAFT CONCLUSION 8/4: THE COMMUNICATION NETWORK FOR IWXXM DATA EXCHANGE

That, the Main and Backup Regional OPMET Centres (Bahrain and Saudi Arabia) and the Main COM Centres in the MID Region be urged to join the CRV Project in order to enable the exchange of OPMET information in IWXXM format.

SITA Integration

2.20 The meeting may wish to note that SITA integration is a pre-requisite to any AMHS inter-regional connection, in order to keep efficient and regular messages exchange. ICAO APAC, EUR/NAT and SAM Regions have completed the integration successfully. The ESAF and WACAF Regions are also progressing well.

2.21 The CNS SG/8 meeting developed SITA Type X Transition Action Plan and agreed that 23rd June 2018 would be the transition date. However, the transition could not be completed, as Egypt has not been ready for that.

2.22 The meeting may wish to note that, lagging in SITA integration may isolate the MID Region from AMHS upgrade with adjacent Regions, and keep operating the old obsolete protocol "AFTN". A coordination meeting will be held with Egypt, EUROCONTROL, ICAO MID and SITA on 18 December 2018 to resolve the issue.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) urge Egypt to complete the necessary actions to enable SITA Transition in the MID Region; and
- b) endorse the proposed Draft Conclusions.

APPENDIX A

<i>AMHS Plan for ROC in Jeddah and Bahrain</i>					
	Task	Timeframe	Assigned to	Champion	Status
AMHS Intra-regional Trunk Connections					
1	Establish Jeddah – Beirut IP Network.	Jul 2015	Saudi Lebanon	IM MS	Completed
2	Establish Bahrain – Beirut IP Network.	Feb 2016	Bahrain Lebanon	YH MS	Completed
3	Establish Cairo – Beirut IP Network.	July 2016	Egypt Lebanon	AF//MR MS	Completed
4	Establish Bahrain – Jeddah IP Network.	Mar 2016	Bahrain Saudi	IM YH	
5	Perform the Interoperability test between Jeddah and Beirut COM Centers.	July 2015	Saudi Lebanon	IB MS	Completed
6	Perform the Interoperability test between Bahrain and Beirut COM Centers.	July 2016	Bahrain Lebanon	MS YH	Completed
7	Perform the Interoperability test between Cairo and Beirut COM Centers	July 2016	Egypt Lebanon	AF/TZ/MR MS/EK	~~Depends on IP network availability~~ completed
8	Perform the Interoperability test between Bahrain and Jeddah COM Centers.	July 2016	Bahrain Saudi	YH IM	
9	Perform the Pre-operational test between Jeddah and Beirut COM Centers.	July 2015	Saudi Lebanon	IM MS	Completed
10	Perform the Pre-operational test between Bahrain and Beirut COM Centers.	July 2016	Bahrain Lebanon	YH MS	Completed
11	Perform the Pre-operational test between Cairo and Beirut COM Centers.	~~July 2016~~ March 2017	Egypt Lebanon	AF/ /MR MS/EK	~~Planned~~ completed
12	Perform the Pre-operational test between Bahrain and Saudi COM Centers.	July 2016	Bahrain Saudi	YH IM	
13	Place the AMHS link into operation between Jeddah and Beirut COM centers, and updating the Routing tables.	July 2015	Saudi Lebanon MID AMC	IM MS/EK MN	Completed July, 2015
14	Place the AMHS link into operation between Bahrain and Beirut COM centers, and updating the Routing tables.	July 2016	Bahrain Lebanon MID AMC	YH MS/EK MN	Completed On 3/5/2016
15	Place the AMHS link into operation between Cairo and Beirut COM centers, and updating the Routing tables.	~~Aug 2016~~ April 2017	Egypt Lebanon MID AMC	AF/TZ/MR MS/EK MN	~~Planned~~ completed

16	Evaluate the Trunks connections bandwidth and increase it if required between (Bahrain, Beirut, Cairo and Jeddah).	March 2019	Bahrain Beirut Cairo Jeddah	YH MS/EK AF/TZ IM	Depends on testing of digital data exchanged Beirut and Cairo increased the bandwidth to 128 kbps
<i>The AMHS Interconnection with EUR Region Depends on Nicosia and Athens</i>					
17	Establish Cairo – Tunis IP Network.	March 2016 July 2016		AF/TZ/MR IB/MA	~~Both Egypt and Tunisia Ready~~ Coordination in process to implement Completed
18	Establish Nicosia – Beirut IP Network.	Awaiting reply from EUR		MS/EK	Lebanon ready Ongoing
19	Establish Nicosia – Jeddah IP Network.	Dec 2016		IM	Saudi Arabia ready
20	Establish Bahrain – Nicosia IP Network.	Dec 2016		YH	
21	Establish Cairo – Athens IP Network.	Dec 2016		AF/TZ/MR	Egypt Ready Link is ready as same CIDIN link will be used
22	Perform the Interoperability test between Cairo and Tunis COM Centers.	April 2016 August 2016		AF/ /MR IB/MA	~~Both Egypt and Tunisia Ready~~ Coordination in process to implement Completed
23	Perform the pre operational test between Cairo and Tunis COM Centers.	Q3 2016		AF/ /MR IB/MA	~~Both Egypt and Tunisia Ready~~ Coordination in process to implement Completed
24	Place the AMHS link into operation between Cairo and Tunis COM Centers, and updating the Routing tables.	Aug 2016		AF/ /MR IB/MA	~~Both Egypt and Tunisia Ready~~ Coordination in process to implement Completed
25	Perform the Interoperability test between Athens and Cairo COM Centers.	Mar 2017		AF/TZ/MR IB/MA	Athens advised that their system will be installed by Dec. 2016
26	Perform the Interoperability test between Bahrain and Nicosia COM Centers.	Q1 2017		YH	

27	Perform the Interoperability test between Nicosia and Jeddah COM Centers.	Q1 2017		IM	
28	Perform the Interoperability test between Nicosia and Beirut COM Centers.	Q1 2017		MS/EK	Nicosia in tender process
29	Perform the Pre-operational test between Athens and Cairo COM Centers.	Mar 2017		AF/TZ/MR	Athens advised that their system will be installed by Dec. 2016
30	Perform the Pre-operational test between Bahrain and Nicosia COM Centers.	Q1 2017		YH	
31	Perform the Pre-operational test between Nicosia and Beirut COM Centers.	Q1 2017		MS/EK	
32	Perform the Pre-operational test between Nicosia and Jeddah COM Centers.	Q1 2017		IM	
33	Place the AMHS link into operation between Athens and Cairo COM Centers, and updating the Routing tables.	Q1 2017		MIDAMC AF/ /MR	
34	Place the AMHS link into operation between Bahrain and Nicosia COM Centers, and updating the Routing tables.	Q1 2017		MID AMC YH	
35	Place the AMHS link into operation between Nicosia and Jeddah COM Centers, and updating the Routing tables.	Q1 2017		MID AMC IM	
36	Place the AMHS link into operation between Nicosia and Beirut COM Centers, and updating the Routing tables.	Q1 2017		MS/EK	
37	Evaluate the inter-region connections bandwidth and increase it if required.	Q1 2017		MID AMC	
38	Transition of all regional AFTN/CIDIN Connections to AMHS.	Q2 2017	All MID States		Beirut and Cairo removed all Regional CIDIN connections Bahrain-Abu Dhabi connection is the only CIDIN link in the Region

Champions:

Bahrain: (YH: Yaseen Hasan)

Egypt: (AF:Ahmed Farghally/TZ:Tarek Zaki/MR: Mohamed Ramzi/Essam Helmi: EH)

Lebanon: (MS: Mohamad Saad / EK: Elias El-Khoury)

Saudi Arabia: (IM: Mr. Ibraheem Mohamed Basheikh)

Tunis: (IB: Issam Bouzid / MA: Mr. Mohamed Ali)

MID AMC/Jordan: (MN: Muna Ribhi Alnadaf)

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

NAVIGATION MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents the Guidance on GNSS Implementation in the MID Region, for endorsement.

Action by the meeting is at paragraph 3.

1. INTRODUCTION

1.1 GNSS is defined by ICAO SARPs as a worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to support the required navigation performance for the intended operation.

2. DISCUSSION

2.1 GNSS is a key enabler of the PBN Implementation in the MID Region. Guidance material on GNSS Implementation has been developed to complement the information in the PBN Plan and provide guidance on the implementation aspects of GNSS in order to assist States in the introduction of GNSS operations.

2.2 The meeting may wish to note that the CNS SG/8 reviewed the Draft Guidance on GNSS Implementation in the MID Region and through Draft Conclusion 8/6 invited States to review the Draft Guidance and provide the ICAO MID Office with their comments/inputs by **15 May 2018**.

2.3 The Final version of the GNSS Implementation in the MID Region at **Appendix A** was consolidated taking into consideration the replies received from Bahrain, Egypt and Jordan.

3. ACTION BY THE MEETING

3.1 The meeting is invited to agree to the following Draft Conclusion:

DRAFT CONCLUSION 6/X: GUIDANCE ON GNSS IMPLEMENTATION

*That, the Guidance on GNSS Implementation in the MID Region at **Appendix A** is endorsed and be published as ICAO MID Doc 00X.*

APPENDIX A



INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST

**AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP
(MIDANPIRG)**

GUIDANCE ON GNSS IMPLEMENTATION IN THE MID REGION

AMENDMENTS

The GNSS Guidance in the MID Region should be reviewed and updated by the CNS Sub-Group. States shall submit their proposal for amendment to the Plan to the ICAO MID Regional Office, the changes can be coordinated by correspondence with main CNS focal points/ or State letters.

The table below provides a means to record all amendments. An up to date electronic version of the Plan will be available on the ICAO MID Regional Office website.

Edition	Date	Comment	Section affected
V0.1	11/2/2018		All
V0.2	1/4/2018	Add NDB IDs to the Appendix A	Page 26-28

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ACRONYMS

AO	Aircraft Operators
AAIM	Aircraft Autonomous Integrity Monitoring
ABAS	Aircraft Based Augmentation System
APCH	Approach
CAPEX	Capital Expenditure
DME	Distance Measuring Equipment
DOP	Dilution of Precision
EGNOS	European Geostationary Navigation Overlay Service
FD	Fault Detection
FDE	Fault Detection and Exclusion
GAGAN	GPS Aided GEO Augmented Navigation
GBAS	Ground Based Augmentation System
GLONASS	Global Navigation Satellite System
GLS	GBAS Landing System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
ILS	Instrument Landing System
INS	Inertial Navigation System
IRS	Inertial Reference System
LNAV	Lateral Navigation
MLS	Microwave Landing System
MSAS	MTSAT Satellite based Augmentation System
NDB	Non-Directional Beacon
NPA	Non-precision Approach
NSE	Navigation Sensor Error
OPEX	Operating Expense
PA	Precision Approach
PBN	Performance Based Navigation
RAIM	Receiver Autonomous Integrity Monitoring
RNAV	Area Navigation
RNP	Required Navigation Performance
SBAS	Satellite Based Augmentation
SDCM	System of Differential Correction and Monitoring
VOR	Very High Frequency Omni Directional Radio Range

THE OBJECTIVE AND SCOPE OF THE DOCUMENT

The objective of this document is to provide States in the Middle East Region with guidance for GNSS implementation based on the Global Air Navigation Plan and Regional Requirements.

The document outlines the status of Satellite constellations and Augmentation systems worldwide, with focus on the available Augmentation systems that can be implemented in the MID Region; the services provided, and requirements to exploit these Navigation services. Moreover, the document provides practical information on GBAS deployment, with reference to other Regions experience and factors to be considered in the process of cost estimation for the cost benefit analysis.

The GNSS application is out of scope of this document and addressed in the MID PBN implementation plan and the MID Region Surveillance Plan. As the GNSS is the key enabler for PBN implementation, this guidance document developed to complement the information in the MID PBN implementation Plan; ICAO MID DOC 007.

This document is divided into three parts; Part one includes information about the GNSS and Augmentation systems worldwide, and ICAO GANP Navigation Roadmap.

Part II identifies the current conventional Navigation aids infrastructure in the MID Region. And focuses on the SBAS Systems that may extends their services to the MID states.

Part III addresses the GNSS vulnerabilities due to intentional and unintentional sources of interference and to certain ionospheric effects. Also, it defines mitigation strategies to be deployed by States to reduce the likelihood and impact of the GNSS interference as defined by ICAO.

Part I: General Navigational Infrastructure

Navigation Aids Infrastructure refers to the ground and space-based NAVAIDs and provides positioning capability.

1- TERRESTRIAL NAVIGATIONS

Terrestrial Navigation Aids “conventional” refers to ground-based navigations such as NDB, ILS, VOR, TACAN, DME, ..., etc.

The basic principle of all of these navigation facilities is the fact that aircraft in general navigate towards and away from the navigation aid itself, “point to point”. This means that the location of the navigation aid must be in an optimized location. This optimized position is, in many cases, not achievable (due to being situated in high terrain, open seas, politically unacceptable areas, etc.). Therefore, the route structure must be aligned with the position of the navigation aid and not aligned in the ideal position for its purpose. This results in additional distances being flown by aircraft which has a number of disadvantages including economic, environmental and efficiency drawbacks.

In addition to the additional distance flown a number of other problem areas arise;

- High terrain. At airports located in high terrain with difficult accessibility arrival procedures, based upon conventional ground based navigation aids, may result in aircraft being unable to land at the airport safely during periods of low visibility.
- Lateral containment of tracks. With conventional ground based navigation aids the accuracy of the track to be flown is a factor of how close to the aid the aircraft is. The closer the aircraft is to the aid the more accurate the track keeping capability. As the aircraft gets further away from the aid the accuracy reduces. This requires that a maximum distance for the aid to be used must be published and that the route spacing requires to be established on the worst case scenario.

In the global context, GNSS based PBN procedures have been implemented, and several GLS (CAT I) procedures are in place.

2- GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)

GNSS is a satellite-based navigation system utilizing satellite signals, for providing accurate and reliable position, navigation, and time services to airspace users. It provides location and time information anywhere on, or near, the earth in all weather conditions.

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. Today several GNSS systems are available in the world, the first system in operation was the Global Positioning System (GPS).

2-1 GPS

The Global Positioning System (GPS) is a space-based radio-navigation system consisting of a constellation of satellites and a network of ground stations used for monitoring and control. Currently 32 GPS satellites

orbit the Earth at an altitude of approximately 11,000 miles providing users with accurate information on position, velocity, and time anywhere in the world and in all weather conditions.

GPS is operated and maintained by the Department of Defense (DoD).

2-2 GLONASS

The Russian Global Navigation Satellite System, which began operation in 1993. GLONASS network provides real-time positioning and speed data for surface, sea and airborne objects with an accuracy of one meter (three feet).

A group of 28 GLONASS satellites was in orbit as of April 2014, with 24 in operation, three spares, and one in the test-flight phase.

2-3 Galileo

Galileo is Europe's Global Satellite Navigation System (GNSS), providing improved positioning and timing information with significant positive implications for many European services and users. The system is still under deployment.

2-4 BeiDou

The BeiDou Navigation Satellite System (BDS) built and operated by China with a three-step strategy of development: to complete the construction of the BDS-1 and provide services to the whole country by the end of 2000; to complete the construction of the BDS-2 and provide services to the Asia-Pacific region by the end of 2012; and to complete the construction of the BDS and provide services worldwide around 2020.

2-5 RNSS

Regional Navigation Satellite System (RNSS) like NAVIC and QZSS. The Indian Regional Navigation Satellite System (IRNSS) with an operational name of NAVIC. QZSS is a system especially for usage in the Asia-Oceania regions, with a focus on Japan.

3- AUGMENTATION

Augmentation System provides additional data to users of GNSS equipment to improve accuracy, integrity, availability, or any other improvement to positioning, navigation, and timing. A wide range of different augmentation systems have been developed.

3-1 Space Based Augmentation System (SBAS)

SBAS systems are designed to augment the navigation system constellations by broadcasting additional signals from geostationary (GEO) satellites. The basic scheme is to use a set of monitoring stations (at very well-known position) to receive GNSS signals that will be processed in order to obtain some estimations of these errors that are also applicable to the users (i.e. ionospheric errors, satellite position/clock errors, etc.). Once these estimations have been computed, they are transmitted in the form of "differential corrections" by means of a GEO satellite.

Wide range of SBAS systems, designed according to the same standard have already been commissioned by the US (Wide Area Augmentation System WAAS) and Japan (MTSAT Satellite based Augmentation System MSAS).

Other systems are under commissioning or deployment in other regions of the world (e.g. GPS Aided GEO Augmented Navigation GAGAN in India and System of Differential Correction and Monitoring SDCM in Russia).

The current and planned SBAS systems coverage depicted in the figure (1-1)

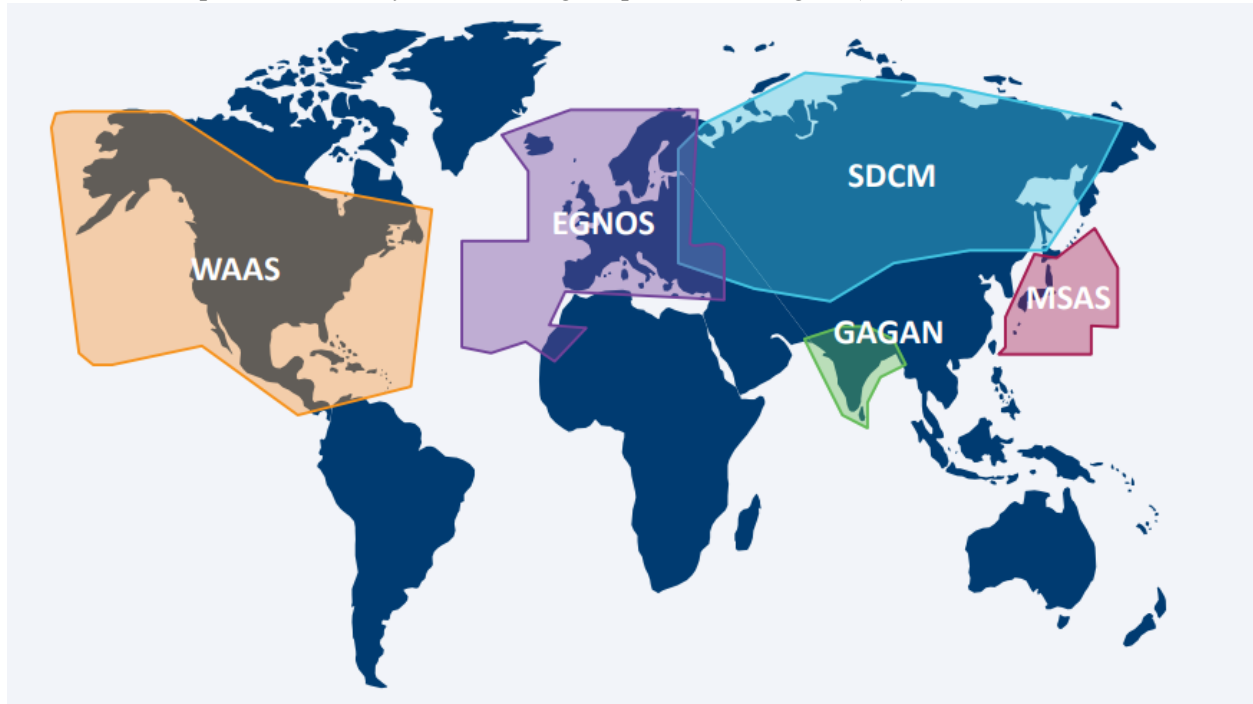


Figure (1-1)

3-1-1 WAAS

The Wide Area Augmentation System (WAAS) is an Air navigation aid developed by the Federal Aviation Administration to augment the Global Positioning System (GPS), with the goal of improving its accuracy, integrity, and availability.

3-1-2 EGNOS

The European Geostationary Navigation Overlay Service Navigation (EGNOS) is the European implementation of SBAS. Originally it was planned to augment GPS and GLONASS. Today, EGNOS augments GPS signals. EGNOS provides corrections and integrity information to GPS signals over a broad area centered over Europe and it is fully interoperable with other existing SBAS systems.

EGNOS provides three services:

- Open Service (OS), freely available to any user;
- Safety of Life (SoL) Service, that provides the most stringent level of signal-in-space performance to all Safety of Life user communities;
- EGNOS Data Access Service (EDAS) for users who require enhanced performance for commercial and professional use.

The main objective of the EGNOS SoL service is to support civil aviation operations down to Localizer Performance with Vertical Guidance (LPV) minima. In order to provide the SoL Service, the EGNOS

system has been designed so that the EGNOS Signal-In-Space (SIS) is compliant to the ICAO SARPs for SBAS.

The Services provided by EGNOS:

- Non-Precision Approach operations and other flight operations supporting PBN navigation specifications other than RNP APCH, not only for approaches but also for other phases of flight.
- Approach operations with Vertical Guidance supporting RNP APCH PBN navigation specification down to LPV minima as low as 250 ft.
- Category I precision approach with a Vertical Alert Limit (VAL) equal to 35m and supporting RNP APCH PBN navigation specification down to LPV minima as low as 200 ft.

A NOTAM (Notice to Airmen) is a notice issued to alert pilots of potential hazards along a flight route that could affect the safety of the flight. The objective of the EGNOS NOTAM proposal generation is to:

- Predict APV-I and LPV-200 services outages at given airports.
- Create and format the corresponding NOTAM proposals into an ICAO format and according to the European Concept for GNSS NOTAM to ease the validation process to be performed by the NOF (NOTAM Offices).
- Distribute the NOTAM proposals to the concerned NOFs through the AFTN network.

3-1-3 GAGAN

GAGAN is the acronym for GPS Aided GEO Augmented Navigation. The GAGAN uses a system of ground stations to provide necessary augmentations to the GPS standard positioning service (SPS) navigation signal. A network of precisely surveyed ground reference stations (INDian Reference Stations INRES) is strategically positioned across the country to collect GPS satellite data. Using this information, the master control center (Indian Master Control Centre INMCC) generates messages to correct any signal errors. These correction messages are then uplinked through (Indian Land Uplink Station INLUS) and broadcast through communication satellites (Geostationary) to receivers onboard aircraft using the same frequency as GPS.

The Indian Space Research Organization (ISRO) and Airports Authority of India (AAI) have implemented the GPS Aided Geo Augmented Navigation-GAGAN project as a Satellite Based Augmentation System (SBAS) for the Indian Airspace. The objective of GAGAN to establish, deploy and certify satellite based augmentation system for safety-of-life civil aviation applications in India has been successfully completed. The system is inter-operable with other international SBAS systems like US-WAAS, European EGNOS, and Japanese MSAS etc. GAGAN GEO footprint extends from Africa to Australia and has expansion capability for seamless navigation services across the region. GAGAN provides the additional accuracy, availability, and integrity necessary for all phases of flight, from enroute through approach for all qualified airports within the GAGAN service volume.

The services provided by GAGAN are the following:

- RNP 0.1 within India FIR
- APV-1 in the landmass of Indian FIR.

Due to impact of ionosphere behavior over the equatorial regions, availability of GAGAN APV -1 service is better than 76% of landmass on nominal iono days.

3-1-4 SDCM

The System for Differential Corrections and Monitoring (SDCM) is the SBAS currently being developed in the Russian Federation as a component of GLONASS.

3-1-5 MSAS

MTSAT Satellite Based Augmentation System (MSAS) is the Japanese SBAS, the system in operation since September 27, 2007.

MSAS provide GPS Augmentation Information for RNAV, from En-route through NPA (RNP 0.3) within Fukuoka FIR. Due to ionosphere horizontal navigation information only provided.

MSAS provide users with NOTAM when required, including alert for Service Interruption or Predicted Service Outage.

3-2 GROUND BASED AUGMENTATION SYSTEM (GBAS)

GBAS is an augmentation system in which the user receives augmentation information directly from a ground-based transmitter. GBAS support precision approach, landing, departure and surface movement.

GBAS cat I is now operational at many Airports, GBAS classified based on approach service type as following:

- GAST-A : APV I Performance
- GAST-B : APV II Performance
- GAST-C : CAT I Performance
- GAST-D : CAT III Performance (amendment 91 to Annex 10 Vol I)
- GAST-F : CAT III Performance (multiconstellation, multifrequency, ICAO Standards will be available 2025-2028)

The cost of a single certified GBAS ground station is from SESAR studies and deployment in Europe 1,5 to 2 M€ per airport, which is equal roughly to the cost of three ILSs.

3-3 AIRCRAFT BASED AUGMENTATION SYSTEM (ABAS)

ABAS is achieved by features of the onboard equipment designed to overcome the performance limitations of the GNSS constellations. The two systems currently in use are Receiver Autonomous Integrity Monitoring (RAIM) and the Aircraft Autonomous Integrity Monitor (AAIM). ABAS considered low cost integrity supervision.

3-3-1 Receiver autonomous integrity monitoring (RAIM)

RAIM is a technology developed to assess the integrity of the GPS in a GPS receiver system and can predict areas in which the GPS signal may be compromised. RAIM requires no data from outside the satellite receiver, only from GPS.

Fault detection and Exclusion (FDE) mechanism is used in RAIM, minimum five (5) satellite is needed for 'fault detection' and six (6) for 'fault exclusion'.

3-3-2 Aircraft Autonomous Integrity monitoring (AAIM)

AAIM uses the redundancy of position estimates from multiple sensors, including GNSS, to provide integrity performance that is at least equivalent to RAIM. An example is the use of an inertial navigation system or other navigation sensors as an integrity check on GPS data when RAIM is unavailable but GPS positioning information continues to be valid. AAIM requires data from GPS and other sensor (INS).

AAIM uses GNSS signal plus onboard Inertial (INS) to achieve primary means for enroute though non-precision approach.

4- Global Air Navigation Plan

The GANP and ASBUs recognize the Global Navigation Satellite System (GNSS) as a technical enabler supporting improved services. Roadmaps in the GANP outline timeframes for the availability of GNSS elements, the implementation of related services and the rationalization of conventional infrastructure. The ICAO Navigation roadmap depicted in figure (1-2)

Figure (1-2)

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Part II: GNSS in ICAO Middle East Region

1- The Conventional Ground Based Navigation systems in the MID

States Should 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 recommendations 6/10. Some ILSs may be retained to support precision approach and to mitigate GNSS outage.

Removal of conventional ground infrastructure should be planned carefully to ensure that safety is not compromised, such as by performance of safety assessment, consultation with users through regional air navigation planning.

The NDB should be rationalized based on need and equipage, MIDANPIRG/12 urged states to plan for complete decommissioning of NDBs by 2012 and to terminate the use of NDB for approach operations not later than 2012. The list of current NDBs and purpose of use in the MID Region is at Appendix A.

Furthermore, table (2-1) shows the current conventional infrastructure in the MID Region.

System	Frequency	Ground Stations	Status
NDB	200 – 1600 MHz	150 NDBs in (Egypt, Iraq, Iran, Jordan, Libya, Qatar, Syria, UAE, and Yemen)	States should plan for Complete decommissioning of NDBs by 2012 unless its operational justified.
ILS	108 – 112 MHz 329 – 335 MHz		-
VOR	108 – 118 MHz		-
TACAN	960 – 1215 MHz	38 TACANs	TACAN used in Egypt, Iran, Iraq, Qatar and Saudi Arabia
DME	960 – 1215 MHz		
MLS	5031 – 5091 MHz	MLS is not implemented in the MID Region	-

Table (2-1)

2) SBAS

The implementation of GNSS and augmentations systems in the MID Region should be in full compliance with ICAO Standards and Recommended Practices and PANS; due to geographic location of some MID States, taking advantages of adjacent SBAS services (EGNOS and GAGAN) is possible.

SBAS-based procedure does not require any infrastructure at the Airport served, but SBAS elements (e.g. reference stations, master station, satellites) must be in place to support required service level*

2-1 EGNOS

Some of MID Region States who are member in the EUROMED* can exploit the use of EGNOS in various applications, mainly in the transport sectors. As of the time of developing this document; five (5) States have officially notified their interest in EGNOS implementation (Algeria, Jordan, Lebanon, Libya, and

Tunisia).

**Euromed countries (Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Palestine, Syria and Tunisia)*

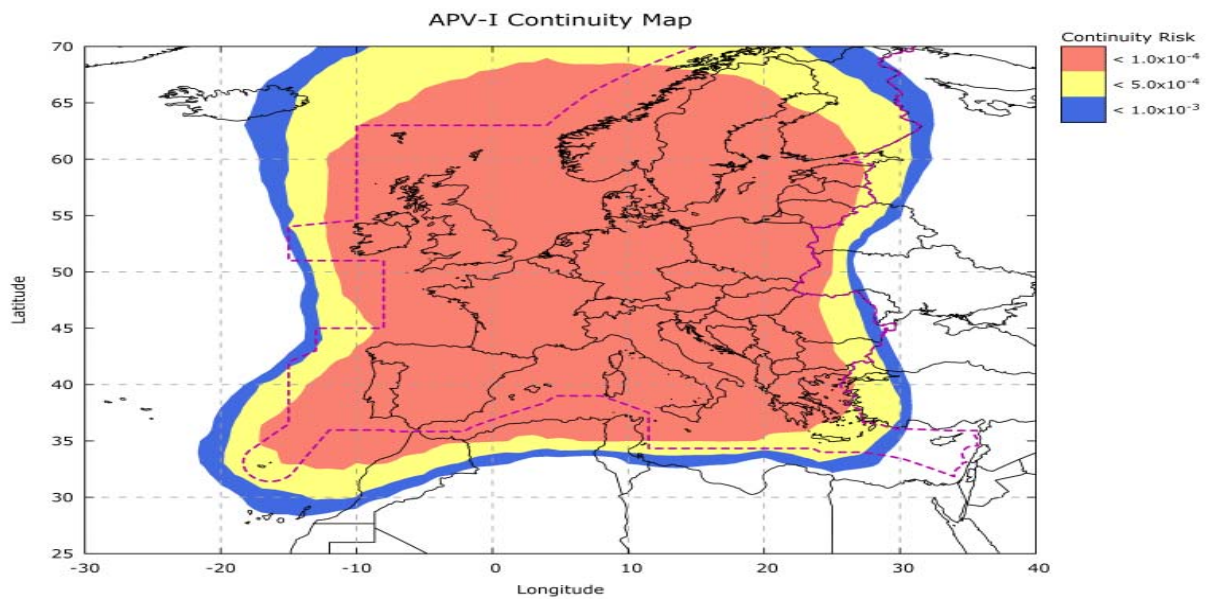
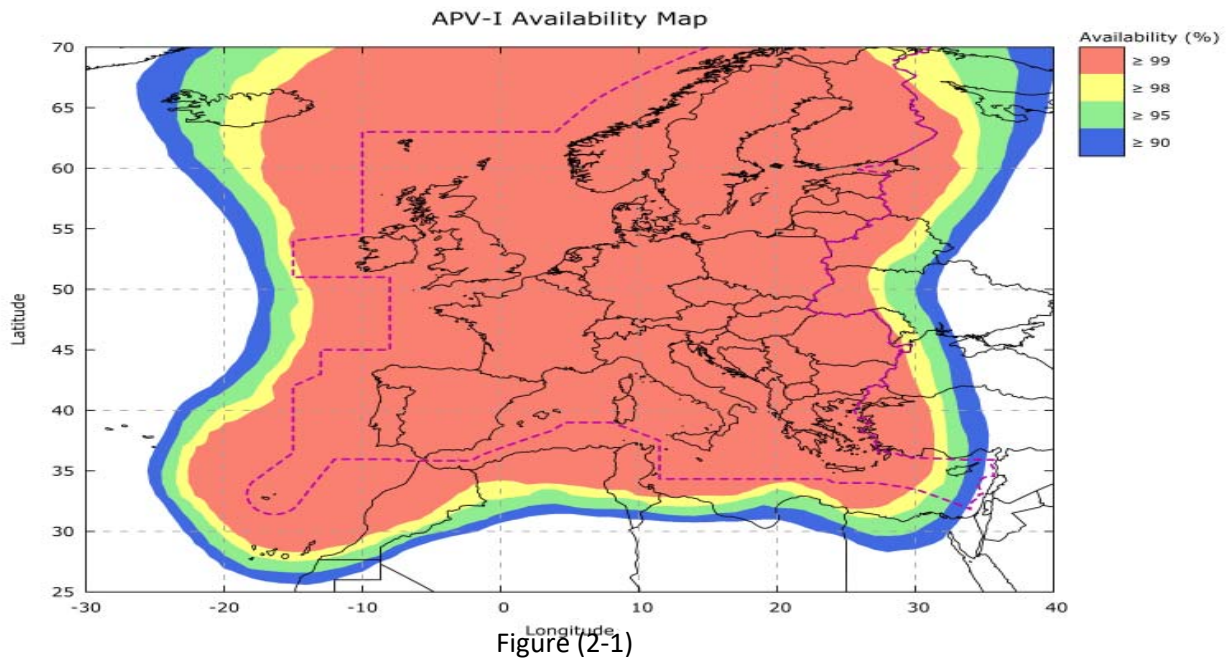
The requirements to use EGNOS services are as follow:

- a) Installation of additionnel RIMS, three RIMS Stations are sufficient to extend the service to EURCOMED States.
- b) Air Navigation Service Providers should sign an EGNOS Working Agreement (EWA) with the ESSP (Certified provider of Safety of Life service in aviation in EU) to be able to activate use of EGNOS SoL.
- c) International bilateral agreements should be signed between EU and each State to define liability in case of EGNOS failure which results in death/injury/loss/damage to equipment.

EGNOS Service Maps

The current service maps shown in the figures (2-1, 2-2, 2-3 and 2-4), the current availability and continuity for APV-I and LPV service level in the MID Region are less than the minimum required signal-in-space performance specified in Annex 10 Vol. I., the requirements are shown in table (2-2)

a) APV-I Service Level



b) LPV200 Service Level

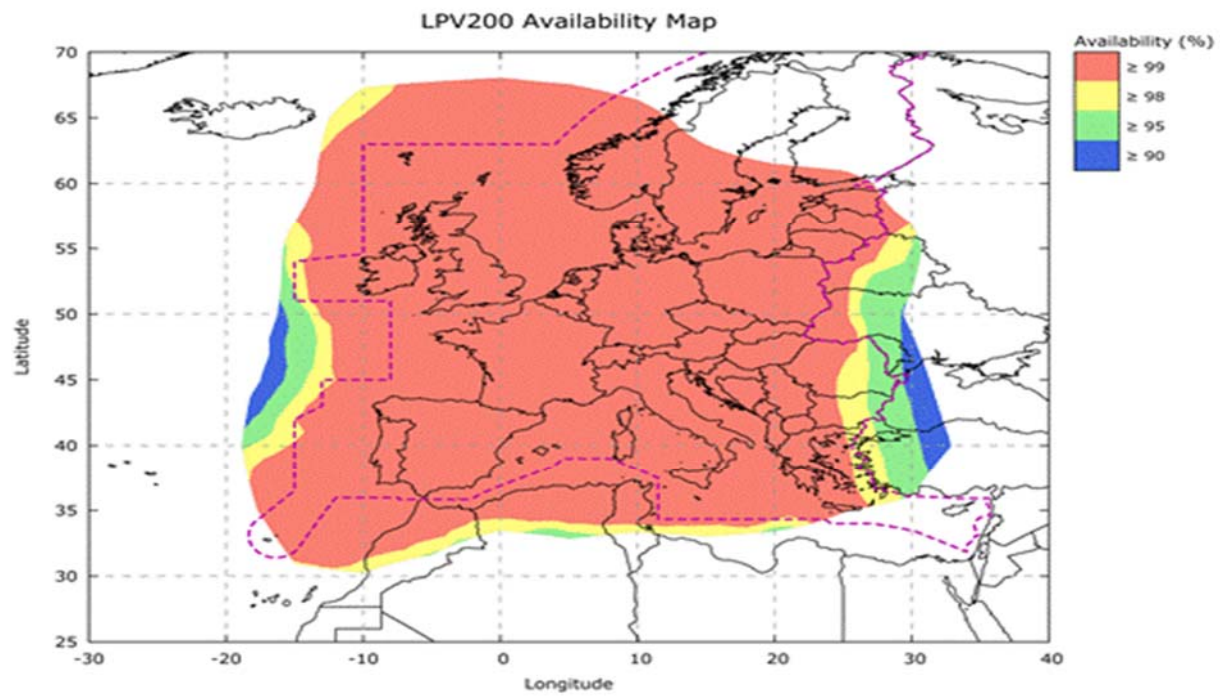


Figure (2-3)

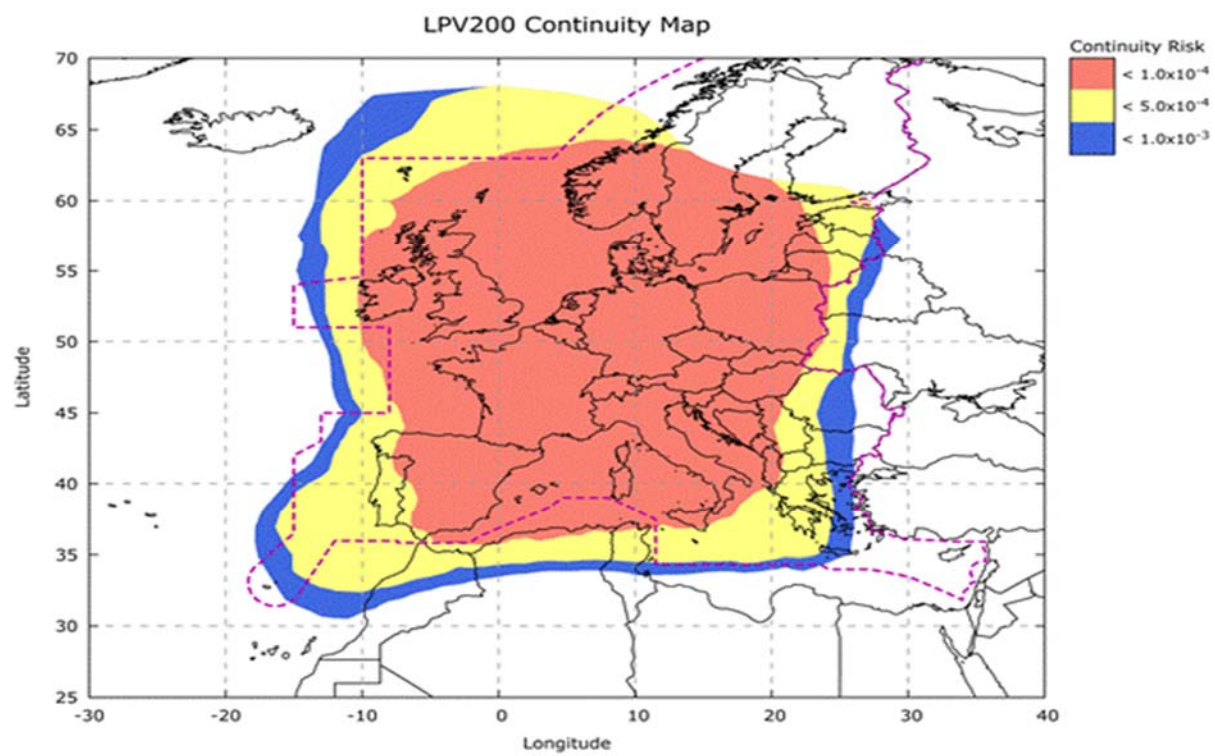


Figure (2-4)

Typical operation	Accuracy horizontal 95% (Notes 1 and 3)	Accuracy vertical 95% (Notes 1 and 3)	Integrity (Note 2)	Time-to-alert (Note 3)	Continuity (Note 4)	Availability (Note 5)
En-route	3.7 km (2.0 NM)	N/A	$1 - 1 \times 10^{-7}/h$	5 min	$1 - 1 \times 10^{-4}/h$ to $1 - 1 \times 10^{-8}/h$	0.99 to 0.99999
En-route, Terminal	0.74 km (0.4 NM)	N/A	$1 - 1 \times 10^{-7}/h$	15 s	$1 - 1 \times 10^{-4}/h$ to $1 - 1 \times 10^{-8}/h$	0.99 to 0.99999
Initial approach, Intermediate approach, Non-precision approach (NPA), Departure	220 m (720 ft)	N/A	$1 - 1 \times 10^{-7}/h$	10 s	$1 - 1 \times 10^{-4}/h$ to $1 - 1 \times 10^{-8}/h$	0.99 to 0.99999
Approach operations with vertical guidance (APV-I)	16.0 m (52 ft)	20 m (66 ft)	$1 - 2 \times 10^{-7}$ in any approach	10 s	$1 - 8 \times 10^{-6}$ per 15 s	0.99 to 0.99999
Approach operations with vertical guidance (APV-II)	16.0 m (52 ft)	8.0 m (26 ft)	$1 - 2 \times 10^{-7}$ in any approach	6 s	$1 - 8 \times 10^{-6}$ per 15 s	0.99 to 0.99999
Category I precision approach (Note 7)	16.0 m (52 ft)	6.0 m to 4.0 m (20 ft to 13 ft) (Note 6)	$1 - 2 \times 10^{-7}$ in any approach	6 s	$1 - 8 \times 10^{-6}$ per 15 s	0.99 to 0.99999

NOTES.—

1. The 95th percentile values for GNSS position errors are those required for the intended operation at the lowest height above threshold (HAT), if applicable. Detailed requirements are specified in Appendix B and guidance material is given in Attachment D, 3.2.
2. The definition of the integrity requirement includes an alert limit against which the requirement can be assessed. For Category I precision approach, a vertical alert limit (VAL) greater than 10 m for a specific system design may only be used if a system-specific safety analysis has been completed. Further guidance on the alert limits is provided in Attachment D, 3.3.6 to 3.3.10. These alert limits are:

Table (2-2)

2-2 GAGAN

Gulf region falls within the GAGAN GEO footprint as shown in figure (2-5), GCC States can take advantage of GAGAN infrastructure to implement the RNP 0.1 and APV 1 service in the respective states without having the full SBAS infrastructure in their country.

