APPENDICES

APPENDIX 2A

FOLLOW-UP ACTION PLAN ON MIDANPIRG/15 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
DECISION 15/1: DISSOLUTION OF THE CALL SIGN CONFUSION AD-HOC WORKING GROUP				**Completed**
That, the Call Sign Confusion Ad-hoc Working Group is dissolved.	MIDANPIRG/15	Dissolve CSC WG	Jun. 2015	
CONCLUSION 15/2: CALL SIGN SIMILARITY PROVISIONS AND GUIDELINES				**Closed**
That, States be urged to:	ICAO	State Letter	July 2015	SL AN 6/34-15/189 dated 25 June 2015
a) take necessary measures to ensure that their Aircraft Operators (AOs) implement a mechanism to de-conflict call similarity between the same AO flights and thereafter between their local AOs and other Middle East AOs flights;	States	Feedback	Sep. 2015	
b) report call sign similarity/confusion cases using the template at **Appendix 4.1C**; and				
c) develop a simplified mechanism to trigger the reporting of call sign similarity/confusion by ATCOs.				
CONCLUSION 15/3: MIDRMA REVISED MEMORANDUM OF AGREEMENT				**Closed**
That,		Revised MIDRMA MOA	Jun. 2015	Completed
a) the revised version of the MIDRMA Memorandum of Agreement (MOA) dated 12 March 2014, at Appendix 4.2A is endorsed, to replace and supersede the MIDRMA MOA dated 27 February 2006; and	MIDANPIRG/15			
b) the ICAO MID Regional Office follow-up with concerned States the signature of the revised MIDRMA MOA.	States	Sign the revised MIDRMA MOA	Dec. 2016	10 States signed the revised MOA

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/4: MIDRMA FUNDING MECHANISM That, a) the activities of the MIDRMA be ensured through contributions from all MIDRMA Member States, which could be recovered in accordance with ICAO Policies on charges for Airports and Air Navigation Services (Doc 9082), in coordination with IATA; b) the MIDRMA Member States pay their contributions on a yearly basis not later than two (2) months after the issuance of the invoices by ICAO; c) ICAO issue the invoices related to States contribution to the MIDRMA Project on a yearly basis as decided by the MIDRMA Board or its Chairperson; d) the annual amounts to be paid by the MIDRMA Member States are, as follows: i) Bahrain, Egypt, Iran, Oman and Saudi Arabia annual contribution is US$ 30,000 each; and ii) Iraq, Jordan, Kuwait, Lebanon, Libya, Qatar, Sudan, Syria and Yemen annual contribution is US$ 10,000 each; e) UAE is exempted from the payment of contributions to the MIDRMA for the first ten (10) years of operation (up-to end of 2015); f) the MIDRMA Member States comply with the payment instructions contained in the invoices sent by ICAO HQ (Project code, fund number, invoice number, Bank information, etc); g) in case a MIDRMA Member State does not pay the contribution to the MIDRMA Project in a timely manner, the MIDRMA Board might consider to take penalty measures against this State (exclusion from the MID RVSM Safety Monitoring Report, review of the Membership, etc); h) the MIDRMA Board Chairperson, in compliance with the Custodian Agreement and based on the agreed funding mechanism and the estimation of the yearly operating budget of the MIDRMA, be delegated the authority to certify on behalf of the MIDRMA Member States the requests for advance payment from the MIDRMA account managed by ICAO HQ to the MIDRMA	MIDANPIRG/15	MIDRMA funding Mechanism	Jun. 2015	**Completed** (Replaced and superseded by MIDRMA Board Conc. 14/3)

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
Bank account in Bahrain, as decided by the MIDRMA Board; i) the bills related to the MIDRMA expenses be certified by the MIDRMA Board Chairperson and reviewed by the MIDRMA Board at each of its meetings; and j) the MIDRMA funding mechanism be revised by the MIDRMA Board, when necessary.				
CONCLUSION 15/5: ONLINE REPORTING OF LARGE HEIGHT DEVIATION (LHD) That, States: a) be urged to use only the online tool at (http://www.midrma.com/lhd) for reporting LHDs; and b) be encouraged to provide feedback to the MIDRMA for further improvement of the tool.	ICAO States	State Letter Feedback	Jul.2015 Oct. 2015	**Closed** SL AN 6/5.10.15A – 15/190 dated 28 June 2015
CONCLUSION 15/6: SIMPLIFIED LARGE HEIGHT DEVIATION (LHD) REPORTING PROCEDURE That, States be urged to implement a procedure within their ACCs to easily trigger the LHD reporting process and provide the ICAO MID Regional Office with an update on the action(s) undertaken.	ICAO States	State Letter Feedback	Jul.2015 Oct. 2015	**Closed** SL AN 6/5.10.15A – 15/190 dated 28 June 2015
CONCLUSION 15/7: MID RVSM SAFETY MONITORING REPORT (SMR) 2014 That, the MID RVSM Safety Monitoring Report (SMR) 2014 is endorsed.	MIDANPIRG/15	MID RVSM SMR 2015	Jun. 2015	**Completed**

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/8: MID RVSM SAFETY MONITORING REPORT (SMR) 2015				**Completed**
That,	ICAO	State Letter	Sep.2015	SL AN 6/5.10.15A – 15/244 dated 7 Sep. 2015
a) the FPL/traffic data for the period **1 – 30 September 2015** be used for the development of the MID RVSM Safety Monitoring Report (SMR 2015);				
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	States	Traffic data	Oct. 2015	Completed
c) the final version of the MID RVSM SMR 2015 be ready for presentation to and endorsement by MIDANPIRG/16.	MIDRMA	SMR 2015	Dec. 2016	SMR 2015 endorsed by MIDANPIRG/16
CONCLUSION 15/9: AVIATION STATISTICS AND TRAFFIC FORECASTS				**Closed**
That,				
a) States be urged to:	ICAO	State Letter	Q1-2016	SL AT 5/3 - 16/120 dated 7 April 2016
i. nominate to ICAO Focal Points for aviation statistics;				
ii. provide the statistics required by ICAO in a timely manner and to the extent possible in an electronic format	States	Focal Point and statistics		
b) ICAO organise a Second Aviation Data Analyses Seminar in 2016 to keep the momentum and further enhance the technical knowledge of States.	ICAO	Seminar	Dec. 2016	Seminar planned for 20-23 Feb.17
CONCLUSION 15/10: MID REGION AIR NAVIGATION STRATEGY				**Closed**
That,				
a) the revised MID Region Air Navigation Strategy:				(Replaced and superseded by Conc. 16/3)
i. is endorsed as the framework identifying the regional air navigation priorities, performance indicators and targets; and	MIDANPIRG/15	MID AN Strategy		
ii. be published as MID Doc 002.	ICAO	MID Doc 002		MID Doc 002 published

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
b) MID States be urged to: i. develop their National Air Navigation Performance Framework, ensuring the alignment with and support to the MID Region Air Navigation Strategy; and ii. provide the ICAO MID Regional Office, on an annual basis (by the end of November), with relevant data necessary for regional air navigation planning, reporting and monitoring.	ICAO States States	State Letter National Performance Framework Feedback	Nov. 2015 Nov. 2015	SL AN 1/7– 15/191 dated 25 June 2015
CONCLUSION 15/11: ENDORSEMENT OF THE MID eANP That, a) the new MID ANP VOL I, II and III available at: http://www.icao.int/MID/MIDANPIRG/Pages/Final%20Report/MID-eANP.aspx are endorsed; and b) the ICAO MID Regional Office process the necessary Proposals for Amendment, in accordance with the procedure for amendment approved by the Council, for formal approval by the end of 2015.	ICAO	Proposals for Amendment	Dec. 2015	**Completed** MID eANP Vol I, II and III, approved and published on the ICAO MID Website
DECISION 15/12: DISSOLUTION OF THE ANP AD-HOC WORKING GROUP That, the ANP Ad-Hoc Working Group is dissolved.	MIDANPIRG/15	Dissolve ANP WG	Jun. 2015	**Completed**
CONCLUSION 15/13: MID FLIGHT PROCEDURE PROGRAMME (FPP) WORKSHOP That, as part of the ICAO support for the establishment of the MID FPP, a Workshop be organized back-to-back with the MAEP SC/2 meeting to be held in October 2015 in order to develop a framework for the establishment of the MID FPP.	ICAO	Conduct of MID FPP Workshop	Oct. 2015	**Completed** Workshop held (18-19 Oct. 2015)

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
DECISION 15/14: DISSOLUTION OF THE MPST That, the MID PBN Support Team (MPST) is dissolved.	MIDANPIRG/15	Dissolve the MPST	Jun.2015	**Completed**
CONCLUSION 15/15: MID CIVIL/MILITARY SUPPORT TEAM That, a MID Civil/Military Support Team be established with a view to expedite the implementation of the Flexible Use of Airspace (FUA) Concept in the MID Region.	MIDANPIRG/15	Establishment of MID Civil/Military Support Team	Jun.2015	**Closed** No request for a Team visit received
DECISION 15/16: COLLABORATIVE AIR TRAFFIC FLOW MANAGEMENT (ATFM-CDM) That, the ATM Sub-Group develop a Preliminary Project Proposal addressing the necessity, feasibility, and timelines related to the eventual implementation of a regional/sub-regional ATFM system, for consideration by the MAEP Steering Committee.	ATM SG	ATM Sub-Group develop a Preliminary Project Proposal	Dec. 2015	**Closed**
CONCLUSION 15/17: FORMAL AGREEMENTS BETWEEN AIS AND DATA ORIGINATORS That, States be urged to: a) take necessary measures for the signature of formal arrangements between AIS/AIM and the data originators, commensurate with the Aerodrome operators, Air Navigation Service Providers (ANSPs) and the Military Authority; and b) inform the ICAO MID Regional Office of the actions taken before **31 December 2015**.	ICAO States	State Letter Feedback	 Dec. 2015	**Closed** SL AN 8/4.1-15/205 dated 6 July 2015 Very few replies received; to be followed-up by the AIM SG
CONCLUSION 15/18: MID REGIONAL GUIDANCE FOR IMPLEMENTATION OF AIDC/OLDI That, the MID Region guidance for the implementation of AIDC/OLDI (Edition 1.1, June 2015) is endorsed as MID Doc 006.	MIDANPIRG/15	MID Region Guidance for AIDC/OLDI3	Jun. 2015	**Competed** MID Doc 006 endorsed

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/19: REGIONAL PERFORMANCE DASHBOARDS That, ICAO expedite the expansion of the regional performance dashboards to include the MID Region-specific indicators, metrics and targets, for which the necessary data is available.	ICAO	Dashboards with Regional indicators, metrics and targets	Dec. 2015	**Closed** MID AN Report developed, pending development of the web-based tool
CONCLUSION 15/20: MID REGION ATM CONTINGENCY PLAN That, the MID Region ATM Contingency Plan (Edition June 2015): a) is endorsed as MID Doc 003; and b) be used by States and concerned stakeholders to ensure the orderly flow of international air traffic in the event of disruptions of air traffic services and related supporting services and to preserve the availability of major world air routes within the air transportation system in such circumstances.	MIDANPIRG/15	MID Region ATM Contingency Plan MID Doc 003	Jun. 2015	**Completed** MID Doc 003 published
CONCLUSION 15/21: MID REGION ACCS LETTER OF AGREEMENT TEMPLATE That, States be encouraged to use the MID Region Area Control Centres (ACCs) Letter of Agreement Template (Edition June 2015) available on the ICAO MID website, to ensure the harmonization of coordination procedures between ACCs.	ICAO	State Letter	Jul. 2015	**Closed** SL AN 6/2.1 – 15/192 dated 28 Jun. 2015
CONCLUSION 15/22: MID REGION HIGH LEVEL AIRSPACE CONCEPT That, the MID Region High Level Airspace Concept (Edition June 2015) is endorsed as MID Doc 004.	MIDANPIRG/15	MID Region High Level Airspace Concept	Jun. 2015	**Completed** Endorsed as MID Doc 004

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/23: MID SSR CODE MANAGEMENT PLAN (CMP)				**Completed**
That,				
a) the Middle East Secondary Surveillance Radar Code Management Plan (MID SSR CMP) (Edition June 2015) is endorsed as MID Doc 005;	MIDANPIRG/15	MID SSR CMP	Jun. 2015	Endorsed as MID Doc 005
b) States (regulator and service provider) be urged to:				SL AN 6/17 – 15/193 dated 25 Jun. 2015
i. take necessary measures to ensure strict compliance with the procedures included in the MID SSR CMP; and	ICAO	State Letter	Jul. 2015	
ii. report interference/conflict cases, if any, to the ICAO MID Regional Office related to the misuse of SSR codes.	States	Feedback	periodically	
DECISION 15/24: MID REGIONAL/SUB-REGIONAL SEARCH AND RESCUE TRAINING EXERCISES				**Closed**
That, the ATM Sub-Group develop an action plan for the conduct of regional/sub-regional SAR training exercises.	ATM SG	Action Plan for SAR training exercises	Dec. 2015	ATM SG/2 established a SAR AG to develop the action plan
CONCLUSION 15/25: MIDAD SUPPORT TEAM (MIDAD ST)				**Closed**
That, the MIDAD Support Team (MIDAD ST)	MIDANPIRG/15	MIDAD ST composition		MIDAD ST Focal Points list is completed
a) be composed of members from Bahrain, Jordan, Iran, Kuwait, Oman, Qatar, Saudi Arabia, Sudan, UAE and the ICAO MID Regional Office; and				
b) provide necessary support to the MIDAD Task Force to successfully complete Phase 2 of the MIDAD Project.				

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/26: EAD-MIDAD MEMORANDUM OF COOPERATION (MOC) That, a Memorandum of Cooperation (MOC) on sharing/exchange of Aeronautical Information/Services between EAD and MIDAD be signed by the ICAO MID Regional Director (on behalf of MIDAD States) with EUROCONTROL.	ICAO	MOC signed	Dec. 2015	**Actioned** EAD-MIDAD Coord meeting held Dec2015
CONCLUSION 15/27: SUPPORT ICAO POSITION TO WRC-15 That, States be urged to: a) support the ICAO Position to the WRC-15; b) make necessary arrangements for the designated Civil Aviation Personnel to participate actively in the preparatory work for WRC-15 at the national level; and c) attend the preparatory regional spectrum management groups meetings and WRC-15 to support and protect aviation interests.	States ICAO	States attendance and support State Letter	 July 2015	**Completed** SL AN 7/30.15.1-15/208 dated 07 Jul. 2015
CONCLUSION 15/28: GNSS RADIO FREQUENCY INTERFERENCE That, States be invited to use the guidance at **Appendix 5.2.2E** for the development/amendment of their regulatory provisions related to the use of GNSS and associated threats.	ICAO	State Letter	Dec 2015	**Completed** AN 7/30.21 – 15/345 dated 22 Dec.2015
CONCLUSION 15/29: WORKSHOP ON THE USE OF THE ICAO FREQUENCY FINDER That, a Workshop on the use of the new Frequency Finder software be scheduled for 2016.	ICAO	Workshop	2nd half 2016	**Completed** Workshop held Oct. 2016

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/30: AFTN/CIDIN AFS CONNECTIVITY AND AMHS IMPLEMENTATION That States be urged to: a) refrain from establishing new AFTN and CIDIN connections at the International level; b) gradually phase out the current connections based on AFTN or CIDIN standards; and c) expedite their AMHS implementation.	ICAO	State Letter	July 2015	**Closed** SL AN 7/5.1-15/209 dated 8 Jul. 2015
CONCLUSION 15/31: MIDAMC ACCREDITATION PROCEDURE That, the accreditation procedure for registering in the MIDAMC be amended as at **Appendix 5.2.2G**.	MIDANPIRG/15	The procedure amended	June 2015	**Completed**
CONCLUSION 15/32: MID REGION PROCESS FOR MODE S IC CODES ALLOCATION That, the Eurocontrol Document "Requirements process for the coordinated allocation and use of Mode S Interrogator Codes in the ICAO Middle East Region" (Edition 1.02 dated August 2014), be used for the allocation of the Mode S IC codes.	MIDANPIRG/15	Procedure adopted	June 2015	**Completed**
CONCLUSION 15/33: OPMET EXCHANGE SCHEME That States be urged to update their OPMET exchange scheme in coordination with ROC Jeddah and back-up ROC Bahrain in order to complete MID ROC implementation by **30 September 2015**.	ICAO/States	State letter Updated OPMET exchange scheme	Sep 2015	**Closed** SL Ref: AN 10/11-15/206 issued 8 Jul 2015 Status: 9 States FI 4 States PI 2 States NI

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/ REMARKS
CONCLUSION 15/34: SINGLE ENGINE TAXI OPERATIONS				**Closed**
That, States be encouraged to:	ICAO	State Letter	Jul. 2015	SL AN 6/17 – 15/194 dated 28 Jun. 2015
a) consider the implementation of Single Engine Taxi Operations at their International Aerodromes,; as a possible measure for the reduction of CO_2 emissions, as practicable (decision to be supported by a safety assessment); and	State	Feedback		
b) share their experience on the subject with other States, as required.				
CONCLUSION 15/35: AIR NAVIGATION DEFICIENCIES				**Closed**
That, States be urged to:	ICAO	State Letter		SL AN 2/2 – 15/351 dated 29 Dec. 2015
a) use the MID Air Navigation Deficiency Database (MANDD) for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies, including the submission of a specific Corrective Action Plan (CAP) for each deficiency; and	States	CAP and necessary updates/ evidences	When necessary	
b) submit a Formal Letter to the ICAO MID Regional Office containing the evidence(s) that mitigation measures have been implemented for the elimination of deficiency(ies) when requesting the elimination of deficiency(ies) from the MANDD.				

APPENDIX 2B

FOLLOW-UP ACTION PLAN ON MSG/5 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/REMARKS
MSG CONCLUSION 5/1: SEMINAR/WORKSHOP ON PANS-AERODROMES				**Actioned**
That, a Seminar/Workshop on the implementation of PANS-Aerodromes (Doc 9981) be organized by ICAO in 2017.	ICAO	Seminar outcomes	Nov. 2017	Seminar planned for Nov. 2017
MSG CONCLUSION 5/2: MID eANP FOCAL POINTS				**Closed**
That, States be urged to assign a MID eANP focal point to be the main point of contact for all issues related to the MID eANP, including the validation of amendments to Volume III Part II – "Air Navigation System Implementation".	ICAO States	State Letter Feedback	Jul. 2016	Ref.: AN 9/2.1-16/155 dated 9 Jun 2016 7 States replied (Bahrain, Egypt, Jordan, Kuwait, Saudi Arabia, Sudan and UAE)
MSG CONCLUSION 5/3: IMPLEMENTATION OF THE TOP SIX ATS ROUTES				**Closed**
That, concerned States be urged to take necessary measures to implement the identified routes at Appendix 5B and provide the ICAO MID Regional Office with an update on the actions undertaken by 15 November 2016, for review by the ANSIG/2 meeting.	ICAO States	State Letter Feedback	Dec. 2016 Jan. 2016	SL Ref.: AN 6/5.8-16/337 dated 1 Dec 2016 MIDANPIRG/16 tasked the ATM SG to review and amend the list of top routes
MSG CONCLUSION 5/4: MID REGION ATM CONTINGENCY PLAN				**Completed**
That, the revised version of the MID Region ATM Contingency Plan (MID Doc 003, Edition April 2016) is endorsed.	MSG/5	MID Doc 003	Apr. 2016	
MSG CONCLUSION 5/5: PUBLICATION OF FIR BOUNDARY POINTS				**Actioned/Ongoing**
That, States be urged to: a) take into consideration the Guidelines at Appendix 5D for the description of their FIR boundaries; b) review the Table ATM I-1 MID Region Flight Information Regions (FIRs)/	ICAO States	State Letter Feedback	Dec. 2016 Mar. 2017	SL Ref.: AN 6/3-16/338 dated 1 Dec 2016

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/REMARKS
(FIRs)/Upper Information Regions (UIRs) at Appendix 5E and coordinate with neighboring States, as appropriate, the definition of common boundaries; and c) provide the ICAO MID Regional Office with their updates and comments before 15 October 2016.				
MSG DECISION 5/6: MID SEARCH AND RESCUE ACTION GROUP That, a MID SAR Action Group be established to: a) carry out a Gap Analysis related to the status of implementation of SAR services in the MID Region; b) develop a SAR Plan for the MID Region based on the Asia/Pacific experience and other best practices; and c) develop an action plan for the conduct of regional/sub-regional SAR training exercises.	MSG/5 SAR Action Group	Establishment of MID SAR Action Group Draft MID Region ATM SAR Plan Action Plan for regional/sub-regional SAREX.	Apr 2016 May 2017	**Actioned/Ongoing**
MSG CONCLUSION 5/7: TRANSITION PLAN FOR THE RNAV TO RNP INSTRUMENT APPROACH CHART DEPICTION That, States be urged to provide their transition plan for the RNAV to RNP Instrument Approach Chart Depiction (Chart Title) to the ICAO MID Regional Office before 31 October 2016, taking into consideration the provisions/timelines set forth in Amendment 6 to PANS-OPS, Volume II, Part III, Section 5, Chapter 1 and the ICAO Circular 336.	ICAO States	State Letter Feedback	Apr 2016 January 2017	**Closed** SL Ref.: AN 6/29 - 16/336 dated 1 Dec 2016
MSG CONCLUSION 5/8: MID REGION PBN IMPLEMENTATION PLAN That, the revised version of the MID Region PBN Implementation Plan (MID Doc 007, Edition April 2016) is endorsed.	MSG/5	MID Doc 007	Apr 2016	**Completed**

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/REMARKS
MSG DECISION 5/9: MID REGION ADS-B IMPLEMENTATION PLAN That, the CNS SG be tasked to develop a MID Region ADS-B Implementation plan including the ADS-B monitoring Template.	CNS SG	ADS-Plan	TBD	**Closed** ADS-B Monitoring Template developed (Replaced and superseded by Dec. 16/23)
MSG CONCLUSION 5/10: NATIONAL AIM IMPLEMENTATION ROADMAP That, States be urged to: a) take into consideration the "MID Region AIM implementation Roadmap" at Appendix 5I in planning for the transition from AIS to AIM in a prioritized manner; and b) provide the ICAO MID Regional Office with their updated National AIM Implementation Roadmap on an annual basis (by end of December), using the Template at Appendix 5H.	ICAO States	State Letter Feedback	Dec 2016	**Closed** Ref.: AN 8/4 - 16/261 dated 22 Sep 2016; Total 12 States provided Roadmaps. Updated Versions (2016) received from Bahrain, Egypt, Iran, Iraq, Kuwait, Lebanon, Oman, Qatar and UAE.
MSG CONCLUSION 5/11: INTERREGIONAL SEMINAR ON "SERVICE IMPROVEMENT THROUGH INTEGRATION OF DIGITAL AIM, MET AND ATM INFORMATION That, a) ICAO organize an Interregional Seminar on "Service improvement through integration of digital AIM, MET and ATM Information" in 2017; and b) States be encouraged to attend and support the Seminar.	ICAO States	Organize Seminar Support the Seminar	Oct 2017	**Closed** Seminar scheduled to be held in Brussels, 2-5 Oct. 2017

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/REMARKS
MSG CONCLUSION 5/12: MID REGIONAL REQUIREMENTS FOR HALF-HOURLY METAR That, States provide the ICAO MID Regional Office with proposed changes to the MET Part of Volume II related to the criteria used for determining which AOP aerodromes should issue half-hourly METAR, by 30 June 2016.	ICAO States	State Letter Feed Back	Mar 2016	**Closed** Ref.: ME 3/2.3-16/075 dated 21 Mar 2016 2 States replied (Replaced and superseded by Conc. 16/29)
MSG CONCLUSION 5/13: MID eANP VOLUME III – B0-AMET That, a) the MID eANP Volume III – B0-AMET be amended to reflect the changes at Appendix 5K; and b) the notification of the amendment of the MID eANP Volume III – B0-AMET be sent to the MID eANP Focal Points.	MIDANPIRG/16 ICAO	eANP VOL III Notification	Feb 2017	**Closed** (Replaced and superseded by Conc. 16/29)
MSG CONCLUSION 5/14: WORKSHOP ON ASBU BLOCK 1 MODULES IMPLEMENTATION That, a Workshop on ASBU Block 1 Modules implementation be organized by ICAO in 2017.	ICAO	Seminar	2017	**Ongoing** Planned for 2018
MSG DECISION 5/15: MIDANPIRG PROCEDURAL HANDBOOK (MID DOC 001) That, the MIDANPIRG Procedural Handbook (MID Doc 001) Edition April 2016 (Appendix 7C) is endorsed.	ICAO	Handbook posted on the Website	Apr 2016	**Completed**
DRAFT CONCLUSION 5/1: ACTION PLAN FOR A-CDM IMPLEMENTATION That, States be urged to develop their action plan for A-CDM implementation in line with the MID Air Navigation Strategy.	States	Action Plan	Feb 2017	**Ongoing** (Replaced and superseded by Conc. 16/29)
DRAFT CONCLUSION 5/2: 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	States	Database	Feb 2017	**Ongoing** (Replaced and superseded by Conc. 16/9)

CONCLUSIONS AND DECISIONS	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	STATUS/REMARKS
DRAFT CONCLUSION 5/3: FTBP TESTING DOCUMENT That, the First Edition of File Transfer Body Part (FTBP) Trial and Testing Document at Appendix 5G is endorsed; and be published as MID Document.	MIDANPIRG	Doc. endorsed and published	Feb 2017	**Completed** FTBP Trial and Testing Document endorsed by MIDANPIRG/16 (Conc. 16/24, refers)
DRAFT CONCLUSION 5/4: MID REGION AIR NAVIGATION STRATEGY That, the revised MID Region Air Navigation Strategy (MID Doc 002, Edition April 2016) is endorsed.	MIDANPIRG	MID Region Air Navigation Strategy (MID Doc 002, Edition April 2016)	Feb 2017	**Closed** Revised version endorsed by MIDANPIRG/16 (Conc. 16/3, refers)
DRAFT CONCLUSION 5/5: MIDANPRIG TORS That, ICAO takes necessary measures to update the PIRGs Terms of Reference (TORs) to keep pace with latest developments.	ICAO	Revised TORs	TBD	**Closed**

APPENDIX 4.1A

Coordination between MIDANPIRG and RASG-MID

Subjects of interest for MIDANPIRG and RASG-MID	Responsible/Leading Group	
	RASG-MID	MIDANPIRG
Aerodrome Operational Planning (AOP)		X
Runway and Ground Safety	X	
AIM, CNS and MET safety issues		X
CFIT	X	
SSP Implementation	X	
SMS implementation for ANS and Aerodromes	X	
Accidents and Incidents Analysis and Investigation	X	
English Language Proficiency	X	
RVSM safety monitoring		X
SAR and Flight Tracking		X
PBN		X
Civil/Military Coordination		X
Airspace management		X
Call Sign Similarity and Confusion		X
Conflict Zones		X
Contingency Planning		X
USOAP-CMA	X	
COSCAP, RSOO and RAIO	X	
Air Navigation Deficiencies		X
Training for ANS personnel		X
Training other civil aviation personnel	X	
Laser attack	X	
Fatigue Risk Management	X	
RPAS		X
GPS Jamming		X
Aeromedical	X	
Airborne Collision Avoidance System (ACAS)		X

APPENDIX 4.1B

Call Sign Similarity/Confusion Reporting Template

Case	**Reporting ANSP or AO**	**Place of occurrence** (Airport, sector, etc)	**Date of occurrence** (26/04/2013)	**Time** (UTC)	**Call signs** (one line for each)	**Departure airport** (ICAO 4-letter code)	**Arrival airport** (ICAO 4-letter code)	**Type of aircraft** (ICAO type desig)	**Aircraft Operator** (ICAO 3-letter code)	**Type of Occurrence** (CSS or CSC)	**AO using CSST** (YES or NO)
1											
2											
3											
4											
1											
2											

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APPENDIX 4.1C

ICAO CAIRO UNITING AVIATION

MID Region NCLB Strategy

First Edition
January 2017

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MID Region NCLB Strategy

1. Background

1.1 The ICAO Council identified there is still 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 so that all States have access to the significant socio-economic benefits of safe and reliable air transport. 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.

1.2 ICAO should find the best way to reduce this gap and increase the regional Effective Implementation (EI), by providing more assistance to developing States, playing a more active coordination role between States and generating the political will to pool resources, participate in regional efforts, earmark voluntary funds and build capacities.

1.3 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, and which ultimately help to create and preserve friendship and understanding among the nations and peoples of the world. In addition, further progress in improving civil aviation, including the efficient human and financial resources for the implementation of assistance activities that are tailored to the needs of individual States, is best achieved through a cooperative, collaborative and coordinated approach in partnership with all stakeholders.

1.4 The ICAO No Country Left Behind (NCLB) initiative, which was launched in December 2014, aims at providing support to all States and in support of the five ICAO strategic objectives, for the resolution of significant safety concerns (SSCs) and significant security concerns (SSeCs) and for an effective implementation of ICAO's SARPs, policies, plans and programmes, in a globally-harmonized manner; promoting and implementing all ICAO's assistance activities.

1.5 Through the NCLB initiative, ICAO resolves to be more effective in directly supporting all willing States that need assistance to develop and improve the aviation system by implementing ICAO's global Standards and policies. In its role as an advocate for aviation, ICAO will work with States to ensure aviation be given greater importance in the context of development at the Country level.

1.6 The NCLB initiative seeks to improve implementation support delivery to States. Support, collaboration and assistance from States, international organizations, industry and other stakeholders is essential to the success of these ICAO efforts to ensure that no Country is left behind.

1.7 The ICAO MID Regional Office promotes and monitors the implementation of Standards and Recommended Practices (SARPs) in 15 Member States of ICAO to which it is accredited.

1.8 The MID Region is faced with a wide variety of geopolitical diversity, airspace features, operational challenges and civil aviation capacity building issues.

1.9 To ensure the success of the assistance/cooperation actions, first ICAO needs to have a deep understanding on the root causes for a State not been able to improve its level of implementation of SARPs. Once this is achieved it is necessary to select the best candidates States for deploying technical assistance/cooperation projects that will produce a sustainable improvement of the USOAP Effective Implementation (EI).

1.10 The design of an effective NCLB Strategy could only be possible by gathering enough information on the organization, structure, formal and informal hierarchy, cultural aspects, etc. This information could be considered as State Profile or as business intelligence, which might be needed for the development of necessary project document and to seek support from donors that might be interested in subsidizing the NCLB initiative.

2. Challenges for States

2.1 States continue to face various challenges regarding the implementation of ICAO's Standards and Recommended Practices (SARPs), which impact a safe, secure, efficient, economically viable and environmentally sound air transport system.

2.2 In order to achieve the objectives of the NCLB Initiative, it is also important to identify and address the challenges facing States to implement ICAO policies, plans and SARPs. The followings are some of the main challenges common to many States in the MID Region:

- rapid and continuing growth of traffic in the MID Region, which places increased demand on airspace capacity and imposes an optimum utilization of the available airspace and airports;
- insufficient financial and human resources capacity;
- retention and training/re-training of personnel;
- changing environment with the development of new technologies and SARPs;
- existing deficiencies;
- political, governance, institutional and legal issues;
- States have other higher priorities than aviation; and
- emergencies – natural disasters, public health, civil unrest, etc.

3. Objectives

3.1 The success of the NCLB initiative will hinge on support and collaboration of resources of partners and donors and requires firm commitment from the States, involving both aviation and non-aviation sectors. One of the priorities of the NCLB is to garner the political will necessary to support aviation improvements. ICAO plays a leadership role in the aviation community to facilitate communication and coordination amongst key stakeholders regarding assistance activities. This will allow the continued growth of a safe, secure, efficient, economically viable and environmentally sound aviation system and well established development frameworks, at both the international and national levels, to engage in providing resources for the effective implementation of aviation global standards and policies.

3.2 The primary objectives of the NCLB initiative include:

a) providing enhanced support for States in the effective implementation of ICAO's SARPs, plans and policies in a more coordinated, comprehensive and globally harmonized manner; and
b) promoting the resolution of significant safety concerns (SSCs) and significant security concerns (SSeCs), if any.

Means to achieve NCLB Objectives:

- advocate the benefits of aviation for States at the highest level;
- prioritize assistance needs and assessing risks for each State;
- facilitate and support implementing capacity-building initiatives;
- establishing and enhancing partnerships;
- mobilizing resources for aviation-related projects
- develop implementation support tools and services; and
- monitoring and recognizing progress by States.

Doha Declaration

3.3 The Doha Declaration, the MID Region Safety and Air Navigation Strategies defined regional performance targets for the monitoring of performance at the national and regional levels, aiming at enhancing safety and improving air navigation capacity and efficiency, through a cooperative, collaborative and coordinated approach in partnership with all stakeholders under the leadership of ICAO. Albeit, there was no specific requirements (what needs to be achieved) for each State to contribute to the achievement of the regional targets.

3.4 The MID Region NCLB Strategy incorporates the previously agreed commitments of the Doha Declaration, and aims to foster the achievement of the regional targets, including:

- regional average EI to be above 70% by 2020; and
- 11 States to have at least 60% EI by 2020.

3.5 This will be achieved through:

- identification of States lacking fundamental oversight capabilities for effective implementation of ICAO SARPs;
- prioritization of States in term of provision of required assistance;
- selection of the best candidates States for deploying technical assistance/cooperation projects that will produce a sustainable improvement of the Effective Implementation (EI);
- proactive approach to foster political will and senior level commitment;
- agreement with concerned States, as part of specific Plan of Actions, on measureable outcomes and clear definition of accountability for the achievement of the set goals; and
- identification of Champions (State, ICAO or stakeholder) to provide required assistance.

4. Prioritization of States in Safety

4.1 MID States are classified in four (4) groups, as follows:

1- States with SSC;
2- States not audited or with EI below 60% (EI < 60);
3- States with EI between 60 and 70% (60 ≤ EI < 70); and
4- States with EI over 70% (EI ≥ 70).

4.2 Other criteria/factors should be considered for the provision of required NCLB assistance, during the development and implementation of the plans of actions, including but not limited to:

a) State willingness/commitment to receive assistance;
b) Security and political stability;
c) EI per Area and per Critical Element (CE);
d) Level of aviation activities in the State;
e) Air navigation deficiencies (including the deficiencies related to aerodrome certification);
f) Level of progress made by State in the development and implementation of Corrective Action Plans (CAPs);
g) Gross Domestic Product (GDP) per capita; and
h) Ongoing or planned assistance projects.

5. MID Region NCLB Strategy – Phases

5.1 The MID Region NCLB Strategy is composed of three (3) phases as follows:

Phase I – Selection: Selection of the best candidates States for deploying assistance that will produce a sustainable improvement of the EI, in accordance with agreed prioritization criteria; and communication with States (Executive Level) for the development and implementation of an NCLB Plan of Actions.

During this phase, the ICAO MID Office plays the main role in the selection of the best candidate States and ensuring necessary leadership, commitment, political will and accountability for the development and implementation of State's NCLB Plan of Actions.

Phase II – Plan of Actions: Development of State's NCLB Plan of Actions, in coordination with concerned States and other stakeholders, as required. This phase includes also the communication of the Plan of Action to the State Executive Level. The Plan of Actions should include measurable outcomes with specific timelines.

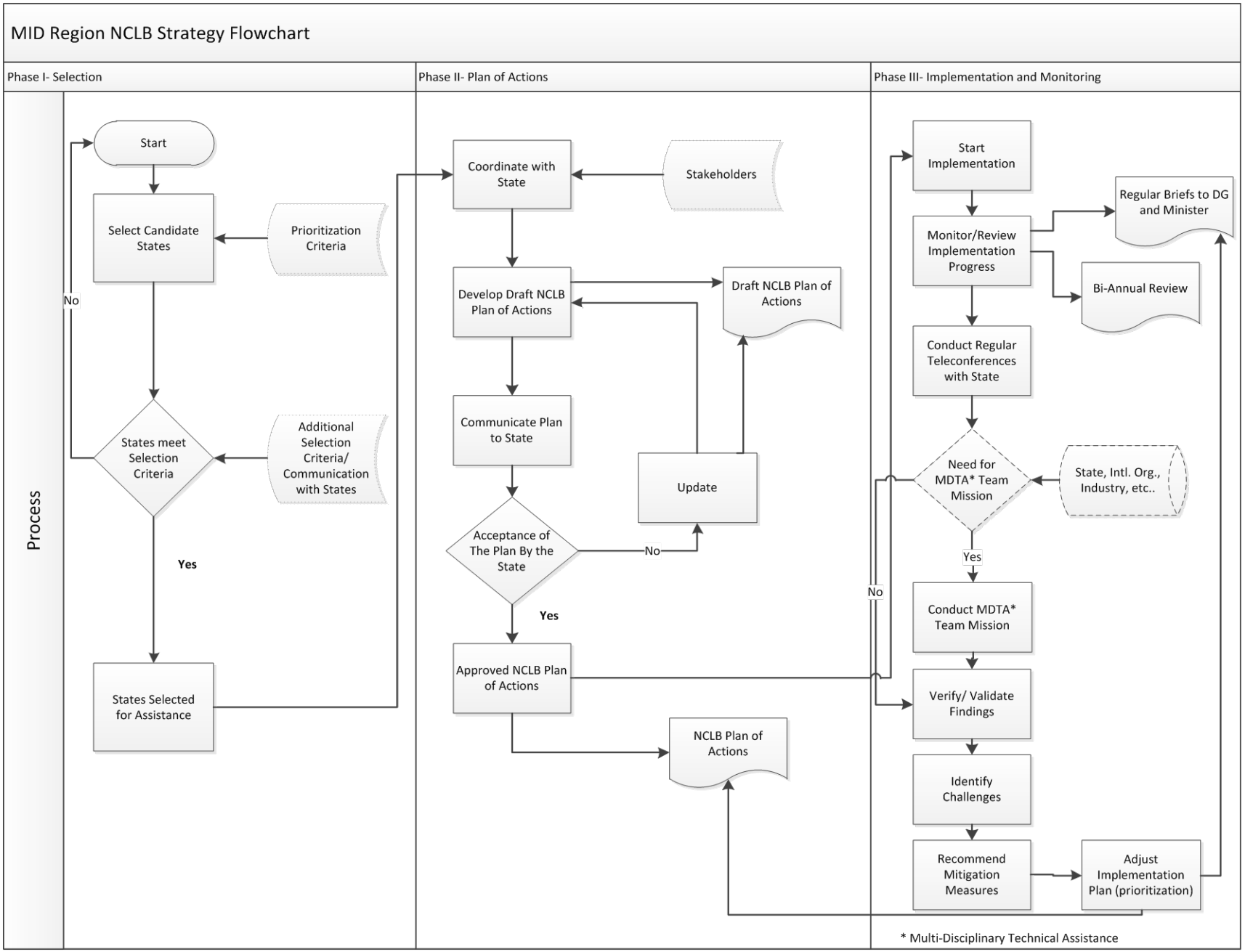
Phase III – Implementation and Monitoring: Implementation of the agreed plan of actions in coordination with concerned stakeholders; and continuous monitoring of the implementation process to ensure the achievement of the agreed objectives and targets.

The implementation of the different activities included in the Plan of Actions could be supported by different stakeholders. During the implementation process, visit(s) by a multi-disciplinary Technical Assistance Team composed of Experts from ICAO and other stakeholders (States, International Organizations, Industry, etc.) might be needed to advance and expedite the implementation of the agreed actions in a prioritized manner, verify/validate the evidences related to the resolution of previously identified findings, provide necessary assistance, identify the main challenges and agree on necessary mitigation measures.

During this phase, regular teleconferences and a bi-annual implementation review should be carried out; and regular briefs will be provided to the DG/Minister.

MID Region NCLB Strategy – Flowchart

5.2 The following Flowchart helps understand the process and activities related to each phase of the MID Region NCLB Strategy:


MID Region NCLB Strategy Flowchart
Phase I- Selection
Phase II- Plan of Actions
Phase III- Implementation and Monitoring
Process
Start
Select Candidate States
Prioritization Criteria
No
States meet Selection Criteria
Additional Selection Criteria/ Communication with States
Yes
States Selected for Assistance
Coordinate with State
Stakeholders
Develop Draft NCLB Plan of Actions
Draft NCLB Plan of Actions
Communicate Plan to State
Update
Acceptance of The Plan By the State
No
Yes
Approved NCLB Plan of Actions
NCLB Plan of Actions
Start Implementation
Regular Briefs to DG and Minister
Monitor/Review Implementation Progress
Bi-Annual Review
Conduct Regular Teleconferences with State
Need for MDTA* Team Mission
State, Intl. Org., Industry, etc..
Yes
No
Conduct MDTA* Team Mission
Verify/ Validate Findings
Identify Challenges
Recommend Mitigation Measures
Adjust Implementation Plan (prioritization)
* Multi-Disciplinary Technical Assistance

5.3 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.

5.4 The MID Region NCLB Implementation Plan is a companion document to the MID Region NCLB Strategy. It 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. Specific goals, outcomes, deliverables and timelines are specified in the States' NCLB Plan of Actions/Recommended Actions.

ICAO CAIRO UNITING AVIATION

MID Region NCLB Implementation Plan

First Edition
January 2017

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MID Region NCLB Implementation Plan

1. Introduction

1.1. The MID Region NCLB Implementation 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. Specific goals, outcomes, deliverables and timelines are specified in the State's NCLB Plan of Actions.

1.2. An overview of various safety indicators and results for each Member State are available on the ICAO integrated Safety Trend Analysis and Reporting System (iSTARS), which could be accessed through the following link: https://portal.icao.int/space/Pages/State-Safety-Briefings.aspx

1.3. The Table below containing some MID States' high level indicators provides a good overview (Dashboard) of the MID Region:

State	SSC	EI	SSP Level	Aerodrome Certification %	PBN Vertical Approach %	GDP/Capita US$	Level of activities or movements
Bahrain	NO	66.19	3	100	0	23 040	High
Egypt	NO	54.96	3	57	20	3 256	High
Iran	NO	90.49	1	44	3	6 578	High
Iraq	NO	NA	0	33	0	6 625	Low
Jordan	NO	58.65	0	66	100	4 909	Low
Kuwait	NO	53.93	3	100	100	56 367	Medium
Lebanon	NO	60.54	3	0	0	9 764	Low
Libya	NO	28.91	0	0	0	13 303	Low
Oman	NO	67.83	3	100	100	23 624	High
Qatar	NO	62.86	3	100	100	92 633	High
Saudi Arabia	NO	89.12	3	100	0	25946	High
Sudan	NO	74.19	3	75	100	1 695	Low
Syria	NO	53.66	2	0	13	2 126	Low
UAE	NO	98.85	3	100	85	41 692	High
Yemen	NO	NA	0	0	25	1 341	Low
Regional Status		66.17		65	29		

Table 1.

2. Contributions

2.1 The following Table reflects the contributions received from States and Stakeholders in support of the MID NCLB activities:

States and Stakeholders	Contribution Cash or in-Kind	Description/Amount	Remark
Saudi Arabia	Cash	US$200,000	MID NCLB activities for 2017
Saudi Arabia	Cash	US$200,000	Other MID NCLB activities
UAE	Cash	US$50,000	To be used for the establishment

			of the MID FPP

Table 2.

3. NCLB Activities

3.1. General Activities

3.1.1. The following regional NCLB activities are planned/conducted in support of the MID NCLB initiative:

Activity	Funded by/from	Venue	Date	Targeted States	Remarks
GSI AIR Course	MID NCLB budget	Cairo	7-18 May		
GSI ANS Course	MID NCLB budget	Cairo	6-17 Aug.		
GSI AGA Course	MID NCLB budget	Cairo	24 Sep -5 Oct		

Table 3.

3.2. NCLB Activities by State

3.2.1. This Section provides State-by-State a high-level briefing on the status of USOAP-CMA results. It contains also the recommended actions that would enhance the oversight capabilities of the States, eventually increase the EI, and improve safety and efficiency of air navigation in the MID Region. This could be in the form of a formal Plan of Actions or just a list of Recommended Actions, agreed with the concerned State. In both cases, the following is defined for each action:

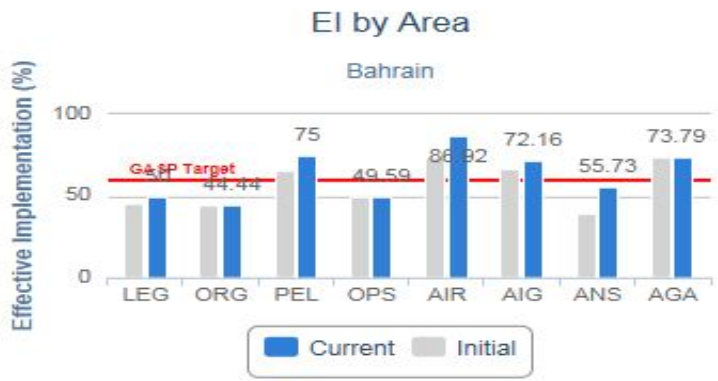
- the link to a USOAP-CMA PQ or air navigation deficiency;
- a State Point of Contact (POC);
- the Accountable person;
- list of States and stakeholders supporting the implementation of the activity/actions;
- the expected deliverables;
- the timelines for the completion of the action;
- the source of funding and assigned amount, as appropriate; and
- the status which provides the information on the progress achieved for the implementation of the action.

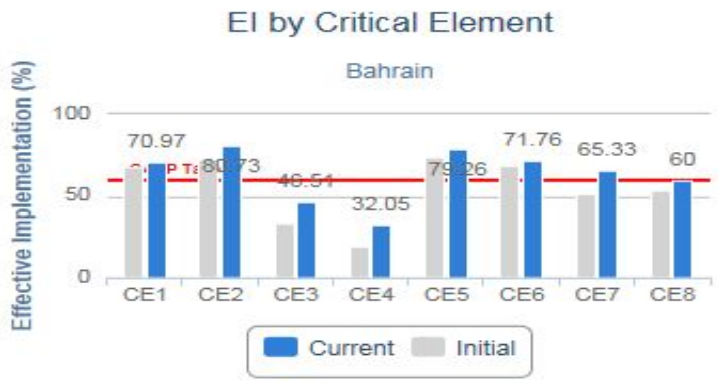
Bahrain
Group: 3

Bahrain EI is **66.19%**.

USOAP Results by Area and Critical Element

4 areas and 6 critical elements are above the target of 60% EI.





Bahrain currently has 262 open USOAP protocol findings. The highest number of protocol findings (37) concern Technical Personnel Qualification and Training (CE-4) in the area of Air Navigation Services (ANS).

	LEG	ORG	PEL	OPS	AIR	AIG	ANS	AGA
CE-1	6	1				1	1	
CE-2	4		1	3	3	3	3	4
CE-3		4	2	2	1	7	26	4
CE-4			1	5	2	5	37	3
CE-5	1		3	4	1	7	4	8
CE-6			9	34	1		5	12
CE-7			2	10	4		4	6
CE-8			2	4	2	4	5	1

Protocol findings by Area and Critical Element intersection

Note: Due to ongoing work on our data management platform, the above results may slightly differ from the ones published on the CMA online framework.

NCLB Plan of Actions/Recommended Actions

Since Bahrain is among the Group 3 States, there's no NCLB Plan of Actions developed for Bahrain. However, the followings are the agreed actions that would improve safety and efficiency of air navigation within Bahrain FIR:

Ref	Key Activity	Actions	Link to USOAP PQ, or AN Deficiency	State POC	Accountable	Supported by	Deliverables	Timeline	Source of Funds/ amount	Remarks/Status
BAH-1	Improve the level of qualified ANS experts	BA1.1 Develop Training Programme for ANS Inspectors		XXX YYY	DG BCAA	ICAO State X ORG Y	Training Programme for ANS Inspectors	Jun. 2017	BCAA	
		BA1.2 Develop Training Plans for ANS Inspectors		XXX YYY	DG BCAA		Training Plans for ANS Inspectors	Aug. 2017	BCAA	
		BA1.3 Organize a GSI course for ANS Inspectors		XXX YYY	ICAO RD			Oct. 2017	ICAO (MID NCLB)	Bahrain attendance is strongly encouraged
BAH-2										

MID DOC 002

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

MID REGION

AIR NAVIGATION STRATEGY

EDITION FEBRUARY, 2017

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.

TABLE OF CONTENTS

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.

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

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

3.4 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.

Long-term Objective (2025 - 2031): ASBU Block 2

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

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 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		

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 subsidary 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 Implemenation 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 subsidary 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.

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

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, 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

* *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	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 – 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

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 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 – FRTO: Improved Operations through Enhanced En-Route Trajectories

Description and purpose:

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

Main performance impact:

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

Applicability consideration:

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

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

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.

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 – 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.

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

Description and purpose:

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

Main performance impact:

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

Applicability consideration:

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

a) least complex – regional/States/locations with some foundational PBN operational experience that could capitalize on near term enhancements, which include integrating procedures and optimizing performance;

b) more complex – regional/States/locations that may or may not possess PBN experience, but would benefit from introducing new or enhanced procedures. However, many of these locations may have environmental and operational challenges that will add to the complexities of procedure development and implementation; and

c) most complex – regional/States/locations in this tier will be the most challenging and complex to introduce integrated and optimized PBN operations. Traffic volume and airspace constraints are added complexities that must be confronted. Operational changes to these areas can have a profound effect on the entire State, region or location.

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

a) least complex: regional/States/locations with some foundational PBN operational experience that could capitalize on near-term enhancements, which include integrating procedures and optimizing performance;

b) more complex: regional/States/locations that may or may not possess PBN experience, but would benefit from introducing new or enhanced procedures. However, many of these locations may have environmental and operational challenges that will add to the complexities of procedure development and implementation; and

c) most complex: regional/States/locations in this tier will be the most challenging and complex to introduce integrated and optimized PBN operations. Traffic volume and airspace constraints are added complexities that must be confronted. Operational changes to these areas can have a profound effect on the entire State, region or location.

B0 – 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

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APPENDIX 5.1B

Amendment to the MID eANP Volume III

MID REGION TMAs Procedures Implementation (ASBU B0-APTA, B0-CCO and B0-CDO) Status as of December 2016

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
BAHRAIN																	1
OBBI	12L	ILS	I	VORDME		Y		Y					Y	Y			
	30R	ILS	I	VORDME		Y		Y					Y				
Total	**2**	**2**		**2**	**Y**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	
%		**100**		**100**	**Dec 2016**	**100**	**0**	**100**	**0**	**0**	**0**	**0**	**100**	**100**	**0**	**0**	
EGYPT																	7
HEBA	14																
	32	ILS	I			Y		Y	Y	Y							
HESN	17			VORDME		Y		Y	Y	Y			Y	Y			
	35	ILS	I	VORDME		Y		Y	Y				Y				
HECA	05L	ILS	I	VORDME		Y		Y									
	05C	ILS	II	VORDME		Y		Y									
	05R	ILS	I														
	23L	ILS	I	VORDME													
	23C	ILS	II	VORDME		Y		Y									
	23R	ILS	I	VORDME		Y		Y									
HEGN	16			VORDME		Y	Y	Y	Y	Y			Y	Y			
	34	ILS	I	VORDME		Y	Y	Y	Y				Y				
HELX	2	ILS	I	VORDME		Y		Y	Y	Y			Y	Y			
	20	ILS	I	VORDME		Y		Y	Y				Y				
HEMA	15			VORDME		Y		Y	Y	Y			Y	Y			
	33			VORDME		Y		Y	Y				Y				
HESH	04L	ILS	I	VORDME		Y	Y	Y	Y	Y			Y	Y			
	04R			VORDME		Y	Y	Y	Y				Y				
	22L			VORDME		Y		Y	Y				Y				
	22R			VORDME		Y		Y	Y				Y				
Total	**20**	**12**		**17**	**Y**	**17**	**4**	**17**	**13**	**6**	**0**	**0**	**12**	**5**	**0**	**0**	
%		**60**		**85**	**Nov 2016**	**85**	**20**	**85**	**65**	**86**	**0**	**0**	**60**	**71**	**0**	**0**	

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
I.R. IRAN																	9
OIKB	03L																
	03R			VORDME / NDB													
	21L	ILS	I	VORDME / NDB													
	21R																
OIFM	08L			VORDME / NDB													
	08R			VORDME / NDB													
	26L			VORDME / NDB													
	26R	ILS	I	VORDME / NDB													
OIMM	13L			VORDME													
	13R			VORDME													
	31L			VORDME / NDB													
	31R	ILS	I	VORDME / NDB													
OISS	11L																
	11R																
	29L	ILS	I	VORDME / NDB													
	29R			VORDME / NDB													
OITT	12L																
	12R																
	30L	ILS	I	VORDME													
	30R	ILS	I	VORDME													

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
OIIE	11L	ILS	I	VORDME / NDB									Y	Y			
	11R			VORDME / NDB									Y				
	29L			VORDME									Y				
	29R	ILS	II	VORDME / NDB		Y	Y	Y					Y				
OIII	11L			VORDME													
	11R			VORDME													
	29L	ILS	I	VORDME													
	29R																
OIZH	17																
	35	ILS	I	VORDME													
OIYY	13			VORDME													
	31			VORDME													
Total	**32**	**10**		**24**	**Y**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	
%		**31**		**75**	**Mar. 2016**	**3**	**3**	**3**	**0**	**0**	**0**	**0**	**13**	**11**	**0**	**0**	
IRAQ																	6
ORBI	15L	ILS	I	VORDME													
	15R					Y		Y									
	33L					Y		Y									
	33R	ILS	I	VORDME													
ORMM	14			VORDME													
	32	ILS	I	VORDME													
ORER	18	ILS	II			Y		Y					Y	Y			
	36	ILS	I			Y		Y					Y				
ORSU	13	ILS	I	VOR		Y		Y									
	31	ILS	I	VOR		Y		Y									
ORNI	10					Y	Y	Y	Y	Y			Y	Y			
	28	ILS		VOR		Y	Y	Y	Y				Y				
ORBM																	NO DATA
Total	**12**	**8**		**7**	**Y**	**8**	**2**	**8**	**2**	**1**	**0**	**0**	**4**	**2**	**0**	**0**	
%		**67**		**58**		**67**	**17**	**67**	**17**	**17**	**0**	**0**	**33**	**33**	**0**	**0**	

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
JORDAN																	3
OJAM	6					Y	Y	Y	Y	Y			Y	Y			
	24	ILS	I	VORDME		Y	Y	Y	Y				Y				
OJAI	08L	ILS	I	NDB DME		Y	Y	Y	Y	Y			Y	Y			
	08R			NDB		Y	Y	Y	Y				Y				
	26L	ILS	II	VOR / NDB		Y	Y	Y	Y				Y				
	26R	ILS	I	VORDME		Y	Y	Y	Y								
OJAQ	1	ILS	I	VORDME		Y	Y	Y	Y	Y			Y	Y			
	19	ILS	I			Y	N/A	Y	Y				Y				LNAV/VNAV not feasible
Total	**8**	**6**		**6**	**Y**	**8**	**8**	**8**	**8**	**3**	**0**	**0**	**8**	**3**	**0**	**0**	
%		**75**		**75**	**July 2009**	**100**	**100**	**100**	**100**	**100**	**0**	**0**	**100**	**100**	**0**	**0**	**Plan needs update**
KUWAIT																	1
OKBK	15L	ILS	II			Y	Y	Y	Y	Y			Y	Y			
	15R	ILS	II	VORDME		Y	Y	Y	Y				Y				
	33L	ILS	II	VORDME		Y	Y	Y	Y				Y				
	33R	ILS	II			Y	Y	Y	Y				Y				
Total	**4**	**4**		**2**	**Y**	**4**	**4**	**4**	**4**	**1**	**0**	**0**	**4**	**1**	**0**	**0**	
%		**100**		**50**	**Mar. 2015**	**100**	**100**	**100**	**100**	**100**	**0**	**0**	**100**	**100**	**0**	**0**	**Plan needs update**
LEBANON																	1
OLBA	3	ILS	I	VORDME		Y		Y		Y			Y	Y			
	16	ILS	I	VORDME		Y		Y					Y				
	17	ILS	I	VORDME / NDB		Y		Y					Y				
	21					Y		Y					Y				
	34	N/A		N/A													Not used for landing
	35	N/A		N/A													Not used for landing
Total	**4**	**5**		**5**	**N**	**4**	**0**	**4**	**0**	**1**	**0**	**0**	**4**	**1**	**0**	**0**	
%		**125**		**125**		**100**	**0**	**100**	**0**	**100**	**0**	**0**	**100**	**100**	**0**	**0**	

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
LIBYA																	3
HLLB	15R			VORDME													VOR not flight checked
	15L			VORDME													VOR not flight checked
	33R			VORDME													VOR not flight checked
	33L	ILS	I	VORDME													ILS not flight checked
HLLS	13	ILS	I	VORDME													ILS not flight checked
	31			VORDME													VOR not flight checked
HLLT	9			VORDME													VOR not flight checked
	27	ILS	I	VORDME													ILS not flight checked
Total	**8**	**3**		**8**	**N**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
%		**38**		**100**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
OMAN																	2
OOMS	08L	ILS	I	VORDME		Y	Y	Y	Y	Y			Y	Y			
	26R	ILS	I	VORDME		Y	Y	Y	Y				Y				
OOSA	7	ILS	I	VORDME		Y	Y	Y	Y	Y			Y	Y			
	25	ILS	I	VORDME		Y	Y	Y	Y				Y				
Total	**4**	**4**		**4**	**Y**	**4**	**4**	**4**	**4**	**2**	**0**	**0**	**4**	**2**	**0**	**0**	
%		**100**		**100**	**Feb. 2015**	**100**	**100**	**100**	**100**	**100**	**0**	**0**	**100**	**100**	**0**	**0**	
QATAR																	2
OTBD	15	ILS	I	VORDME		Y	N/A	Y	Y	Y	Y	Y	Y	Y	Y	Y	LNAV/VNAV not feasible
	33	ILS	II/III	VORDME/NDB		Y	Y	Y	Y		Y		Y		Y		CCO/CDO tactically achieved
OTHH	16L	ILS	I/II/III	VORDME		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	CCO/CDO tactically achieved
	16R	ILS	I/II/III	VORDME		Y	Y	Y	Y		Y		Y		Y		CCO/CDO tactically achieved
	34L	ILS	I/II/III	VORDME		Y	Y	Y	Y		Y		Y		Y		CCO/CDO tactically achieved
	34R	ILS	I/II/III	VORDME		Y	Y	Y	Y		Y		Y		Y		CCO/CDO tactically achieved
Total	**6**	**6**		**6**	**Y**	**6**	**6**	**6**	**6**	**2**	**6**	**2**	**6**	**2**	**6**	**2**	
%		**100**		**100**	**Jan. 2016**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
SAUDI ARABIA																	4
OEDF	16L	ILS	II	VORDME													
	16R	ILS	II	VORDME													
	34L	ILS	II	VORDME													
	34R	ILS	II	VORDME													
OEJN	16L	ILS	I	VORDME		Y		Y		Y			Y	Y			
	16C	ILS	II										Y				
	16R	ILS	II			Y		Y					Y				
	34L	ILS	II			Y		Y					Y				
	34C	ILS	II	VORDME									Y				
	34R	ILS	I	VORDME		Y		Y					Y				
OEMA	17	ILS	I	VORDME		Y		Y	Y	Y			Y	Y			
	18			VORDME		Y		Y	Y				Y				
	35	ILS	I	VORDME		Y		Y	Y				Y				
	36	ILS	I	VORDME		Y		Y	Y				Y				
OERK	15L	ILS	I	VORDME													
	15R	ILS	I														
	33L	ILS	I														
	33R	ILS	I	VORDME													
Total	**18**	**17**		**13**	**Y**	**8**	**0**	**8**	**5**	**2**	**0**	**0**	**10**	**2**	**0**	**0**	
%		**94**		**72**	**May 2012**	**44**	**0**	**44**	**28**	**50**	**0**	**0**	**56**	**50**	**0**	**0**	**Plan needs update**

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
SUDAN																	4
HSNN	4					Y	Y	Y									
	22					Y	Y	Y									
HSOB	1					Y	Y	Y									
	19					Y	Y	Y									
HSSS	18	ILS	I	VORDME		Y	Y	Y									
	36	ILS	I	VORDME		Y	Y	Y									
HSPN	17			VORDME / NDB		Y	Y	Y									
	35	ILS	I	VORDME / NDB		Y	Y	Y									
Total	**6**	**3**		**4**	**Y**	**6**	**6**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
%		**50**		**67**	**Dec. 2015**	**100**	**100**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
SYRIA																	3
OSAP	9			VORDME													
	27	ILS	II	VORDME / NDB													
OSLK	17	ILS	I	VORDME / NDB													
	35																
OSDI	05L			VOR													
	05R	ILS	II	VORDME / NDB													
	23L			VORDME / NDB DME													
	23R	ILS	II	VORDME		Y	Y	Y									
Total	**8**	**4**		**7**	**Draft**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
%		**50**		**88**	**Dec. 2009**	**13**	**13**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA											Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
UNITED ARAB EMIRATES																	8
OMAA	13L	ILS	II			Y	Y	Y	Y	Y			Y	Y			RNP AR
	13R	ILS	I	VOR		Y	Y	Y	Y				Y				RNP AR
	31L	ILS	II/III	VOR		Y	Y	Y	Y				Y				RNP AR
	31R	ILS	II			Y	Y	Y	Y				Y				RNP AR
OMAD	13			VORDME		Y	Y	Y					Y	Y			RNP AR
	31	ILS	I	VORDME		Y	Y	Y					Y				RNP AR
OMAL	1	ILS	I	VOR													
	19			VOR													
OMDB	12L	ILS	I/II/III	VOR		Y	Y	Y	Y	Y			Y	Y			
	12R	ILS	I/II/III	VOR		Y	Y	Y	Y				Y				
	30L	ILS	I/II/III			Y	Y	Y	Y				Y				
	30R	ILS	I/II/III	VOR		Y	Y	Y	Y				Y				
OMDW	12	ILS	II/III			Y	Y	Y	Y	Y			Y	Y			
	30	ILS	II/III			Y	Y	Y	Y				Y				
OMFJ	11								Y	Y							
	29	ILS	I	VOR		Y	Y	Y	Y								
OMRK	16			VOR		Y	Y	Y									
	34	ILS	I	VOR		Y	Y	Y									
OMSJ	12	ILS	I			Y	Y	Y	Y	Y			Y	Y			
	30	ILS	II			Y	Y	Y	Y				Y				
Total	**20**	**16**		**12**	**Y**	**17**	**17**	**17**	**14**	**5**	**0**	**0**	**14**	**5**	**0**	**0**	
%		**80**		**60**	**Dec. 2015**	**85**	**85**	**85**	**70**	**63**	**0**	**0**	**70**	**63**	**0**	**0**	

Int'l Aerodrome (Ref. MID ANP)	RWY	Conventional Approaches			APTA				CCO				CDO				Remarks
		Precision		VOR or NDB	PBN PLAN Update date	LNAV	LNAV / VNAV	PBN RWY	RNAV SID	PER AERO	CCO	PER AERO	RNAV STAR	PER AERO	CDO	PER AERO	
		xLS	CAT														
YEMEN																	5
OYAA	8	ILS	I	VORDME													
	26			VORDME													
OYHD	3			VOR										Y			
	21			VOR / NDB		Y		Y					Y				
OYRN	6																
	24			VORDME													
OYSN	18	ILS	I	VORDME/NDB		Y	Y	Y	Y	Y			Y	Y			
	36			VOR		Y	Y	Y	Y				Y				
OYTZ																	NO DATA
Total	**8**	**2**		**7**	**Draft Plan**	**3**	**2**	**3**	**2**	**1**	**0**	**0**	**3**	**2**	**0**	**0**	**59**
%		**25**		**88**	**Jan. 2010**	**38**	**25**	**38**	**25**	**20**	**0**	**0**	**38**	**40**	**0**	**0**	
Results					**Plans**			**PBN**		**SID**		**CCO**		**STAR**		**CDO**	
Total	**160**	**102**		**124**	**11**	**89**	**55**	**89**	**58**	**24**	**6**	**2**	**75**	**27**	**6**	**2**	**13 PBN APV + 102 ILS (115/160)**
Percentage (%)		**64**		**78**	**73**	**56**	**34**	**56**	**36**	**41**	**4**	**3**	**17**	**46**	**4**	**3**	**72% RWY Ends with Vertical guidance**

59 Aerodrmes

Note. 6 RNP AR Approach were implemented in OMAA, UAE.

TABLE B0-SURF (A-SMGCS Level 1-2)

EXPLANATION OF THE TABLE

Column

1 Name of the State

2 Name of City/Aerodrome and Location Indicator

3 Status of implementation of A-SMGCS Level 1, where:
Y – Yes, implemented
N – No, not implemented

4 Status of implementation of A-SMGCS Level 2, where:
Y – Yes, implemented
N – No, not implemented

5 Action plan — short description of the State's Action Plan with regard to the implementation of A-SMGCS Level 1-2, especially for items with "N".

6 Remarks

State	City/ Aerodrome Location Indicator	Level 1	Level 2	Action Plan	Remarks
1	*2*	*3*	*4*	*5*	*6*
BAHRAIN	Bahrain/Bahrain Intl (OBBI)	N	N	A-SMGCS Level 1-2 Project is under Execution phase. expected completion on Dec 2015	
EGYPT	Cairo/Cairo Intl (HECA)	Y	Y		
IRAN	Tehran/Mehrabad Intl (OIII)	N	N		
KUWAIT	Kuwait/Kuwait Intl (OKBK)	N	N		
OMAN	Muscat/Muscat Intl (OOMS)	N	N		
QATAR	Doha/Doha Intl (OTBD)	Y	Y		
	Doha/Hamad Intl (OTHH)	Y	Y		
SAUDI ARABIA	Dammam/King Fahad Intl (OEDF)	N	N		
	JEDDAH/King Abdulaziz Intl (OEJN)	N	N		
	RIYADH/King Khalid Intl (OERK)	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	Y	Y	Level 4 2017	
	Dubai/Dubai Intl (OMDB)	Y	Y	Level 4 ~~2016~~2017	
	DUBAI/Al Maktoum Intl (OMDW)	Y	N	Level 4 2018	
Total Percentage		**46%**	**46%**		

TABLE B0-ACDM

EXPLANATION OF THE TABLE

Column

1 Name of the State

2 Name of City/Aerodrome and Location Indicator

3 Status of implementation of Apron Management, where:
- Y – Yes, implemented
- N – No, not implemented

4 Status of implementation of ATM-Aerodrome coordination, where:
- Y – Yes, implemented
- N – No, not implemented

5 Terminal & runway capacity is declared, where:
- Y – Yes, declared
- N – No, not declared

6 Action plan — short description of the State's Action Plan with regard to the implementation of B0-ACDM.

7 Remarks

State	City/ Aerodrome Location Indicator	Apron Management	ATM-Aerodrome Coordination	Terminal &runway capacity declared	Action Plan	Remarks
1	*2*	*3*	*4*	*5*	*6*	*7*
BAHRAIN	Bahrain/Bahrain Intl (OBBI)	N	N	N	2018	
EGYPT	Cairo/Cairo Intl (HECA)	N	N	N		
IRAN	Tehran/Mehrabad Intl (OIII)	N	N	N		
KUWAIT	Kuwait/Kuwait Intl (OKBK)	N	N	N		
OMAN	Muscat/Muscat Intl (OOMS)	N	N	N		
QATAR	Doha/Doha Intl (OTBD)	N	N	N		
	Doha/Hamad Intl (OTHH)	N	N	N		
SAUDI ARABIA	Jeddah/King Abdulaziz Intl (OEJN)	N	N	N		
	Riyadh/King Khalid Intl (OERK)	N	N	N		
UAE	Abu Dhabi/Abu Dhabi Intl (OMAA)	N	N	N	2017	
	Dubai/Dubai Intl (OMDB)	N	N	N	~~2016~~2017	
	Dubai/Al Maktoum Intl (OMDW)	N	N	N	2017	
Total Percentage		**0**	**0**	**0**		

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 of AIDC/OLDI Implementation, where:
- Y – If AIDC/OLDI is implemented at least with one neighbouring ACC
- N – Not Implemented

6 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	AIDC/OLDI Implementation	Action Plan	Remarks
1	*2*	*3*	*4*	*5*	*6*	*7*
Bahrain	Y	~~N~~Y	Y	N	~~Sep 2015 for AMHS Int.~~	
Egypt	Y	Y	Y	Y		
Iran	N	N	Y	N		Contract signed for AMHS
Iraq	N	N	N	N		
Jordan	Y	Y	Y	N		
Kuwait	Y	~~N~~Y	Y	N	~~Dec 2015 for AMHS Int.~~	
Lebanon	Y	N	Y	Y		
Libya	Y	N	Y	N		
Oman	Y	Y	Y	N		
Qatar	Y	Y	Y	Y		local implementation for OLDI
Saudi Arabia	Y	Y	Y	Y		local implementation for AIDC
Sudan	Y	Y	Y	N		AMHS Int. Feb 2015
Syria	N	N	N	N		
UAE	Y	Y	Y	Y	~~Q2 2016~~	Local implementation for OLDI
Yemen	N	N	N	N	~~Dec 2015 for AMHS~~	Contract signed for AMHS
Total Percentage	**73%**	**~~47~~60%**	**80%**	**33%**		

TABLE B0-DATM-3-1

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

State	IAID	eAIP	NOTAM	SNOWTAM	PIB	Charting	Procedure Design	ATS	Action Plan	Remarks
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
BAHARAIN	PI	FI	FC	FC	FC	FC	PI	FI	National AIM Roadmap-2015	**AIXM**: 4.5 (5.1 by Dec. 2015)
EGYPT	FI	PI	NC	NC	FC	NC	NI	PI	National AIM Roadmap-2015	**AIXM**: 5.1 3 by 2015, 4-9 by 2016
IRAN, ISLAMIC REPUBLIC OF	NI	NI	NC	NC	NC	NC	NI	NI	National AIM Roadmap-2015~~6~~	**AIXM**: NI
IRAQ	NI	NI	NC	NC	NC	NC	NI	NI	National AIM Roadmap-2014	**AIXM**: NI
JORDAN	PI	NI	FC	FC	FC	PC	NI	NI	National AIM Roadmap-2014	**AIXM**: Database via EAD
KUWAIT	PI	NI	FC	NC	PC	NC	NI	NI	National AIM Roadmap-2015	**AIXM**: NI (5.1 by Dec. 2015)
LEBANON	~~NI~~PI	~~NI~~FI	NC	NC	~~NC~~F C	~~NC~~FC	~~NI~~FI	NI	National AIM Roadmap-2014~~5~~6	**AIXM**: 4.5
LIBYA	NI	NI	NC	NC	NC	NC	NI	NI	No Action Plan	**AIXM**: NI
OMAN	NI	NI	NC	NC	NC	NC	NI	NI	National AIM Roadmap-2014~~5~~6	**AIXM**: NI (5.1 in progress)
QATAR	PI	PI	FC	PC	FC	PC	PI	NI	National AIM Roadmap-2015~~5~~6	**AIXM**: 5.1
SAUDI ARABIA	FI	FI	FC	FC	FC	FC	FI	FI	National AIM Roadmap-2014	**AIXM**: 4.5
SUDAN	PI	NI	FC	NC	FC	PC	PI	PI	National AIM Roadmap-2015	**AIXM**: NI (planned; Mar 2016) 1.AIS DB integrated with MET & ATM 2. Contract Signed for eAIP, AIXM connected with Charting SYS. 7. Contract signed. 8. Ongoing project
SYRIAN ARAB REPUBLIC	NI	NI	NC	NC	NC	NC	NI	NI	No Action Plan	**AIXM**:NI

Table B0-AMET 3-1

~~SADIS 2G and Secure~~ SADIS FTP

EXPLANATION OF THE TABLE

Column

1 Name of the State

2~~, 3~~ Status of implementation of ~~SADIS 2G and/or Secure~~ SADIS FTP, where:

Y – Yes, implemented

N – No, not implemented

State	Implementation	
	~~SADIS 2G~~	~~Secure~~ SADIS FTP
1	~~2~~	~~3~~ 2
BAHRAIN	~~Y~~	Y
EGYPT	~~Y~~	Y
IRAN (ISLAMIC REPUBLIC OF)	~~Y~~	N
IRAQ	~~Y~~	Y
JORDAN	~~N~~	Y
KUWAIT	~~Y~~	Y
LEBANON	~~N~~	N
LIBYA	~~Y~~	Y
OMAN	~~Y~~	Y
QATAR	~~Y~~	~~N~~ Y
SAUDI ARABIA	~~Y~~	Y
SUDAN	~~Y~~	Y
SYRIAN ARAB REPUBLIC	~~Y~~	N
UNITED ARAB EMIRATES	~~Y~~	Y
YEMEN	~~Y~~	~~N~~ Y

Table B0-AMET 3-4

Quality Management System

EXPLANATION OF THE TABLE

Column

1 Name of the State

2, 3, 4, 5 Status of implementation of Quality Management System of meteorological information – 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		
IRAN, ISLAMIC REPUBLIC OF		~~√~~	√	Oct 2015	~~No Action Plan~~	
IRAQ	√				No Action Plan	
JORDAN			√	2 Apr 2014		
KUWAIT			√	23 Aug 2013		
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		
YEMEN	√				No Action Plan	

APPENDIX 5.1C

MID eANP FOCAL POINTS

(Last updated 05/03/2017)

	States	Main Focal Point		
		Name	Title	Email/Tel/Mobile
1	Bahrain	Ahmed Al Sayed Abdulla Al Qadhi (Alt)	A/Director AN Systems Chief AIM & Airspace Planning	ahmed.alsayed@mtt.gov.bh 0097317321199 aalqadhi@mtt.gov.bh 0097317321180
2	Egypt	Khaled Reda		Khaled.reda@civilaviation.gov.eg 01005648346
3	Iran			
4	Iraq			
5	Jordan	Daoud Abu-Hussein	Planning and studies Director	Daoud@carc.gov.go Mob: 00962795885779 Tel:+96264799145
6	Kuwait	Adel S. Boresli	Director Air Navigation	as.buresli@dgca.gov.kw
7	Lebanon			
8	Libya			
9	Oman			
10	Qatar			
11	Saudi Arabia	Adnan Alhendi		aalhendi@gaca.gov.sa Mob: +966599993215
12	Sudan	Abdulmonem Elsheikh Ahmed	ANS Director	aelsheikh78@gmail.com; a.elshiekh@scaa.gov.sd Mob: +249914101300
13	Syria			
14	UAE	Robert Novac Bara	ANS inspector (AIM)	rbara@gcaa.gov.ae Mob: +971565015900
15	Yemen			

APPENDIX 5.2.1A

MID CIVIL/MILITARY SUPPORT TEAM

Objective and Working Arrangements

I. Objective

The overall objective of the MID Civil/Military Support Team is to provide States with high-level guidance and recommendations to enhance the civil/military cooperation and expedite the implementation of the Flexible Use of Airspace (FUA) Concept.

II. MID Civil/Military Support Team Composition

The MID Civil/Military Support Team will be composed of experts from ICAO, IATA and other representatives/subject matter experts from States and Stakeholders, as appropriate.

III. State Civil Aviation Authority Responsibilities

- Provide facilities and all kind of support for a successful conduct of the visit.
- Ensure that all stakeholders (civil and military) involved in the FUA implementation are represented during the visit.
- Provide required information and documentation.

IV. Working Arrangements

Phase 1 – Coordination for the Visit

- Identification of the candidate States in need of a MID Civil/Military Support Team by IATA, ICAO, or through the relevant MIDANPIRG subsidiary bodies.
- ICAO to coordinate with the candidate State the dates and pre-acceptance of the visits.
- Hosting State to formally confirm, to the ICAO MID Regional Office, the acceptance of the MID Civil/Military Support Team visit.
- Hosting State to appoint a Point of Contact (POC).
- Agenda, Work Programme, activities and expected outcomes of the visit to be communicated with the State.
- Teleconference(s) to be conducted with the POC jointly by IATA and ICAO to ensure good preparation for the visit.

PHASE III –Team Coordination

- IATA and ICAO to coordinate the establishment of the Team (call for experts).
- Team members to agree on the States to be visited.
- The team should prepare the Work Programme for the visit with the assigned tasks for each member.
- Priority work areas to be identified by the Team.
- The Team members should share the required information.
- The coordination between the Team members will be mainly through emails and teleconferences.

a)

PHASE IV – Support Team Tasks

Utilizing best practices and available ICAO provisions, the MID Civil/Military Support Team will assist States through the following process:

- Assessment of the existing ATS route network.
- Assessment of the existing airspace structure.
- Review the status of CNS infrastructure.
- Identify potential gaps and develop a list of recommended actions.
- Assist States in the development of measures to implement the FUA through strategic Civil/Military coordination and dynamic interaction, in order to open up segregated airspace when it is not being used for its originally-intended purpose and allow for better airspace management and access for all users.
- Address with the relevant authorities the ICAO provisions related to civil/military cooperation and FUA, as well as the recommendations emanating from the ICAO General Assembly, DGCA-MID and MIDANPIRG.
- Organize Workshop(s) as deemed necessary.

PHASE IV – Follow-up Activities.

- The MID Civil/Military Support Team will provide a report with a list of Recommendations/Action Plan, which would foster the FUA Implementation, within 30 days after the completion of the visit.

- State visited is requested to provide the ICAO MID Regional Office with a periodic update on the implementation of the Recommendations (Action Plan).

MID Region

AIR NAVIGATION REPORT

2016 EDITION

Disclaimer

Coordinated Approach to Air Navigation Planning and Implementation

Air transport today plays a major role in driving sustainable economic and social development. It directly and indirectly supports the employment of 58.1 million people, contributes over $2.4 trillion to global Gross Domestic Product (GDP), and carries over 3.3 billion passengers and $6.4 trillion worth of cargo annually.

A fully harmonized global air navigation system built on modern performance-based procedures and technologies is a solution to the concerns of limited air traffic capacity and unnecessary gas emissions being deposited in the atmosphere.

The GANP represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/ industry agreed operational objectives. The Global Air Navigation Plan's Aviation System Block Upgrades (ASBU) methodology is a programmatic and flexible global system's engineering approach that allows all Member States to advance their Air Navigation capacities based on their specific operational requirements. The Block Upgrades will enable aviation to realize the global harmonization, increased capacity, and improved environmental efficiency that modern air traffic growth now demands in every region around the world.

The GANP's Block Upgrades are organized in six-year time increments starting in 2013 and continuing through 2031 and beyond. The GANP ASBU planning approach also addresses airspace user needs, regulatory requirements and the needs of Air Navigation Service Providers and Airports. This ensures a single source for comprehensive planning. This structured approach provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers.

The resultant framework is intended primarily to ensure that the aviation system will be maintained and enhanced, that ATM improvement programmes are effectively harmonized, and that barriers to future aviation efficiency and environmental gains can be removed at a reasonable cost. In this sense, the adoption of the ASBU methodology significantly clarifies how the ANSP and airspace users should plan for future equipage.

Although the GANP has a worldwide perspective, it is not intended that all Block Modules be required to be applied in every State and Region. Many of the Block Upgrade Modules contained in the GANP are specialized packages that should be applied only where the specific operational requirement exists or corresponding benefits can be realistically projected. The inherent flexibility in the ASBU methodology allows States to implement Modules based on their specific operational requirements. Using the GANP, Regional and State planners should identify those Modules which provide any needed operational improvements. Although the Block Upgrades do not dictate when or where a particular Module is to be implemented, this may change in the future should uneven progress hinder the passage of aircraft from one region of airspace to another.

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.

CONTENTS

1. INTRODUCTION

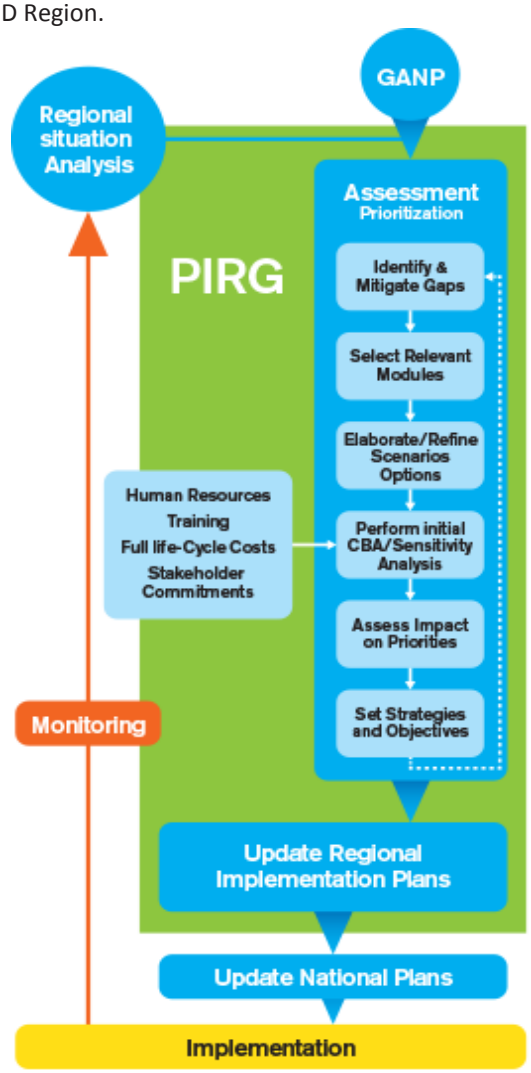
1.1 Objectives

The 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 year 2016.

The implementation status data covers the 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.



Regional Planning

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 endorsed by MIDANPIRG/15 and published as MID Doc 002. The Strategy includes 11 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.

The MID Region Air Navigation Report is an integral part of the air navigation planning and implementation process 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 year 2016.

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

The necessary data for the MID Air Navigation Report was collected 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

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 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 global developments related to the environmental protection, status of State's CO2 action plans and the operational improvements that had been/would be implemented in the MID Region.

Section 5 includes few success stories related to the 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 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.

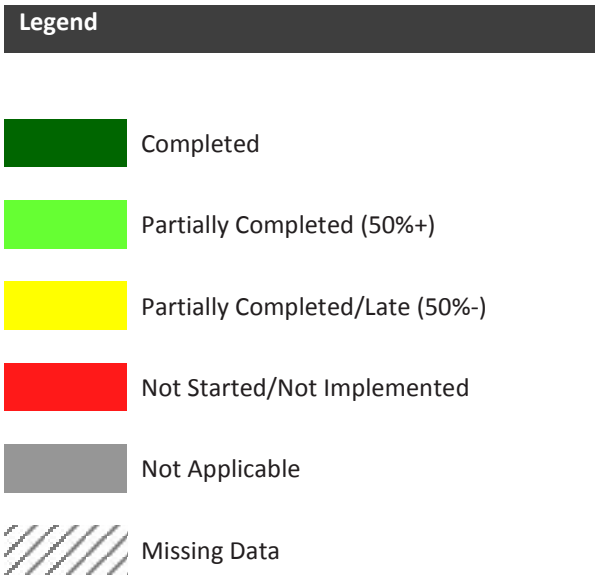
2. STATUS OF IMPLEMENTATION

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 eleven (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 June 2015, refers).

Module Code	Module Title	Priority	Monitoring		Remarks
			Main	Supporting	
***Performance Improvement Areas (PIA) 1*: Airport Operations**					
B0-APTA	Optimization of Approach Procedures including vertical guidance	1	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	ANSIG	CNS SG	Coordination with RGS WG
B0-ACDM	Improved Airport Operations through Airport-CDM	1	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	CNS SG	ATM SG	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	1	AIM SG	-	
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	1	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	ATM SG		
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	1			
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	CNS SG		
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	2			
***Performance Improvement Areas (PIA) 4* Efficient Flight Path – Through Trajectory-based Operations**					
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	1	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	PBN SG		

2.2 ASBU Implementation Status in the MID Region

2.2.1 B0-APTA

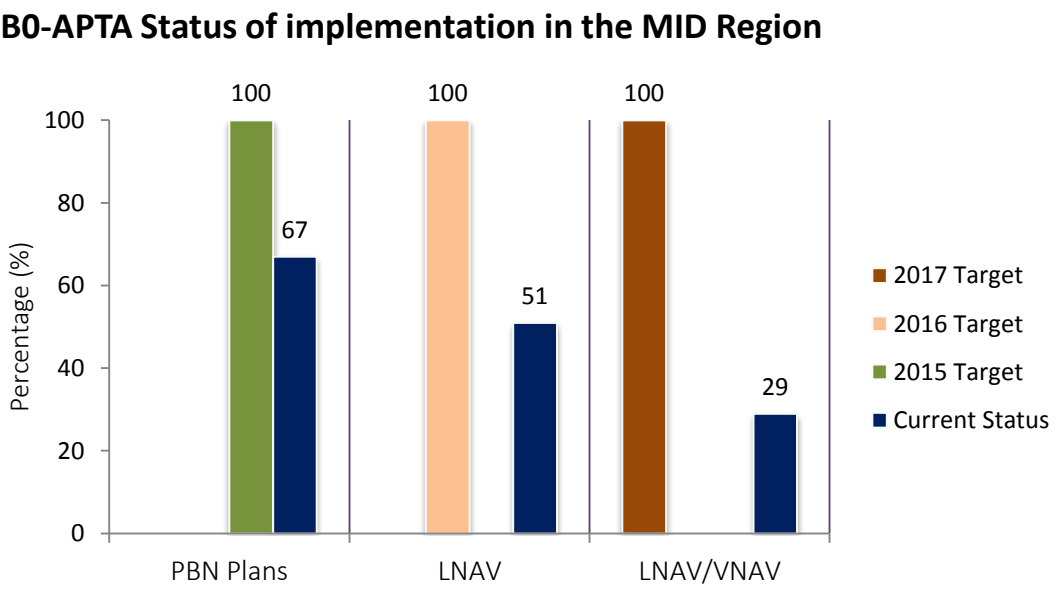
2.2.1.1 B0-APTA Elements and Performance Targets

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	80 % by Dec. 2014 100% by Dec. 2015
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

2.2.1.2 B0-APTA Status of Implementation

The following chart provides the regional status of implementation of B0-APTA against the performance targets agreed in the MID Air Navigation Strategy:

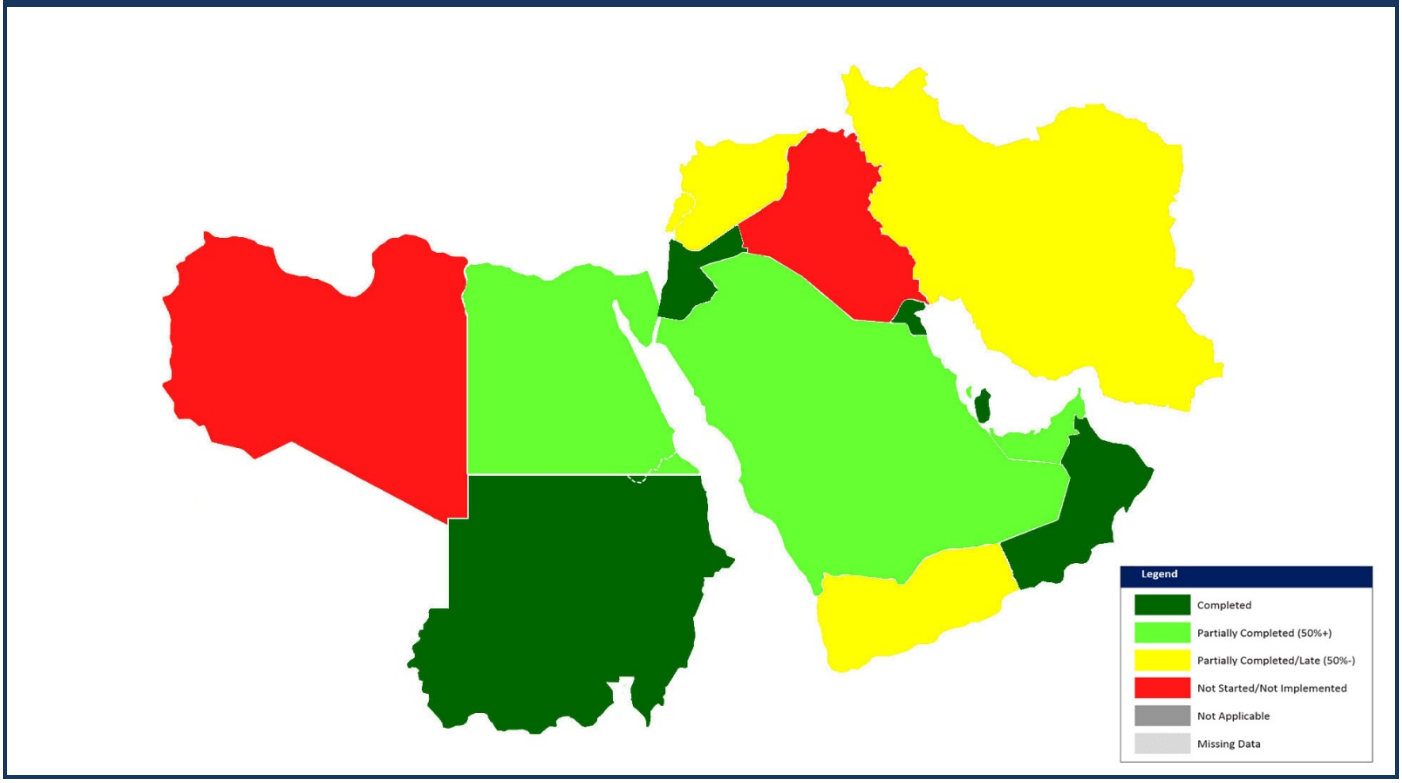


The Table and map below provide the status of implementation of B0-APTA in each of the MID States:

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 slow (with approximately 40% implementation). Nevertheless, if we consider the status of implementation of PBN RWYs, which is considered at the global level, the status of implementation is approximately 52% (acceptable).

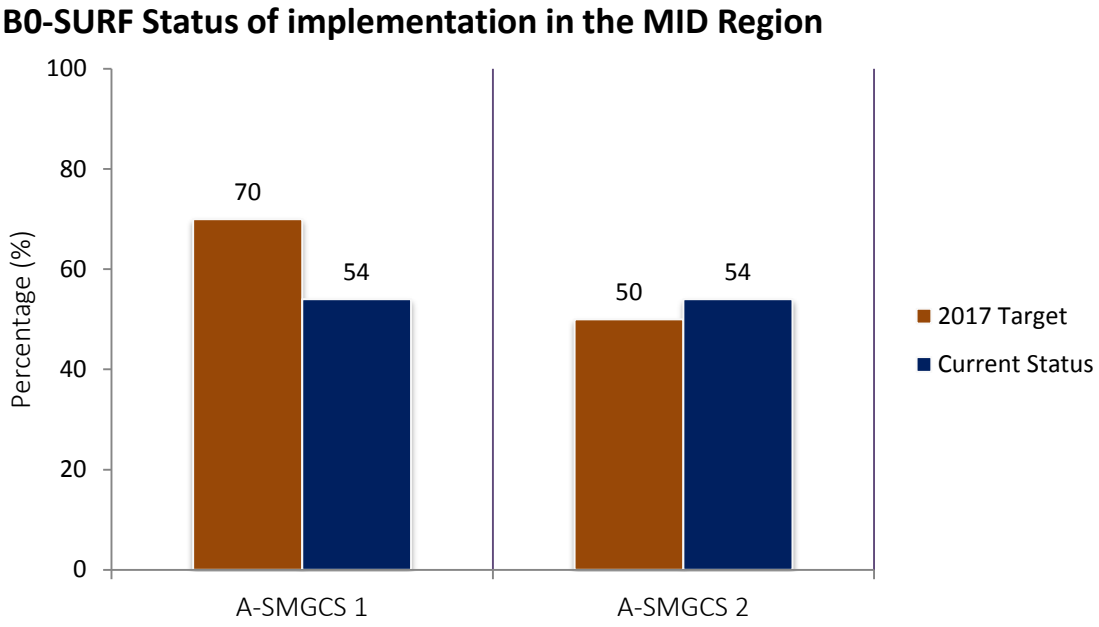
B0-APTA Status of implementation in the MID Region



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).

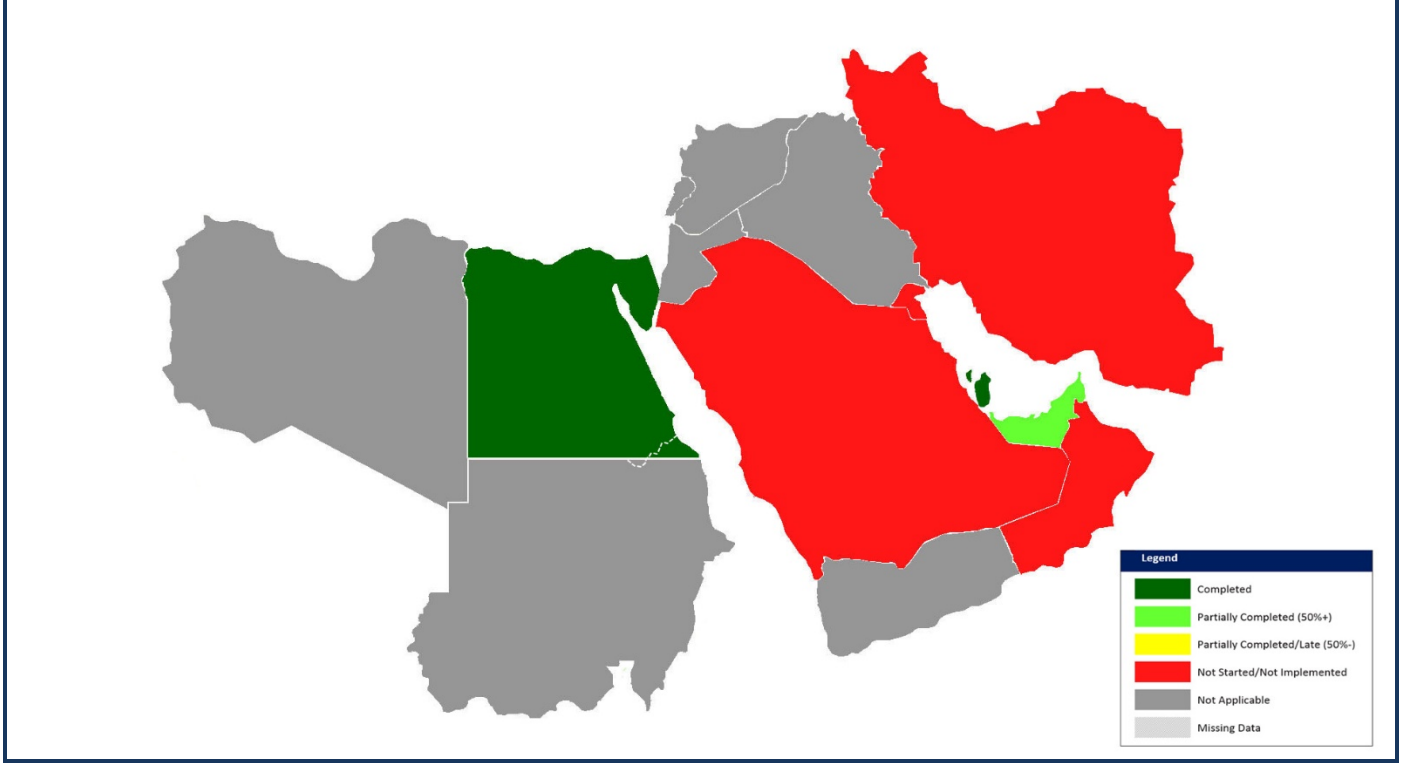
B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
A-SMGCS Level 1	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes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



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 acceptable (with approximately 54% implementation). B0-SURF is not applicable for 7 States.

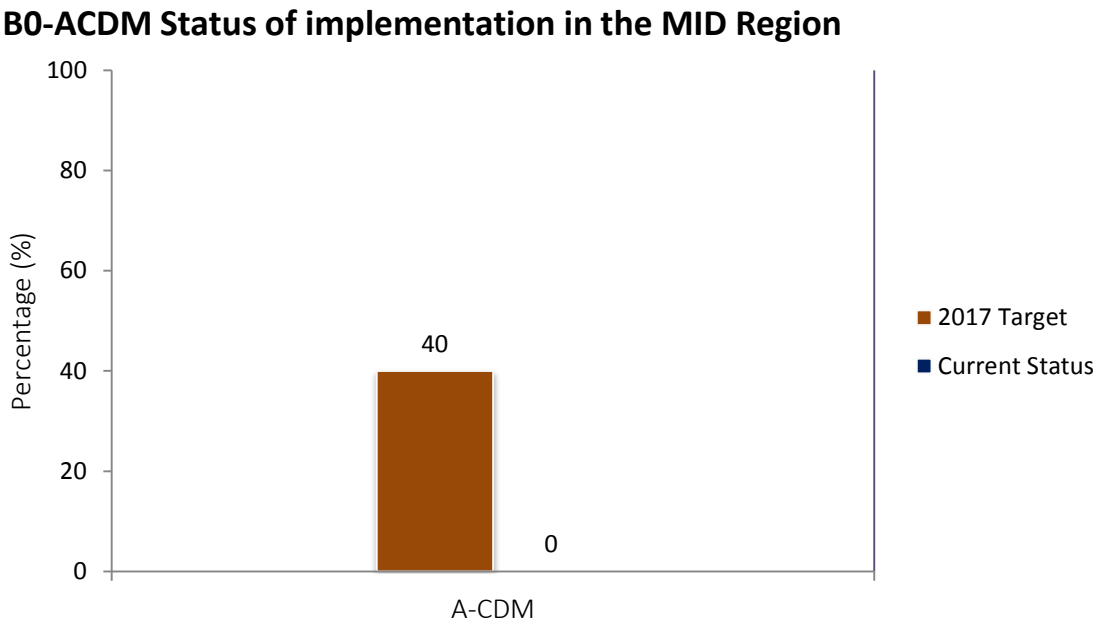
B0-SURF Status of implementation in the MID Region



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 manoeuvering areas and enhance safety, efficiency and situational awareness.

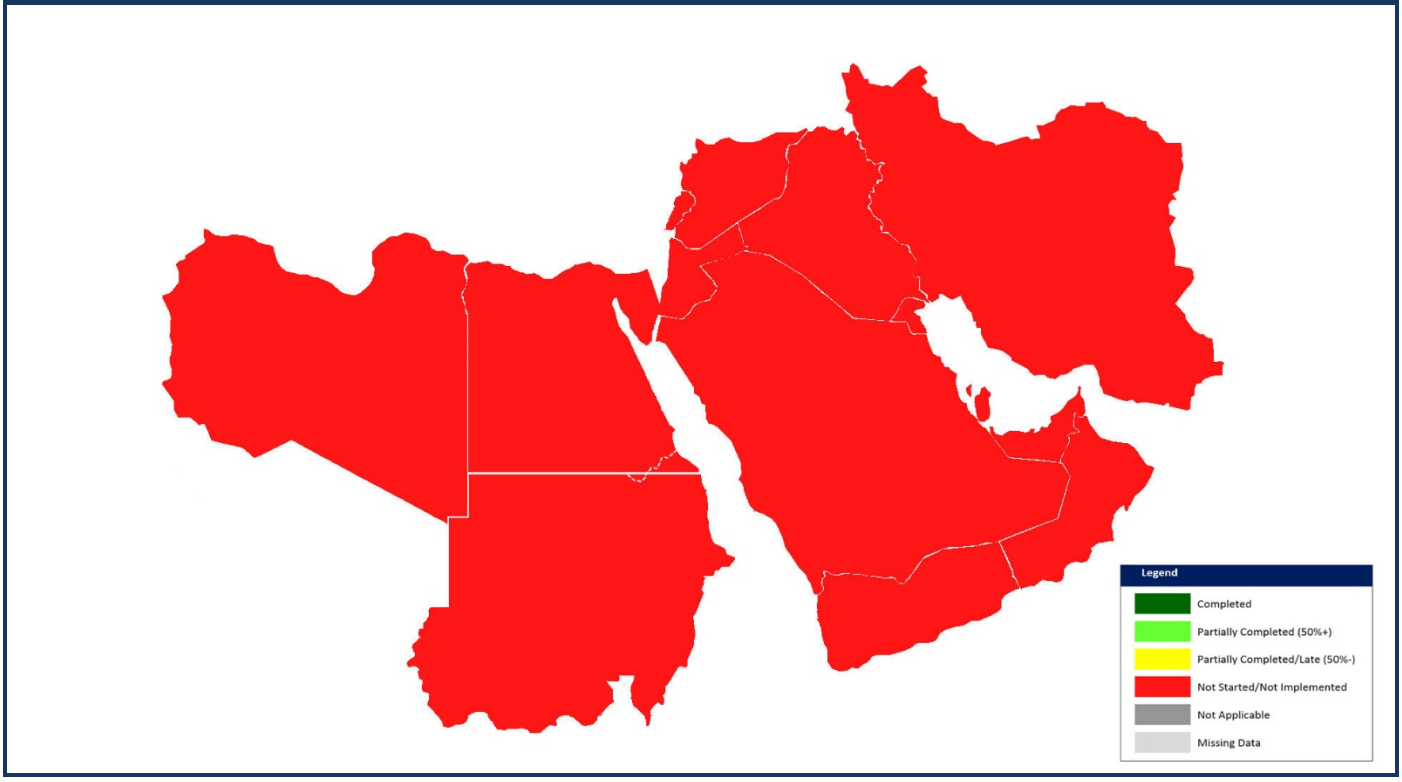
B0 – ACDM: Improved Airport Operations through Airport-CDM			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
A-CDM	OBBI, HECA, OIII, OKBK, OOMS, OTBD, OTHH, OEJN, OERK, OMDB, OMAA, OMDW	Indicator: % of applicable international aerodromes having implemented improved airport operations through airport-CDM Supporting metric: Number of applicable international aerodromes having implemented improved airport operations through airport-CDM	40% by Dec. 2017



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

B0-ACDM has not yet been fully implemented by any MID State. Nevertheless, implementation is ongoing in some States.