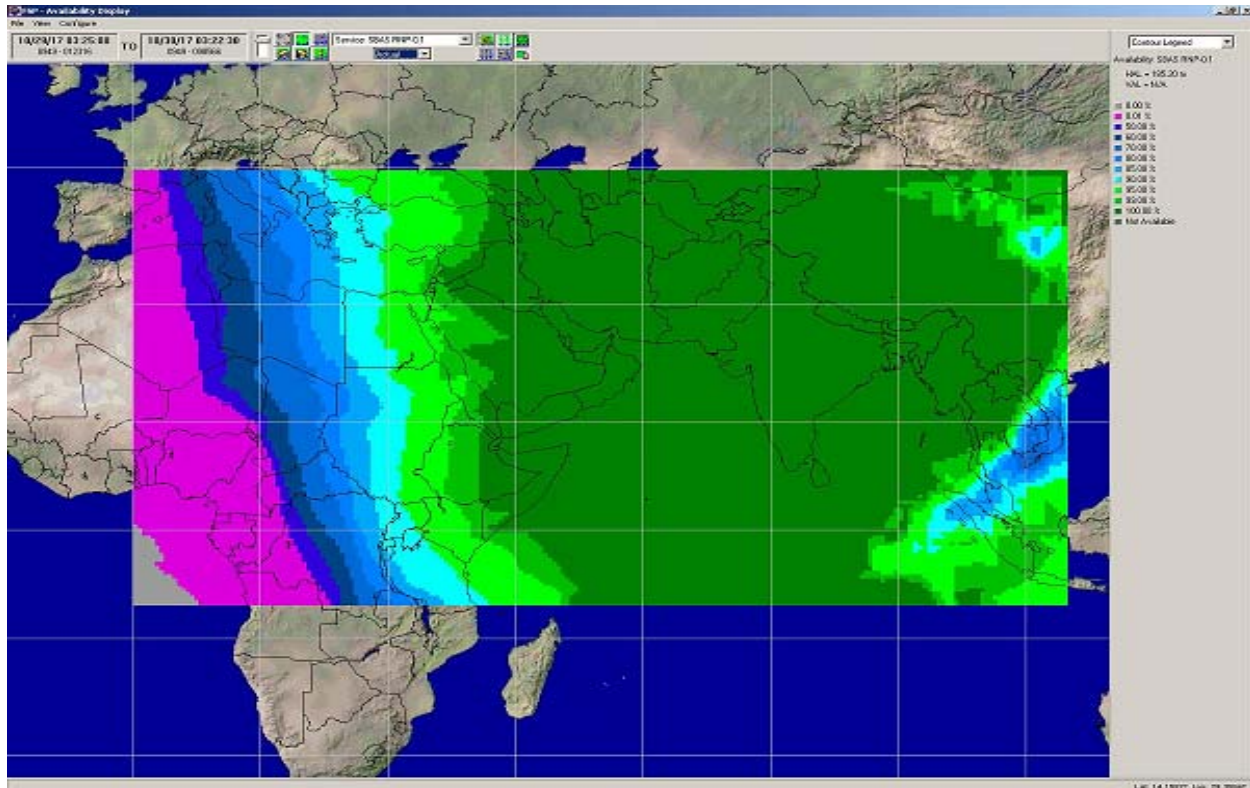


figure (2-5)

India and Gulf regions are on equatorial anomaly region. Ionosphere Scintillation is most intense and most frequent in that equatorial region. It can severely affects the performance of SBAS, Therefore, An MLDF (Multi-Layer Data Fusion) iono model suitable to serve the equatorial anomaly region was implemented in GAGAN system .

The Requirements to use GAGAN as follow:

- 1- Installing additional reference stations at strategic locations in gulf region and forward the measurements data to GAGAN-INMCC, RNP 0.1/APV 1 services can be extended to gulf region.
- 2- States to notify Indian Airport Authority (IAA) about their interest to use GAGAN

3-GNSS Application in the MID Region

The GNSS is the foundation for the Regional implementation of PBN, Automatic dependent surveillance (ADS-B), the Multilateration System (MLAT), in addition to many other aircraft and ground applications that require position or time information.

4-GBAS

Transition from ILS to GBAS should be based on an economic assessment, an operational assessment and from a safety and security perspective. Cost benefits analysis should be conducted taking on consideration that one GBAS can be used for several runways ends and even in some cases more than one Airports.

5- Cost Benefits Analysis

The use of GNSS in PBN applications reduces the overall running cost of Navigation infrastructure. Also deploying GBAS reduces the cost for ground infrastructure since a single GBAS ground station can provide approach guidance to all runways at an airport. GBAS can increase the Airport capacity, because it does not have sensitive areas that must be protected. However, the CBA is very dependent on specific operational and airport infrastructure aspects.

States may consider the following factors during the process of estimating the cost associated with competing alternative in CBA:

- a) CAPEX
 - a.1 Installation Cost;
 - One GBAS costs around 1.5 -2 M euro (equal to the cost of 3 ILSs).
 - ILS(s) must be retained to ensure the service continuity during the GNSS/GBAS outage.
 - a.2 Training for operational and technical staff.
- b) OPEX
 - c.1 Cost of Flight Check (Calibration).
 - c.2 Maintenance costs (Preventive, Reactive, maintenance Contract, less Spare parts).

It has been reported by several CBA studies, that GBAS initial investment is higher than for ILS, and lower OPEX. However, Net Present Cost need to be calculated based on Airport infrastructure and operational requirements.

6- GBAS Implementation in the MID Region

Currently GBAS is not implemented in the MID Region.

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PART III: GNSS VULNERABILITIES

1- Introduction

GNSS signals are very weak at the receiver antenna therefore the signal is vulnerable, and also susceptible to ionosphere effects. Current GNSS use a single frequency band common to GPS, GLONASS and SBAS. This makes it easier to intentionally jam GNSS signals.

2- Unintentional Interference Sources

There are a number of sources of potential interference to GNSS, including mobile and fixed VHF communications, Solar effect and other sources. The likelihood and operational effect of interference vary with the environment.

Unintentional interference is not considered a significant threat provided that States exercise proper control and protection over the electromagnetic spectrum for both existing and new frequency allocations.

2-1 Solar Effect

GNSS signals are delayed by varying amounts of time depending on the density of ionized particles (ionosphere) which itself depends on the intensity of solar radiation and other solar energy bursts. The solar activity can cause GNSS service to be degraded or temporarily lost.

The type and severity of ionospheric effects vary with the level of solar activity, the region of the world and other factors such as time of year and time of day. Rare solar storms can affect GNSS service over a wide area. The Solar activity peaks happens every eleven years.

The availability of a second frequency will allow avionics to calculate ionospheric delay in real time, effectively eliminating a major error source.

2-2 Radio Frequency Interference

Harmonics of television stations, certain radars, mobile satellite communications and military systems can cause interference with GNSS signals.

2-3 On-board systems

Many reported instances of GNSS interference have been traced to on-board systems; such interference can be prevented by installing advanced avionics.

3-Intentional Interference Sources

3-1 Jamming

Personal privacy devices (PPDs) have been recognized as being responsible for causing interference to GPS receivers in many occurrences. The intention of PPDs is to protect the privacy of the user so that the user's location is not revealed, therefore the user will not be tracked or monitored. PPDs are low-cost jammers to mask GPS signal.

3-2 Spoofing

Spoofing is the broadcast of GNSS-like signals that cause avionics to calculate erroneous positions and provide false guidance. It is considered that the spoofing of GNSS is less likely than the spoofing of traditional aids because it is technically much more complex.

Spoofing of the GBAS data broadcast is virtually impossible, because of an authentication scheme that has been developed.

4-Reducing the Likelihood of Interferences

The likelihood of interference depends on such factors as population density and the motivation of individuals or groups in an area to disrupt aviation and non-aviation services

- a) Effective spectrum management, this comprises creating and enforcing regulations/laws that control the use of spectrum and carefully assessing applications for new spectrum allocations.
- b) The introduction of GNSS signals on new frequencies will ensure that unintentional interference does not cause the complete loss of GNSS service (outage) although enhanced services depending upon the availability of both frequencies might be degraded by such interference
- c) State should develop and enforce a strong regulatory framework governing the use of intentional radiators, including GNSS repeaters, pseudolites, spoofers and jammers, should forbid the use of jamming and spoofing devices and regulate their importation, exportation, manufacture, sale, purchase, ownership and use.
- d) Multi-constellation GNSS would allow the receiver to track more satellites, reducing the likelihood of service disruption.

5- Mitigation Strategies

The disruption of GNSS signals will require the application of realistic and effective mitigation strategies to both ensure the safety and regularity of air services and discourage those who would consider disrupting aircraft operations.

There are three principal methods which can be applied in combination:

- a) taking advantage of on-board equipment, such as IRS;
- b) taking advantage of conventional navigation aids and radar; and
- c) employing procedural (aircrew and/or ATC) methods.

Mitigation of GNSS vulnerabilities needs to be balanced in the context of the overall threats to communications, navigation, and surveillance/air traffic management (CNS/ATM) operations to ensure that the applied effort is neither too small (leading to potentially unacceptable risks and/or preventing realization of GNSS enabled benefits) nor too large (in comparison with the effort expended on mitigating other risks).

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APPENDIX A

LIST OF NDBs IN THE MID REGION AND PURPOSE OF RETAIN

NO.	State	NDB ID	Purpose of retain	Plan to remove
1.	EGYPT	MB	Used at local airport for homing	Until the end of lifetime
2.	EGYPT	NWB	Used for enroute	Until the end of lifetime
3.	EGYPT	OCT	Used at local airport for homing	Until the end of lifetime
4.	IRAN	ABD		
5.	IRAN	ABM		
6.	IRAN	AJ		
7.	IRAN	ARB		
8.	IRAN	ARK		
9.	IRAN	AWZ		
10.	IRAN	BAM		
11.	IRAN	BND		
12.	IRAN	BRD		
13.	IRAN	BRG		
14.	IRAN	BRN		
15.	IRAN	BUZ		
16.	IRAN	DNZ		
17.	IRAN	DZF		
18.	IRAN	ESH		
19.	IRAN	FSA		
20.	IRAN	GGN		
21.	IRAN	GSN		
22.	IRAN	HAB		
23.	IRAN	HAM		
24.	IRAN	HAS		
25.	IRAN	IFN		
26.	IRAN	IKA		
27.	IRAN	ILM		
28.	IRAN	ISR		
29.	IRAN	JAM		
30.	IRAN	JIR		
31.	IRAN	JRM		
32.	IRAN	JSK		
33.	IRAN	KAZ		
34.	IRAN	KER		
35.	IRAN	KHG		
36.	IRAN	KHM		
37.	IRAN	KHY		
38.	IRAN	KIH		
39.	IRAN	KLH		
40.	IRAN	KMS		
41.	IRAN	KRD		

42.	IRAN	LAM		
43.	IRAN	LAR		
44.	IRAN	LEN		
45.	IRAN	LVA		
46.	IRAN	MSD		
47.	IRAN	NSR		
48.	IRAN	OMD		
49.	IRAN	PAD		
50.	IRAN	PIM		
51.	IRAN	PRG		
52.	IRAN	PSR		
53.	IRAN	RAF		
54.	IRAN	RST		
55.	IRAN	SAV		
56.	IRAN	SBZ		
57.	IRAN	SHD		
58.	IRAN	SHR		
59.	IRAN	SIR		
60.	IRAN	SKD		
61.	IRAN	SMN		
62.	IRAN	SNJ		
63.	IRAN	SR		
64.	IRAN	SRN		
65.	IRAN	SRS		
66.	IRAN	TBS		
67.	IRAN	TBZ		
68.	IRAN	UMH		
69.	IRAN	VR		
70.	IRAN	YSJ		
71.	IRAN	YZD		
72.	IRAN	ZAJ		
73.	IRAN	ZAL		
74.	IRAN	ZD		
75.	IRAQ	ALI		
76.	JORDAN	AQC		
77.	JORDAN	MDB		
78.	JORDAN	QA		
79.	Lebanon	BOD	Used by Helicopters and light aircraft	Not Determined
80.	LIBYA	BNA		
81.	LIBYA	CW		
82.	LIBYA	GAD		
83.	LIBYA	GAL		
84.	LIBYA	GHT		
85.	LIBYA	GRT		
86.	LIBYA	GS		
87.	LIBYA	HON		

88.	LIBYA	IZD		
89.	LIBYA	JFR		
90.	LIBYA	KDR		
91.	LIBYA	KFR		
92.	LIBYA	KH		
93.	LIBYA	LAB		
94.	LIBYA	MB		
95.	LIBYA	OA		
96.	LIBYA	OB		
97.	LIBYA	OJ		
98.	LIBYA	OR		
99.	LIBYA	OV		
100.	LIBYA	OXY		
101.	LIBYA	PRB		
102.	LIBYA	PRC		
103.	LIBYA	RAG		
104.	LIBYA	ROO		
105.	LIBYA	SAH		
106.	LIBYA	SEB		
107.	LIBYA	SRT		
108.	LIBYA	STF		
109.	LIBYA	TRO		
110.	LIBYA	TZR		
111.	LIBYA	UBR		
112.	LIBYA	VA		
113.	LIBYA	VG		
114.	LIBYA	VH		
115.	LIBYA	VO		
116.	LIBYA	VR		
117.	LIBYA	WF		
118.	LIBYA	WLD		
119.	LIBYA	XS		
120.	LIBYA	XY		
121.	LIBYA	ZAR		
122.	LIBYA	ZEL		
123.	LIBYA	ZT		
124.	LIBYA	ZUE		
125.	QATAR	AK		
126.	QATAR	QPC	Used for Qatar Petroleum Company	-
127.	SYRIA	ABD		
128.	SYRIA	ALE		
129.	SYRIA	DAL		
130.	SYRIA	DAN		
131.	SYRIA	DRZ		
132.	SYRIA	HAS		

133.	SYRIA	KAM		
134.	SYRIA	KAR		
135.	SYRIA	LTK		
136.	SYRIA	MER		
137.	SYRIA	MEZ		
138.	SYRIA	PAL		
139.	UAE	BH		
140.	UAE	JD		
141.	UAE	RNZ		
142.	UAE	ZKU		
143.	YEMEN	BDE		
144.	YEMEN	GDA		
145.	YEMEN	HD		
146.	YEMEN	MRB		
147.	YEMEN	SCT		
148.	YEMEN	SYE		
149.	YEMEN	SYN		
150.	YEMEN	TZ		

NUMBER OF RETAINED NDBs PER STATES

STATE	NUMBER OF NDBs
EGYPT	3
IRAN	71
IRAQ	1
JORDAN	3
LEBANON	1
LIBYA	45
QATAR	2
SYRIA	12
UAE	4
YEMEN	8
TOTAL	150

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 – 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

SURVEILLANCE MATTERS

(Presented by the Secretariat)

SUMMARY

This paper highlights the need for Training on Mode S IC Code Allocation (MICA) tool and presents the draft MID Region Surveillance Plan.

Action by the meeting is at paragraph 3.

1. INTRODUCTION

1.1 The Middle East Secondary Surveillance Radar (SSR) Code Management Plan (CMP) was endorsed by MIDANPIRG/13 through Conclusion 13/7, based on the outcome of the SSR Code Allocation Study Group (SSRCA SG).

1.2 MIDANPIRG/15 through Conclusion 15/32, endorsed the “MID Region Process for Mode S Interrogator Codes Allocation” as MID Doc 005, which is used for the allocation of the Mode S IC codes in the MID Region.

2. DISCUSSION

Surveillance/MICA Workshop

2.1 The meeting may wish to recall that MIDANPIRG/16 noted that MICA process is still not fully implemented/followed by some States, therefore, the meeting agreed to the following Conclusion:

CONCLUSION 16/22: MODE S INTERROGATOR CODE (IC) ALLOCATION

That, States, that have not yet done so, be urged to:

- a) provide the ICAO MID Office with their Mode S Interrogator Code (IC) Focal Points; and*
- b) register to the MICA application for the allocation of the Mode.*

2.2 During the past years of MICA operations, the need to conduct MICA Training for Operators from MID States was recognised. Therefore, the MID Office agreed with EUROCONTROL to organize a Surveillance/MICA Workshop in 2019.

MID Region Surveillance Plan

2.5 The meeting may wish to recall that MIDANPIRG/16, through Conclusion 16/23 agreed that a comprehensive MID Region Surveillance Plan should be developed by the CNS SG in coordination with the ATM SG, taking into consideration the Users' and States' operational needs and requirements.

DECISION 16/23: MID REGION SURVEILLANCE PLAN

That, the MID Region Surveillance Plan be developed by the CNS SG, based on the operational needs identified by the ATM SG.

2.6 The CNS SG/8 meeting reviewed the MID Region Surveillance plan developed by the Secretariat and agreed that the plan needs further improvements. Accordingly, the meeting developed the following Draft Conclusion:

DRAFT CONCLUSION 8/9: MIDREGION SURVEILLANCE PLAN

That, States review the Draft MID Region Surveillance Plan at Appendix 4G, and provide the ICAO MID Office with their comments/inputs by 15 April 2018 in order to present the consolidated version to the ATM SG/4 and ANSIG/3 meetings for further review and improvement.

2.7 As a follow-up action, the ICAO MID Office circulated the draft MID Region Surveillance Plan. Replies received from four (4) States (Bahrain, Egypt, Jordan, and Qatar). States inputs have been incorporated into the plan as at **Appendix A**.

2.8 Furthermore, the ATM SG/4 reviewed the Draft MID Region Surveillance Plan, and the meeting agreed that ADS-B OUT would be used in the MID Region either to fill the gaps where radar coverage is not available or to be used as back up to the surveillance system in place.

2.9 Based on all the above, the meeting is invited to endorse the following Draft Conclusion:

DRAFT CONCLUSION 6/XX: MID REGION SURVEILLANCE PLAN AND WORKSHOP

That, with a view to provide MICA Operators with necessary knowledge to implement MICA processes efficiently, and in order to develop a comprehensive Surveillance Plan in the MID Region:

- a) a Surveillance/MICA Workshop with support of EUROCONTROL be organised in February 2019;*
- b) States be invited to participate actively in the Workshop; and*
- c) the Draft MID Region Surveillance Plan be reviewed/updated during the Surveillance/MICA Workshop and presented to the MIDANPIRG/17 for endorsement.*

3. ACTION BY THE MEETING

3.1 The meeting is invited to endorse, as appropriate, the Draft Conclusion at para. 2.9



MID Region Surveillance Plan

Version 0.2

24/4/2018

Developed by

COMMUNICATION, NAVIGATION AND SURVEILLANCE SUB-GROUP
(CNS SG)

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1- BACKGROUND

Aeronautical surveillance systems are major elements of modern air navigation infrastructure required to safely manage increasing levels and complexity of air traffic. The sixteenth meeting of Air Navigation Planning and Implementation Regional Group in the Middle East (MIDANPIRG/16) tasked the CNS SG through Decision 16/24 to develop the MID Region Surveillance Plan based on the Regional operational requirements, Users' capabilities and specificities of the Region:

DECISION 16/ 23: MID REGION SURVEILLANCE PLAN

That, the MID Region Surveillance Plan be developed by the CNS SG, based on the operational needs identified by the ATM SG.

The global Air Navigation Plan (GANP) through B0-ASUR, defined the possibility of using lower cost ground surveillance supported by new technologies such as ADS-B OUT and Wide Area Multilateration (MLAT) systems.

This document reviews the available surveillance technologies and highlight their strengths and weaknesses. The plan timelines are divided into three stages; short-term until 2020, mid-term from 2021 to 2025, and long-term beyond 2025.

2- INTRODUCTION

The surveillance service delivered to users may be based on a mix of three main types of surveillance:

- a) independent non-cooperative surveillance: the aircraft position is derived from measurement not using the cooperation of the remote aircraft; like Primary Surveillance Radar (PSR);
- b) independent cooperative surveillance: the position is derived from measurements performed by a local surveillance subsystem using aircraft transmissions. Aircraft derived information (e.g., pressure altitude, aircraft identity) can be provided from those transmissions, like Secondary Surveillance Radar (SSR) and Multilateration; and
- c) dependent cooperative surveillance: the position is derived on board the aircraft and is provided to the local surveillance subsystem along with possible additional data (e.g., aircraft identity, pressure altitude). Like Automatic Dependent Surveillance-Broadcast (ADS-B) and Automatic Dependent Surveillance-Contract (ADS-C).

The main applications of ATC Surveillance in civil aviation are:

- 1- Aerodrome Control Service;
- 2- Approach Control Service; and

- 3- Area Control Service.
- 4- Surface/ Ground Management

3- SURVEILLANCE IN GANP

The GANP addressed the emerging Surveillance technologies through the thread Alternative Surveillance in block 0 (B0-ASUR), the technologies laid down in that module are ADS-B Out and MLAT.

The lower costs of dependent surveillance infrastructure (ADS-B and MLAT) in comparison to conventional radars support business decisions to expand radar-equivalent service volumes and the use of radar-like separation procedures into remote or non-radar areas.

The eleventh Air Navigation Conference recommended ADS-B on 1090MHz for international use and this is happening. Equipage rate is growing together with Mode S, airborne collision avoidance system (ACAS) and ADS-B OUT mandates. ADS-B OUT, Version 2 also provides ACAS RA DOWNLINK information.

The GANP Surveillance roadmap is depicted in figure (1).

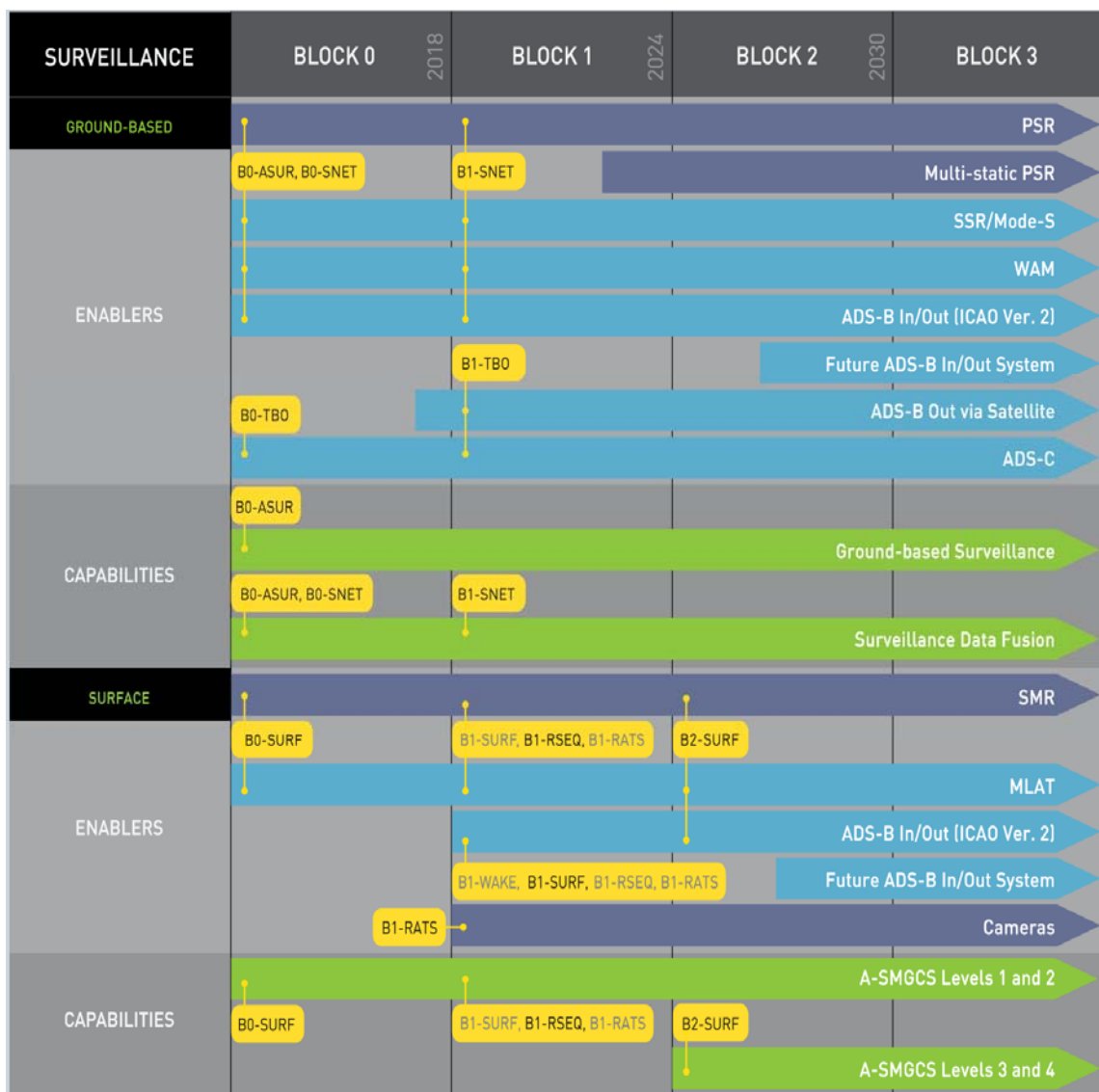


Figure (1)

4- SURVEILLANCE TECHNOLOGIES

4-1 PRIMARY RADAR

Primary Surveillance Radar (PSR) derives aircraft position based on radar echo returns, PSR transmits a high-power signal, some of which is reflected by the aircraft back to the radar. The radar determines the aircraft's position in range from the elapsed time between transmission and reception of the reflection.

Surface Movement Radar (SMR) is the most widely used non-cooperative surveillance system for aerodrome surveillance. SMR is a primary radar that provides surveillance cover for the manoeuvring area, which is defined as that used for the take-off, landing

and taxiing of aircraft. In A-SMGCS, the non-cooperative surveillance service is typically provided by one or several SMRs.

Millimetre radar is an emerging technology used for aerodrome surveillance which provides higher resolution than traditional SMR. Millimetre Radar and SMR can be used for FOD Detection.

The strengths and weaknesses below are related to the PSR.

4-1-1 Strengths

- ✚ independent Radar, does not require any specific equipment of the aircraft (Transponder).

4-1-2 Weaknesses

- ✚ does not provide the identity or the altitude of the Aircraft
- ✚ cannot be easily sited in oceanic locations, or rough terrain such as in mountainous regions
- ✚ PSR has a heavy reliance on mechanical components with large maintenance requirements
- ✚ high CAPEX
- ✚ can report false target
- ✚ depends on the cross section of the target
- ✚ Silence Cone

4-2 SECONDARY SURVEILLANCE RADAR (SSR/MSSR)

A surveillance radar system which uses transmitters/receivers (interrogators) and transponders.

4-2-1 Strengths

- ✚ receive aircraft data for barometric altitude, identification code
- ✚ depends on Reply pulses, which are stronger than echo signals used in Primary Radar.
- ✚ Separate frequency spectrum for transmission and reception, Clutter reduction

4-2-2 Weaknesses

- ✚ high CAPEX
- ✚ cannot be easily sited in oceanic locations, or rough terrain such as in mountainous regions
- ✚ has a heavy reliance on mechanical components with large maintenance requirements
- ✚ Silence Cone

4-3 MODE S RADAR

An enhanced mode of SSR that permits selective interrogation and reply capability.

4-3-1 Strengths

- ✚ improve shortage and constraints in Mode a codes (Aircraft ID)
- ✚ backward compatible with transponder mode A/C
- ✚ ability to download enhance surveillance information
- ✚ increase in data integrity by the use of a parity check mechanism.
- ✚ high parametric altitude accuracy (Coding of altitude data in 25-foot increments).

4-3-2 Weaknesses

- ✚ has a heavy reliance on mechanical components with large maintenance requirements
- ✚ cannot be easily sited in oceanic locations, or rough terrain such as in mountainous regions
- ✚ high CAPEX
- ✚ Silence Cone

4-4 ADS-B

Dependent surveillance is an advanced surveillance technology that allows avionics to broadcast an aircraft's identification, position, altitude, velocity, and other information.

4-4-1 Strengths

- ✚ improve shortage and constraints in Mode a codes (Aircraft ID)
- ✚ Low cost
- ✚ Easy to maintain
- ✚ The non-mechanical nature of the ADS-B ground infrastructure make it easy to relocate and maintain.
- ✚ it to be sited in locations that are difficult for radar installations, like hilly areas, filling the surveillance gap between radar coverage
- ✚ provide radar-like separation procedures into remote or non-radar areas
- ✚ Use of dependent surveillance also improves the search and rescue support provided by the surveillance network, ADS-B's positional accuracy and update rate allows for improved flown trajectory tracking allowing for early determination of loss of contact and enhances the ability for search and rescue teams to pinpoint the related location
- ✚ no Silence Cone

4-4-2 Weaknesses

- ✚ aircraft must be equipped with ADS-B OUT
- ✚ dependent on GNSS, outage of GNSS affect ADS-B

4-5 ADS-C

The aircraft uses on-board navigation systems to determine its position, velocity and other data. A ground ATM system establishes a “contract” with the aircraft to report this information at regular intervals or when defined events occur. This information is transmitted on point-to-point data links.

4-5-1 Strengths

- ✚ can be easily sited in oceanic locations, or rough terrain such as in mountainous regions
- ✚ does not need ground infrastructure
- ✚ minimal cost at ANSP
- ✚ use of dependent surveillance also improves the search and rescue support provided by the surveillance network

4-5-2 Weaknesses

- ✚ high cost per report, as the airline use third party network.
- ✚ long latency when satellite used.

The ADS-C used in Oceanic and remote areas (non-Radar area), therefore, it will be excluded in the next section as it's not applicable in the MID Region.

4-6 MLAT

MLAT is a system that uses currently existing aircraft transponder signals to calculate, usually as a minimum, a three-dimensional position. It requires a minimum of four receiving stations to calculate an aircraft's position. If the aircraft's pressure altitude is known then the position may be resolved using three receiving stations.

MLAT can act in two modes; Passive mode where it uses the existing transmissions made by the aircraft, or active mode, to trigger replies in the manner of Mode S SSR interrogations.

The technique is used to provide surveillance over wide area (wide area MLAT system - WAM).

4-6-1 Strengths

- ✚ can make use of currently existing aircraft transmissions, does not requires specific avionic.
- ✚ improve shortage and constraints in Mode A codes (Aircraft ID)
- ✚ provides a transition to an environment where the majority of aircraft will be equipped with ADS-B.
- ✚ no Silence Cone.

4-6-2 Weaknesses

- ✚ requires multiple sensors to calculate aircraft's positions
- ✚ high running cost; including maintenance; telecommunication; multiple secured sites
- ✚ needs a common time reference to determine the relative TOA of the signal at the receiving stations (time-stamped by a common clock or synchronism by a common reference such as GNSS)

4-7 SURVEILLANCE CAMERAS

Surveillance Camera can be used to send High-resolution images at the airport to a workstation in the control tower. Surveillance Camera is an enabler to run remotely aerodrome control as in ASBU module B1-RATS. The air traffic controller can monitor air traffic via screens which provide an image that corresponds to the view through the window in a traditional control tower.

5- COMPARISON BETWEEN SURVEILLANCE TECHNOLOGIES

	MSSR	Mode S	ADS-B	MLAT
1)Required Avionics	Mode A/C	Mode S transponder	ADS-B or 1090 ES (Mode S + ADS-B)	Can process data from all ADS-B/ES, Mode S, Mode A/C
2)Information Provided	mode A codes, Pressure altitude	mode A codes; Pressure altitude; 24-bit address of the aircraft; aircraft “on-the-ground” status; aircraft ID; aircraft pressure-altitude with 25-ft resolution; and other information	Position, flight level (barometric), position integrity, geometric altitude (GPS altitude), 24 bit unique code, Flight ID, velocity vector, vertical rate, emergency flags, aircraft type category	Position, flight level (barometric), calculated altitude, 4 digit octal identity, calculated velocity vector +mode s data
3)Accuracy & update rate	moderately high update rate high accuracy (Less than 30 m)	Moderately high update rate high accuracy (Less than 30 m)	High accuracy (Less than 30 m), inherent accuracy of the GPS determined position, and very high update rate	High accuracy at Local Area (LAM), less accurate for Wide Area (WAM) GNSS is critical for MLAT
4)Coverage	250 NM	250 NM	250 NM	**Depending on the geometry, covering 250NM may require 15 sensors as

				average, hilly areas requires more
5) Failure effect	Total loss of coverage	Total loss of coverage	Total loss of coverage	Partial or negligible, (N-1) principle
6) Cost*				
6.1 CAPEX				
Sensor Purchase	3 M \$	4 M\$	300 K\$	Depending on geometry, for 15 sensors average cost is 5M\$
Site requirement (Civil work, renting/buying land(s), fence,..., etc.)	One site required High cost of the tower	One site required High cost of the tower	One site required Cost less	15 sites required
6.2 OPEX				
Maintenance cost (periodic, preventive, emergency)	Heavy maintenance (mechanical parts)	Heavy maintenance (mechanical parts)	Less maintenance cost	High maintenance costs to multiple sites (15)
Telecommunication media	Dual Telecom. connections Required From the sensor site to the ATM centre	Dual Telecom. connections Required From the sensor site to the ATM centre	Dual Telecom. connections Required From the sensor site to the ATM centre	Multiple (15) Dual Telecom. connections Required From the sensor site to the ATM centre
Site physical Security	One secured site	One secured site	One secured site	Multiple (15) secured Site

**The cost does not take into consideration fleet equipage cost*

*** Number of MLAT sensor depends on geometry area and number of clusters, 15 sensors is an estimated number to cover flat 250 NM.*

DRAFT

6. OPERATIONAL REQUIREMENTS

To be added by ATM SG

Airspace capacity requirements

Surveillance Gap areas exists in the Region

7. BASELINE IN THE MID REGION (24/4/2018)

- All MID State uses SSR/MSSR, some States Uses PSR for Security and Safety purposes.
- Bahrain, Egypt, Oman and UAE implemented MLAT at International Aerodromes
- ADS-B has been implemented at some States as backup and complementary means to the MSSR in Egypt, Jordan, Sudan and UAE.
- Bahrain has implemented ADS-B for Vehicle Tracking purpose.
- Bahrain, Egypt, Jordan, Oman, Sudan and UAE have installed SSR Mode S
- UAE issued ADS-B/Out carriage Mandate as of 01 January 2020, ADS-B IN capability shall not be carried unless approved by the GCAA.
- Other ICAO Regions/States mandated carriage of ADS-B; Australia, Europe and United States (FAA) in 2020.
- Several ADS-B mandates worldwide will accelerate the ADS-B equipage. However, Regional Airline, General flights and Military aircraft impeding the ADS-B implementation in the MID Region.

8- SURVEILLANCE PLAN

8.1 Short Term (2018 – 2020)

- Make full use of SSR Mode 'S' capabilities, reduce reliance on 4-digit octal code.
- States to consider emerging dependent Surveillance technologies (ADS-B and MLAT) in their National Surveillance Plans.
- ADS-B/Out Implementation:
 - 1- Prioritize ADS-B/Out implementation in areas where there is no radar coverage surveillance.
 - 2- State should conduct safety assessment for ADS-B/ MLAT implementation as per *Reference [5]*.
 - 3- The proportions of equipped aircraft are critical for the ADS-B deployment, therefore, States should early involve Users, communicate the change, the rationale and the impact.

- 4- States are encouraged to use INCENTIVE strategy with stakeholders to accelerate ADS-B equipage; incentive approach might be financial or operational incentive or combined (e.g. Most Capable Best Served principle, waive fees).
- MLAT/SMR to be implemented at Aerodrome to enable A-SGMCS and approach

8.2 Mid Term (2021-2024)

- ADS-B/Out Implementation (*High proportion of ADS-B equipage is anticipated*):
 - 1- ADS-B to be implemented for Area and approach Control Services, where implementation would bring capacity and operational efficiencies;
 - 2- Relocate, as appropriate, WAM Sensors to work as ADS-B receivers.
- States to share Radar/ADS-B data to improve boundary coverage and enhance the surveillance availability.
- Retain SSR Mode S Radar as backup to ADS-B
- MLAT/SMR/Camera to be implemented at Aerodrome for Ground/Surface Management service.
- Surveillance Camera can be used to operate Remote Control Tower (B1-RTAS).

8.3 Long Term (2025 Onward)

- ADS-B is foreseen to be main Surveillance technology. The existence of Multi-constellation GNSS (GPS, Galileo, GLONASS, ..., etc.) reduces the likelihood of ADS-B outage.
- Implementation of Airborne Collision Avoidance System (ACAS) adapted to trajectory-based operations with improved surveillance function supported by ADS-B aimed at reducing nuisance alerts and deviations.
- Airlines to upgrade ADS-B/Out Avionic to ADS-B in/out.

REFERENCES

- [1] ICAO Annex 10, Aeronautical Telecommunication.
- [2] ICAO Doc 9924, Aeronautical Surveillance Manual
- [3] The Aviation System Block Upgrade Doc, July, 2016.
- [4] ICAO Doc 9871, Technical Provisions for Mode S Services and Extended Squitter.
- [5] ICAO circular 326, Assessment of ADS-B and Multilateration Surveillance to Support Air Traffic Services and Guidelines for Implementation
- [6] EUROCONTROL Standard Document for RADAR Surveillance in EN-Route Airspace and Major Terminal Areas.
- [7] Guidance Material on Comparison of Surveillance Technologies (GMST), APAC Region.

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

CYBER SECURITY

(Presented by the Secretariat)

SUMMARY

This paper presents the cyber security progress in the Region and proposes organizing Cyber Security and Resilience Seminar for Aviation Security and safety streams.

Action by the meeting is at paragraph 3.

1. INTRODUCTION

1.1 The twelfth amendment of Annex 17 included provisions to further strengthen Standards and Recommended Practices in order to address new and emerging threats to civil aviation. The amendment included, inter-alia, deployment of security equipment; security of air traffic service providers; and cyber threats.

1.2 The 39th Session of the ICAO Assembly called for a coordinated approach to cybersecurity. The Resolution A39-19; sets out the actions to be undertaken by States and other stakeholders to counter cyber threats to civil aviation through a cross-cutting, horizontal and collaborative approach.

2. DISCUSSION

2.1 The future ATM would extensively rely on data exchange and system interoperability; the ATM data security becomes crucial to the continuity of the ATM operations.

2.2 In this vein, MIDANPIRG/16 through Decision 16/26 agreed to establish the ATM DATA Security Action Group (ADSAG) to develop the MID Region ATM Data Security Plan.

DECISION 16/ 26: ATM DATA SECURITY ACTION GROUP

That, the ATM Data Security Action Group (ADSAG) be:

- a) established to develop the MID Region ATM Data Security Plan, to be presented to the CNS SG/8; and
- b) composed of members from Bahrain, Iran, Kuwait, Oman, Saudi Arabia, UAE (Rapporteur), ICAO and IFAIMA

2.3 The ADSAG has been working to develop the MID Region ATM Data Security plan. The plan would include the following parts:

- a) Security Regulations;
- b) Physical Security
- c) ICT Cyber Security baseline
- d) Disaster Recovery

2.4 The meeting may recall that UAE presented the Minimum Security Baseline documents (MSBs) to the CNS SG/8 meeting. The meeting reviewed and agreed that the MSBs be included to the MID Region ATM Data Security as ICT Cyber Security Baseline.

2.5 The ANSIG/3 meeting recognized the need to strengthen the Regional collective ability to detect and defend against malicious activities, by sharing information about adversaries and their behaviours through the Security portal developed by UAE. the Portal has been developed to allow ANSPs to report cyber events, as well as to share knowledge and information on cyber security incidents. Therefore, the meeting is invited to endorse the following draft conclusion:

DRAFT CONCLUSION 3/11: ATM DATA CYBER SECURITY (ADCS) PORTAL

That;

- a) *the ADCS Portal be used as a prototype platform for ATM cyber security; and*
- b) *States be encouraged to:*
 - i. *register on the ADCS Portal,*
 - ii. *provide feedback to the ADCS Admin by 29 November 2018 for further enhancements; and*
 - iii. *share their experience related to Cyber Security, through the ADCS Portal.*

2.6 In order to enrich cyber Security awareness in the Region and strengthen the ability to prepare for, respond to and recover from a cyber-attack; a Cybersecurity & Resilience Seminar is planned for 2019. The Seminar will address; inter-alia, the Cyber Security Regulatory Framework; Cyber Risk Management; Infrastructure and information Security; Proactive cyber defence; Incident management and Resilience Techniques. Therefore, the meeting is invited to agree to the following Draft Conclusion:

DRAFT CONCLUSION 6/XX: CYBER SECURITY AND RESILIENCE SEMINAR

That, in order to enrich the cyber security awareness and strengthen the cyber resilience in the MID Region, ICAO organise a Cyber Security and Resilience Seminar in 2019.

3. ACTION BY THE MEETING

3.1 The meeting is invited to endorse, as appropriate, the Draft Conclusions.



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation Issues

MET MATTERS

(Presented by the Secretariat)

SUMMARY
This paper presents an update on IWXXM implementation, establishment of the MID ROC and Wind Shear issues.
Action by the meeting is at paragraph 3.
REFERENCES
- MET SG/7 Report
- ANSIG/3 Report
- State Letter Ref.: ME 3/2.3 – 18/066 dated 21 February 2018
- State Letter Ref.: ME 3/2.3 – 18/114 dated 10 April 2018

1. INTRODUCTION

1.1 The MET SG/7 meeting (Cairo, Egypt, 14-16 November 2017) agreed to three (3) Draft Conclusions and one (1) Draft Decision; and those relevant to this meeting are described in this working paper.

2. DISCUSSION

IWXXM Implementation Survey

2.1 The meeting may wish to recall that the MET SG/7 meeting agreed to develop an IWXXM Implementation Survey in order to gather and analyse information pertaining to States' action plans for IWXXM implementation in the MID Region and present the results of the survey to MIDANPIRG/17 (MID MET SG Draft Conclusion 7/1 refers). Accordingly, the IWXXM survey was distributed to States on 10 April 2018 (State letter Ref.: ME3/2.3 – 18/114). Replies have so far been received from Five (5) States (Egypt, Jordan, Libya, Oman and Sudan). A summary of responses is at **Appendix A**.

2.2 ANSIG/3 meeting urged States, that have not yet done so, to complete the IWXXM survey and provide their feedback to the ICAO MID Office.

IWXXM Implementation Guidance Material

2.3 The meeting may wish to note that the MET SG/7 meeting agreed that the *Guidelines for the Implementation of OPMET data exchange using IWXXM* be presented to MIDANPIRG/17 for endorsement and publication as MID Doc 010 (MID MET SG Draft Conclusion 7/2 refers). This document is maintained by the Meteorology Panel (METP) Working Group on Meteorological Information Exchange (WG-MIE) and a recent update will be promulgated to Regions.

IWXXM Implementation – MID ROCs

2.4 The meeting may wish to note that the ANSIG/3 meeting recommended that the Regional OPMET Centre (ROC) Jeddah and back-up ROC Bahrain implement the exchange of OPMET data in IWXXM and consider serving as translation Centre(s).

MID ROCs Implementation – support from States

2.5 The meeting may wish to recall that in order to implement Aviation System Block Upgrade (ASBU) module B1-AMET such as IWXXM, completion of implementing B0-AMET is a prerequisite. With reference to the status of implementation of ROC Jeddah and back-up ROC Bahrain: nine (9) States (Iraq, Lebanon, Libya, Jordan, Oman, Qatar, Saudi Arabia, Sudan and United Arab Emirates) have fully implemented the appropriate OPMET exchange scheme. Four (4) States (Bahrain, Egypt, Iran and Kuwait) have partially implemented this scheme, while two (2) States (Syria and Yemen) have not started implementation in this regard. Accordingly, the ANSIG/3 meeting urged States, that have not yet done so, to complete the implementation.

Wind Shear Questionnaire

2.6 The MET SG/7 meeting agreed that the ANSIG/3 and MET SG/8 meetings should consider the inclusion of wind shear as an element of the B0-AMET in the MID Air Navigation Strategy with well identified applicability area (list of International Airports requiring implementation of wind shear systems). In parallel, necessary monitoring Tables (enablers) should be developed for inclusion in the MID eANP Vol III to support the monitoring of wind shear implementation.

2.7 To support this effort, a Wind Shear Questionnaire was developed and distributed to States on 21 February 2018 (ref.: State letter ME 3/2.3 – 18/066). Replies have so far been received from eight (8) States (Bahrain, Egypt, Iran, Kuwait, Libya, Qatar, Sudan and Yemen). A summary of responses is at **Appendix B**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) support implementation of IWXXM in the MID Region and urge States, that have not yet done so, to complete the IWXXM Survey;
- b) support implementation of ROC Jeddah and back-up ROC Bahrain;
- c) urge States, that have not yet done so, to complete the Wind Shear Questionnaire and provide their feedback to the ICAO MID Office; and
- d) agree to include Wind Shear in the MID eANP Vol III, based on the results of the survey by the Wind Shear Questionnaire.

APPENDIX A

Summary of IWXXM Implementation Questionnaire – MID Region

(Updated 7 Jun 2018)

Question\ State	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
1 AFS COM ATSMHS includes FTBP		Yes			Yes			Plan when CAA upgrades their system	Plan No Date			No			
2 AMHS direct connect AFS COM- ROC Jeddah		Yes			Yes			Yes	Plan No Coord			Yes			
3 MET switch support exchange IWXXM MET mssg Extended ATSMHS including FTBP		Plan 2018-2020			No			Plan Planning to connect the MET-Switch System with the COM-Centre	Plan End of 2018			No			
4 National OPMET data in IWXXM		Plan 2018-2020			Yes			Yes 2019	Plan No Date			No			
5 Rx OPMET data in IWXXM		Plan 2018-2020			Plan 2019			Plan When CAA upgrades their AFTN Circuit to the AMHS	Plan No Date			No			
6 Need of assistance in IWXXM impl		No			Yes Training			Yes Guidance	Yes Training			Yes Workshop			

Questions

1. Does your AFS COM-Centre plan to implement a subset of the extended Air Traffic Services Message Handling Services (ATSMHS) that includes File Transfer Body Parts (FTBP) which is required for the exchange of IWXXM messages?
2. Do you intend to establish a direct ATS Message Handling System (AMHS)-connection between your AFS COM-Centre and AFS COM-Centre of your associated Regional OPMET Centre (ROC Jeddah)?

3. Does your MET-Switch system support the exchange of IWXXM MET-messages by means of a sub-set of extended ATSMHS including File Transfer Body Parts?
4. Do you plan to provide your national OPMET data in IWXXM format?
5. Do you plan to receive OPMET data in IWXXM format?
6. Do you need any kind of assistance for IWXXM implementation?

APPENDIX B

Appendix B - Summary of Wind Shear Questionnaire – MID Region

(last updated 16 April 2018)

Question\ State	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
1	Y	Y	N		Y	Y		N		Y		Y			N
2	Y	Y	Y		Y	Y		Y		Y		Y			N
3	OBBI	HECA	N		N	OKBK		N		OTHH		HSSS			N
3a	OBBI	HECA	N		N	OKBK		N		OTHH		HSSS			N
3b	Y	Y	N		N	Y		N		N 10 min		Y			N
3c	Y	Y	N		N	Y		N		Y		Y			N
4	N/A	N	Y		N	N		N		N/A		Y			N
5	Y	Y	N		N	Y		N		N		Y			N

Systems used by States

Bahrain: Wind & Temp Profile (2016) / Aircraft observations / Forecasting using sounding.

Egypt: No system/mechanism in place to collect and disseminate information related to wind shear. But the detection equipment to detect wind shear is found only in Cairo International Airport and MWO in Cairo is responsible of issuing wind shear warnings/alerts.

Iran: In a few airports in Iran, IRIMO (I.R. of Iran Met. Org.) have ground based Doppler weather radars that can be used to alert on WS, but it can be used just in times that there is an active weather system with meteors like rain and snow on the air in order to get back radar reflectivities. Otherwise, in clear air which sometimes has considerable WS due to surface temperature/pressure differences or synoptic conditions without considerable particulate matter on the air, this is impossible.

Jordan: No

Kuwait: Not Provided

Libya: Due to the exceptional situation our country is experiencing, regulations and procedures concerning wind shear have not been established and promulgated by Aerodrome MET Offices. We shall establish and promulgate such regulations and procedures when the situation improves.

Qatar: Wind Profiler automated equipment updated every 10 minutes. *Note that WS is considered a rare event.*

Sudan: Not Provided

Yemen: No

Questions

1. Has your State established/promulgated Regulations and/or Procedures concerning wind shear by Aerodrome MET offices?
2. Has your State determined/identified those International Aerodromes for which wind shear is considered a safety factor for operation; and require the issuance of wind shear warnings/alerts? (Ref Annex 3, para. 7.4.1)? (**see end notes*)
3. Which International Aerodromes in your State are issuing wind shear warnings/alerts?
 - a) Which Aerodromes are equipped with automated, ground-based, wind shear remote-sensing or detection equipment to detect wind shear?
 - b) Are the wind shear alerts updated at least every minute?
 - c) Are the wind shear alerts cancelled as soon as the headwind/tailwind change falls below 7.5 m/s (15 kt)?
4. For the Aerodromes issuing wind shear warnings/alerts but not equipped with automated, ground-based, wind shear remote-sensing or detection equipment to detect wind shear; are there any other system/mechanism in place to collect and disseminate information related to wind shear? (*Please explain*)
5. Does your State ensure that the wind shear warnings and alerts are issued in accordance with Annex 3 requirements? (Ref Annex 3, para. 7.4.1, Appendix 6 para. 6.2 & Table A6-3)

**Notes:*

Note 1 - In determining whether or not wind shear is a factor to operations, the following can be used: ground-based, wind shear remote-sensing equipment (e.g. Doppler radar); ground-based, wind shear detection equipment (e.g. a system of surface wind and/or pressure sensors located in an array monitoring a specific runway or runways and associated approach and departure paths); aircraft observations during the climb-out or approach phases of flight to be made in accordance with Chapter 5 of Annex 3; other meteorological information (e.g. from appropriate sensors located on existing masts or towers in the vicinity of the aerodrome or nearby areas of high ground).

Note 2 - Wind shear conditions are normally associated with the following phenomena: thunderstorms, microbursts, funnel cloud (tornado or waterspout), gust fronts, frontal surfaces, strong surface winds coupled with local topography, sea breeze fronts, mountain waves (including low-level rotors in the terminal area), and low-level temperature inversions.

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

PBN MATTERS

(Presented by the Secretariat)

SUMMARY

This paper presents some Performance Based Navigation (PBN) matters through the review of the outcome of the PBN SG/3, CNS SG/8, ATM SG/4 and ANSIG/3 meetings for consideration and/or endorsement by the meeting.

Action by the meeting is at paragraph 3.

REFERENCES

- PBN SG/3 Report
- CNS SG/8 Report
- ATM SG/4 Report
- ANSIG/3 Report

1. INTRODUCTION

1.1 The MID Region PBN Implementation Plan was reviewed and endorsed by the MSG/5 meeting (Cairo, Egypt, 16-18 April 2016) based on the outcome of the PBN SG/2 and ATM SG/1 meetings.

1.2 The meeting may wish to recall that MIDANPIRG/14 agreed that the PBN Sub-Group will be responsible for PBN implementation for Terminal and Approach, while the ATM Sub-Group will be responsible for PBN implementation for en-route.

2. DISCUSSION

MID Region PBN Implementation Plan

2.1 The meeting may wish to note that the PBN SG/3 meeting (Cairo, Egypt, 11-13 February 2018) reviewed and updated the MID Region PBN Implementation Plan (MID Doc 007) parts related mainly to terminal airspace. The meeting agreed that Chapter 2 of the plan (CNS Infrastructure) should be reviewed and updated by the CNS SG/8 meeting, as appropriate. The CNS SG/8 meeting (Cairo, Egypt, 26-28 February 2018) reviewed and updated Chapter 2 of the plan.

2.2 The ATM SG/4 meeting (Amman, Jordan, 29 April – 2 May 2018) was apprised of the PBN SG/3 and CNS SG/8 meetings outcomes related to the update of the MID Region PBN Plan (MID Doc 007). The meeting reviewed and updated the Plan parts related to en-route. The meeting agreed through ATM SG/4 Draft Conclusion 4/1 that the revised plan should be circulated to States for their review and inputs before 15 June 2018 in order for the Secretariat to present a consolidated version to the ANSIG/3 meeting.

2.3 Taking into consideration that MSG/6 meeting was planned for December 2018 and to give more time for States to comment on the revised MID Region PBN Implementation Plan, the MID Office circulated the Plan through State Letter Ref: AN 6/28 – 18/245 with deadline for response 30 September 2018. The consolidated version of the revised Plan is at **Appendix A**.

MID Flight Procedure Programme (MID FPP)

2.4 Considering the challenges related to PBN implementation, it was recognized that the MID FPP would be the ultimate solution to support States at national level in meeting their obligations related to PANS-OPS (regulatory and service provision) through an effective resource sharing approach under ICAO umbrella.

2.5 The services that will be provided by the MID FPP free of charge for its Active States are listed in the Project Document including PANS-OPS training courses.

2.6 It is to be highlighted that based on the outcome of the MID FPP Kick-off meeting (Cairo, Egypt, 22 – 24 January 2018), the MID Office circulated the consolidated draft MID FPP Project Document for States review through State Letter AN 6/33 – 18/144 dated 9 May 2018 at **Appendix B**. Only, Jordan and Lebanon provided feedback. The MID Office sent follow-up Letters on 15 November 2018 with a new deadline for comments 15 December 2018. It is to be noted that it was envisaged that the Programme starts operation in January 2019.

2.7 As an example of the MID FPP benefits, a PBN OPS-Approval Course was conducted at the MID FPP premises in Beirut from 26-30 November 2018 free of charge instead of USD 3100 per trainee, as in-kind contribution from IATA to the MID FPP; twenty-two (22) experts from the Region benefited from the course.

2.8 The meeting may wish to recall that in order to start the recruitment of the Manager for the MID FPP by ICAO TCB and formally start operation, it is required that five (5) States sign the MID FPP Project Document with ICAO and that USD300,000 be secured in the Programme's bank account at ICAO. Currently, USD100,000 were provided by Saudi Arabia and UAE and ICAO MID Office is working on some additional options for resource mobilization.

2.9 States were invited to provide advance payments that will be deducted from their annual financial contributions for the coming years to expedite the launching of the project.

2.10 It is to be underlined that the MID FPP funding mechanism including the exact amount of the financial annual contributions will be agreed upon by the MID FPP Steering Committee. It is to be noted that States' advance financial contributions to the MID FPP will not be used without the MID FPP Steering Committee Decision.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) urge States, if not yet done so, to respond to the MID Office State Letter related to the MID FPP, join and support the Programme to benefit from its services;

- b) urge States to provide the ICAO MID Office with their updated National PBN Implementation Plans by end of each year or to notify in case of no changes in accordance with MSG Conclusion 4/11;
- c) agree that the States' National PBN Implementation Plan be published on the MID Office website to facilitate consultation and the planning of the airspace users; and
- d) review and endorse the revised version of the MID Region PBN Implementation Plan through the following Draft Conclusion:

Why	To update the MID Region PBN Implementation Plan
What	Endorsement of the revised MID Region PBN Implementation Plan
Who	MSG/6
When	Dec 2018

DRAFT CONCLUSION 6/X: MID REGION PBN IMPLEMENTATION PLAN

*That the MID Region MID Region PBN Implementation Plan (MID Doc 007) at **Appendix A** is endorsed and to be published on the ICAO MID website.*

MID Doc 007



INTERNATIONAL CIVIL AVIATION ORGANIZATION

MIDDLE EAST AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (MIDANPIRG)

MID REGION PERFORMANCE BASED NAVIGATION IMPLEMENTATION PLAN

EDITION DECEMBER, 2016⁸

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

An up to date electronic version of the Plan will be available on the ICAO MID Regional Office website.

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EXECUTIVE SUMMARY

The MID Region Performance Based Navigation (PBN) Implementation Plan has been developed to harmonize PBN implementation in the MID Region and to address the strategic objectives of PBN 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.

The Plan was prepared in accordance with ICAO provisions related to PBN, the Global Air Navigation Plan, Aviation System Block Upgrades (ASBU) methodology, MID Region Air Navigation Plan and the MID Region Air Navigation Strategy. In addition to the Assembly Resolutions and the twelfth Air Navigation Conference (AN-Conf/12) Recommendations related to PBN.

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~~2018) and for the medium term (~~2018-2019~~ – ~~2022~~2025) have been projected in tabular forms to facilitate easy reference. For the long term (~~2023-2026~~ and beyond) it has been envisaged that GNSS and its augmentation system would become the primary navigation infrastructure

This Document consolidates, updates and supersedes all previous MID Region PBN and GNSS Strategies/Plans.

The parts related to PBN implementation for En-route will be reviewed and updated by the ATM Sub-Group and those related to terminal and approach will be reviewed and updated by the PBN Sub-Group.

Explanation of Terms

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

MID Region PBN Implementation 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.

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.

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.

REFERENCE DOCUMENTS

The below ICAO Documents provide Guidance related to the PBN implementation:

- PANS-ATM (Doc 4444)
- PANS-Ops (Doc 8168)
- PBN Manual (Doc 9613)
- GNSS Manual (Doc 9849)
- RNP AR Procedure Design Manual (Doc 9905)
- CDO Manual (Doc 9931)
- Manual on Use of PBN in Airspace Design (Doc 9992)
- CCO Manual (Doc 9993)
- Procedure QA Manual (Doc 9906)
- PBN Ops Approval Manual (Doc 9997)

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ACRONYMS

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
AOC	Air operator certificate
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
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
MEL	Minimum equipment list
MID eANP	MID Region Air Navigation Plan
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
MIDRMA	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
SOP	Standard operating procedure
STAR	Standard Instrument Arrival
TAWS	Terrain awareness warning system
TMA	Terminal Control Area
VOR	VHF Omni-directional Radio-range
WGS	World Geodetic System

CHAPTER 1

PERFORMANCE BASED NAVIGATION

1. INTRODUCTION

1.1 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.

1.2 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.

1.3 The MID Regional PBN Implementation Plan will serve as guidance for regional projects for the implementation of air navigation infrastructure, as well as for the development of national implementation plans.

1.4 The PBN Manual (Doc 9613) provides guidance on PBN 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. PBN approval will be granted to operators that comply with these two types of approval.

1.5 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.

2. BENEFITS OF PERFORMANCE BASED NAVIGATION

- a) *Access and Equity*: Increased aerodrome accessibility.
- b) *Capacity*: In contrast with ILS, the GNSS based approaches 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

3. GOALS AND OBJECTIVES OF PBN IMPLEMENTATION

- 3.1. The MID Region PBN Implementation Plan has the following strategic objectives:
- a) ensure that implementation of the navigation element of the MID CNS/ATM system is based on clearly established operational requirements;
 - b) avoid unnecessarily imposing the mandate for multiple equipment on board or multiple systems on ground;
 - c) avoid the need for multiple airworthiness and operational approvals for intra and inter-regional operations; and
 - d) avoid an eclipsing of ATM operational requirements by commercial interests, generating unnecessary costs to States, organizations, and airspace users.
- 3.2. Furthermore, the Plan will provide a high-level strategy for the evolution of the navigation applications to be implemented in the MID Region in the short term (2013-2018), medium term (2019-2025).
- 3.3. The plan is intended to assist the main stakeholders of the aviation community to plan the future transition and their investment strategies. For example, 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.

4. PLANNING PRINCIPLES

- 4.1. The implementation of PBN in the MID Region shall be based on the following principles:
- a) implementation of PBN specification and granting PBN operational approvals should be in compliance with ICAO provisions;
 - b) States conduct pre- and post-implementation safety assessments to ensure the application and maintenance of the established target level of safety;
 - c) continued application of conventional air navigation procedures during the transition period, to guarantee the operation by users that are not PBN capable;
 - d) Users/operational requirements should be taken into consideration while planning for PBN implementation;
 - e) States should provide the ICAO MID Regional Office with their updated PBN implementation Plan on annual basis (before December);
 - ~~f) the implementation of Advanced RNP should start by January 2015;~~
 - ~~g) implementation of approach procedures with vertical guidance (APV) (Baro VNAV and/or augmented GNSS), including LNAV only minima, for all runway ends at international Aerodromes, either as the primary approach or as a back-up for precision approaches by 2017 with intermediate milestones as follows: 50 percent by 2015 and 70 per cent by 2016;~~
 - ~~h) implementation of straight in LNAV only procedures, as an exception to g) 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; and~~
 - ~~i) States should assess the benefit accrued from the implementation of PBN procedures and ATS Routes, and to report the environmental benefits to the ICAO MID~~

Regional Office.

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.

5.2. Continuous Climb and Descent Operations (CCO and CDO) ~~are two of several tools available to aircraft operators and ANSPs, through collaboration between stakeholders,~~ would enhance efficiency, flight predictability, while reducing fuel burn, emissions and controller-pilot communications, thereby enhancing safety.

En-route

5.3. Considering the traffic characteristic and CNS/ATM capability of the Region, the en-route operations 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 PBN navigation specification. This implementation strategy will be applied by the States and international organizations themselves, as coordinated at regional level to ensure harmonization.

5.4. 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 more accurate navigation specification on the basis of coordination with stakeholders and affected neighbouring States.

Terminal

5.5. 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.

5.6. In this context, the States should develop their own national plans for the implementation of PBN in Terminal Control Areas (TMAs), based on the MID Region PBN 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.

Approach

5.7. ATC workload should be taken into account while developing PBN Approach Procedures. One possible way to accomplish this would be by co-locating the Initial Approach Waypoint (IAW) for PBN with the Initial Approach Fix (IAF) of the 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.

5.8. MID States are encouraged to include implementation of CCO and CDO, where appropriate, as part of their PBN implementation plans, in compliance with the provisions of ICAO Documents 9931 and 9993, and in accordance with the MID Region Air Navigation Strategy.

5.9. States are encouraged to plan for the implementation of RNP AR procedures, which can provide significant operational and safety advantages over other area navigation (RNAV) procedures by incorporating additional navigational accuracy, integrity and functional capabilities to permit operations using reduced obstacle clearance tolerances that enable approach and departure procedures to be implemented in circumstances where other types of approach and departure procedures are not operationally possible or satisfactory. Procedures implemented in accordance with RNP AR Procedure

Design Manual (Doc 9905) allow the exploitation of high-quality, managed lateral and vertical navigation (VNAV) capabilities that provide improvements in operational safety and reduced un-stabilized approaches and Controlled Flight Into Terrain (CFIT) risks.

CHAPTER 2

CNS INFRASTRUCTURE

1. NAVIGATION INFRASTRUCTURE

Global Navigation Satellite System (GNSS)

1.1. Global Navigation Satellite System (GNSS) is a satellite-based navigation system utilizing satellite signals, such as Global Positioning System (GPS), and GLONASS 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.

1.2. 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.

1.3. GNSS augmentations include Aircraft-Based Augmentation System (ABAS), Satellite-Based Augmentation System (SBAS) and Ground-Based Augmentation System (GBAS). More information about GNSS can be found in the Guidance on GNSS Implementation in the MID Region (MID DOC XXX).

~~1.4. For GNSS implementation States need to provide effective spectrum management and protection of GNSS frequencies by enforcing strong regulatory framework governing the use of GNSS repeaters, and jammers. States need to assess the likelihood and effects of GNSS vulnerabilities in their airspace and apply, as necessary, recognized and available mitigation methods.~~

~~1.5. 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 consulted and given reasonable transition time to allow them to equip accordingly.~~

~~1.6. GNSS implementation should take advantage of the improved robustness and availability made possible by the existence of multiple global navigation satellite system constellations and associated augmentation systems.~~

~~1.7. Operators consider equipage with GNSS receivers able to process more than one constellation in order to gain the benefits associated with the support of more demanding operations. States allow for realization of the full advantages of on-board mitigation techniques.~~

2. OTHER NAVIGATION INFRASTRUCTURE SUPPORTING PBN

2.1. 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.

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

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

2.4. 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.

3. SURVEILLANCE INFRASTRUCTURE

3.1. 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 (Doc 9613) and ICAO PANS-ATM (Doc 4444), and information on the current surveillance infrastructure in the MID can be found in -the MID eANP [and in the MID Region Surveillance Plan](#):-

~~3.2. 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.~~

4. COMMUNICATION INFRASTRUCTURE

4.1. 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 MID eANP.-

CHAPTER 3

IMPLEMENTATION OF PBN

1. ATM OPERATIONAL REQUIREMENTS

1.1. 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.

1.2. During the planning phase of any implementation of PBN, 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

1.3. In this regard, the following should be taken into consideration:

- 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 provisions
- 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

1.4. Table 23-1 shows the navigation specifications published in PBN Manual (Doc 9613), Volume II. It demonstrates, for example, that navigation specifications extend over various phases of flight. It also contains the NavAids/Sensor associated with each PBN specification.

1.5. The implementation of PBN additional functionalities/path terminator should be considered while planning/designing new procedures such as:

- the Radius to Fix (RF) for approach;
- Fixed Radius Transition (FRT) for En-route; and
- Time of Arrival Control (TOAC).

Table 3-1. Application of navigation specification by flight phase

Navigation Specification	FLIGHT PHASE								NAVAIDS/SENSORS				
	En-route oceanic/ remote	En-route continental	Arrival	Approach				DEP	GNSS	IRU	DME/ DME	DME/ DME/ IRU	VOR/ DME
				Initial	Intermediate	Final	Missed ¹						
RNAV 10	10	N/A		N/A				N/A	One or combination of-GNSS, INS				
RNAV 5 ²	N/A	5	5					One or combination of GNSS, VOR/DME, DME/DME, INS, IRS					
RNAV 2		2	2					One or combination of GNSS, DME/DME, DME/DME/IRU					
RNAV 1		1	1										1
RNP 4	4	N/A		N/A				N/A	GNSS				
RNP 2	2	2	N/A					N/A					
RNP 1 ³	N/A		1	1	1	N/A	1	1					
Advanced RNP (A-RNP) ⁴	2	2 or 1	1	1	1	0.3	1	1					
RNP APCH ⁶	N/A			1	1	0.3 ⁷	1	N/A					
RNP AR APCH				1-0.1	1-0.1	0.3-0.1	1-0.1						
RNP 0.3 ⁸	N/A		0.3	0.3	0.3	0.3	0.3						

O: Optional; M: Mandatory; SR: Subject ANSP Requirements

1. Only applies once 50 m (40 m, Cat H) obstacle clearance has been achieved after the start of climb.
2. RNAV 5 is an en-route navigation specification which may be used for the initial part of a STAR outside 30 NM and above MSA.
3. The RNP 1 specification is limited to use on STARs, SIDs, the initial and intermediate segments of IAPs and the missed approach after the initial climb phase. Beyond 30 NM from the ARP, the accuracy value for alerting becomes 2 NM.
4. A-RNP also permits a range of scalable RNP lateral navigation accuracies
5. PBN manual contains two sections related to the RNP APCH specification: Section A is enabled by GNSS and Baro-VNAV, Section B is enabled by SBAS.
6. RNP 0.3 is applicable to RNP APCH Section A. Different angular performance requirements are applicable to RNP APCH Section B only.
7. The RNP 0.3 specification is primarily intended for helicopter operations.

2. IMPLEMENTATION PHASES:

En-route

Short Term:

2.1. The current application of RNAV 10 will continue for Oceanic and Remote continental routes.

2.2. For Continental RNAV 5 specifications should be completed by December 2017. Before the PBN concept, the MID Region adopted the Regional implementation of RNP 5. Further to application of the PBN concept, RNP 5 routes have been changed into RNAV 5 routes. 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).

Medium Term:

2.3. RNP 4 and/or RNP 2 routes would be considered for implementation for the en-route oceanic/remote operations.

2.4. RNP 2 or RNAV 1 would be considered for implementation for en-route continental/local domestic operations.

Long Term

A-RNP would be considered for implementation beyond 2026 as a regional requirement based on the PBN SG and ATM SG decisions.

Terminal

Short Term:

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

2.6. CCO and CDO should be implemented at the defined TMAs, in accordance with the State PBN implementation Plans, the MID Region Air Navigation Strategy and the MID ANP.

Medium Term:

2.7. RNAV 1, A-RNP 1 will be implemented in all TMAs, ~~expected target will be 70 % by the end of this term.~~

Approach

Short Term:

2.8. Implementation of PBN approaches with vertical guidance (LNAV/VNAV minima) (~~APV~~) for runway ends at the international aerodromes listed in the MID ANP ~~should be completed by December 2017~~, including LNAV only minima.

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

Medium Term:

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

2.11. To progress further with the universal implementation of PBN approaches. GLS procedures should be implemented for the defined runway ends to enhance the reliability and predictability of approaches to runways increasing safety, accessibility, and efficiency.

2.12. Table 3-2 summarizes the implementation targets of each PBN navigation specification in the MID Region:

Table 3-2. SUMMARY TABLE AND IMPLEMENTATION TARGETS

Airspace	Short term ~~2013-2018~~ Up to 2020		Medium term ~~2019~~ 2021-2025	
	Navigation Specification Preferred	Targets	Navigation Specification Acceptable	Targets
En-route – Oceanic	RNAV 10 ~~RNP 4*~~	100 % by 2016 <u>50% by 2020</u>	RNP 4* ~~RNP 2*~~ Defined airspace (A-RNP)	~~TBD~~ <u>100% by 2025</u>
En-route - Remote continental	RNAV 5 ~~RNAV 10~~	~~W/A~~ 100% by 2016	RNP 4* ~~RNP 2*~~ Defined airspace (A-RNP)	50% by 2023 <u>100% by 2025</u> ~~TBD~~
En-route – Continental	RNAV 5 RNAV 1	100 % by 2017 W/A ¹	~~RNP 2*~~ Defined airspace (A-RNP)	~~TBD~~
En-route - Local / Domestic	RNAV 5 RNAV 1	100 % by 2017 W/A	~~RNP 2~~ Defined airspace (A-RNP)	~~TBD~~
TMA – Arrival	RNAV 1 (surveillance environment) <u>or</u> RNP 1 (non-surveillance environment)	50% by December 2016 100% by <u>2018</u> <u>2020</u>	~~RNP 1 and RNP 2 beyond 30 NM from ARP~~ (A-RNP)	~~TBD~~
TMA – Departure	RNAV 1 (surveillance environment) <u>or</u> RNP 1 (non-surveillance environment)	50% by 2016 100% by <u>2018</u> <u>2020</u>	~~RNP 1 and RNP 2 beyond 30 NM from ARP~~ (A-RNP)	~~TBD~~
Approach	LNAV: for all RWY Ends at International Aerodromes LNAV/VNAV: for all RWY Ends at International Aerodromes	80 % by 2014. 100% by <u>2016</u> <u>2020</u> 70% by 2016 100% by <u>2018</u> <u>2020</u>	GLS (GBAS) For the defined RWY Ends <u>Based on operational needs and CBA</u>	~~TBD~~
CCO and CDO	W/A	~~100~~ 50% by <u>2018</u> <u>2020</u>	W/A	~~TBD~~ <u>100 % by 2025</u>

- W/A: where applicable/defined Airspace, in accordance with State PBN implementation Plans, the MID Region Air ~~navigation~~Navigation Strategy and the MID ANP.
- * would be considered for implementation at the identified Airspace/TMAs
- When no month is specified (e.g. by 2017) means by the end of the year (December 2017).

Long Term (2025~~6~~ and Beyond)

2.13. In this phase, GNSS augmentation 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.

2.14. 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.

2.15. The required PBN navigation specifications and their associated targets to be implemented for the Long term will be defined in due course.

CHAPTER 4

SAFETY ASSESSMENT AND MONITORING

1. NEED FOR SAFETY ASSESSMENT

1.1. 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

2. ROLES AND RESPONSIBILITIES

2.1. 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.

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

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

CHAPTER 5 OPERATIONAL APPROVAL

1. OPERATIONAL APPROVAL REQUIREMENTS

1.2. Operational approval is usually the responsibility of the regulatory authority of the State of the Operator for commercial air transport operations and the State of Registry for general Aviation (GA) operations. For certain operations, GA operators may not be required to follow the same authorization model as commercial operators.

1.3. The operational approval assessment must take account of the following:

- a) aircraft eligibility and airworthiness compliance;
- b) operating procedures for the navigation systems used;
- c) control of operating procedures (documented in the OM);
- d) flight crew initial training and competency requirements and continuing competency requirements;
- e) dispatch training requirements; and
- f) control of navigation database procedures. Where a navigation database is required, operators need to have documented procedures for the management of such databases. These procedures will define the sourcing of navigation data from approved suppliers, data validation procedures for navigation databases and the installation of updates to databases into aircraft so that the databases remain current with the AIRAC cycle. (For RNP AR applications, the control of the terrain database used by TAWS must also be addressed.)

Aircraft eligibility

1.4. An aircraft is eligible for a particular PBN application provided there is clear statement in:

- a) the Type Certificate (TC); or
- b) the Supplement Type Certificate (STC); or
- c) the associated documentation — Aircraft Flight manual (AFM) or equivalent document; or
- d) a compliance statement from the manufacturer that has been approved by the State of Design and accepted by the State of Registry or the State of the Operator, if different.

1.5. The operator must have a configuration list detailing the pertinent hardware and software components and equipment used for the PBN operation.

1.6. The TC is the approved standard for the production of a specified type/series of aircraft. The aircraft specification for that type/series, as part of the TC, will generally include a navigation standard. The aircraft documentation for that type/series will define the system use, operational limitations, equipment fitted and the maintenance practices and procedures. No changes (modifications) are permitted to an aircraft unless the CAA of the State of Registry either approves such changes through a modification approval process, STC or accepts technical data defining a design change that has been approved by another State.

1.7. For recently manufactured aircraft, where the PBN capability is approved under the TC, there may be a statement in the AFM limitations section identifying the operations for which the aircraft

is approved. There is also usually a statement that the stated approval does not itself constitute an approval for an operator to conduct those operations. Alternate methods of achieving the airworthiness approval of the aircraft for PBN operations is for the aircraft to be modified in accordance with approved data. (e.g. STC, minor modification, etc.)

1.8. One means of modifying an aircraft is the approved Service Bulletin (SB) issued by the aircraft manufacturer. The SB is a document approved by the State of Design to enable changes to the specified aircraft type and the modification then becomes part of the type design of the aircraft. Its applicability will normally be restricted by the airframe serial number. The SB describes the intention of the change and the work to be done to the aircraft. Any deviations from the SB require a design change approval; any deviations not approved will invalidate the SB approval. The State of Registry accepts the application of an SB and changes to the maintenance programme, while the State of the Operator accepts changes to the maintenance programme and approves changes to the MEL, training programmes and Operations specifications. An Original Equipment Manufacturer (OEM) SB may be obtained for current production or out of production aircraft.

1.9. In respect of PBN, in many cases for legacy aircraft, while the aircraft is capable of meeting all the airworthiness requirements, there may be no clear statement in the applicable TC or STC or associated documents (AFM or equivalent document). In such cases, the aircraft manufacturer may elect to issue an SB with appropriate AFM update or instead may publish a compliance statement in the form of a letter, for simple changes, or a detailed aircraft type specific document for more complex changes. The State of Registry may determine that an AFM change is not required if it accepts the OEM documentation. **Table 5-1** lists the possible scenarios facing an operator who wishes to obtain approval for a PBN application, together with the appropriate courses of action.

Table 5-1

Scenario	Aircraft certification status	Actions by operator/owner
1	Aircraft designed and type certificated for PBN application. Documented in AFM, TC or the STC	No action required, aircraft eligible for PBN application
2	Aircraft equipped for PBN application but not certified. No statement in AFM. SB available from the aircraft manufacturer	Obtain SB (and associated amendment pages to the AFM) from the aircraft manufacturer
3	Aircraft equipped for PBN application. No statement in AFM. SB not available. Statement of compliance available from the aircraft manufacturer	Establish whether the statement of compliance is acceptable to the regulatory authority of the State of Registry of the aircraft
4	Aircraft equipped for PBN application. No statement in AFM. SB not available. Statement of compliance from the aircraft manufacturer not available	Develop detailed submission to State of Registry showing how the existing aircraft equipment meets the PBN application requirements
5	Aircraft not equipped for PBN application	Modify aircraft in accordance with the aircraft manufacturer's SB or develop a major modification in conjunction with an approved design organization in order to obtain an approval from the State of Registry (STC).

Operating procedures

1.10. The Standard operating procedure (SOP) must be developed to cover both normal and non-normal (contingency) procedures for the systems used in the PBN operation. The SOP must address:

- a) preflight planning requirements including the MEL and, where appropriate, RNP/RAIM prediction;
- b) actions to be taken prior to commencing the PBN operation;
- c) actions to be taken during the PBN operation; and
- d) actions to be taken in the event of a contingency, including the reporting of significant incidents

GA pilots must ensure that they have suitable procedures/checklists covering all these areas

Control of operating procedures

1.11. The SOP must be adequately documented in the OM and checklists

Flight crew and dispatch training

1.12. A flight crew and dispatch training programme for the PBN operation must cover all the tasks associated with the operation and provide sufficient background to ensure a comprehensive understanding of all aspects of the operation. The operator must have adequate records of course completion for flight crew, flight dispatchers and maintenance personnel.

Control of navigation database procedures

1.13. If a navigation database is required, the procedures for maintaining currency, checking for errors and reporting errors to the navigation database supplier must be documented in the maintenance manual by commercial operators

2. DOCUMENTATION OF OPERATIONAL APPROVAL

2.1. Operational approval may be documented as an endorsement of the Air operator certificate (AOC) through:

- a) Operations specification, associated with the AOC; or
- b) amendment to the OM; or
- c) LOA.

2.2. During the validity of the operational approval, the CAA should consider any anomaly reports received from the operator or other interested party. Repeated navigation error occurrences attributed to a specific piece of navigation equipment may result in restrictions on use or cancellation of the approval for use of that equipment. Information that indicates the potential for repeated errors may require modification of an operator's training programme. Information that attributes multiple errors to a particular pilot or crew may necessitate remedial training and checking or a review of the operational approval.

2.3. The State may determine that a GA aircraft may operate on a PBN route/procedure provided that the operator has ensured that the aircraft has suitably approved equipment (is eligible), the navigation database is valid, the pilot is suitably qualified and current with respect to the equipment, and adequate procedures (checklists) are in place.

3. STATE REGULATORY MATERIAL

3.1. Individual States must develop national regulatory material which addresses the PBN applications relevant to their airspace or relevant to operations conducted in another State by the State's operators or by aircraft registered in that State. The regulations may be categorized by operation, flight phase, area of operation and/or navigation specification. Approvals for commercial operations should require specific authorization.

4. APPROVAL PROCESS

General

4.2. Since each operation may differ significantly in complexity and scope, the project manager and the operational approval team need considerable latitude in taking decisions and making recommendations during the approval process. The ultimate recommendation by the project manager and decision by the DGCA regarding operational approval should be based on the determination of whether or not the applicant:

- a) meets the requirements established by the State in its air navigation regulations;
- b) is adequately equipped; and
- c) is capable of conducting the proposed operation in a safe and efficient manner.

4.3. The complexity of the approval process is based on the inspector's assessment of the applicant's proposed operation. For simple approvals, some steps can be condensed or eliminated. Some applicants may lack a basic understanding of what is required for approval. Other applicants may propose a complex operation, but may be well prepared and knowledgeable. Because of the variety in proposed operations and differences in an applicant's knowledge, the process must be thorough enough and flexible enough to apply to all possibilities.

Phases of the approval process

Step 1 — Pre-application phase

4.4. The operator initiates the approval process by reviewing the requirements; establishing that the aircraft, the operating procedures, the maintenance procedures and the training meet the requirements; and developing a written proposal to the regulator. A number of regulators have published "job aids" to assist the operator in gathering the necessary evidence to support the approval application. At this stage a pre-application meeting with the regulator can also be very beneficial. If the proposed application is complex, the operator may need to obtain advice and assistance from OEMs or other design organizations, training establishments, data providers, etc.

Step 2 — Formal application phase

4.5. The operator submits a formal, written application for approval to the CAA, which appoints a project manager either for the specific approval or generally for PBN approvals.

Step 3 — Document evaluation phase

4.6. The CAA project manager evaluates the formal, written application for approval to determine whether all the requirements are being met. If the proposed application is complex, the project manager may need to obtain advice and assistance from other organizations such as regional agencies or experts in other States.

Step 4 — Demonstration and inspection phase

4.7. During a formal inspection by the project manager (assisted as necessary by a CAA team), the operator demonstrates how the requirements are being met.

Step 5 — Approval phase

4.8. Following a successful formal inspection by the CAA, approval is given through:

- a) Operations specification, associated with the AOC; or
- b) amendment to the OM; or
- c) LOA.

Some PBN applications may not require formal approval for GA operations — this will be determined by the State of Registry.

Note.— The approval procedure described above consists of a simplified process of the certification guidance contained in Part III of the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).

5. FOREIGN OPERATIONS

5.1. A State undertakes, in accordance with Article 12 to the Convention, to ensure that every aircraft flying over or maneuvering within its territory shall comply with the rules and regulations relating to the flight and maneuver of aircraft there in force. Article 33 to the Convention provides that certificates of airworthiness and certificates of competency and licenses issued, or rendered valid, by the State in which an aircraft is registered, shall be recognized by other States, provided that the requirements under which such certificates or licenses were issued or rendered valid are equal to or above the minimum standards which may be established by ICAO. This requirement for recognition is now extended by Annex 6, Part I and Part III, Section II, such that Contracting States shall recognize as valid an AOC issued by another Contracting State, provided that the requirements under which the certificate was issued are at least equal to the applicable Standards specified in Annex 6, Part I and Part III.

5.2. States should establish procedures to facilitate the application by foreign operators for approval to operate into their territory. States should be careful in their requirements for applications, to request only details relevant to the evaluation of the safety of the operations under consideration and their future surveillance. When evaluating an application by an operator from another State to operate within its territory a State will examine both the safety oversight capabilities and record of the State of the Operator and, if different, the State of Registry, as well as the operational procedures and practices of the operator. This is necessary in order for the State, in the terms of Article 33 to the Convention, to have confidence in the validity of the certificates and licenses associated with the operator, its personnel and aircraft, in the operational capabilities of the operator and in the level of certification and oversight applied to the activities of the operator by the State of the Operator.

5.3. The operator will need to make applications to each State into or over which it is intended to operate. The operator will also need to keep its own CAA, as the authority of the State of the Operator, informed of all applications to operate in other States. Applications should be made direct to the CAAs of the States into which it is intended to operate. In some cases it will be possible to download information and instructions for making an application and the necessary forms from a website maintained by the CAA in question.

5.4. States should promote the implementation and operational approval of Advanced RNP (A-RNP) navigation specifications, which serves all the flight phases as follows:

- En-Route Oceanic, Remote: RNP 2;
- En-Route Continental: RNP 2 or RNP 1;
- Arrival and Departures: RNP 1;
- Initial, intermediate and missed approach phases: RNP 1; and
- Final Approach Phase: RNP 0.3.

5.5. Because functional and performance requirements are defined for each navigation specification, an aircraft approved for an RNP specification is not automatically approved for all RNAV specifications. Similarly, an aircraft approved for an RNP or RNAV specification having a stringent accuracy requirement (e.g. RNP 0.3 specification) is not automatically approved for a navigation specification having a less stringent accuracy requirement (e.g. RNP 4).

CHAPTER 6

PBN CHARTING

1. INTRODUCTION

6.1 Charting of PBN Instrument Approach Procedures in the MID Region should follow the criteria included in Annex 4 and the PANS OPS (DOC 8168).

2. TRANSITION PLAN FOR RNAV TO RNP INSTRUMENT APPROACH CHART DEPICTION

6.2 For a harmonized implementation of the Amendment 6 to the PANS OPS related to RNAV to RNP Approach Chart Depiction, the following transition plan should apply in the MID Region:

- MID States, that have not yet done so, should implement RNAV to RNP Chart naming convention for their current PBN Approach Procedures published in their AIPs, starting from 29 March 2019 up to 8 September 2022.
- New PBN Approach Procedures, planned to be published before 29 March 2019, should be published using the new naming convention, if practicable.
- If a PBN Approach Procedure published in the National AIP is amended and re-published before 29 March 2019 (for any reason), the new naming convention should be used, if practicable.

6.3 States are required to provide the ICAO MID Office with their action plan for the implementation of RNAV to RNP Chart naming convention, and keep the MID Office apprised of the status of implementation.