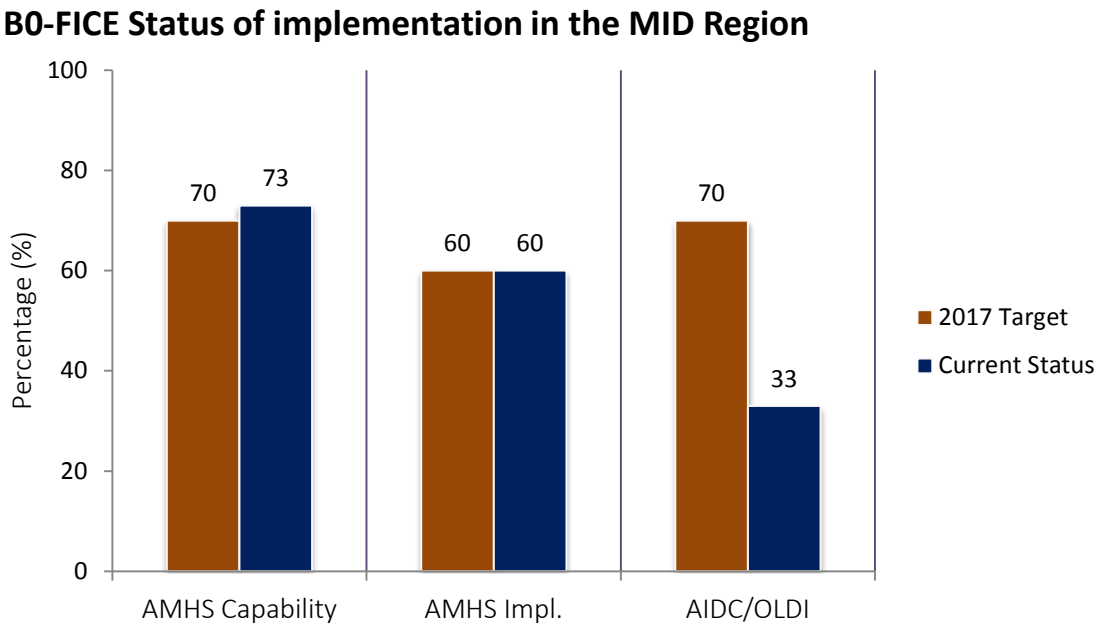
B0-ACDM Status of implementation in the MID Region



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.

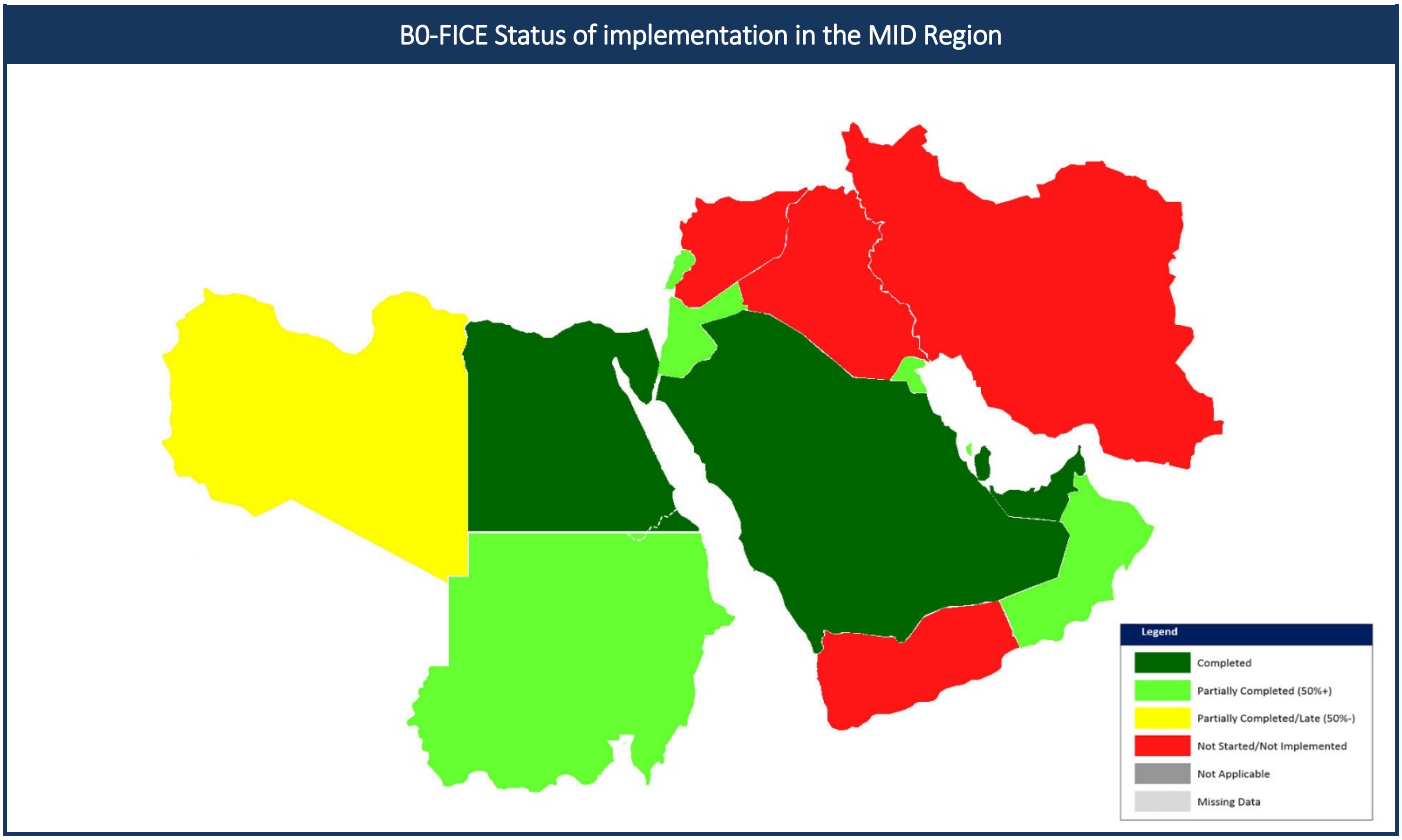
B0 – FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
AMHS capability	All States	Indicator: % of States with AMHS capability Supporting metric: Number of States with AMHS 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



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 acceptable (with approximately 55% implementation).

B0-FICE Status of implementation in the MID Region

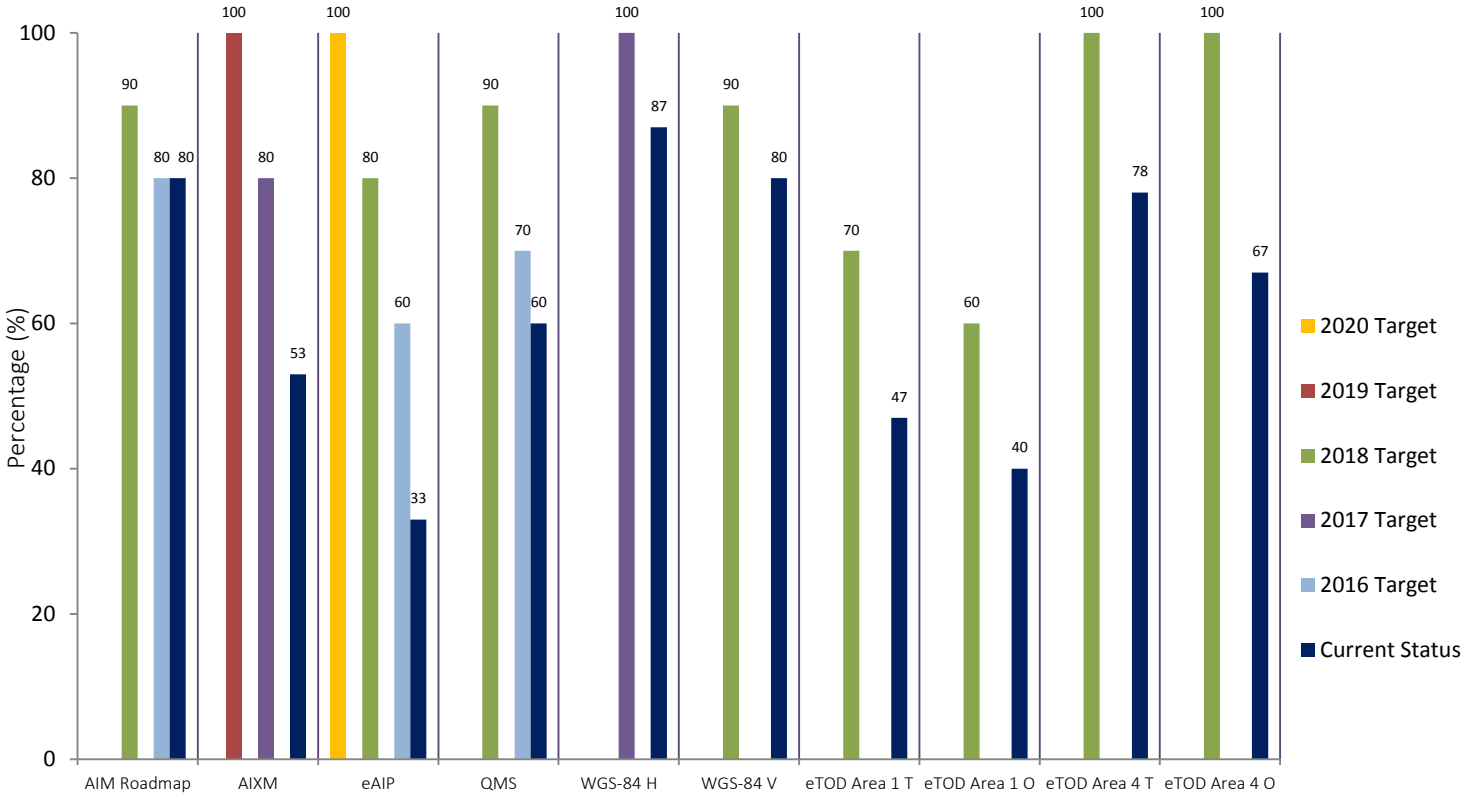


2.2.5 B0-DATM

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	80% by Dec. 2016 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	60% by Dec. 2015 80% by Dec. 2017 100% by Dec. 2019
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)	60% by Dec. 2016 80% by Dec. 2018 100% 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	70% by Dec. 2016 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. 2017 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: 50% by Dec. 2015, 70% by Dec. 2018 Obstacles: 40% by Dec. 2015, 60% by Dec. 2018 Area 4: Terrain: 50% by Dec. 2015, 100% by Dec. 2018 Obstacles: 50% by Dec. 2015, 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	80% by Dec. 2016 90% by Dec. 2018

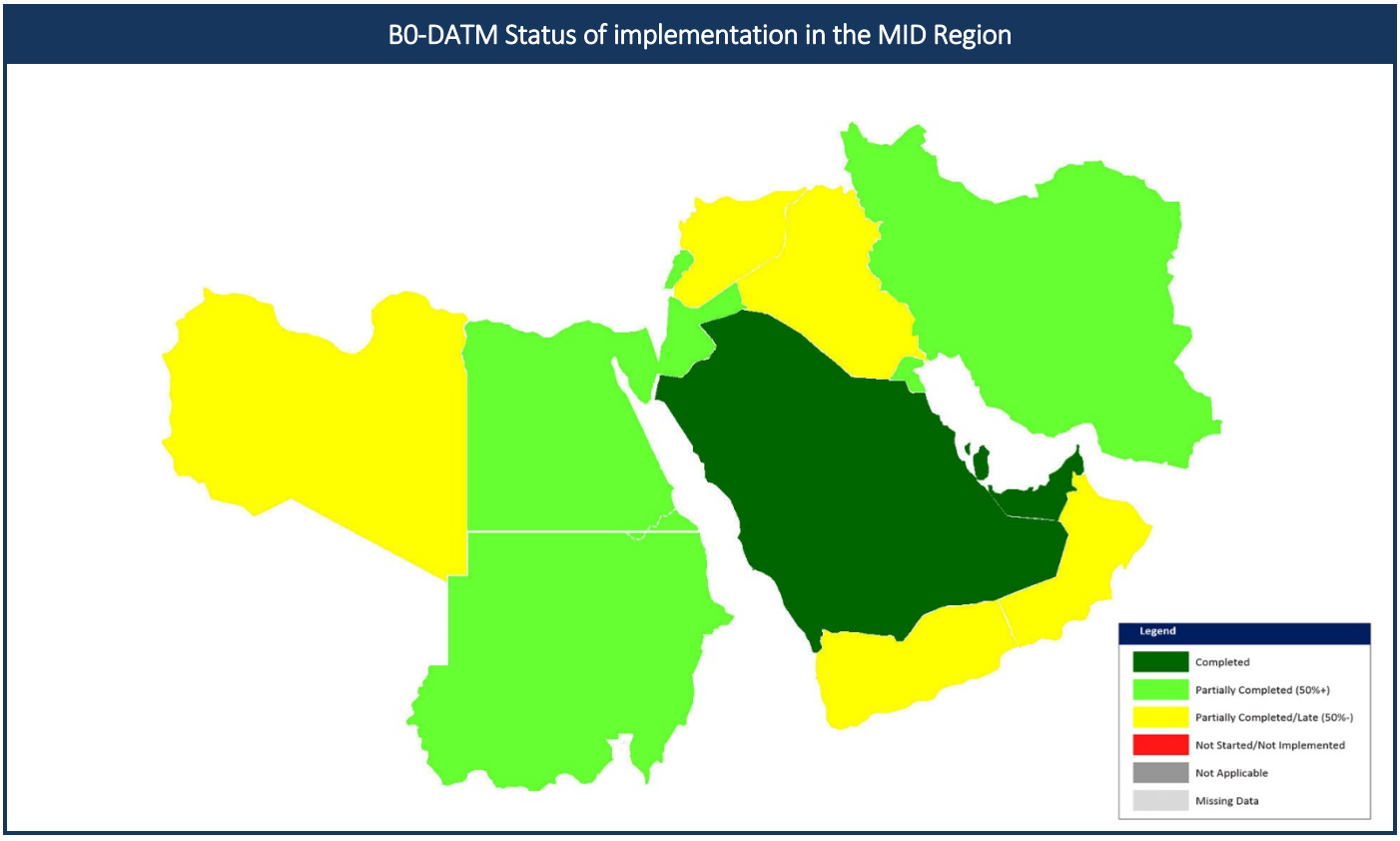
B0-DATM Status of implementation in the MID Region



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-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 acceptable (with approximately 63% implementation). eTOD Area 4 is not applicable in 6 States.

B0-DATM Status of implementation in the MID Region



2.2.6 B0-AMET

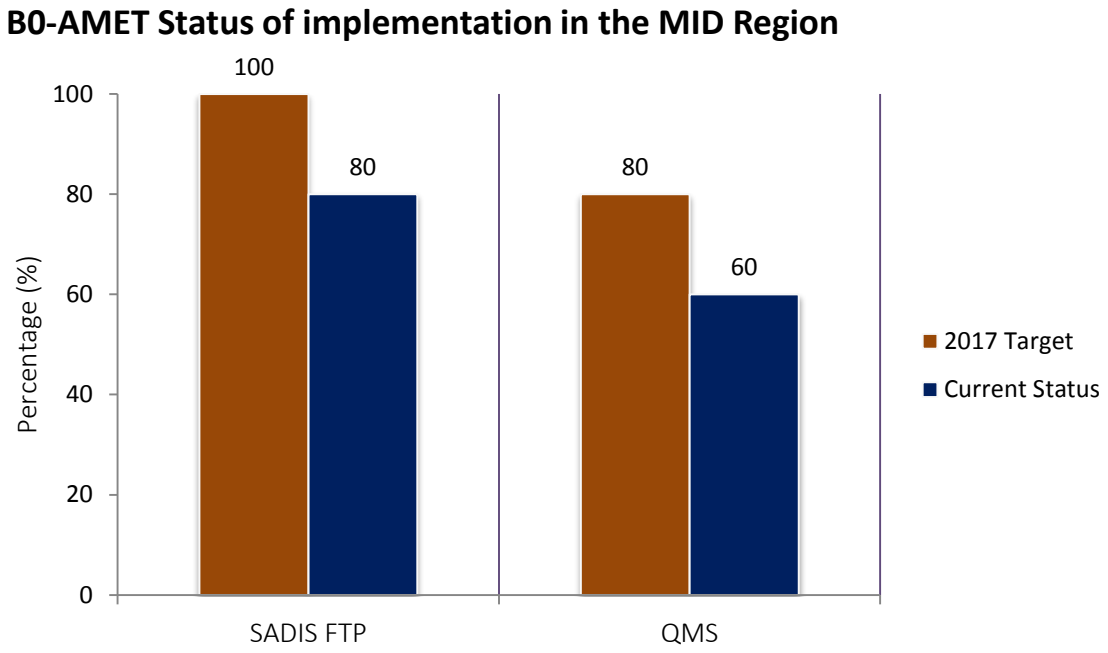
Global, regional and local meteorological information:

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.

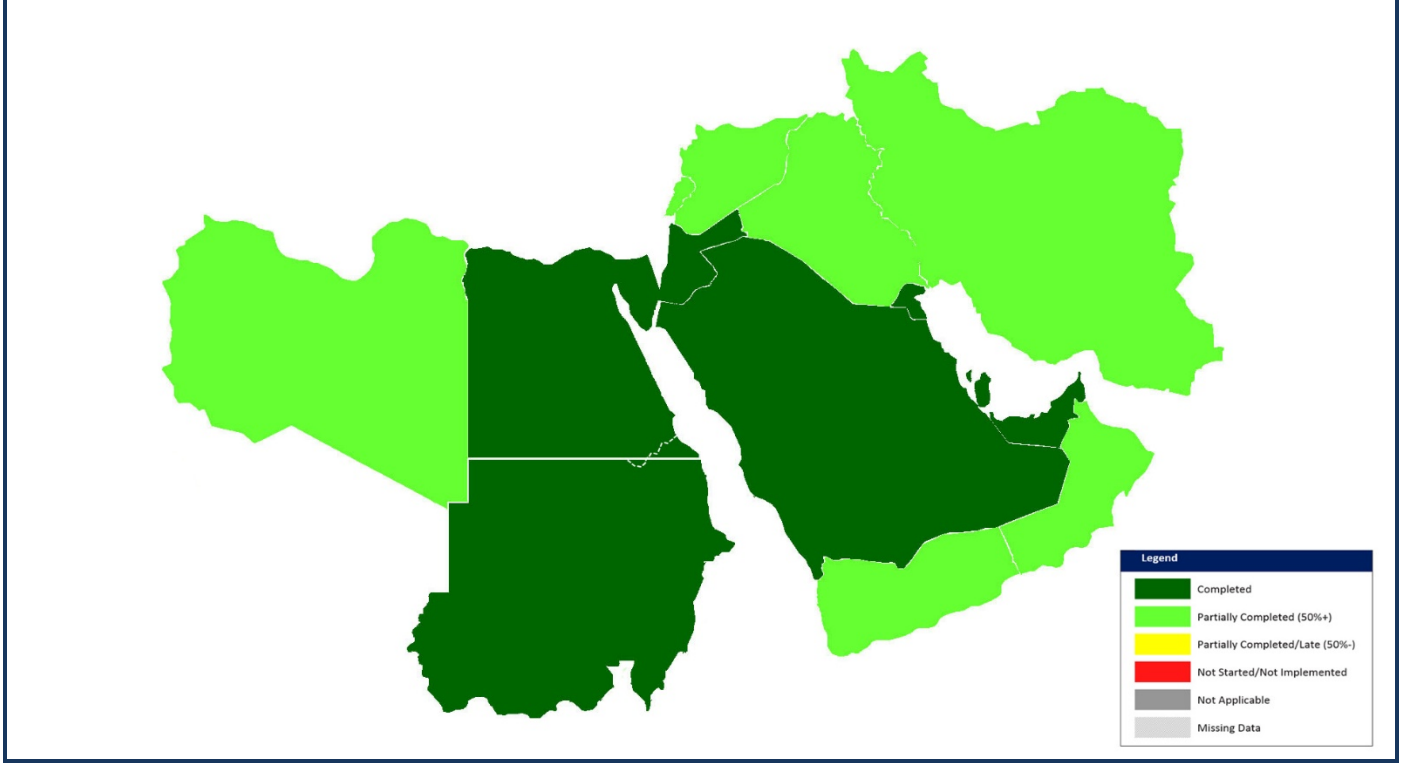
B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
SADIS FTP	All States	Indicator: % of States having implemented SADIS FTP service Supporting metric: number of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service	90% by Dec. 2015 100% by Dec. 2017
QMS	All States	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	60% by Dec. 2015 80% by Dec. 2017



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-AMET	SADIS 2G/Secure SADIS FTP															
	QMS															

The progress for B0-AMET is acceptable (with approximately 70% implementation).

B0-AMET Status of implementation in the MID Region

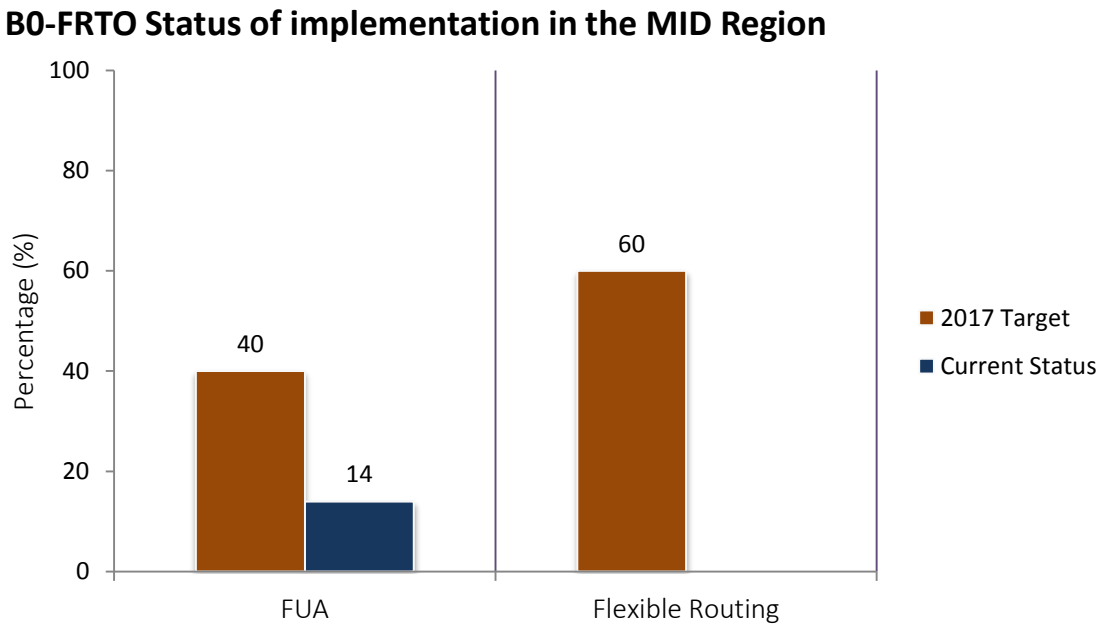


2.2.7 B0-FRTO

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

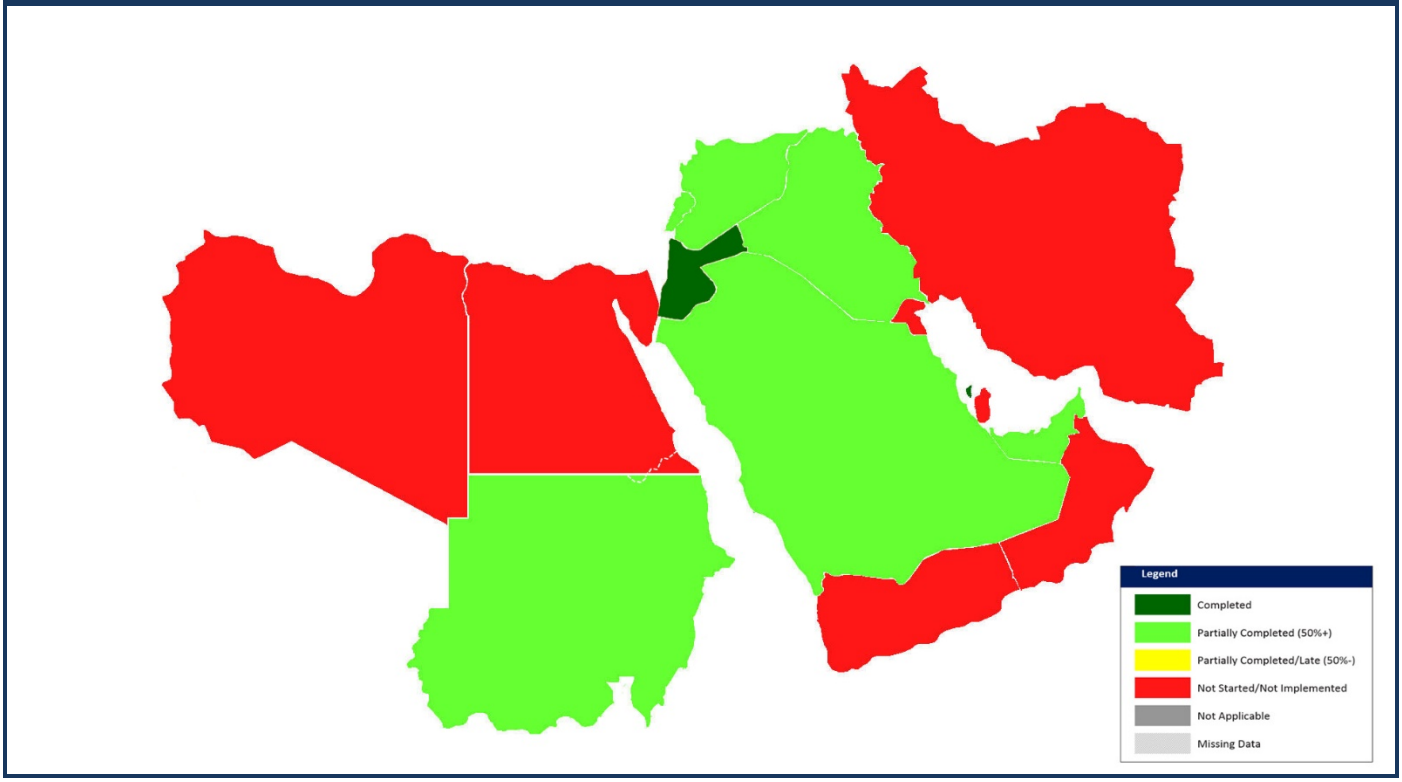
* *Implementation should be based on the published aeronautical information*



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)															
	Flexible routing															

The progress for B0-FRTO (FUA) is very slow (with approximately 14% 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**.**

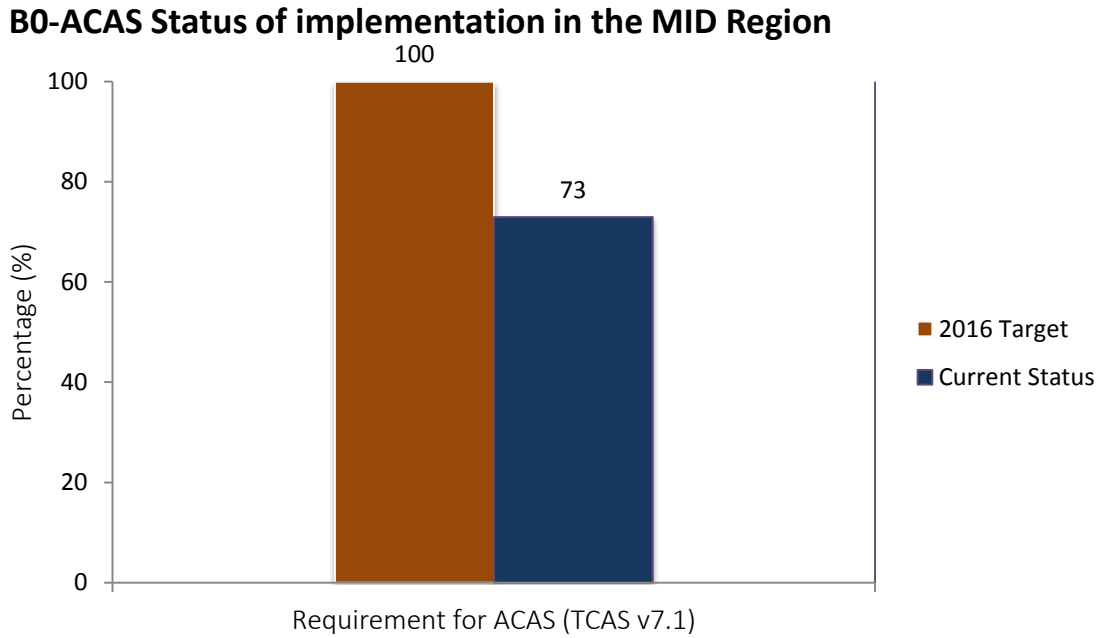
B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
ATFM Measures implemented in collaborative manner	All States	Indicator: % of States that have established a mechanism for the implementation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

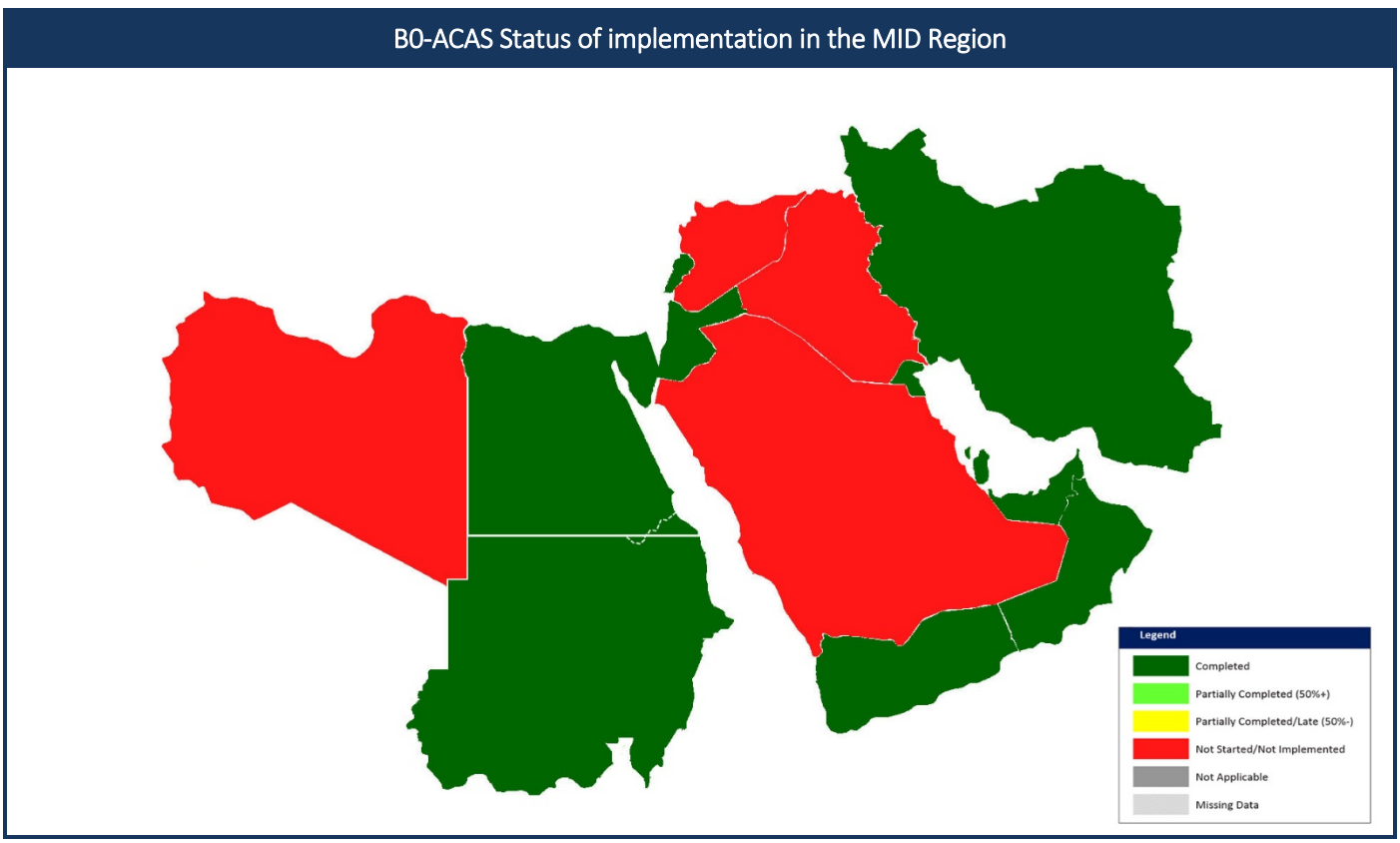
B0 – ACAS: ACAS Improvements			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
Avionics (TCAS V7.1)	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: 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	80% by Dec. 2015 100% by Dec. 2016



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 acceptable (with approximately 73% implementation).

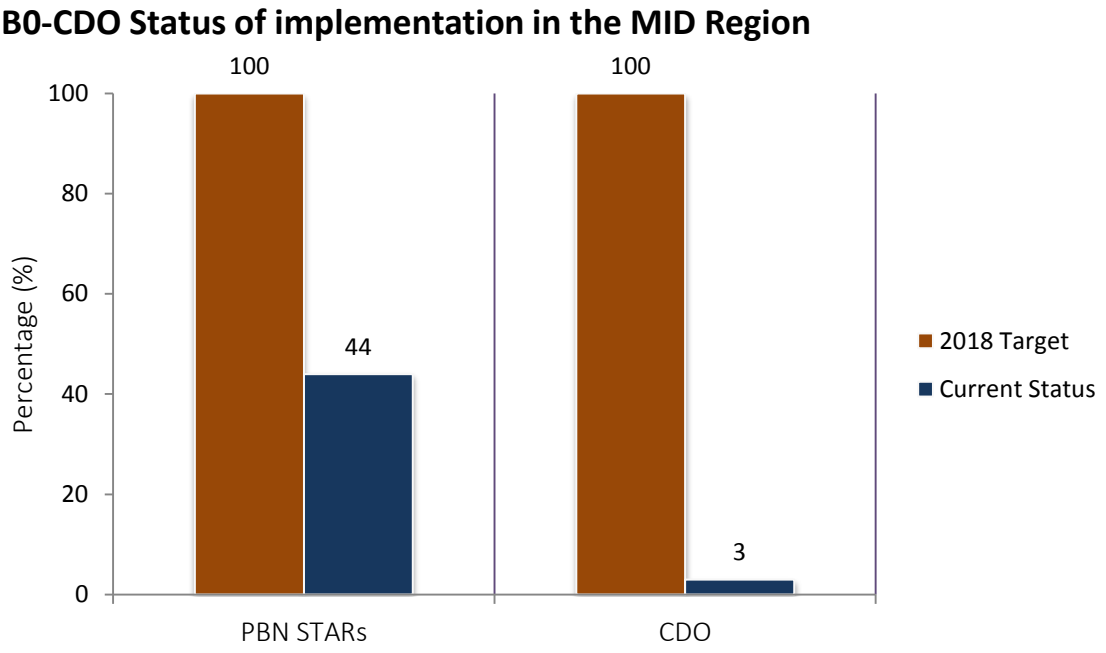
B0-ACAS Status of implementation in the MID Region



2.2.10 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.

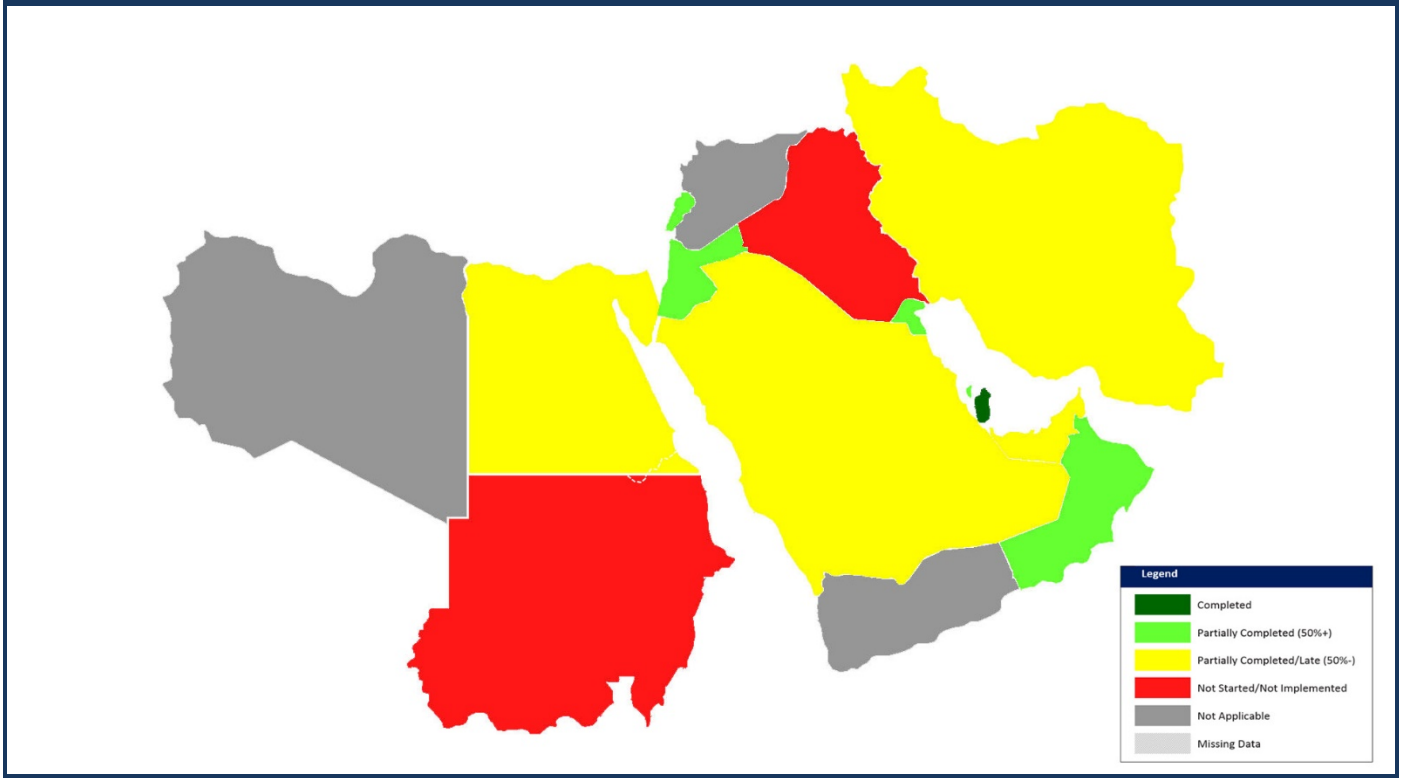
B0 – CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
PBN STARs	In accordance with States' implementation Plans: (OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, OIMM, OIFM, ORER, ORNI, OJAM, 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. 2016 for the identified Aerodromes/TMAs 100% by Dec. 2018 for all the International Aerodromes/TMAs
International aerodromes/TMAs with CDO	In accordance with States' implementation Plans: (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



Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-CDO	PBN STARs															
	International aerodromes/TMAs with CDO															

The progress for B0-CDO is very slow (with approximately 23% implementation).

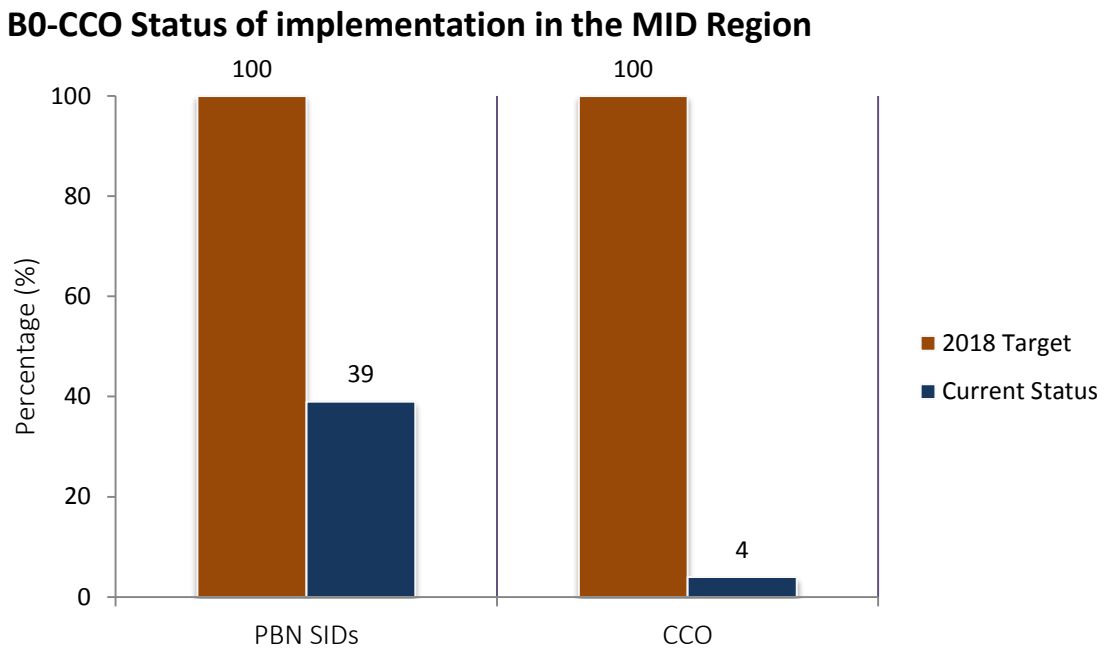
B0-CDO Status of implementation in the MID Region



2.2.11 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.

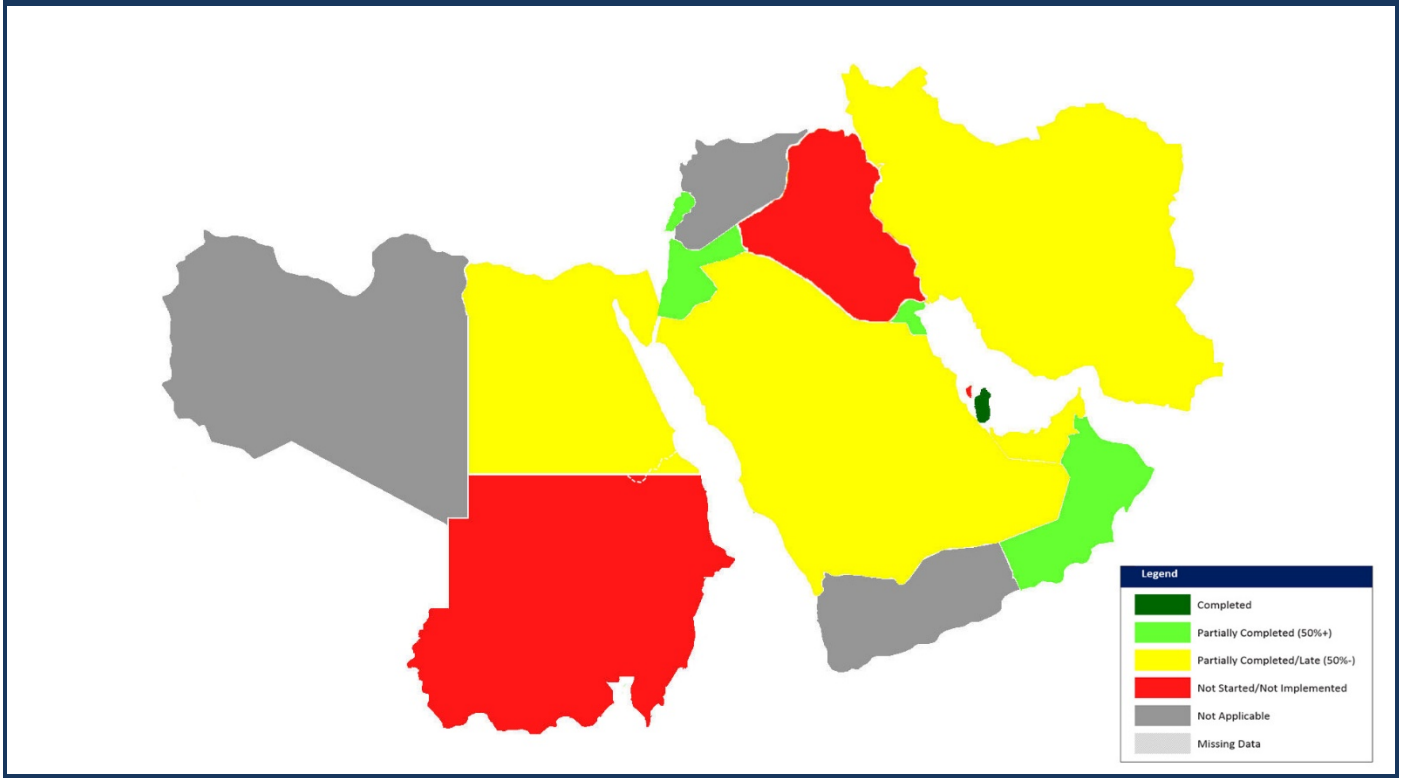
B0 – CCO: Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)			
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**
PBN SIDs	in accordance with States' implementation Plans: OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OISS, OIKB, 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. 2016 for the identified Aerodromes/TMAs 100% by Dec. 2018 for all the International Aerodromes/TMAs
International aerodromes/TMAs with CCO	in accordance with States' implementation Plans: 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 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



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 very slow (with approximately 21% implementation).

B0-CCO Status of implementation in the MID Region



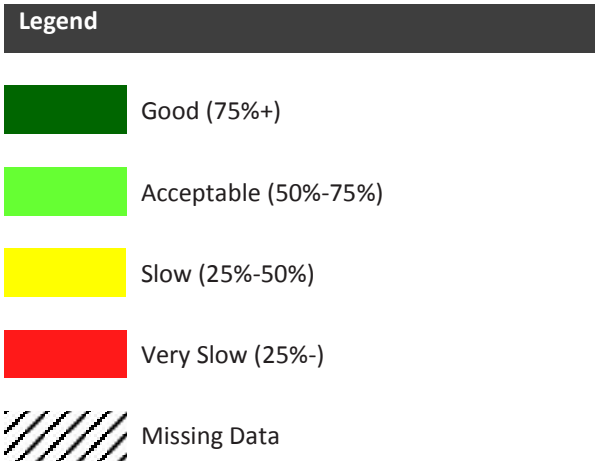
3. ASBU BLOCK 0 IMPLEMENTATION OUTLOOK FOR 2020

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:



Module	Current Status of implementation (approximate rate)	Projected Status of implementation by 2020* (approximate rate)
B0-APTA	33%	**96%**
B0-WAKE	(Priority 2)	**71%**
B0-RSEQ	(Priority 2)	**55%**
B0-SURF	46%	**67%**
B0-ACDM	0%	**50%**
B0-FICE	55%	**83%**
B0-DATM	61%	**87%**
B0-AMET	70%	**92%**
B0-FRTO	14%	**71%**
B0-NOPS	(Priority 2)	**46%**
B0-ASUR	(Priority 2)	**70%**
B0-ASEP	(Priority 2)	**69%**
B0-OPFL	(Priority 2)	**60%**
B0-ACAS	73%	**100%**
B0-SNET	(Priority 2)	**92%**
B0-CDO	10%	**67%**
B0-TBO	(Priority 2)	**44%**
B0-CCO	19%	**63%**

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

4. ENVIRONMENTAL PROTECTION

4.1 Global Developments related to Environmental Protection

Environmental Protection represents one of the ICAO strategic objectives. Significant advances have been made in reducing the amount of noise and emissions produced by international civil aviation. For example, significant technological progress has resulted in aircraft produced today being approximately 75 per cent quieter and 80 per cent more fuel efficient per passenger kilometer than in the 1960s.

The international aviation consumed approximately 142 million metric tons (Mt) of fuel in 2010. By 2040, it is expected that despite an anticipated increase of 4.2 times in international air traffic, fuel consumption is projected to increase by only 2.8 to 3.9 times over the same period.

The 39th ICAO General Assembly, Montreal, Canada, 27 September – 6 October 2016, agreed on the Assembly Resolution A39-1, A39-2 and A39-3 related to the Environmental Protection which superseded A38-17 and A38-18:

A39-1 Consolidated statement of continuing ICAO policies and practices related to environmental protection – General provisions, noise and local air quality

A39-2 Consolidated statement of continuing ICAO policies and practices related to environmental protection – Climate change

A39-3 Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) Scheme

4.2 State's action plan on CO2 emission

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.

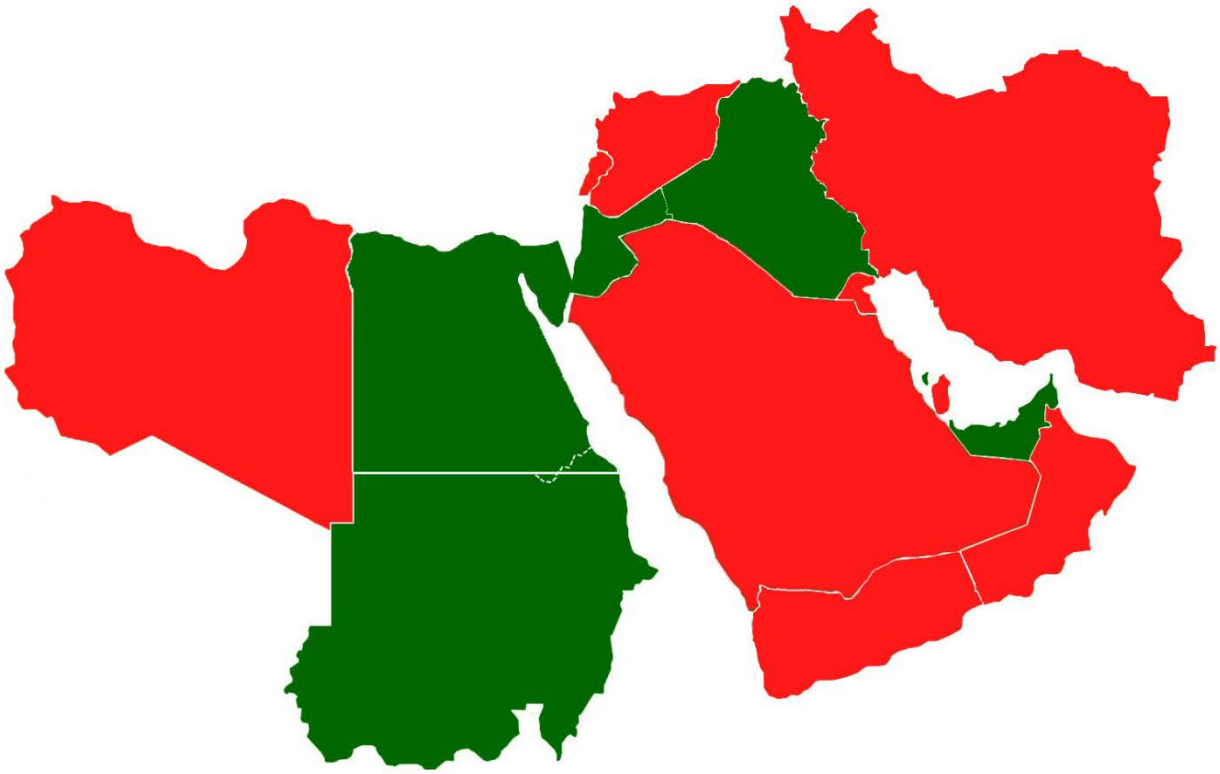
The MIDANPIRG/14 meeting (Jeddah, Saudi Arabia, 15 - 19 December 2013) encouraged States to develop/update their Action Plans for CO2 emissions and submit them to ICAO through the APER website on the ICAO Portal or the ICAO MID Regional Office.