- END -



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авиации

منظمة الطيران
المدنى الدولى

国际民用
航空组织

File Ref: AN 6/33 – 18/144

9 May 2018

Subject: ICAO MID Region Flight Procedure Programme Draft Project Document

Action required: Reply not later than 10 June 2018

Sir,

I have the honor to refer to the outcome of the Fourth Meeting of the Directors General of Civil Aviation-Middle East Region (DGCA-MID/4), Muscat, Oman, from 17 to 19 October 2017 and the Kick-off meeting of the MID Region Flight Procedures Programme (MID FPP), Cairo, Egypt, 22 – 24 January 2018.

The MID FPP objective is to assist States to develop sustainable capability in the Instrument Flight Procedure (IFP) design, PBN Airspace Design and PBN OPS Approval, including regulatory oversight, so as to meet their obligations related to instrument flight procedure and the regional requirements (MID Region Air Navigation Strategy, MID Region PBN Implementation Plan and the Doha Declaration on Aviation Safety and Air Navigation in the MID Region) related to PBN implementation. In this respect, the MID FPP would support States to overcome the challenges identified as the main impediments faced by States in meeting the agreed global and regional PBN Performance Targets.

As a follow-up to the DGCA-MID/2 meeting (Jeddah, Saudi Arabia, 20 - 22 May 2013) Conclusion 2/5, the ICAO MID Office exerted all efforts for the establishment of the MID FPP. Several meetings/workshops addressing the subject were convened with the support of ICAO HQ, African and Asia Pacific Flight Procedure Programmes and other stakeholders. I would like to recall that the Global Ministerial Aviation Summit (Riyadh, Saudi Arabia, 29-31 August 2016) endorsed the MID FPP as the regional air navigation project with the highest priority.

States willing to join the MID FPP are required to sign a Project Document with ICAO, which defines the institutional framework of the MID FPP, organizational structure, scope, operating concept, host/location, expected outcomes and objectives, first year work plan, Job Descriptions, budget, etc.

The attached Draft MID FPP Project Document was consolidated by ICAO based on the outcome of the MID FPP Kick-off Meeting (Cairo, Egypt, 22-24 January 2018).

../.

The MID FPP will be established as an ICAO technical cooperation project and its office will be hosted by Lebanon in Beirut, based on the results of the selection process of the host State, which was communicated to your Administration through my Letter Ref.: AN 6/33 – 16/176 dated 30 June 2016.

In order for the ICAO Technical Cooperation Bureau (TCB) to initiate the recruitment of the Manager of the Programme at least five (5) States should sign the Project Document and an amount of **USD 300,000** should be available in the bank account of the Programme. Accordingly, States have been strongly encouraged to make advance payments, which would be deducted later from their annual financial contributions based on the agreed funding mechanism. It is to be highlighted that ICAO is exploring all resource mobilization opportunities from donors to expedite the establishment/start of operation of the MID FPP.

Currently, Saudi Arabia and UAE gratefully offered to provide **USD 50,000** each to support the establishment of the MID FPP.

I would like to highlight that the funding mechanism of the MID FPP including the annual amount that should be paid by each Active State will be agreed upon by the MID FPP Steering Committee, which should meet tentatively during the last quarter of 2018 (after the signature of the Project Document by at least five States).

I would be grateful, if you could review the attached Draft MID FPP Project Document and provide the ICAO MID Office with your comments/inputs, if any, preferably not later than **10 June 2018**, in order to consolidate the final version of the Document to be signed by the ICAO Secretary General and then sent to States for signature.

I would also appreciate if you could confirm, by **10 June 2018**, your willingness to join the MID FPP as Active State or User State, indicating the amount of the advanced financial contribution or the in-kind contribution your Administration will provide to the MID FPP.

Mr. Elie El Khoury, Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR) (ekhoury@icao.int), the MID FPP focal point, could be contacted if additional information/clarification is needed.

Accept, Sir, the assurances of my highest consideration.



for/ Mohamed Khalifa Rahma
Middle East Regional Director

Attachments

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**MID REGION FLIGHT PROCEDURE PROGRAMME
(MID FPP)**

Prepared by the

International Civil Aviation Organization (ICAO)

for the

**Directorate General of Civil Aviation (DGCA) of Lebanon
and the**

Civil Aviation Administrations of other Participating States

March 2018

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INTERNATIONAL CIVIL AVIATION ORGANIZATION PROJECT DOCUMENT

Project Title: MID Region Flight Procedure Programme (MID FPP)
Project Number: RAB/18801
Duration: 3 years:
Project Cost: US\$
Participating State: [State]
Sector and Subsector: Air Navigation/Air Traffic Management (ATM)/PANS-OPS
Governments Executing Agency: Civil Aviation Authorities of the MID States
Executing Agency: International Civil Aviation Organization (ICAO)
Location : Beirut, Lebanon
Estimated Starting Date: 01 January 2019

- ☐ **Active State:** A MID Participating State that commits to funding the Programme by means of an annual financial contribution in line with an approved budget
- ☐ **User State:** A MID Participating State that is not an Active State, but one that intends to use the MID FPP services

Brief Description: The Programme objective is to assist States to develop sustainable capability in the instrument flight procedure (IFP) design, PBN airspace design and PBN OPS approval, including regulatory oversight, so as to meet their commitments under Assembly Resolutions A37-11 for Performance Based Navigation (PBN) implementation and the regional requirements, and comply with ICAO provisions related to flight procedure design and PBN.

Signed by	Signature	Name	Title	Date
State				
ICAO				

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1. BACKGROUND

1.1 ICAO developed harmonized navigation specifications for all existing area navigation applications, and published these navigation specifications in the Performance Based Navigation (PBN) Manual (Doc. 9613).

1.2 The 37th session of the ICAO Assembly in 2010 in its Resolution A37-11 reaffirmed the global commitment for PBN implementation and called upon the States to complete a PBN implementation plan as a matter of urgency and ICAO to develop a coordinated action plan to assist States in the implementation of PBN and to ensure development and/or maintenance of globally harmonized SARPs, Procedures for Air Navigation Services (PANS) and guidance material including a global harmonized safety assessment methodology to keep pace with operational demands.

1.3 In 2009, ICAO published the Quality Assurance Manual for Flight Procedure Design (Doc. 9906). This document addresses two levels of processes. A high-level process, called the Instrument Flight Procedure (IFP) process, covers all elements from initiation to publication of the procedure and the relevant maintenance, safety, validation and flight inspection activities. The process does not end with publication. Feedback from users must be considered in the improvement process. A second specific process, for the design of the IFP — the Flight Procedure Design (FPD) process — is part of the IFP process.

1.4 The MID Air Navigation Strategy (ICAO MID Doc 002), endorsed by MIDANPIRG, includes the Aviation System Block Upgrades (ASBU) B0-APTA, B0-CCO and B0-CDO Modules, which are considered as priority 1 for implementation in the MID Region. In this respect, the MID FPP would support its Participating States with the implementation of the mentioned Modules.

1.5 The Directors General of Civil Aviation-Middle East (DGCA-MID) Region through the Doha, Declaration, April 2015, agreed to take necessary measures to implement PBN approach procedures with vertical guidance, for all runways ends at international aerodromes, either as the primary approach or as a back-up for the precision approaches by 2017

1.6 The DGCA-MID/2 (Jeddah, Saudi Arabia, 20 - 22 May 2013) recognized the need for cooperation and exchange of experience between MID States in the field of procedure design (PANS-OPS). The meeting through DGCA-MID Conclusion 2/5 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.

1.7 The MIDANPIRG/15 meeting (Bahrain, 8-11 June 2016) emphasized that the establishment of the MID Flight Procedure Programme (MID FPP) would foster the PBN implementation in the Region. The meeting noted that the MID FPP was endorsed as one of the MID Region ATM Enhancement Programme (MAEP) projects.

1.8 The MIDANPIRG/15 meeting noted with appreciation that ICAO is ready to provide necessary support for the establishment of the MID FPP and to share the experience gained from the ASIA-Pacific and AFI FPPs' establishment. Accordingly, the meeting agreed, through Conclusion 15/13, that a Workshop on the establishment of the MID FPP to be held in Cairo, Egypt, 18-19 October 2015, back-to-back with the Second meeting of the MAEP Steering Committee (MAEP SC/2) (20-22 October 2015). The main objective of the Workshop was to develop a framework for establishing an FPP for the MID Region along with the proposed organizational structure, governance procedures, scope of activities and services, work plan and deliverables, resources and financial structure to be presented in a Project Document.

1.9 The MID FPP Workshop developed the draft MID FPP Project Document, which was further reviewed by the PBN SG/2 meeting (Sharm El Sheikh, Egypt, 22-25 February 2016) and circulated to States for their comments and inputs on 16 March 2016.

1.10 The MAEP Board/2 meeting (Cairo, Egypt, 11-13 April 2016) noted that, as a follow-up action to the MAEP SC/2 Draft Conclusion 2/2, the ICAO MID Regional Office circulated a Questionnaire to seek

States' willingness to join the MID FPP and/or provide in-kind contributions, get their views regarding the hosting, identify the States' needs and determine the flight procedures design and PBN capabilities in the MID Region. The meeting reviewed the survey results as presented to the PBN SG/2 meeting and noted with appreciation that the majority of States are supporting the establishment of the MID FPP.

1.11 The MAEP Board/2 meeting received with appreciation three (3) offers for hosting the MID FPP from Egypt, Lebanon and Sudan. The meeting agreed that the evaluation process of the offers should be based on clear criteria and procedure of evaluation.

1.12 The Evaluation Committee met on 26 June 2016 and selected Lebanon as the hosting State for the MID FPP based on the agreed criteria. The selection result was communicated to States through State Letter Ref. AN 6/33 – 16/176 dated 30 June 2016.

1.13 The Global Ministerial Aviation (GMA) Summit (Riyadh, Saudi Arabia, 29-31 August 2016) supported the MID FPP and agreed to the following Recommendation:

MID FPP Recommendation

- a. States are encouraged to sign the MID FPP Project Document
- b. States and Stakeholders are encouraged to support:
 - i. the establishment of MID FPP through the provision of cash and/or in-kind contributions; and
 - ii. the MID FPP activities through the assignment of experts to be part of the MID FPP pool of resources

1.14 The DGCA-MID/4 meeting (Muscat, Oman, 17-19 October 2017) emphasized that the establishment of the MID FPP would enhance the States' capabilities related to PANS-OPS and eventually foster PBN implementation in the Region. The DGCA-MID/4 meeting agreed to the following Conclusion:

DGCA-MID/4 CONCLUSION 4/3 – MID FLIGHT PROCEDURE PROGRAMME

That:

- a) States are urged to sign the MID FPP Project Document with ICAO TCB;
- b) till the recruitment of a MID FPP Manager/Coordinator, the ICAO MID Office provide full support to run the Programme, in close coordination with the Host State;
- c) a Kickoff meeting of the MID FPP be held in January 2018; and
- d) States and Stakeholders are urged to participate in the Kickoff meeting of the MID FPP

2. INSTITUTIONAL FRAMEWORK

2.1. **Participating States:** The Programme will be executed on the basis of the Project Document signed by the Host (*Lebanon*) and ICAO and to which any State wishing to participate may sign on. Upon signature onto the Project Document, such State becomes a Participating State. Participating States are grouped in two categories:

- **Active States:** All Participating States that commit to funding the Programme by means of an annual financial contribution in line with an approved budget become an Active State. The Host State (*Lebanon*) is considered an Active State, based on the in-kind contribution provided to the Programme.
- **User States:** MID States that are not Active States but intend to use the MID FPP services are User States.

2.2. **Donors:** States, organizations and entities that support the MID FPP by financial and/or in-kind contribution (experts, equipment, services, etc.). A specific agreement with the Donor might be required.

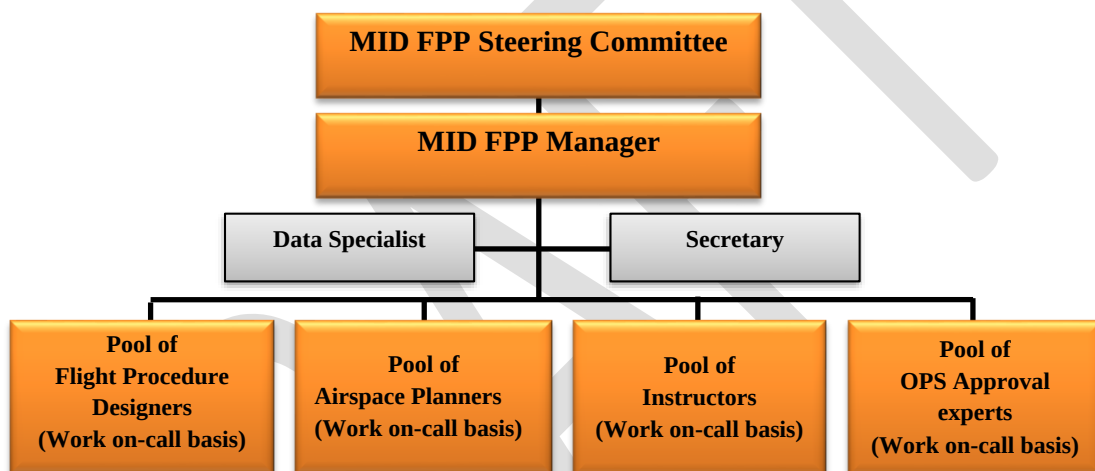
2.3. **Observer States:** States that are not Participating States or Donors and are interested in the Programme.

2.4. The Host State's in-kind contribution related to the hosting of the MID FPP should be taken into account by the MID FPP SC for offsetting its annual financial contribution to the Programme. Contributions in kind from other Participating States may also be taken into account for offsetting their annual financial contribution to the Programme.

Host Administration

2.5. During Phase I of the Programme, *Lebanon* is the Host Administration. The MID FPP will be located at the Lebanese Safety Training Centre, Hariri International Airport, Beirut, Lebanon.

MID FPP Organizational Structure



2.6. The Programme will be governed by the MID FPP Steering Committee (MID FPP SC), in accordance with its Terms of Reference at **Appendix A**.

2.7. The MID FPP Manager should present to the ICAO Regional Director, Middle East Office, on a quarterly basis, progress reports related to the Programme developments, recommending necessary measures to improve the effectiveness and efficiency of the Programme. The MID FPP Manager should present progress reports on an annual basis to the MID FPP Steering Committee, including recommendations to improve the performance and efficiency of the Programme.

2.8. The MID FPP Manager will be responsible for the local coordination and the management of the Programme, for maintaining liaison with States and stakeholders as well as ensuring full coordination and cooperation between the MID FPP assigned experts and CAA counterparts. The FPP Manager will also be responsible for the submission of periodic progress reports and for the preparation of the draft Terminal Report prior to the termination of his/her assignment.

Roles and Responsibilities

2.9. In the context of the MID FPP, the roles and responsibilities of the MID FPP Steering Committee, as outlined in **Appendix A**, should include but not be limited to the following:

- review the Programme performance;
- review and approval of the:
 - strategic objectives of the MID FPP;

- annual Work Plan of the MID FPP;
- annual Budget;
- annual financial contribution of the Active States. Contributions in-kind from Participating States may also be taken into account for offsetting their annual financial contribution to the Programme;
- fee schedule for services and trainings in compliance with ICAO existing Policy; and
- MID FPP Project Document as deemed necessary.

2.10. The role of the ICAO MID Regional Office is as follows:

- support the MID FPP Manager who is responsible for the execution of the work plan approved by the MID FPP Steering Committee;
- collaborate with the MID FPP Manager to develop the work plan;
- ensure that the MID FPP work plan is in line with the MID Region priorities and would support States in meeting the regional targets related mainly to PBN implementation;
- monitor PBN implementation and capacity building progress; and
- communicate to the MID FPP the States' needs.

2.11. The role of Technical Cooperation Bureau (TCB) is as follows:

- Assign a Focal Point for the MID FPP;
- Recruit and deploy the MID FPP Manager;
- procure services and goods in accordance with ICAO's Procurement Code, Financial Regulations and Rules, and applicable process and procedures; and
- provide administrative and financial support to the MID FPP.

2.12. The role of Air Navigation Bureau (ANB) at ICAO Headquarters is as follows:

- review the MID FPP Technical work programme/plan to ensure that it is consistent with the ANB PBN regular programme;
- provide the technical/operational input/advice; and
- facilitate the global coordination amongst the FPPs (African, APAC and MID), specifically on educative tools/presentations etc. as necessary.

2.13. The role of the MID FPP Manager includes but is not limited to the following:

- act as the Secretary of the MID FPP Steering Committee;
- develop the Work Plan in collaboration with the MID Regional Office;
- work under the supervision of the ICAO MID Regional Director;
- report to the MID Office technical and operational matters;
- provide progress reports on the Programme to the relevant MIDANPIRG subsidiary bodies; and
- represent the MID FPP in relevant events that would support the achievements of the MID FPP objectives.

3. CHALLENGES AND OPERATING CONCEPT

Challenges

3.1. Instrument flight procedures developed to take advantage of the benefits of PBN are reliant on the data in a database on the aircraft. For this reason, quality assurance in the flight procedure design process, while always important, takes on added importance for PBN-based procedures. A great safety concern in this respect is that many States lack the expertise to establish a sustainable internal procedure design capability, meeting the requirements of PANS-OPS and their responsibility under Annex 15 for the quality of their aeronautical information and data, including instrument flight procedures.

3.2. Following are some of the main procedure design-related challenges and problems faced by States:

- a) Insufficient number of procedure designers;
- b) Insufficient procedure design work in some States to attain or maintain proficiency;
- c) Lack of airspace and procedure design training: initial, On-the-Job Training (OJT), and/or recurrent;
- d) Lack of knowledge to integrate procedure design efficiently into airspace design;
- e) Lack of depth in procedure design organization to perform quality assurance (QA);
- f) Insufficient expertise in procedure design organization to provide adequate QA of procedures;
- g) Lack of procedure design and obstacle data storage automation in the States;
- h) Lack of operational approval expertise to obtain proper operational approval and to oversee operators for PBN operations;
- i) Lack of regulatory expertise to oversee the process leading to procedure publication; and
- j) Lack of service provision for Air Traffic Control/ Air Traffic Management (ATC/ATM) training for PBN implementation.

Operating Concept

3.3. The MID FPP would serve as a means to assist Participating States to address the issues listed in para 3.2. The MID FPP will foster the implementation of instrument flight procedures, developed with the appropriate quality systems, especially focusing on PBN in Terminal Area and vertically guided instrument approach procedures by:

- a) assisting States with sufficient number of procedures to establish a sustainable internal procedure design capability capable of meeting the requirements of PANS-OPS and their responsibility for the quality of their procedures;
- b) providing the appropriate level of technical expertise necessary to enable States that do not have the volume of procedures necessary to sustain an internal procedure design capability; and
- c) providing a vehicle to improve quality in the States' procedure design process through access to procedure design automation solutions and associated data storage; and assisting States with airspace design and operational approval functions.

3.4. At Participating States' request the MID FPP would:

- a) assist State's procedure and airspace designers in developing their Instrument Flight Procedures (IFP) with priority for PBN procedures;
- b) assist State with the development of a Quality Assurance (QA) system for IFP, including flight procedure regulatory approval;

- c) provide refresher, recurrent and PBN initial training courses and OJT to procedure designers, remotely, on-site or at the MID FPP location;
- d) provide training course and OJT on QA for IFP including flight procedure regulatory approval;
- e) provide training course and OJT on operators' approval for PBN operations;
- f) assist State in PBN Plan implementation through operational assessment, business case, and activity planning for PBN Implementation;
- g) assist States in the design of IAPs, SIDs, STARs, Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO);
- h) assist State in developing PBN-related regulations;
- i) develop procedures implementation for States that have no or little procedure design capability;
- j) assist State with data origination and validation;
- k) assist State with ground and flight validation;
- l) assist State in operators' approval for PBN operations;
- m) provide training courses for air traffic controllers about PBN flight procedures operations;
- n) provide State with any other associated assistance, as required;
- o) provide training courses for newly recruited flight procedures designers in accordance with ICAO Doc 9906;
- p) assist States with the estimation of environmental benefit accrued from the implementation of instrument flight procedures/PBN procedures; and
- q) assist States with PBN airspace design.

Note: in order to assist the Participating States in expediting the implementation, both training and services may be extended to air navigation service providers of the Participating States in accordance with applicable ICAO policies.

3.5. As part of the services provided in 3.4 above, the Programme would:

- a) provide States access to procedure design software applications at the MID FPP location; and
- b) provide States access to available databases for training purposes.

3.6. The services listed in 3.4 will be provided free of charge to the Active States. The provision of additional services by MID FPP including the design of new instrument flight procedures, may be against a fee determined based on a cost formula agreed upon by the MID FPP SC.

3.7. User States will be charged for the services provided by the MID FPP in accordance with applicable ICAO policies and as agreed by the MID FPP SC.

3.8. Other States may benefit from the services provided by the MID FPP against fees in accordance with applicable ICAO policies and as agreed by the MID FPP SC.

3.9. For on-site missions/training courses, the travel and accommodation expenses and the daily subsistence allowance for the MID FPP personnel, ICAO Team and course' instructors should be covered by the beneficiary State in accordance with applicable ICAO policies.

4. RELEVANT DOCUMENTS

- a) Global Air Navigation Plan (GANP) (Doc 9750)
- b) Procedures for Air Navigation Services – Aircraft Operations (Doc 8168)
- c) Performance Based Navigation Manual (Doc 9613)
- d) World Geodetic System Manual (Doc 9674)
- e) Guidelines for Electronic Terrain, Obstacle and Aerodrome Mapping Information (Doc 9881)
- f) Required Navigation Performance – Authorization Required Procedure Design Manual (Doc 9905)
- g) Quality Assurance Manual for Flight Procedure Design (Doc 9906)
- h) Continuous Descent Operations Manual (Doc 9931)
- i) Manual on Use of PBN in Airspace Design (Doc 9992)
- j) Continuous Climb Operations Manual (Doc 9993)
- k) PBN Operational Approval Manual (Doc 9997)
- l) PANS-ATM (Doc 4444)
- m) ICAO Annexes 4, 6, 10, 11, 14 and 15
- n) ICAO Assembly Resolutions A37-11
- o) Manual of All-Weather Operations (Doc 9365)
- p) Aeronautical Charting Manual (Doc 8697)

5. PROGRAMME IMPLEMENTATION STRATEGY

5.1 In order to support the goals of the Assembly Resolution A37-11, GANP and the MID regional requirements, Phase I of the Programme will commence on **1 January 2019** and is expected to last at least until **31 December 2021**.

5.2 The following resources are planned to achieve the Programme objectives for Phase I:

- a) The MID FPP is hosted by Lebanon in Beirut. The inputs to be provided by Lebanon are specified in **Appendix B1**; and the MID FPP office minimum requirements are at **Appendix B2**;
- b) The ICAO MID Office will support setting up the office and building the pool of experts for the MID FPP during the first year and may organize some activities as appropriate funded through the Programme budget;
- c) The MID FPP Manager is appointed by ICAO for a period of one-year renewable. The Job descriptions of the MID FPP Manager are presented in **Appendix C1**;
- d) Experts in PANS-OPS, Airspace Planning, OPS Approval, and Instructors, as well as data specialist may be nominated by States, Organizations, and Industry to create a pool of experts who will support the provisions of the MID FPP services. Their Job descriptions are presented in **Appendices C2, C3, C4 and C5**, respectively. Candidates nominated by Participating States and Donors shall meet the job description requirements. The Regional Director of the MID Office and the Chief of the Programmes Coordination and Implementation Section at ICAO Headquarters in coordination with the MID FPP Manager will evaluate the nominated experts. The appointment of the

experts shall be carried out in accordance with the ICAO Policies on Secondment, Consultancy, ICAO Programme for Aviation Volunteers (IPAV), Internship, etc.

5.3 The MID FPP will build its capacity to provide assistance, training, quality assurance, procedure and airspace design, and operational approval to the Participating States. Other specific fields may be identified during implementation. Additional staff may be needed, as deemed necessary, to meet the demand.

5.4 The draft work plan for the first year to be agreed upon by the MID FPP SC is presented at **Appendix D**.

5.5 Implementation strategy detailed in 5.1 through 5.4 herein may be revised by a decision of the MID FPP SC and ICAO.

6. STRATEGIC OBJECTIVES OF THE PROGRAMME

6.1. The strategic objectives of the MID FPP are detailed in **Table 1**.

Note: "T0" in the table refers to the start of operation date of the Programme:

Category		Objective		Target	Remarks
1	Building MID FPP human resources (pool of experts)	a	Assignment of expert by States and stakeholders (PANS-OPS, OPS approval, Airspace Planners, Instructors) to support the MID FPP activities	T0 + 3 Months	
		b	Ensuring competency of the MID FPP experts through training courses and workshops	T0 + 12 Months	
2	Regulatory oversight framework	a	Develop PANS-OPS Regulation for 80% of Active Participating States	T0 + 15 Months	
		b	Assist States as appropriate in meeting the requirements of the USOAP CMA related to PANS-OPS. 100% of Active Participating States receiving USOAP CMA activity to score above 70% EI in PANS-OPS field	T0 + 24 Months	
3	Meeting the targets set out in the MID Region Air Navigation Strategy related to PBN	a	Develop/update PBN National Implementation Plans for 100% of Active Participating States	T0 + 12 Months	
		b	Implementation of PBN flight procedures at 80% runway ends at international aerodromes of Active Participating States	T0 + 24 Months	
		c	Implementation of PBN SIDs and STARs at 70% international aerodromes of Active Participating States, with due regard to incorporate CCO and CDO	T0 + 24 Months	

4	Training Programmes	a	100% of Participating States develop Training Programme for PANS OPS inspectorate	T0 + 18 Months	
		b	100% of Participating States develop Training Programme for PANS OPS technical experts (service provider)	T0 + 18 Months	
		c	Qualify at least one OPS Approval expert for each Active participating State	T0 + 24 Months	

Table. 1

6.2. A review by the MID FPP Steering Committee should be conducted at least one (1) year prior to the end of Phase I to determine whether the Programme should be continued into the next Phase, and if so, the strategic direction that the Programme should take.

7. MID FPP FIRST YEAR OUTPUTS AND ACTIVITIES

7.1 The following outputs and activities, related mainly to the setup of the MID FPP capabilities, are targeted for the first year of the Programme.

Objective 1: Convene the First MID FPP Steering Committee meeting

Outputs	Activities
<u>Output 1.1:</u> Convene the kickoff meeting of MID FPP from 22 to 24 January 2018 to officially launch the Programme	<u>Activity 1.1.1:</u> The ICAO MID Regional Office to issue the invitation for the meeting by 20 November 2017 to the 15 MID States and stakeholders.
<u>Output 1.2:</u> Convene the First MID FPP Steering Committee meeting in in second half of 2018	<u>Activity 1.2.1:</u> The ICAO MID Regional Office to issue the invitation for the first MID FPP SC/1 meeting at least 2 months in advance. <u>Activity 1.2.2:</u> The MID FPP SC/1 meeting to agree on the MID FPP work plan for the first year and the funding mechanism.

Objective 2: Establish capability for PBN Workshop Implementation Plan, using external expertise, if required.

Outputs	Activities
<u>Output 2.1:</u> Establish workshop programme for PBN Implementation Plan	<u>Activity 2.1.1</u> Define external expertise origin and source of funding <u>Activity 2.1.2</u> Determine contents and schedule for the workshop

Objective 3: Establish capability for operational approval of air operators by Civil Aviation Authorities (CAA) course, using external expertise if required.

Outputs	Activities
<u>Output 3.1:</u> Establish workshop programme for operational approval of air operators by CAA	<u>Activity 3.1.1:</u> Define external expertise origin and source of funding <u>Activity 3.1.2:</u> Determine contents and schedule for the course

Objective 4: Establish capability for airspace design course, using external expertise if required.

Outputs	Activities
<u>Output 4.1:</u> Establish workshop	<u>Activity 4.1.1:</u> Define external expertise origin and source of funding

programme for Airspace Design Course	<u>Activity 4.1.2</u> : Determine contents and schedule for the course

Objective 5: Establish operating capability of the MID FPP in the areas of procedure design including initial PANS-OPS, PBN and OJT (On-The-Job) training capability.

Outputs	Activities
<u>Output 5.1</u> : Establish automation system for the input, storage and output of aeronautical data required for the instrument flight procedure process, based on global standards that will interface with flight procedure design automation tools and avionics database packing tools	<u>Activity 5.1.1</u> : Install automated software and middleware supporting on the software on technical computers of the internal network
<u>Output 5.2</u> : Establish initial procedure design and OJT (On-The-Job) training capabilities.	<u>Activity 5.2.1</u> : Train procedure designers as instructors. <u>Activity 5.2.2</u> : Determine contents for procedure design training sessions and OJT sessions

Objective 6: Establish Flight Procedure validation process and regulatory approval process support capability.

Outputs	Activities
<u>Output 6.1</u> : Establishment of Flight Procedure validation process support capability	<u>Activity 6.1.1</u> : Identify a list and pricing or through in-kind contribution of Flight procedure validation suppliers to cover MID Region to establish initial Flight procedure validation capability, <u>Activity 6.1.2</u> : Train MID FPP staff in Flight Procedure design ground validation process. <u>Activity 6.1.3</u> : Establish a support framework to assist States in validating flight procedures.
<u>Output 6.2</u> : Establishment of Flight Procedure regulatory approval process support capability	<u>Activity 6.2.1</u> : Train MID FPP staff in Flight Procedure regulatory validation process based on Doc 9906 (Quality Assurance Manual), examples from competent States (at least three) and consultation with ICAO <u>Activity 6.2.2</u> : Continue updating the training as new ICAO documentation becomes available. <u>Activity 6.2.3</u> : Establish a support framework to assist States in approving flight procedures

Objective 7: Execute -2019 MID FPP annual work plan, as at **Appendix D**.

Outputs	Activities
<u>Output 7.1</u> : Successful execution of MID FPP 2019 annual work plan	<u>Activity 7.1.1</u> : Provide to Member States the schedule list of training and support activities. <u>Activity 7.1.2</u> : Provide trainings and support activities according to annual work plan. <u>Activity 7.1.3</u> : initiate procedure design projects for the top priority runway ends identified in consultation with the airspace users.

Objective 8: Attain the full capability for MID FPP for Phase I.

Outputs	Activities
<u>Output 8.1:</u> Establish a pool of specialists in PANS-OPS, OPS Approval and Flight procedures Instructors who will mainly work remotely with the MID FPP Manager (on-call basis).	<u>Activity 8.1.1:</u> Establish selection process and identify a pool of suitable candidates, preferably through approaching MID States, Organizations, Airlines, and Donors, according to the job descriptions at Appendices C2-C5 . <u>Activity 8.1.2:</u> select the required pool of resources for the execution of the MID FPP work plan.

Objective 9: Obtain approved work plan, budget and agreement on annual States contribution for the second year of operation

Outputs	Activities
<u>Output 9.1:</u> Obtain approved work plan, budget and agreement on States contribution for the second year.	<u>Activity 9.1.1:</u> provide progress report on the implementation of - 2019 work plan to PBN SG and/or MIDANPIRG meetings <u>Activity 9.1.2:</u> Prepare and propose work plan, budget and annual States contribution level for the second year.

8. INPUTS

8.1. The minimum requirements for the hosting of the MID FPP are specified in **Appendix B2**.

8.2. By 1 January 2019, Lebanon as the Host Administration will provide the facilities and services as outlined in **Appendix B1** (Lebanese offer to host the MID FPP) based on the minimum hosting requirements at **Appendix B2**.

8.3. The host State will facilitate the issuances of visas, accreditations or residence permits for the ICAO experts and recognized dependents ensuring the expeditious relocation of them at the duty station and for the whole duration of their ICAO contracts and subsequent renewals.

Active States

8.4. Active States will provide the following:

- a) annual financial contributions covering the cost of the Programme, as indicated in the annual budget of the Programme; and
- b) participation in the MID FPP SC meetings as Member States with the right to vote.

Participating States

- a) Participating States might provide in-kind contribution to support the MID FPP such as:
 - Computer and Information Technology equipment.
 - Procedure design and charting equipment and software.
 - Suitably equipped classroom(s) for MID FPP training courses held in their States.
- b) support the MID FPP by nominating Procedure Designers, Instructors, Airspace Planners, OPS Approval experts, etc. to support the MID FPP with the implementation of its work plan;
- c) authorize and release to the MID FPP of aeronautical data from third parties, including AIP and electronic terrain and obstacle data, as well as appropriate topographic mapping

data and charts pertaining to their State for the purposes of the Programme, in particular for the design of instrument flight procedures and for quality assurance assistance;

- d) bear the expenses of duty travel (Air Tickets, Transportation, Accommodation and Daily Subsistence Allowances, in accordance to ICAO policies and practices) of MID FPP and ICAO staff as required supporting the MID FPP activities in their States.
- e) release of the assigned experts from their daily duties in order to support the MID FPP activities using their facilities (software, etc.), as required; and
- f) complete all remaining necessary steps to publish instrument flight procedures developed wholly or partly within the MID FPP framework in their State Aeronautical Information Publication.

ICAO (funded by the FPP Programme)

8.5. ICAO will provide the following:

- a) full support from the ICAO MID Office to run the Programme, in close coordination with the Host State, until such a time when the recruitment of a MID FPP Manager is completed;
- b) International Personnel (Programme Manager) for the MID FPP for 3 years;
- c) mission travel of ICAO personnel for monitoring purposes;
- d) administrative and other services for the handling of the Programme;
- e) financial account management and budgetary control of the Programme;
- f) technical support to the Programme experts in the performance of their duties including monitoring missions; and
- g) procurement through TCB: turn-key services for the procurement of goods and services as requested by the MID FPP SC; provided the requisite funds are made available and the project budget is revised, as appropriate. The procurement of equipment or services will be carried out in accordance with ICAO's Procurement Code, Financial Regulations and Rules, and applicable process and procedures.

9. RISKS, MITIGATION MEASURES AND PREREQUISITES

Risks and Risk Levels

9.1. The following are the main identified risks with their associated level:

Risks	Risk Level
a) Delay in the recruitment of MID FPP Manager	High
b) Delays in transfer of funds to ICAO	High
c) Delays in sourcing OPS Approval Instructor	High
d) Delays in nominating of experts from participating States and Organizations	Medium to High
e) Delays in identification of suitably qualified candidates for positions	Medium to High
f) Delays in sourcing of implementation workshop facilitator	Low
g) Delays in MID FPP expert training as Procedure Design Instructor	Low

Risk Mitigation Measures

9.2. It may be considered that low level in risk is acceptable and does not need any mitigation measure.

9.3. Considering the high and medium to high level for delays in:

- a) Delay in transferring fund to MID FPP account: follow-up by ICAO with the concerned States and Donors would mitigate the risk to an acceptable low level;
- b) Delay in the recruitment of the MID FPP Manager: the MID Office, based on the Steering Committee approval, could set up the Programme in coordination with the host State, establish the pool of expertise, and initiate the implementation of some activity from the first year's work plan, until the recruitment of the Manager. This action could mitigate the risk to an acceptable low level;
- c) Designation and release of experts by States: the MID FPP work plan could be difficult to implement. The MID FPP activity supposed to be provided by the missing expert would be replaced by another activity with capacity to provide. This action could mitigate the risk to an acceptable low level; and
- d) Identification of suitably qualified candidates: MID FPP Manager will support States with the identification of candidates. This mitigation could reduce risk to medium level. The MID FPP activity supposed to be provided by the missing nominated expert would be replaced by another activity that MID FPP is in capacity to provide. This action could mitigate the risk to an acceptable low level.

Pre-requisites

9.4. The Project Document should be signed by the host State and a minimum of four (4) Active States before the start of the Programme to ensure funding for the Annual Budget and to permit the MID FPP to perform its activities effectively and efficiently.

9.5. The establishment of the pool of resources and the readiness of the premises.

10. PROGRAMME WORK PLAN

10.1 The work plan for the first year is provided at **Appendix D**.

11. PROGRAMME BUDGET

11.1 MID FPP budget is composed of resources and expenses.

Resources are composed of:

- Annual contribution paid by the Active States;
- Cash contribution provided by Donors; and
- Fees paid by States in relation to services provided by MID FPP as outlined in Section 3.

Expenses mainly relate to:

- Manager Salary and allowances;
- Allowances paid to MID FPP experts;
- Workshops and courses organization, consultant expertise costs,
- Travel Missions Expenses (travel, transportation and DSA),
- Office costs, and
- Administrative Overhead.

11.2 The activities/events should normally be convened at the MID FPP premises. If a State/Organization offers to host an activity, it shall coordinate with the MID FPP Manager as early as possible, but in any case at least six (06) months in advance and, shall be responsible for providing a venue, services and all costs of travel, accommodation and daily subsistence allowance for MID FPP experts, ICAO personnel, Instructors and Experts performing the activity.

11.3 The Programme budget corresponding to Phase I is provided at **Appendix E**.

12. LEGAL FRAMEWORK

12.1 The funds and activities under this Agreement shall be administered according to applicable ICAO regulations, rules, directives, procedures and practices.

12.2 The obligations assumed by the parties under this Agreement shall continue to exist after termination of this Agreement to the extent necessary to permit the orderly finalization of activities, the withdrawal of personnel, the distribution of funds and assets, the liquidation of accounts existing between the parties, and the settlement of contractual obligations. Additional funds, if necessary, to cover the above-mentioned expenditures shall be provided by the Participating States.

12.3 All cash receipts to, and payments made by, ICAO under this Agreement shall be recorded in a separate account, opened, inter alia, in order to place on record the receipt and administration of payments. All payments made to ICAO shall be made in U.S. dollars and deposited in ICAO's bank account as follows:

Pay to://CC000305101
Royal Bank of Canada
Ste. Catherine and Stanley Branch
1140 Ste. Catherine Street West
Montreal, Quebec
Canada H3B 1H7
For credit to: 05101 404 6 892
Project: RAB/18/801
ICAO Account
Swift code: ROYCCAT2

12.4 ICAO shall not be obliged to begin or continue the provision of the Services until the payments of this Agreement have been received and ICAO shall not be obliged to pay or commit any sums exceeding the funds deposited in the aforementioned account.

12.5 ICAO shall furnish the Participating States with unaudited financial statements concerning the Services covered in this Agreement, showing the status of the funds in U.S. dollars as at the end of March, June, September and December. After ICAO has concluded the provision of the Services, it shall submit a final financial statement. In the event that the Participating State(s) requests that a special audit/evaluation of its account or project under this Agreement be performed by the Internal or External Auditor of ICAO, the Participating State(s) shall bear the cost of such audit.

12.6 If due to unforeseen circumstances the funds received under this Agreement should prove insufficient to cover the total cost of provision of the Services and Administrative Charges, ICAO shall inform the Participating States to that effect and additional funds, if required, shall be made available to ICAO before the continuation of the project

12.7 Any dispute, controversy or claim arising out of or relating to this Agreement, or the breach, termination or invalidity thereof, shall be settled, in the first instance, by direct negotiations between the parties. If unsuccessful, such dispute, controversy or claim shall be settled by arbitration in accordance with the United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules, as in force at the time of arbitration. The place of arbitration shall be Montreal, Province of Quebec, Canada, conducted in the English language. Arbitration shall be conducted by one arbitrator. The arbitral award shall contain a statement of reasons on which it is based and shall be accepted by the Parties as the final adjudication of the dispute.

12.8 Nothing in or relating to this Agreement shall be deemed a waiver, express or implied, of any immunity from suit or legal process or any privilege, exemption or other immunity enjoyed or which may be

enjoyed by ICAO, its officers, staff, assets and funds either pursuant to the Convention on the Privileges and Immunities of the Specialized Agencies, 1947 or other applicable conventions, agreements, laws or decrees

12.9 The Participating States shall indemnify, hold harmless and, in consultation with ICAO, defend ICAO, including its personnel from any and all actions, claims or other demands arising out of any act performed by ICAO on behalf of the Participating States pursuant to this Agreement.

DRAFT

MID FPP STEERING COMMITTEE (MID FPP SC)

TERMS OF REFERENCE

A) Purpose of the MID FPP SC:

The MID FPP Steering Committee shall meet at least once a year at a venue and time agreed upon by the SC Members.

In order to meet its Terms of Reference, the MID FPP SC shall:

1. elect a Chairperson for a cycle of three years unless re-elected;
2. review regional objectives, plans and users' requirements;
3. monitor and evaluate the Programme activities since the previous meeting;
4. formulate policies and assign priorities for the activities of the MID FPP taking into account the requirements of this Institutional Framework, the provisions of the MID FPP Project document and the availability of funds;
5. review and approve the annual work plan and budget of the MID FPP; taking into account the Host State's and Participating States' in-kind contributions for offsetting their annual financial contribution to the Programme.
6. review plans submitted by the MID FPP Manager;
7. ensure that the business plans are in line with the MID Air Navigation Strategy;
8. oversee the activities of the MID FPP in line with the plans and approved budgets;
9. monitor the financial performance at project level in line with the approved budget;
10. monitor and follow-up the implementation of the MIDANPIRG Conclusions and Decisions related to the MID FPP;
11. follow up with the implementation of the agreed projects and provide regular progress report to the relevant MIDANPIRG subsidiary bodies;
12. coordinate technical issues with the appropriate MIDANPIRG subsidiary bodies; and
13. review and update its terms of reference as deemed necessary.

B) Composition:

The MID FPP SC is composed of:

- a) MID FPP Active States: Directors General of Civil Aviation of the MID FPP Active States, or their designated representatives;
- b) ICAO: Regional Director, Middle East Office, Director, Technical Cooperation Bureau (TCB), and Chief of Programmes Coordination and Implementation Section (ANB/PCI) or their representatives; and
- c) MID FPP Manager, who will act also as the Secretary of the Steering Committee meetings.

The following may participate in the Steering Committee meetings as observers:

- a) MID FPP Users States: Directors General of Civil Aviation of the MID FPP Member States, or their designated representatives;
- b) Donor States, agencies, organizations and industry having made a financial or in-kind contribution (recognized as "Partners" in the implementation of the Programme);
- c) Representatives from observers States, agencies, organizations and industry with an interest in

aviation safety or air navigation issues in the MID Region; and

d) Representatives from the following Partners:

AACO, ACAC, ACI, AIRBUS, BOEING, CANSO, EUROCONTROL/SESAR JU, IATA, IFALPA IFAIMA, and IFATCA.

Other representatives from States and industry may be invited on ad-hoc basis, as required.