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

Status of State's CO2 Action Plan



4.3 Implementation of operational improvements

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

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

The implementation of ASBU Bloc 0 will lead to enhanced efficiency and savings in aircraft fuel burn. These savings will result in environmental benefits in terms of reduced CO2 emissions.

Some of the operational improvements that had been implemented in the MID Region and those which are planned to be implemented are listed in the Tables below:

Implemented Operational Improvements

- Vast improvements in the regional ATS route network and the implementation of RNAV routes through close cooperation between neighboring States (Bahrain, Egypt, Iran, Iraq, Jordan, Libya and UAE)
- Establishment of new PBN SIDs and STARs (Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia and UAE)
- CCO/CDO implementation (Bahrain and Qatar)
- Implementation of LNAV/VNAV (Egypt, Iran, Jordan, Kuwait, Oman, Qatar, Jordan and UAE)
- Implementation of A-SMGCS (Bahrain, Egypt, Qatar and UAE)
- FUA implementation (Bahrain and Jordan)
- Implementation of Arrival Manager (AMAN) (Bahrain and UAE)
- Implementation of Departure Flow Manager (DFLOW) Web Interface (UAE)
- Improvement of airside structure including enhancing aprons, taxiways (rapid exit taxiways, etc.) (Bahrain)
- Implementation of Single-engine taxi operation (Bahrain, Qatar, UAE)
- Improving situational awareness using modernized aeronautical and MET information management systems (Bahrain, Qatar, Saudi Arabia and UAE)
- Modernization of CNS/ATM infrastructure and equipment (Oman, Qatar, Saudi Arabia, UAE)

Planned Operational Improvements
• Further improvements of the regional ATS route network and the implementation of RNAV1 routes • Establishment of new PBN SIDs and STARs • CCO/CDO implementation • Implementation of LNAV/VNAV • Implementation of A-SMGCS (Iran and Saudi Arabia) • FUA implementation (Egypt, Iran, Jordan, Saudi Arabia, Sudan and UAE) • Implementation of RNP AR approach (UAE) • Further Modernization of CNS/ATM infrastructure and equipment (Iran, Kuwait, Saudi Arabia, Sudan)

4.4 Aviation Noise Management

Aircraft noise is the most significant cause of adverse community reaction related to the operation and expansion of airports. This is expected to remain the case in most regions of the world for the foreseeable future. Public pressure against existing operations and the development of new infrastructure could have a negative influence on the future growth of the aviation industry.

Reducing or limiting the effect of aircraft noise on people and the communities they live in is one of ICAO's environmental goals. However, the forecast growth in aviation will result in an increase in the number of people impacted by such significant aircraft noise. This may lead to an increasing community opposition to future airport development and growth.
The Balanced Approach needs to be implemented with equal emphasis given to all of its four elements; reduction of noise at source, land use planning, noise abatement operational procedures and operational restrictions. Because local conditions need to be taken into account, the implementation will continue to be on an airport-by-airport basis.

The airport authority should work closely with those authorities responsible for land-use management to educate them regarding the noise impact of aviation operations. ICAO Contracting States should provide a leadership role by encouraging local and regional authorities to implement land-use planning and management around airports through appropriate early action and cooperative mechanisms between interested stakeholders, such as coordination committees.

In the MID Region, 3 out of 66 International Airports (5%) (HECA, HEGN and HESH) are equipped with noise monitoring system. However 19 International Airports (29%) have considered noise abatement procedures/restrictions in AIPs (OBBI, HECA, OIFM, OISS, OIII, ORMM, ORER, ORNI, OJAM, OKBK, OLBA, HLLB, HLLS, HLLT, OEJN, HSSS, OMAD, OMDB and OMFJ).

5. SUCCESS STORIES/BEST PRACTICES

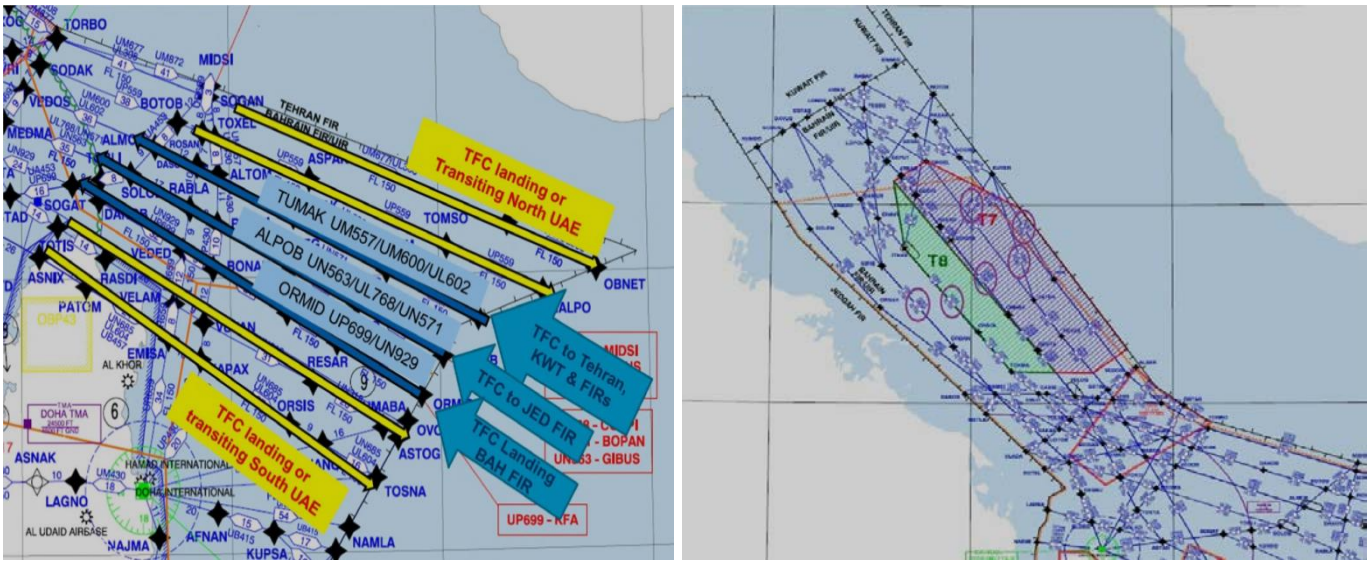
5.1 BAHRAIN

I. Bahrain FIR RNAV1 New Route Structure (Implemented since 2013)

Bahrain has introduced a set of new RNAV1 routes and entry/exit points providing routings closer to users preferences, the restructured routes were designed for specific traffic flow patterns, greater routing possibilities, and reduced congestions through trunk routes/busy crossing points, resulting in reduced flight track miles, reduced fuel combustion and reduced CO2 emissions.

In addition, the reduction of traffic convergence within Bahrain Central sector (one of the most complex and busiest sectors in the MID Region), traffic flow from the Kuwait FIR can now transit and/or land into UAE FIR without requiring as much intervention against traffic transiting from Jeddah FIR and vice versa, resulting in majority aircraft within Bahrain FIR reaching optimum cruising levels without interventions, thus a significant reduction of CO2 emissions and further environmental benefits.

In addition to the above, as a result of the implementation of the FIR route restructure, in the dynamic tactical use of military airspace context, about 220 aircraft per day fly on airways (UL602, UT602, UM444 & UL443) exiting the FIR via point ROTOX and about 110 aircraft per day fly on airways (UT677, UT975 & UT438) entering the FIR via point KUVER, are benefiting from approximate savings of about 2% of fuel burn and saving up to 3,000kgs of CO2 emissions per 10-hours intercontinental flights.



Bahrain FIR New Rote Restructure (May 2013)

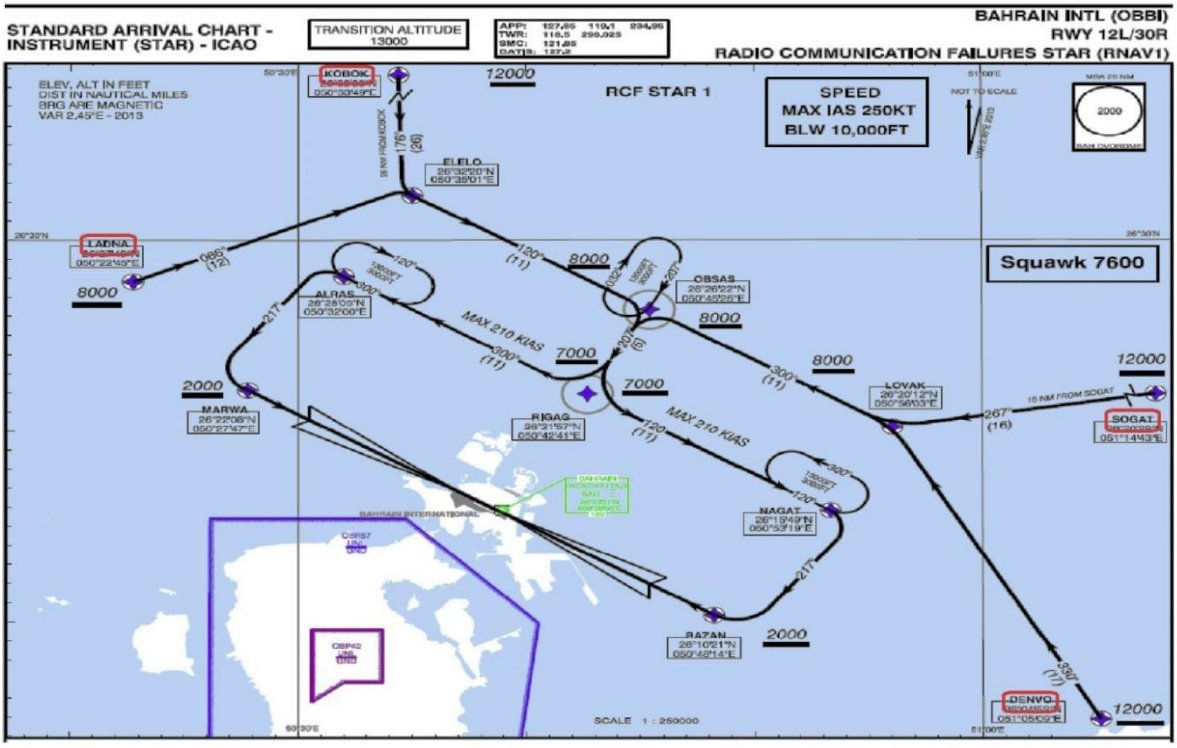
II. Bahrain TMA CDO operations, (implemented since March 2015)

The following savings are an example of an approximate result of 75% CDO Implementation within Bahrain TMA, the CDO operations within the Bahrain TMA are constrained with the adjacent airspaces close proximity, complexity and limitations;

The example is based on the ASBU Working document, Module B0-CDO, Appendix B, Cost Benefit Analysis;

- CDOs LADNA 1, KOBOK 1, SOGAT 1 and DENVO 1 STARs (RNAV1) for runway 12L/30R, implemented since March 2015, and in use full time at Bahrain;
- About 150 - 160 aircraft per day fly LADNA 1, KOBOK 1, SOGAT 1 and DENVO 1 STARs representing approximately 80% of all jet arrivals into Bahrain, 80% per cent reduction in radio transmissions; and
- Significant fuel savings – average 125 pounds per flight, 150 flights/day * 125 pounds per flight * 365 days = 6.85 million pounds/year; and
- More than 1 million gallons/year saved = more than 20.5 million pounds of CO2 emission avoided.

Due to the limited space in this document, the Radio Communication Failures STARs chart is used to demonstrate the combined chart of LADNA 1, KOBOK 1, SOGAT 1 and DENVO 1 (RNAV1) STARs;



Bahrain runway 12L/30R Radio Communication Failures STARs (RNAV1) Chart

III. Bahrain installation of ASMGCS (Installed and operational in 2016)

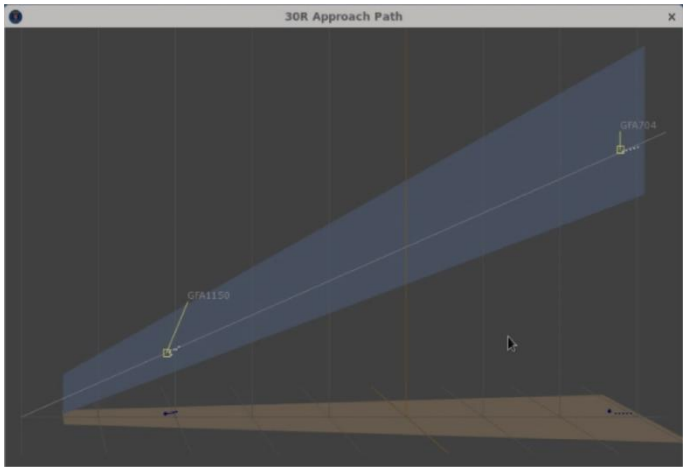
The following environmental savings are some examples of the results of installing and implementing ASMGCS at Bahrain International Airport.

The aviation fuel burn during Low Visibility Procedures awaiting taxi clearances together with the fuel burn at the departure holding points awaiting release causes the excessive emissions of carbon dioxide and harmful environmental emissions. The installation of the (ASMGCS) at Bahrain International Airport has resulted in a significant reduction of CO2 emissions and other environmental benefits.

Based on a medium WVC aircraft type, such as the Boeing 737-400, and an average saving of 5% in taxi time at airports with 350,000 movements per annum, this would result in approximate savings of:

- 1,470,000 kg fuel burn,
- 4,630,000 kg CO2, and
- 1,230 kg SO2.

In addition, monitoring and using the ASMGCS by the approach units for a better situational awareness has resulted in a reduction of sequencing gaps of arriving traffic, thus, greater traffic utilization and coordination with the tower units for better departures startup times together with reduced taxi times management at the airport. Planned (under study) CAT II operations will take further advantages of this system.



5.2 JORDAN

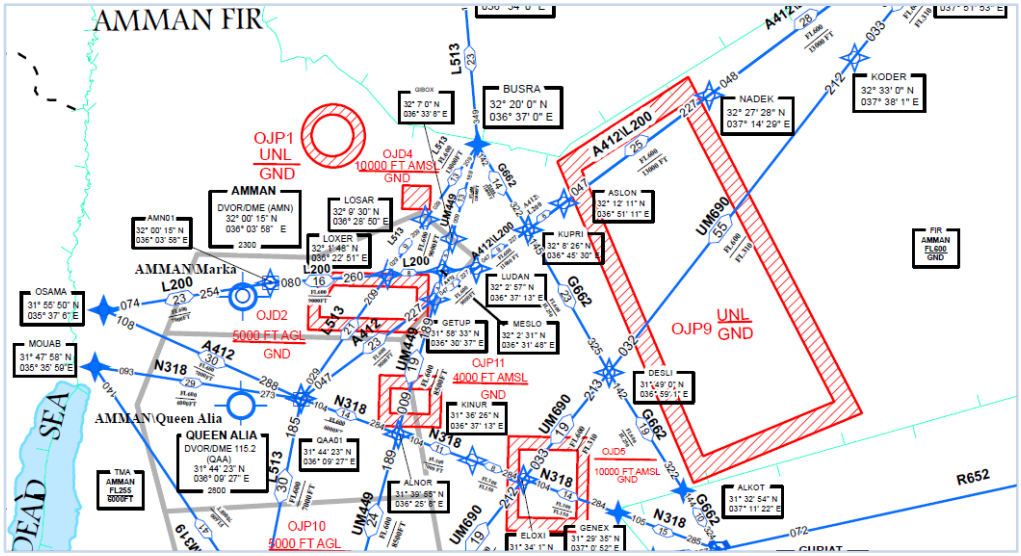
I. FRTO Implementation

Flexible Use of Airspace (FUA) concept was the major outcome of the coordination with Military Authorities, the process of coordinating of all events and activities with the military were indicating adoption for the main principle of FUA within Amman FIR.

Jordan has complied with the airspace requirements as a policy and formed a joint civil and military coordination committee in 2006, which formulates the National ASM policy and carries out the necessary strategic planning work, taking into account National and International airspace Users' requirements. A Letter of Agreement (LoA) has been signed with the military authorities, identifying the area of responsibility and coordination process between civil and military.

At the pre-tactical level, an Airspace Management Cell (AMC) has been established earlier as a joint Civil/Military ASM to conduct all the activities as a cooperative effort and the Civil Aviation Regulatory Commission (CARC) has nominated focal points for this purpose.

A Conditional Route (CDR) had been established since 2011 called UM690, constituting short cut route crossing over military airspace as a permanently plan able CDR, and published in Jordan AIP ever since. CDR are also implemented within QAIA TMA as potential temporary reservations (e.g. TRA or TSA), with opening/closure conditions resulting from associated military activities. Jordan recognizes that, with these actions taken, Flexible Use of Airspace is adopted and implemented within Amman FIR.



5.3 UNITED ARAB EMIRATES

I. Arrival Manager (AMAN)

UAE economy is continuing its growth and the aviation industry is contributing more than 14% to the GDP of the country. The growth in the number of air traffic movements to Dubai International Airport in general and Emirates Airlines in particular is continuing to be on the rise since the year 2005. This was causing some imbalance between the capacity and demand at certain time periods of the day. The type of hub operation of Emirates Airlines and flydubai fueled into this. This caused an increase in airborne holding and delays. The issue alarmed the managements of UAE General Civil Aviation Authority (GCAA) and Dubai ANS (dans) to find short, mid and long term solutions to address the issue. The Arrival Manager (AMAN) is one of such initiative that is in operational use for Dubai International Airport since March 2013.

AMAN is an arrival sequencing support tool. It supports Air Traffic Controllers to take operational decisions for optimized arrivals sequencing based on aircraft performance, wind data and surveillance position reports. About 40% of arriving traffic to Dubai International Airport is conceding delays. The initial implementation of the AMAN had two activities running in parallel. The trial run of AMAN in the Area control Centre (ACC) with live traffic carried out by GCAA and the redesign of arrival procedures to the Terminal Area (TMA) carried out by dans. These activities helped the Air Traffic Controllers to gain knowledge about the system and procedures, at the same time increased the system trust and confidence between the managements of both organisations. This was a catalyst for the implementation of AMAN. The result was encouraging and this gave the management further confidence to introduce more enhancements such as grouping of traffic based on Wake Turbulence Category (WTC) and APO to squeeze the last bit of space available in the final approach. The table below indicates the average delay conceded by each category of aircraft before and after implementing AMAN.

	Before AMAN	After AMAN	
Category (WTC)	December 2012	August 2013	October 2016
Heavy	0:08:39	0:07:15	0:06:30
Medium	0:05:38	0:06:03	0:05:10
Super Heavy	0:09:13	0:07:43	0:06:19

Table 1-Average of reduction in overall delay

- **Quantitative benefits of AMAN implementation:**

1. *Consistency in inbound flow resulting in increased runway throughput:*

The performance of Air Traffic Controllers vary from one individual to another in stressful situations. This had some negative impact in achieving maximum arrivals in an hour.

AMAN brought in consistency in arrival rates by supporting Air Traffic Controllers in decision making at ACC and APP ATSUs. This increased the runway throughput. The table below is a comparison of hourly arrival rates before and after AMAN implementation, i.e. how many occasions the hourly arrival was less than 28 or more than 28 per hour.

	Before AMAN	After AMAN	
Arrival Rates	December 2012 (Count of Occasions)	August 2013 (Count of Occasions)	October 2016 (Count of Occasions)
28 or less	677	662	511
More than 28	67	82	233

Table 2-Increase in hourly arrivals

2. *Reduction in Holding Delay and low level vectoring*

Airborne holding of traffic in holding patterns at high altitudes is more effective economically and environmentally in oppose to the vectoring of traffic at lower levels. The airborne holdings cannot be fully eliminated due to surges in demand. AMAN helped to reduce the holding time per aircraft as well as distribute holding delays evenly among traffic from all directions rather than penalizing traffic from a certain direction. Another important gain is the elimination of low level vectoring in the TMA. The table below indicates the average holding delay based on aircraft category before and after AMAN implementation.

	Before AMAN	After AMAN	
Category	December 2012	August 2013	October 2016
Heavy	0:13:16	0:10:59	0:09:19
Medium	0:10:49	0:10:41	0:09:55
Super Heavy	0:12:46	0:10:11	0:09:13

Table 3-Reduction in average airborne holding delays

The picture below illustrates the distribution of delay before and after AMAN:

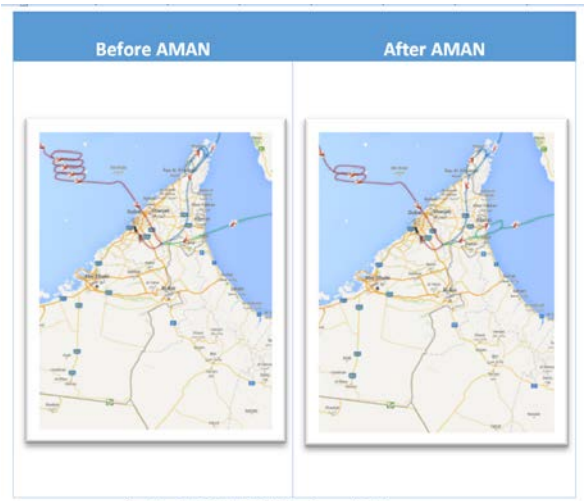


Table 4-AMAN distribution of delays

3. Environmental improvements

New inventions and developments have always been part of dynamic communities so is their impact on planet Earth. The ultimate aim has to be sustainable developments without harming the environment. To this end, the implementation of AMAN has brought in considerable reduction in fuel burn and CO2 emissions. The calculations based on the figures in Table 1 and Table 3 produces the results as listed in the table below for the month of October 2016.

Category	Count of flight in Hold	Minutes saving	Fuel Burn/Minute	Fuel Savings	CO2 Savings
Heavy	1415	2830 minutes	92 KG	260 MT	819 MT
Medium	1723	3446 minutes	46 KG	159 MT	500 MT
Super Heavy	589	1178 minutes	115 KG	135 MT	425 MT

Table 5 - Fuel and CO2 savings - October 2016

- **Qualitative benefits of AMAN implementation:**

1. Improved ATCO Planning and higher Predictability for ATSUs

High predictability contributes to accurate planning and accurate planning optimizes the air traffic service provision. This is one of the benefits brought in by AMAN. AMAN displays to the Air Traffic Controller a Time to Lose (TTL) or a Time to Gain (TTG) considering the demand at the runway. The controller at ACC only have to follow these times. AMAN displays the arrival sequence at Approach facility, as early as 1 hour before arrival, enabling the ATCO to plan for the sequence accordingly.
An example of a TTL display is given below.

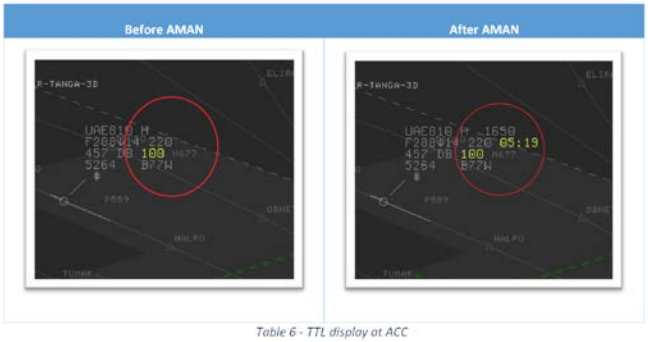


Table 6 - TTL display at ACC

2. Automated calculation of EAT

An additional benefit brought by AMAN to the ACC ATCO with regards to traffic in the holding pattern is the display of Estimated Approach Time (EAT). This was manually calculated by ATCO before AMAN increasing workload for the ATCOs. This proves the reduction in ATCO workload as well as the EATs became more accurate with the implementation of AMAN as it is an automatic process. The ATCOs are now able to communicate accurate to the pilot. This helps the pilot in planning the approach procedures.

3. Improved ground handling

One of the contributors to congestion in the air is the the non-availability of parking stands or ground handling resources. Accurate sharing of landing times greatly improves this situation. AMAN shares estimated time for landing traffic up to one hour before arrival with an accuracy of +/-5 minutes.

II. Departure Flow Manager (DFLOW) Web Interface

Departure flow management system (DFLOW) is a part of the UAE GCAA ATM system used for the allocation of Departure Slot Times (DST). The DSTs are shared with ATSUs and airspace users by way of web interface. The system is operationally used since April 2015.

The requirement for this system was formulated by the National Airspace Advisory Committee (NASAC) Working Group 12 (WG12). NASAC is a committee founded and chaired by UAE GCAA consisting of decision makers from UAE ANSPs, Airport Authorities, Airspace users and the UAE Military.

The key requirements are the following:

No	Requirements	Implementation
1	Availability of departure slots in advance	CTOTs are available up to 6 hours before EOBT, subject to FPL availability
2	Transparency in allocation process	Entire CTOT allocations are displayed to all authorized users by way of web interface
3	Minimal role for Control Tower in departure slots allocation process	CTOT allocations are purely based on ATS Messages

Table 7 - DFLOW Key Requirements

- **Quantitative benefits of DFLOW implementation:**

1. *Increased compliance to DSTs*

The early availability of DSTs and the ability of ATSUs and Airspace Users to manage their DSTs increased the adherence to allocated DSTs. Meeting DST is a huge challenge for airports and airline operations as the compliance window is +/- 2 minutes. The 87% compliance is a true achievement facilitated by the DFLOW web interface despite the traffic growth rate of 6%.

	Before DFLOW Web Interface	After DFLOW Web Interface
Difference between DST and ATD	December 2014	November 2016
On time departure (+/- 2 minutes to DST)	84%	87%
Non-compliance to DST	16%	13%

Table 8 - Compliance to DST

2. *Reduction in ground delays*

The new method of managing and sharing DST information has facilitated the distribution of delay evenly without increasing delay with the growth of traffic.

	Before DFLOW Web Interface	After DFLOW Web Interface
Ground Delay	December 2014	November 2016
Less than 30 minutes delay	78%	85%
More than 30 minutes delay	22%	15%

Table 9 - Ground Delay

3. *Reduction ground delays*

The new method of managing and sharing DST information has made the ATSUs and airline operations to prioritize their departures using the web interface. This has significantly reduced the need for voice coordination.

	Before DFLOW Web Interface	After DFLOW Web Interface
Telephone Calls	December 2014	November 2016
Average number of telephone calls per day from ATSU or Airline Operations to Flow Operator	109	23

Table 10 - Voice Coordination

- **Qualitative benefits of DFLOW implementation:**

1. *The DST allocations are displayed though the web interface. All eligible users are able to view all slot allocations.*

2. *ATSUs and Airspace Users are able to manage their priorities themselves using the web interface.*

III. First System Activation (FSA) messages

Aviation is a complex system and the key to its efficiency depends on various stakeholders working together in a holistic manner. As a first step toward this vision, EUROCONTROL and UAE GCAA entered into a real-time flight data sharing agreement in October 2015.

Every day, there are approximately five hundred flights operated between European airspace and the Middle East. The majority of these flights are originating from or destined to the UAE. Adding to this scenario is the flights from the Asia Pacific region overflying the Emirates FIR to Europe and North America. Accurate information about these flights are still a challenge. Surely, a flight plan will be there for these flights, but further updates such as a delay or a departure information may not be transmitted in good time, or lost in the legacy AFTN or not transmitted at all. It happens often that these flights are unknown to the receiving units until a boundary estimate is received from the transferring unit. This is narrowing the opportunities for accurate predictions resulting in inefficient planning.

The First System Activation (FSA) messages will help to reduce these issues. The FSA messages by UAE GCAA enriches EUROCONTROL's planning and prediction tool and provides accurate information to NMOC that help smoothening of uneven traffic surges at times from these regions. Before starting the FSA messages from the UAE, the planning carried out by EUROCONTROL for the above flights were with a window of +/- 30 minutes based on assumptions. With FSA messages this window is much smaller in size due to the availability and accuracy of the information. The ultimate result of this initiative is the multifaceted efficiency gains for all involved stakeholders from departure to destination. These efficiency gains increases safety and passenger comfort.

The pictures below shows the departure and destination airports that are part of UAE GCAA FSA messages. On an average, 192 flights are accurately predicted by EUROCONTROL NMOC and planned for accordingly.

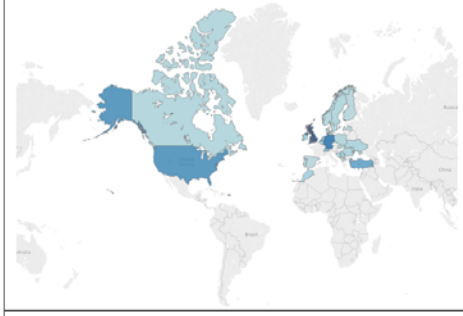
FSA Message Destination Airports	FSA Message Departure Airports
	
Average Daily Traffic Count	**Average Daily FSA Count**
196	192

Table 11- FSA Message Airports & Daily Counts

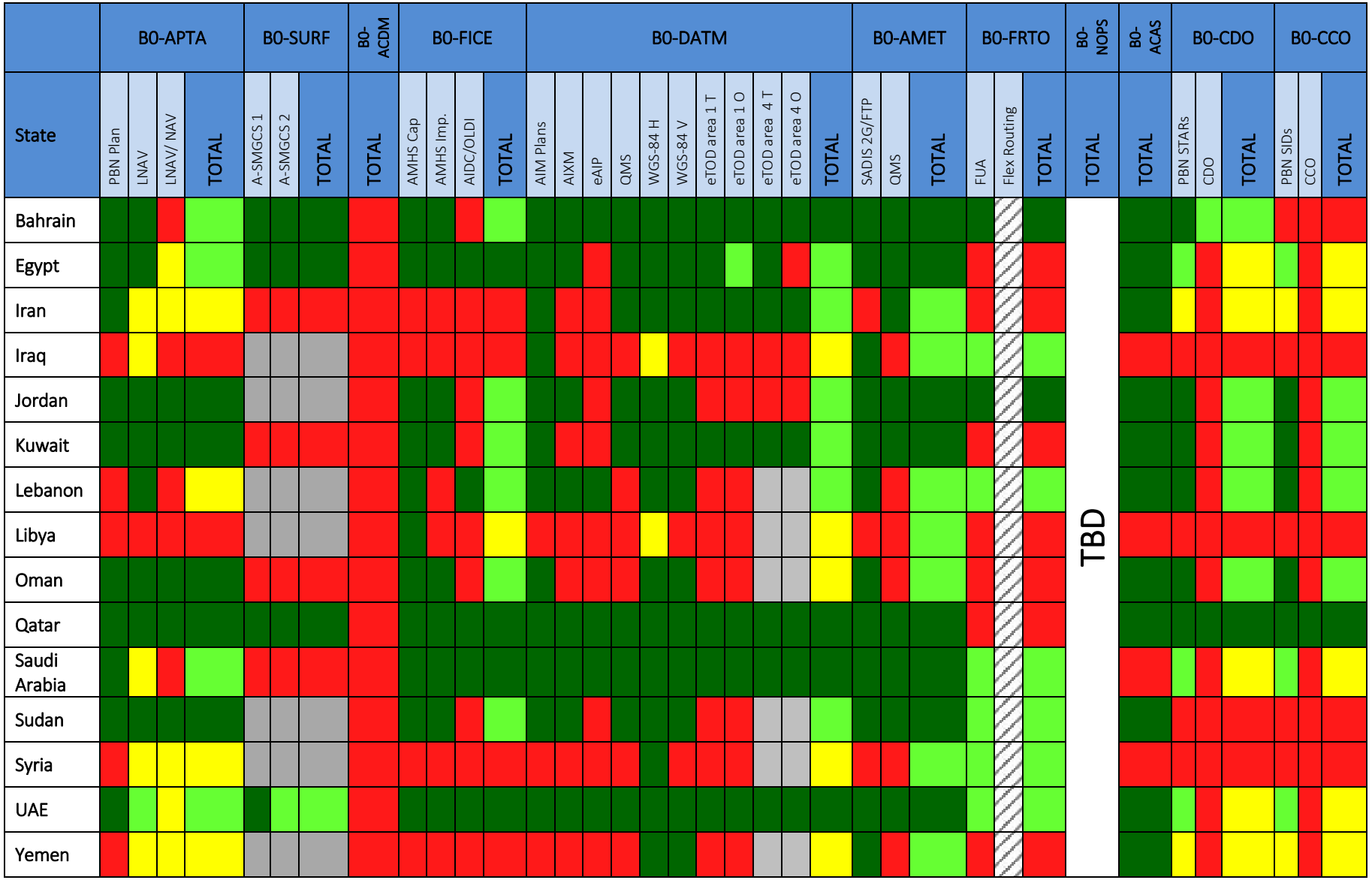
6. CONCLUSION

The progress for the implementation of some priority 1 Block 0 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.

APPENDIX A: STATUS OF ASBU BLOCK 0 MODULES



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	PI	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	MD	MD	MD	N/A	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	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	PI	PI	N/A	PI	PI	PI	FI	PI	PI	PI	PI	PI	FI	PI	PI	PI	PI
Syria	MD	MD	MD	N/A	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	N/A	FI	FI	FI	PI	FI
Yemen	MD	MD	MD	N/A	MD	MD	MD	MD	MD	MD	MD	MD	MD	FI	MD	MD	MD	MD

Legend

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

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APPENDIX 5.2.2A

Status of Implementation of Aerodrome Certification in the MID Region

	State	Number of Intl Aerodromes	Number of Certified Intl Aerodromes	Percentage certified
1	Bahrain	1	1	100%
2	Egypt	7	5	71%
3	Iran	9	4	44%
4	Iraq	6	2	33%
5	Jordan	3	2	67%
6	Kuwait	1	1	100%
7	Lebanon	1	0	0%
8	Libya	3	0	0%
9	Oman	2	2	100%
10	Qatar	2	2	100%
11	Saudi Arabia	4	4	100%
12	Sudan	4	3	75%
13	Syria	3	0	0%
14	UAE	8	8	100%
15	Yemen	5	0	0%
	Total	**59**	**34**	**58%**

MID REGION AIM IMPLEMENTATION ROADMAP FOR THE TRANSITION FROM AIS TO AIM

	2014				2015				2016				2017				2018				Priority	Remarks
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
AIXM																					1	The target is to have, 80% by 2018
eAIP																					1	The target is to have 80% by 2020
Terrain A-1																					2	The target is to have 70% by 2018
Obstacle A-1																					2	The target is to have 60% by 2018
Terrain A-4																					2	The target is to have 100% by 2018
Obstacle A-4																					2	The target is to have 100% by 2018
Terrain A-2a																					3	The target is to have 50% by 2018
Obstacle A-2a																					3	The target is to have 50% by 2018
Data Quality Monitoring																					3	Target for 2018: To be implemented by 50% of the States that have implemented QMS at least for the segment originator-AIS (excluding the segment AIS-End user)
Data Integrity Monitoring																					3	
Agreement with data originators																					3	Target for 2018: 50% of the States that have implemented QMS
Terrain and Obstacle for Areas 2b, 2c, 2d and 3																					4	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																					4	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs

***White**: Not started* ***Yellow**: Initial Target* ***Orange**: Intermediate Target* ***Green**: Target for full implementation*

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

GUIDANCE FOR AIM PLANNING AND IMPLEMENTATION IN THE MID REGION

EDITION FEBRUARY, 2017

RECORD OF AMENDMENTS

Edition Number	Edition Date	Description	Pages Affected
0.1	1 September 2015	Initial draft version	All
0.2	7 October 2015	Inputs incorporated by AIM SG/2	All
0.3	April 2016	Change in Doc title; improving order and content of chapters; States comments considered; Reviewed by MSG/5	All
0.4	November 2016	Review by ANSIG/2	All
1.0	February 2017	Endorsed by MIDANPIRG/16	All

TABLE OF CONTENTS

FOREWARD

The “Guidance for AIM Planning and Implementation in the MID Region” has been developed to harmonize transition from AIS to AIM in the MID Region and to addresses Global and Regional issues related to planning and implementation of Aeronautical Information Management. This Regional AIM Guidance material explains concept and operational elements of AIM; outlines the Regional and National AIM Roadmaps; and provides guidance and tools for their implementation at the Regional and National levels.

This Document consolidates updates and supersedes all previous guidance materials on the AIM implementation in the MID Region (National AIM Roadmap Template, Regional AIM Roadmap, etc.). The “Guidance for AIM Planning and Implementation in the MID Region” will be reviewed and updated, whenever deemed necessary, by the AIM Sub-Group.

First edition of the Document, consolidated by the ICAO MID Regional Office, was endorsed by MIDAPIRG/16 (Kuwait, 13-16 February 2017).

The Document was prepared in accordance with ICAO provisions related to AIM, 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 twelfth Air Navigation Conference (AN-Conf/12) Recommendation 3/8 related to AIM. States are invited to take necessary measures to implement provisions of this document and notify their experiences and practices related to transition from AIS to AIM.

Abbreviations and Acronyms

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

AI	Aeronautical Information
AICM	Aeronautical Information Conceptual Model
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
AIS	Aeronautical Information Services
AIS-AIM SG	AIS to AIM Study Group
AIM	Aeronautical Information Management
AIM SG	Aeronautical Information Management Sub-Group
AIXM	Aeronautical Information Exchange Model
AN-Conf/11	Eleventh Air Navigation Conference
AN-Conf/12	Twelfth Air Navigation Conference
ANP	Air Navigation Plan
ANSP	Air Navigations Services Provider
ASBU	Aviation System Block Upgrade
ATM	Air Traffic management
eAIP	electronic Aeronautical Information Publication
eANP	electronic Air Navigation Plan
eTOD	electronic Terrain and Obstacle Data
GANP	Global Air Navigation Plan
GANR	Global Air Navigation Report
GIS	Geographic Information System
GML	Geography Markup Language
IM	Information Management
IMP	Information Management Panel
ISO	International Organization for Standardization
MET	Meteorology
MIDAD	MID Region AIM Database
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group

MIL	Military
MSG	MIDANPIRG Steering Group
PBN	Performance-Based Navigation
QMS	Quality Management System
RWY	Runway
SARPs	Standards and Recommended Practices
SMART	Specific, Measurable, Achievable, Relevant and Timely
SWIM	System Wide Information Management
TORs	Terms of Reference
UML	Unified Modeling Language
WGS-84	World Geodetic System-1984
XML	Extensible Markup Language

CHAPTER 1

ICAO AIM CONCEPT

INTRODUCTION

1.1 The Eleventh Air Navigation Conference (AN-Conf/11) held in Montréal, 22 September to 3 October 2003, endorsed the Global ATM Operational Concept (Doc 9854) and recognized that, in the global air traffic management (ATM) system environment envisioned by the operational concept, aeronautical information service (AIS) would become one of the most valuable and important enabling services. As the global ATM system foreseen in the operational concept was based on a collaborative decision-making environment, the timely availability of high-quality and reliable electronic aeronautical, meteorological, airspace and flow management information would be necessary. Some recommendations of AN-Conf/11 addressed the importance of aeronautical information in particular.

1.2 Aeronautical Information Management (AIM) during its evolution has been defined as the provision of the right Aeronautical Information (quality assured), at the right place (through digital exchange), and at the right time (timeliness). ICAO Annex 15 defines AIM as the *dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties*.

1.3 The Twelfth Air Navigation Conference (AN-Conf/12) held in Montréal, 19 to 30 November 2012, through Recommendation 3/8, supported and pushed:

- Transition from AIS to AIM by implementing a fully automated digital aeronautical data chain;
- Implementing necessary processes to ensure the quality of aeronautical data; and
- Engage in intraregional and interregional cooperation for an expeditious transition from AIS to AIM in a harmonized manner and to using digital data exchange and consider regional or subregional AIS databases as an enabler for the transition from AIS to AIM information from the origin to the end users

TRANSITION FROM AIS TO AIM

ICAO Roadmap for the transition from AIS to AIM

1.4 The aeronautical information/data based on paper and telex-based text messages can not satisfy anymore the requirements of the ATM integrated and interoperable system. AIS is required to evolve from the paper product-centric service to the data-centric aeronautical information management (AIM) with a different method of information provision and management.

1.5 ICAO published in 2009 the "*Roadmap for the transition from AIS to AIM*". The changes foreseen are such that this development is being referred to as the transition from aeronautical information services (AIS) to aeronautical information management (AIM). It identifies the major milestones recommended for a uniform evolution across all regions of the world and specific steps that need to be achieved for implementation.

1.6 The Roadmap envisaged the transition into three phases and twenty one steps. Three phases of action are envisaged for States and ICAO to complete the transition to AIM:

– *Phase 1 — Consolidation*

Phase 1 is the pre-requisite for the transition from AIS to AIM (implementation of the current SARPs). In Phase 1, QMS implementation is still a challenge for some States.

– *Phase 2 — Going digital*

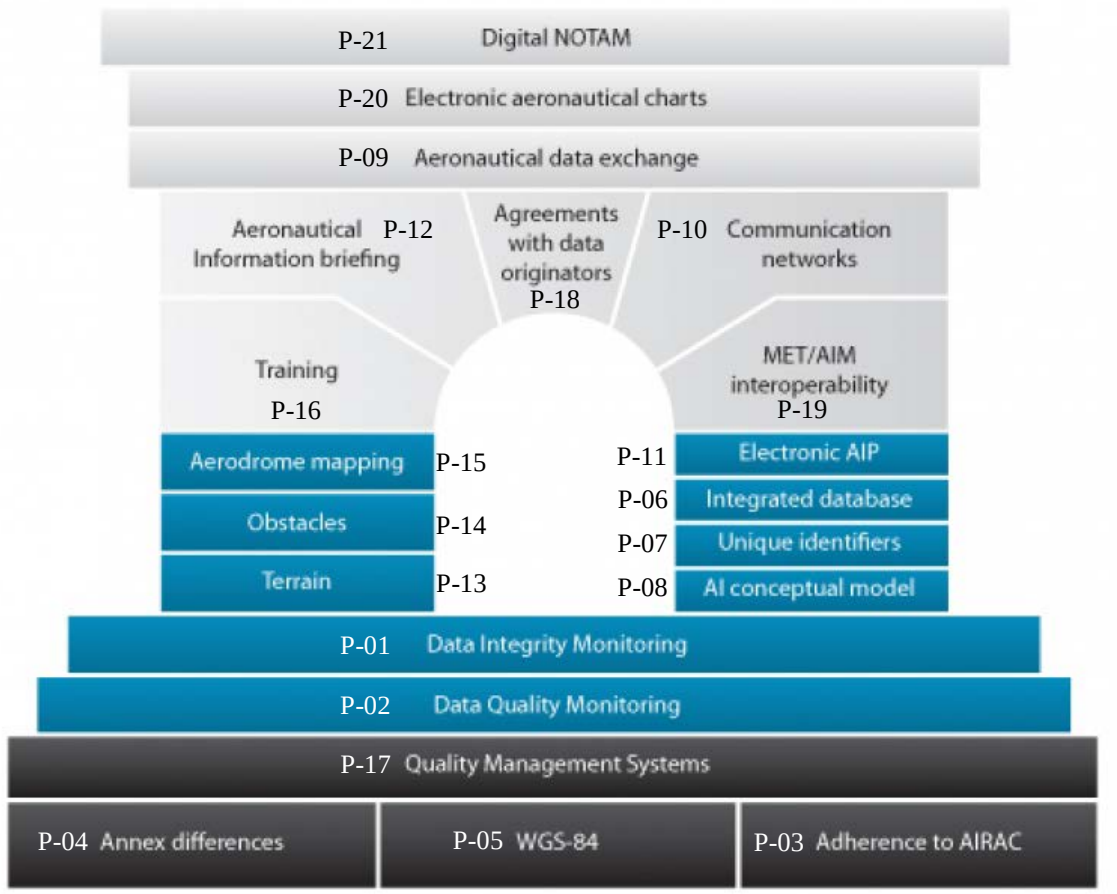
Main components of the Phase 2 are:

- Data-driven processes for the production of the current products;
- Introduction of structured digital data from databases into AIS/AIM processes;
- Introduction of highly structured databases and tools such as GIS;
- Electronic Terrain and Obstacle Datasets; and
- Implementation of aeronautical information conceptual model (AICM).

– *Phase 3 — Information management*

Main components of the Phase 3 are:

- Enabling AIM functions to address the new requirements of the Global ATM Operational Concept in a net-centric information environment;
- Transfer of information in the form of digital data based on the established databases; and
- Aeronautical data exchange model ensuring interoperability between all systems.



Positioning of the 21 steps of the roadmap in the three phases

AIS-AIM Study Group

1.7 The Air Navigation Commission in 2008 agreed to the establishment of AIS-AIM SG in order to assist with the development of:

– A global strategy/roadmap for the transition from AIS to AIM;

– SARPs and guidance material related to the provision of a standard AICM and standard AIXM to enable the global exchange of data in digital format; and

– Other SARPs, guidance material and training material necessary to support AIM implementation.

1.8 Some achievements of the AIS-AIM Study Group have been as follows:

- ICAO Roadmap for transition from AIS to AIM;
- Amendments to Annex 15:
  - Amendment 36: New provisions related to the operational use of the public Internet; volcanic ash deposition; QMS; use of automation enabling digital data exchange; eAIP; NOTAM Format; and eTOD.
  - Amendment 37: Annex 15 restructuring; Chapter 1 (General), Chapter 2 (Responsibilities and functions) and Chapter 3 (Aeronautical Information Management) introduced in Nov 2014;
  - Amendment 40: Chapters 4 (Scope of AI and data), Chapter 5 (AI Products and services) and Chapter 6 (AI updates) instead of current Chapters 4-11 (in progress, applicability date would be November 2018).
- Development of new PANS AIM (in progress, applicability date would be November 2018)
- Development of Aeronautical Data Catalogue (in progress; Appendix A to the new PANS AIM)
- Development of Training Manual, Quality Manual, update of AIS Manual (Doc 8126) (in progress)

1.9 AIS-AIMSG/12 was the last AIS-AIMSG held in Montreal, Canada from 19 to 23 October 2015. Materials related to the AIS-AIM SG including the meetings' Study Notes, Information Papers and Summary of Discussions are available on the ICAO AIM website at:

http://www.icao.int/safety/ais-aimsg/Pages/default.aspx

Information Management Panel (IMP)

1.10 The Air Navigation Commission in 2014 agreed to the establishment of the Information Management Panel (IMP) to elaborate on necessary concepts and develop a global and interoperable approach to ensure effective management of information within the global air navigation system. The IMP will undertake tasks relating to the global transition from AIS to AIM, based upon Recommendations 3/1, 3/2, 3/3 and 3/9 of the Twelfth Air Navigation Conference in 2012 (AN-Conf/12).

1.11 Four (4) Working Groups were established to undertake tasks of the Panel:

- Information Services and NOTAM
- Information Architecture & Management
- SWIM Awareness & Communication
- SWIM Governance

1.12 Materials related to the IMP including the meetings' Working/Information Papers and Reports are available on the ICAO AIM website at:

http://www.icao.int/airnavigation/IMP/Pages/default.aspx

CHAPTER 2

REGIONAL AIM PLANNING

REGIONAL ROADMAP FOR AIM IMPLEMENTATION

2.2 Having Phase I of the transition from AIS to AIM mostly completed in the MID Region, the current focus should be the implementation of phase II of the Roadmap for the transition from AIS to AIM to prepare further transition to Phase III in a timely manner. Accordingly, States should take into consideration the “MID Region AIM Implementation Roadmap” in planning for the transition from AIS to AIM in a prioritized manner.

MID REGION AIM IMPLEMENTATION ROADMAP

	2014				2015				2016				2017				2018				Priority	Remarks
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CHAPTER 3

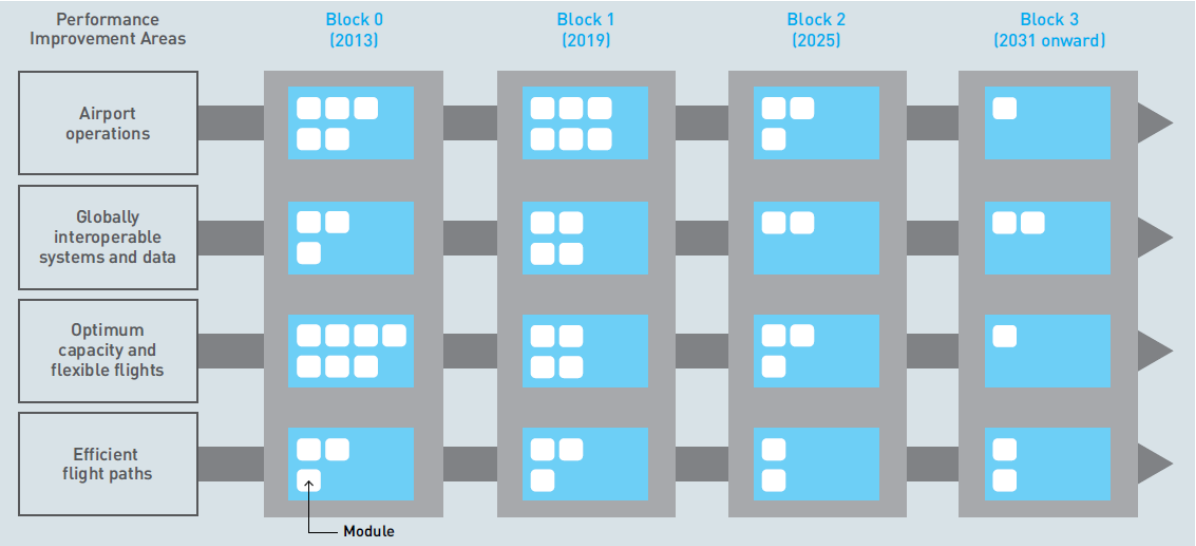
ASBU METHODOLOGY AND THE MID AIR NAVIGATION STRATEGY (AIM/SWIM RELATED ASBU MODULES)

ASBU METHODOLOGY

3.1 ICAO introduced the Aviation System Block Upgrades (ASBU) methodology in the fourth edition of the Doc 9750 (Global Air Navigation Plan), endorsed by the ICAO Assembly in 2013 (further revised by Assembly 39 in 2016), 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.

3.2 The GANP represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives. The Block Upgrades are organized in six-year time increments starting in 2013 and continuing through 2031 and beyond.

3.3 ASBU methodology defines improvements, through modules, over four blocks in four performance improvements areas:



MID REGION AIR NAVIGATION STRATEGY

3.4 Revised MID Region Air Navigation Strategy (MID Doc 002) was endorsed by the MIDANPIRG/16 meeting to introduce Block 0 ASBU Modules implementation priorities, elements, indicators and targets for the MID Region. It recognizes 11 (out of 18) Block 0 Modules as priority 1 in the MID Region (for more information refer to the MID Doc 002 in the ICAO Secure Portal at: https://portal.icao.int/RO_MID/Pages/MIDDocs.aspx).

BLOCK 0 AIM RELATED MODULE

B0-DATM Implementation

3.5 Block 0 contains 18 Modules and serves as the enabler and foundation for the envisioned future aviation systems. B0-DATM is a priority 1 ASBU Module in accordance with the

MID Region Air Navigation Strategy (MID Doc 002). MID Doc 002 defines the B0-DATM as follows:

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

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. 2018

Aeronautical Information Exchange Model (AIXM)

3.6 The aeronautical information exchange model (AIXM) is designed to enable the management and distribution of aeronautical information services data in digital format. AIXM takes advantages of established information engineering standards and supports current and future aeronautical information system requirements. The major tenets are:

a) an exhaustive temporality model, including support for the temporary information contained in NOTAM;

b) alignment with ISO standards for geospatial information, including the use of the geography markup language (GML);

c) support for the latest ICAO and user requirements for aeronautical data including obstacles, terminal procedures and airport mapping databases; and

d) modularity and extensibility.

3.7 AIXM covers the ICAO requirements for the "data necessary for the safety, regularity and efficiency of international air navigation", existing industry standards (e.g. ARINC 424) and emerging data needs. It has constructs for: aerodromes, navigation aids, terminal procedures, airspace and route structures, ATM and related services, air traffic restrictions and other data.

3.8 AIXM has two components:

a) The AIXM UML Model provides a formal description of the information.

b) The AIXM XML Schemas are an encoding format for aeronautical data.

3.9 AIXM 5 takes advantages of established information engineering standards and supports current and future aeronautical information system requirements.

electronic AIP (eAIP)

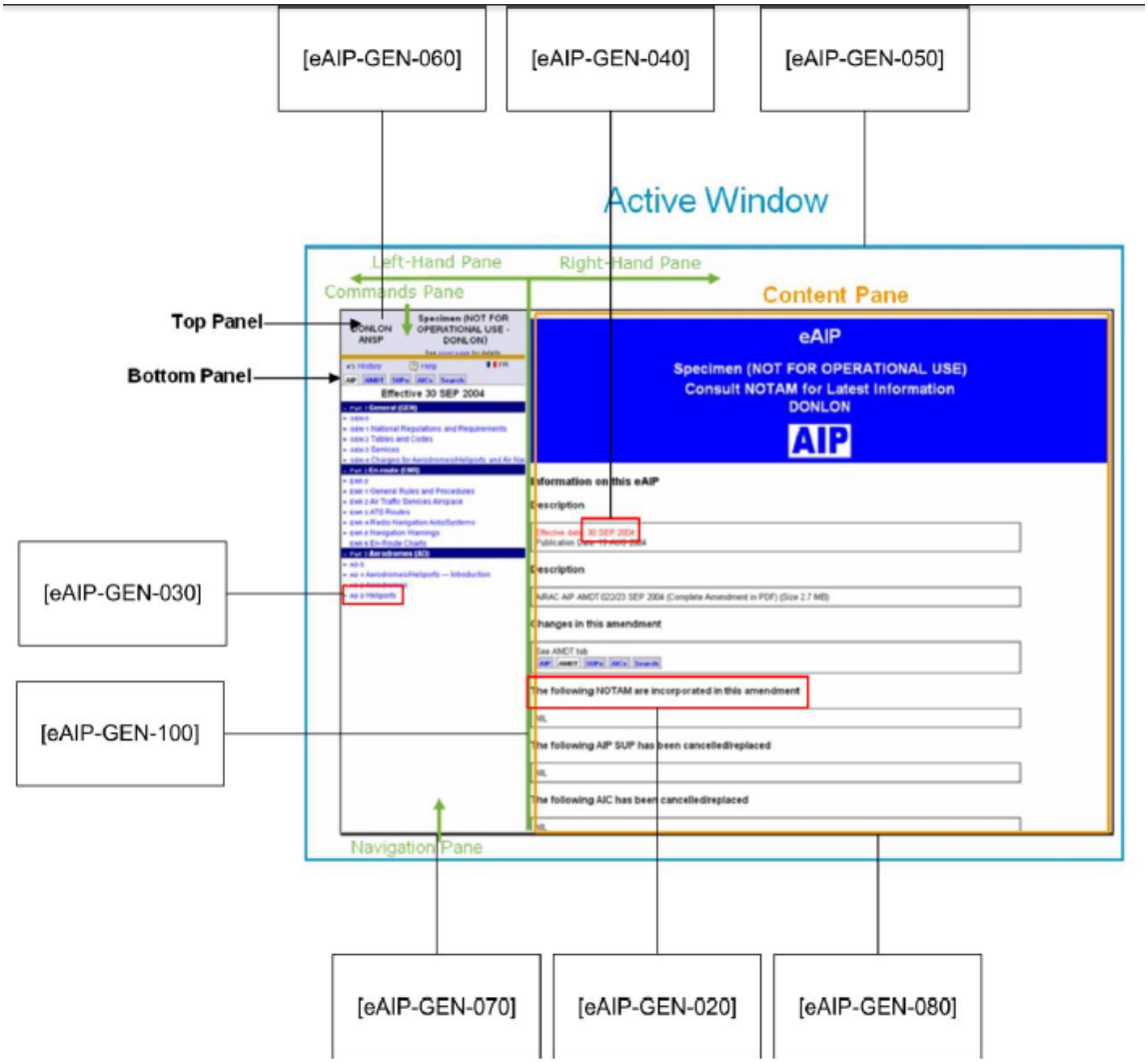
3.10 The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for displaying on a computer screen and printing on paper. When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the Internet. When provided, the 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.

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 - The eAIP is not intended to support the Digital Notice to Airmen (NOTAM) process, as Digital NOTAM require a database of aeronautical information and are, therefore, not reliant on the eAIP.

3.11 Aeronautical data and aeronautical information within the AIPs, AMDTs and SUPs should be made available, as a minimum, "in a way that allows the content and format of the documents to be directly readable on a computer screen".

3.12 General requirements associated with the **display of the eAIP** are reflected below:



3.13 The eAIP, as a minimum, should have help and search facility and provide history of current and previous amendments to users. It should also include a table of content. Format, display and content requirement for AIP Pages, AIP SUP, AIP Amendment and AIC should be in accordance with Annex15, Doc 8126 and other related SARPs.

Note 3 – More guidance material on the specifications of eAIP could be found in the EUROCONTROL Specifications for the electronic Aeronautical Information Publication (eAIP).

Quality Management System (QMS)

3.14 Quality management systems shall be implemented and maintained encompassing all functions of an aeronautical information service. The execution of such quality management systems shall be made demonstrable for each function stage.

Note 1 - An ISO 9000 certificate issued by an accredited certification body would be considered an acceptable means of compliance.

Note 2 - Guidance material is contained in the Manual on the Quality Management System for Aeronautical Information Services (Doc 9839).

Note 3 - Necessary measures should be taken for the signature of formal arrangements concerning data quality between AIS/AIM and the data originators, commensurate with the Aerodrome operators, Air Navigation Service Providers (ANSPs) and the Military Authority.

World Geodetic System-1984 (WGS-84)

3.15 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.

3.16 WGS-84 shall be introduced in the published coordinates in AIP in the following sections:

a) Horizontal:

- Enroute
- Terminal
- Aerodrome

b) Vertical:

- Geoid Undulation

Note - Comprehensive guidance material concerning WGS-84 is contained in the World Geodetic System - 1984 (WGS-84) Manual (Doc 9674).

electronic Terrain and Obstacle Dataset (eTOD)

3.17 eTOD is an electronic set(s) of terrain and/or obstacle data for the defined coverage areas and with the defined data specifications to fulfill the needs of electronic air navigation applications for digital data. 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.

— 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 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.

3.18 Electronic terrain data shall be provided for Area 1 and 4. The obstacle data shall be provided for obstacles in Area 1 higher than 100 m above ground.

Note 1 - Comprehensive guidance material concerning eTOD is contained in Annex 15; the Guidelines for electronic terrain, obstacle and aerodrome mapping information (Doc 9881) and the EUROCONTROL Terrain and Obstacle Data Manual.

Note 2 – Description and method of obtaining of the eTOD should be defined in AIP GEN 3.1.6.

AIM/SWIM RELATED MODULES

3.19 Performance Improvement Area 2 (Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management) focuses on ASBU Modules which mainly support Collaborative Decision Making (CDM) through Information Management (i.e. Aeronautical Information, MET, Flight and Flow, etc.) in a SWIM environment. PIA 2 includes 11 Modules over 4 blocks as follows:

Performance Improvement Area 2: Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management			
Block 0 (2013)	**Block 1 (2018)**	**Block 2 (2023)**	**Block 3 (2028)**
B0-FICE Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	**B1-FICE** Increased Interoperability, Efficiency and Capacity though FF-ICE, Step 1 application before Departure	**B2-FICE** Improved Coordination through multi-centre Ground-Ground Integration: (FF-ICE/1 and Flight Object, SWIM)	**B3-FICE** Improved Operational Performance through the introduction of Full FF-ICE
B0-DATM Service Improvement through Digital Aeronautical Information Management	**B1-DATM** Service Improvement through Integration of all Digital ATM Information		
	B1-SWIM Performance Improvement through the application of System-Wide Information Management (SWIM)	**B2-SWIM** Enabling Airborne Participation in collaborative ATM through SWIM	
B0-AMET Meteorological information supporting enhanced operational efficiency and safety	**B1-AMET** Enhanced Operational Decisions through Integrated Meteorological Information (Planning and Near-term Service)		**B3-AMET** Enhanced Operational Decisions through Integrated Meteorological Information (Near-term and Immediate Service)

CHAPTER 4

AIM NATIONAL PLANNING AND IMPLEMENTATION

AIM NATIONAL PLANNING

4.1 States should focus on the implementation of phase II and III of the ICAO Roadmap for the transition from AIS to AIM and take into consideration the "MID Region AIM implementation Roadmap" in planning for the transition from AIS to AIM in a prioritized manner

4.2 States are required to develop/update their National AIM Implementation Roadmap on an annual basis (by end of December), using the Template at **Appendix A** (National AIM Implementation Roadmap Template) and provide their feedback, lessons learned and difficulties to the ICAO MID Office for further assistance, as necessary.

IMPLEMENTATION OF A SYSTEM FOR AIRAC ADHERENCE MONITORING

4.2 Operationally significant changes to the AIP, listed in Annex 15, Appendix 4 shall be published in accordance with AIRAC procedures and shall be clearly identified by the acronym — AIRAC.

4.3 When an AIP Amendment or an AIP Supplement is published in accordance with AIRAC procedures, a NOTAM 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.

4.4 The Trigger NOTAM shall be issued as soon as possible, preferably at the publication date of the AIRAC AIP Amendment or the AIP Supplement. This NOTAM shall come into force on the same effective date and time as the amendment or supplement and shall remain valid for a period of fourteen days.

4.5 The text in Item E) should start with the words 'TRIGGER NOTAM' (followed only in the case of an AIP Amendment by the abbreviation PERM), the reference number of the published AIP Amendment or AIP Supplement concerned, the effective date and a brief description of its contents.

4.6 Trigger NOTAM shall be issued in the appropriate NOTAM series, according to the information to be promulgated and shall follow the normal NOTAM procedures.

Example:

Q) HECA/QARTT/I/BO/000/999
A) HECC B) 1704270000 C) 1705102359
E) TRIGGER NOTAM – PERM AIRAC AIP AMDT 4/17 WEF 27 APR 2017.
IMPLEMENTATION OF NEW ATS ROUTE UL111.

Note – the term 'PERM' is inserted in Item E) to stress that Item C) contains an artificial end-date and that the information is of a permanent nature.

4.7 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.

4.8 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.

4.9 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. Information provided as electronic media, concerning the circumstances listed in Annex 15, Appendix 4 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.

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.*

4.10 AIS/AIM units should:

1) raise the awareness of the Data Originators regarding the AIRAC provisions; and

2) include necessary procedures related to AIRAC adherence in the arrangement with the Data Originators.

4.11 States should implement a system for AIRAC adherence monitoring and report on annual basis (by 31 December) to the ICAO MID Regional Office the case(s) of late publication of aeronautical information of operational significance and non-adherence to the AIRAC provisions. **Appendix B** could be used as a monitoring and reporting tool in the AIRAC adherence.

4.12 List of AIRAC effective dates for 2017 to 2021 is as follows:

2017	2018	2019	2020	2021
05 January	04 January	03 January	02 January	28 January
02 February	01 February	31 January	30 January	25 February
02 March	01 March	28 February	27 February	25 March
30 March	29 March	28 March	26 March	22 April
27 April	26 April	25 April	23 April	20 May
25 May	24 May	23 May	21 May	17 June
22 June	21 June	20 June	18 June	15 July
20 July	19 July	18 July	16 July	12 August
17 August	16 August	15 August	13 August	09 September
14 September	13 September	12 September	10 September	07 October
12 October	11 October	10 October	08 October	04 November
09 November	08 November	07 November	05 November	02 December
07 December	06 December	05 December	03 December	30 December
			31 December	

AIR NAVIGATION DEFICIENCIES

4.13 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.

4.14 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.

4.15 MIDANPIRG is responsible to identify and address specific deficiencies in the air navigation field and to facilitate the development and implementation of an action plan by States to resolve identified deficiencies, where necessary.

4.16 States are required to use the MID Air Navigation Deficiency Database (MANDD) for the submission of requests for addition, update, and elimination of Air Navigation Deficiencies, including the submission of a specific Corrective Action Plan (CAP) for each deficiency. Each State MANDD Focal Point is given the required credential and MANDD is accessible at: http://www.icao.int/mid

4.17 A Sample State's Corrective Action Plan (CAP) is provided as **Appendix C** for assistance to States in developing their CAPs for the Air Navigation Deficiencies.

4.18 States are required to submit a Formal Letter to the ICAO MID Regional Office containing the evidence(s) that mitigation measures have been implemented for the elimination of deficiency(ies) when requesting the elimination of deficiency(ies) from the MANDD.

HUMAN RESOURCE AND TRAINING

4.19 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.

Note 1 - Guidance material concerning training methodology to ensure the competency of personnel is contained in the Aeronautical Information Management Training Development Manual (Doc 9991).

CHAPTER 5

REPORTING AND MONITORING

MID eANP VOLUME III

5.1 The status of implementation is reported and monitored by the AIM Sub-Group and through the B0-DATM Tables contained in the MID eANP Volume III. the MID eANP is available on the ICAO MID website at: http://www.icao.int/MID/Pages/MIDeANP.aspx

REGIONAL PERFORMANCE DASHBOARD

5.2 The 38th Assembly approved the Regional Performance Dashboards. The Dashboards aim to provide a glance of both Safety and Air Navigation Capacity and Efficiency strategic objectives, using a set of indicators and targets based on the regional implementation of the Global Aviation Safety Plan (GASP) and the Global Air Navigation Plan (GANP).

5.3 ICAO introduced the Regional Performance Dashboards as a framework of nested reporting of results with an increased focus on implementation. The initial version of the dashboard shows the globally agreed targeted performance at the regional level and contains graphics and maps with a planned expansion to include regionally agreed targets and the Aviation System Block upgrades (ASBU) Block 0 Modules (i.e. AIM National Plan/Roadmap, AIXM, eAIP, eTOD, WGS-84 and QMS).

5.4 For the first edition of the Regional Performance Dashboards, the implementation of 3 steps from Phase I of the ICAO Roadmap for transition from AIS to AIM (AIRAC, QMS and WGS-84) is monitored. The dashboard can be accessed on the ICAO website at: http://www.icao.int/safety/Pages/Regional-Targets.aspx.

5.5 It is agreed that in the expansion of the MID Regional Performance Dashboard, AIM National Roadmap, AIXM 5+, eAIP, eTOD Area 1 and 4 should be added to the MID Region Dashboard.

MID REGION AIR NAVIGATION REPORT

5.2 MIDANPIRG/16 endorsed the first MID Region Air Navigation Report-2016. The objective of the Report is to monitor the status of implementation of the priority 1 ASBU Block 0 Modules in the MID Region as well as the outlook of ASBU implementation in 2020. The MID Region Air Navigation Report will be an annual document for reporting and monitoring the ASBU implementation in the MID Region. The Report is available on the ICAO MID Office website at: http://www2010.icao.int/MID/Pages/default.aspx

DEVELOPING A METHODOLOGY FOR REPORTING THE PROGRESS OF AIM IMPLEMENTATION

5.6 "*Methodology for assessing and reporting the progress of transition from AIS to AIM*" aims to develop a uniform method and plan for the reporting by the States on the progress achieved for the AIM transition, based on the ICAO Roadmap for Transition from AIS to AIM. The ICAO air navigation planning and implementation performance framework requires that reporting, monitoring, analysis and review activities be conducted on a cyclical, annual basis (ICAO DOC 9750). The Methodology is used while collecting data for monitoring the progress achieved in the transition from AIS to AIM and for the purpose of Regional Performance Dashboard, MID eANP, etc.

5.7 MIDANPIRG/15 meeting (Bahrain, 8-11 June 2015) reviewed the draft Methodology for reporting and assessing the progress related to the transition from AIS to AIM, as an initial MID Regional framework for monitoring the progress achieved for the AIM transition.

METHODOLOGY FOR REPORTING AND ASSESSING THE PROGRESS RELATED TO THE TRANSITION FROM AIS TO AIM

Element (Phase/Step/Step No.)			Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1			2	3	4	5
Phase 1						
AIRAC adherence		P-03	FC/NC	Implementation of a system for AIRAC adherence monitoring (compliance with annex 15 AIRAC provisions) (TBD)	Block 0	
WGS-84 implementation		P-05	FC/PC/NC	National AIP GEN 2.1.3 ‘Geodetic reference datum’ provides information about the implementation of WGS-84 in ENR, Terminal and AD	Block 0	
QMS		P-17	FC/NC	ISO 9001 Certification	Block 0	
Phase 2						
Data quality monitoring		P-01	FI/NI	QMS (P-17) and Agreement with data originators (P-18) is implemented (TBD)	Block 0	
Data integrity monitoring		P-02				*Linked to P-01*
Integrated aeronautical information database	AIXM-based AIS Database	P-06	FI/NI	National aeronautical data and information is stored and maintained in AIXM-based AIS database	Block 0	*Structured AI Database with digital exchange capabilities (AIXM 5.1)*
	Implementation of IAID		FI/PI/NI	Implementation of a database providing eAIP (text, tables and charts) and NOTAM, linked to the terrain/obstacles and aerodrome mapping datasets (TBD)	Block 1	
Unique identifiers		P-07				*Linked to P-06*
Aeronautical information conceptual model		P-08				*Linked to P-06*
Electronic AIP		P-11	FI/NI	National AIP GEN 3.1.3 ‘Aeronautical publications’ provides information about the availability of the National AIP in electronic format (eAIP)	Block 0	
Terrain	Area 1	P-13	FC/NC	National AIP GEN 3.1.6 ‘Electronic terrain and obstacle data’ provides information on how the dataset can be obtained	Block 0	
	Area 4	P-13	FC/PC/NC or N/A	National AIP GEN 3.1.6 ‘Electronic terrain and obstacle data‘ provides information on how the dataset for specific CAT II/III RWY can be obtained. States should indicate in remarks the number of existing CAT II/III RWY. N/A for States with no CAT II/III RWY.	Block 0	*In case of PC, list name of CAT II/III ADs having the dataset*

Element (Phase/Step/Step No.)			Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1			2	3	4	5
	Area 2a	P-13	FC/PC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained. States should indicate in remarks the number of AD eligible for provision of Area 2 data. This number should come from the Regional eANP Table AOP II-1 – for aerodromes with one of the following designation: — RS: international scheduled air transport, regular use — RNS: international non-scheduled air transport, regular use — RG: international general aviation, regular use.	Block 0	*In case of PC, list name of ADs having the dataset*
	Take-off flight path area	P-13	FC/PC/NC	Same as Terrain Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
	An area bounded by the lateral extent of the aerodrome obstacle limitation surfaces	P-13	FC/PC/NC	Same as Terrain Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
Obstacles	Area 1	P-14	FC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained	Block 0	
	Area 4	P-14	FC/PC/NC or N/A	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset for specific CAT II/III RWY can be obtained. States should indicate in remarks the number of existing CAT II/III RWY. N/A for States with no CAT II/III RWY.	Block 0	*In case of PC, list name of CAT II/III ADs having the dataset*
	Area 2a	P-14	FC/PC/NC	National AIP GEN 3.1.6 'Electronic terrain and obstacle data' provides information on how the dataset can be obtained. States should indicate in remarks the number of AD eligible for provision of Area 2 data. This number should come from the Regional eANP Table AOP II-1 – for aerodromes with one of the following designation: — RS: international scheduled air transport, regular use	Block 0	*In case of PC, list name of ADs having the dataset*

Element (Phase/Step/Step No.)		Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1		2	3	4	5
			— RNS: international non-scheduled air transport, regular use — RG: international general aviation, regular use.		
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	P-14	FC/PC/NC	Same as Obstacles Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
penetrations of the aerodrome obstacle limitation surfaces	P-14	FC/PC/NC	Same as Obstacles Area 2a	Block 0	*In case of PC, list name of ADs having the dataset*
Aerodrome mapping	P-15	FI/PI/NI	National AIP GEN 3.1.6 ‘Electronic terrain and obstacle data’ provides information on how the dataset can be obtained	Block 1	*In case of PC, list name of ADs having the dataset*
Phase 3					
Aeronautical data exchange	P-09	FI/PI/NI	Direct data exchange between AIS and data originators/users (TBD)	Block 1	*In case of PC, list name of Units (Data Originators/Users)*
Communication networks	P-10				
Aeronautical information briefing	P-12	FI/PI/NI	Provision of preflight aeronautical information briefing at the international aerodromes (TBD) Mandatory for international aerodromes contained in the Regional eANP Table AOP II-1 – for aerodromes with one of the following designation: — RS: international scheduled air transport, regular use — RNS: international non-scheduled air transport, regular use — RG: international general aviation, regular use.	Block 1	*In case of PC, list name of ADs providing AI briefing*
Training	P-16				

Element (Phase/Step/Step No.)		Metric/ Indicator	Finalization/Compliance Criteria	Link to ASBU Block	Remarks
1		2	3	4	5
Agreement with data originators	P-18	FI/PI/NI	Signed agreements between AIS and ANSPs (ATM, CNS, etc.), Aerodromes and Military	Block 0	*In case of PC, list name of Data Originator(s)*
Interoperability with meteorological products	P-19				*Linked to P-12*
Electronic aeronautical charts	P-20	FI/NI	National AIP GEN 3.2 'Aeronautical Charts provides information about the availability of the e-Aeronautical Charts	Block 1	
Digital NOTAM	P-21	FI/NI	TBD	Block 1	

FC: Fully Compliant; PC: Partially Compliant; NC: Not Compliant; FI: Fully Implemented; PI: Partially Implemented; NI: Not Implemented; N/A: Not Applicable

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APPENDICES

APPENDIX A
NATIONAL AIM IMPLEMENTATION ROADMAP TEMPLATE

Phase/Step	Step No.	Timeline																		Start	End	Remarks
		2014				2015				2016				2017				2018						
Phase I																						
AIRAC adherence	P-03																					
WGS-84 implementation	P-05																					
QMS	P-17																					
Phase II																						
Data Quality Monitoring	P-01																					
Data Integrity Monitoring	P-02																					
AIXM	P-06																					
Unique identifiers	P-07																					
Aeronautical information conceptual model	P-08																					
eAIP	P-11																					
Terrain A-1	P-13																					
Obstacle A-1	P-14																					
Terrain A-4	P-13																					
Obstacle A-4	P-14																					
Terrain A-2	P-13																					Please specify implementation of Area 2a, 2b, 2c and/or 2d

Phase/Step	Step No.	Timeline																				Start	End	Remarks
		2014				2015				2016				2017				2018						
Obstacle A-2	P-14																							Please specify implementation of Area 2a, 2b, 2c and/or 2d
Terrain A-3	P-13																							
Obstacle A-3	P-14																							
AD Mapping	P-15																							
Phase III																								
Aeronautical data exchange	P-09																							
Communication networks	P-10																							
Aeronautical information briefing	P-12																							
Training	P-16																							
Agreement with data originators	P-18																							
Interoperability with meteorological products	P-19																							
Electronic aeronautical charts	P-20																							
Digital NOTAM	P-21																							

Legend		
		Not Started
		In Progress
		Implemented

APPENDIX B

AIRAC ADHERENCE MONITORING

YEAR: 2016			STATE: …….		
AIRAC EFF Date	**AIRAC AMDT Serial Number; or NIL Notification**	**AIRAC AMDT PUB/Distribution Date**	**Trigger NOTAM (Serial Number)**	**No change until 28 days after EFF Date? (Yes / No)**	**Remarks**
7 JAN 16	- AIRAC …../16; or - NIL notification issued on …….				
4 FEB 16	- AIRAC …../16; or - NIL notification issued on …….				
3 MAR 16	- AIRAC …../16; or - NIL notification issued on …….				
31 MAR 16	- AIRAC …../16; or - NIL notification issued on …….				
28 APR 16	- AIRAC …../16; or - NIL notification issued on …….				
26 MAY 16	- AIRAC …../16; or - NIL notification issued on …….				
23 JUN 16	- AIRAC …../16; or - NIL notification issued on …….				
21 JUL 16	- AIRAC …../16; or - NIL notification issued on …….				
18 AUG 16	- AIRAC …../16; or - NIL notification issued on …….				
15 SEP 16	- AIRAC …../16; or - NIL notification issued on …….				
13 OCT 16	- AIRAC …../16; or - NIL notification issued on …….				
10 NOV 16	- AIRAC …../16; or - NIL notification issued on …….				
8 DEC 16	- AIRAC …../16; or - NIL notification issued on …….				

APPENDIX C

SAMPLE STATE'S CORRECTIVE ACTION PLAN

<table>
<tr><td colspan="2">DEFICIENCY DESCRIPTION</td><td>PRIORITY
(U/A/B)</td></tr>
<tr><td colspan="2" rowspan="3"></td><td></td></tr>
<tr><td>RATIONALE
F:Financial, H:HR, S:State, O:Other</td></tr>
<tr><td></td></tr>
<tr><td colspan="3">STATE'S COMMENTS/OBSERVATION</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>CORRECTIVE ACTION(S) PROPOSED</td><td>ACTION OFFICE/BODY</td><td>DATE OF COMPLETION</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

References

- ICAO Annex 15 – Aeronautical Information Services
- ICAO Doc 9750 – Global Air Navigation Plan
- ICAO Roadmap for the transition from AIS to AIM
- EUROCONTROL Guidelines – Operating procedures for AIS Dynamic Data (OPADD)
- EUROCONTROL Specifications for the electronic Aeronautical Information Publication (eAIP)
- EUROCONTROL Terrain and Obstacle Data Manual
- MIDANPIRG/15 Report
- MID Doc 002 – MID Region Air Navigation Strategy
- MSG/4 Report
- http://www.aixm.aero
- http://www.icao.int/airnavigation/Documents/ICAO_AN%20Report_EN_final_30042014.pdf
- http://www.icao.int/airnavigation/IMP/Pages/default.aspx
- http://www.icao.int/safety/ais-aimsg/Pages/default.aspx
- http://www.icao.int/safety/Pages/Regional-Targets.aspx.
- https://portal.icao.int/RO_MID/Pages/MIDDocs.aspx
- https://portal.icao.int/space/anp/Pages/Home.aspx

- END -

APPENDIX 5.2.2D

AIRAC ADHERENCE MONITORING QUESTIONNAIRE– 2016

NAME OF STATE: ……...

Please circle the appropriate response.

1. Have you published, in 2016, any operationally significant information, as referred to in Appendix 4 of Annex 15, other than using the AIRAC System? **Yes / No**

   If the answer is "Yes", please explain:
   ……
   ……
   ……
   ……
   ……

2. Have you received, in 2016, any complain from the users about non-adherence to AIRAC? **Yes / No**

   If the answer is "Yes", please explain:
   ……
   ……
   ……
   ……
   ……

3. Please fill the required data in the table below on the AIRAC System in your State:

AIRAC EFF Date	AIRAC AMDT Serial Number; or NIL Notification	AIRAC AMDT PUB/Distribution Date	Trigger NOTAM (Serial Number)	No change until 28 days after EFF Date? (Yes / No)	Remarks
7 JAN 16	- AIRAC …../16; or - NIL notification issued on …….				
4 FEB 16	- AIRAC …../16; or - NIL notification issued on …….				
3 MAR 16	- AIRAC …../16; or - NIL notification issued on …….				
31 MAR 16	- AIRAC …../16; or - NIL notification issued on …….				
28 APR 16	- AIRAC …../16; or - NIL notification issued on …….				
26 MAY 16	- AIRAC …../16; or - NIL notification issued on …….				
23 JUN 16	- AIRAC …../16; or				

	- NIL notification issued on …….				
21 JUL 16	- AIRAC …../16; or - NIL notification issued on …….				
18 AUG 16	- AIRAC …../16; or - NIL notification issued on …….				
15 SEP 16	- AIRAC …../16; or - NIL notification issued on …….				
13 OCT 16	- AIRAC …../16; or - NIL notification issued on …….				
10 NOV 16	- AIRAC …../16; or - NIL notification issued on …….				
8 DEC 16	- AIRAC …../16; or - NIL notification issued on …….				

4. Details and signature of the person completing this form:

Full Name:

Title:

Organization:

Mailing address:

Contact details:

Email address:

Signature:

……..

Please return completed form by 31 January 2016 to:

Email: icaomid@icao.int or Fax: +2 (02) 22674843

APPENDIX 5.2.2E

MID Region ATM Enhancement Programme Board (MAEP Board)

TERMS OF REFERENCE

The Terms of Reference of the MAEP Board are:

1. Provide a regional platform for collaborative and harmonized approach towards planning and implementing air navigation projects in support of the MID Air Navigation Strategy and the Global Air Navigation Plan (GANP), taking into consideration previous initiatives and the users' requirements.

2. Carry out initial assessment of new identified projects and propose to MIDANPIRG candidates MAEP projects for implementation in a prioritized manner; for final decision.

3. Coordinate at all levels with States and stakeholders to enhance collaboration and foster the implementation of the MAEP projects.

4. Oversee the MAEP projects and monitor their progress , including the identification of challenges/risks, and ensuring harmonized and effective implementation across projects, as appropriate.

5. Maintain a close and permanent consultation and cooperation with Stakeholders that might contribute to the work of the Board.

6. Review the recommendations emanating from the MIDANPIRG subsidiary bodies related to the MAEP projects and take appropriate decisions.

7. Provide high level support and guidance to States to ensure harmonization and interoperability in line with the projects deliverables and recommendations.

8. Provide regular progress reports to MIDANPIRG.

In order to effectively perform its tasks and responsibilities:

1. The MAEP Board shall elect a Chairperson for a cycle of five years unless otherwise re-elected. The Chairperson acts as the contact point and coordinator on behalf of the MAEP Board members to oversee the Programme in coordination with ICAO.

2. The MAEP Board shall meet at least once each 18 Months and/or when deemed necessary.

3. The MAEP Board meetings should be hosted by its members on rotation basis.

Composition:

The MAEP Board is composed of:

a) High Level (Decision Makers) Members from the MID States;

b) The MAEP Board Chairperson;

c) Managers of the MAEP Projects; and

d) Observers from AACO, ACAC, ACI, AIRBUS, BOEING, CANSO, EUROCONTROL/SESAR JU, FAA-USA, IATA, IFALPA and IFATCA

Other representatives from States and industry may be invited on ad-hoc basis as Observers, when required.

The ICAO MID Regional Office will act as the Secretary of the MAEP Board meetings.

APPENDIX 5.2.2F

MID IP Network Project (CRV) Focal Points and Commitment Status

State	Name/Title	Contact Details (Tel./Fax/Mobile/Email)	IP Network Equipment Room Coordinates	Commitment/ No of Location
Bahrain	Mohamed Ali Saleh *Chief Aeronautical Telecomm*	Fax: +973 17329966 Tel: +973 17321187 Email: masaleh@caa.gov.bh	Air Navigation Directorate Building: 353, Road: 2408, Block:224, Muharraq, Bahrain Technical Room coordination point: 2616N 05038E	Y (1)
	Yaseen Hassan AlSayed *Head Aeronautical Telecomm Network*	Fax: +973 17329966 Tel: +973 17321183 Email: y.alsayed@caa.gov.bh		
Egypt	Mr. Mohamed Ramzy Mohamed Abdallah *Director of AFTN/AMHS Technical Department*	Tel: +202 22657981 +201007736780 Email: Mrma_eg@yahoo.com	Building Name: Cairo Air Navigation Center (CANC) Address: NANSC Company – Cairo 300701.0 N 0312342.4 E	
	Eng. Haitham Mohamed Ahmed Eldosoki *Director of AIM Technical Department*	Tel: +202 22650781 +201007810781 Email: Haitham.mohamed@nansceg.net		
Iran	Mr. AliAkbar SalehiValojerdi *Senior Expert of IRANAFTN/AMHS Training Department*	Fax: +98 21 66025101 Tel: +98 21 6102337 Mobile: +989 124 202775 Email: aasalehi@airport.ir		Y (1)
	Mr. Alireza Mahdavisefat *Senior Expert of IRANAFTN/AMHS COM Centre*	Fax: +98 21 66025101 Tel: +98 21 6314 6432 Mobile: +989 333510320 Email: mahdavi@airport.ir		
Iraq				
Jordan	Ms. Mona Ribhi AlNaddaf	Tel: +9626 4881473 +96279 9876710 Email: m.al-nadaf@carc.gov.jo		Y (1)
Kuwait	Mr. Hassan Alattar *Communication Engineer*	Fax: +965-2 4721 279 Tel: +965-2 4732 530 Mobile: +965 99449454 Email: ha.alattar@dgca.gov.kw		Y (1)

State	Name/Title	Contact Details (Tel./Fax/Mobile/Email)	IP Network Equipment Room Coordinates	Commitment/ No of Location
Lebanon	Mr. Mohamad Abdallah Saad *Head of Telecommunication Equipment*	Fax: +961 1 629 031 Tel: +961 1 628 151 Mobile: +961 3 280 299 Email: msaad@beirutairport.gov.lb		Y (1)
Libya				
Oman	Mr. Nasser Salim Al-Suleimani Chief ATM Systems Mr. Ibrahim Said Al-Hajri ATM Systems Engineer	Email: nassers@paca.gov.om alhajri@paca.gov.om		P-Y (1)
Qatar				
Saudi Arabia	Ibrahim bash Senior Systems Engineer Automation Engineering Branch	Fax: +966 12 671 9041 Tel: +966 12 671 7717 Ext 1119 Mobile: +966 50 567 1231 Email: ibasheikh@gaca.gov.sa		(3 sites) (Riyadh, Jeddah and Dammam)
Sudan	Eng. Yasir Eltayeb Sidahmed	Fax: +249 183 770001 Tel: +249 183 782701 Email: yasirts@gmail.com		Y (1)
Syria				
UAE	Greg Kurten A/Director CNS Communication, Navigation and Surveillance	Fax: +971 2 599 6872 Tel: +971 2 599 6860 Email: gegkurten@szc.gcaa.ae	The co-ordinates are as follows: 242641.82 N 0543635.46 E The working number at site is: +971 2 5996900	P-Y (1)
	Shahzad Chaudhary Senior CNS Engineer Communication, Navigation and Surveillance	Fax: +971 2 599 6872 Tel: +971 2 599 6865 Email: shahzad@szc.gcaa.ae		
Yemen				

APPENDIX 5.2.2G

MID IP Network (CRV) Implementation Process

	Action Title	Activities	Responsible	Timeline
1	Technical requirements	• States/ANSP develop their requirements (specify performance, interface, conversion, operational procedure, acceptance test procedure) • Present to Vendor for comment and response • Finalize requirements	• States/ANSPs (with support of Vendor) • States/ANSPs and Vendor • States/ANSPs	6 to 9 months
2	Negotiation and agreement between two connecting States/ Administrations	• To decide on the type of data or voice to be exchanged via CRV, QoS for each type of applications and the required bandwidth • CRV Contractor to comment and response to the agreed requirements • Agree to implementation schedule	• Two connecting States/ANSPs • Vendor • Two connecting States/ANSPs	6 to 9 months (concurrent with Action 1)
3	CRV Contractor proposes draft Contract to ANSP/State	• Vendor to develop and propose a draft Contract	• Vendor	3 months
4	Signature of the Contract	• Review and finalize the Contract ➢ Contractual and Legal review ➢ Technical and operational review ➢ Finalize contract ➢ Establish contract and payment system • Signature of the Contract	• States/ANSPs • States/ANSPs and Vendor	3 to 6 months
5	Operation, test and evaluation	• Implementation and operation • Perform acceptance test with associated applications • Perform acceptance test with respective ANSPs/States	• States/ANSPs and Vendor	3 to 6 months
6	Service acceptance	• Service acceptance	• States/ANSPs	1 month

---

APPENDIX B

TERMS OF REFERENCE (TOR) OF
Advanced Inter-Regional ATS Route Development Task Force (AIRARD/TF)

1. TERMS OF REFERENCE

1.1 The terms of reference of the AIRARD Task Force are to:

a) identify requirements and improvements for achieving and maintaining an efficient route network across the ICAO APAC, EUR/NAT and MID Regions based on the airspace user needs and in coordination with stakeholders (States, International Organizations, user representative organizations and other ICAO Regions);

b) ensure harmonized planning and implementation of ATS routes and airspace improvement projects at the interfaces between the three ICAO Regions;

c) monitor the status of implementation of the agreed ATS routes and airspace improvement projects;

d) in case of implementation problems, identify the associated difficulties and propose/agree to solutions to further progress with the implementation;

e) review and amend the components of the ATS route structure and airspace description in order to ensure their compliance with ICAO provisions (e.g. five-letter name-code (5LNC) uniqueness, ATS route designators, WGS-84 coordinates, flexible use of airspace (FUA) implementation);

f) discuss and support the implementation of new concepts, such as the PBN Highway concept;

g) determine the CNS requirements, interoperable entry/exit points or areas, connections into the TMAs, weather related issues, terrain aspects, airspace organisation which would be needed in order to support the implementation of the new concepts;

h) achieve common understanding and support from all stakeholders involved in or affected by the ATM developments/activities in the three ICAO Regions; and

i) use the AIRARD/TF meetings as a forum for bilateral and multilateral discussions (such as review of ANS Letters of Agreements.

1.2 In order to meet the Terms of Reference, the AIRARD Task Force shall:

a) Discuss and review the ATS route network and airspace improvement projects which involve States (including the Military) and all aviation stakeholders (airspace users, international organisations and Computer Flight Plan Software/Service Providers (CFSPs)) across the three Regions;

b) propose a strategy and prioritized plan for development of improvements to the route network and/or airspace structure, highlighting:

- areas that require immediate attention (solution of safety, capacity or complexity constraints);
- interface issues with adjacent ICAO Regions;

c) monitor and report on the implementation status of the prioritized plan;

d) develop a roadmap for the implementation of new concepts such as the PBN highways;

e) develop a working depository for route proposals that will be used as a dynamic reference document for ongoing discussions on routes under development/ modification. In this respect, the Task Force should explore the utility that can be realized from the route catalogue concept/ATS routes database; and

f) address CNS and ATM interface issues with other regions and make specific recommendations to achieve a harmonized and interoperable environment in the interface areas between the regions.

2. In order to effectively perform its tasks and responsibilities:

a) The AIRARD TF shall elect Co-Chairpersons (one from a State and one from the airspace users) for a cycle of three meetings, unless otherwise re-elected.

b) The TF shall meet at least once a year and/or when deemed necessary.

c) The TF meetings should be hosted by its members on rotation basis.

d) The TF shall report to the relevant ATM Groups in the APAC and MID Regions under the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the European Air Navigation Planning Group (EANPG), North Atlantic Systems Planning Group (NAT SPG) and the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG).

3. COMPOSITION

The AIRARD Task Force is composed of:

a) States from APAC, EUR/NAT and MID Regions, or States providing services in the APAC, EUR/NAT and MID Regions;

b) concerned International and Regional Organizations; and

c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

Status of Contingency Agreements in the MID Region

STATE	CORRESPONDING STATES			REMARKS
BAHRAIN	☒ IRAN ☒ KUWAIT	☒ QATAR ☒ SAUDI ARABIA	☒ UAE	Completed
EGYPT	☒ GREECE ☒ JORDAN	☒ LYBIA ☒ CYPRUS	☒ SAUDI ARABIA ☒ SUDAN	Completed
IRAN	☒ ARMENIA ☐ AZERBAIJAN ☐ TURKMENISTAN ☐ AFGHANISTAN	☒ BAHRAIN ☒ IRAQ ☐ KUWAIT ☒ OMAN	☒ PAKISTAN ☒ TURKEY ☒ UAE	7/11
IRAQ	☒ IRAN ☐ JORDAN	☐ KUWAIT ☐ SAUDI ARABIA	☐ SYRIA ☐ TURKEY	1/6
JORDAN	☒ EGYPT ☐ IRAQ	☐ ISRAEL ☒ SAUDI ARABIA	☐ SYRIA	2/5
KUWAIT	☒ BAHRAIN ☐ IRAN	☐ IRAQ	☒ SAUDI ARABIA	2/4
LEBANON	☐ CYPRUS	☐ SYRIA		0/2
LIBYA	☐ ALGERIA ☐ CHAD ☒ EGYPT	☐ MALTA ☐ NIGER	☐ SUDAN ☐ TUNIS	1/7
OMAN	☐ INDIA ☒ IRAN	☐ PAKISTAN ☐ SAUDI ARABIA	☒ UAE ☒ YEMEN	3/6
QATAR	☒ BAHRAIN	☐ SAUDI ARABIA	☒ UAE	2/3
SAUDI ARABIA	☒ BAHRAIN ☒ EGYPT ☐ ERITREA ☐ IRAQ	☒ JORDAN ☒ KUWAIT ☐ OMAN ☐ QATAR	☐ SUDAN ☒ UAE ☐ YEMEN	5/11
SUDAN	☐ CENTRAL AFRICAN ☐ CHAD ☒ EGYPT	☐ ERITREA ☐ ETHIOPIA ☐ LIBYA	☐ SAUDI ARABIA ☐ SOUTH SUDAN	1/8
SYRIA	☐ IRAQ ☐ JORDAN	☐ LEBANON ☐ CYPRUS	☐ TURKEY	0/5
UAE	☒ BAHRAIN ☒IRAN	☒ OMAN ☐ QATAR	☒ SAUDI ARABIA	4/5
YEMEN	☐ DJIBOUTI ☐ ERITREA ☐ ETHIOPIA	☐ INDIA ☒ OMAN ☐ SAUDI ARABIA	☐ SOMALIA	1/7

☒ Agreement Signed ☐ Agreement NOT Signed Signed Agreements / Total No. of required Agreements

---

Attachment 1

DRAFT
MCC/SPOC Model Agreement

[Agreement]
between

[name] Mission Control Centre

and

[State name] SAR Point of Contact

for the Distribution and Reception of COSPAS-SARSAT Distress Alert Data for Search and Rescue

DEFINITIONS

"Agreement" means this Agreement;

"Ground Segment Provider" means any State which establishes and operates the ground segment equipment and avails itself to the System, under the terms of the International COSPAS-SARSAT Programme Agreement (ICSPA) and in the context of this [agreement], [State];

"Local User Terminal (LUT)" means a computer hardware system installed to receive signals relayed by the satellites and processes them to determine radio beacon location;

"Mission Control Centre (MCC)" means a computer system established to accept the output from the Local User Terminal and convey distress alert and location data to appropriate authorities and in the context of this MOU, the [name] SPOC;

"Radio beacons" means distress alert instruments designed to be activated in a distress and to transmit a radio signal at 406 MHz, the characteristics of which comply with appropriate provisions of the International Telecommunication Union and COSPAS-SARSAT specifications;

"Search and Rescue Point of Contact (SPOC)" means Rescue Co-ordination Centres and other established and recognized national points of contact which can accept responsibility to receive COSPAS-SARSAT alert data to enable the rescue of persons in distress;

"Service Area" means that part of the world within which a COSPAS-SARSAT alert data distribution service is provided by an MCC, in accordance with document C/S P.011 "COSPAS-SARSAT Programme Management Policy"; an MCC Service Area is defined by the list of SPOCs to which that MCC distributes COSPAS-SARSAT alert data;

"System" means the COSPAS-SARSAT System comprising a Space Segment, Ground Segment and radio beacons operating at 406 MHz.

1. PURPOSE

a. The purpose of this Agreement between the [MCC] and [SPOC] is to formalize the exchange of space based distress alerts received through the satellite system of the International COSPAS-SARSAT Programme. This is to ensure that institutional arrangements between the two entities at the operational level are effective.

b. This Agreement aims to ensure that rapid and reliable two-way communication is established between the two centres servicing the [name] Search and Rescue Region (SRR) for prompt provision of Search and Rescue Services to persons in distress in aviation, maritime and land incidents.

2. INTRODUCTION

a. Knowing the importance of co-operation in search and rescue (SAR), and of the provision of expeditious and effective SAR services;

b. Desiring to support the provisions of the Convention on International Civil Aviation of the International Civil Aviation Organisation (ICAO) and the International Convention on Maritime Search and Rescue of the International Maritime Organisation (IMO);

c. Noting the Standards and Recommended Practices in Annex 12 to the Convention on International Civil Aviation of ICAO and the provisions of the International Convention for the Safety of Life at Sea (SOLAS);

d. Supporting the principles of the COSPAS-SARSAT Programme as determined by the COSPAS-SARSAT Council;

e. The [MCC[and [SPOC] have agreed as follows:

3. OBJECTIVES

[Administration of MCC], as signatory to the International COSPAS-SARSAT Programme Agreement, shall pursue the following objectives:

a. Provide distress alert and location data from the System to the international community in support of SAR operations on a non-discriminatory basis;

b. Support, by providing these distress alert and location data, the objectives of IMO and ICAO concerning search and rescue;

c. Cooperate with other national authorities and relevant international organizations in the operation and co-ordination of the System;

d. Provide and confirm distress alert and location data from the COSPAS-SARSAT System from the [name] MCC to the [SPOC]; and

e. Provide information concerning the System status to [SPOC].

The [SPOC] shall at all times endeavour to support the [MCC] in its efforts to fulfil its objectives and commitments under the ICSPA in accordance with the provisions of this [Agreement].

The MCC and SPOC shall establish reliable communication links (AFTN, fax, email) and operational procedures, which include backup routines.
In the spirit of close cooperation, the MCC and SPOC shall consult from time to time with a view to ensuring the full implementation of the provisions of this [Agreement] and necessary amendments as appropriate.

4. PROCEDURES

a. The [name] Mission Control Centre ([.]MCC) established in [location], [State], providing services under the ICSPA shall communicate distress alerts located in the SRR of the SPOC, or for beacons which contain the country code of the SPOC to [SPOC], [State] for undertaking search and rescue services, assisted as required by RCCs within the State of the SPOC.
b. MCC and SPOC agree that the distribution of alert data by [name] MCC is undertaken on a best effort basis and that [name] MCC cannot guarantee continuous system availability.
c. [State] shall designate a single SAR point of contact (SPOC), where possible, for receiving COSPAS-SARSAT alert and location data for distress locations in their SAR area of responsibility and provide the address, telephone, telex or facsimile number or AFTN address of their SPOC to [MCC] and the COSPAS-SARSAT Secretariat (Attachment 1).
d. [SPOC] will immediately notify [MCC] of any changes to the provided contact details in (Attachment 1).
e. [SPOC] shall develop a comprehensive plan for the distribution of distress alert and location data to SAR authorities within its SRR, as appropriate.
f. The [SPOC] shall endeavour to minimize false alerts in their country.
g. The [SPOC] shall provide information on their national point of contact for beacon registers to the COSPAS-SARSAT Secretariat and the [MCC].
h. The [SPOC] shall maintain reliable communication links with MCC and respond to monthly communication tests from the [name] MCC immediately after receipt thereof (not using an automatically generated response) to verify the integrity of communications links between the MCC and SPOC.
i. [SPOC] shall communicate routine reports, such as alert summaries and monthly operations reports on SAR incidents that were assisted by Emergency Locator Transmitters (ELTs), Emergency Position-indicating Radio Beacons (EPIRBs) or

Personnel Locator Beacons (PLBs) to [MCC] on a regular basis, with special reports as and when required.

5. DEPOSITARY

The Depositary of this Agreement and any subsequent amendments thereto shall be the Secretariat of the International COSPAS-SARSAT Programme.
The MCC and SPOC will also provide a signed copy of this Agreement to the ICAO Regional Office concerned with the [name] SRR and the IMO Secretariat, if desired by them.

6. ENTRY INTO FORCE, AMENDMENT, RENEWAL AND TERMINATION

This [Agreement] will enter into effect when it has been signed on behalf of all parties. The [Agreement] shall remain in force for a period of two years from the date on which it enters into force and shall be extended automatically for successive periods of two years.

a. This [Agreement] is signed on Day_____of_____20xx, between [MCC] and [SPOC].

b. The [Agreement] will be reviewed as required and may be modified or amended by mutual agreement of both parties in writing.

c. Both parties, in the event of initiating action to terminate the [Agreement] shall give the other party a minimum of 120 days prior notice in writing.