Note 1: *The composition of the MID FPP SC may be updated over time to include only States and/or Partners that could participate actively and contribute to the work of the SC.*

DRAFT

Appendix B1

MID FPP LEBANON HOSTING OFFER

State Name:	Lebanese General Directorate of Civil aviation	date: 18 JUNE 2016
Filled by:	Kamal Nassereddine/chief of air navigation Department	email: atm@beirutairport.gov.lb

Please complete and send in a closed envelope by courier (DHL, ARAMEX, etc.) to the ICAO Middle East Office, Cairo International Airport, Ministry of Civil Aviation Complex, P.O.Box 85, Postal Code 11776, Cairo, Egypt

During evaluation grades will be set out of 10 marks and then multiplied by the relevant factors.

Item	Requirements	Multiply Factor	Details	Your Offer/Answers
General Living conditions				
1	City Accessibility	2	Indicate which of the MID States have NO direct flight to your State	All states have more than one daily direct flights to Beirut airport Except for Sudan, Libya, and Yemen.
2	Visas	2	Indicate which of the MID States require entry visa to your State	(Egypt , Libya, Sudan, Yemen)
3			Will your Administration facilitate the visa process for the participants?	these states need some documents to get the visas at Beirut airport like hotel reservation , 2way flight tickets, 2000 USD cache, a security check might also be required for some participants, even though the DGCA will provide appropriate support to facilitate visa issuance for them.
4	United Nations privileges	2	Is the necessary procedures in place that facilitate the issuances of visas, accreditations or residence permits for the MID FPP Manager and his family members (UN-ICAO expert) ensuring the expeditious relocation of them at the duty station and for the whole duration of their ICAO contracts and subsequent renewals.	yes Lebanon will facilitate the issuances of their visas also The Programme Coordinator will benefit from the same privileges provided to the United Nations Staff working in Lebanon (residency, Immunities, etc.) in accordance with the Lebanese law and policies.
5	Transportation	1	What are you offering for the MID FPP Manager for his daily transportation?	upon request DGCA can provide the transportation with driver to/from within Beirut city Zone for the FPP coordinator and for purposes of official movements between programme office and supporting facilities as needed or requested.
Premises				
6	Building	2	Building Type (Villa, Apartment, Centre, etc.)	the premises will be in the safety training center located within Beirut Rafic Hariri International Airport-Beirut Area and just away 9 km from Beirut city center.
7	Offices	3	Number of Offices for the Manager and experts.	2 -3 OFFICES as requested by ICAO letters :AN 6/33-16/023, and Letter Ref: AN 6/33-16/149 dated 2 June 2016.
8	Facilities	1	List the facilities that will be provided within the premises such as: parking, garden, kitchen, cafeteria, playground, coffee machines, etc.	the center include: large parking for more than 50 cars, backyard garden, kitchen, small self service cafeteria , play ground ,coffee machines and Beverages machines, library with study room . (please see the pictures No 1 &2)
9	Furniture	1	What furniture will be provided?	all requested by ICAO letter:AN 6/33-16/023 AN 6/33-16/023, and Letter Ref: AN 6/33-16/149 dated 2 June 2016 for fully new furnished offices
10	Labs	3	Number of laboratory to be used by procedure designers	Two laboratories are available upon request with pre-reservation : 1- Computer LAB contains 20 workstations. (see the pictures No 3) 2- Another available large ROOM (20 persons) can be used as LAB
11	Meeting Rooms	3	Number and capacity of meeting rooms	3 meeting rooms are available upon request with pre-reservation with the center coordinator and CERSA (security training academy) : 1- examination hall can contain 80 persons.(see the pictures No 4) 2- Amphitheatre capacity 64 people .(see the pictures No 5). 3- one meeting room for 18 persons equipped with smart projector (see the pictures No 6).
12	Classrooms	3	Number and capacity of classrooms	the center has 7 classrooms (Capacity between 10 and 25 trainees) (see the pictures No 7).
13	Air conditioning	2	Indicate if the premises is or will be air-conditioned through the hosting offer	the center is already air-conditioned 24/24hours through the Lebanese DGCA offer.

Running cost of the premises				
14	Security of the premises	1	Are you willing to provide security services?	yes Centre is provided with private parking ,fence and the police is guarding the center 24/24 hours since in the same location there is the CERSA Aviation Security Training Academy and police office (see the pictures No 8).
15	Electricity	1	Is electricity fees covered by your offer?	yes for 24/24hours through the lebanese DGCA offer.
16	Internet	1	Is internet fees covered by your offer?	yes 4 MB HDSL will be provided through the lebanese DGCA offer.
17	Telephone	1	Is telephone bills covered by your offer (specify if local and/or international calls)?	the local telephone bills will be only covered by lebanon DGCA offer, for the international calls the center is equipped by a pay-phone machine.
18	Cleaning services	1	Are you willing to provide cleaning services of the premises?	yes / a daily cleaning services are already provided through DGCA to all training center premises including MFPP offices.
19	Maintenance	1	Are you willing to cover the maintenance expenses related to the premises?	yes maintenance are already covered through DGCA to all training center premises .
Man power support				
20	PANS-OPS experts	2	Indicate the number of experts that will support the MID FPP and in which area (PANS-OPS, Airspace Planners, OPS-Approval, Instructors)	LEBANON Doesn't have procedures designer experts (we have one person didn't complete all the required courses and without OJT) and we are willing to train 3-4 persons in the mentioned area through the MFPP project training courses.
21	data analyst	1	Are you willing to support the MID FPP with a Data Analyst?	NO
22	secretary	1	Are you willing to support the MID FPP with a Secretary?	NO
Equipment and software				
23	PCs	3	Indicate number of PCs that will be provide (Workstations and Server)	1 server + 4 workstations (PC)
24	Monitors	3	Number of 19 inch monitors for the above PCs	5 Monitors
25	Maps Storage cabinet	1	Cabinet for MAPs and documentation storage	yes (and we will provide more than one cabinet if needed)
26	A0 Printer or Plotter	1	Type of the A0 printer	HP DESIGN-JET
27	Maps A3 printer	1	Type of the A3 printer	HP
28	A0 scanner	1	Type of the A0 scanner	HP DESIGN-JET
29	Computer Data Projector	2	Projector (type and numbers)	ALL classrooms and meeting rooms in the center are equipped with projectors and there is one meeting room is equipped with smart projector and we can provide one extra projector (sony or epson) if needed or requested by MFPP manager.
30	Supplies for training sessions**	1	Are willing to provide supplies for training sessions such as: set squares, protractors, compasses, rulers and nocket calculators?	yes (but we need a list of the items needed+ numbers and types)
31	2 Procedure Design Software Licenses	3	Are willing to provide the procedure design software? Indicate type and how many licenses?	the MFPP STAFF will have access (if requested or needed) to use the lebanese flight procedure design software and tools(GeoTITan) which we are going to upgarde to the new version during 2016/17 and we are planning to get 2 licenses and we will then dedicate one of them to the MFPP project.
32	2 GOOGLE EARTH licenses	1	Are willing to provide 2 GOOGLE EARTH licenses?	yes
33	2 ACROBAT READER licenses	1	Are willing to provide2 ACROBAT READER licenses?	yes
34	2 COREL DRAW licenses	1	Are willing to provide 2 COREL DRAW licenses?	yes
35	Simulator	2	Are you willing to provide or make available the use of a Fast Time Simulator.	A project for a new ATC Simulator (Tower - Approach - Area), including a FTS has been already initiated with ICAO TCB and could be used by the MID FPP .
36	2 virtual machines (such as VMWARE) licenses	1	Are willing to provide 2 virtual machines (such as VMWARE) licenses for the remotely use of the MID FPP software?	YES
Readiness to sign the Agreement				
37	Premises	2	How much time is needed for the readiness of the premises?	the premises is already exist and the training center is opened and operated many years ago.
38	Agreement	3	how much time is needed for the signature of the Hosting Agreement with ICAO Technical Cooperation Bureau (TCB)?	after the signature of the hosting agreement with ICAO (TCB) we need 6 months for purchasing the furniture , tools , and the softwares offered by the Lebanese DGCA.

END

MID FPP MINIMUM OFFICE REQUIREMENTS

MID FPP staff	
	• Programme Manager (1) Full Time Recruited by ICAO TCB • 5 to 10 Procedure Designers and Airspace Planners, 2- to 4 OPS Approval experts and 2 to 4 PD Instructors assigned by States and Donors, who will work on-call-basis. • PANS-OPS Specialist, Data Specialist (1), Administrative Assistant (1) and/or IT Specialist (1) should be seconded when needed in compliance with the ICAO policy on secondment.
Office space	
1 office	• Programme Manager
1 office	• PANS-OPS Expert
1 room	• Lab for procedure design
1 room	• Classroom/ Meeting room
Furniture equipment	
Manager	• Desk and chair • Storage/File cabinet • Book case • Conference table (6 persons) and chairs • Monitor/Webcam for conferences
Offices	• Standard furniture for all offices • Desk, chair, storage/file cabinet, book case – per person
Classroom OJT room	• Adequate space for 20 students • 4 drawing tables • White boards • Student tables • Projector
Meeting room	• Adequate equipment for 20 persons
IT equipment	
	• Secure Wi-Fi Internet connection • Desk-top Phone with international services • 1 Mobile phone (Manager) – Laptop computer with docking station – monitor 19" • Data Specialist when seconded – Office computer equipment (monitor 19") • External storage disks • 1 desktop multi-functional color copier/scanner/printer
Procedure Design equipment	
Offices	• Maps Storage cabinet • Maps A3 printer • A0 scanner • A0 printer Semi-professional • GPS • 1 server and 2 workstations (PCs)
Classroom	• Computer Data Projector • Supplies for training sessions : set squares, protractors, compasses, rulers and pocket calculators
software	• 2 Procedure Design Software Licenses • 2 GOOGLE EARTH licenses • 2 ACROBAT READER licenses • 2 COREL DRAW licenses • 2 virtual machines (such as VMWARE) licenses for the remotely use of the Procedure Design Software

APPENDIX C - JOB DESCRIPTION



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Programme Manager	Position Number (ID):	
Specific Title:	MID FPP Manager	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	TBD	CCOG code:	
Duration:	1 year	Starting Date:	1 January 2019

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional Director and in cooperation with the national counterparts and other MID FPP Programme personnel:

- work with ICAO and the participating States on the establishment of the MID FPP Office and commencement of operations, including establishment of office capability and processes;
- be responsible for all aspects of the operation and management of the Flight Procedure Programme to include Programme coordination functions, personnel resourcing and training, office software and automation implementation, work plans, travel, and budget;
- implement of the work plan agreed upon by the MID FPP Steering Committee;
- perform frequent coordination with ICAO MID Regional Office, other FPP offices, sub-regional groups, international and regional Organizations and States on issues related to FPP operations;
- foster positive relationships and cooperation among assigned staff, international experts, nominated experts, seconded officers and CAA counterparts;
- identify, and develop Programme resources;
- report on a quarterly basis to the MID FPP Steering Committee and the ICAO Middle East Regional Director, on the progress of the FPP to include:
 - a. Programme Status (Interim or Full Operational Capability, status of resources, budget, etc.);
 - b. Accomplishments (since last report);
 - c. Objectives for the next reporting period; and
 - d. Other (new requirements, concerns, issues, etc.)
- develop and amend business plans (deliverables, timeline, budget and concerned entities) for MID FPP and recommends them to the Steering Committee;
- develop Key Performance Indicators (KPIs) to monitor the implementation, assess and measure the effectiveness of the Programme;
- identify and report Programme risk to the MID FPP SC and maintain a risk database;
- assign projects to the MID FPP personnel;
- supervise/monitor the performance of the MID FPP Specialists; and
- perform other related duties as required.

QUALIFICATIONS AND EXPERIENCE

Educational background

A first level university degree in aeronautics, ATM, or in a related field, is required. A technical qualification in aviation such as an Airline Transport Pilot License (ATPL) and Air Traffic Control (ATC) License may be accepted in lieu of a university degree.

Professional experience and knowledge

- At least 10 years' operational experience as PANS-OPS Specialist, Airspace Planner, pilot or Air Traffic Controller, with a good understanding of instrument flight procedure design process. A working knowledge of the Ops Approval and Airspace Design processes is highly desirable.
- Knowledge in aeronautical data quality and trajectories' publication.
- At least 5 years' aviation management experience.
- Knowledge of the ICAO GANP as well as the Performance Based Navigation (PBN) concept, objectives and supporting ICAO provisions and guidance.
- Ability to work and coordinate with civil aviation officials at all levels, as well as industry, regional and sub-regional groups, to accomplish the goals of the Programme.
- Ability to successfully lead major projects under a team structure; Experience in team management with the ability to foster and maintain harmonious, positive working relationships in a multi-national environment.
- Satisfactory completion of PANS-OPS, Airspace planning or PBN course(s).
- Satisfactory completion of the ICAO online course related to PBN.
- Knowledge of the process related to the development of IFPs for conventional and PBN procedures.
- Completion of SMS or Quality assurance course(s) with knowledge about the implementation of Flight Procedure Design Quality Assurance (Doc 9906) requirements.
- Experience using Flight Procedure Design automation systems for flight procedure design is preferable.
- Experience as an Instrument Flight Procedure Design Instructor for ICAO PANS-OPS (Doc 8168) courses is preferable.

Language Skills

Essential

- Fluent reading, writing and speaking abilities in English is essential.

Desirable

- A working knowledge of Arabic is an asset

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTION



International Civil Aviation Organization

Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Procedure Designer	Position Number (ID):	
Specific Title:	Procedure Designer	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	Remotely	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- design instrument flight procedures;
- review, verify, maintain and make sure that the flight procedure is ready for the final approval;
- guarantee a quality assurance in the flight procedure design;
- provide OJT training to new procedure designers;
- maintain a well-structured database for obstacles assessment; and
- perform other related duties as assigned.

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Minimum five (5) years' experience at increasing levels of responsibility in flight procedure design
- Experience in aviation operations as a pilot, navigator or air traffic controller is desirable.
- Satisfactory completion of an approved PANS OPS flight procedures design courses and advanced courses on PANS OPS flight procedures design (PBN, RNAV, GBAS, etc.) at a specialized recognized institution.
- Knowledge in the aeronautical information conceptual and exchange model (AIXM), automation, digital terrain model (DTM), geographic information systems and cartography.
- Experience in the use of flight procedure design software.
- Knowledge in participating in the work of International Organization for Standardization (ISO) and quality assurance.
- Thorough knowledge of ICAO Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS).
- Ability to write clearly and concisely detailed technical and specialized reports and to make verbal presentations.
- Ability to develop clear goals that are consistent with agreed strategies.

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTION



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Instructor	Position Number (ID):	
Specific Title:	Instructor	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	Remotely	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- conduct airspace planning, procedure design and OPS Approval courses as tasked by the MID FPP Manager; and
- perform other related duties as assigned by the MID FPP Manager.

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Significant aviation experience as air traffic controller or a pilot or demonstrated equivalencies.
- Significant experience as Instrument Flight Procedure Design specialist with extensive knowledge of ICAO PANS-OPS (Doc 8168) and ICAO PBN (Doc 9613) requirements.
- Significant experience as an Airspace Design specialist with knowledge of ICAO use of PBN in Airspace Design (ICAO Doc 9992).
- Training and Experience as an Instrument Flight Procedure Design Instructor for ICAO PANS-OPS (Doc 8168) courses with thorough understanding of teaching techniques and assessment methods is desirable.
- Thorough understanding of Flight Procedure Design Quality Assurance (Doc 9906) requirements and its implementation.

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTIONS



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	OPS approval Expert	Position Number (ID):	
Specific Title:	OPS approval Expert	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	Remotely	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- assist States with the developments/implementation of flight procedure regulatory approval as tasked by the MID FPP Manager;
- review, verify, maintain and make sure that the flight procedure is ready for the final approval;
- provide on-the-job training to OPS Approval experts; and
- perform other related duties as assigned

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Satisfactory completion of formal PANS-OPS course(s) to cover the conventional and PBN procedure design criteria.
- Experience in the development of IFPs for conventional and PBN procedures.
- Understanding of Flight Procedure Design Quality Assurance (Doc 9906) requirements and its implementation.
- Experience using Flight Procedure Design automation systems for flight procedure design is preferable.
- Experience as an Instrument Flight Procedure Design Instructor for ICAO PANS-OPS (Doc 8168) courses is preferable.
- Experience of working with CAAs (Regulatory authorities).

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.
- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

APPENDIX B - JOB DESCRIPTIONS



International Civil Aviation Organization Technical Cooperation Bureau – Job Description

POSITION INFORMATION

Generic Title:	Data Specialist	Position Number (ID):	
Specific Title:	Data Specialist	Job Card:	
Project Number:		Post Number/Job Code:	
Duty Station:	TBD	CCOG code:	
Duration:	1 year	Starting Date:	

ORGANISATIONAL SETTING

Under the direction of the Director/Technical Cooperation Bureau, the Field Operations Section is responsible for the strategic planning, development, execution and evaluation of Projects in TCB. The Section assists with the identification of priority development requirements across civil aviation and with technical cooperation to recipient States. It carries out resource mobilization with multilateral and bilateral development partners and industry and develops regional and country specific technical cooperation programmes and projects. The Section executes these programmes and projects in accordance with the policies and contractual modalities of TCB.

MAJOR DUTIES AND RESPONSIBILITIES

Under the direction of the ICAO Middle East Regional and with the supervision of the MID FPP Manager:

- establish and update MID FPP data base of aeronautical data to support procedure design;
- acquire and store obstacle data to support procedure design; and
- perform other related duties as assigned

QUALIFICATIONS AND EXPERIENCE

Educational background

University degree or equivalent qualifications and experience in the air navigation.

Professional experience and knowledge

- Significant experience in aeronautical data management.
- Knowledge of ICAO PANS-OPS (Doc 8168) and ICAO PBN (Doc 9613) data requirements.
- Thorough understanding of Flight Procedure Design Quality Assurance (Doc 9906) requirements and its implementation.
- Training and experience using Flight Procedure Design automation systems for flight procedure design.
- Experience of working with CAAs, preferably in the MID Region.

Language Skills

Essential

- Good command of oral and written English is essential.

Desirable

- A working knowledge of Arabic is an asset.

Competencies

- **Judgment/Decision-Making:** Demonstrated ability to take ownership of all responsibilities and commitments, to

exercise a mature opinion, to recognize key issues and analyse relevant information, to formulate viable recommendations and make decisions.

- **Vision:** Identifies strategic issues, opportunities and risks.
- **Leadership:** Drives for change and improvement, does not accept the status quo, establishes and maintains relationships with a broad range of people to understand needs and gain support.
- **Managing Performance:** Monitor progress against milestones and deadlines.
- **Building Trust:** Operates with transparency, treats sensitive or confidential information appropriately.
- **Teamwork:** Ability to work with colleagues to achieve the project objectives and maintain harmonious working relations in a multinational environment.
- **Client Orientation:** Ability to establish and maintain partnerships with outside partners, to work and argue effectively in a system based on consensus and to successfully manage and resolve conflicts.
- **Communication:** Ability to write clearly and concisely and present oral reports.

REMUNERATION

WORK PLAN 2019

MID FPP Objectives for Year 1 (2019)

The first year will be an important year for the MID Flight Procedures Programme (MID FPP). The purpose of the Programme is to provide opportunity to use the training activities and services proposed by the Programme for Participating States.

In order to propose a variety of training activities and services addressing the needs of Participating States while complying with the ICAO Resolution A37-11, ASBU B0-APTA and the Global and regional requirements, the MID FPP training programme is composed of workshops, training courses and support activities. The training activities centered on PBN Implementation Plan, regulatory approval procedures and PBN OPS Approval for operators have to be considered as essential to improve or start PBN implementation in States.

On the other hand, specific projects and implementation support activities will assist Participating States to consolidate or implement the flight procedures through ground validation and approval process. These activities will allow the Participating States to expedite or to make the first steps for implementing PBN flight procedures in the Region.

The MID FPP Objectives for 2019 are as follows;

- Commence Phase 1 MID FPP operations on **01 January 2019**;
- Conduct 4 Training activities; and
- Conduct 2 Project-orientated implementation support activities

MID FPP Training Activities for-2019

1) PBN Implementation Workshop--5 days – [date]

Description: This PBN Implementation Workshop is intended to assist States/Administrations in enhancing their PBN Implementation Plans and move forward with actual PBN implementations. The Workshop will also provide updated information regarding global PBN activities and how PBN can be an enabler for enhancing ATM operations. During the workshops, the participants with assistance from MID FPP facilitators will develop a list of short-term action items aiming to enhance their existing PBN Implementation Plans and advance their on-going PBN implementations and deployments. The list of action items along with relevant recommendations will then be submitted to appropriate CAAs for their actions.

Participants to these workshops should be representatives from all aviation stakeholders with an interest in PBN implementation.

- Facilitator – TBD
- Coordination/Sponsorship –TBD
- Material – ANB, APAC FPP, AFI FPP, MID FPP
- Facility – TBD
- Funding – TBD

2) PBN Ops Approval Course - 1 week - [date]

Description: The course is based on ICAO Doc 9997 and conducts to support States in developing their operational approval capability for approving PBN operations and air operators in obtaining PBN OPS approvals. The purpose of the course is to provide experienced flight inspectors, flight operations regulators and air operators' personnel with a comprehensive understanding of the requirements for PBN operational approval.

At the end of the course, each participant will be individually assessed and the outcome of the assessment will be reported to each participant and his/her agency. The course is open to qualified and experienced flight inspectors, regulators and air operator personnel involved in PBN flight operations.

- Instructor – TBD
- Coordination/Sponsorship – TBD
- Material – ANB, TBD
- Facility – TBD
- Funding - TBD

3) PANS-OPS Initial Procedure Design Course– 4 Weeks – [dates]

Description: The course is based on ICAO PANS-OPS and aims to support States in developing their conventional flight procedures and basic procedure design capability by providing fundamental knowledge regarding procedure design. The instruction consists of lecturing, exercises, progress tests and examinations. At the end of the course, each participant will be individually assessed and the outcome of the assessment will then be reported to each participant and his/her agency.

- Instructor – TBD
- Material – TBD
- Facility – TBD
- Funding – TBD

4) PBN Procedure Design – 4 Weeks – [dates]

Description: The course aimed to support States/Administrations in developing their PBN procedure design capacity. The course is a follow-up to the ICAO PANS-OPS Initial Procedure Design Course. At the end of the course, each student will be individually assessed and the outcome of the assessment will then be reported to each student and his/her agency. The course is open to qualified procedure designers who have successfully completed PANS-OPS Initial Course either at the MID FPP or other institutions.

- Instructor – TBD
- Material – TBD
- Facility – TBD
- Funding - TBD

MID FPP Project-oriented Implementation Support for 2019

1) OJT on ground validation and approval procedures with specific projects, [States, dates]

Description: The OJT sessions are targeted to assist regulators in validating and approving specific PBN procedures. The purpose of the session is to provide hands-on assistance for regulators in reviewing specific procedure design and validation packages which have been submitted prior to actual approvals and publications into the State AIPs. It is expected that once the validation and approval process is completed, the said procedures will be promptly published and implemented.

- Instructor - Qualified procedure designer from MID FPP
- Funding by States participating on the OJTs or Donors if available
- Facility - TBD
- Conditions – This OJT session is available for
 - Active States with annual contributions to the MID FPP; or
 - States that request this support under a service fee

2) Provision of assistance for the development of IFPs including Quality Assurance. [States, dates]

Description: The MID FPP would assist States for the development of instrument flight procedures with a focus on quality assurance, including the conduct of training courses or workshops for the personnel involved in the development process.

Appendix E

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
TECHNICAL CO-OPERATION PROGRAMME**

PROJECT BUDGET COVERING MSA CONTRIBUTION
(IN UNITED STATES DOLLARS)

COUNTRY:		REGIONAL PROJECT								
PROJECT NO:		RAB18801								
PROJECT TITLE:		FLIGHT PROCEDURES PROGRAMME - MID								
WORK ORDER:		RAB18801-01								
VERSION:		3								
			TOTAL		2019		2020		2021	
			w/m	\$	w/m	\$	w/m	\$	w/m	\$
PROJECT PERSONNEL										
INTERNATIONAL PROFESSIONAL POSTS										
B500A	900186 / PROGRAMME MANAGER		36.0	809 200	12.0	286 400	12.0	226 200	12.0	296 600
B554A	CONSULTANTS			85 000		25 000		30 000		30 000
SUB-TOTAL (INTERNATIONAL PROFESSIONAL POSTS)			36.0	894 200	12.0	311 400	12.0	256 200	12.0	326 600
B814A	INTERNATIONAL TRAVEL			45 000		15 000		15 000		15 000
TOTAL (PROJECT PERSONNEL)				939 200		326 400		271 200		341 600
SUB-CONTRACTS										
B803A	SUB-CONTRACT - LOCAL			45 000		15 000		15 000		15 000
TOTAL (SUB-CONTRACTS)				45 000		15 000		15 000		15 000
EQUIPMENT										
B751D	EXPENDABLE EQUIPMENT - LOCAL			15 000		5 000		5 000		5 000
TOTAL (EQUIPMENT)				15 000		5 000		5 000		5 000
MISCELLANEOUS										
B807M	MISCELLANEOUS EXPENSES			25 000		8 700		7 300		9 000
B754A	OVERHEAD CHARGES			102 500		35 500		29 900		37 100
TOTAL (MISCELLANEOUS)				127 500		44 200		37 200		46 100
PROJECT TOTAL				1 126 700		390 600		328 400		407 700

-END-



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 5.3: Specific Air Navigation issues

STATUS OF SEARCH AND RESCUE IN THE MID REGION

(Presented by the Secretariat)

SUMMARY The paper presents the status of Search and Rescue in the MID Region and presents the draft MID Region SAR Plan for the meeting review and endorsement. Action by the meeting is at paragraph 3.
REFERENCES - MIDANPIRG/16 Report - ATM SG/4 Report - USOAP CMA Results

1. INTRODUCTION

1.1 The Standards, Recommended Practices and Procedures and guidance material related to the implementation of Search and Rescue (SAR) are contained in ICAO Annex 12, International Aeronautical and Maritime Search and Rescue Manual (IAMSAR - Doc 9731).

1.2 The ICAO Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) focuses on a State's capability in providing safety oversight by assessing whether the State has effectively and consistently implemented the critical elements of a safety oversight system and determining the State's level of implementation of ICAO's safety – related SARPs, including Annex 12 Search and Rescue, and associated procedures and guidance material.

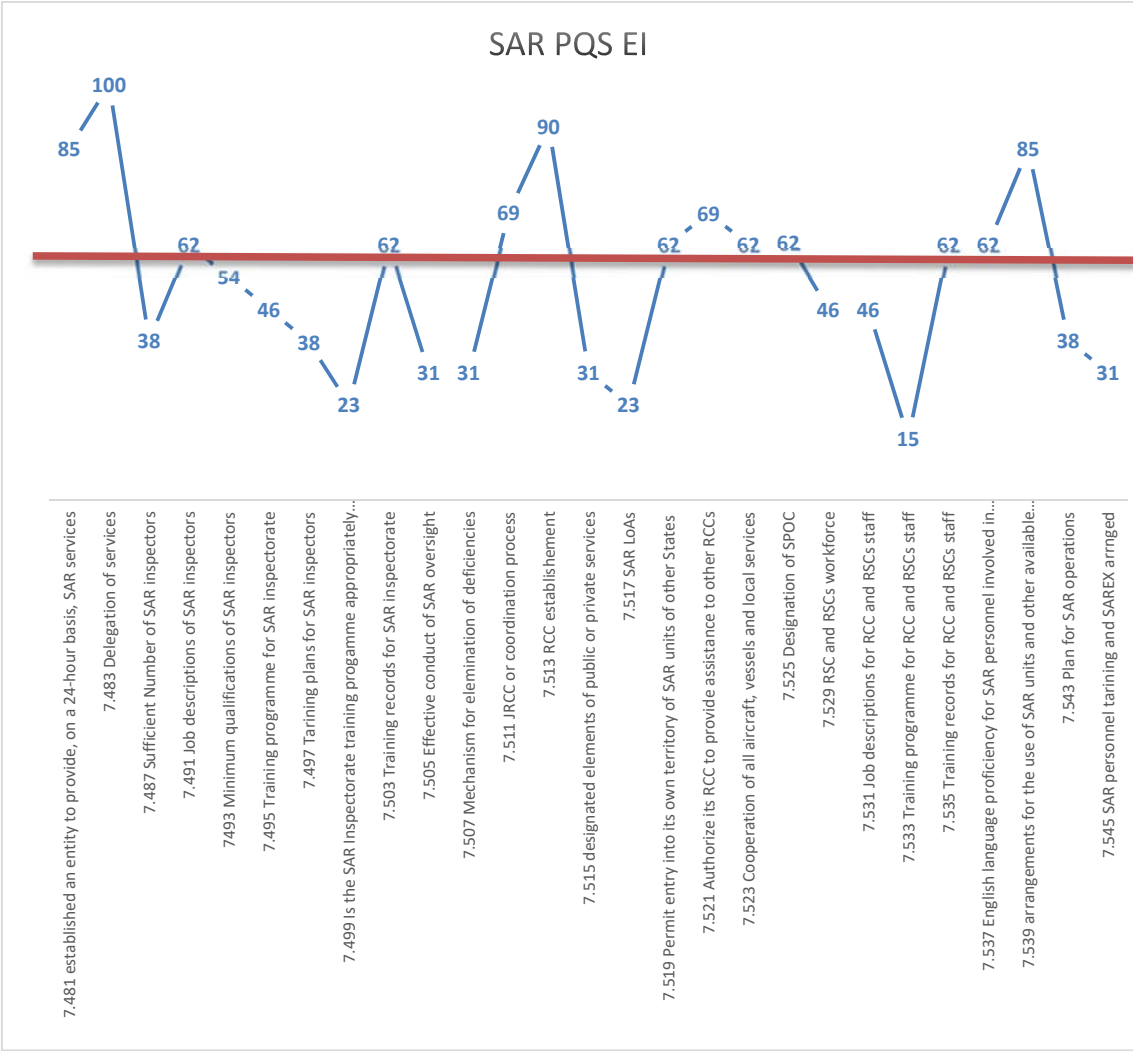
2. DISCUSSION

2.1 The meeting may wish to note that SAR main USOAP-CMA findings in the MID Region are related to lack of:

- effective SAR oversight activities;
- English language proficiency for RCC radio operators;
- appropriate training programmes/plans of SAR experts;
- signature of SAR agreements;
- plans of operations for the conduct of SAR operations and SAR exercises;

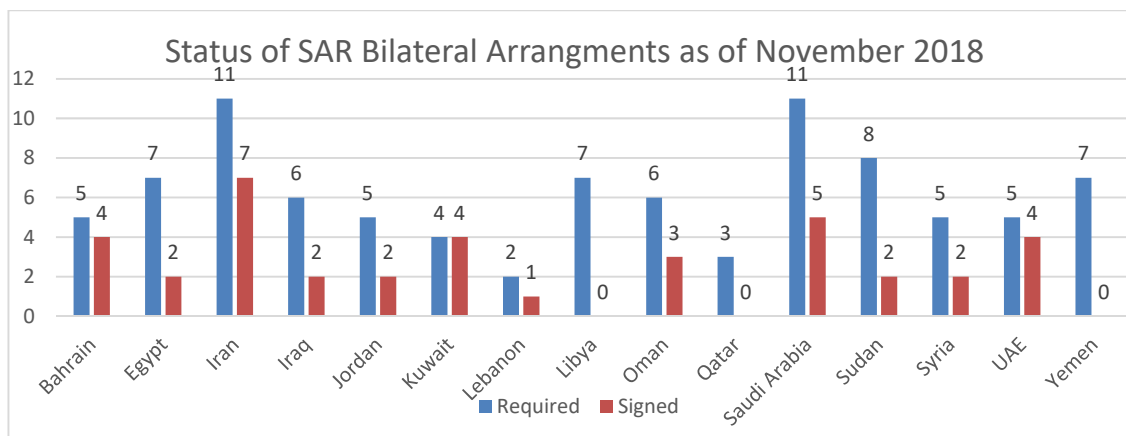
- provision of required SAR services; and
- non-compliance with the carriage of Emergency Locator Transmitter (ELT) requirements.

2.2 The SAR EI in the MID Region per Protocol Question (PQ) as of May 2017 are reflected in **Graph 1**:



Graph 1

2.3 The meeting may wish to note the status of SAR bilateral Arrangements as of 25 November 2018 at **Appendix A**, which is also reflected in the following **Graph 2**:

**Graph 2**

2.4 The meeting may wish to recall that MIDANPIRG/16 meeting urged States to implement the relevant recommendations emanating from the ICAO AFI/APAC/MID Regional and Inter-regional SAR Workshop (Mahe, Seychelles, 19 - 22 July 2016). Based on the success of the Workshop, it was agreed to organize the SAR Inter-Regional Workshop between the 4 ICAO Regions each 2 years and on rotation basis. In this respect, the ICAO MID Office initiated coordination with for the conduct of the Workshop in one in the Middle East Region, tentatively it might be held in Salalah, Oman, 1-4 July 2019.

2.5 The meeting may wish to note that the ATM SG/4 meeting reviewed the Draft MID SAR Implementation Plan developed by the MID SAR Action Group (SAR AG) as at **Appendix B**, which includes guidance material to support States to comply with global and regional requirements for SAR provision. The Plan includes also the Matrix that will be used for the analysis of the SAR status of implementation in the MID Region and Templates related to the conduct of SAREX.

2.6 The meeting commended the work of the Action Group and agreed that the Plan to be presented to MIDANPIRG/17 meeting for endorsement. Accordingly, the meeting agreed to the following Draft Conclusion:

Why	To support SAR regional implementation
What	Endorsement of the MID Region SAR Implementation Plan
Who	MSG/6
When	Dec 2018

DRAFT CONCLUSION 4/8: MID REGION SEARCH AND RESCUE IMPLEMENTATION PLAN

*That, the MID Region Search and Rescue Implementation Plan at **Appendix B** is endorsed as MID Doc XXX.*

2.7 The ATM SG/4 meeting urged States to keep up-to-date their SAR Point of Contact (SPOC) contact details in their AIPs (GEN 3.6) and on the COSPAS-SARSAT website: <http://www.cospas-sarsat.int/en/contact-lists-mccs-and-spocs>

2.8 The ATM SG/4 meeting reviewed and updated the SAR Focal Points contact details as at **Appendix C**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) explore ways and means to support States in the elimination of the longstanding SAR deficiencies;
- b) review and endorse the MID Region SAR Implementation Plan at **Appendix B**; and
- c) review and update:
 - i. the status of bilateral Arrangements between ANSPs/ACCs at **Appendix A**;
 - ii. the SAR Point of Contact (SPOC) contact details on the COSPAS-SARSAT website; and
 - iii. the list of SAR focal points in the MID Region at **Appendix C**.

MID REGION SAR AGREEMENT STATUS BETWEEN ANSPS/ACCS**November 2018**

STATE	CORRESPONDING STATES			REMARKS
BAHRAIN	☒ IRAN ☒ SAUDI ARABIA	☒ KUWAIT ☒ UAE	☐ QATAR	4/5
EGYPT	☒ CYPRUS ☐ JORDAN ☐ SUDAN	☐ GREECE ☒ LYBIA	☐ Israel ☐ SAUDI ARABIA	2/7
IRAN	☒ ARMENIA ☒ BAHRAIN ☒ OMAN ☐ TURKMANISTAN	☒ AZERBAIJAN ☒ IRAQ ☐ PAKISTAN ☒ UAE	☐ AFGHANISTAN ☒ KUWAIT ☐ TURKEY	7/11
IRAQ	☒ IRAN ☒ JORDAN	☐ KUWAIT ☐ SAUDI ARABIA	☐ SYRIA ☐ TURKEY	2/6
JORDAN	☐ EGYPT ☒ IRAQ	☐ ISRAEL ☒ SAUDI ARABIA	☐ SYRIA	2/5
KUWAIT	☒ BAHRAIN ☒ IRAN	☐ IRAQ	☒ SAUDI ARABIA	3/4
LEBANON	☒ CYPRUS	☐ SYRIA		1/2
LIBYA	☐ ALGERIA ☐ CHAD ☐ EGYPT	☐ MALTA ☐ NIGER	☐ SUDAN ☐ TUNIS	0/7
OMAN	☐ INDIA ☒ IRAN	☒ SAUDI ARABIA ☐ PAKISTAN	☐ UAE ☐ YEMEN	2/6
QATAR	☐ BAHRAIN	☐ SAUDI ARABIA	☐ UAE	0/3
SAUDI ARABIA	☒ BAHRAIN ☐ IRAQ ☒ OMAN ☐ UAE	☐ EGYPT ☒ JORDAN ☐ Qatar ☐ YEMEN	☐ ERITREA ☒ KUWAIT ☐ SUDAN	4/11
SUDAN	☐ CENTRAL AFRICAN ☐ CHAD ☐ EGYPT	☒ ERITREA ☒ ETHIOPIA ☐ LIBYA	☐ SAUDI ARABIA ☐ SOUTH SUDAN	2/8
SYRIA	☐ IRAQ ☐ JORDAN	☐ LEBANON ☒ CYPRUS	☒ TURKEY	2/5
UAE	☒ BAHRAIN ☒ IRAN	☐ OMAN ☐ SAUDI ARABIA	☐ QATAR	2/5
YEMEN	☐ DJIBOUTI ☐ ERITREA ☐ ETHIOPIA	☐ INDIA ☐ OMAN ☐ SAUDI ARABIA	☐ SOMALIA	0/7

☒ Agreement Signed ☐ Agreement NOT Signed Signed Agreements / Total No. of required Agreements

MID Doc 0XX



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**MIDDLE EAST AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP
(MIDANPIRG)**

MID REGION

SEARCH AND RESCUE (SAR) IMPLEMENTATION PLAN

DRAFT 0.2 MAY 2018

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

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ABBREVIATIONS AND ACRONYMS

ADS-B	Automatic Dependent Surveillance-Broadcast
ADS-C	Automatic Dependent Surveillance-Contract
ANRF	Air Navigation Reporting Form
ANSP	Air Navigation Service Provider
ARCC	Aeronautical Rescue Coordination Centre
ARSC	Aeronautical Rescue Sub-Centre
A/SMC	Assistant SMC
ASPOCS	Administrative Single Point of Contact for SAR
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
CONOPS	Concept of Operations
COSPAS-SARSAT	Cosmicheskaya Sistema Poiska Avariynyh Sudov-Search and Rescue Satellite-Aided Tracking
EI	Effective Implementation
ELT	Emergency Locator Transmitters
GADSS	Global Aeronautical Distress and Safety System
GANP	Global Air Navigation Plan
GASP	Global Aviation Safety Plan
GLONASS	GLOBAL NAVIGATION SATELLITE SYSTEM
GPS	Global Positioning System
IAMSAR	International Aeronautical and Maritime SAR (Manual)
IMO	International Maritime Organization
iSTARS	Integrated Safety Trend Analysis and Reporting System
JRCC	Joint (aeronautical and maritime) Rescue Coordination Centre
JRSC	Joint Rescue Sub-Centre
JWG	ICAO/IMO Joint Working Group on the Harmonisation of Aeronautical and Maritime Search and Rescue
LoA	Letter of Agreement
MCC	Mission Control Centres
MEOSAR	Medium-altitude Earth Orbit Search and Rescue
MRCC	Maritime Rescue Coordination Centre
MRO	Mass Rescue Operations
MRSC	Maritime Rescue Sub-Centre
OJT	On-the-Job Training
PQs	Protocol Questions
PSCS	Preferred SAR Capability Specifications
RANP	Regional Air Navigation Plan
RCC	Rescue Coordination Centre
RPK	Revenue Passenger Kilometres
RPAS	Remotely Piloted Aircraft Systems
SAR	Search and Rescue
SARPs	Standards and Recommended Practices
SAREX	SAR Exercises
SC	Search and Rescue Coordinator

SCC	Search and Rescue Coordinating Committee
SMC	Search and Rescue Mission Coordinator
SMS	Safety Management System
SOLAS	International Convention for the Safety of Life at Sea
SPOC	SAR Point of Contact
SRR	Search and Rescue Region
SRU	Search and Rescue Unit
SWIM	System Wide Information Management
UNCLOS	United Nations Convention on the Law of the Sea
USOAP-CMA	Universal Safety Oversight Audit Programme – Continuous Monitoring Approach
VSP	Variable Set Parameter

DRAFT

SCOPE OF THE PLAN

Plan Structure

1.1 The MID Search and Rescue (SAR) Implementation Plan (hereinafter referred to as the 'Plan') references different levels. At the higher level are global requirements established by the ICAO Annex 12 to the ICAO Convention on International Civil Aviation (ICAO Doc 7300). Global guidance material is provided by the International Maritime Organization (IMO) and ICAO's joint publication, the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual. Beneath this is regional planning guidance primarily provided by this Plan and other regional guidance material, in order to enable States to define the goals and means of meeting objectives for State planning towards improving State SAR System capability, such as Regional Air Navigation Plan (MID ANP, ICAO Doc 9708) objectives.

1.2 The global air navigation perspective is guided mainly by the *Global Air Navigation Plan* (GANP, Doc 9750), the *Global ATM Operational Concept* (Doc 9854) and the *Global Aviation Safety Plan* (GASP).

1.3 The scope of the Plan is to:

- determine the current status of SAR in MID Region States; and
- identify recommendations for SAR planning and preparedness enhancements, in terms of compliance with Annex 12 of the ICAO Convention, IAMSAR Manual guidance, and accepted best international practice.

Plan Review

1.4 As an iterative process, the Plan requires regular updating to keep current with changes in ICAO Annexes and guidance material, the IAMSAR manual, regional aviation activity, developments in the Air Traffic Management (ATM) system, new technology, political considerations, human performance and lessons learned from actual SAR responses. Plan updates should also focus on the SAR system being an important component of an integrated regional and global air navigation system. It is intended that MIDANPIRG and its contributory bodies conduct a complete review every three years of the Plan to align with the review cycle of the GANP and the IAMSAR Manual. The review should be guided by a consultative process involving States and relevant International Organizations such as the IMO and other technical bodies.