(I) **SIGNATURE**

_____

AUTHORIZED REPRESENTATIVE

[MCC]

_____

(II) **SIGNATURE**

_____

AUTHORIZED REPRESENTATIVE
[SPOC]

_____

Attachment 1: CONTACT DETAILS

[MCC]

Phone:

Fax:

Email:

AFTN:

Other:

[SPOC]

Phone:

Fax:

Email:

AFTN:

Other:

[Other]

Phone:

Fax:

Email:

AFTN:

Other:

[Add further contacts as required]

APPENDIX 5.2.2K

MID REGION SAR AGREEMENT STATUS BETWEEN ANSPS/ACCS
December 2016

STATE	CORRESPONDING STATES			REMARKS
BAHRAIN	☒ IRAN ☐ SAUDI ARABIA	☒ KUWAIT ☒ UAE	☐ QATAR	3/5
EGYPT	☒ CYPRUS ☐ JORDAN ☐ SUDAN	☐ GREECE ☒ LYBIA	☐ Israel ☐ SAUDI ARABIA	2/7
IRAN	☒ ARMENIA ☒ BAHRAIN ☒ OMAN ☐ TURKMANISTAN	☒ AZERBAIJAN ☐ IRAQ ☐ PAKISTAN ☒ UAE	☐ AFGHANISTAN ☐ KUWAIT ☐ TURKEY	5/11
IRAQ	☐ IRAN ☒ JORDAN	☐ KUWAIT ☐ SAUDI ARABIA	☐ SYRIA ☐ TURKEY	1/6
JORDAN	☐ EGYPT ☒ IRAQ	☐ ISRAEL ☐ SAUDI ARABIA	☐ SYRIA	1/5
KUWAIT	☒ BAHRAIN ☐ IRAN	☐ IRAQ	☐ SAUDI ARABIA	1/4
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	1/11
SUDAN	☐ CENTRAL AFRICAN ☐ CHAD ☐ EGYPT	☐ ERITREA ☐ ETHIOPIA ☐ LIBYA	☐ SAUDI ARABIA ☐ SOUTH SUDAN	0/8
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

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APPENDIX 5.2.2L

MID REGION SAR FOCAL POINTS CONTACT DETAILS

STATE	NAME	TITLE	ADDRESS	EMAIL/AFS	FAX	TEL	MOBILE
Bahrain	ACC Duty Supervisor	ACC Duty Supervisor	Bahrain CAA P.O.Box – 586 Kingdom Of Bahrain	bahatc@caa.gov.bh	+973 17321029	+97317321081 +97317321080	
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	01147710035 01001112375
Iran							
Iraq	Ali Muhsin Hashim	Director ATS	ANS Building, BIAP	Atc_iraqcaa@yahoo.com		964 7815762525	964 7815762525
Jordan	Mr. Ahmad Al Heders	Chief Amman ACC	Queen Alia Airport	Ahmad.al-hederes@carc.gov.jo			962796664328
Kuwait							
Lebanon							
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/AFS	FAX	TEL	MOBILE
Qatar							
Saudi Arabia	Mr. Ahmad B. Altunisi	Manager SAR Head of SAMCC	General Authority of Civil Aviation	altunisi@gaca.gov.sa	966-126402855	966-12 671 7717/1840	966-50 460 1445
Sudan	Hashim Mohamed Ahmed	RCC Head	Sudan CAA PO BOX 165	BEGER124@gmail.com	249183528323	249183528323	24912327797 249912382433
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	UAE ATC Duty Supervisor			atc@szc.gcaa.ae	971 2 599 6850	971 2 599 6969	
Yemen							

APPENDIX 5.2.2M

ADS-B OUT Implementation

State	Mandate	Ground Station Capabilities	Flight Level	ATC Procedure	Data sharing Protocol	Data sharing States
Bahrain						
Egypt						
Iran						
Iraq						
Jordan						
Kuwait						
Lebanon						
Libya						
Oman						
Qatar						
Saudi Arabia						
Sudan						
Syria						
UAE						
Yemen						

ATS Extended Services Trial

File Transfer Body Part (FTBP) Testing Document

Author: *MIDAMC STG*
Date: *5/1/2017*
Version: *0.1 (First Version)*

Table of Contents

Table of Figures

References

[1] ICAO Annex 10 – Aeronautical Telecommunication; Vol.II, Communication Procedure

[2] ICAO doc 9880- Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols, Part II – Ground-Ground Applications - Air Traffic Services Message Handling Services (ATSMHS), First Edition – 2010

[3] EUR Doc 020 – AMHS Manual

Acronyms

ADMD	*Administrative Management Domain*
AFTN	*Aeronautical Fixed Telecommunication Network*
AMHS	*ATS Message Handling Services*
ASST	*ATS Extended Services Trial Team*
ATS	*Air Traffic Services*
DIR	*Directory Service*
DL	*Distribution List*
DR	*Delivery Report*
FTBP	*File Transfer Body Part*
IHE	*IPM Heading extensions*
IP	*Internet Protocol*
IPM	*Interpersonal Message*
IPN	*Interpersonal Notification*
MIDAMC	*ATS Messages Management Center in the MID Region*
MTA	*Message Transfer Agent*
MTCU	*Message Transfer & Control Unit*
NDR	*Non Delivery Report*
NRN	*Non Receipt Notification*
OR-address	*Originator- recipient address*
PRMD	*Private Management Domain*
RN	*Receipt Notification*
SEC	*Security (X.500)*
UA	*User Agent*

1. Introduction

The Message Handling service provided in the ATN is called the ATS Message Handling Service (ATSMHS). This service is specified using X.400 standards. There are two levels of ATSMHS service: Basic ATS Message Service and Extended ATS Message Service.

The Basic ATS Message Service provides a nominal capability equivalent from a user perspective to those provided by AFTN. And Extended ATS Message Service provides enhanced features such as supporting transfer of more complex message structures (body parts), use of the directory service, and support for security. The Extended Service is a technical and functional superset of the Basic ATS service.

The MID Region has decided to implement the Basic ATS service as a first step. SARPS has defied various AMHS subset, the AMHS capabilities in MID states are elaborated in table (1).

The World Metrological Organization (WMO) initially decided to migrate from alphanumeric codes to BUFR for the representation of Metrological data, therefore, ATS Extended services was introduced to meet the Metrological requirement. However, most of ATS systems in the MID can run extended services and specially File Transfer body Part (FTBP). The MIDAMC STG has defined possible use of the FTBP in the MID such as:

a) **Exchanging messages related to Flight Permission messages**
When Airliner need to get overflying/landing permissions to/over an Aerodrome, they/ or the agent send a flight permission Request to the designated Authority, few messages exchanged to complete this process and it may include the need to send some document. In Current AFS Network, the Flight permission request and related messages are exchanged via AFTN/CIDIN, and other documents should be sent via FAX or email. Introduction of a User Agent at the originator side can make use of the FTBP service to exchange messages with attachment and any further enhancement.

b) **Distribution of the Aeronautical Information Publications (AIP) amendments and supplements**
The Aeronautical Information Services office distributes the updated AIP document via email, CD, or internet. Introduction of a User Agent with FTBP can make it possible to deliver updated data to a group of users at once.

State	Basic ATS Message Service	Enhancement with the Extended ATS Message Services			
		FTBP	IHE	DIR	SEC
Bahrain	✓				
Egypt	✓	✓			
Iran	✓	✓			
Iraq	✓				
Jordan	✓	✓		✓	
Kuwait	✓				
Lebanon	✓	✓			
Libya					

Oman	✓				
Saudi Arabia	✓	✓			
Sudan	✓	✓			
Syria					
Qatar	✓				
UAE	✓				
Yemen					

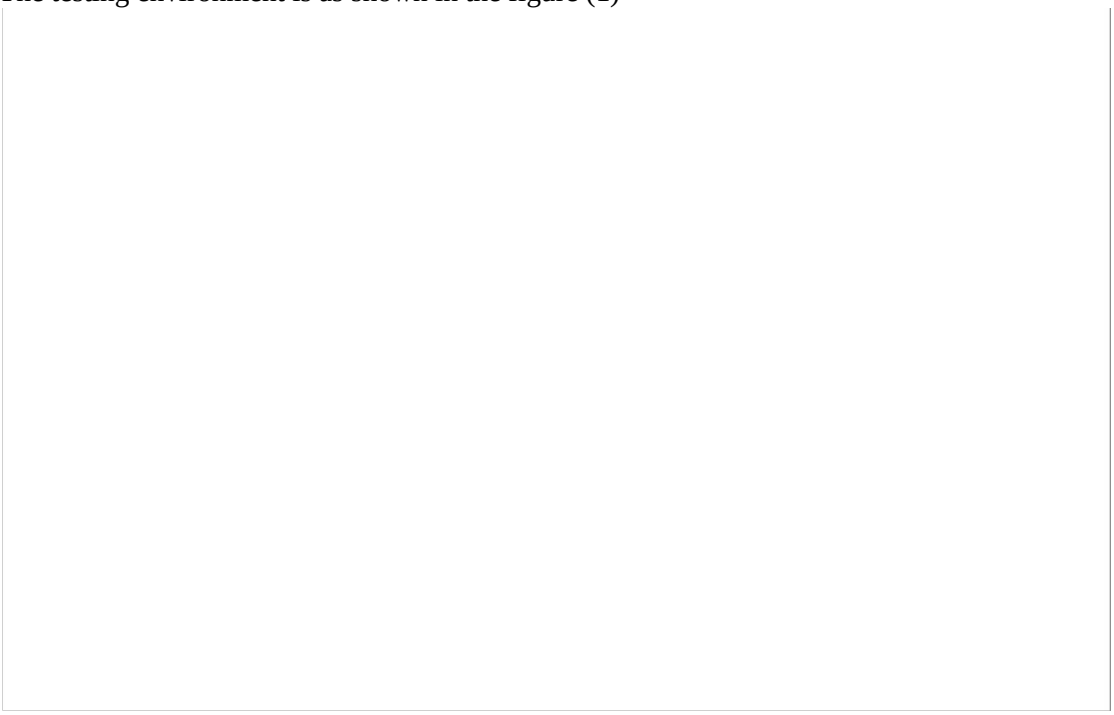
Table (1) AMHS Implementation Profile in the MID

2. Scope of Document

The purpose of this document is to define the functional tests for ATS Extended Service handling specially File Transfer body part (FTBP) in order to ensure the end- to-end capability of AMHS systems and network to exchange this type of messages. These tests are performed after the successful operation of AMHS basic services, through which the compliance of all systems to the AMHS technical specifications has been demonstrated and proved.

3. Test Environment

Both test systems should have operational AMHS link, and P1 connection setup. Two User Agents should be used to exchange traffic with File Transfer Body Part capability. The testing environment is as shown in the figure (1)



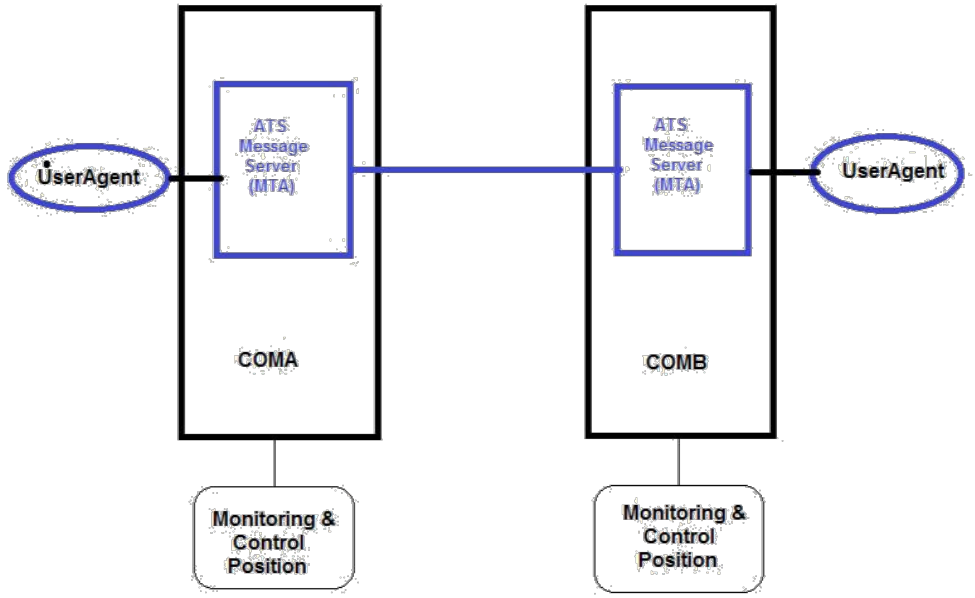


Figure (1) Testing Infrastructure

The test can be performed in AMHS Network and unnecessary to have direct AMHS link between the two COM centers, the traffic can be exchanged via intermediary(ies) COM center(s), which should be involved in the test activities.

The User Agent address at COM A could be "COMAASTT", and at COM B "COMBASTT". The User Agent can be either P3 or P7 User Agent.

Network Analysis software can be used to monitor X.400 traffic and its effect on network Bandwidth. The software can be agreed on prior the test.

The exchange of binary files will have significant impact on the switches' storage, which should be monitored during the test. Several commands can display the memory status such as *top, free, /proc/meminfo, vmstat ,…etc,* however, the memory monitoring tools varies depends on the operating system types and versions.

4. Test Procedure

Before the tests, the test partners should coordinate and document the type of body part used in IPMs submitted by their User Agents when submitting text messages, either as:
- IPMs containing a basic ia5-text body part, or
- IPMs containing an extended ia5-text body part, or
- IPMs containing a general-text body part with ISO646 repertoire.

The Delivery report (DR) is an enhancement feature of the AMHS, the default operation is to send non delivery report (NDR) when the delivery fails, to inform the originator. However, in this trial, the delivery report should always be requested with each message.

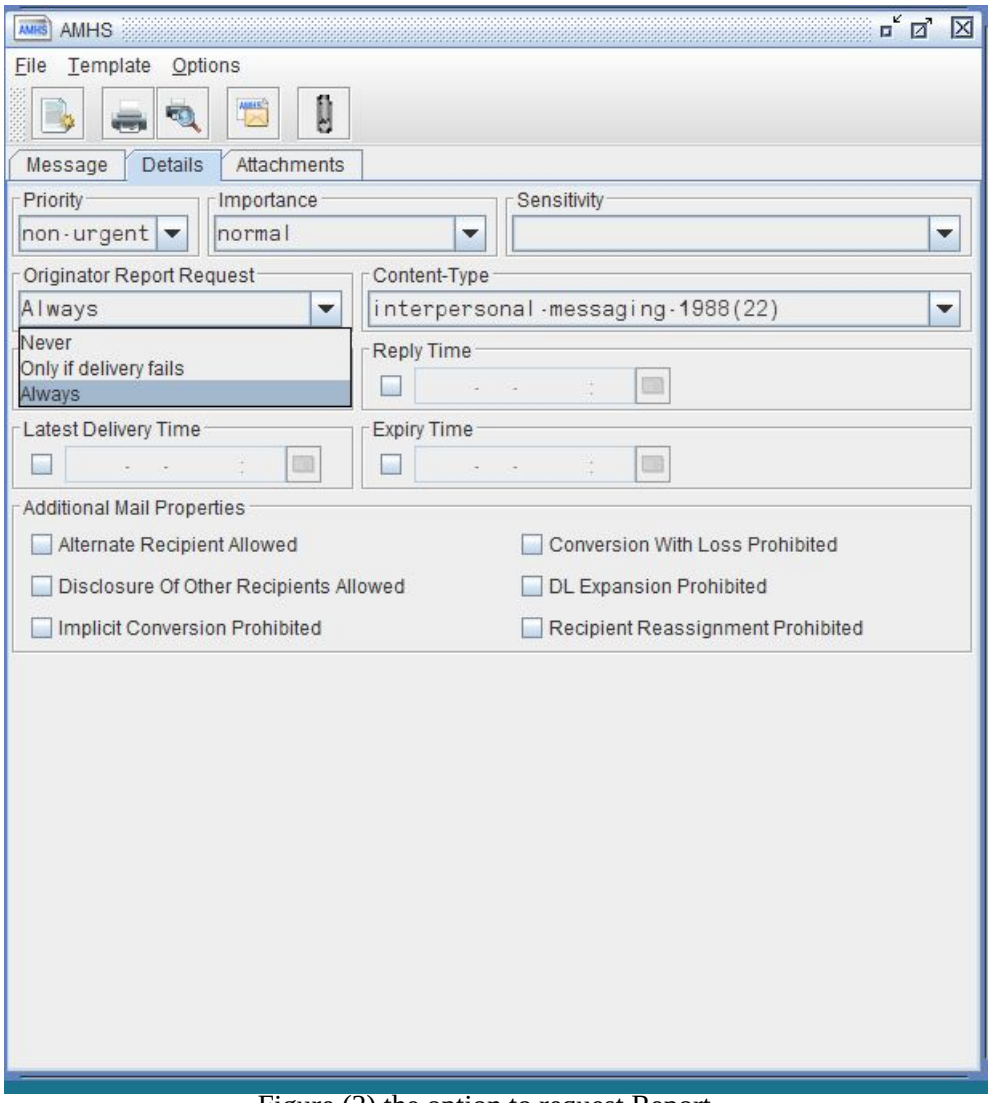


Figure (2) the option to request Report

4.1 Submission, Transfer and Delivery of a message including Binary file from UserAgent to UserAgent.

Test01	**Submission of Binary file**	
Test Criteria	The Test is successful if COMB receive the message with binary file attached with text message from COMA	
Test Scenario	From COMA send two ATS Messages (IPMs) to COMB (COMBASST) • Message 1 (Test11) shall have ATS priority non-urgent and binary file attached • Message 2 (Test12) shall have ATS priority normal and binary file attached Verify the messages received by the remote UA. In particular, verify: •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size Verify that COMA receives a Delivery report.	
Result	☐ PASS	☐ Failed

Test02	Submission of Binary file	
Test Criteria	The Test is successful if COMA receive the message with binary file attached with text message from COMB	
Test Scenario	From COMB send two ATS Messages (IPMs) to COMA (COMAASST) • Message 1 (Test21) shall have ATS priority non-urgent and binary file attached • Message 2 (Test22) shall have ATS priority normal and binary file attached Verify the messages received by the remote UA. In particular, verify: •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size Verify that COMB receives a Delivery report.	
Result	☐ PASS	☐ Failed

Example of DR

Reported Recipients:

OJTTMHSA	
Delivered:	2017-01-25 09:47:17
User type:	Private User Agent
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:47:17
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
MTA Name:	MTA-OJAM-1
Arrival Time:	2017-01-25 09:47:17
Routing Action:	relayed

Figure (3) DR

Test031	**Submission of Binary file**	
Test Criteria	The Test is successful if COMA receive the SS ACK after sending urgent message with binary file attached from COMB	
Test Scenario	From COMA send Urgent ATS Messages (IPMs) to COMB (COMBASST) • Message 1 (Test31) shall have ATS priority urgent and binary file attached Verify the messages received by the remote UA. In particular, verify: •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size COMA may receive SS ACK or RN depends on system configuration. Option 1 : SS Ack Option 2: RN	
Result	☐ PASS	☐ Failed
	Option :	

Test032	**Submission of Binary file**	
Test Criteria	The Test is successful if COMB receive the SS ACK after sending urgent message with binary file attached from COMA	
Test Scenario	From COMB send Urgent ATS Messages (IPMs) to COMA (COMAASST) • Message 1 (Test32) shall have ATS priority urgent and binary file attached Verify the messages received by the remote UA. In particular, verify: •ATS-message-priority, •ATS-message-filing-time, •ATS-message-text. •The Binary file • The message size COMB may receive SS ACK or RN depends on system configuration. Option 1 : SS Ack Option 2: RN	
Result	☐ PASS	☐ Failed
	Option :	

4.2 Submission, Transfer and Delivery of a message including Binary file from UserAgent to AFTN User

Test041	**Submission of Binary file to AFTN User**	
Test Criteria	The Test is successful if COMA receive Non Delivery report from the MTCU of the switch at COMB	
Test Scenario	From COMA send ATS Messages (IPM) to AFTN User at COMB (COMBZTZX) • Message 1 (Test41) shall have ATS priority normal and binary file attached Verify that the message is not received at the remote AFTN user Verify that COMA receive non-delivery report In particular, verify: •Non-Delivery reason is *unable-to-transfer* •Diagnostics is *encoded-information-types-unsupported* •the NDR originated by the MTCU For ex: MTA name*: HECA-MTA-MTCU*	
Result	☐ PASS	☐ Failed

Test042	Submission of Binary file to AFTN User	
Test Criteria	The Test is successful if COMB receive Non Delivery report from the MTCU of the switch at COMA	
Test Scenario	From COMB send ATS Messages (IPM) to AFTN User at COMA (COMAZTZX) • Message 1 (Test42) shall have ATS priority normal and binary file attached Verify that the message is not received at the remote AFTN user Verify that COMB receive non-delivery report In particular, verify: •Non-Delivery reason is *unable-to-transfer* •Diagnostics is *encoded-information-types-unsupported* •the NDR originated by the MTCU For ex: MTA name*: HECA-MTA-MTCU*	
Result	☐ PASS	☐ Failed

Example of NDR

HECAYFYX	
Non-delivery Reason:	unable-to-transfer
Diagnostic:	encoded-information-types-unsupported
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	

Trace Information	
Global Domain ID:	/PRMD=he/ADMD=icao/C=xx/
Arrival Time:	2017-01-25 09:36:02
Routing Action:	relayed

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:36:04
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=he/ADMD=icao/C=xx/
MTA Name:	HECA-MTA-MTCU
Arrival Time:	2017-01-25 09:36:02
Routing Action:	relayed

Figure (4) NDR from MTCU

4.3 Submission, Transfer and Delivery of a message including Binary file from UserAgent to Distribution list

Test051	**Submission of Binary file to AFTN User and UA**	
Test Criteria	The Test is successful if COMA receive Non Delivery report from the MTCU of the switch at COMB, and DR from the UA	
Test Scenario	From COMA configure DL (COMADLAB) with two addresses, one for UA and one for AFTN user of the COMB: COMBFTNA, COMBMHSA. From COMA send ATS Messages (IPM) to the address (COMADLAB) • Message 1 (Test51) shall have ATS priority normal and binary file attached Verify that the message is not received at the remote AFTN user, and received at the useragent Verify that COMA receive two reports; non-delivery report from the MTCU and DR from the UA In particular, verify the following for the NDR: •Non-Delivery reason is *unable-to-transfer* •Diagnostics is *context-syntax-error* •the NDR originated by the MTCU For ex: MTA name*: HECA-MTA-MTCU* And verify that the DR from the UA and the supplementary information is *list expanded*	
Result	☐ PASS	☐ Failed

Example of DR after DL expanded

OJAMDLRE	
Delivered:	2017-01-25 09:56:59
User type:	Distribution List
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	list expanded

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:56:59
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
MTA Name:	MTA-OJAM-1
Arrival Time:	2017-01-25 09:56:59
Routing Action:	relayed

Figure (5) DR from UA after DL expanded

Test052	Submission of Binary file to AFTN User and UA	
Test Criteria	The Test is successful if COMB receive Non Delivery report from the MTCU of the switch at COMA, and DR from the UA	
Test Scenario	From COMB configure DL (COMBDLAB) with two addresses, one for UA and one for AFTN user of the COMA: COMAFTNA, COMAMHSA. From COMB send ATS Messages (IPM) to the address (COMBDLAB) • Message 1 (Test51) shall have ATS priority normal and binary file attached Verify that the message is not received at the remote AFTN user, and received at the useragent Verify that COMB receive two reports; non-delivery report from the MTCU and DR from the UA In particular, verify the following for the NDR: •Non-Delivery reason is *unable-to-transfer* •Diagnostics is *context-syntax-error* •the NDR originated by the MTCU For ex: MTA name*: HECA-MTA-MTCU* And verify that the DR from the UA and the supplementary information is *list expanded*	
Result	☐ PASS	☐ Failed

Test61	**Submission of Binary file to AFTN User and UA while DL expansion is prohibited**	
Test Criteria	The Test is successful if COMA receive Non Delivery report	
Test Scenario	From COMA configure DL (COMADLAB) with two addresses, one for UA and one for AFTN user of the COMB: COMBFTNA, COMBMHSA. From COMA send ATS Messages (IPM) to the address (COMADLAB) and select option of "DL expansion Prohibited" • Message 1 (Test61) shall have ATS priority normal and binary file attached Verify that the message is not received at the remote AFTN user and the useragent Verify that COMA receive a non-delivery report from the COMB In particular, verify the following for the NDR: •Non-Delivery reason is *unable-to-transfer* •Diagnostics is *dl-expansion-prohibited*	
Result	☐ PASS	☐ Failed

Test62	**Submission of Binary file to AFTN User and UA while DL expansion is prohibited**	
Test Criteria	The Test is successful if COMB receive Non Delivery report	
Test Scenario	From COMB configure DL (COMBDLAB) with two addresses, one for UA and one for AFTN user of the COMA: COMAFTNA, COMAMHSA. From COMB send ATS Messages (IPM) to the address (COMBDLAB) and select option of "DL expansion Prohibited" • Message 1 (Test62) shall have ATS priority normal and binary file attached Verify that the message is not received at the remote AFTN user and the useragent Verify that COMB receive a non-delivery report from the COMA In particular, verify the following for the NDR: •Non-Delivery reason is *unable-to-transfer* •Diagnostics is *dl-expansion-prohibited*	
Result	☐ PASS	☐ Failed

Example of NDR with diagnostics DL expansion prohibited

OJAMDLRE	
Non-delivery Reason:	unable-to-transfer
Diagnostic:	dl-expansion-prohibited
Conv. encoding:	
Intended Recipient:	
Suppl. Information:	DL expansion prohibited for this message

Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
Arrival Time:	2017-01-25 09:53:36
Routing Action:	relayed

Internal Trace Information	
Global Domain ID:	/PRMD=OJ/ADMD=ICAO/C=XX/
MTA Name:	MTA-OJAM-1
Arrival Time:	2017-01-25 09:53:36
Routing Action:	relayed

Figure (6) NDR because DL expansion prohibited

4.4 Submission, Transfer and Delivery of a message including Binary file from UserAgent larger than the maximum size of remote COM center

The com center shall send message with binary file larger than the maximum capability of the remote COM center, the sender COM center shall receive NDR with *Reason: Unable-to-transfer, reject message larger than the maximum size.*

5. Test Summary

Use the Network Analysis software to analyze the traffic overhead occurred when sending binary files with the message. Also document the message size on system hard disks. Monitor any warning message or alarm during the tests.

Stress tests can be performed, by sending 20, 50 messages repeating test Test01 and Test02. Network and system response should be carefully monitored in order not affecting the life traffic.

6. ATS Extended Services Trial Team (ASTT)

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- END -

APPENDIX 5.2.2O

MIDAMC Steering Group (MIDAMC STG)

1. TERMS OF REFERENCE (TOR)

1.1 The Terms of Reference of the MIDAMC Steering are:

a) to promote the efficiency and safety of aeronautical fixed services in the MID Region through the operation and management, on a sound and efficient basis, of a permanent MID Regional ATS Messaging Management Center (MIDAMC);

b) foster the implementation of the Air traffic service Message handling service in the MID Region through provision of the guidance materials and running facilitation tools, utilizing the MIDAMC;

c) MIDAMC Steering Group will consist of a focal point from each Participating MID State who would represent the State and acts as the Steering Group Member;

d) MIDAMC Steering Group will be responsible for overall supervision, direction, evaluation of the MIDAMC project and will review/update the MIDAMC work plan whenever required;

e) The MID Region is considering the establishment of Reginal MID IP Network; the MIDAMC STG will drive the project which is called Common aeRonautical VPN (CRV), until the Operation Group is established; and

f) provide regular progress reports to the CNS SG, ANSIG and MIDANPIRG concerning its work programme.

1.2 In order to meet the Terms of Reference, the MIDAMC Steering Group shall:

a) Develop/update the accreditation procedure for all users on the MIDAMC;

b) develop and maintain guidance materials for MIDAMC users;

c) discuss and identify solution for operational problems may be arising;

d) provide support/guidance to States for AMHS Implementation, and monitor the AMHS activities;

e) assist and encourage States to conduct trial on Implementation of the ATS extended services, and identify operational requirements;

f) identify the need for any enhancement for the MIDAMC and prepare functional and technical specifications, and define its financial implications;

g) follow-up on ICAO standards and recommendations on the ATS messaging management;

h) define future liabilities and new participating States and ANSPs;

i) follow-up and review the work of similar groups in other ICAO Regions;

j) Follow of the Reginal MID IP Network project (CRV) and act as project manager; and

k) proposes appropriate actions for the early implementation also support the IP Network until the Operational Group is establish.

2. COMPOSITION

a) ICAO MID Regional Office;

b) Members appointed by the MIDANPIRG member States; and

c) other representatives, who could contribute to the activity of the Steering Group , could be invited to participate as observers, when required .

APPENDIX 5.2.2P

No	Recommendation	Action description and Status
1	ACAC has to continue raise awareness regarding the Global Navigation Satellites System (GNSS: EGNOS, GBAS) (Workshops, Seminar and training etc	On Going Basis
2	ACAC GNSS WG AN Provide regular papers to the MIDANPIRG CNS SG	On Going Basis
3	States to provide effective spectrum management and protection of Global Navigation Satellite System (GNSS) frequencies to reduce the likelihood of unintentional interference or degradation of GNSS performance;	On Going Basis
4	States engage all Stakeholders in all planning process;	On Going Basis
5	Plan the upgrade of Air Navigation systems based on the identification of needs and expectation of the airspace users and the identification of the optimum solution from operational and economic perspective. Maximize the use of the available technologies before investing in any new technologies;	On Going Basis
6	States to share experience on GNSS and ASBU B0 Modules implementation including sharing of training and implementation packages and visits to other States;	On Going Basis
7	State to identify operational requirements/Scope and improvements and plan for implementation accordingly taking into account the cost benefits of the different Augmentation systems available	On Going Basis
8	GAGAN (ISRO/AAI) to provide to CNS SG/7 details on the services and the requirement for extension of these services to the MID Region	Completed
9	EC to provide working papers to the CNS SG/7 on the progress achieved in the MID/ACAC States from the MEDUSA including the work programme for the Workshop in September which will discuss the template of the International Agreements;	Completed
10	States participated in the MEDUSA interested in further progress on EGNOS activities have to send official letters to EC, and provide updates on their GNSS plans and implementations Status to the CNS SG/7;	Partially Completed
11	EC is ready to assist any ACAC States not participated in MEDUSA for the conduct of the cost benefit analysis free of charge upon official request from the CAA or ACAC;	On Going
12	JPO and MID Region to share their experience on legal and institutional frame work on EGNOS implementation. JPO is also ready will provide support to interested African States;	On Going
13	ACAC and ICAO assist in harmonization to enhance interoperability and maximize available resources;	On Going Basis
14	ACAC GNSS WG with ICAO Support to carry out the study to assess the likelihood and effects of Global Navigation Satellite System Vulnerabilities in the MID Region airspace;	On Going
15	CNS SG and GNSS WG to develop MID Region GNSS mitigation strategy	Not started
16	Regional and Global coordination should be improved in order to define and meet the requirements of the Regional ANP and GANP; and	On Going
17	Evaluation of the implementation of GBAS system costs and benefits in the area of Arab Countries.	On Going

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

MID REGIONAL SIGMET GUIDE

EDITION.2 FEBRUARY, 2017

(70 pages)

RECORD OF AMENDMENTS AND CORRIGENDA

Amendments			
No.	Date of issue	Date entered	Entered by

Corrigenda			
No.	Date of issue	Date entered	Entered by

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1. INTRODUCTION

1.1. General

1.1.1. The main purpose of this regional SIGMET guide is to provide guidance for standardization and harmonization of the procedures and formats related to the preparation and issuance of aeronautical meteorological information pertaining to specified en-route hazardous weather, and other phenomena in the atmosphere, which may affect safety of aircraft operations, known as SIGMET. The guidance is complementary to Annex 3 to the Convention on International Civil Aviation – *Meteorological Services for International Air Navigation*, the Standards and Recommended Practices (SARPs) contained therein regarding SIGMET, and to the SIGMET-related provisions in ICAO Regional Air Navigation Plans (ANPs).

1.1.2. The guidance is specifically provided for the provision of SIGMET in traditional alphanumeric code (TAC) form. As the provision and use of SIGMET data in digital form (IWXXM XML/GML) is used increasingly across ICAO communications networks it is expected that the conventions of the digital form will result in more compliant and less ambiguous SIGMET messages. During the period of transition, where it is likely that originating MWOs will issue both TAC and digital forms of SIGMET and until TAC SIGMET is formally retired, it is considered necessary to make available a guidance document of this form.

1.1.3. ICAO provisions concerning the preparation and issuance of SIGMET information are primarily contained in:

- Annex 3 - *Meteorological Service for International Air Navigation*, Part I, Chapters 3 and 7 and Part II, Appendix 6;
- Annex 11 - *Air Traffic Services*, Chapter 4, 4.2.1 and Chapter 7, 7.1;
- Regional Air Navigation Plans, Basic ANP, Part VI - Meteorology (MET);
- Regional Air Navigation Plans, Volume II, FASID, Part VI – Meteorology (MET) FASID, Tables MET 1B, MET 3A and MET 3B;
- *Procedures for Air Navigation Services – Air Traffic Management (PANS-MET*, Doc 4444*)*, Chapter 9, 9.1.3.2;
- Regional Supplementary Procedures (Doc 7030), Chapter 6, 6.13.2;
- *ICAO Abbreviations and Codes* (Doc 8400);
- *Handbook on the International Airways Volcano Watch (IAVW) – Operational Procedures and Contact List* (Doc 9766);
- *Manual of Aeronautical Meteorological Practice* (Doc 8896), Chapters 1 and 4;
- *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services* (Doc 9377).

1.1.4. This regional SIGMET guide is primarily intended to assist meteorological watch offices (MWOs) in preparing and disseminating SIGMET information in conformance with the format prescribed in Annex 3. The explanations of the format to be used are accompanied by examples. The regional SIGMET guide also provides information regarding the necessary coordination between the MWOs, air traffic services (ATS), volcanic ash advisory centres (VAACs), tropical cyclone advisory centres (TCACs) and pilots, and their respective responsibilities.

1.1.5. To support regional management of SIGMET issuance and dissemination, Appendix C of the regional SIGMET guide contains guidance on the purpose, scope and procedures for conducting regional SIGMET tests.

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2. RESPONSIBILITIES AND COORDINATION

2.1. General

2.1.1. SIGMET messages provide information on hazardous meteorological and other phenomena which may affect safety of aircraft operations; hence they are considered a high priority among other types of meteorological information provided to the aviation users. The primary purpose of SIGMET is for in-flight service, which requires timely transmission of the SIGMET messages to pilots by the ATS units and/or through VOLMET and D-VOLMET. Further information on the responsibilities of each party involved in the SIGMET process can be found in the *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services* (Doc 9377).

2.1.2. Airlines are the main users of the SIGMET information. They contribute to the effectiveness of the SIGMET service through issuance of special air-reports reported by pilots to the ATS units. Special air-reports are among the most valuable sources of information for the MWOs in the preparation of SIGMET. The ATS units receiving special air-reports should forward them to their associated MWOs without delay.

2.1.3. In view of the foregoing, it should be well understood that the effectiveness of the SIGMET service depends strongly on the level of collaboration between the MWOs, ATS units, pilots, TCACs, VAACs and State volcano observatories. That is why, close coordination between these parties, as well as mutual understanding of their needs and responsibilities are essential for the successful implementation of the SIGMET service.

2.1.4. For the special cases of SIGMET for volcanic ash and tropical cyclones, the MWOs are provided with advisories from VAACs and TCACs respectively, as designated in the regional ANPs.

2.1.5. SIGMET is also used for flight planning. This requires global dissemination of SIGMET through the regional OPMET data banks (RODBs), the Internet-based SADIS FTP service and the WAFS Internet File Service (WIFS). SIGMET should also be distributed to the World Area Forecast Centres (WAFCs) London and Washington for use in the preparation of the significant weather (SIGWX) forecasts.

2.2. Meteorological watch office (MWO) responsibilities

2.2.1. SIGMET is to be issued by the MWO in order to provide timely information on the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere affecting the safety of the flight operations in the MWO's area of responsibility. SIGMET provides information concerning the location, extent, intensity and expected evolution of the specified phenomena.

2.2.2. Information about the provision of the SIGMET service, including details on the designated MWO(s), is to be included in the State's Aeronautical Information Publication (AIP) as required by Annex 15 – *Aeronautical Information Service*, Appendix 1, GEN 3.5.8.

2.2.3. If a State is temporarily unable to meet its obligations for establishing MWO(s) and for provision of SIGMET, arrangements have to be made for another State to assume this responsibility. Such delegation of responsibilities is to be agreed by the meteorological authority of each State concerned and should be notified by a NOTAM, within the State's AIP and in a letter to the ICAO Regional Office concerned.

2.2.4. The meteorological authority concerned should ensure that the MWO obligations and responsibilities are clearly defined and assigned to the unit designated to serve the MWO. Corresponding operational procedures should be established and the meteorological staff should be trained accordingly.

2.2.5. In preparing SIGMET information MWOs should follow the format prescribed in Annex 3, Appendix 6, Table A6-1A. Whilst Table A6-1A is the authoritative source, Appendix A of this regional SIGMET guide, includes an enhanced SIGMET specific guidance based on Table A6-1A and provides more specific instructions on how SIGMET should be compiled. The aim is to ensure that SIGMET is produced reliably and consistently worldwide.

2.2.6. SIGMET must be issued only for those phenomena listed in Annex 3, Appendix 6, 1.1.4 and only when specified criteria for their intensity and spatial extent are met.

2.2.7. The MWOs should be adequately equipped in order to be able to identify, analyze and forecast those phenomena for which SIGMET is required. The MWO should make use of all available sources of information including:

- special air-reports passed to the MWO from ATS (voice communication);
- special air-reports received from automated downlink;
- numerical Weather Prediction (NWP) data, especially high resolution models where available;
- meteorological observations, including those from automatic weather stations and human observers;
- upper wind information;
- information from meteorological satellites;
- weather radar (including Doppler radar);
- State volcano observatories;
- International Atomic Energy Agency (IAEA) through the relevant World Meteorological Organization (WMO) Regional Specializes Meteorological Centre (RSMC) for radioactive cloud;
- local knowledge;
- volcanic ash or tropical cyclone advisory messages.

2.2.8. On receipt of a special air-report from the associated ACC or FIC, the MWO shall:

a) issue SIGMET information based on the special-air report; or

b) send the special air-report for onward transmission to MWOs, WAFCs and other meteorological offices in accordance with regional air navigation agreement in the case that the issuance of SIGMET information is not warranted (e.g., the phenomenon concerned is of transient nature).

2.2.9. Appropriate telecommunication means should be available at the MWO in order to ensure timely dissemination of SIGMET according to a dissemination scheme, which should include transmission to:

- local ATS users;
- aerodrome MET offices within its area of responsibility, where SIGMET is required for briefing and/or flight documentation;
- other MWOs in accordance with regional air navigation plans;
- Centres designated for transmission of VOLMET or D-VOLMET where SIGMET is required for those transmissions;
- responsible ROBEX centres and regional OPMET data bank (RODB). It should be arranged that, through the ROBEX scheme, SIGMETs are sent to

the designated RODB in the other ICAO regions, to the WAFCs and to the SADIS and WIFS providers;

2.2.10. In issuing SIGMET for tropical cyclones or volcanic ash, the MWOs should include as appropriate the advisory information received from the responsible TCAC or VAAC. In addition to the information received from the TCAC and VAAC, the MWOs may use the available complementary information from other reliable sources.

2.3. Air traffic service (ATS) unit responsibilities

2.3.1. Close coordination should be established between the MWO and the corresponding ATS unit (ACC or FIC) and arrangements should be in place to ensure:

- receipt without delay and display at the relevant ATS units of SIGMET issued by the associated MWO;
- receipt and display at the ATS unit of SIGMETs issued by MWOs responsible for the adjacent FIRs/ACCs if these SIGMETs are required according to 2.3.4 below; and
- transmission without delay by the ATS unit of special air-reports received through voice communication to the associated MWO.

2.3.2. SIGMET information should be transmitted to aircraft with the least possible delay on the initiative of the responsible ATS unit, by the preferred method of direct transmission followed by acknowledgement or by a general call when the number of aircraft would render the preferred method impracticable.

2.3.3. SIGMET information transmitted to aircraft-in-flight should cover a portion of the route up to two hours flying time ahead of the aircraft. SIGMET should be transmitted only during the time corresponding to their period of validity.

2.3.4. Air traffic controllers should ascertain whether any of the currently valid SIGMETs may affect any of the aircraft they are controlling, either within or outside the FIR/CTA boundary, up to two hours flying time ahead of the current position of the aircraft. If this is the case, the controllers should at their own initiative transmit the SIGMET promptly to the aircraft-in-flight likely to be affected. If necessary, the controller should pass to the aircraft available SIGMETs issued for the adjacent FIR/CTA, which the aircraft will be entering, if relevant to the expected flight route.

2.3.5. The ATS units concerned should also transmit to aircraft-in-flight the special air-reports received, for which SIGMET has not been issued. Once a SIGMET for the weather phenomenon reported in the special air report is made available this obligation of the ATS unit expires.

2.4. Pilot responsibilities

2.4.1. Timely issuance of SIGMET information is largely dependent on the prompt receipt by MWOs of special air-reports. It is essential that pilots prepare and transmit such reports to the ATS units whenever any of the specified en-route hazardous conditions are encountered or observed.

2.4.2. It should be emphasized that, even when automatic dependent surveillance (ADS) is being used for routine air-reports, pilots should continue to make special air-reports.

2.4.3. Pilots should compile special air-reports and disseminate to ATS by air-ground data link as per Annex 3, Appendix 4, 1.2 and *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444), 4.12.3.2, or by voice communication as per Annex 3, Appendix 4, 1.3 and PANS-ATM (Doc 4444), 4.12.3.3.

Note. — The MWO will compile special air-reports for uplink as per Annex 3, Appendix 6, and as reported using the instructions given PANS-ATM, Appendix 1.

2.5. Coordination between MWOs and ATS units

2.5.1. To achieve the best service to aviation and as part of the collaborative decision-making process, close coordination between the MWO and the ATS units is required. This is of particular importance for the avoidance of hazardous weather.

2.5.2. A Letter of Agreement between the ATS authority and the meteorological authority is also recommended (as per Annex 3, 4.2) to outline the responsibilities and coordination processes between the MWOs and ATS units.

2.6. Coordination between MWOs, VAACs, TCACs and State volcano observatories

2.6.1. Amongst the phenomena for which SIGMET information is required, volcanic ash and tropical cyclones are of particular importance.

2.6.2. Since the identification, analysis and forecasting of volcanic ash and tropical cyclones requires considerable scientific and technical resources, normally not available at each MWO, VAACs and TCACs have been designated to provide volcanic ash advisories and tropical cyclone advisories respectively to the users and assist the MWOs in the preparation of SIGMETs for those phenomena. Close coordination should be established between the MWO and its responsible VAAC and/or TCAC.

2.6.3. Information regarding the VAACs and TCACs areas of responsibility and lists of MWOs and ACC/FICs to which advisories are to be sent is provided in the regional ANPs FASID Tables MET 3A and MET 3B. Volcanic ash advisories and tropical cyclone advisories are required for global exchange through SADIS and WIFS as they are used by the operators during the pre-flight planning. Nevertheless, it should be emphasized that SIGMET information is still required especially for in-flight re-planning. SIGMETs should be transmitted to aircraft-in-flight through voice communication, VOLMET or D-VOLMET, thus providing vital information for making in-flight decisions regarding large-scale route deviations due to volcanic ash clouds or tropical cyclones.

2.6.4. Information from State volcano observatories is an important part of the process for issuance of volcanic ash advisories and SIGMETs. Information from a State volcano observatory should be in the form of a Volcano Observatory Notification for Aviation (VONA) and include information on significant pre-eruption volcanic activity, volcanic eruptions or the presence of volcanic ash clouds. Guidance including responsibilities for the issuance of the VONA is given in the *Handbook on the International Airways Volcano Watch (IAVW) – Operational Procedures and Contact List* (Doc 9766); the format of the VONA is given in Appendix E of the Doc 9766.

3. PROCEDURES FOR PREPARATION OF SIGMET INFORMATION

3.1. General

3.1.1. SIGMET is intended for transmission to aircraft in flight either by ATC or by VOLMET or D-VOLMET, and therefore, SIGMET messages should be kept concise. To this end, SIGMET information is prepared using approved ICAO abbreviations, a limited number of non-abbreviated words and, numerical values of a self-explanatory nature.

3.1.2. The increasing use of automated systems for handling the aeronautical meteorological information by the users makes it essential that all types of OPMET information, including SIGMET messages, are prepared and issued in the prescribed standardized format. Therefore, the format of the SIGMET message, as specified in Annex 3, Appendix 6, should be strictly followed by the MWOs.

3.1.3. The MWO should maintain watch over the evolution of the phenomenon for which a SIGMET has been issued. If the phenomenon persists or is expected to persist beyond the period of validity of the SIGMET, another SIGMET message for a further period of validity should be issued with updated information. SIGMETs for volcanic ash and tropical cyclone should be updated at least every 6 hours, while SIGMET for all other phenomena should be updated at least every 4 hours.

3.1.4. SIGMET should be promptly cancelled when the phenomenon is no longer occurring or no longer expected to occur in the MWO's area of responsibility.

3.1.5. Some SIGMET are generated using information from special air-reports (received by voice communications or data link (downlink)). The reporting of turbulence and icing used in special air-reports includes both moderate and severe categories (as per Doc 4444, Appendix 1).

Note. — Although the categories for the reporting, by pilots, of moderate and severe turbulence in special air-reports is provided in PANS-ATM (Doc 4444), some pilots report turbulence as "moderate to severe". A MWO is then faced with determining which category to use in a special air-report (uplink) or in a SIGMET message for severe turbulence. Some States elect to treat such "moderate to severe" observations as 'severe' in the context of using the report to prompt the issuance of a special air-report (uplink) or a SIGMET message.

3.2. SIGMET phenomena

3.2.1. SIGMET shall only be issued for the phenomena listed in Table 1 below and only using the abbreviations as indicated.

Phenomena Abbreviation	Description
OBSC TS	Thunderstorms that are obscured by haze or smoke or cannot be readily seen due to darkness.
EMBD TS	Thunderstorms that are embedded within cloud layers and cannot be readily recognized by the pilot in command
FRQ TS	Frequent thunderstorms where, within the area of thunderstorms, there is little no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75%.
SQL TS	A squall line indicating that a line of thunderstorms with little or no space between individual cumulonimbus clouds (CB).
OBSC TSGR	Thunderstorms with hail that are obscured by haze or smoke or cannot be readily seen due to darkness.
EMBD TSGR	Thunderstorms with hail that are embedded within cloud layers

Phenomena Abbreviation	Description
	and cannot be readily recognized.
FRQ TSGR	Frequent thunderstorms with hail, within the area of thunderstorms, there is little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75%.
SQL TSGR	A squall line indicating that a line of thunderstorms with hail with little or no space between cumulonimbus clouds (CB).
TC	A tropical cyclone with a 10 minute mean surface wind speed of 17m/s (34 kt) or more.
SEV TURB	Severe turbulence referring to: • low-level turbulence associated with strong surface winds; • rotor streaming; or • clear air turbulence, whether in cloud or not in cloud. *Note. — Turbulence should not be used in connection with convective clouds. Severe turbulence shall be considered whenever the peak value of the cube root of EDR exceeds 0.7.*
SEV ICE	Severe icing not associated with convective cloud.
SEV ICE (FZRA)	Severe icing caused by freezing rain and not associated with convective cloud.
SEV MTW	Severe mountain wave the accompanying downdraft is 3 m/s (600 ft/min) or more or when severe turbulence is observed or forecast.
HVY DS	Heavy duststorm where the visibility is below 200 m and the sky is obscured.
HVY SS	Heavy sandstorm where the visibility is below 200 m and the sky is obscured.
VA	Volcanic ash
RDOACT CLD	Radioactive cloud

Table 1: SIGMET phenomena abbreviations and descriptions

3.3. Allowable abbreviations

3.3.1. Abbreviations that can be used in the meteorological section of SIGMET are given in Table 1 above and in Table 2 below.

Abbreviation	Meaning		Abbreviation	Meaning
ABV	Above		NE	North-east
APRX	Approximate or approximately		NNE	North-north-east
AT	At (followed by time)		NNW	North-north-west
BLW	Below		NM	Nautical miles
BTN	Between		NO	No
CB	Cumulonimbus cloud		NW	North-west
CLD	Cloud		OBS	Observe or observed or observation
CNL	Cancel or cancelled		PSN	Position
E	East or eastern longitude		S	South or southern latitude
ENE	East-north-east		SE	South-east
ESE	East-south-east		SFC	Surface
EXP	Expect or expected or expecting		SSE	South-south-east

Abbreviation	Meaning	Abbreviation	Meaning
FCST	Forecast	SSW	South-south-west
FIR	Flight information region	STNR	Stationary
FL	Flight level	SW	South-west
FT	Feet	TO	To
INTSF	Intensify or intensifying	TOP	Cumulonimbus cloud top (height)
KM	Kilometres	W	West or western longitude
KT	Knots	WI	Within (area)
LCA	Location	WID	Width or wide
M	Metres	WKN	Weaken or weakening
MOV	Move or moving or movement	WNW	West-north-west
MT	Mountain	WSW	West-south-west
N	North or northern latitude	Z	Coordinated Universal Time
NC	No change		

Table 2: SIGMET phenomena abbreviations and descriptions.

3.4. SIGMET structure

3.4.1. A SIGMET message consists of:

- ***WMO Abbreviated Heading Line (WMO AHL)*** – all SIGMETs are preceded by an appropriate WMO AHL;
- ***First line***, containing location indicators of the respective ATS unit and MWO, sequential number and period of validity;
- ***SIGMET main body***, containing information concerning the observed or forecast phenomenon for which the SIGMET is issued together with its expected evolution within the period of validity;

3.5. SIGMET format

Note. — In the following text, square brackets - [ ] - are used to indicate an optional or conditional element, and angled brackets - < > - for symbolic representation of a variable element, which in a real SIGMET accepts a discrete numerical value.

3.5.1. WMO header

$T_1T_2A_1A_2$ii CCCC YYGGgg [BBB]

3.5.1.1. The group **$T_1T_2A_1A_2$ii** is the bulletin identification (WMO AHL) for the SIGMET message. It is constructed in the following way:

T_1T_2	Data type designator	**WS** – for SIGMET for phenomena other than volcanic ash cloud or tropical cyclone **WC** – for SIGMET for tropical cyclone **WV** – for SIGMET for volcanic ash
A_1A_2	Country or territory designators	Assigned according to Table C1, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to p 2.3.2.2, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)

Table 3: Specification of the WMO Abbreviated Header Line for SIGMET

Note .1 — Tropical cyclone and volcanic ash cloud SIGMETs will be referred to hereafter as WC SIGMET (due to the T_1T_2 section of the WMO AHL being set to WC) and WV SIGMET (due to the T_1T_2 section of the WMO AHL being set to WV) respectively. All other SIGMET types will be referred to by WS (due to the T_1T_2 section of the WMO AHL being set to WS).

Note 2. — WMO AHLs for SIGMET bulletins used by [INSERT REGION NAME] MWOs are listed in Appendix D to this SIGMET Guide.

3.5.1.2. **CCCC** is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

3.5.1.3. **YYGGgg** is the date/time group; where **YY** is the day of the month and **GGgg** is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).

Examples:

WSTH31 VTBS 121200

WVJP31 RJTD 010230

WCNG21 AYPY 100600

3.5.2. First line of SIGMET

CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-

3.5.2.1. The meaning of the groups in the first line of the SIGMET is as follows:

CCCC	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers
SIGMET	Message identifier
[n][n]n	Daily sequence number (see 3.5.2.2)
VALID	Period of validity indicator
YYGGgg/YYGGgg	Validity period of the SIGMET given by date/time group of the beginning and date/time group of the end of the period (see 3.5.2.3)
CCCC	ICAO location indicator of the issuing MWO
-	Mandatory **hyphen** to separate the preamble from the text

Table 4: Elements making up the first line of SIGMET

3.5.2.2. The numbering of SIGMETs starts every day at 0001 UTC. The sequence number should consist of up to three alphanumeric characters and may be a combination of letters and numbers, such as:

- **1**, **2**, …
- **01**, **02**, …
- **A01**, **A02**, …

Examples:

RPMM SIGMET 3 VALID 121100/121700 RPLL-
WSJC SIGMET A04 VALID 202230/210430 WSSS-

*Note 1. — No other combinations should be used, like "***CHARLIE 05***" or "***NR7***".*

Note 2. — Correct numbering of SIGMET is very important since the number is used for reference in communication between ATC and pilots and in VOLMET and D-VOLMET.