OBJECTIVES

Introduction

2.1 MID States who are signatories to the Chicago Convention accept the responsibility for the provision of SAR services per the requirements of its Annex 12 - Search and Rescue. Increases in both aviation and maritime traffic throughout the MID Region places additional importance on the ability for States to be adequately prepared for potentially increased demand for aeronautical and maritime SAR services.

2.2 States need to be adequately prepared for the provision of efficient and effective SAR services. To assist in achieving this, it is essential for States to cooperate, collaborate and in some cases assist with resources to neighboring and sub-regional RCCs.

2.3 ICAO Regional Office maintains a record of the status of State's SAR compliance against Annex 12 requirements. There are significant variations in the level of State SAR capability across the Region with significant gaps requiring urgent action. A number of States have not reported their status at all to ICAO. The ICAO Universal Safety Oversight Audit Programme – Continuous Monitoring Approach (USOAP-CMA) also provides a useful tool to States to self-assess their individual SAR system status.

2.4 There is a high risk of negative consequences to a State that does not provide an adequate SAR response to an aircraft or vessel in distress. The primary concern is the higher probability for loss of lives that may have been saved. The ability for news to spread rapidly in today's technologically connected world also provides the opportunity for a poor or ineffective SAR response to quickly reach a global audience resulting in damage to that State's reputation internationally and potential economic loss to sensitive State industries such as tourism and transport. However, the benefits of an effective and reliable SAR service to States offers many advantages. Besides reduction of loss of life and human suffering, other advantages include the following aspects:

- a) Safer and more secure environment for aviation and maritime related industries, commerce, recreation and travel. Increased safety may promote use and enjoyment of aviation and maritime environments, tourism and economic development. This is especially true when the SAR system is associated with programmes aimed at preventing or reducing the effects of mishaps, sometimes referred to as "Preventative SAR."
- b) Availability of SAR resources often provides the initial response and relief capabilities critical to saving lives in the early stages of natural and man-made disasters. SAR services offer an integral part of local, national and regional emergency management systems.
- c) Well performed SAR operations can provide positive publicity about situations, which may otherwise be viewed negatively. This can lead to improved public confidence in that State's reputation and commitment to providing a safe environment, leading to increased confidence to conduct activities beneficial to that State's economy.
- d) As SAR is a relatively non-controversial and humanitarian mission, it provides an excellent opportunity to enhance cooperation and communication in general between States and organizations, not only for SAR. It can also foster better working relationships between States and organizations at the local, national and international levels, including civil/military cooperation.

2.5 In 2014 Malaysia Airlines flight MH370, a Boeing 777 with 239 persons on board, disappeared when flying from Kuala Lumpur, Malaysia to Beijing, China, and Air Asia QZ8501 was lost on a flight from Surabaya to Singapore. The MH370 event resulted in probably the largest and most expensive search response for a missing aircraft in human history. Together with Air France flight AF447, which crashed into the Atlantic Ocean in 2009, these tragedies have highlighted vulnerabilities in the current air navigation system, including the SAR system, which have hampered timely identification and localization of aircraft in distress, hindering effective response efforts. ICAO is taking measures to assist with addressing these vulnerabilities through the Global Aeronautical Distress and Safety System (GADSS) concept; however, this also requires improvements in global SAR capability.

2.6 The Plan is designed to address both civil and military SAR authorities and has been developed in consultation with MID States, SAR administrations and relevant International Organizations. States should consult with stakeholders nationally, regionally and internationally as appropriate and determine actions in order to commit to achieving the objectives of this Plan in order to meet the minimum SAR service requirements in accordance with ICAO Annex 12. It is noted that where a State is unable to meet minimum SAR Standards and Recommended Practices (SARPs) of ICAO Annex 12, Article 38 to the ICAO Convention requires notification to ICAO of the differences between its own practice and that established by the international standards.

2.7 States should aim to meet their obligations progressively in a strategically structured and planned manner with improvement goals set for short term, medium term and long term implementation. It may be more productive to make gains in small steps commencing with measures that are more easily achievable in the short term and have a minimal cost, progressing to measures, which will take longer to implement over the medium to long term. Short term measures that may be implemented relatively easily include the establishment of a national SAR Committee and ensuring SAR Agreements are in place with neighboring States allowing for seamless cross-border transit of search assets engaged in SAR activity.

2.8 All States are encouraged to use the guidance provided within this Plan as a way forward, thus ensuring a timely, well-coordinated response to any SAR incident within their area of responsibility, or during cooperative responses involving more than one Search and Rescue Region (SRR).

Plan Objective

2.9 The objective of this SAR Plan is to provide a framework to assist MID States to meet their SAR needs and obligations accepted under the Convention on International Civil Aviation and for the harmonized and interoperable delivery of both aeronautical and maritime SAR services within the Region, and across other ICAO Regional boundaries, where practicable.

2.10 The Plan is to be consistent with the SARPs of ICAO Annex 12 - Search and Rescue, and aligned where appropriate with the SAR technical and operational standards and guidance of the IMO.

2.11 The Plan recognizes that ICAO serves as the forum for the implementation of practical and achievable measures to improve SAR services for international civil aviation. The Plan also recognizes that the IMO provides a similar forum for SAR services to maritime shipping.

2.12 Both ICAO and IMO share the same goal of ensuring that SAR services are available globally wherever people sail or fly. The SAR services that ICAO and IMO promote are complementary and offer tangible opportunities to derive mutually beneficial efficiencies for both the aviation and maritime transportation SAR systems globally, regionally and nationally. The objective of this Plan includes encouraging States to take advantage of such efficiencies. States should, where practicable, align their SAR systems with the guidance provided by the IAMSAR Manual, which also

provides the benefit for standardized SAR coordination between RCCs and across SRR lines of delineation.

2.13 State SAR plans describe how SAR services will be provided, organized and supported in order for States to meet their obligations under the relevant Conventions. Search and Rescue Coordinators (SC) and SAR managers oversee and implement these plans. National SAR plans should be signed by all Government agencies, which can provide or support SAR services. These agencies should all be represented on the State's Search and Rescue Coordinating Committee (SCC), which oversees these plans.

Note: The SC should not be confused with the operational nature of the SAR Mission Coordinator (SMC). The primary purpose of the national SC is to enable a whole-of-government approach to make efficient and effective use of a State's capabilities for SAR.

SAR System Funding

2.14 The level of funding provided for effective SAR systems is a matter of concern for all senior decision-makers. The resources should be sufficient to develop and/or maintain the required SAR service per their obligations as signatories to the relevant aeronautical and maritime SAR conventions. This may require the development of business cases to governments outlining where additional funding is required.

2.15 Business cases should include consideration of amendments to existing State SAR arrangements which may provide more efficient delivery of the SAR service by better utilization of existing resources (for example by establishing Joint RCCs (JRCCs), or additional funding sources where required (for example charging a levy to aircraft operators for providing the SAR service or seeking company sponsorship for SRUs).

Joint Rescue Coordination Centres (JRCCs)

2.16 Where practicable, States are encouraged to examine the potential benefits that may be derived by the establishment of JRCCs to incorporate the aeronautical and maritime SAR activities and/or facilities of ARCCs/ARSCs and MRCC/MRSCs. JRCCs have the potential to not only provide a more effective SAR service to both the aeronautical and maritime industries, but also offer potential financial efficiencies by releasing funds for improvements in other SAR areas.

Note: Where JRCCs are not practicable, development of facilities and procedures which provide and/or enhance effective SAR coordination and collaboration between the ARCCs and MRCCs in support of each other, to provide an efficient and integrated State SAR system for both aeronautical and maritime SAR incident response.

2.17 Where practicable, the JRCC evaluation may consider consolidation of two or more different State RCCs into single sub-regional JRCCs.-

Note: a single sub-regional JRCC may be established in partnership with a group of States and serve as a 24 hour nodal JRCC supported by Joint Rescue Sub-Centres (JRSCs) of the other partner States which may not necessarily need to be manned 24 hours but could be activated when required

Plan Development

2.18 The Plan is expected to provide guidelines and recommendations for MID States to consider for the enhancement and improvement of national, sub-regional and regional SAR capability including:

- a) compliance with Annex 12 SARPs;
- b) identification and addressing of deficiencies in SAR capability;

- c) continuous and coherent development of SAR capability;
- d) harmonization of aeronautical and maritime SAR services;
- e) civil/military cooperation and coordination (including SAR response, information sharing and use of airspace);
- f) remote SAR response capability, including provision for Mass Rescue Operations (MRO);
- g) establishment and review of arrangements between neighboring States to expeditiously facilitate SAR coordination, operations and cooperation across regional boundaries including contingency procedures;
- h) facilitation of the implementation of SAR systems and services including the establishment of JRCCs where suitable and practicable;
- i) supporting the sharing of SAR information, data and expertise;
- j) integration with ATM systems and future ATS developments, where appropriate;
- k) monitoring of outcomes from MIDANPIRG Sub-Groups, other ICAO Region SAR groups, ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime SAR (JWG) and related forums for issues that may affect the Plan;
- l) facilitation of a continuous reporting mechanism of State SAR capability, Annex 12 compliance and SAR performance data to the MID Regional Office through the MIDANPIRG Air Traffic Management Sub-Group (ATM SG);
- m) implementation of a SAR System Improvement and Assessment measures, including Safety Management System, Quality Assurance programme and risk assessment;
- n) coordinating the introduction of new technology affecting the regional SAR system;
- o) sharing future research and development concepts;
- p) seeking efficiencies, through the coordination and facilitation of concurrent regional SAR meetings, seminars, workshops and exercises, including joint ICAO and IMO, and sub-regional forums where practicable; and
- q) conducting efficient SAR Exercises (SAREXs) that identify improvements and latent problems.

BACKGROUND INFORMATION

Improvement Drivers

5.1 The ICAO USOAP-CMA focuses on a State's capability in providing safety oversight by assessing whether the State has effectively and consistently implemented the critical elements of a safety oversight system and determining the State's level of implementation of ICAO's safety –related SARPs, including Annex 12 Search and Rescue, and associated procedures and guidance material.

5.2 ICAO MID Regional Office maintains MIDANPIRG Air Navigation Deficiencies Database (MANDDD). The MANDDD is based on the uniform methodology for identification, assessment and reporting of such deficiencies. By identifying and addressing specific deficiencies, MIDANPIRG and its Sub-groups facilitate the development and implementation of corrective action plans by States to resolve identified deficiencies, where necessary.

Recent ICAO SAR Initiatives

5.3 The tragedies of Malaysia Airlines flight MH370 in 2014 and Air France flight AF447 in 2009 had highlighted vulnerabilities in the current air navigation system, which had hampered timely identification and location of aircraft in distress, particularly remote oceanic areas. This had significantly hindered effective SAR efforts and recovery operations.

5.4 As part of the response to the Conclusions and Recommendations from the ICAO Multi-disciplinary Meeting on Global Tracking, ICAO developed a Concept of Operations (CONOPS) for a GADSS. The implementation of this target concept will have implications for the provision of services such as air traffic control, SAR and accident investigation. It contained a large number of measures targeting improvements in SAR system response integrated within the wider ATM and aircraft/airline operations systems.

5.5 The CONOPS noted that the effectiveness of the current alerting and SAR services should be increased by addressing a number of key improvement areas. The ICAO GADSS CONOPS also included aspects that potentially involve use of different distress systems, including for example 406 MHz Emergency Locator Transmitters (ELTs) and the COSPAS-SARSAT system as part of the proposed GADSS solution.

COSPAS-SARSAT System

5.6 COSPAS-SARSAT had been developing two major enhancements to its distress-alerting System of value to all System users, including the aviation industry. One is the introduction over the period of approximately 2016 to 2018, and beyond, of a new space-segment architecture based primarily on Medium-altitude Earth Orbit Search and Rescue (MEOSAR) payloads aboard the European Commission's Galileo system, the Russian Federation's GLObal Navigation Satellite System (GLONASS) and the United States' Global Positioning System (GPS) satellites.

5.7 This architecture would permit determination of a distress incident location (independent of any location data transmitted in the beacon message) beginning with the first burst from the distress beacon. This could mean near real-time and very frequent delivery of distress alerts.

5.8 The SAR/Galileo space segment would also provide a Return Link Service (RLS) that, among other possible future uses, would provide an acknowledgment back to the beacon to confirm when the distress message has been received.

5.9 The other major development was the completion in the next couple of years of specifications for the next generation of 406 MHz distress beacons, including ELTs. This new generation of beacons should further improve speed and accuracy in locating an activated distress beacon. The period from beacon activation to first transmission was expected to be reduced from 50 seconds to three seconds. The specification would consider in-flight activation of ELTs when certain flight parameters were exceeded. The RLS was also being considered as part of the GADSS Concept, being a means of remotely activating an ELT in the case of an unresponsive or uncooperative cockpit.

5.10 States should ensure that aviators were aware that 121.5 MHz beacons cannot be detected by the global COSPAS-SARSAT System and were only intended as a final homing signal for 406 MHz beacons.

5.11 States also need to ensure the critical requirement to provide for a suitable, clear and simple means for aircraft owners to register and keep updated their 406 MHz distress beacon details.

Note: information on beacon registration is at: <http://www.cospas-sarsat.int/en/beacons-pro/beacon-regulations-pro/ibrd-user-information-for-professionals>).

5.12 Entries in the beacon register should be available to both aeronautical and maritime RCCs on a 24-hour basis (Annex 12 – *Search and Rescue* refers, although Annex 10 establishes the registration requirement). States should note that Annex 12 should be read in conjunction with elements of the following ICAO Annexes:

Annex 6 – *Operation of Aircraft*;

Annex 10 – *Aeronautical Telecommunications*;

Annex 11 – *Air Traffic Services*; and

Annex 14 – *Aerodromes*.

CURRENT SITUATION

Global Situation

6.1 The Report on ICAO USOAP CMA Results (2013-2015) indicated that, at the global level, about 70% of the States have not established and implemented an effective system to conduct surveillance of their Rescue Coordination Centres (RCCs) and Rescue Sub-Centres (RSCs), if any. In many States, SAR services are provided by military authorities, and thus coordination between these military authorities and the State's CAA is essential. In practice the coordination (e.g. on the basis of a Memorandum of Understanding) is often limited to the operational aspect of SAR and does not clearly address the conduct of surveillance activities. Common factors preventing the effective surveillance of the RCCs are the lack of sufficiently qualified inspectorate staff and the absence of a formal surveillance programme. The global Effective Implementation (EI) of SAR is 61%

MID SAR Analysis

6.2 Based on the USOAP CMA results analysis, it appeared that the major areas of weakness is in coordination with adjacent States, effective SAR oversight, and training of SAR staff that provide the SAR services. Therefore, a focus on the minimization of barriers associated with the efficient cross-border coordination of SRU (such as pre-arranged approval) and other coordination mechanisms, including updates of SAR agreements (whatever their form) was vital. Finally, there was a need for improved systemic approaches to training for both SAR inspectors and personnel responsible for the provision of SAR services, including the regular organization of effective SAR exercises that test systems and personnel. It should be noted that the training of SAR inspectors did not require SAR-specific technical training, but was more focused on effective audit and inspection techniques, etc.

Challenges

6.3 The following potential challenges should be considered to ensure they do not become barriers to the achievement of the expected SAR capability:

- a) absence of established appropriate legal framework designating, recognizing, supporting and giving authority to national SAR authorities, RCCs and SMCs;
- b) lack of legislation ensuring effective oversight by the CAAs over the SAR service providers;
- c) low number of qualified SAR regulators/inspectors in the MID Region;
- d) inadequate funding and equipping of SAR authorities and in particular, resourcing of RCCs;
- e) absence of an appropriate SAR organizational framework;
- f) absence of a national SAR committee;
- g) lack of clarity of responsibilities for each component of the SAR system;
- h) absence of bilateral/multi-lateral/international SAR Agreements;
- i) inadequate civil/military cooperation; and
- j) complacency about, or lack of recognition of, the importance or priority given to SAR.

6.4 The provision of sufficient resources was critical in a number of areas, including:

- a) Financial-
 - funding for 24 hour RCC facility and staff;

- funding for use/hire of search and rescue units; and
 - Provision of a suitable administrative process enabling financial support including the ability for SAR authorities to quickly authorise payments required for emergency response aircraft, vessels and supporting logistics such as fuel.
- b) RCC personnel: suitable number of trained and skilled staff, supplemented by a pool of trained RCC support staff where appropriate;
- c) RCC facilities-
- appropriate RCC facility space;
 - minimum RCC tools (such as current charts, plotting equipment, documentation, etc.);
 - identify and task available SRUs;
 - Aircraft and vessel tracking information including ADS-B, Automatic Identification System, etc.;
 - reliable and rapid H24 communications, and a suitable means to-
 - o receive and communicate distress alerts
 - o communicate with ATS units, other RCCs/RSCs, Coast Radio Stations, COSPAS-SARSAT Mission Control Centres (MCCs), military units, medical services, meteorological offices, etc.;
 - information technology-
 - o RCC workstation computers;
 - o Software including basic databases, drift modelling, incident management, etc.;
- d) Contingency: back-up RCC facility, or arrangement with another RCC as a contingency against inability to operate from the primary RCC due to the need to evacuate or loss of systems, etc.;
- e) Search and Rescue Units (SRUs):
- available and suitable SAR aircraft and crews;
 - funding arrangements/agreements for hiring/payment/sharing of SRUs to permit rapid deployment; and
 - Available and suitable SAR survival equipment for delivery by aircraft to survivors and to assist SAR coordination efforts (e.g.: SAR Datum Buoys, droppable life rafts and survival supplies, etc.);
- f) Training support:
- RCC staff – basic and ongoing;
 - SRU crews – pilots, air crew and air observers; and
 - RCC support staff – basic and refresher.

PERFORMANCE IMPROVEMENT PLAN

Preferred SAR Capability Specifications (PSCS)

Note: PSCS are the non-mandatory expectations on all MID States to enhance SAR systems in order to meet a minimum level of SAR capability, with a high degree of interoperability and harmonization, and interoperability with other ATM components such as Air Navigation Service Providers (ANSPs) and aerodrome operators. PSCS were not expected to contravene existing Annex 12 standards.

PSCS (expected implementation by 07 November 2020)

Note: Guidance Material for the implementation and monitoring of PSCS is expected to be developed by MIDANPIRG.

7.1 Legal Framework and Structure Planning: All States should develop statutes and related provisions that establish or enhance the legal foundation for a State SAR organization and its framework, resources, policies and procedures to, where appropriate to:

- a) ensure that it is party to, and/or aligned with the following Conventions, as applicable –
 - i. Convention on International Civil Aviation 1944;
 - ii. International Convention on Maritime Search and Rescue, 1979;
 - iii. International Convention for the Safety of Life at Sea (SOLAS), 1974;
 - iv. Convention on the High Seas, 1958; and
 - v. United Nations Convention on the Law of the Sea (UNCLOS), 1982;
- b) establish a SAR inspectorate within the CAA to regulate SAR and carry effective oversight activities over the SAR service providers;
- c) unless delegated by written agreement, establish an entity that provides, on a 24-hour basis, SAR services within its territories and designated area of responsibility/SRR;
- d) establish a national SAR committee consisting of civil and where appropriate, military members to enable a whole-of-government approach;
- e) empower SAR Mission Coordinators with the authority to adequately carry out their responsibilities;
- f) establish an Administrative Single Point of Contact for SAR (ASPOCS) for non-urgent, administrative matters, such details to be submitted to the ICAO Regional Office;
- g) conduct studies to check the feasibility for, and develop an implementation plan if practicable, the integration of aviation and maritime SAR activities, and as far as practicable, civil and military activities, including joint training and familiarization of staff and review of documentation to ensure harmonization of procedures, and joint exercises;
- h) conduct studies to align, as far as practicable, aeronautical and maritime Search and Rescue Regions (SRRs); and SRRs and Flight Information Regions (FIRs); and
- i) establish a single State SAR Plan that:
 - i. designates the responsible RCC(s), RSC(s) and 24-hour SPOC/ASPOC;
 - ii. describes the relevant SRRs, including the coordinates and geographical chart

- notified of any SAR event 24 hours a day;
- ii. include procedures for joint aeronautical and maritime distress alert notification, including reliable delivery and acknowledgement of COSPAS-SARSAT distress alerts, support and response to both aviation and maritime SAR incidents; and
- iii. where applicable, include protocols for civil and military support and sharing of information.

SAR Facilities and Resources

7.3 RCC Facility: All States should ensure that RCCs are of sufficient size with adequate provision for operational positions designed in accordance with human factors principles (such as human machine interface) for a major search involving civil and military assets where applicable, and facilities such as:

- a) Workstations, telephones (with international access), plotting tables, wall notice/status boards, computer, and communications equipment and systems, briefing/debriefing areas room for storage including incident records and recorders, RCC staff break and rest facilities;
- b) computer resources which may provide support to RCCs with incident management, plotting, search planning, mapping, contact databases, web-based information, etc.;
- c) charts, electronic or paper, which:
 - i. apply to SAR (aeronautical, nautical, topographic and hydrographic);
 - ii. depict SRR, neighboring SRRs, FIR(s), SAR resources and made available for all relevant aeronautical and maritime RCCs, ATS units, aircraft operators; and
 - iii. provide a means of plotting;
- d) ability to reliably receive and acknowledge distress alerts 24 hours a day;
- e) maritime broadcast facilities;
- f) a means of recording, playback and archiving of communications;
- g) shipping/vessel communications and maritime broadcast facilities such as Coast Radio Stations, RCC radio and satellite communications, marine radio networks;
- h) aircraft communications via ATS units, aircraft operators, satellite communications or direct between RCC and aircraft;
- i) access to aircraft and ship tracking data, e.g. ADS-B, Automatic Identification System and Long Range Identification and Tracking of Ships (LRIT) allowing rapid identification of potential aircraft and vessels that may divert to assist;
- j) a means of obtaining meteorological information – forecast, present and historical data;
- k) if applicable drift modelling software;
- l) if applicable, ocean data including sea temperature, currents, winds, tides, etc.;
- m) if applicable, SAR Datum Buoys, preferably with satellite tracking capability; and
- n) RCC documentation and reference material such as plans of operation, procedures manuals, guidance material, ICAO and IMO references, SAR agreements; and
- o) COSPAS-SARSAT equipment and reference material.

7.4

Personnel and Training.

- a) All States shall Staff the SAR inspectorate the sufficient number of qualified SAR inspectors and provide them with adequate trainings necessary to perform their duties;
All State should maintain a 24 hour service:
- b) provide adequate ATC resources (either an ATS supervisor or other staff) that can provide relief within Area Control Centres (ACCs) to allow timely SAR alerts and information to RCCs;
- c) provide sufficient RCC staffing;
- d) provide a sufficient number of trained specialist RCC officers including SMCs and Assistant SMCs (A/SMCs);
- e) provide availability of a pool of RCC support staff who are familiar with RCC operations, but not trained as coordinators, that can assist with the functioning of the RCC during SAR incident response;
- f) develop SAR personnel position descriptions that detail responsibilities and eligibility criteria for recruitment of operational staff;
- g) develop a comprehensive training programme that includes SAR training for:
 - i. RCC SAR Coordinators (SCs) based on a competency-based assessment approach to ensure technical and English language proficiency, cyclical (periodic) instruction that provides continuous training to ensure competency is maintained, and a system for maintaining training records; and
 - ii. SRU staff, including military personnel.
- h) facilitate RCC staff to be proficient in the English language; and
- i) facilitate a programme of regular liaison visits between relevant RCCs, ATC units and airline operating Centres in order to understand those organizations, facilities and capabilities (reference Annex 12, paragraph 3.1.9).

7.5

Search and Rescue Units: All States should establish capabilities enabling:

- a) availability and deployment of suitably crewed, trained and equipped SRUs (including a pool of air search observers trained in visual search techniques), public and/or private, civil and military, for rapid SAR response;
- b) availability and deployment of SRU craft that may be in use for another primary purpose but made available to RCCs for SAR purposes on an as needed emergency basis (vessels, aircraft and land units);
- c) protocols for civil SAR authorities to request the assistance of military assets, and similarly military SAR authorities to request civil assets;
- d) a communication means and information protocols between the State's Aeronautical and Maritime SAR Authorities;
- e) cooperative use and/or sharing of SAR assets with protocols incorporated within National SAR Plans and bilateral SAR Agreements;
- f) pre-arranged government authority for funding of costs associated with hiring of SRUs, and payment for critical supporting logistics such as fuel, to avoid any delays in response availability;
- g) aircraft with the ability and regulatory approval to safely conduct SAR missions.

Note: guidance material on SAR aircraft capability is found in the IAMSAR.

7.6

Distress Beacons: All States should :

- a) where separate ARCCs and MRCCs exist with responsibility for coincident aviation and maritime SRRs, coordinate distress beacon alert procedures to ensure both RCCs are aware of any distress beacon activations within their areas to avoid duplication of response. For example, MRCCs should ensure their procedures alert ARCCs and ATS units to any EPIRB activations;
- b) have a reliable distress beacon registration system that:
 - i) provides a readily-accessible mechanism (preferably one that is available by Internet as well as other conventional means) to enable distress beacon owners to fulfil their obligation to register ELTs, EPIRBs and PLBs, and update the registration data as information changes (e.g., change in ownership);
 - ii) is available to RCCs 24 hours a day and includes up-to-date registration details for all national civil and military ELTs, EPIRBs and PLBs;
- c) take steps (including education) required to prepare for, and to implement changes related to, the introduction of next generation beacons (e.g.: update beacon registration systems to be compatible with new beacon hexadecimal identifications) and the transition to the MEOSAR satellite architecture (e.g.: update local user terminals and mission control centres to properly receive and manage MEOSAR data), in accordance with COSPAS-SARSAT specification documents (<http://www.cospas-sarsat.int/en/documents-pro/system-documents>); and
- d) establish an appropriate nationwide means of disposal for old distress beacons.

Note 1: Information on beacon registration is at:

<http://www.cospas-sarsat.int/en/beacons-pro/beacon-regulations-pro/ibrd-user-information-for-professionals>.)

Note 2: Incorrect disposal of distress beacons often causes the deployment of scarce and often expensive SAR resources only to have the beacon located as a non-distress event in a rubbish dump or similar location. This also creates the risk of SAR resources being diverted away from a real emergency should it arise at the time. Beacon batteries are hazardous items, which should be disposed of in an environmentally friendly manner.

7.7

Contingency Facilities: All States should ensure there are established contingency facilities, or when a SAR service is not able to be provided, procedures in place for the temporary delegation of the SAR responsibility to another appropriate national body or State. All States should test their contingency arrangements periodically, but not less than once every six months.

SAR Information

7.8

Provision of Information: All States should ensure the:

- a) establishment of a centralized information source publishing all MID State Aeronautical Information Publication (AIP) information as required by ICAO Annex 15 Appendix 1, page APP 1-8 including:
 - i. The agency responsible for providing SAR services;
 - ii. The area of SAR responsibility where SAR services are provided;
 - iii. The type of SAR services and facilities provided including indications where SAR aerial coverage is dependent upon significant deployment of aircraft;
 - iv. SAR agreements;
 - v. The conditions of SAR facility and service availability; and

- vi. SAR procedures and signals used;
- b) establishment of an Internet-based SAR information sharing system (with security protocols as required and in accordance with the emerging System Wide Information Management – SWIM concept as applicable) to share SAR activity with States and key stakeholders participating in a SAR activity (the information sharing system should include a means of handling media and next of kin enquiries, and recognize the need to avoid premature media statements); and
- c) maximum practicable cooperation between State entities in the provision of accurate and timely information when required, including from military sources except where national security could be adversely affected.

7.9 SAR Facilities and Equipment Lists: All States should develop and maintain a current, comprehensive electronic list of State SAR Facilities, SAR Equipment, and SAR Units (SRUs), including joint or shared facilities and equipment, and provide the Internet link to that list to the ICAO Asia/Pacific Regional Office.

7.10 SAR Library: All States should:

- a) establish a web-based SAR Library, or cooperate by contributing to an Internet-based MID resource (such as <http://www.uscg.mil/hq/cg5/cg534/NSARC.asp>); and
- b) ensure that each RCC and SAR Authority has ready access to a current copy (either electronic or hard copy) of the following reference documents at a minimum:
 - i. ICAO Annex 12;
 - ii. IAMSAR Manual Volumes I, II and III;
 - iii. International Convention on Maritime SAR (SAR Convention);
 - iv. MID SAR Plan
 - v. MID Air Navigation Plan; and
 - vi. relevant regional, national and agency SAR documents.

Note: The US Coast Guard contains a list of documents that may be held by RCCs and JRCCs as appropriate. In addition, a list of documents would be available on the IMO website at:

(<http://www.imo.org/en/OurWork/Safety/RadioCommunicationsAndSearchAndRescue/SearchAndRescue/Pages/Default.aspx>).

SAR Improvement

7.11 Search and Rescue Exercises (SAREX): All States should conduct regular SAREX (at least once every two years) to test and evaluate existing coordination procedures, data and information sharing and SAR response arrangements involving:

- a) both aeronautical and maritime SAR authorities including both civil and military agencies as applicable, and related bodies such as Air Navigation Service Providers (ANSPs) and Airline Operations Centres (AOCs);
- b) where appropriate, cross-aeronautical SRR coordination (SAREX should routinely involve SAR authorities of adjacent SRRs, especially if the SAREX area concerned is within 50NM of the adjoining SRR); and
- c) SAREX effectiveness through a post-SAREX review and written report, completed to ensure that deficient areas or latent problems are identified and remedied.

*Note 1: a SAREX template is provided at **Appendix 1**.*

Note 2: SAREX should test the SAR system, including unannounced alerts that allow an actual search (whether it is a desktop or a physical operation), to be conducted which will indicate weaknesses in the system. SAREX should not be confused with, or take the form of, simulated crash fire exercises such as for Aerodrome Emergency Procedures that do not have a search component.

Note 3: Real SAR incident responses which include an adequate post-response review and evaluation with lessons learned may replace the need for a SAREX.

7.12 SAR Quality Assurance: All States should implement SAR System Improvement and Assessment measures, including Safety Management and Quality Assurance systems, that:

- a) provide performance and safety indicators, including post-incident/accident lessons learned and management reviews (RCC and SAR System Continuous Improvement process), and feedback from RCC staff, SAR system users or SAR stakeholders;
- b) identifies risk and corrective and preventive actions that prevent or minimize risk and the possibility of substandard SAR performance;
- c) establishes an internal quality assurance programme, which includes regular internal audits of the RCC, SAR operations, SAR facilities and procedures that are conducted by trained auditors;
- d) ensures the person responsible for internal quality assurance within the entity responsible for SAR services has direct access to report to the Head of the entity responsible for SAR services on matters of quality assurance; and
- e) where appropriate, provides submissions to the JWG to share lessons learned and experiences with other global States for the continuous improvement of the worldwide SAR system.

Note 1: Resourcing of SAR system audit arrangements could be mitigated by States entering cooperative arrangements, including sub-regional regulation, between States for auditing of each other's SAR systems to share expertise and costs.

Note 2: Provisions of Annex 19 for a Safety Management System (SMS) may apply where a SAR service is provided under the authority of an ATS provider (Annex 19, Chapter 3, 3.1.3 e refers).

Note 3: Peer review, either external or internal, may provide a useful internal quality assurance tool.

7.13 SAR Management Review: All States should conduct an annual or more frequent analysis of their current State SAR system to identify specific gaps in capability against the minimum requirements of Annex 12 and the guidelines of the IAMSAR Manual to:

- a) enable the ICAO MID SAR data to be updated to accurately reflect the State's capability;
- b) be informed regarding the availability and capability of SAR services in neighboring States;
- c) identify SAR research and development programmes, especially those which could be conducted if possible in cooperation with other States;
- d) establish a common set of basic SAR system statistics, which include:
 - i. number of SAR incidents per year;

- ii. number of lives at risk versus number of lives saved;
 - iii. time from first alert to tasking the SRU;
 - iv. time from first alert to arrival on scene of first SRU; and
 - v. time from first alert to rescue.
- e) plan for any necessary improvements to gradually build and improve capability over time, which would be detailed in the State SAR Plan; and
- f) regularly review and update SAR agreements as appropriate.

Note 1: The National Self-Assessment found in IAMSAR Manual Vol I Appendix H and the ICAO USOAP-CMA Protocol Questions for SAR may assist States with their reviews.

Note 2: The number of incidents should identify the type (e.g. COSPAS-SARSAT alert, ATS alerts, etc.) and outcome of SAR incidents.

7.14 **SAR Promotion:** All States should conduct SAR promotional programs (e.g. Seminars, Workshops and public safety campaigns) to:

- a) encourage higher SAR preparedness by persons that may require SAR services through public safety campaigns aimed at preventing persons getting into distress situations (i.e.: 'preventative SAR');
- b) ensure the support of government decision-makers for SAR facilities and improvements, in particular adequate funding availability;
- c) assist media to understand SAR operations in order to minimize the need for explanations during SAR responses;
- d) recognize improvement in State SAR systems;
- e) enhance cooperation between SAR services and –
 - i. civil, military and police agencies;
 - ii. ANSPs;
 - iii. aerodrome and port operators;
 - iv. aircraft and shipping operators;
 - v. meteorological agencies;
 - vi. accident investigation agencies;
 - vii. government and non-government agencies affected by SAR operations, in particular large scale national and international responses involving whole of government agencies and
 - viii. other States.

Note: social media may be an effective means of SAR promotion that reduces the workload of SAR staff during major SAR responses.

RESEARCH AND FUTURE DEVELOPMENT

Research and Development

8.1 To develop the tools and systems required to meet foreseeable long-term requirements, there is a need for States to undertake planning and co-operation on SAR matters. This includes major efforts to define concepts, to extend knowledge and invent new solutions to future SAR challenges so these new concepts are selected and applied in an appropriate timely manner. Such efforts could be forged through collaborative partnerships between, States, ANSPs, International Organizations, institutes of higher learning and specialized technical agencies. This concept may manifest itself in joint projects such as:

- ICAO and/or IMO regional SAR training opportunities where provided to assist States that are unable to provide their own SAR training;
- Bilateral or Joint Sub-regional cooperation that brings together civil and military SAR experts and provides a single SAR facility that is cost-effective and has a level of resources and facilities that would be difficult for all States to maintain by themselves; and
- Regional online eLearning packages.

Note: Appendix 3 provides a summary of benefits to the SAR System of States assisting other States.

8.2 With the end goal of a globally interoperable SAR system in mind, the region will have to consider planning for a long term supporting concept and infrastructure. The following are possible areas that should be considered for future SAR research and development, in order to promote the maximum possible harmonization and interoperability of SAR systems:

- a) data sharing such as aircraft and ship tracking information;
- b) automated data link communication to RCCs when an aircraft or ship exceeds a Variable Set Parameter (VSP) in terms of its operating envelope, or activation of an emergency status (could be displayed as a symbol, and the data could include certain operating parameters such as acceleration and altitude for an aircraft) – note the ICAO GADSS includes this concept;
- c) regional Remotely Piloted Aircraft Systems (RPAS) SAR capability;
- d) inclusion of the SAR system and RCC access as a component of the new ICAO SWIM concept of operation and implementation;
- e) on-going development of standardized SAR training objectives and advanced training systems, including the use of high fidelity simulators; and
- f) enhanced technology oriented systems to improve SAR system effectiveness.

MILESTONES, TIMELINES, PRIORITIES AND ACTIONS

Milestones

9.1 Section 7 (*Performance Improvement Plan*) provides a scheme for the implementation of a collective set of enhancements for a number of elements in the PSCS, effective 07 November 2020.

9.2 States should commence planning for the various PSCS elements from the approval date of this Plan, to ensure a smooth transition by 08 November 2018, and should include consideration of issues such as:

- safety/operational analysis and assessment;
- cost-effectiveness;
- budgetary issues;
- development of operational procedures; and
- training.

9.3 Section 8 (*Research and Future Development*) provides, subject to future agreement by concerned parties, possible SAR improvements beyond 2019 until 2028.

Priorities

9.4 It is a matter for each State to determine priorities in accordance with its own economic, environmental, safety and administrative drivers.

Actions

9.5 This Plan necessitates a number of implementation actions. It is expected that each MID State report progress on each applicable element to ICAO MID Office. All States should note the importance of SAR status monitoring.

9.6 Section 6 (*Current Situation*) provides analysis and major concerns in the region, which should be considered in the formulation of specific State Plan.

MID SAR Coordination Forums

9.7 The MID Region will benefit from the cooperation and coordination of States and International Organizations involved in SAR. The establishment of permanent joint ICAO/IMO Regional SAR Forums to enable collaboration and cooperation on SAR matters should be considered.

Gap analysis and MID SAR Plan Monitoring

9.8 The matrix at **Appendix 1** will be used to identify the capabilities of the States related to SAR, and a set of KPIs should be recommended to MIDANPIRG for endorsement. The MIDANPIRG ATM SG is responsible to monitor the implementation of the Plan.

MID SAR Support Team

9.9 A MID SAR Support Team composed of SAR Aeronautical and Maritime experts would be established to support States meet their SAR obligations and implement the provisions of the MID SAR Plan.

SAREX

9.10 A programme is expected to be established for an annual SAREX, with every second year being a desktop communications exercise, and alternate years being a full exercise. The SAREX outcomes and lessons learned should be reported to MIDANPIRG through the ATM Sub-Group. A sample for SAREX Work plan is at **Appendix 2**.

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APPENDIX 1.
SAR Capability Matrix

	Legislation	Oversight	SAR Committee	Training	Alerting	SAR Agreements	Relationships	Communications	Quality Control	Civil Military	Resources	SAREX	Library	Computerization	SAR Programme	Supply Dropping	Special Equipment	SAR aircraft	Navigation	ELTs	COSPAS-SARSAT Alerts
Bahrain																					
Egypt																					
Iran																					
Iraq																					
Jordan																					
Kuwait																					
Lebanon																					
Libya																					
Oman																					
Qatar																					
Saudi Arabia																					
Sudan																					
Syria																					
UAE																					
Yemen																					

A = Fully meets Annex 12 requirements

B = Meets Annex 12 requirements in most areas

C = Meets Annex 12 requirements in some areas

D = Initial implementation

E = Not implemented

Blank = No response

SAR Matrix Element Descriptions

Training: The appropriate level and type of training for SAR coordinator, SAR mission coordinator, on-scene coordinator, and operational facilities. (IAMSAR Manual Vol. 1, Chapter 3)

Oversight: the effectiveness of the States' oversight activities conducted over the RCC and RSCs

Alerting: Fast and reliable means for the rescue coordination center to receive distress alerts. (IAMSAR Manual Vol. 1, Chapter 2)

Legislative: Statutes and related provisions that establish a legal foundation for establishing a SAR organization and its resources, policies, and procedures. (IAMSAR Manual Vol. 1, Chapter 1)

SAR committee: Typically established under a national SAR plan, the SAR coordinating committee is comprised of SAR system stakeholders. (IAMSAR Manual Vol. 1, Chapter 6 and Appendix J)

Agreements : States should enter into agreements with neighboring States to strengthen SAR cooperation and coordination. (Chapter 3 – *Cooperation*, in both Annex 12 – Search and Rescue, and the International Convention on Maritime SAR)

Relationships: Close cooperation between services and organizations which may contribute to improving SAR service in areas such as operations, planning, training, exercises and research and development.

Communications: Communication capability for receipt of distress alerts and operational coordination among the SAR mission coordinator, the on-scene coordinator and SAR facilities. (IAMSAR Manual Vol. 1, Chapter 3)

Quality Control: Procedures to focus on improving the quality of SAR services so as to improve results and reduce costs. (IAMSAR Manual Vol. 1, Chapter 6)

Civil/Military: Close cooperation between the various civilian and military organizations.

Resources: The primary operational facilities made available to the national SAR system by various authorities and arrangements with others. (IAMSAR Manual Vol. 1, Chapter 5 and Appendix C)

SAR Exercise: Exercise to test and improve operational plans, provide learning experience and improve liaison and coordination skills. (IAMSAR Manual Vol. 1, Chapter 3; Annex 12, and Annex 14 regarding Airport Emergency Plan)

Library: Quick access to the applicable international, national, and agency SAR publications that provide standards, policy, procedures and guidance.

Computerization: Use of or access to output of various computer resources including databases, computer aids for SAR system management, search planning software, etc. (IAMSAR Manual Vol. 1, Chapter 2)

SAR programme: National structure to establish, manage and support the provision and coordination of SAR services. (IAMSAR Manual Vol. 1, Chapter 1)

Supply dropping: Supplies and survival equipment carried by air and maritime SAR facilities to aid survivors and facilitate their rescue, as appropriate. (IAMSAR Manual Vol. 1, Chapter 2 and Appendix B)

Special equipment: Equipment created for specific rescue scenarios (such as mountain or desert rescue) and equipment typically carried on designated SAR units to support coordination and locating functions as well as special supplies and survival equipment to aid survivors and facilitate their rescue. (IAMSAR Manual Vol. 1, Chapter 2 and 4)

SAR aircraft: An aircraft provided with specialized equipment suitable for the efficient conduct of SAR missions (Annex 12, Chapter 2 - *Organization*)

Navigation: Suitable means provided within the SAR region to determine position, and the responding SAR facilities have the appropriate equipment on board to determine their position in the SAR region they are likely to operate. (IAMSAR Manual Vol. 1, Chapter 2)

ELT: National regulations for carriage of ELTs, and arrangements for registration of the 406 MHz beacon and rapid access to the beacon registration database. (Annex 6 – Operation of Aircraft and Annex 10 - Aeronautical Telecommunications; and IAMSAR Manual Vol. 1, Chapter 4)

Cospas-Sarsat Distress Alerts : A SAR Point of Contact (SPOC) designated for receipt of Cospas-Sarsat distress data, and arrangements for efficient routing of the distress data to the appropriate SAR authority (the aeronautical emergency locator transmitter ELT), maritime emergency position-indicating beacon (EPIRB), and personal locator beacon (PLB)). (Annex 12, paragraph 3.2.5 and Section 2.4; and, IAMSAR Manual Vol. 1, Chapter 4)

APPENDIX 2: WORK PLAN FOR THE [[JOINT]] SAREX COORDINATION MEETING

1. OBJECTIVES

State the objectives of the [joint] SAREX and what are to be achieved out of the SAREX by all participants.

1.1 The objectives of the [joint] SAREX are:

- a) To provide continuation of SAR exercise and improve cooperation between (participating agencies or State RCC) and (participating agencies or State RCC).
- b) To provide continuation training for personnel of SAR organizations from both (participating agencies or State RCC) and (participating agencies or State RCC)
- c) To test the communication facilities and procedures between (participating agencies or State RCC) and (participating agencies or State RCC); and
- d) To test and determine the effectiveness of the Search and Rescue Units of (participating agencies or State RCC) and (participating agencies or State RCC).

2 DATE AND TIMING OF SAREX

State the agreed date, time and year for the [joint] SAREX. Have alternate or contingency plan in the event that the full scale SAREX cannot be conducted due to weather or any unforeseen circumstances. It is recommended that a pre-SAREX brief be conducted to ensure all participants understand their roles and the required actions to be taken. State the agreed time for a pre-SAREX brief to be carried out for all participants and States may conduct simultaneous pre-SAREX brief at their own location for their local participants. For standardization and to avoid confusion, it is recommended that all timing and dates used should be in UTC as there may be difference in time and day for different States. After the SAREX, it is also recommended to conduct a de-brief for all participants.

For example:

- 2.1 Table Top SAREX or A Full Scale Exercise will be held between (participating agencies or States) and (participating agencies or State) on(date/month/year according to UTC)(day of the week according to UTC) from (time in UTC) to (time in UTC).
- 2.2 In the event of bad weather, the Full Scale SAREX will be converted into a Table Top SAREX. The cut off time will be at (time in UTC).
- 2.3 A Pre-SAREX brief will be held on (day/month/year according to UTC) (day of the week according to UTC) in (location of the pre- SAREX brief) at (time in UTC).
- 2.4 De-Brief will be held on (day/month/year according to UTC) (day of the week according to UTC) in (location of the de-brief) at (time in UTC).

3 SCENARIO

Discussion and development of exercise scenario with participating State or States and agencies involved. Scenario created should be as realistic as possible to simulate close to a real incident. A fictitious flight plan can be included to provide additional information pertaining to the distressed aircraft as required by the RCCs. Using fictitious call signs or airlines for distressed aircraft will avoid complication or confusion especially if it involves the social media.

For example:

- 3.1 At (time in UTC), a chartered(type of aircraft) (call sign of distressed aircraft) departed from (point of departure) to (destination) with (POB). At (time in UTC), aircraft declared “**MAY DAY**” due to (nature of emergency) at (location in Lat and Long or with reference to a prominent location known to all).
- 3.2 Other information like Pilot-in-command equipment carried on board, color of aircraft fuselage or tail.

4 PARTICIPATING ORGANISATIONS OR UNITS

Identify and list all participating agencies or agencies from both States. Agencies should include both government and private. ANSP, Aircraft Investigation Bureau, Airlines etc. should be involved in a SAREX as they are directly involved in any real air incident

For example:

- 4.1 From (participating local agencies or States)
- 1) Civil Aviation Authority of
 - 2) Local Air Force
 - 3) Local Navy
 - 4)
 - 5)

From (the other participating local or States):

- 1) Civil Aviation Authority of
- 2) Local Air Force
- 3) Local Navy
- 5)
- 6)

5 DEPLOYMENT OF EXERCISE SAR UNITS (SRUs) AND CALLSIGNS

State all the SAR assets that will take part in the SAREX. It is recommended that the call signs of the SRUs should be pre-fixed with the word “SAREX” to indicate that it is an exercise aircraft or surface vessel. This will not create any confusion between a SAREX and a real incident. Call sign assigned to a particular SAR asset should not be changed and to be used throughout the exercise. Different SAR asset should be assigned with an individual flight number.

5.1 SRUs from (participating State) and their call signs are as follows:

<u>Type of SRUs</u>	<u>Call sign</u>	<u>Remarks</u>
Fokker 50	SAREX 01	Search
C130	SAREX 02	Search
Dolphin Helicopter	SAREX 03	Search and Rescue
.....	SAREX.....	
.....	SAREX.....	
.....	SAREX.....	

5.2 SRUs from (the other participating State) and their call signs are as follows:

<u>Type of SRUs</u>	<u>Call sign</u>	<u>Remarks</u>
Helicopter	SAREX 04	Search and Rescue
Ship	SAREX 05	Search and rescue
.....	SAREX....	

6 COMMUNICATIONS

State the agreed radio frequencies to be used in the SAREX. Make communication arrangements between the two RCCs as well as between the RCCs and the SRUs. It is recommended that a communication check be conducted between all parties before the SAREX to ensure serviceability of communication equipment. A standby day may be necessary if the communication check is found not satisfactory or unsuccessful.

6.1 The communications arrangement will be as follows:

- a) Between (participating agency or State RCC) and (the other agencies or participating State RCC)
 - Primary communication - KHz or Mhz or landlines
 - Secondary communication - KHz or Mhz or landlines
 - Standby communication - KHz or Mhz or landlines
- b) Between(participating agencies or State RCC) and SRUs)
 - Primary communication - KHz or MHz
 - Secondary communication - KHz or MHz
 - Standby communication - KHz or MHz

6.2 A communication test between (participating agency or State RCC) and (the other participating agencies or State RCC) will be conducted prior to the SAREX. The date for the test is on (date/month/year according to UTC) between (time in UTC) to (time in UTC).

6.3 In the case of unsatisfactory communication test, another test will be conducted on (date/month/year according to UTC) between (time in UTC) to (time in UTC). .

6.4 All messages pertaining to the exercise shall be prefixed with the words “SAREX SAREX SAREX”

7 SEARCH OBJECT

In a Full Scale SAREX, States can consider the deployment of a search object to add realism to the exercise. This will enable participating SRUs to practice visual search from air as well as on from the surface of the sea. If the homing capability of the SRUs is desired, a beacon can be placed on the search object for electronic search. Arrangement can be made for the search object to be deployed at the proposed distress location at the activation time of the SAREX. A search object with some significant marking or markings on it will enable easier visual sighting of search target on land or on water.

- 7.1 The search object will be provided by (one of the participating agency or State RCC) and will be deployed at (time in UTC) on(date of the SAREX according to UTC) at the position in which the distressed aircraft is assumed to have crashed.
- 7.2 Search target is marked with..... (bright color or with the words “SAREX” or some significant marking).

8 ALERTING AND ACTIVATION

State clearly on the alert and activation processes for the SAREX. Decide on which agency or State would initiate the distress phase and notify the other participating agencies or State or States so that [joint] SAR effort can be carried out. In a joint SAREX, if the distressed location is within the area of responsibility of a particular State, the State concern should carry out the alerting and activation phase. The other participating State or States should be notified and [joint] SAR operations can be carried out.

- 8.1 Since the crash will occur in (location or name the State FIR) or area of responsibility, ... (State concern) RCC will notify (participating State) . Both RCCs will coordinate the SAR Operations.

9 SEARCH AREA

Discuss on how to determine the search area or which State should determine the search area. In a joint SAR effort, the two RCCs can determine their own search areas and agree on a common search area.

- 9.1 The respective Search Mission Coordinators (SMCs) will work out a search area upon receipt of the distress location or crash report.
- 9.2 The two SMCs shall discuss with each other and agree on a common search area.
- 9.3 If there is a great difference between the two search areas, the controlling RCC shall decide on the most probable area and take the necessary action to promulgate the area as a restricted area for SAR operations accordingly.

10 DIPLOMATIC CLEARANCE

In a joint SAREX, make necessary arrangement for the application of Diplomatic Clearance required if State assets may or are required to enter into another State’s territorial airspace or waters. The process for application should be made known or if there is an agreement in place between the two States, then the agreed procedure should be followed. Provide information regarding the SRUs and particulars of the personnel on board. It is recommended that particulars of the SRUs be provided to the State concern prior to the SAREX. This will assist in the Diplomatic Clearance process.

- 10.1 (State) SMC will request to (State) for diplomatic clearance to allow (State's) SRUs to enter (State's) territorial airspace and waters.
- 10.2 To obtain diplomatic clearance for (State's) SRU, ... (State) SMC shall provide the following particulars:
- a) Registration of SRU
 - b) Type of aircraft or vessel
 - c) Name of Captain/Pilot in Command
 - d) Names of crew on board (not required for sea asset)
 - e) Area of operation
 - f) Date and time of operation
- 10.3 The details of the (State's) SRU shall be provided to (State) one or two weeks before the exercise. Application for diplomatic clearances through the normal channel via the (agency for the process of the Diplomatic Clearance) is advised in order to accelerate the diplomatic clearance process.

11 SEARCH OPERATIONS

Note: Ensure the safe conduct of the SAREX especially with the air assets. It is recommended that there should be one controlling RCC providing instructions to search aircraft prior to entering the search area. It is also recommended that an Air Coordinator be deployed to provide instructions to search aircraft during transit to and fro from the search area as well as within the search area if the RCC personnel have no knowledge of Air Traffic Control.

- 11.1 All SRUs shall report to the controlling RCC or On Scene Coordinator (OSC) prior to entering the Search Area and while conducting search in the Search Area to ensure safety and efficiency in the [joint] SAR effort. All air search assets must observe and adhere to ATC instructions.
- 11.2 Non exercise aircraft shall keep clear of the search area unless clearance has been obtained for these aircraft to transit through.

12 RESCUE OPERATIONS

Note: Discuss on how the rescue operation is to be executed. Agency or States can decide on a simulated rescue operation by taking photographs of the search object once sighted or if actual personnel are deployed at the distressed location as survivors, actual rescue operations can be conducted. Actual rescue operation will provide training for the rescue of survivors from sea or land to hospitals or landing sites. If possible, recover the search object from the land or sea after the exercise, this will help to avoid the search object becoming an obstacle to others on land or sea. If recovering is not possible, make a general broadcast to warn others of the objects.

- 12.1 When the search object is sighted, the SRU shall inform the (State) RCC. The (State) RCC will disseminate the information to all other SRUs.
- 12.2 The SRUs to take photographs of the search object to simulate the rescue of the survivors.
- 12.3 Recovery of the search object will be by (agency that is recovering the search object).

- 12.4 If the search object is unable to be recovered due to sea state or weather, an Urgent Marine Information Broadcast is provided by (maritime agency responsible for the area).

13 EMERGENCY LANDING OF SEARCH AIRCRAFT

Note: In a joint SAREX, make arrangement for search aircraft to land in airport or airfield of another State in the event of an emergency encountered by the search aircraft where immediate landing is required.

- 13.1 (State's) search aircraft will be given permission to land in (name of airport or airfield) if an emergency landing is required.

14 TERMINATION OF SAREX

Note: State the requirements or under what circumstances that will terminate the SAREX. Make arrangement in the event of a real incident that might occur during the SAREX. Consideration can be given to have a code word or words which are understood by all participating agencies and SRUs in the event of a real incident. Once the code word is broadcast to all concern, it will be understood by all participants and the SAREX will be converted into real SAR operations.

- 14.1 The SAREX will be terminated under any one of the following circumstances:
- a) When the all the SRUs have returned to base.
 - b) When the time for the SAREX has expired and no search object is sighted.
 - c) When there is an actual emergency.
- 14.2 In the case of a real emergency, the exercise will be converted into a real SAR Operations. The code word "NO DUFF NO DUFF" will be broadcast and all agencies to terminate the exercise immediately and prepare and convert it into a real SAR Operations.

15 SAREX De-brief

Note: Conduct of a SAREX de-brief is important as this is where the evaluation process of the exercise is presented by evaluation experts who observed the exercise and observations by people who actually participated in the exercise scenarios. This is the final step to identify weaknesses and development of recommendations for improvement. Agree on a date and venue to conduct a SAREX de-brief to all participants from both States.

- 15.1 SAREX Debrief will be held in on (date/month/year) at (time in UTC).
- 15.2 The venue for the SAREX De-brief will be at (name the venue).

16 SAREX CONTROLLERS/EVALUTORS/OBSERVERS

Note: Name the personnel who will be involved in the SAREX as observers, evaluators and controllers. As for evaluators and controllers, they must have expertise in the areas of SAR as they will understand what is to be evaluated and how to control the exercise to maximize the training value.

- 16.1 Personnel involved in the SAREX will be as follows:

From SAREX Controllers/Evaluators/Observers

..... (Agency or State) (name of personnel and their role)

17 INVITATION TO FOREIGN OBSERVERS

Note: Agency or States may consider inviting observers from other agencies or foreign countries or international organizations to attend and observe the SAREX. These personnel can provide valuable feedbacks for improvement to the system. Arrangement to be made as to which State will do the invitation and who should be invited to attend.

- 17.1 Invitation to foreign observers to observe the SAREX at (indicate the venue for the observation of the SAREX) will be provided (State that is providing the invitation) on behalf of (the other State).
- 17.2 The following countries and organizations will be invited to attend:
- a) (name of country or organization)
 - b) (name of country or organization)
 - c) (name of country or organization)
 - d) (name of country or organization)

18 PRESS COVERAGE

Note: If there provision for any press coverage for the SAREX, made the arrangement for drafting of press release.

- 18.1 If there is a requirement for a [joint] press release on the SAREX to be issued, ...(Agency or State that will produce the draft) will draft the press release and forward to (the other participating agencies or State) for concurrence.

19 SAREX REPORT

Note: SAREX Report is important as it serve as a permanent record of the exercise. Each element of the exercise is recorded and lesson learnt during the exercise is captured. Make arrangement on who should produce the SAREX Report for dissemination to all participating agencies as well as others who may be interested.

- 19.1 (Agency or State) will produce the SAREX Report with assistance from (the other participating agencies or State). Photographs will be made available for the SAREX Report.
- 19.2 A copy of the report will be sent to each of the following countries and International Organizations.
- a) (agency or country or International Organization)
 - b) (agency or country or International Organization)

20 VENUE FOR THE NEXT SAREX

Note: It will be good to plan for an annual [joint] SAREX with relevant agencies or neighbouring State or States. State the tentative date and venue if possible for the next SAREX coordination meeting and SAREX.

- 20.1 The next SAREX Coordination Meeting will be held at (venue) on (date/month/year).

20.2 The next Full Scale SAREX will be held on (date/month/year).

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APPENDIX 3: BENEFITS TO THE SAR SYSTEM OF STATES ASSISTING OTHER STATES

MID States Face Demanding SAR Responsibilities with Few Resources

2.1 Many MID States have the challenging responsibility of providing SAR services over vast and remote land and oceanic areas and several have few resources available to meet Annex 12 requirements.

Taking A Regional Approach Improves Effectiveness and Efficiency

2.2 To provide an effective and efficient SAR service in the region it is important that States focus not only on meeting their own national obligations, but also take the broader view that their State SAR system is only one part of the wider regional SAR system. States therefore need to cooperate, collaborate and share resources and technical expertise with their neighboring and regional RCCs.

When Developed SAR States Support Less Developed Neighbors, Everyone Wins

2.3 Sometimes simple measures can reduce the incidence of SAR operations in a State's Area of Responsibility.

2.4 An example of this is where New Zealand has been regularly requested to send resources to Kiribati, which is not in New Zealand's SRR, to conduct aerial searches for people missing in small vessels at sea. New Zealand recognized that with the provision of basic aids, the number of people going missing at sea could be reduced. The work was completed through an aid program and the benefit was immediate and twofold. There has been a large reduction in the number of people going missing at sea and New Zealand has reduced costs through less aerial searches being required.

2.5 Another example is where Australia has recognized that increasing aircraft and vessel traffic in the north and western areas of its SRR in the Indian Ocean region comes with increased likelihood of more frequent SAR responses in that region. As a result, Australia has commenced a new project in partnership with the Maldives, Mauritius and Sri Lanka to fund and provide technical assistance to improve the SAR capabilities of those countries that will also assist Australia's SAR response obligations in that area of its SRR. Similarly, since 2008 Australia has been providing funding and development assistance to Indonesia to improve SAR capability and cooperation.

2.6 States who aren't compliant with Annex 12 SARPs and who are unable to meet the minimum SAR service requirements could consult and seek assistance from 'champion' States who are compliant and have well developed SAR systems in place.

2.7 Examples of assistance that could be provided by States, International Organizations (such as IMO/ICAO) or multi-lateral initiatives include:

- a) conduct of a SAR Gap Analysis;
- b) advice on the establishment of a SAR organizational framework;
- c) advice for the establishment of a National SAR Committee;
- d) technical assistance in the development of a National SAR Plan;
- e) providing copies of relevant SAR documents to be used as templates;
- f) technical assistance on the establishment of SAR agreements;
- g) technical assistance in the development of RCC position descriptions;
- h) training of SAR personnel;
- i) provision of SRU where appropriate and training of SRU crews;

- j) provision/sharing of computerized SAR tools including incident management systems, databases, maritime drift modelling software, etc.;
- k) establishing data and information sharing agreements between RCCs;
- l) the provision of operational search plan data;
- m) provide advice on how to conduct a SAREX and post-SAREX analysis; and
- n) set up of SAR system publicity and safety awareness campaigns.

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MID REGION SAR FOCAL POINTS CONTACT DETAILS

STATE	NAME	TITLE	ADDRESS	EMAIL	FAX	TEL	MOBILE
Bahrain	Mr. Fareed Ibrahim	Head of Search and Rescue	Bahrain CAA P.O. Box – 586 Kingdom Of Bahrain	fbucheery@caa.gov.bh	+973 17 329 949	+973 17 329 969	
Egypt	Mr. Khaled Abdelraouf Kamel	General Director of Operations Centers & Crisis Management	Ministry of Civil Aviation Cairo - EGYPT	Operation-center-ecaa@hotmail.com Operation-center-ecaa@yahoo.com	+202 22681371	+202 22688387 +202 22678535	+2 011 47710035 +2 0100 1112375
Iran	Mr. Faramarz Faramarzpor	SAR Expert in charge Iran Airports Company		faramarzpor@airport.ir		(98-21) 4454 4107	
Iraq	Mr. Fadel Gatea	Director ATS	Iraq Civil Aviation Authority (ICAA)	atc@iraqcaa.com		+964 7716440448	+964 7828844998
Jordan	Mr. Ahmad Al Heders	Chief Amman ACC	Queen Alia Airport	Ahmad.al-hederes@carc.gov.jo			+962 796664328
Kuwait							
Lebanon	Mr. Kamal Nassereddine	Chief of Air Navigation Department	Directorate General of Civil Aviation (DGCA)	atm@beirutairport.gov.lb		+961 1 628178	
Libya							
Oman	RCC HQ RAFO		P.O. Box 722 Muscat P.C. 111, Oman	Hq.rafo.@rafo.gov.om AFS:- OOMSYCYX	+968 24334776	+968 24334211 +968 24334212	

STATE	NAME	TITLE	ADDRESS	EMAIL	FAX	TEL	MOBILE
Qatar	Mr. Nasser Al-Khalaf	Senior Air Traffic Controller and SAR Coordinator	Hamad Int'l Airport-Doha	nasser.alkhalaf@caa.gov.qa			
Saudi Arabia	Mr. Fahad Saud Alharbi	Manager SAR Head of SAMCC	Saudi Air Navigation Services	fasalharbi@sans.com.sa	+966126402855	+966126717717/ 1840	+966 505329284
Sudan	Hashim Mohamed Ahmed	RCC Head	Sudan CAA PO BOX 165	BEGER124@gmail.com	+249 18352 8323	+249 183528323	+249 12327797 +249 912382433
Syria	Mr. Monif Abdulla	Head of S.A.R. Department Syrian Civil Aviation Authority	Damascus Airport	monif77@hotmail.com	+963-11 540 0312	+963-11 540 0312	+963 932 710351
UAE	Mr. Waleed Al Riyami	SAR Inspector	Air Navigation & Aerodrome Department GCAA- Abu Dhabi	walriyami@gcaa.gov.ae	+971 2 405406	+971 2 4054214	
Yemen	Mr. Mohamed Abdulrab Ali	SAR Director	CAMA Yemen			+967 777214088	



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 6: Air Navigation Deficiencies

AIR NAVIGATION DEFICIENCIES

(Presented by the Secretariat)

SUMMARY
This paper presents the outcome of the MIDANPIRG subsidiary bodies with regard to the review and update of air navigation deficiencies. Action by the meeting is at paragraph 3.
REFERENCES
- MIDANPIRG/16 Report - AIM SG/4 Report - ATM SG/4 Report - CNS SG/8 Report - MET SG/7 Report - RGS WG/5 Report

1. INTRODUCTION

1.1 The MIDANPIRG/16 meeting noted with concern that the majority of deficiencies listed in the MANDD have no specific Corrective Action Plan (CAP). The meeting urged States to implement the provisions of MIDANPIRG Conclusion 15/35 related to elimination of Air Navigation Deficiencies, in particular, the submission of a specific Corrective Action Plan (CAP) for each deficiency.

2. DISCUSSION

2.1 The different MIDANPIRG Subsidiary bodies have reviewed the list of air navigation deficiencies related to their Terms of Reference (TORs) and agreed to the following:

RGS WG/5 meeting¹:

- The meeting reviewed and updated the list of deficiencies in the AOP field.

AIM SG/4 meeting:

- The meeting reviewed and updated the list of deficiencies in the AIM field. The meeting agreed that the elimination of the Deficiencies related to QMS implementation is a high

¹ The RGS WG is a subsidiary body of the RASG-MID

priority and collaboration of States in this respect was strongly encouraged. Accordingly, in support of the NCLB initiative, the meeting noted with appreciation that Saudi Arabia, Sudan and UAE offered their support by inviting interested States to visit their AIS and share their experience, documentation and best practices.

- The meeting encouraged States to extend the invitation of training courses and workshops organized at National level to experts from other States/AISs, in close coordination with the ICAO MID Office.

ATM SG/4 meeting:

- The meeting reviewed and updated the list of deficiencies in the ATM and SAR fields. Taking into consideration that the signature of contingency agreements is a regional requirement in the MID Region and it is not mandated in the adjacent Regions, the meeting agreed that the signature of the contingency agreements with ACCs of the States at the interfaces with the ICAO MID Region be considered as “recommended” and not mandatory. Therefore, the meeting agreed that the deficiencies reported against the States at the interfaces for non-signature of contingency agreements should be removed. The MANDD has been updated accordingly.
- The meeting may wish to note that:
 - o the two (2) ATM deficiencies of Egypt related to ATS Routes are proposed for deletion, based on the outcome of the ATM SG/3 meeting.
 - o the two (2) SAR deficiencies of Qatar are proposed for deletion, based on the evidences provided to the ICAO MID Office by Qatar.

MET SG/7 meeting:

- The meeting reviewed and updated the list of deficiencies in the MET field. The meeting agreed that two new deficiencies related to the non-issuance of SIGMET in Damascus and Sana’a FIRs should be proposed.

CNS SG/8 meeting:

- The meeting reviewed and updated the list of deficiencies in the CNS field.

2.2 The lists of air navigation deficiencies as updated by the different MIDANPIRG subsidiary bodies and the Secretariat (based on inputs received from States) are at **Appendices A to F**.

2.3 The analysis of the MID States’ air navigation deficiencies is shown in the tables and graphs presented at **Appendices G and H** to this working paper. In particular, it’s to be highlighted that:

- The total number of air navigation deficiencies recorded in MANDD would be **105** deficiencies compared to **114** deficiencies approved by MIDANPIRG/16.
- The total number of deficiencies varies between 0 and 21 deficiencies per State as shown in **Appendix H**.
- The distribution of air navigation deficiencies by field is shown in **Appendix G** as follows: AIM 44.8%, AOP 9.5%, ATM 24.8%, CNS 1.9%, MET 9.5% and SAR 9.5%.
- The distribution of air navigation deficiencies by priority is shown in **Appendix G** as follows: 0% “U”, 85% “A”, and 15% “B”:

2.4

It's also to be highlighted that:

- a. Although the MIDANPIG Conclusion 15/35 urged States to submit a specific Corrective Action Plan (CAP) for each deficiency, the majority of States have not yet provided CAPs for their deficiencies. Accordingly, even the dates of completion of the deficiencies are not updated.
- b. In the AOP field; the current total number of AOP deficiencies is ten (10) priority "A" deficiencies. Eight (8) deficiencies are related to aerodrome certification; one (1) related to runway physical characteristics; and one (1) related to apron lighting. The lack of implementation of aerodromes' certification represents 80% of these deficiencies.
- c. In the AIM field; the current total number of AIM deficiencies is forty seven (47); forty one (41) priority "A" and six (6) priority "B" deficiencies. Seventeen (17) deficiencies are related to eTOD; six (6) related to QMS; six (6) related to AIXM; six (6) related to WAC; four (4) related to pre-flight information services; three (3) related to AIP and aeronautical charts; three (3) related to AIRAC adherence; and two (2) related to WGS-84.
- d. In the ATM field; the current total number is twenty six (26); seventeen (17) priority "A" and nine (9) priority "B" deficiencies. Thirteen (13) related to the uncompleted signature of contingency agreements; Nine (9) related to the non-implementation of planned regional ATS Routes; and four (4) related to unsatisfactory reporting of large Height deviation (LHD) to the MIDRMA
- e. In the CNS field; the current total number of CNS deficiencies is two (2); one (1) priority "A" and one (1) priority "B" deficiencies. Both deficiencies are related to ATS Direct speech circuits.
- f. In the MET field; the current total number of MET deficiencies is ten (10) priority "A" deficiencies. Six (6) deficiencies are related to QMS; and four (4) related to METAR, TAF, SIGMET and WAFS.
- g. In the SAR field; the current total number is ten (10) priority "A" deficiencies. Five (5) related to the lack of SAR provisions; and five (5) related to non-compliance with the carriage of Emergency Locator Transmitter (ELT) requirements.

3. ACTION BY THE MEETING

3.1

The meeting is invited to:

- a) review and update the air navigation deficiencies at **Appendices A, B, C, D, E and F**; and
- b) urge States to implement the provisions of the MIDANPIRG/15 Conclusion 15/35 and provide updates on the status of their deficiencies using MANDD.

APPENDIX A

Deficiencies in the AIM Field

EGYPT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 15: Para. 10.1.3, Para. 10.1.9 ANNEX 15: Para. 5.3.3.4.3, Para. 5.3.3.4.10	-	Lack of the required Obstacle Datasets for eTOD Area 1 and Area 4 Lack of the required Obstacle Datasets for Area 1 and Area 4	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State Phase 1: Determine the required specification for Obstacles area 1 and 4 (1/1/2018 to 1/3/2018); Phase 2: provide the required specification to Consultancy office to determine the implementing entity (1/3/2018 to 1/3/2019); Phase 3: Determine the implementing entity and begin to produce new software for eTOD (1/03/2019 to 1/12/2019); Phase 4: finish the new software and begin to produce eTOD area 4 (from existing raw data from Cairo International Airport Company) (1/1/2020 to 1/6/2020); Phase 5 (in parallel with phase 4): begin to produce eTOD area 1 after get raw data (1/1/2020 to 31/12/2020)	Egypt	Dec, 2018 Dec, 2020	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AIM Field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 15: Para. 3.6 ANNEX 15: Para. 2.3.10 and 3.5.3	-	Lack of AIXM-based AIS Database	Dec, 2007	-	O	Corrective Action Plan has not been formally provided by the State	Iran	Dec, 2018	A

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Deficiencies in the AIM Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 4: Para. 16.2	-	Non-production of World Aeronautical Chart – ICAO 1:1 000 000	May, 1995	-	F H S	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	B
2	~~ANNEX 15: Para. 1.2.2~~ ANNEX 15: Para. 1.2.1.1	-	Implementation of geoid undulation referenced to the WGS-84 ellipsoid	Dec, 1997	-	F H O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A
3	~~ANNEX 15: Para. 3.7~~ ANNEX 15: Para. 3.6	QMS Implementation	Lack of Implementation of QMS	Jan, 2003	-	F H O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A
4	ANNEX 4: Para. 11.2	-	Non-production of Instrument Approach Chart-ICAO for Mousl Intl. Airport	Jan, 2003	-	F H O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A
5	~~ANNEX 15: Para. 8.1~~ ANNEX 15: Para. 5.5	-	Non provision of pre-flight information service at international airports	Mar, 2004	-	F H O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

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“S”= State (Military/political)

“O”= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
6	ANNEX 15: Para. 10.1.3 Para. 10.1.9 ANNEX 15: Para. 5.3.3.3.2 and 5.3.3.3.8	-	~~Lack of the required Terrain Datasets for eTOD Area 1 and Area 4~~ Lack of the required Terrain Datasets for Area 1 and Area 4	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A
7	ANNEX 15: Para. 10.1.3 Para. 10.1.9 ANNEX 15: Para. 5.3.3.4.3 and 5.3.3.4.10	-	~~Lack of the required Obstacle Datasets for eTOD Area 1 and Area 4~~ Lack of the required Obstacle Datasets for Area 1 and Area 4	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

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Deficiencies in the AIM Field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 4: Para. 16.2	-	Non-production of World Aeronautical Chart – ICAO1:1 000 000	Feb, 2008	-	F H	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2018	B
2	~~ANNEX 15: Para. 10.1.3 Para. 10.1.9~~ ANNEX 15: Para. 5.3.3.3.2 and 5.3.3.3.8	-	~~Lack of the required Terrain Datasets for eTOD Area 1 and Area 4~~ Lack of the required Terrain Datasets for Area 1 and Area 4	May, 2014	-	F H	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2018	A
3	~~ANNEX 15: Para. 10.1.3 Para. 10.1.9~~ ANNEX 15: Para. 5.3.3.4.3 and 5.3.3.4.10	-	~~Lack of the required Obstacle Datasets for eTOD Area 1 and Area 4~~ Lack of the required Obstacle Datasets for Area 1 and Area 4	May, 2014	-	F H	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

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“O”= Other unknown causes

Deficiencies in the AIM Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 4: Para. 16.2	-	Non-production of World Aeronautical Chart – ICAO1:1 000 000	May, 1995	-	H	Corrective Action Plan was provided in August 2016.	Lebanon	Dec, 2018	B
2	~~ANNEX 15:Para. 3.7~~ ANNEX 15:Para. 3.6	QMS Implementation	Lack of Implementation of QMS	Jan, 2003	(USOAP-CMA finding)	H	Corrective Action Plan was provided in August 2016.	Lebanon	Dec, 2018	A
3	~~ANNEX 15:Para. 1.2.2~~	-	~~Implementation of geoid undulation referenced to the WGS 84 ellipsoid.~~	~~Jan, 2003~~	-	~~H~~	~~Corrective Action Plan was provided in August 2016.~~	~~Lebanon~~	~~Dec, 2018~~	~~A~~
4	~~ANNEX 15: Para. 10.1.3~~ ANNEX 15: Para. 5.3.3.3.2	-	~~Lack of the required Terrain Datasets for eTOD Area 1~~ Lack of the required Terrain Dataset for Area 1	May, 2014	-	O	Corrective Action Plan was provided in August 2016.	Lebanon	Dec, 2018	A
5	~~ANNEX 15: Para. 10.1.3~~ ANNEX 15: Para. 5.3.3.4.3	-	~~Lack of the required Obstacle Datasets for eTOD Area 1~~ Lack of the required Obstacle Dataset for Area 1	May, 2014	-	O	Corrective Action Plan was provided in August 2016.	Lebanon	Dec, 2018	A

(1) Rationale for non-elimination: “F”= Financial

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“O”= Other unknown causes

Deficiencies in the AIM Field

LIBYA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 4: Para. 16.2	-	Non-production of World Aeronautical Chart – ICAO 1:1 000 000	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	B
2	~~ANNEX 15: Para. 3.7~~ ANNEX 15: Para. 3.6	QMS Implementation	Lack of Implementation of QMS	May, 2014	(USOAP-CMA finding)	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A
3	~~ANNEX 15: Para. 6.~~ ANNEX 15: Para 6.2	-	Lack of a system for AIRAC adherence monitoring	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A
4	~~ANNEX 15: Para. 3.6~~ ANNEX 15: Para. 2.3.10 and 3.5.3	-	Lack of AIXM-based AIS Database	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A
5	~~ANNEX 15: Para. 10.1.3~~ ANNEX 15: Para. 5.3.3.3.2	-	~~Lack of the required Terrain Datasets for eTOD Area 1~~ Lack of the required Terrain Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

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“O”= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
6	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.4.3	-	~~Lack of the required Obstacle Datasets for eTOD Area 1~~ Lack of the required Obstacle Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

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Deficiencies in the AIM Field

OMAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~ANNEX 15:Para. 3.7~~ ANNEX 15:Para. 3.6	QMS Implementation	Lack of Implementation of QMS	Jan, 2003	(USOAP-CMA finding)	O	~~An agreement with an international quality company is established to assist for progressive implementation of quality systems within DGAN AIS.~~ ~~QMS is expected to be fully implemented by December 2017.~~ - An agreement with an international quality company is established to assist for progressive implementation of quality systems within DGAN AIS. - QMS is expected to be fully implemented by September 2019.	Oman	~~Dec, 2017~~ Sep, 2019	A

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Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
2	ANNEX 15: Para. 3.6 ANNEX 15: Para. 2.3.10 and 3.5.3	-	Lack of AIXM-based AIS Database	Jul, 2005	-	O	A contract is going to be signed with a company specializing in this area for AIP Data Migration. AIM equipment installation will be completed by end of February 2017. The target is to have 70% of the data by June 2018	Oman	Dec, 2018 Dec, 2019	A
3	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.3.2	-	Lack of the required Terrain Datasets for eTOD Area 1 Lack of the required Terrain Datasets for Area 1	May, 2014	-	O	~~An agreement with National survey authority is going to be established to assist for progressive implementation of terrain datasets for eTOD area 1. The target is to have the required data by Dec 2018.~~ An agreement with National survey authority is going to be established to assist for progressive implementation of terrain datasets for area 1. The target is to have the required data by Dec 2019.	Oman	Dec, 2018 Dec, 2019	A
4	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.4.3	-	Lack of the required Obstacle Datasets for eTOD Area 1 Lack of the required Obstacle Datasets for Area 1	May, 2014	-	O	Area 1 obstacles are published in AIP Oman ENR 5.4 "Air Navigation (En-Route) Obstacles". Data originators for obstacles will be consulted for Area 1 obstacle completeness and update.	Oman	Dec, 2018 Dec, 2019	A

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Deficiencies in the AIM Field

SAUDI ARABIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 15: Para. 8.1 ANNEX 15: Para. 5.5	-	Pre-flight information service not provided at International Airports	Nov, 2007	-	O	Corrective Action Plan has not been formally provided by the State	Saudi Arabia	~~Dec, 2017~~ Apr, 2018	A

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Deficiencies in the AIM Field

SUDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 15: Para. 3.6 ANNEX 15: Para. 2.3.10 and 3.5.3	-	Lack of AIXM-based AIS Database	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Sudan	Dec, 2018	A
2	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.3.2	-	Lack of the required Terrain Datasets for eTOD Area 1 Lack of the required Terrain Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Sudan	Dec, 2018	A
3	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.4.3	-	Lack of the required Obstacle Datasets for eTOD Area 1 Lack of the required Obstacle Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Sudan	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

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Deficiencies in the AIM Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~ANNEX 15: Para. 6.~~ ANNEX 15: Para 6.2	-	Lack of a system for AIRAC adherence monitoring	May, 1995	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
2	ANNEX 4: Para. 16.2	-	Non-production of World Aeronautical Chart – ICAO1:1 000 000	May, 1995	-	F H S	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	B
3	~~ANNEX 15: Para. 3.7~~ ANNEX 15: Para. 3.6	QMS Implementation	Lack of Implementation of QMS	Jan, 2003	(USOAP-CMA finding)	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
4	~~ANNEX 15: Para. 1.2.2~~ ANNEX 15: Para. 1.2.1.1	-	Implementation of geoid undulation referenced to the WGS-84 ellipsoid.	Jan, 2003	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
5	~~ANNEX 15: Para. 4.~~ ANNEX 15: Para. 5.2 and 6.3.1	-	Lack of consistency in AIP information and lack of regular and effective updating of the AIP.	Jul, 2005	-	H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

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Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
6	ANNEX 15: Para. 3.6 ANNEX 15: Para. 2.3.10 and 3.5.3	-	Lack of AIXM-based AIS Database	Jul, 2005	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
7	ANNEX 15: Para. 8.1 ANNEX 15: Para. 5.5	-	Non provision of pre-flight information service at international airports	Jul, 2005	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
8	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.3.2	-	~~Lack of the required Terrain Datasets for eTOD Area 1~~ Lack of the required Terrain Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
9	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.4.3	-	~~Lack of the required Obstacle Datasets for eTOD Area 1~~ Lack of the required Obstacle Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

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Deficiencies in the AIM Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 15: Para. 6. ANNEX 15: Para 6.2	-	Lack of a system for AIRAC adherence monitoring	May, 1995	-	H O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
2	ANNEX 4: Para. 16.2	-	Non-production of World Aeronautical Chart – ICAO1:1 000 000	May, 1995	-	F	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	B
3	ANNEX 15: Para. 3.7 ANNEX 15: Para. 3.6	QMS Implementation	Lack of Implementation of QMS	Jan, 2003	-	F	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
4	ANNEX 4: Para. 11.2	-	Non-production of Instrument Approach Chart-ICAO for TAIZ Intl. Airport	Jan, 2003	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
5	ANNEX 15: Para. 8.1 ANNEX 15: Para. 5.5	-	Non provision of pre-flight information service at international airports	Mar, 2004	-	F H	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A

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Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
6	ANNEX 15: Para. 3.6 ANNEX 15: Para. 2.3.10 and 3.5.3	-	Lack of AIXM-based AIS Database	Jul, 2005	-	F	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
7	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.3.2	-	Lack of the required Terrain Datasets for eTOD Area 1 Lack of the required Terrain Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
8	ANNEX 15: Para. 10.1.3 ANNEX 15: Para. 5.3.3.4.3	-	Lack of the required Obstacle Datasets for eTOD Area 1 Lack of the required Obstacle Datasets for Area 1	May, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

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APPENDIX B

Deficiencies in the AOP Field

EGYPT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table AOP II-1	Alexandria Intl Airport	Runway is short and current distance is 7221 FT with runway all up weight maximum 68000kgs	Jul, 2004	-	F O	Upgrade for RWY 04/22 is done, study is carried out with conclusion of MTOW 72000 Kg commensurate the demand aircraft fleet mix serve at the airport taking into consideration the current Rwy characteristics (Length, PCN)	Egypt	Jul, 2018	A
2	ANNEX 14 VOL I: Para. 1.4	Luxor and Borg El Arab Intl. Airports	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	- - Certification of: - LUXER/Luxor Intl Airport (HELX) will be in Dec 2017 - ALEXANDRIA/ Borg El-Arab Intl Airport (HEBA) will be in the first half of 2018	F H	State submitted a letter dated 22/07/2015 stating that all primary international aerodromes will be certified by the end of November 2018.	Egypt	Nov, 2018 Jun, 2018	A

(1) Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Deficiencies in the AOP Field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Imam Khomeini, Mehrabad, Mashhad, Yazd and Tabriz Intl. Airports - MASHHAD/Shahid Hashemi Nejad Intl (OIMM), SHIRAZ/Shiraz Intl (OISS), TABRIZ/Tabriz Intl (OITT), TEHRAN/Imam Khomeini Intl (OIIE), BANDAR ABBAS/Bandar Abbas Intl (OIKB)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	- Certification Status for: - TEHRAN/ IKIA Intl (OIIE) - BANDAR Abbas /Bandar Abbas Intl (OIKB) are waiting final action for certification very soon	F H	Corrective Action Plan has not been formally provided by the State	Iran	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	~~Baghdad/ Basrah/ Erbil /Sulaymaniyah/ Al Najaf Intl. Airports~~ Al Najaf/Al Najaf Intl (ORNI), BASRAH/Basrah Intl (ORMM), MOUSL/Mousl Intl (ORBM), SULYMANIYA H/Sulaymaniyah Intl (ORSU)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table AOP II-1	Queen Alia Airport Runway 08L/26R	Runway is not operational and closed since long time	Dec, 2014	construction handing over	F	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2018	B

(1) Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
2	ANNEX 14 VOL I: Para. 1.4	Marka Intl Airport AMMAN/Marka Intl Airport	Implementation of Certification of Aerodromes used for international operations	May, 2015	-	F H	Corrective Action Plan has not been formally provided by the State	Jordan	Dec, 2017 Mar, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Hariri Beirut Intl. Airport BEIRUT/ Rafic Hariri Intl (OLBA)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

B-7

Deficiencies in the AOP Field

LIBYA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Benina, Sebha, and Tripoli Intl Airports BENGHAZI/Benina (HLLB), SEBHA/Sebha (HLLS), TRIPOLI/Tripoli Intl (HLLT)	Implementation of Certification of Aerodromes used for international operations	May, 2015	-	F H S	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

SUDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Nyala and El Obeid Intl. Airports - Nyala/Nyala Airports	Implementation of Certification of Aerodromes used for international operations	May, 2015	- -Certification of NYALA/Nyala (HSNN) Will be in January 2018	F H	~~Corrective Action Plan has not been formally provided by the State~~ -	Sudan	~~Dec, 2018~~ Jan, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table AOP II-1	Damascus int'l Airport	Apron lighting inadequate	Sep, 2003	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
2	MID eANP VOL II Table AOP II-1	Damascus int'l Airport	Runway surface rough and damaged. Runway markings unsatisfactory	Sep, 2003	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
3	ANNEX 14 VOL I: Para. 1.4	~~Damascus, Aleppo, Bassel Al-Assad Int'l. Airports~~ ALEPPO/Aleppo Intl (OSAP), DAMASCUS/Damascus Intl (OSDI), LATTAKIA/Bassel AL-Assad Intl (OSLK)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the AOP Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	ANNEX 14 VOL I: Para. 1.4	Sana'a, Aden, Hodeidah, Mukalla, Taiz Intl. Airports ADEN/Aden Intl (OYAA), HODEIDAH/ Hodeidah Intl (OYHD), MUKALLA/Riy an Intl (OYRN), SANA`A/Sana'a Intl (OYSN), TAIZ/ Taiz Intl (OYTZ)	Implementation of Certification of Aerodromes used for international operations	Nov, 2006	-	F H	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