Note 3. — In accordance with Annex 5 – Units of Measurement to be Used in Air and Ground Operations*, when the validity period begins or ends at midnight, YY should be set for the following day and GGgg should be '0000'. i.e. SIGMET validity ending at midnight on the 23rd day of the month should be expressed as '240000'.*

3.5.2.3. The following regulations apply when determining the validity period:

- The period of validity of a **WS** SIGMET should not be more than 4 hours;
- The period of validity of a **WC** or **WV** SIGMET should not be more than 6 hours;
- In case of a SIGMET for an observed phenomenon, the filing time (date/time group in the WMO header) should be the same or very close to the time in the date/time group indicating the start of the SIGMET validity period;
- When the SIGMET is issued for a forecast phenomenon:
  - the beginning of validity period should be the time of the expected commencement (occurrence) of the phenomenon in the MWO area of responsibility;
  - the time of issuance of a **WS** SIGMET should not be more than 4 hours before the start of validity period (i.e., expected time of occurrence of the phenomenon); and for **WC** (tropical cyclone) and **WV** (volcanic ash) SIGMET the lead time should not be more than 12 hours.

3.5.2.4. The period of validity is that period during which the SIGMET information is valid for transmission to aircraft in flight.

Examples:

1) First two lines of a SIGMET for an observed phenomenon:

```
WSTH31 VTBS 241120
VTBB SIGMET 3 VALID 241120/241500 VTBS–
```

2) First two lines of a SIGMET for a forecast phenomenon (expected time of occurrence 1530)

```
WSSR20 WSSS 311130
WSJC SIGMET 1 VALID 311530/311930 WSSS-
```

3.5.3. Structure of the meteorological part of SIGMET

3.5.3.1. The meteorological part of a SIGMET for the phenomena consists of elements as shown in the table below.

Start of the second line of the message

1	2	3	4	5	6	7	8	9
Name of the FIR/UIR or CTA (M)	Phenomenon (M)	Observed or forecast phenomenon (M)	Location (C)	Level (C)	Movement *or* expected movement (C)	Changes in intensity (C)	Forecast time (C)	Forecast position (C)
See 3.5.3.2	See 3.5.3.3	See 3.5.3.4	See 3.5.3.5	See 3.5.3.6	See 3.5.3.7	See 3.5.3.8	See 3.5.3.9	See 3.5.3.10

Table 5: Elements making up the meteorological part of SIGMET.
Note 1) Item 6, 'Movement or expected movement' should not be used if the 'forecast time' and 'forecast position' elements are used.
Note 2) M = inclusion mandatory, part of every message. C = inclusion conditional, include whenever applicable.

3.5.3.2. Name of the FIR/UIR or CTA

CCCC <name> FIR[/UIR]

or

CCCC <name> CTA

The ICAO location indicator and the name of the FIR/CTA are given followed by the appropriate abbreviation: FIR, FIR/UIR or CTA. The name may consist of up to 10 characters.

Examples:
VTBB BANGKOK FIR

3.5.3.3. Phenomenon

The phenomenon description consists of a qualifier and a phenomenon abbreviation. SIGMET should be issued only for the following phenomena observed and forecast to persist for more than a transitory period.:

- thunderstorms – if they are **OBSC**, **EMBD**, **FRQ** or **SQL** with or without hail (**GR**);
- turbulence – only **SEV**
- icing – only **SEV** with or without **FZRA**
- mountain waves – only **SEV**
- dust storm – only **HVY**
- sand storm – only **HVY**
- radioactive cloud – **RDOACT CLD**

For volcanic ash SIGMET (WV) only, the following conventions should be used

In the case when the eruption is from a previously unknown or un-named volcano.

VA ERUPTION PSN Nnn[nn] or Snn[nn] Ennn[nn] or Wnnn[nn] VA CLD

In the case when the eruption is from a known and named volcano. The name may be up to 10 alphanumeric characters.

VA ERUPTION MT nnnnnnnnnn PSN Nnn[nn] or Snn[nn] Ennn[nn] or Wnnn[nn] VA CLD

In the case when a region of volcanic ash cloud is known to exist, but the precise origin of its source is unknown (the ash cloud may be of large horizontal extent, and obscuring the precise vent from which it emanates, and is otherwise in an area sparse of observation to identify the source).

VA CLD

For tropical cyclone SIGMET (WC) only, the following conventions should be used

In the case when the tropical cyclone is known and named. The name may be up to 10 alphanumeric characters.

TC nnnnnnnnnn PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB

In the case when the tropical cyclone is not yet named.

TC NN PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] CB

The appropriate abbreviations and combinations, and their meaning are given in Table 1.

3.5.3.4. Indication whether the phenomenon is observed or forecast

OBS

or

OBS AT GGggZ

or

FCST

or

FCST AT GGggZ

The indication whether the phenomenon is observed or forecast is given by using the abbreviations **OBS** or **FCST**. **OBS AT** and **FCST AT** may be used, in which case they are followed by a time group in the form **GGggZ**. If the phenomenon is observed, **GGggZ** is the time of the observation in hours and minutes UTC. If the exact time of the observation is not known the time is not included. When the phenomenon is based on a forecast without a reported observation, the time given for **GGggZ** represents the time of commencement of the validity period**.**

Examples:

OBS

OBS AT 0140Z

FCST

FCST AT 0200Z

3.5.3.5. Location of the phenomenon

The location of the phenomenon is given with reference to geographical coordinates (latitude and longitude). Latitude and longitude may be reported in degrees, or in degrees and minutes. When

reporting in degrees the format will be **Nnn** or **Snn** for latitude, and **Ennn** or **Wnnn** for longitude. When reporting in degrees and minutes the format will be **Nnnnn** or **Snnnn** for latitude, and **Ennnnn** or **Wnnnnn** for longitude. The MWOs should try to be as specific as possible in reporting the location of the phenomenon and, at the same time, to avoid overwhelming the SIGMET with too many coordinates, which may be difficult to process or follow when transmitted by voice radio.

The following are the possible ways to describe the location of the phenomenon:

1) An area of the FIR defined by a polygon. Minimum 4 coordinates[1], and not normally more than 7 coordinates. This is the format preferred operationally by users.

   Symbolically, this is indicated as:

   ```
   WI <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> -
   <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> -
   <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> -
   <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> -
   <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> -
   <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>
   ```

   For example:

   WI N6030 E02550 – N6055 E02500 – N6050 E02630 – N6030 E02550

   WI N60 E025 – N62 E027 - N58 E030 - N59 E026 - N60 E025

Note. — The points of a polygon should be provided in a clockwise order, and the end point should be a repeat of the start point.

Use of polygons with complex FIR boundaries.

*Annex 3 (19th Edition, July 2016) specifies that the points of a polygon '... should be kept to a minimum and should not normally exceed seven'. However, some FIR boundaries are complex, and it would be unrealistic to expect that a polygon would be defined that followed such boundaries exactly. As such, some States have determined that the polygon points be chosen in relation to the complex boundary such that the FIR boundary approximates, but is wholly encompassed by, the polygon, and that any additional area beyond the FIR boundary be the minimum that can be reasonably and practically described. Caution should however be exercised in those instances where international aerodromes are located in close proximity to such a complex FIR boundary. **Appendix B** provides examples and advice with regard to describing such areas.*

2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and end points on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point).

[1] Including the last point as a repeat of the first point to explicitly close the polygon

Symbolically this is indicated as:

```
<N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or
<SW OF> or <W OF> or <NW OF> LINE <Nnn[nn]> or
<Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or
<Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>
```

For example:

NE OF LINE N2500 W08700 – N2000 W08300

W OF LINE N20 E042 – N35 E045

2b) In a sector of the FIR defined as being between two specified lines, or between two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points).

```
<N OF> or <NE OF> or <E OF> or <SE OF> or <S OF> or
<SW OF> or <W OF> or <NW OF> LINE <Nnn[nn]> or
<Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or
<Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[ - <Nnn[nn]> or
<Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][ - <Nnn[nn]> or
<Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>] AND <N OF> or <NE
OF> or <E OF> or <SE OF> or <S OF> or <SW OF> or <W
OF> or <NW OF> LINE <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]>
or <Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or
<Ennn[nn]> [ - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or
<Ennn[nn]>][ - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or
<Ennn[nn]>]
```

For example:

NE OF LINE N2500 W08700 – N2000 W08300 AND SW OF LINE N2800 W08500 – N2200 W08200

W OF LINE N20 E042 – N35 E045 AND E OF LINE N20 E039 – N35 E043

2c) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant);

Symbolically this is indicated as:

```
<N OF> or <S OF> <Nnn[nn]> or <Snn[nn]> AND
<E OF> or <W OF> <Wnnn[nn]> or <Ennn[nn]>
```

For example:

N OF N1200 AND E OF W02530

S OF N60 AND W OF E120

2d) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment), where a coordinate of latitude (or longitude) defines a line, and the preceding descriptor defines on which side of the line the phenomena is expected

Symbolically, this is indicated as:

<N OF> or <S OF> <Nnn[nn]> or <Snn[nn]> or
<E OF> or <W OF> <Wnnn[nn]> or <Ennn[nn]>

For example:

N OF S2230

W OF E080

3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by;

APRX nnKM WID LINE BTN <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>]

or

APRX nnNM WID LINE BTN <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]> - <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>[- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>][- <Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>]

4) At a specific point within the FIR, indicated by a single coordinate of latitude and longitude.

Symbolically, this is indicated as:

<Nnn[nn]> or <Snn[nn]> <Wnnn[nn]> or <Ennn[nn]>

For example:

N5530 W02230

S23 E107

5) Within a specified radius of the centre of a tropical cyclone.

Symbolically, this is indicated as:

```
WI nnnKM OF TC CENTRE
WI nnnNM OF TC CENTRE
```

6) A reference to the whole FIR, FIR/UIR, or CTA .

Symbolically, this is indicated as:

```
ENTIRE FIR[/UIR]

ENTIRE CTA
```

More detail on reporting the location of the phenomenon is given in the examples provided in **Appendix B** to this guide.

3.5.3.6. Flight level

Symbolically, the options permitted are:

FLnnn

or

nnnnM

or

[n]nnnnFT

or

SFC/FLnnn

or

SFC/nnnnM

or

SFC/[n]nnnnFT

or

FLnnn/nnn

or

TOP FLnnn

or

ABV FLnnn

or

TOP ABV FLnnn

or

TOP BLW FLnnn (only to be used for tropical cyclone)

or

nnnn/nnnnM

or

[n]nnnn/[n]nnnnFT

or

nnnnM/FLnnn

or

[n]nnnnFT/FLnnn

In more detail, the location or extent of the phenomenon in the vertical is given by one or more of the above methods, as follows:

1) reporting at a single flight level

For example: **FL320**

2) reporting at a single geometric level, in metres or feet

For example: **4500M or 8250FT or 12000FT**

3) reporting a layer extending from the surface to a given height in meters,feet or flight level

For example: **SFC/3000M or SFC/9900FT or SFC/11000FT or SFC/FL350**

4) reporting a layer extending from a given FL to a higher flight level

For example: **FL250/290**

5) reporting a layer where the base is unknown, but the top is given:

For example: **TOP FL350**

6) reporting phenomenon above a specified flight level, but where the upper limit is unknown:

For example: **ABV FL350**

7) reporting phenomenon that has an unknown lower limit, but has an upper limit that is known to extend above a known flight level:

For example: **TOP ABV FL350**

8) reporting phenomenon expected between a lower and upper geometric level expressed in metres or feet:

For example: **3500/9000M or 8000/12000FT or 11000/14000FT**

9) reporting phenomenon expected between a lower geometric level expressed in metres or feet and a higher flight level:

For example: **4000M/FL220 or 6000FT/FL140 or 11000FT/FL190**

10 reporting the CB upper limit for tropical cyclone SIGMET

For example: **TOP BLW FL450**

Additional examples:

EMBD TS … TOP ABV FL340
SEV TURB … FL180/210
SEV ICE … SFC/FL150
SEV MTW … FL090

3.5.3.7. Movement

Note. — Footnote 24 to Table A6-1A of ICAO Annex 3 states that "The elements 'Forecast Time' and 'Forecast Position' are not to be used in conjunction with the element 'Movement or Expected Movement'".

Rate of movement is indicated in the following way:

MOV <direction> <speed>KMH[KT]

or

STNR

Direction of movement is given with reference to one of the sixteen points of compass (**N**, **NNE**, **NE**, **ENE**, **E**, **ESE**, **SE**, **SSE**, **S**, **SSW**, **SW**, **WSW**, **W**, **WNW**, **NW**, **NNW**). Speed is given in **KMH** or **KT**. The abbreviation **STNR** is used if no significant movement is expected.

Examples:

MOV NNW 30KMH

MOV E 25KT

STNR

Note – Movement information should not be provided when a forecast position is explicitly given

3.5.3.8. Expected changes in intensity

The expected evolution of the phenomenon's intensity is indicated by one of the following abbreviations:

INTSF

or

WKN

or

NC

3.5.3.9. Forecast time

This section is used, with 'Forecast position' to explicitly provide a forecast of the position of the phenomena at the time specified. The format is fixed, and is of the form

FCST AT nnnnZ

for example

FCST AT 1600Z

where the forecast time is the same as the SIGMET validity end time.

Note. — In accordance with Annex 5 – Units of Measurement to be Used in Air and Ground Operations*, when the validity period ends at midnight, YY should be set for the following day and GGgg should be '0000'. i.e. SIGMET validity ending at midnight on the 23rd day of the month should be expressed as '240000'.*

3.5.3.10. Forecast position of the hazardous phenomenon at the end of the validity period of the SIGMET message

The available methods of describing the forecast position of the phenomenon in the 'Forecast position' section is exactly as detailed in section 3.5.3.5 with the addition of:

a) The forecast centre position of a tropical cyclone is given by:

TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn]

TC CENTRE PSN N2740 W07345

b) For volcanic ash which is not expected to be present within the FIR at the end of the validity of the SIGMET, the following is permitted:

NO VA EXP

Note. — Currently, there is no provision for indicating changes to the levels affected by phenomena between the initial position and the forecast position. As such, and as per footnote 28 to Table A6-1A of Annex 3 (19th Edition, July 2016), it should be assumed that the levels affected remain the same for both initial and forecast positions. If levels differ significantly then separate SIGMET should be issued.

3.5.3.11. Repetition of elements (volcanic ash and tropical cyclone SIGMET only)

Inclusion of instances of volcanic ash phenomenon and tropical cyclone phenomenon in the same SIGMET is permitted for volcanic ash and tropical cyclone only.

With regard to the portrayal of complex volcanic ash events (which implies areas of volcanic ash at different levels) guidance in this regard is provided in Appendix B.

With regard to the portrayal of two tropical cyclones, guidance is provided in Appendix B.

3.5.4. Cancellation of SIGMET

3.5.4.1. Annex 3, 7.1.2 requires that "*SIGMET information shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area*".

3.5.4.2. As such, it is mandatory for an MWO to cancel any SIGMET that is currently valid but for which the specified phenomena no longer exists or is expected to exist.

3.5.4.3. The cancellation is done by issuing the same type of SIGMET (i.e. WS, WV or WC) with the following structure:

- WMO heading with the same data type designator;
- First line that contains as period of validity the remaining time of the original period of validity;
- Second line, which contains the name of the FIR or CTA, the combination CNL SIGMET, followed by the sequence number of the original SIGMET and its original validity period.

3.5.4.4. A cancellation SIGMET should have a unique sequence number, and should follow the format below.

For a SIGMET that is cancelled during its period of validity, the cancellation SIGMET will be of the form:

As an example, an original SIGMET of:

```
YMMM SIGMET A01 VALID 260300/260700 YPRF-
YMMM MELBOURNE FIR EMBD TS FCST WI S4000 E12000 – S3830 E12200
– S4200 E12100 – S4000 E12000 TOP FL450 MOV SW 05KT INTSF=
```

If it were to be cancelled early (i.e. prior to 0700 UTC), then the following would be appropriate:

```
YMMM SIGMET A02 VALID 260600/260700 YPRF-
YMMM MELBOURNE FIR CNL SIGMET A01 260300/260700=
```

Where:

- the sequence number will be the next incrementing, unique sequence number.
- the validity time will be the time remaining between issuance and the end time of the original SIGMET.
- the sequence number of the original (and to be cancelled) SIGMET shall follow '`CNL SIGMET `'.
- the original validity time of the original (and to be cancelled) SIGMET shall be included in the message after the reference to the original SIGMET's sequence number.

For SIGMET for volcanic ash only, the following is permitted:

```
WSAU21 ADRM 202155
YBBB SIGMET E03 VALID 202155/210000 YPDM-
YBBB BRISBANE FIR CNL SIGMET E01 202000/210000 VA MOV TO WXYX
FIR=
```

Where the FIR (`WXYZ` in the example) into which the volcanic ash has moved is indicated.

3.5.5. Amendment/correction of SIGMET

3.5.5.1. If it is known that an existing SIGMET no longer accurately describes the existing or expected future evolution of the phenomena a new SIGMET, correctly describing the hazard should be issued, followed immediately by a cancellation of the original, erroneous SIGMET. The new SIGMET should be issued before the cancellation in order to ensure there is always a SIGMET in force and that the cancellation is not mistakenly understood to mean that the hazard has completely dissipated.

Originally issued SIGMET, later determined to no longer be accurate (bold text identifies points that will be changed):

```
WSAU21 ADRM 201855
YBBB SIGMET E01 VALID 202000/210000 YPDM-
YBBB BRISBANE FIR SEV TURB FCST WI S1530 E13700 - S1900 E13730
– S2000 E13130 - S1600 E13500 - S1530 E13700 SFC/FL120 MOV SE
12KT WKN=
```

Updated SIGMET (bold text identifies points that have been changed):

```
WSAU21 ADRM 202155
YBBB SIGMET E02 VALID 202200/210000 YPDM-
YBBB BRISBANE FIR SEV TURB FCST WI S1530 E13700 - S2000 E13750
– S2045 E13245 - S1600 E13500 - S1530 E13700 SFC/FL120 MOV SE
12KT WKN=
```

Cancellation SIGMET (this cancels the original SIGMET):

```
WSAU21 ADRM 202156
YBBB SIGMET E03 VALID 202155/210000 YPDM-
YBBB BRISBANE FIR CNL SIGMET E01 202000/210000=
```

Note, it is essential that the times of issuance of the updated (correct) SIGMET and the cancellation are separated by at least one minute to prevent inadvertent suppression by message switches. However, it is also important that the minimum delay between issuance of the updated and the cancellation messages.

3.6. Dissemination of SIGMET

3.6.1. SIGMET is part of operational meteorological (OPMET) information. According to Annex 3, the telecommunication facilities used for the exchange of the operational meteorological information should be the aeronautical fixed service (AFS).

3.6.2. The AFS consists of a terrestrial segment, AFTN or ATN (AMHS), as well as the Internet-based SADIS FTP and WIFS services provided by WAFC London and WAFC Washington respectively. Note that SIGMET priority indicator is **FF** for flight safety messages (Annex 10, Volume II, 4.4.1.1.3 refers).

3.6.3. Currently, AFTN links should be used by the MWOs to send the SIGMET, as follows:

- to the adjacent MWOs and ACCs[2] using direct AFTN addressing;

[2] For this dissemination it is required that SIGMET is available at the ACCs for transmission to aircraft in flight for the route ahead up to a distance corresponding to two hours flying time.

- when required for VOLMET or D-VOLMET, SIGMET should be sent to the relevant centre providing the VOLMET service;

- SIGMET should be sent to all regional OPMET Data Banks (RODB);

- it should be arranged that SIGMET is relayed to the SADIS and WIFS providers for satellite/public internet dissemination, as well as to the WAFCs London and Washington, either through the ROBEX scheme, or directly by the issuing MWO;

- SIGMET for volcanic ash should be disseminated to the responsible VAAC.

3.6.4. Through SADIS and WIFS, SIGMET is disseminated to all authorised users. In this way, SIGMET is available on a global basis, meeting the aeronautical requirements.

— — — — — — — —

APPENDIX A

ENHANCED SIGMET GUIDANCE TABLE DEVELOPED FROM ANNEX 3 TABLE A6-1A

Note. — The table below seeks to provide more detailed guidance than that given in Table A6-1A of Annex 3 (19th Edition, July 2016). It does this by removing all references to the AIRMET message. Table A6-1A. The table below simplifies the available options and provides more specific expansion of the symbolic structure of SIGMET messages, with guidance sub-titles where appropriate. It should be noted that Annex 3, Appendix 6, Table A6-1A remains the authoritative reference.

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
1.1	Location indicator of FIR/CTA (M)[1]	ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers	nnnn	YUCC[2] YUDD[2]
1.2	Identification (M)	Message identification and sequence number[3]	SIGMET n SIGMET nn SIGMET nnn	SIGMET 1 SIGMET 01 SIGMET A01
1.3	Validity period (M)	Day-time groups indicating the period of validity in UTC	VALID nnnnnn/nnnnnn	VALID 010000/010400 VALID 221215/221600 VALID 101520/101800 VALID 251600/252200 VALID 152000/160000 VALID 192300/200300 VALID 122200/130400 (6 hour validity applicable to TC or VA only)
1.4	Location indicator of MWO (M)	Location indicator of MWO originating the message with a separating hyphen	nnnn-	YUDO–[2] YUSO–[2]
1.5	Name of the FIR/CTA	Location indicator and name of the FIR/CTA[4] for which the SIGMET is issued	nnnn nnnnnnnnnn FIR nnnn nnnnnnnnnn FIR/UIR nnnn nnnnnnnnnn CTA	YUCC AMSWELL FIR[2] YUDD SHANLON FIR/UIR[2] YUDD SHANLON FIR[2] YUCC AMSWELL CTA[2]
2.1	Phenomenon (M)[5]	Description of phenomenon causing the	OBSC[6] TS OBSC[6] TSGR[7]	OBSC TS OBSC TSGR

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
		issuance of SIGMET	EMBD[8] TS EMBD[8] TSGR[7] FRQ[9] TS FRQ[9] TSGR[7] SQL[10] TS SQL[10] TSGR[7] TC nnnnnnnnnn PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] CB TC NN[11] PSN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] CB SEV TURB[12] SEV ICE[13] SEV ICE (FZRA)[13] SEV MTW[14] HVY DS HVY SS VA ERUPTION PSN Nnn[nn] *or* Snn[nn] Ennn[nn] *or* Wnnn[nn] VA CLD VA ERUPTION MT nnnnnnnnnn PSN Nnn[nn] *or* Snn[nn] Ennn[nn] *or* Wnnn[nn] VA CLD VA CLD RDOACT CLD	EMBD TS EMBD TSGR FRQ TS FRQ TSGR SQL TS SQL TSGR TC GLORIA PSN N2215 W07500 CB TC NN PSN S26 E150 CB SEV TURB SEV ICE SEV ICE (FZRA) SEV MTW HVY DS HVY SS VA ERUPTION PSN N27 W017 VA CLD VA ERUPTION PSN S1200 E01730 VA CLD VA ERUPTION MT ASHVAL[2] PSN S15 E073 VA CLD VA ERUPTION MT VALASH[2] PSN N2030 E02015 VA CLD VA CLD RDOACT CLD
2.2	Observed or forecast phenomenon (M)	Indication whether the information is observed and expected to continue, *or* forecast	OBS OBS AT nnnnZ FCST FCST AT nnnnZ	OBS OBS AT 1210Z FCST FCST AT 1815Z

Ref No.	Element as specified in Chapter 5 and Appendix 6	Detailed Content	Expanded symbolic - These 'expanded' symbolic representations of the various SIGMET code elements represent the interpretation of Table A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the guidelines below.	Examples. These examples of various SIGMET code elements represent the interpretation A6-1A of Annex 3. MWOs are encouraged to align their SIGMETs with the examples below.
2.3	Location (C)[19]	Location (referring to latitude and longitude (in degrees and minutes))	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI[20, 21] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]][- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 2b) In a sector of the FIR defined as being between two specified lines, or between two series of upt to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] AND [N][NE][E][SE][S][SW][W][NW] OF LINE Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] 2c) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant);	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI N6030 E02550 – N6055 E02500 – N6050 E02630 - N6030 E02550 WI N30 W067 – N32 W070 – N35 W068 - N30 W067 *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). NE OF LINE N2515 W08700 – N2000 W08330 S OF LINE S14 E150 – S14 E155 *or* 2b) In a sector of the FIR defined as being between two specified lines, or between two series of upt to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 2c) In a sector of the FIR defined relative to a line of latitude and a line of

			N OF Nnn[nn] AND W OF Wnnn[nn] *or* N OF Nnn[nn] AND E OF Wnnn[nn] *or* S OF Nnn[nn] AND W OF Wnnn[nn] *or* S OF Nnn[nn] AND E OF Wnnn[nn] *or* N OF Snn[nn] AND W OF Ennn[nn] *or* N OF Snn[nn] AND E OF Ennn[nn] *or* S OF Snn[nn] AND W OF Ennn[nn] *or* S OF Snn[nn] AND E OF Ennn[nn] *or* *or* 2d) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or* 3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by; APRX nnKM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] APRX nnNM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 4) At a specific point within the FIR;	longitude (effectively a quadrant); S OF N3200 AND E OF E02000 S OF S3215 AND W OF E10130 S OF N12 AND W OF E040 N OF N35 AND E OF E078 *or* 2d) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF S2230 S OF S43 E OF E01700 E OF W005 *or* 3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by; APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010 – N60 E015 APRX 50NM WID LINE BTN S1530 W09500 – S1815 W10130 – S2000 W10300 *or* 4) At a specific point within the FIR;

			Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* 5 tropical cyclone; *or* 6) A reference to the whole FIR, FIR/UIR, or CTA ENTIRE FIR ENTIRE FIR/UIR ENTIRE CTA	N5530 W02230 S12 E177 *or* 5 tropical cyclone; *or* 6) A reference to the whole FIR, FIR/UIR, or CTA ENTIRE FIR[18] ENTIRE FIR/UIR ENTIRE CTA[18]
2.4	Level (C)[19]	Flight level or altitude[23]	1) Generic height/range descriptors to be used when 'Location' descriptors above are used. FLnnn nnnnFT nnnnnFT nnnnM SFC/FLnnn SFC/nnnnM SFC/nnnnFT SFC/nnnnnFT FLnnn/nnn TOP FLnnn ABV FLnnn TOP ABV FLnnn nnnn/nnnnM [n]nnnn/[n]nnnnFT nnnnM/FLnnn [n]nnnnFT/FLnnn *or*[22] TOP BLW FLnnn	1) Generic height/range descriptors to be used when 'Location' descriptors above are used. FL180 7000FT 10000FT 600M 1200M SFC/FL070 SFC/9000FT SFC/10000FT SFC/2500M FL050/080 FL310/450 TOP FL390 ABV FL280 TOP ABV FL100 3000M 2000/3000M 8000FT 6000/12000FT 11000/14000FT 2000M/FL150 8000FT/FL190 10000FT/FL250 *or*[22] TOP BLW FL450

			or[22] TOP ABV FLnnn	*or*[22] TOP ABV FL360
2.5	Movement *or* expected movement (C)[19, 24]	Movement *or* expected movement (direction and speed) with reference to one of the sixteen points of compass, *or* stationary	MOV[N][NNE][NE][ENE][E][ESE][SE][SSE][S][SSW][SW][WSW][W][WNW][NW][NNW] nnKMH *or* MOV[N][NNE][NE][ENE][E][ESE][SE][SSE][S][SSW][SW][WSW][W][WNW][NW][NNW] nnKT *or* STNR	MOV E 40KMH MOV E 20KT MOV SE STNR
2.6	Changes in intensity [19]	Expected changes in intensity (C)	INTSF *or* WKN *or* NC	WKN INTSF NC
2.7	Forecast time (C)[24]	Indication of the forecast time of the phenomena	FCST AT nnnnZ	FCST AT 2200Z FCST AT 0000Z
2.7	Forecast position (C)[19, 24, 25]	Forecast position of volcanic ash cloud *or* the centre of the TC *or* other hazardous phenomena[25] at the end of the validity period of the SIGMET message (C)	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI[20, 21] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]][- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]]	1) An area of the FIR defined by a polygon. The end point shall be a repeat of the start point. Minimum 4 coordinates (including the last point as a repeat of the first), and not normally more than 7 coordinates. WI N6030 E02550 – N6055 E02500 – N6050 E02630 - N6030 E02550 WI N30 W067 – N32 W070 – N35 W068 - N30 W067 *or* 2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and endpoints on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). NE OF LINE N2515 W08700 – N2000 W08330 S OF LINE S14 E150 – S14 E155

			or 2b) In a sector of the FIR defined as being between two specified lines, or between two series of upt to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). [N][NE][E][SE][S][SW][W][NW] OF LINE[20] Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] AND [N][NE][E][SE][S][SW][W][NW] OF LINE Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [- Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] 2c) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant); N OF Nnn[nn] AND W OF Wnnn[nn] *or* N OF Nnn[nn] AND E OF Wnnn[nn] *or* S OF Nnn[nn] AND W OF Wnnn[nn] *or* S OF Nnn[nn] AND E OF Wnnn[nn] *or* N OF Snn[nn] AND W OF Ennn[nn] *or* N OF Snn[nn] AND E OF Ennn[nn] *or* S OF Snn[nn] AND W OF Ennn[nn] *or* S OF Snn[nn] AND E OF Ennn[nn] *or* *or* 2d) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF Nnn[nn] *or* S OF Nnn[nn] *or* N OF Snn[nn] *or* S OF Snn[nn] *or* W OF Wnnn[nn] *or* E OF Wnnn[nn] *or* W OF Ennn[nn] *or* E OF Ennn[nn] *or*	*or* 2b) In a sector of the FIR defined as being between two specified lines, or between two series of upt to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points). SW OF LINE N50 W020 – N45 E010 AND NE OF LINE N45 W020 – N40 E010 2c) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant); S OF N3200 AND E OF E02000 S OF S3215 AND W OF E10130 S OF N12 AND W OF E040 N OF N35 AND E OF E078 *or* 2d) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment); N OF S2230 S OF S43 E OF E01700 E OF W005 *or*

			3) Defined by a 'corridor' of specified width, centred upon a line, of up to three connected segments, described by; APRX nnKM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] APRX nnNM WID LINE[20] BTN Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] – Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] [– Nnn[nn] *or* Snn[nn] Wnnn[nn] *or* Ennn[nn]] *or* 4) At a specific point within the FIR; Nnn[nn] Wnnn[nn] *or* Nnn[nn] Ennn[nn] *or* Snn[nn] Wnnn[nn] *or* Snn[nn] Ennn[nn] *or* 5 tropical cyclone; TC CENTRE PSN Nnn[nn] or Snn[nn] Wnnn[nn] or Ennn[nn] *or* 6) A reference to the whole FIR, FIR/UIR, or CTA ENTIRE FIR ENTIRE FIR/UIR ENTIRE CTA *or* 7) No volcanic ash expected[26] NO VA EXP	3) Defined by a 'corridor' of specified width, centred upon the line described; APRX 50KM WID LINE BTN N64 W017 – N60 W010 – N57 E010 – N60 E015 APRX 50NM WID LINE BTN S1530 W09500 – S1815 W10130 – S2000 W10300 *or* 4) At a specific point within the FIR; N5530 W02230 S12 E177 *or* 5 tropical cyclone; TC CENTRE PSN N1230 W04530 *or* 6) A reference to the whole FIR, FIR/UIR, or CTA ENTIRE FIR[18] ENTIRE FIR/UIR ENTIRE CTA[18] 7) No volcanic ash expected NO VA EXP

	Repetition of elements (C)[27]	Repetition of elements included in a SIGMET message for volcanic ash cloud or tropical cyclone	[AND] [27]	AND
	Cancellation of SIGMET (C)[28]	Cancellation of SIGMET referring to its identification	CNL SIGMET n nnnnnn/nnnnnn CNL SIGMET nn nnnnnn/nnnnnn CNL SIGMET nnn nnnnnn/nnnnnn *or* CNL SIGMET n nnnnnn/nnnnnn VA MOV TO nnnn FIR[18] CNL SIGMET nn nnnnnn/nnnnnn VA MOV TO nnnn FIR[18] CNL SIGMET nnn 251030/251430 VA MOV TO YUDO FIR	CNL SIGMET 2 102000/110000 CNL SIGMET 12 101200/101600 CNL SIGMET A12 031600/032000 CNL SIGMET 3 251030/251630 VA MOV TO YUDO FIR CNL SIGMET 06 191200/191800 VA MOV TO YUDO FIR CNL SIGMET B10 030600/031200 VA MOV TO YUDO FIR

Table A-1: Expanded SIGMET template

Footnotes to table: (note, in order to ensure consistency between this document and ICAO Annex 3, Table 6-1A, any footnote in Table 6-1A that refers to AIRMET only is identified as such below.

1. See 4.1. "**Recommendation.—** *In cases where the airspace is divided into a flight information region (FIR) and an upper flight information region (UIR), the SIGMET should be identified by the location indicator of the air traffic services unit serving the FIR. Note.— The SIGMET message applies to the whole airspace within the lateral limits of the FIR, i.e. to the FIR and to the UIR. The particular areas and/or flight levels affected by the meteorological phenomena causing the issuance of the SIGMET are given in the text of the message.*"
2. Fictitious location.
3. In accordance with 1.1.3 "The sequence number referred to in the template in Table A6-1A shall correspond with the number of SIGMET messages issued for the flight information region since 0001 UTC on the day concerned. The meteorological watch offices whose area of responsibility encompasses more than one FIR and/or control area (CTA) shall issue separate SIGMET messages for each FIR and/or CTA within their area of responsibility."
4. AIRMET only – not SIGMET
5. As per 1.1.4 "In accordance with the template in Table A6-1A, only one of the following phenomena shall be included in a SIGMET message, using the abbreviations as indicated below [list of SIGMET phenomena follows in section 1.1.4 – see section]"
6. In accordance with 4.2.1 a) "*obscured (OBSC) if it is obscured by haze or smoke or cannot be readily seen due to darkness*".
7. In accordance with 4.2.4 "*Hail (GR) should be used as a further description of the thunderstorm, as necessary*"
8. accordance with 4.2.1 b) "*embedded (EMBD) if it is embedded within cloud layers and cannot be readily recognized*"
9. In accordance with 4.2.2 "**Recommendation.—** An area of thunderstorms should be considered frequent (FRQ) if within that area there is little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75 per cent of the area affected, or forecast to be affected, by the phenomenon (at a fixed time or during the period of validity)"
10. In accordance with 4.2.3 "**Recommendation.—** Squall line (SQL) should indicate a thunderstorm along a line with little or no space between individual clouds."
11. Used for unnamed tropical cyclones.
12. In accordance with 4.2.5 and 4.2.6 "**Recommendation.—** Severe turbulence (TURB) should refer only to: low-level turbulence associated with strong surface winds; rotor streaming; or turbulence whether in cloud or not in cloud (CAT). Turbulence should not be used in connection with convective clouds." and "Turbulence shall be considered: a) severe whenever the peak value of the cube root of EDR exceeds 0.7"
13. In accordance with 4.2.7 "**Recommendation.—** Severe icing (ICE) should refer to icing in other than convective clouds. Freezing rain (FZRA) should refer to severe icing conditions caused by freezing rain".
14. In accordance with 4.2.8 "**Recommendation.—** A mountain wave (MTW) should be considered: a) severe whenever an accompanying downdraft of 3.0 m/s (600 ft/min) or more and/or severe turbulence is observed or forecast; and *b) moderate whenever an accompanying downdraft of 1.75–3.0 m/s (350–600 ft/min) and/or moderate turbulence is observed or forecast.*"
15. AIRMET only – not SIGMET
16. AIRMET only – not SIGMET

17. AIRMET only – not SIGMET
18. AIRMET only – not SIGMET
19. In the case of the same phenomenon covering more than one area within the FIR, these elements can be repeated, as necessary.
20. A straight line is to be used between two points drawn on a map in the Mercator projection or between two points which crosses lines of longitude at a constant angle.
21. The number of coordinates should be kept to a minimum and should not normally exceed seven.
22. Only for SIGMET messages for tropical cyclones.
23. Only for SIGMET messages for volcanic ash cloud and tropical cyclones.
24. The elements “forecast time” and “forecast position” are not to be used in conjunction with the element “movement or expected movement”.
25. The levels of the phenomena remain fixed throughout the forecast period.
26. Only for SIGMET messages for volcanic ash.
27. To be used for two volcanic ash clouds or two centres of tropical cyclones simultaneously affecting the FIR concerned.
28. End of the message (as the SIGMET message is being cancelled).

Additional notes (not specifically identified in footnotes to Table 6-1A:

In accordance with 4.2.9 “Sandstorm/duststorm should be considered: a) heavy whenever the visibility is below 200 m and the sky is obscured; and b) moderate whenever the visibility is: 1) below 200 m and the sky is not obscured; or 2) between 200 m and 600 m.” (no footnote in Annex 3, but this is applicable reference)

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APPENDIX B

SIGMET EXAMPLES

*Note. — The figures used in this appendix are intended simply to clarify the intent of the SIGMET message in abbreviated plain language, and therefore how each SIGMET should be **constructed** by MWOs and also **interpreted** by users. The figures used are <u>not</u> intended to give guidance on how a SIGMET in graphical format should be produced.*

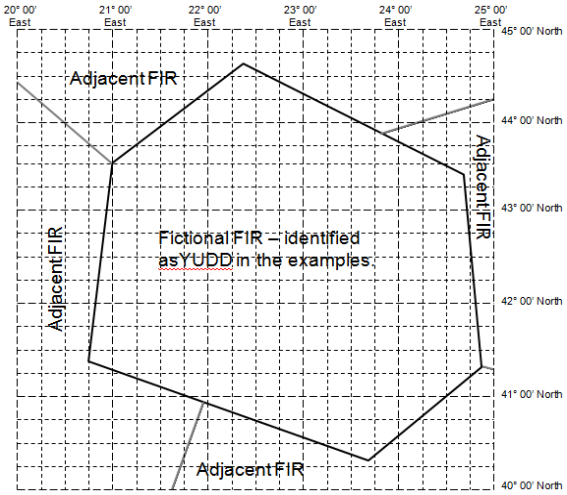
Examples of '**WS**' SIGMET. See the sections for SIGMET for volcanic ash only (WV) and SIGMET for tropical cyclone only (WC) for examples specific to those phenomena.

Contents

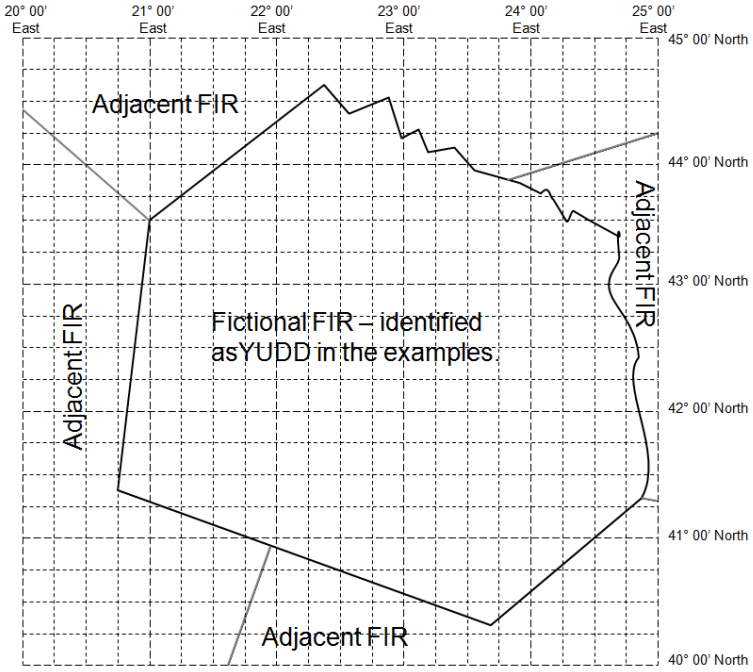
General

Explanation of fictional FIR.

In each of the examples below, a fictional FIR area is indicated, with portions of adjacent fictional FIRs also indicated. The FIR areas are overlaid on a coordinate grid, in order that the example plain language SIGMETs can be explicitly related to the intended meaning.



For some cases, examples are given where the FIR has boundaries that are complex (country borders for example, especially when defined by rivers)



Fictional FIR 'Shanlon = YUDD' is used for the examples.

Repetition of start point as last coordinate.

> In accordance with practices and procedures laid down for other aeronautical bulletins (i.e. NOTAM), it is recommended that the last point of a polygon is a repeat of the first point of the polygon. This will ensure that the polygon has been closed, and that no points have been accidentally omitted.

'Direction' of encoding of the points of a polygon

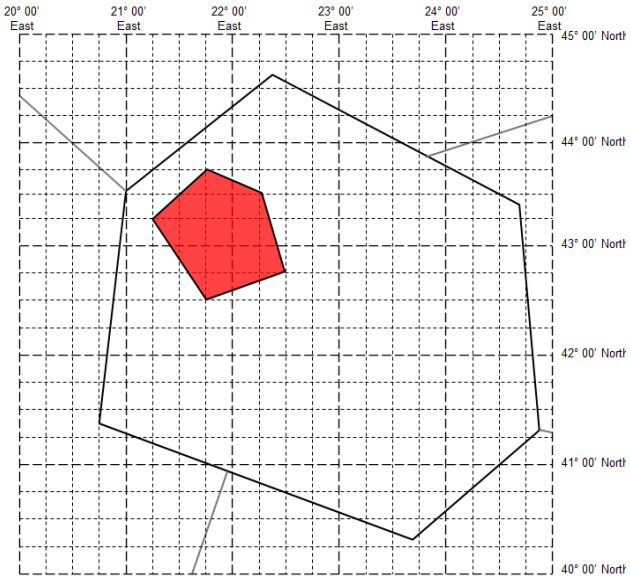
> In accordance with practices and procedures laid down for other aeronautical bulletins and international practice (e.g. BUFR encoding of WAFS significant weather (SIGWX) forecasts), it is recommended that the points of a polygon are provided in a 'clockwise' sense. This assists automated systems in determining the 'inside' of polygons.

Use of ‘Expected Movement’ and ‘Forecast Position’/’Forecast Time’.

With applicability of Amendment 77, the ‘Expected Movement’ element of SIGMET should not be used if the ‘Forecast Position’/’Forecast Time’ element is being used, and vice versa. This is to prevent duplication at best and inconsistencies at worst.

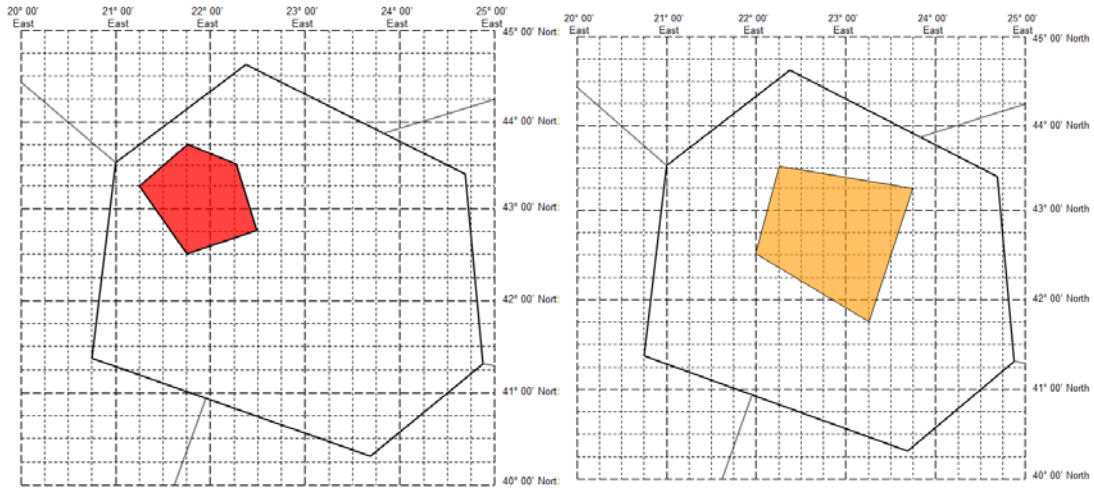
1) An area of the FIR defined by a polygon. The end point should be a repeat of the start point.

When the SIGMET does not include a 'forecast position' section.



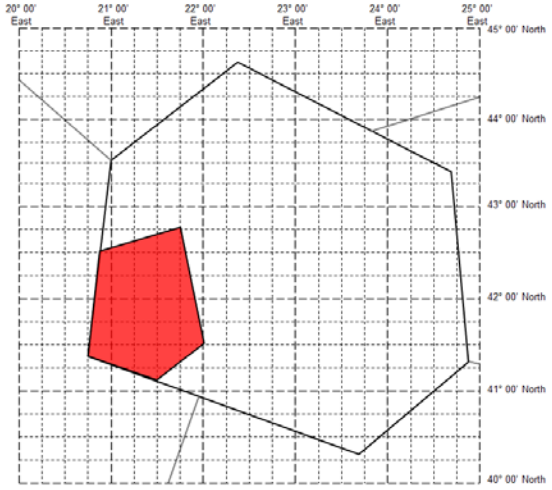

```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02145 – N4315 E02115 –
N4345 E02145 – N4330 E02215 – N4245 E02230 - N4230 E02145 FL250/370
MOV ESE 20KT INTSF=
```

With an explicit forecast position:



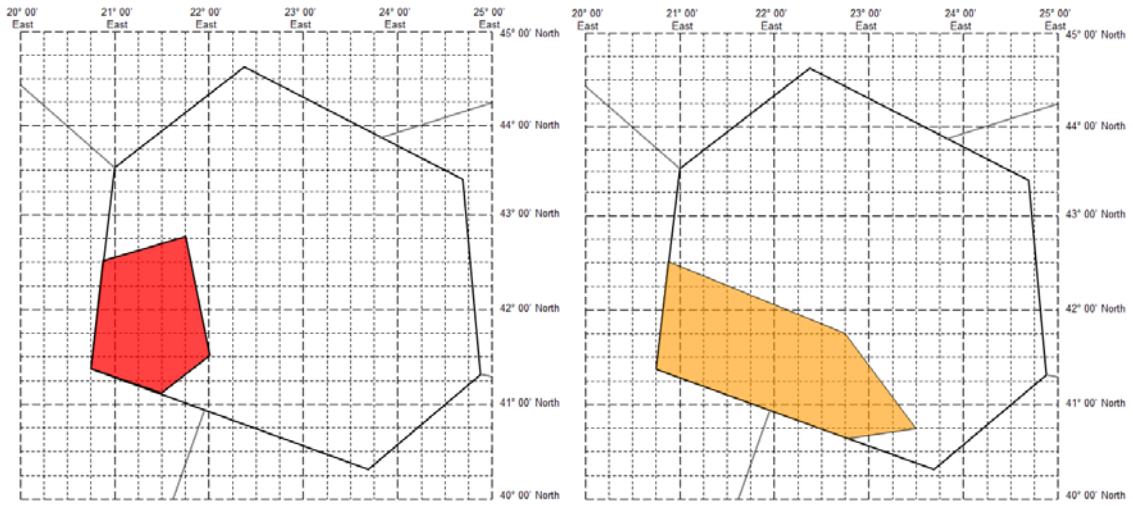

```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02145 – N4315 E02115 –
N4345 E02145 – N4330 E02215 – N4245 E02230 - N4230 E02145 FL250/370
INTSF FCST AT 1600Z WI N4145 E02315 – N4230 E02200 – N4330 E02215 –
N4315 E02345 - N4145 E02315=
```

When the SIGMET does not include a 'forecast position' section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02052 – N4245 E02145 – N4130 E02200 – N4107 E02130 – N4123 E02045 - N4230 E02052 FL250/370 MOV SE 30KT WKN=

With an explicit forecast position:



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4230 E02052 – N4245 E02145 – N4130 E02200 – N4107 E02130 – N4123 E02045- N4230 E02052 FL250/370 WKN FCST AT 1600Z WI N4230 E02052 – N4145 E02245 – N4045 E02330 – N4040 E02248 – N4123 E02045- N4230 E02052 =

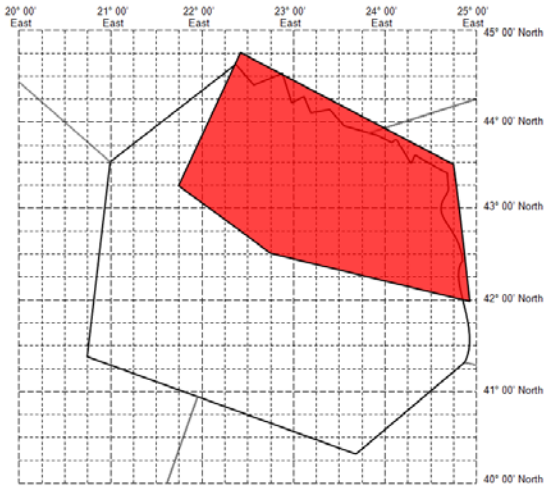
Use of polygons with complex FIR boundaries.

Annex 3 (19th Edition, July 2016) specifies that the points of a polygon '... should be kept to a minimum and should not normally exceed seven'. However, some FIR boundaries are complex, and it would be unrealistic to expect that a polygon would be defined that followed such boundaries precisely. As such, some States have determined that the polygon points be chosen in relation to the complex boundary such that the FIR boundary approximates, but is wholly encompassed by, the polygon, and that any additional area beyond the FIR boundary be the minimum that can be reasonably

and practically described. Caution should however be exercised in those instances where international aerodromes are located in close proximity to such a complex FIR boundary.

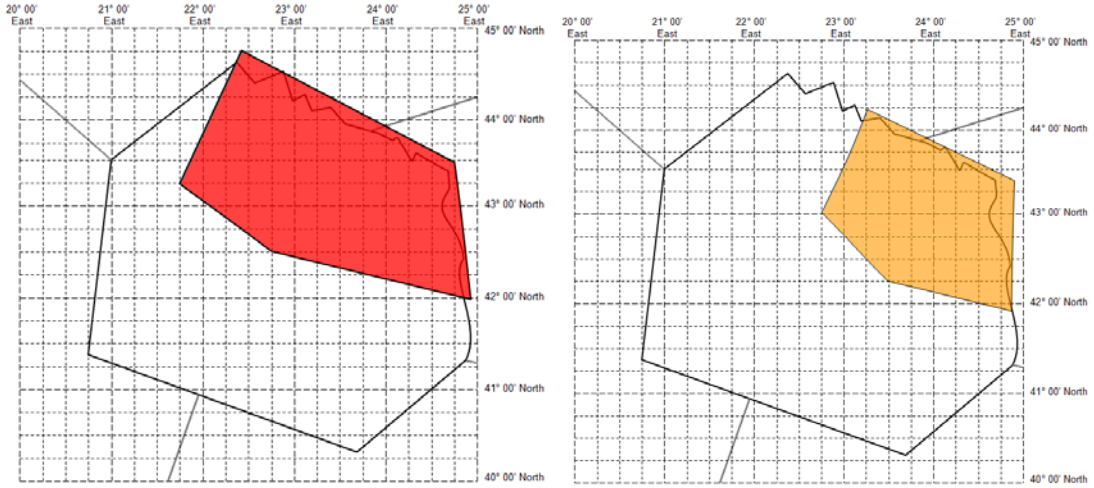
In the examples below, it would not be practical to follow the northeastern boundary of the FIR exactly. The point close to N4330 E02245 is obviously a 'major' turning point along the FIR boundary, but the other, numerous and complex turning points can only be approximated when constrained to seven points.