APPENDIX C

Deficiencies in the ATM Field

EGYPT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID ANP Table ATM II MID 1 MID REGION ATS ROUTE NETWORK	-	ATS routes M305/UM305 not implemented	Apr, 2013	Segment BRN-ATMUL not implemented.	S	step 1 Dated 2/2015: held meeting with ECAA, NANSO and Military to study the proposed Routes step 2 Dated 14/5/2015: send letter for approval of the proposed routes to the military side step 3 Dated 23/6/2015: Receiving rejection letter from military side for the proposed routes step 4 : Dated 25/6/2015 : notify NANSO ANSP company to study the proposed Routes step 5 Dated 4/2017: Egypt will present a working paper in the third meeting of the MIDANPIRG ATM Sub-group (ATM-SG 3) to address the subject	Egypt	Dec, 2018	B

(1) Rationale for non-elimination: "F"= Financial

"H"= Human Resources

"S"= State (Military/political)

"O"= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
2	MID ANP Table ATM II MID I MID REGION ATS ROUTE NETWORK	-	ATS routes M312/UM312 not implemented	Apr, 2013	Segment DBA-AMIBO not implemented.	S	step 1 Dated 2/2015: held meeting with ECAA, NANSO and Military to study the proposed Routes step 2 Dated 14/5/2015: send letter for approval of the proposed routes to the military side step 3 Dated 23/6/2015: Receiving rejection letter from military side for the proposed routes step 4 : Dated 25/6/2015 : notify NANSO ANSP company to study the proposed Routes step 5 Dated 4/2017: egypt will present a working paper in the third meeting of the MIDANPIRG ATM Sub-group (ATM-SG 3) to address the subject	Egypt	Dec, 2018	B

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11 Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	Signed with all neighboring States except Afghanistan, Azerbaijan, Kuwait and Turkmenistan Still to sign with Kuwait	H	Corrective Action Plan has not been formally provided by the State	Iran	Dec, 2018	A
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS routes A418/UP574 not implemented	Dec, 2006	KUMUN-PAPAR segment not implemented.	S O	Corrective Action Plan has not been formally provided by the State	Iran- UAE	Dec, 2018	B
3	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS Route G202 is restricted to certain defined airspace users	~~Jun, 2014~~ Jun, 2014	Not all Operators are authorized to fly G202	O	Corrective Action Plan has not been formally provided by the State	Iran	Dec, 2018	B

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G667 not implemented	Sep, 2006	Segment ALSAN-ABD not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq- Iran- Kuwait	Dec, 2018	B
2	Annex 11 Para. 2.30 Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency Agreement signed only with Iran~~ Contingency Agreement to be signed with Syria	S	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A
3	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G795 not implemented	May, 2008	RAF-BSR segment not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq- Saudi Arabia	Dec, 2018	B

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
4	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route A424 not implemented	May, 2008	LOTAN-LOVEK segment not implemented	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	B
5	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	ATS route	ATS Route G669 not implemented	May, 2008	segment RAF - SOLAT not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	B

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency agreements not signed with Iraq, Israel and Syria.~~ Contingency agreements not signed with Syria.	H	Corrective Action Plan has not been formally provided by the State. State comment: due to political impact in the region Jordan is not able to complete the signature of contingency agreements with all adjacent States	Jordan	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

C-7

Deficiencies in the ATM Field

KUWAIT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency Plans with Iraq and Iran are still to be signed.~~ Contingency Plan to be signed with Iran	S	Corrective Action Plan has not been formally provided by the State	Kuwait	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency agreements not signed with Cyprus and Syria~~ Contingency agreements not signed with Syria	S	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

LIBYA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs	Dec, 2014	Agreement signed only with Egypt	S O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A
2	Annex 11 Para 3.3.5.1	-	Not reporting the required data to the MIDRMA in a timely manner.	Dec, 2013	-	H O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

OMAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency Agreements to be signed with India and Pakistan.~~ Contingency Agreements to be signed with Saudi Arabia.	S	Corrective Action Plan has not been formally provided by the State	Oman	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

C-11

Deficiencies in the ATM Field

QATAR

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency agreements not signed with Saudi Arabia.~~ Contingency agreements not signed with UAE.	S	Corrective Action Plan has not been formally provided by the State	Qatar-Bahrain	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

SAUDI ARABIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	~~Contingency Agreements not signed with Eritrea, Iraq, Qatar, Sudan and Yemen.~~ Contingency Agreements not signed with Iraq, Qatar, Sudan and Yemen.	S	Corrective Action Plan has not been formally provided by the State	Saudi Arabia	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

C-13

Deficiencies in the ATM Field

SUDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Dec, 2014	Contingency Agreement signed only with Egypt	H S O	Corrective Action Plan has not been formally provided by the State	Sudan	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G202 not implemented	Dec, 1997	Segment DAKWE - Damascus not implemented	S	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	B
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route UL602 not implemented	Dec, 2003	Segments ELEXI-DRZ-GAZ not implemented.	S	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	B
3	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	No signed agreement yet	H O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
4	Annex 11 Para 3.3.5.1	-	Reporting unsatisfactory LHDs to MIDRMA	Oct, 2013	Syria to coordinate with MIDRMA.	H	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the ATM Field

UAE

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov, 2006	Plan completed and Agreements signed with Bahrain, Iran, Oman and Saudi Arabia. The plan next is to sign with Qatar after the finalisation of the LoA.	O	Corrective Action Plan has not been formally provided by the State	UAE	Dec, 2018	A
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS routes A418/UP574 not implemented	Dec, 2006	KUMUN-PAPAR segment not implemented.	S	Corrective Action Plan has not been formally provided by the State	Iran- UAE	Dec, 2018	B

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

C-17

Deficiencies in the ATM Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	~~Annex 11~~ ~~Para. 2.30~~ Annex 11 Para. 2.31	-	Development of contingency plan for implementation in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs	Nov, 2006	Contingency Agreement signed only with Oman.	H O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
2	Annex 11 Para 3.3.5.1	-	Granting RVSM approvals for aircraft without known hight-keeping monitoring results	Dec, 2012	-	H O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
3	Annex 11 Para 3.3.5.1	-	Reporting Unsatisfactory LHDs to MIDRMA	Oct, 2013	Yemen to coordinate with MIDRMA.	H	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

APPENDIX D

Deficiencies in the CNS Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table CNS II 3	ATS Direct Speech Circuit Baghdad-Damascus	ATS Direct speech circuit is required between Baghdad and Damascus.	Oct, 2008	In progress between Iraq and Syria. Iraq advised that they are ready to implement the circuit using VSAT, however the matter is pending in Syria.	Ø	Corrective Action Plan has not been formally provided by the State	Iraq-Syria	Dec, 2018	A
2	MID eANP VOL I Para. 2.6	Baghdad VOR and DME	VOR and DME not installed/operational	Jan, 2009	In progress. Iraq advised that all NAV AIDs will be installed according to the master plan.	Ø	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

(1) Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the CNS Field

OMAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table CNS II-3	Direct Speech Circuit Muscat-Sana`a	Direct Speech Circuit (LIM MID RAN) is required between Muscat and Sana`a	Oct, 1998	Under implementation. Oman Ready. Oman and Yemen are working to implement the circuit	O	Corrective Action Plan has not been formally provided by the State.	Oman- Yemen	Dec, 2018	B

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the CNS Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table CNS II-3	ATS Direct Speech Circuit Damaseus-Baghdad	Direct Speech circuit is required between Damaseus and Baghdad.	Oct, 2008	-	Ø	Corrective Action Plan has not been formally provided by the State	Syria-Iraq	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the CNS Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II Table CNS II-3	ATS Direct speech Circuits Sana`a-Asmara, Sana`a-Djibouti, Sana`a-Mogadishu, Sana`a-Mumbai and Sana`a-Muscat.	<del>ATS Direct speech circuits are required between Sana`a and Asmara, Djibouti, Mogadishu, Mumbai and Muscat.</del> ATS Direct speech circuits are not implemented between Sana`a-Mumbai and Sana`a-Muscat.	Oct, 1998	-	O	Corrective Action Plan has not been formally provided by the State	~~Yemen-Eritrea-India-Oman-Somalia~~ Yemen, India and Oman	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

APPENDIX E

Deficiencies in the MET Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 3: Para 2.2	QMS Implementation	Lack of Implementation of QMS	Sep, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the MET Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 3: Para 2.2	QMS Implementation	Lack of Implementation of QMS	Sep, 2014	(USOAP - CMA finding)	O	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec, 2018	A
2	Annex 3: Para. 9.1.4, 9.3.1, 9.4.1 and Appendix 2, 2.1.1	WAFS forecasts required for briefing and flight documentation	SADIS FTP not available	May, 2016	-	O	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the MET Field

LIBYA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 3: Para 2.2	QMS Implementation	Lack of Implementation of QMS	Sep, 2014	(USOAP - CMA finding)	O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the MET Field

OMAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 3: Para 2.2	QMS Implementation	Lack of Implementation of QMS	Sep, 2014	(USOAP-CMA finding)	O	Corrective Action Plan has not been formally provided by the State	Oman	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the MET Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	MID eANP VOL II, MET Table II-2	OSAP METAR and 24-hour TAF	OSAP METAR and 24-hour TAF not available internationally	Nov, 2013	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
2	Annex 3: Para 2.2	QMS Implementation	Lack of Implementation of QMS	Sep, 2014	(USOAP - CMA finding)	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
3	Annex 3; Para 7.1	SIGMET implementation	Non-issuance of SIGMET information	Nov, 2017	(USOAP – CMA finding)	O	Corrective Action Plan has not been formally provided by the State	Syria	Jun, 2019	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the MET Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 3: Para 2.2	QMS Implementation	Lack of Implementation of QMS	Sep, 2014	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
2	Annex 3; Para 7.1	SIGMET implementation	Non-issuance of SIGMET information	Nov, 2017	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Jun, 2019	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

APPENDIX F

Deficiencies in the SAR Field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A
2	Annex 6 Part I, Chap.6 and Part II Chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the SAR Field

KUWAIT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Kuwait	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the SAR Field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Lebanon	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the SAR Field

LIBYA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Dec, 2014	-	H S O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A
2	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Dec, 2014	-	H S O	Corrective Action Plan has not been formally provided by the State	Libya	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the SAR Field

QATAR

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr, 2012	-	Ø	Corrective Action Plan has not been formally provided by the State	Qatar	Dec, 2018	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr, 2012	-	Ø	Corrective Action Plan has not been formally provided by the State	Qatar	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the SAR Field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Deficiencies in the SAR Field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date First Reported	Remarks/ Rationale for Non-elimination		Description	Executing Body	Date of Completion	Priority for Action
1	Annex 12 Para. 2.1	-	Lack of provision of required SAR services	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of Emergency Locator Transmitter (ELT) requirements	Apr, 2012	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	Dec, 2018	A

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

Note:* Priority for action to remedy a deficiency is based on the following safety assessments:

'U' priority = Urgent requirements having a direct impact on safety and requiring immediate corrective actions.

Urgent requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is urgently required for air navigation safety.

'A' priority = Top priority requirements necessary for air navigation safety.

Top priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation safety.

'B' priority = Intermediate requirements necessary for air navigation regularity and efficiency.

Intermediate priority requirement consisting of any physical, configuration, material, performance, personnel or procedures specification, the application of which is considered necessary for air navigation regularity and efficiency.

Definition:

A deficiency is a situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.

⁽¹⁾ Rationale for non-elimination: “F”= Financial

“H”= Human Resources

“S”= State (Military/political)

“O”= Other unknown causes

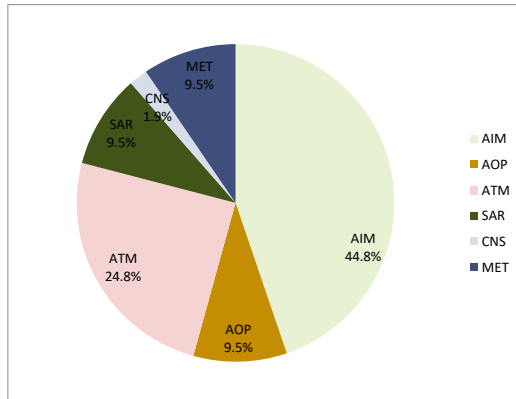
APPENDIX G

AIR NAVIGATION DEFICIENCIES IN THE THE MID REGION

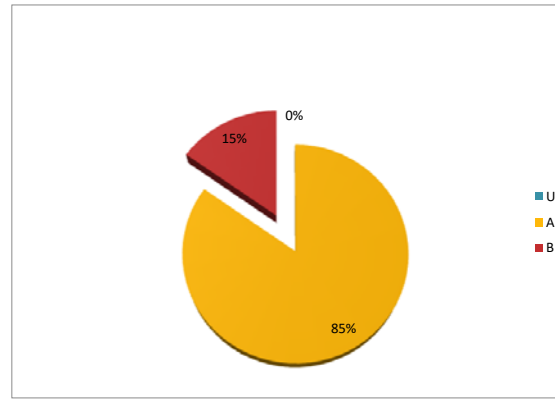
STATE	AIM							Total AIM	AOP							Total AOP	ATM							Total ATM	SAR							Total SAR	CNS							Total CNS	MET							Total MET
	Priority			Rational					Priority			Rational					Priority			Rational					Priority			Rational					Priority			Rational					Priority			Rational				
	U	A	B	F	H	S	O		U	A	B	F	H	S	O		U	A	B	F	H	S	O		U	A	B	F	H	S	O		U	A	B	F	H	S	O		U	A	B	F	H	S	O	
Bahrain							0							0										0								0													0			
Egypt	1						1	1				1	1	1										0									0												0			
Iran	1						1	1			1	1	1										3										0												0			
Iraq	6	1		5	5	1	6	7			1	1	1			1	4						5		2							2	2									1			1	1		
Jordan	2	1		3	3			3								0				1			1										0												0			
Kuwait								0								0	1					1		1		1						1	1												0			
Lebanon	3	1			2		2	4		1		1	1			1	1					1		1		1						1	1									2		2	2			
Libya	5	1					6	6		1		1	1	1		1	2				1	1	2	2	2				2	2	2	2							0	1	1			1	1			
Oman	4						4	4								0	1					1		1								0											1	1				
Qatar								0								0	1					1		1								0													0			
Saudi Arabia	1						1	1								0	1					1		1								0													0			
Sudan	3						3	3		1						1	1					1	1	1	1							0													0			
Syria	8	1		6	7	1	2	9		3		3	3			3	2	2				2	2	1	4		2					2	2								3			3	3			
UAE								0								0	1	1				1	1	2									0													0		
Yemen	7	1		4	2		4	8		1		1	1			1	3				3			2	3		2					2	2							1	1		2			2	2	
Total	0	41	6	18	19	2	30	47	0	10	0	10	10	1	1	10	0	17	9	0	9	15	10	26	0	10	0	0	2	2	10	10	0	1	1	0	0	0	2	2	0	10	0	0	0	10	10	

TOTAL DEFICIENCIES:105

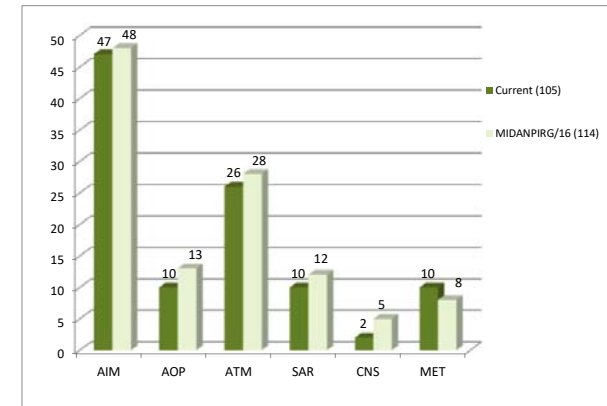
Distribution of Air Navigation deficiencies by field in %

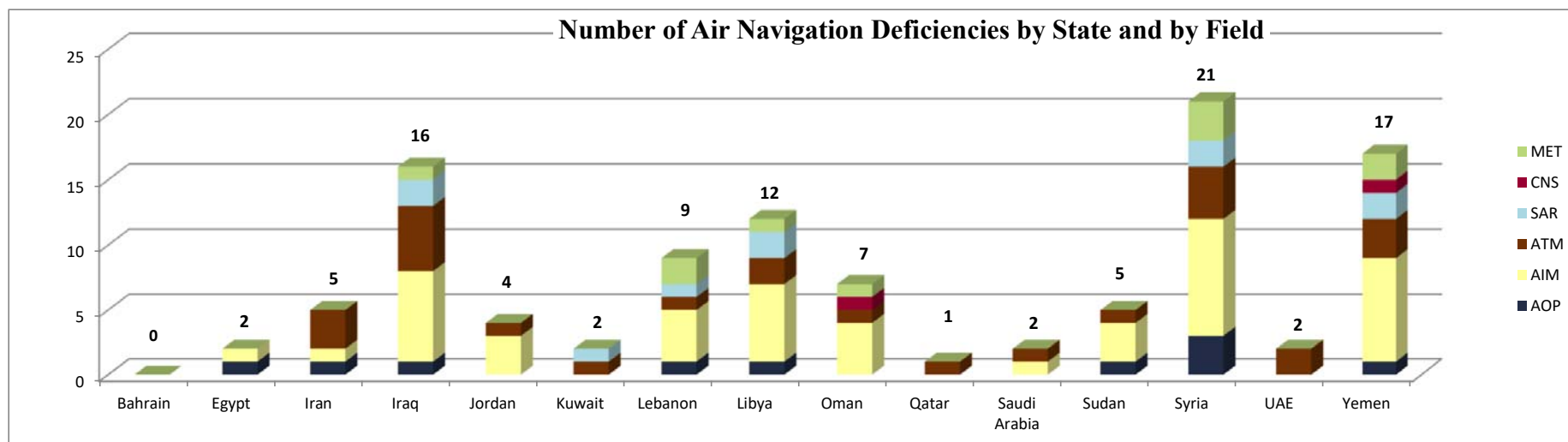


Distribution of Air navigation deficiencies by priority in %



Reported Deficiencies by field (MIDANPIRG/16 vs MIDANPIRG/15)





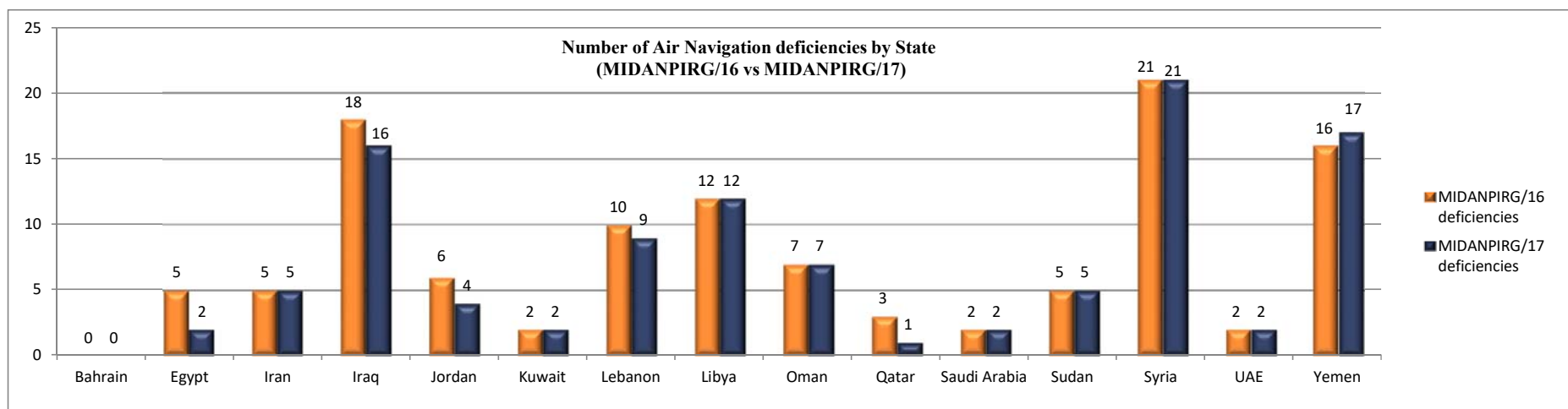
Deficiencies approved by MIDANPIRG/17

	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen	Total
AOP	0	1	1	1	0	0	1	1	0	0	0	1	3	0	1	10
AIM	0	1	1	7	3	0	4	6	4	0	1	3	9	0	8	47
ATM	0	0	3	5	1	1	1	2	1	1	1	1	4	2	3	26
SAR	0	0	0	2	0	1	1	2	0	0	0	0	2	0	2	10
CNS	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
MET	0	0	0	1	0	0	2	1	1	0	0	0	3	0	2	10
TOTAL	0	2	5	16	4	2	9	12	7	1	2	5	21	2	17	105

Deficiencies approved by MIDANPIRG/16

	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen	Total
AOP	0	2	1	1	2	0	1	1	0	0	0	1	3	0	1	13
AIM	0	1	1	7	3	0	5	6	4	0	1	3	9	0	8	48
ATM	0	2	3	5	1	1	1	2	1	1	1	1	4	2	3	28
SAR	0	0	0	2	0	1	1	2	0	2	0	0	2	0	2	12
CNS	0	0	0	2	0	0	0	0	1	0	0	0	1	0	1	5
MET	0	0	0	1	0	0	2	1	1	0	0	0	2	0	1	8
TOTAL	0	5	5	18	6	2	10	12	7	3	2	5	21	2	16	114

	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen	Total
MIDANPIRG/16 deficiencies	0	5	5	18	6	2	10	12	7	3	2	5	21	2	16	114
MIDANPIRG/17 deficiencies	0	2	5	16	4	2	9	12	7	1	2	5	21	2	17	105





International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 7: MIDANPIRG Working Arrangements

**REVIEW AND UPDATE OF MIDANPIRG MEMBERS/ALTERNATES/ADVISERS
AND SUBSIDIARY BODIES' FOCAL POINTS**

(Presented by the Secretariat)

SUMMARY

The aim of this working paper is to update the list of the MIDANPIRG Members/Alternates/Advisers, as well as the Subsidiary bodies' focal points.

Action by the meeting is at paragraph 3.

1. INTRODUCTION

1.1 In accordance with the MIDANPIRG Procedural Handbook, each MIDANPIRG Member State should designate a Member, an Alternate and Adviser(s) able to support MIDANPIRG goals and objectives.

2. DISCUSSION

2.1 The list of MIDANPIRG Members/Alternates/Advisers at **Appendix A** should be updated on a regular basis.

2.2 Participation in the Subsidiary bodies should be by specialists in the subjects under consideration. Such specialists should have relevant experience in the field concerned. The list of the Subsidiary bodies' Focal Points (ATM SG, AIM SG, CNS SG, MET SG and PBN SG) are at **Appendices B, C, D, E and F**, respectively.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and update the list of MIDANPIRG Members/Alternates/Advisers at **Appendix A**;
- b) review and update the list of Focal Points at **Appendices B, C, D, E and F**; and
- c) urge States to support the work of the Subsidiary bodies by providing experts and specialists able to effectively contribute to the work of the different MIDANPIRG subsidiary bodies.

APPENDIX A

MIDDLE EAST AIR NAVIGATION PLANNING
AND IMPLEMENTATION REGIONAL GROUP (MIDANPIRG)

LIST OF MEMBERS/ALTERNATES/ADVISERS

8 November 2018

No	STATE	MEMBER	ALTERNATE	ADVISER
1	BAHRAIN NOV 2018	Mr. Ahmed M. Bucheeri Chief Air Traffic Management Civil Aviation Affairs P.O. Box 586 Kingdom of Bahrain Fax: (973) 17 329 977 Tel: (973) 17 321 117 Mobile: (973) 39 588696 E-mail : a.ali@mtt.gov.bh	Mr. Abdullah H. Al Qadhi Chief AIM & Airspace Planning Civil Aviation Affairs P.O. Box 586 Kingdom of Bahrain Fax: (973) 17 329 977 Tel: (973) 17 321 180 Mobile: (973) 36639955 E-mail : aalqadhi@mtt.gov.bh	Mr. Mohammed Ali Saleh A/Director Air Navigation Systems Civil Aviation Affairs P.O. Box 586 Kingdom of Bahrain Fax: (973) 17 329 977 Tel: (973) 17 321 187 Mobile: (973) 32222022 E-mail : masaleh@mtt.gov.bh
2	EGYPT NOV 2018	Mr. Hisham Abdel Fattah Ibrahim Head of Air Navigation Egyptian Civil Aviation Authority Cairo Airport Road Cairo – Egypt Fax : (202) 2268 8232 Tel : (202) 2267 7617 Mobile : (20100) 606 8185 Email: htantawi@civilaviation.gov.eg	Mr. Alaa Eldin Mahmoud Orabi General Director of Air Traffic Planning National Air Navigation Services Company Cairo Air Navigation Center (CANC) Cairo Airport Road Cairo – Egypt Fax: (202) 2268 0627 Tel: (202) 2267 8889 Mobile: (20100) 6666128 Email: alaa.orabi@nansceg.net	Mr. Tayseer M. Abdelkareem General Manager of ATS Egyptian Civil Aviation Authority Cairo Airport Road Cairo – Egypt Fax : (202) 2268 7849 Tel : (202) 2267 8883 Mobile : (20100) 5228675 Email: tayseer.mohamed@civilaviation.gov.eg tayseekasem73@gmail.com
3	IRAN (LAST UPDATE) FEB 2017 MIDANPIRG/16	Mr. Morteza Dehghan Vice President for Aeronautical and International Affairs Civil Aviation Organization Islamic Republic of Iran Fax : (9821) 66036340 Tel : (9821) 66036341 Mobile: (98912) 3182007 Email: m-dehghan@cao.ir	Mr. Saeed Sharafi Director General for Aeronautical Affair Department Civil Aviation Organization Islamic Republic of Iran Fax: (9821) 63148906 Tel: (9821) 6607 3534 Email: m-sharafi@cao.ir	Mr. Meisam Shaker Deputy Director for Aeronautical Affair Dept Civil Aviation Organization Islamic Republic of Iran Fax: (9821) 6314 8906 Tel: (9821) 6607 3534 Mobile: (98912) 645 4753 Email: m-shaker@cao.ir
4	IRAQ	Mr. Ali Muhsin Hashim Director, ATS Iraq Civil Aviation Authority Baghdad , Iraq Mobil: (964) 781 576 2525 Email: atc_iraqcaa@yahoo.com	Mr. Najah Ali Raheem Chief of Operations Iraq Civil Aviation Authority Baghdad , Iraq Mobil: (964) 781 707 3750 Email: najahali@iraqcaa.com	

NO	STATE	MEMBER	ALTERNATE	ADVISER
5	JORDAN (LAST UPDATE) 18 MAY 2015	Eng. Saleh Alamoush ANS Commissioner Civil Aviation Regulatory Commission (CARC) P.O. Box 7547 Amman – Jordan Fax : (962-6) 4897 826 Mobile: (962) 777 934030 Email: anscom@carc.gov.jo	Mr. Nayef Irshaid Al-Marshoud Director of ATM Civil Aviation Regulatory Commission P.O. Box 7547 Amman - Jordan Fax: (962-6) 489 7729 Tel: (962-6) 4891 401 - 3354 Mobile: (962-7) 97498992 Email: datm@carc.gov.jo	Mr. Wafa Al-hawamleh Acting Director of Aerodrome Safety & Standard Department Civil Aviation Regulatory Commission Amman - Jordan Fax: (962-6) 4897 483 Tel: (962-6) 4892 282 Mobile: (962-77) 5930 205 Email: wafaa.al-hawamleh@carc.gov.jo Mrs. Muna Alnadaf Head of AFS Engineering Civil Aviation Regulatory Commission Amman - Jordan Tel: (962-6) 488 1473 Mobile: (962-79) 5930 205 Email: m.al-nadaf@carc.gov.jo Eng. Ahmed Amireh ATC, PANSOPS designer Air Traffic Management Department Civil Aviation Regulatory Commission Amman - Jordan Fax: (962-6) 489 1266 Tel: (962-6) 489 2282 Mobile: (962-79) 507 9688 Email: a.amireh@carc.gov.jo
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APPENDIX B

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International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

Agenda Item 7: MIDANPIRG Working Arrangements

MIDANPIRG PROCEDURAL HANDBOOK

(Presented by the Secretariat)

SUMMARY

The aim of this paper is to review and amend, as deemed necessary, the MIDANPIRG working arrangements and identify the necessary amendments that would be introduced to the MIDANPIRG Procedural Handbook.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG Procedural Handbook
- MIDANPIRG/16 Report
- MSG/5 Report

1. INTRODUCTION

1.1 The Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG) Procedural Handbook (MID Doc 001) is a publication prepared by the ICAO Secretariat and adopted by the MIDANPIRG. Its purpose is to provide, for easy reference of interested parties, a consolidation of material, particularly of a procedural nature, about the work of the MIDANPIRG and its contributory bodies. It contains the Terms of Reference of the MIDANPIRG and certain other provisions approved by the Council of ICAO. It also contains the working arrangements and internal instructions developed by the Group for the practical application of its Terms of Reference.

2. DISCUSSION

2.1 The Fourth meeting of the MIDANPIRG/RASG-MID Coordination meeting (Bahrain, 25 September 2017) agreed that, in many cases, there is a need for an expeditious decision-making process (fast track, approval by passing, etc). It was further agreed that the MIDANPIRG and RASG-MID should agree on such procedure and include it in their Procedural Handbooks.

2.2 As a follow-up to the MRC/4 meeting agreement on the development of a Fast Track/ approval by passing procedure, it is proposed to include the following paragraph in the RASG-MID Procedural Handbook:

“In case an urgent follow-up action on an outcome from a MIDANPIRG subsidiary body is identified/needed, the ICAO MID Office may coordinate with the Chairperson(s) the approval by passing of the corresponding outcome, without waiting for the MIDANPIRG or MSG approval”.

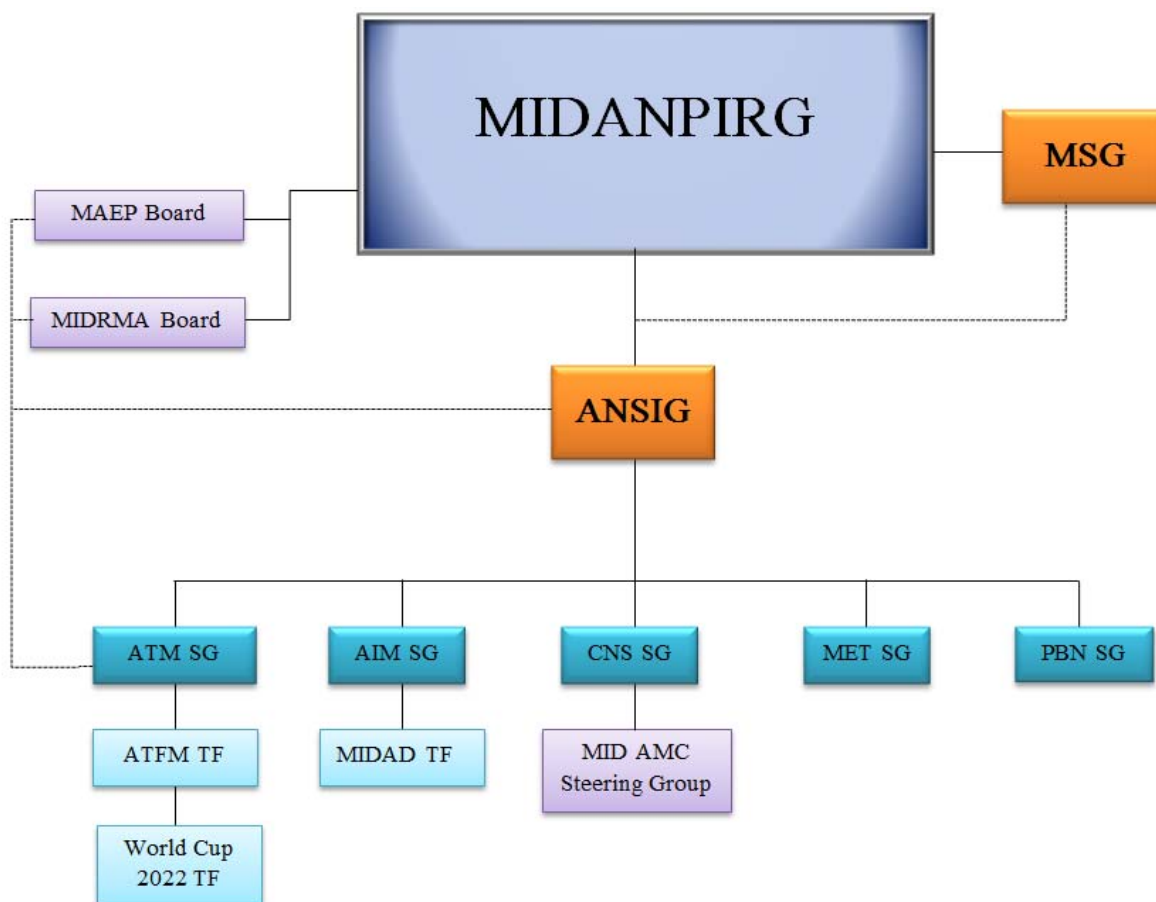
2.3 The meeting may wish to recall that the MSG/5 meeting initiated discussion on the working arrangements of MIDANPIRG and in particular the interaction between MSG and ANSIG. Considering the global developments related to PIRGs and RASGs, the meeting may wish to review the MIDANPIRG Organizational Structure at **Appendix A** and its working arrangements; and propose amendments, as deemed necessary, to improve efficiency.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review the MIDANPIRG Organizational Structure at **Appendix A**, and propose amendments, as deemed necessary;
- b) initiate discussions about the necessary changes to the MIDANPIRG working arrangements; and
- c) identify the consequent amendments to the MIDANPIRG Procedural Handbook.

MIDANPIRG ORGANIZATIONAL CHART



MSG	MIDANPIRG Steering Group	PBN SG	Performance Based Navigation Sub-Group
ANSIG	Air Navigation Systems Implementation Group	ATFM TF	Air Traffic Flow Management Task Force
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
CNS SG	Communication Navigation Surveillance Sub-Group	MIDRMA Board	Middle East Regional Monitoring Agency Board
MET SG	Meteorology Sub-Group	MID AMC Steering Group	MID Region ATS Message Management Centre Steering Group



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 – 5 December 2018)

Agenda Item 8: Future Work Programme

FUTURE WORK PROGRAMME

(Presented by the Secretariat)

SUMMARY

The aim of this paper is to agree on the dates and venue of the MSG/7 meeting.

Action by the meeting is at paragraph 2.

1. INTRODUCTION

1.1 In accordance with the MIDANPIRG Procedural Handbook, the MIDANPIRG Steering Group (MSG) is expected to review and update, as necessary, its Terms of Reference and to decide on the dates and venue of its next meeting.

1.2 The MSG Terms of Reference are at **Appendix A**.

1.3 The meeting may wish to recall that the MSG/5 agreed that the MIDANPIRG Chairpersons in coordination with the Secretariat should decide on the conduct of MSG meetings on ad-hoc basis, taking into consideration the regional developments and needs. The MSG/5 meeting initiated discussion also on the working arrangements of MIDANPIRG and in particular the interaction between MSG and ANSIG.

1.4 MIDANPIRG/17 is planned to be held in Cairo, Egypt, 15 – 16 April 2019, back-to-back with the RASG-MID/7 meeting.

2. ACTION BY THE MEETING

2.1 The meeting is invited to:

- a) review and amend, as necessary, the MSG Terms of Reference; and
- b) agree on the dates and venue of the MSG/7 meeting.

MIDANPIRG STEERING GROUP (MSG)

TERMS OF REFERENCE

1. The Terms of Reference of the MIDANPIRG Steering Group (MSG) are:
 - a) execute its pivotal function as a coordinating and steering organ with highest possible efficiency in accordance with the goals set by MIDANPIRG;
 - b) define and keep under review the MID Region Air Navigation Strategy, including the air navigation priorities, targets and associated action plans;
 - c) ensure that the planning and implementation of air navigation systems in the Region, is coherent and compatible with systems in adjacent Regions, and that it is carried out within the framework of the ATM Operational Concept (Doc 9854) and the Global Air Navigation Plan (GANP, Doc 9750);
 - d) manage the MID Air Navigation Plan (Doc 9708) and ensure its alignment with the GANP (Doc 9750);
 - e) direct the work of the MIDANPIRG subsidiary bodies in the best manner, commensurate with the overall MIDANPIRG work programme, with clearly defined tasks, deliverables and target dates;
 - f) approve, on behalf of MIDANPIRG, those Draft Conclusions/Decisions emanating from MIDANPIRG subsidiary bodies, which necessitate urgent follow-up action(s);
2. In order to meet the Terms of Reference, the MSG shall:
 - a) support regional air navigation planning and implementation processes taking into consideration forecasts for major traffic flows from, to and within the MID Region;
 - b) develop and continuously update the MID Region performance objectives in the light of new developments, taking into consideration the region priorities and MID States national plans;
 - c) provide necessary high level assistance and guidance to the MIDANPIRG subsidiary bodies to ensure harmonization and interoperability in line with the GANP, the MID ANP and Aviation System Block Upgrade (ASBU) methodology;
 - d) ensure that the work programmes of the different MIDANPIRG subsidiary bodies are in line with the agreed air navigation priorities;
 - e) follow-up the on-going work undertaken within the MIDANPIRG framework and make recommendations for further evolution of the framework;
 - f) manage the MID Air Navigation Plan (Doc 9708) and related documentation and facilitate the implementation of the international operational requirements contained therein;

A-2

- g) identify the issues related to funding, training and resource requirements necessary to support a safety framework that would lay the foundation for successful implementation of the ASBUs;
- h) develop action plans to address the identified impediments to air traffic management modernization as part of ASBU planning and implementation activities;
- i) develop a mechanism for sharing of best practices for the ASBU implementation;
- j) carry out specific tasks assigned to it by MIDANPIRG to advance its work at the required speed; and
- k) address special issues of strategic and/or financial nature for which no agreement has been reached by the appropriate MIDANPIRG subsidiary body, with a view to facilitate their presentation to MIDANPIRG.

3. Composition

The MSG is composed of:

- a) the Chairperson and in his/her absence the First Vice-Chairperson of MIDANPIRG;
- b) MIDANPIRG Member States;
- c) concerned International and Regional Organizations as observers; and
- d) other representatives from provider States and Industry may be invited on ad-hoc basis, as observers, when required.

- END -



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

LIST OF WORKING AND INFORMATION PAPERS

(Presented by the Secretariat)

1- WORKING PAPERS

WP No.	Agenda Item	Title of Working Paper	Presented by
1	1. Adoption of the Provisional Agenda	Provisional Agenda	Secretariat
2	2. Follow-up on the outcome of MIDANPIRG/16	Review of action taken by the ANC on MIDANPIRG/16 Report Review of MIDANPIRG/16 Follow-up Action Plan	Secretariat
3	3. Global and Regional Developments	AN-Conf/13 Outcome	Secretariat
4	4. Air Navigation Safety Matters	RASG-MID activities and coordination between MIDANPIRG and RASG-MID	Secretariat
5	5. Air Navigation Planning and Implementation 5.1 State of Air Transport in the MID Region (aviation statistics for 2017)	MID Region Aviation Statistics and Forecasts	Secretariat
6	5. Air Navigation Planning and Implementation 5.2 MID Region Air Navigation Priorities and targets	ASBU Implementation Monitoring: MID Air Navigation Reports	Secretariat
7	5. Air Navigation Planning and Implementation 5.2 MID Region Air Navigation Priorities and targets	MID Region Air Navigation Strategy	Secretariat
8	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	AIM matters	Secretariat
9	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	AOP matters	Secretariat

WP No.	Agenda Item	Title of Working Paper	Presented by
10	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	ATM matters	Secretariat
11	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	Outcome of ATFM TF & World Cup 2022 TF	Secretariat
12	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	COM matters	Secretariat
13	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	NAV matters	Secretariat
14	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	SUR matters	Secretariat
15	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	Cybersecurity Issues	Secretariat
16	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	MET matters	Secretariat
17	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	PBN matters	Secretariat
18	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	SAR matters	Secretariat
19	6. Air Navigation Deficiencies	Review of Air Navigation Deficiencies	Secretariat
20	7. MIDANPIRG Working Arrangements	Review and update of MIDANPIRG Members/Alternates/Advisers and Subsidiary bodies' focal points	Secretariat
21	7. MIDANPIRG Working Arrangements	MIDANPIRG Procedural Handbook	Secretariat
22	8. Future Work Programme	Future Work Programme	Secretariat

2- INFORMATION PAPERS

IP No.	Agenda Item	Title of Information Paper	Presented by
1		List of IPs/WPs	Secretariat
2		Daily Order of Business	Secretariat
3			

2- PRESENTATIONS

IP No.	Agenda Item	Title of Information Paper	Presented by
1	5. Air Navigation Planning and Implementation 5.3 Specific Air Navigation issues	ATM Data and Cyber Security Portal (ADCS)	UAE
2			



International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Sixth Meeting (MSG/6)
(Cairo, Egypt, 3 - 5 December 2018)

DAILY ORDER OF BUSINESS AND WORK PROGRAMME

(Presented by the Secretariat)

Days	Registering 08:30- 09:00	1st Session 09:00 - 10:30	Break 10:30 - 11:00	2nd Session 11:00 - 12:30	Break 12:30 - 13:00	3rd Session 13:00 - 14:30
Day 1: Monday 03/12/2018	Registration of Delegates	Opening of meeting (IP/1, IP/2)	Break (Group Photo)	Agenda Item 4: WP/4 Agenda Item 5.1: WP/5 Agenda Item 5.2: WP/6, WP/7	Break	Agenda Item 5.3: WP/8, WP/9, WP/10
		Agenda Item 1: WP/1 Agenda Item 2: WP/2 Agenda Item 3: WP/3				
		1st Session 09:00 - 10:30	Break 10:30 - 11:00	2nd Session 11:00 - 12:30	Break 12:30 - 13:00	3rd Session 13:00 - 14:30
Day 2: Tuesday 04/12/2018	Agenda Item 5.3: WP/11, WP/12, WP/13, WP/14		Break	Agenda Item 5.3: WP/15, PPT/1 WP/16, WP/17, WP/18	Break	Agenda Item 6: WP/19 Agenda Item 7: WP/20, WP/21 Agenda Item 8: WP/22 AOB
Day 3: Wednesday 05/12/2018	Review of the Draft Report Closing of the Meeting					

Notes:

IP: Information Paper

WP: Working Paper

PPT: Presentation

- END -