When the SIGMET does not include a 'forecast position' section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4315 E02145 – N4445 E02245 – N4330 E02445 – N4200 E02455 – N4230 E02245- N4315 E02145 FL250/370 MOV SE 20KT WKN=

With an explicit forecast position:

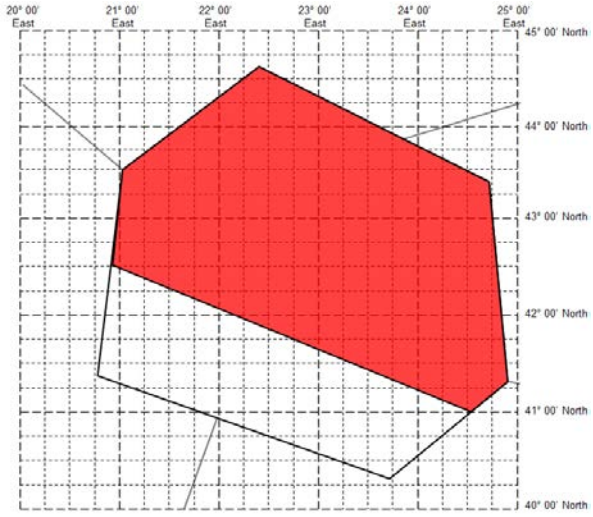


YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST WI N4315 E02145 – N4445 E02245 – N4330 E02445 – N4200 E02455 – N4230 E02245- N4315 E02145 FL250/370 WKN FCST AT 1600Z WI N4300 E02245 – N4415 E02315 – N4322 E02452 – N4155 E02445 – N4215 E02330- N4300 E02245=

2a) In a sector of the FIR defined relative to a specified line, or single series of up to three connected lines, with start and end points on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point).

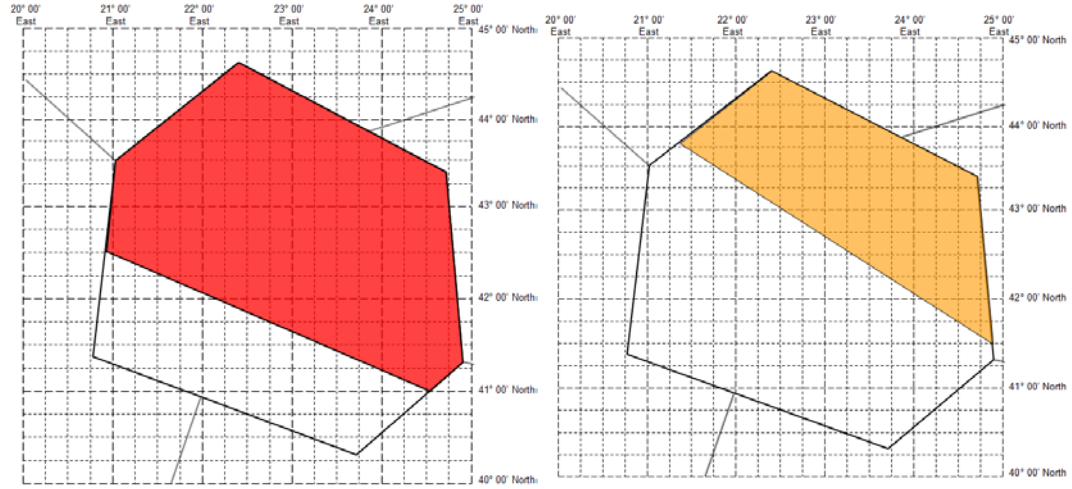
The specified points shall be on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point)

When the SIGMET does not include a 'forecast position' section.



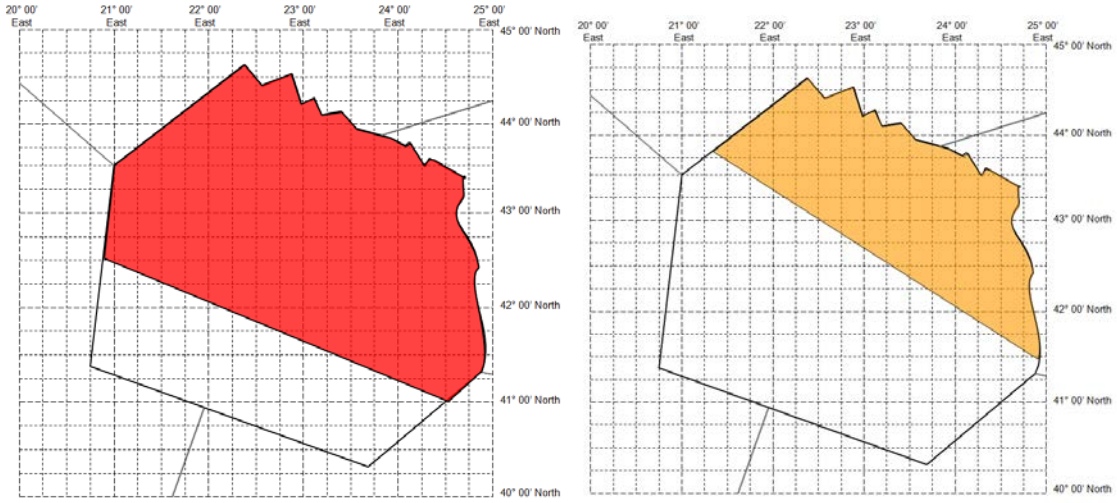
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4230 E02052 – N4100 E02430 FL250/370 MOV NE 15KT WKN=

With an explicit forecast position:



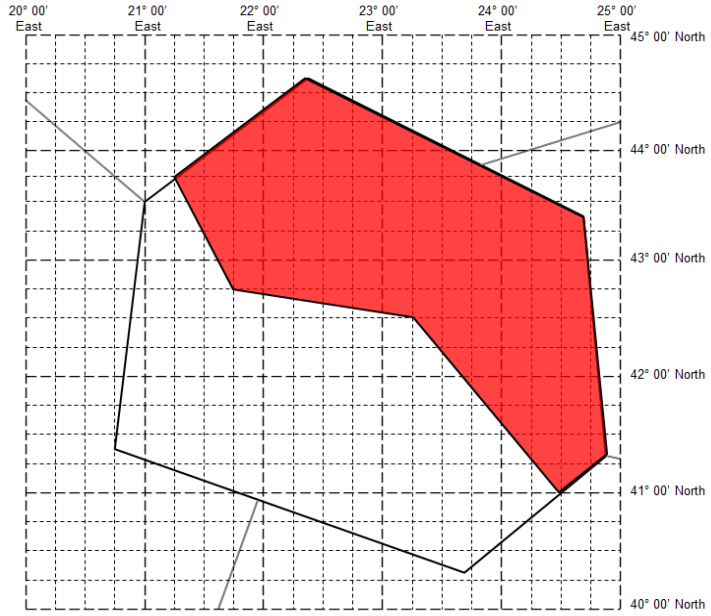
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4230 E02052 – N4100 E02430 FL250/370 WKN FCST AT 1600Z NE OF LINE N4346 E02122 – N4130 E02452=

A separate example is provided below illustrating a case where the northeastern boundary is complex.



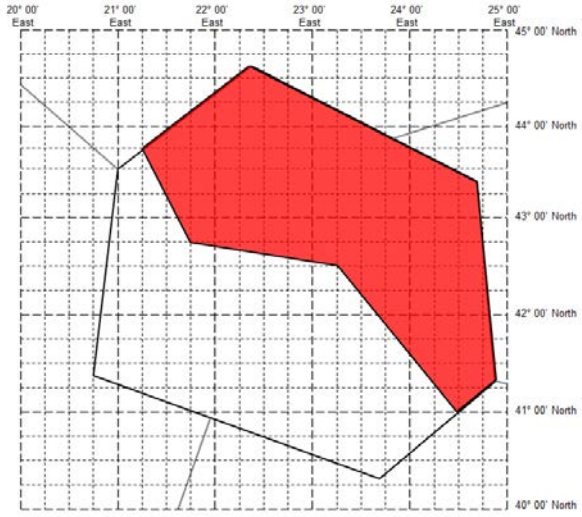
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4230 E02052 – N4100 E02430
FL250/370 WKN FCST AT 1600Z NE OF LINE N4346 E02122 – N4130 E02457=

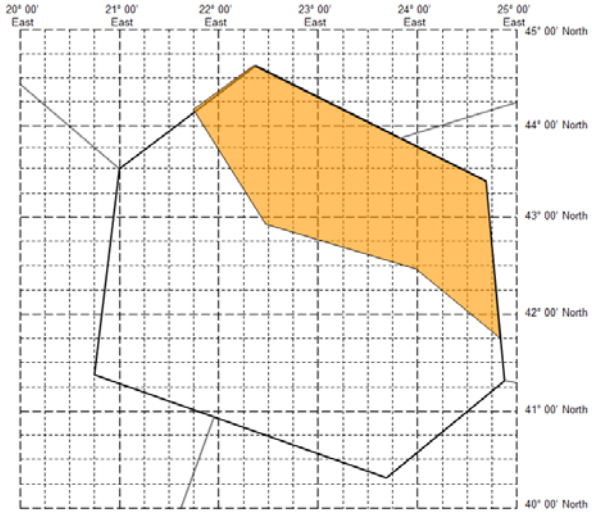
For a series of connected lines when the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4345 E02115 – N4245 E02145
- N4230 E2315 – N4100 E2430 FL250/370 WKN MOV NE 20KT=

With an explicit forecast position:



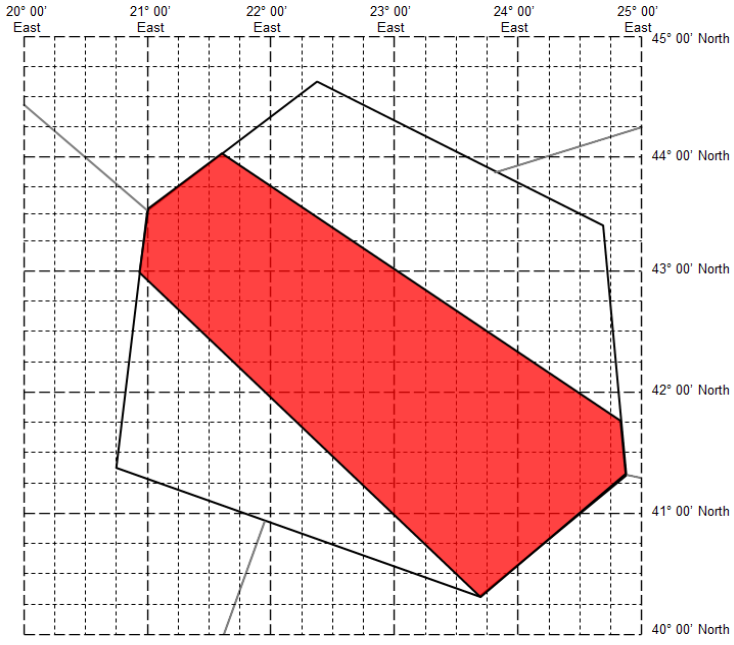


YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4345 E02115 – N4245 E02145 - N4230 E2315 – N4100 E2430 FL250/370 WKN FCST AT 1600Z NE OF LINE N4411 E02145 – N4255 E02228 - N4228 E2400 – N4130 E2450=

2b) In a sector of the FIR defined as being *between* two specified lines, or *between* two series of up to three connected lines, each with start and endpoints on the FIR boundary (or start and endpoints so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at those points).

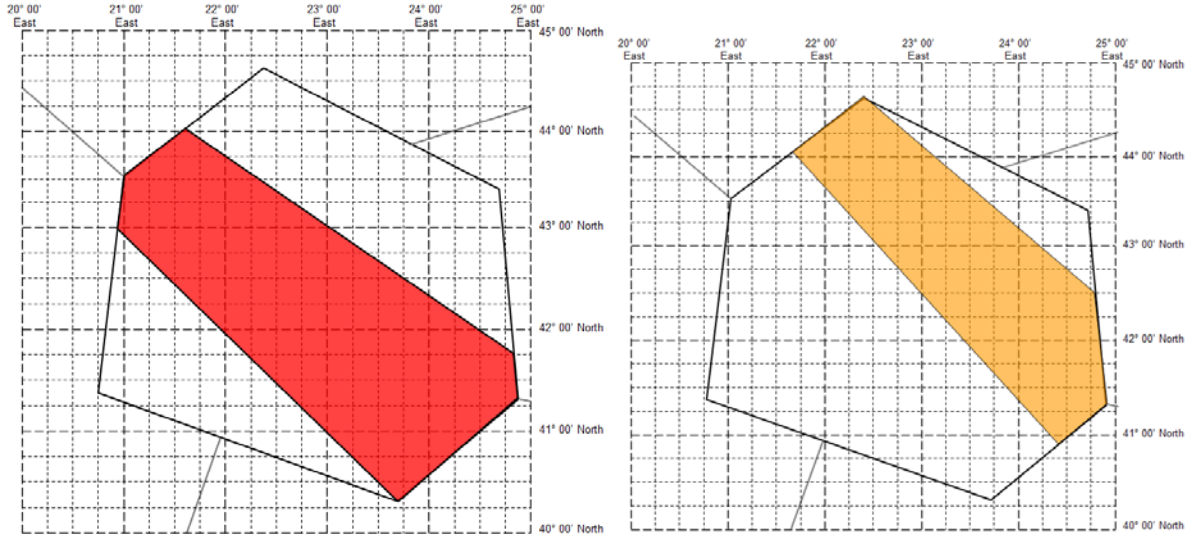
The specified points shall be on the FIR boundary (or so close to the FIR boundary so as to leave no doubt that the intent is for the line to connect to the FIR boundary at that point)

When the SIGMET does not include a 'forecast position' section.



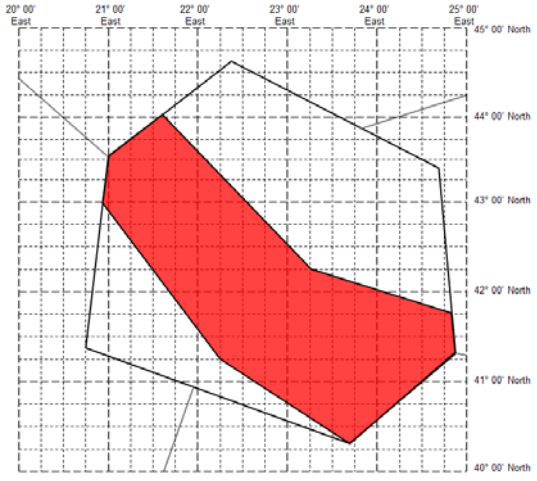
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 – N4020 E02340 AND SW OF LINE N4402 E02142 – N4145 E02450 FL250/370 WKN MOV NE 20KT=

With an explicit forecast position:



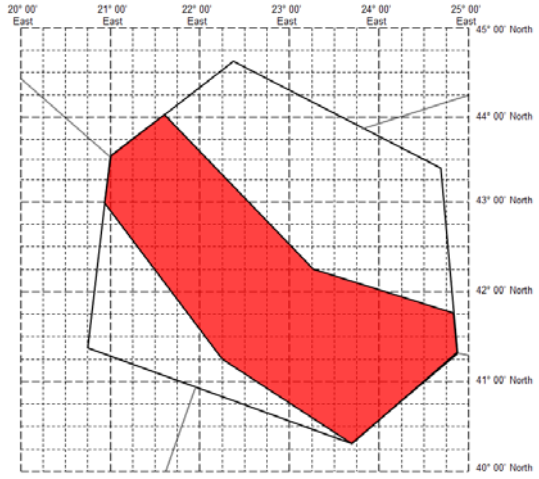
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 – N4020 E02340 AND SW OF LINE N4402 E02142 – N4145 E02450 FL250/370 WKN FCST AT 1600Z NE OF LINE N4403 E02140 – N4055 E02422 AND SW OF LINE N4437 E02222 – N4230 E02447=

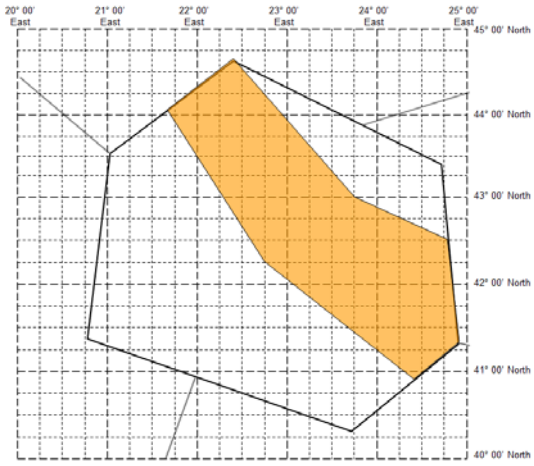
For a series of connected lines when the SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 – N4115 E02215 – N4020 E02340 AND SW OF LINE N4402 E02142 – N4215 E02315 - N4145 E02450 FL250/370 WKN MOV NE 20KT=

With an explicit forecast position:

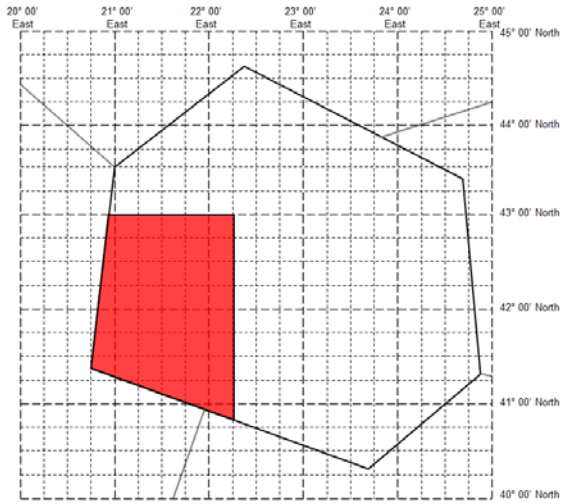




YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR SEV TURB FCST NE OF LINE N4300 E02057 – N4115 E02215 – N4020 E02340 AND SW OF LINE N4402 E02142 – N4215 E02315 - N4145 E02450 FL250/370 WKN FCST AT 1600Z NE OF LINE N4403 E02140 N4215 E02245 – N4055 E02422 AND SW OF LINE N4437 E02222 – N4300 E02345– N4230 E02447=

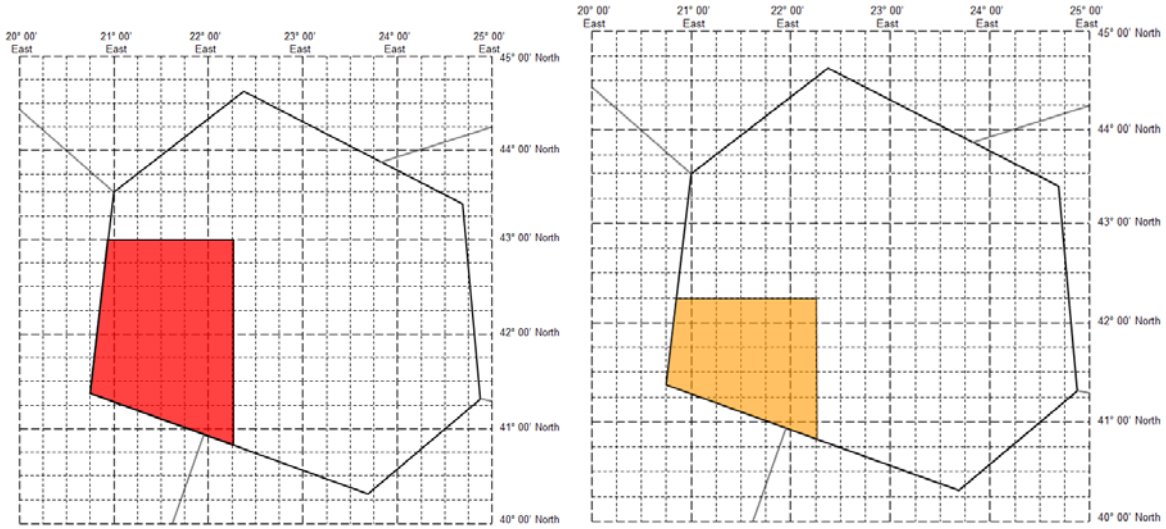
2c) In a sector of the FIR defined relative to a line of latitude and a line of longitude (effectively a quadrant)

When the SIGMET does not include a 'forecast position' section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST S OF N4300 AND W OF E02215 FL250/370 MOV S 12KT WKN=

When the SIGMET does include a ‘forecast position'.

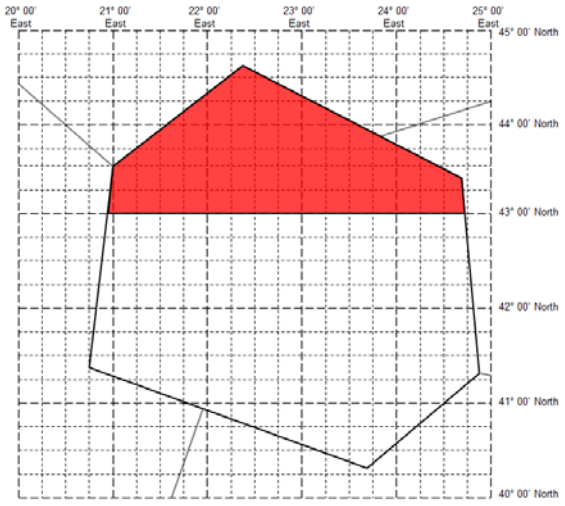


With an explicit forecast position:

```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST S OF N4300 AND W OF E02215
FL250/370 WKN FCST AT 1600Z S OF N4215 AND W OF E02215=
```

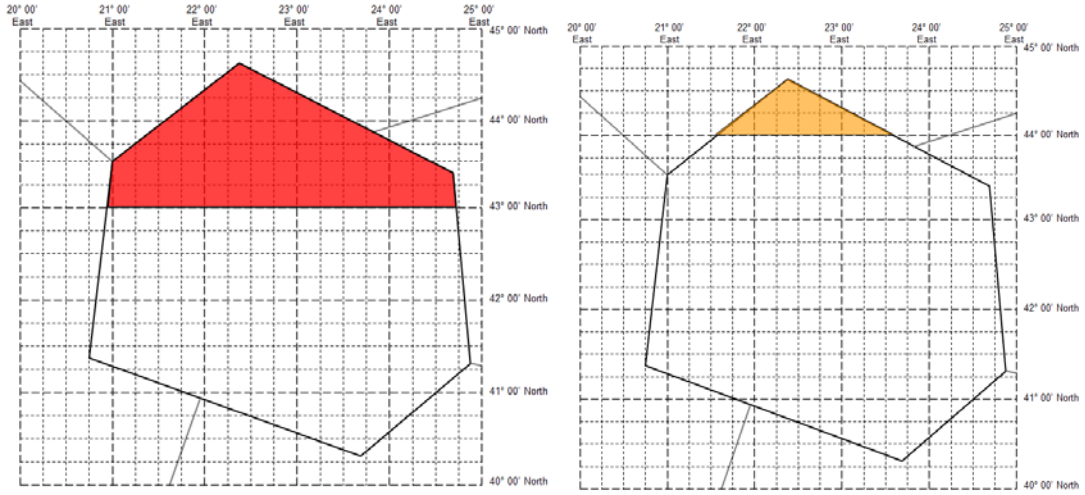
2d) In a sector of the FIR defined relative to a line of latitude or longitude (effectively a segment)

When the SIGMET does not include a ‘forecast position’ section.

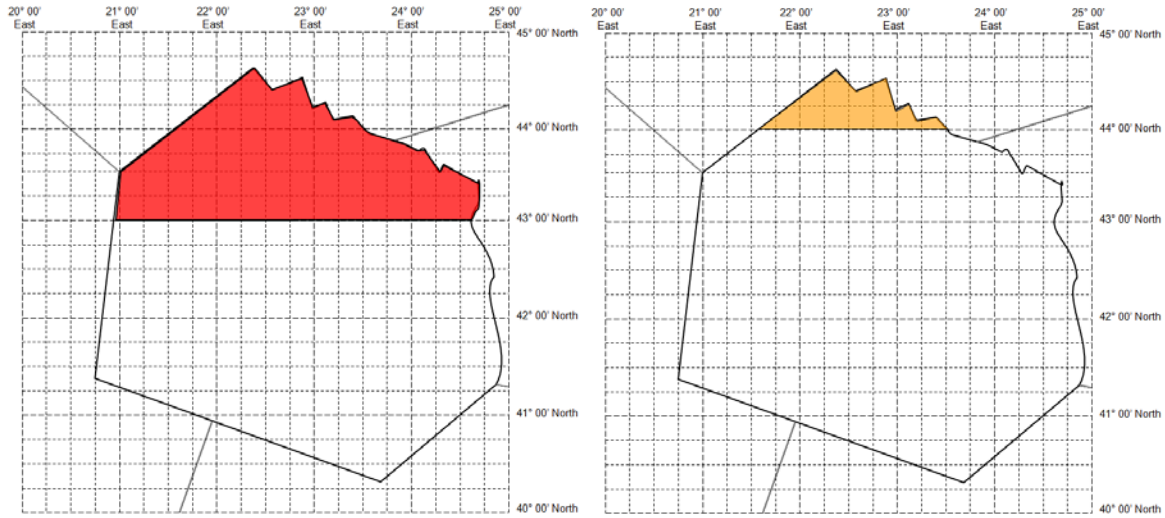



```
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43 FL250/370 MOV N 15KT WKN=
```

When the SIGMET does include a ‘forecast position’ section.



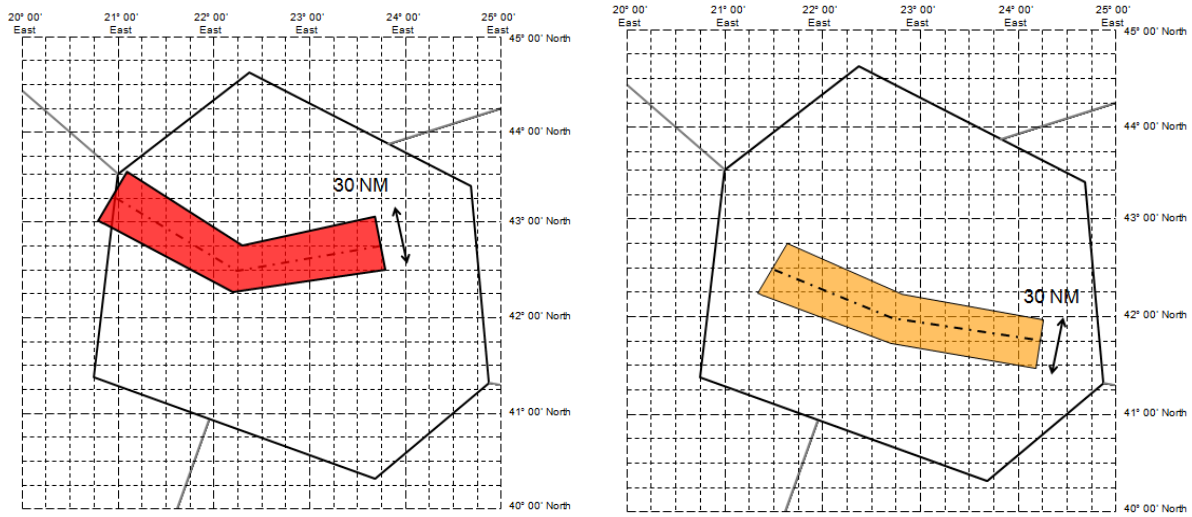
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43[3] FL250/370 WKN FCST AT 1600Z N OF N44=



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST N OF N43[4] FL250/370 WKN FCST AT 1600Z N OF N44=

[3] It would be equally valid to use 'N4300'.
[4] It would be equally valid to use 'N4300'.

3) Defined by a ‘corridor’ of specified width, centred upon the line described;

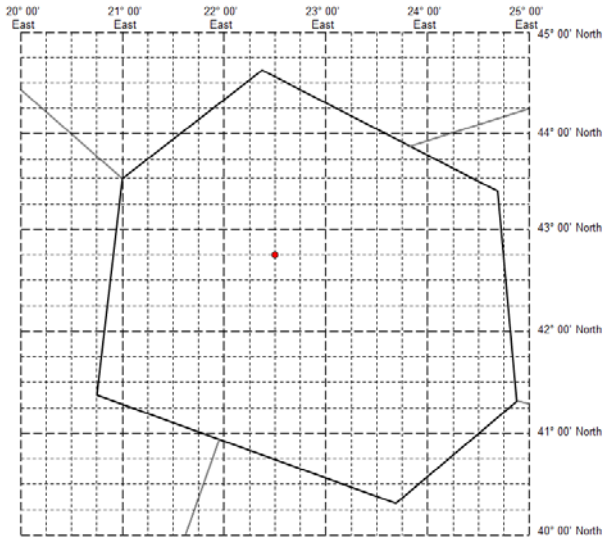


YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB FCST APRX 30NM WID LINE BTN N4315 E02100 – N4230 E02215 – N4245 E02345 FL250/370 WKN FCST AT 1600Z APRX 30NM WID LINE BTN N4230 E02130 – N4200 E02245 – N4145 E02415=

Note: The nature of this option means that, as at N4315 E02100, it is inferred that there is some encroachment into the neighbouring FIR.

4) At a specific point within the FIR;

When the SIGMET does not include a ‘forecast position’ section.

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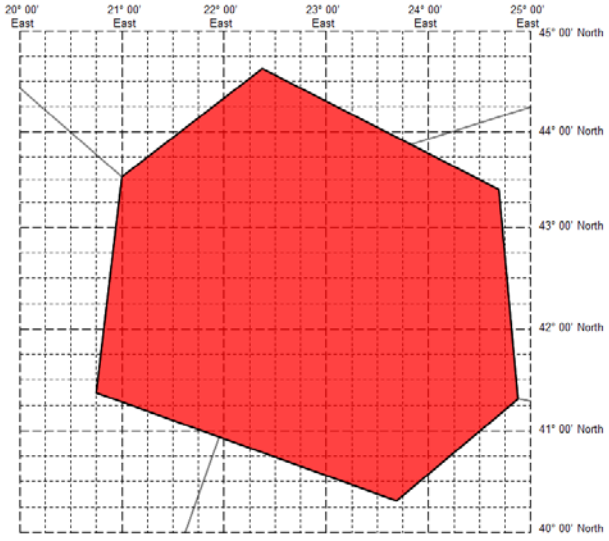
YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR/UIR SEV TURB OBS N4245 E02230 FL250/370 STNR WKN=
```

5) Covering entire FIR.

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YUDD SIGMET 2 VALID 101200/101600 YUSO –
YUDD SHANLON FIR/UIR VA CLD FCST AT 1200Z ENTIRE FIR FL250/370 STNR
WKN=
```
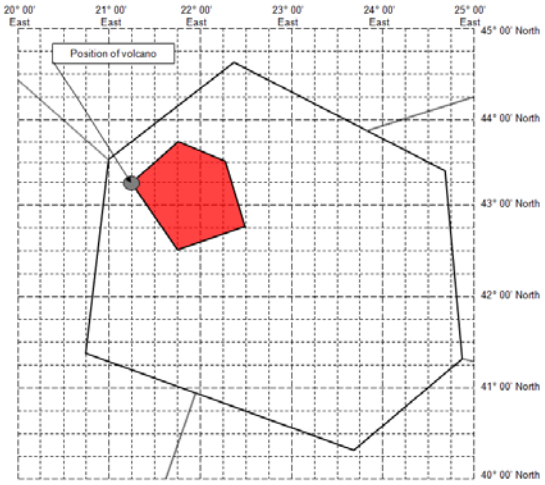

6) Additional examples using volcanic ash references applicable to volcanic ash SIGMET only

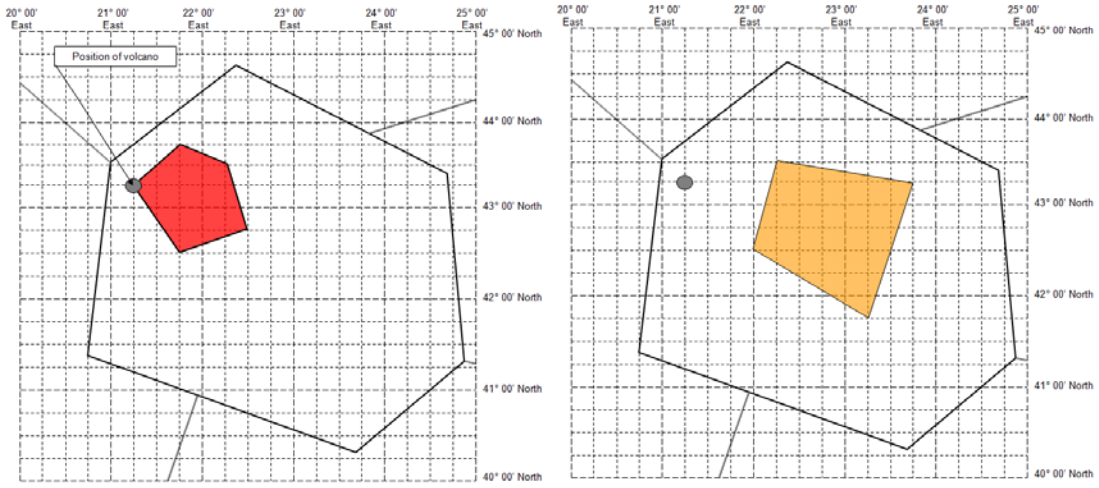
When the VA SIGMET does not include a ‘forecast position’ section.



YUDD SIGMET 2 VALID 101200/101600 YUSO–
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 - N4330 E02215 – N4245 E02230 – N4230 E02145 - N4315 E02115 FL250/370 MOV ESE 20KT NC=

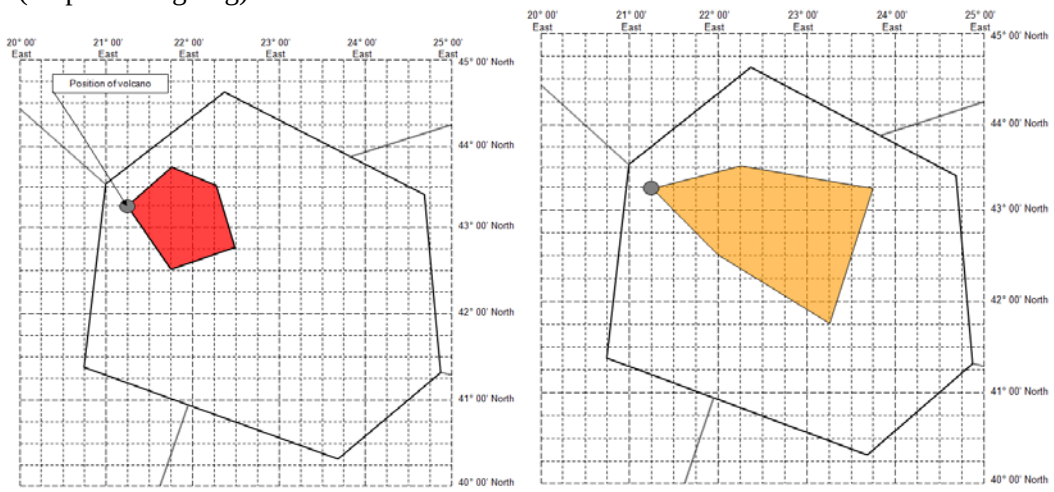
When the SIGMET does include a ‘forecast position’ section (no rate of movement).

For VA (eruption ceased, ash cloud persists downwind):



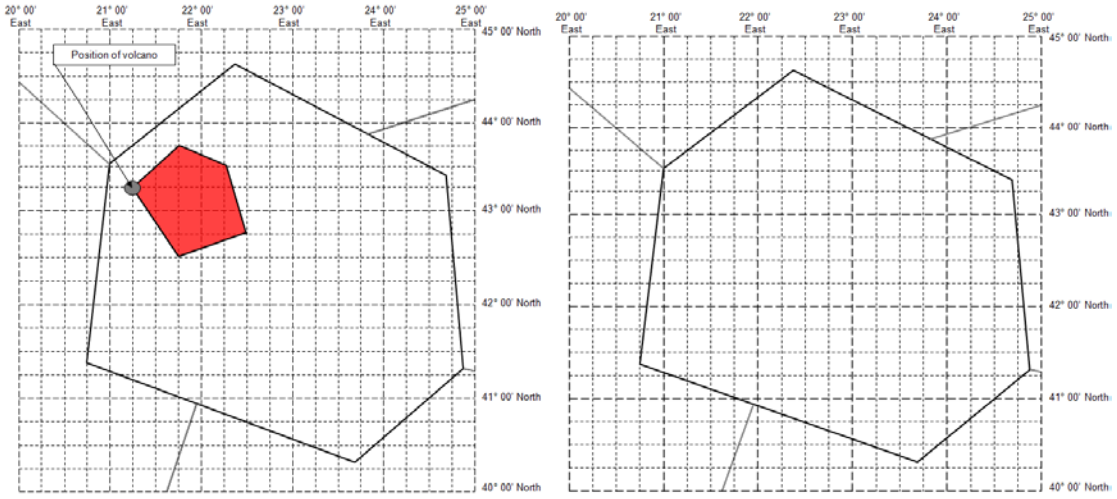
YUDD SIGMET 2 VALID 101200/101800 YUSO–
YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 N4330 E02215 – N4245 E02230 – N4230 E02145 - N4315 E02115 FL250/370 NC FCST AT 1800Z WI N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 - N4330 E02215=

For VA (eruption on-going):



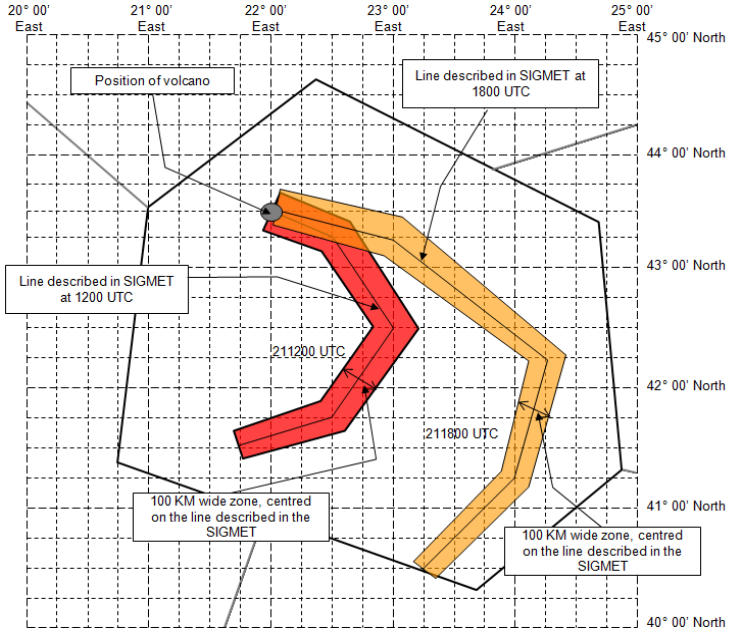
YUDD SIGMET 2 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 - N4345 E02145 – N4330 E02215 – N4245 E02230 – N4230 E02145 – N4315 E2115 FL250/370 NC FCST AT 1800Z WI N4315 E02115 - N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 – N4315 E02115=

For VA (eruption ceasing, ash dispersing):



YUDD SIGMET 2 VALID 101200/101800 YUSO–
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 - N4345 E02145 – N4330 E02215 – N4245 E02230 - N4230 E02145 - N4315 E02115 FL250/370 WKN FCST AT 1800Z NO VA EXP=

For VA (eruption on-going), defining the area affected as a corridor of specified width;

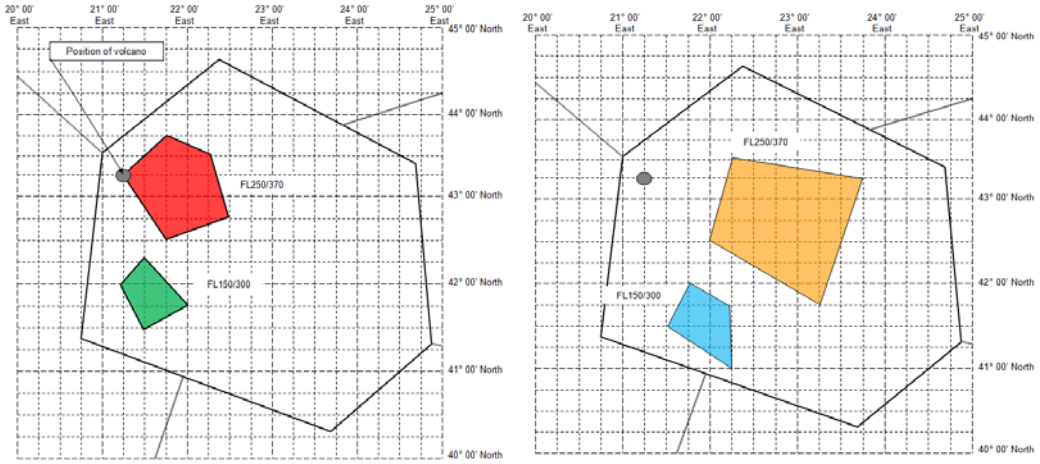


YUDD SIGMET 2 VALID 211200/211800 YUSO –
YUDD SHANLON FIR/UIR VA ERUPTION MT ASHVAL PSN N4330 E02200 VA CLD FCST AT 1200Z APRX 100KM WID LINE BTN N4330 E02200 – N4315 E02230 – N4230 E02300 – N4145 E02230 – N4130 E02145 FL310/450 NC FCST AT 1800Z APRX 100KM WID LINE BTN N4330 E02200 – N4315 E02300 – N4215 E02415 – N4115 E02400 – N4030 E02315=

7) Additional examples using volcanic ash references applicable to multiple areas in SIGMET for volcanic ash.

The only way to include a second instance of a volcanic ash cloud in a SIGMET message is to use the 'AND' option after the 'Forecast position' section.

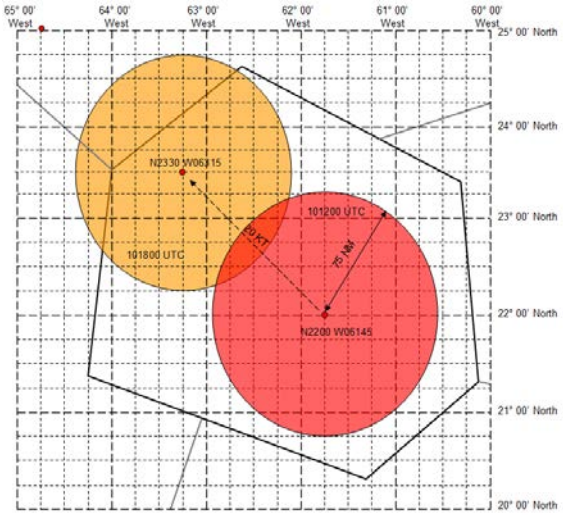
In the example below, two areas of volcanic ash cloud (at different levels) are forecast to move as described. The normal courier font refers to the northernmost areas of ash, and the italicised font refers to the southernmost areas of ash during the period. 'AND' is highlighted in **bold** to identify the separation of the two features.



YUDD SIGMET 2 VALID 101200/101800 YUSO –
YUDD SHANLON FIR VA ERUPTION MT ASHVAL PSN N4315 E02115 VA CLD OBS AT 1200Z WI N4315 E02115 – N4345 E02145 N4330 E02215 – N4245 E02230 – N4230 E02145 - N4315 E02115 FL250/370 NC FCST AT 1800Z WI N4330 E02215 – N4315 E02345 – N4145 E02315 – N4230 E02200 - N4330 E02215 **AND** *N4200 E02115 – N4217 E02130 – N4145 E02200 – N4130 E02130 – N4200 E02100 FL150/300 NC FCST AT 1800Z WI N4200 E02145 – N4145 E02215 – N4100 E02215 - N4130 E02130 - N4200 E02145=*

The above only works if there are two instances of ash at the start and end of the period. If the number of ash areas is different at the start and end, it is recommended that separate SIGMETs be issued as necessary.

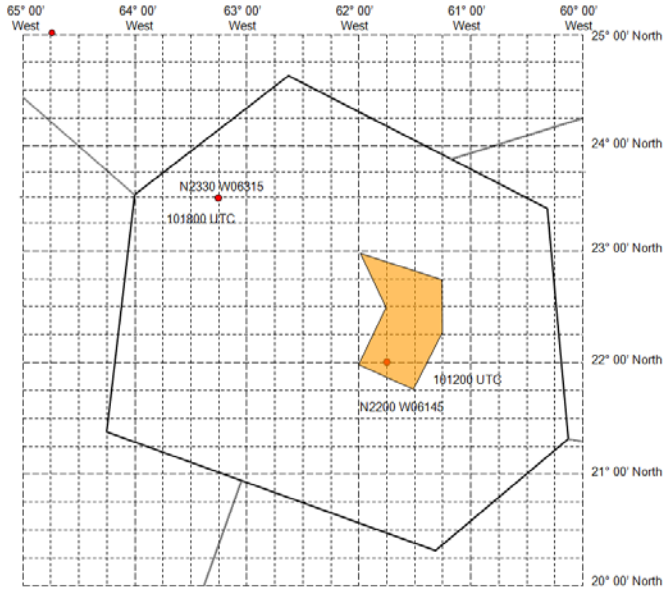
8) Additional example using volcanic illustrating use of "WI nnnKM (or nnnNM) OF TC CENTRE " Tropical Cyclone SIGMET Only



YUDD SIGMET 2 VALID 101200/101800 YUSO–
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 75NM OF TC CENTRE TOP BLW FL500 MOV NW 20KT WKN=

YUDD SIGMET 2 VALID 101200/101800 YUSO–
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI 75NM OF TC CENTRE TOP BLW FL500 WKN FCST AT 1800Z TC CENTRE PSN N2330 W06315=

It is acceptable to use the other 'Location' options to describe the area affected by the CB of a Tropical Cyclone:

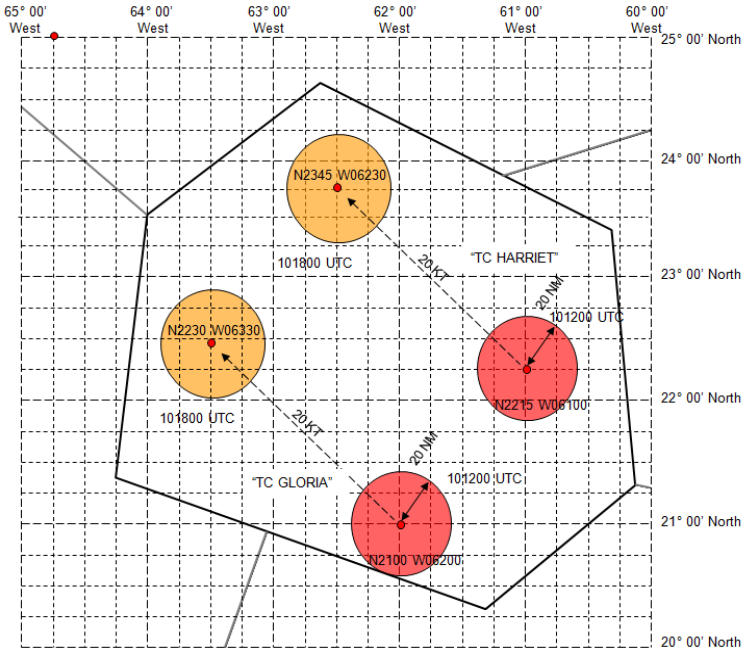


YUDD SIGMET 2 VALID 101200/101800 YUSO–
YUDD SHANLON FIR TC GLORIA PSN N2200 W06145 CB OBS AT 1200Z WI N2200 W06200 – N2230 W06215 – N2300 W06200 - N2245 W06245 – N2215 W06245 – N2145 W06230 –N2200 W06200 TOP BLW FL500 WKN FCST AT 1800Z TC CENTRE PSN N2330 W06315=

9) Additional example using volcanic ash references applicable to multiple areas in SIGMET for tropical cyclone.

The only way to include a second instance of a tropical cyclone in a SIGMET is to use the 'AND' option following the 'Forecast position' section.

The example below demonstrates how two separate TCs, and the CB within a specified radius of those TCs, can be described. The normal courier font refers to TC Gloria, and the italicised font refers to TC Harriet. 'AND' is highlighted in **bold** to identify the separation between information for the two features.



YUDD SIGMET 2 VALID 101200/101800 YUSO–
YUDD SHANLON FIR TC GLORIA PSN N2100 W06200 CB OBS AT 1200Z WI 20NM OF TC CENTRE TOP FL500 MOV NW 20KT WKN FCST AT 1800Z TC CENTRE N2230 W06330 **AND** *TC HARRIET FCST AT 1200Z N2215 W06100 CB TOP FL400 WI 20NM OF CENTRE MOV NW 20KT WKN FCST AT 1800Z TC CENTRE N2345 W06230*=

— — — — — — — —

APPENDIX C

SIGMET TEST PROCEDURES

CHAPTER 1 — REGIONAL SIGMET TEST PROCEDURES

1. Introduction

1.1. The Meteorology Divisional Meeting (2002) formulated Recommendation 1/12 b), *Implementation of SIGMET requirements,* which called, *inter alia,* for the relevant planning and implementation regional groups (PIRGs) to conduct periodic tests of the issuance and reception of SIGMET messages, especially those for volcanic ash.

1.2. This document describes the procedures for conducting regional SIGMET tests. The test procedures encompass all the three types of SIGMET, as follows:

- SIGMET for volcanic ash (WV SIGMET);
- SIGMET for tropical cyclone (WC SIGMET); and
- SIGMET for other weather phenomena (WS SIGMET).

1.3. The requirements for dissemination of SIGMET are specified in Annex 3, Appendix 6, 1.2 and in this guide on pages 3-17 and 3-18.

1.4. Tropical cyclone and volcanic ash cloud SIGMETs will be referred to hereafter as **WC** SIGMET (due to the $\mathbf{T_1T_2}$ section of the WMO AHL being set to **WC**) and **WV** SIGMET (due to the $\mathbf{T_1T_2}$ section of the WMO AHL being set to **WV**) respectively. All other SIGMET types will be referred to by **WS** (due to the $\mathbf{T_1T_2}$ section of the WMO AHL being set to **WS**).

2. Purpose and scope of regional SIGMET tests

2.1. The purpose of the regional SIGMET tests is to check the awareness of participating MWOs of the ICAO requirements for the issuance of SIGMET and the compliance of the States' procedures for preparation and dissemination of SIGMET bulletins with the relevant ICAO Standards and Recommended Practices (SARPs) and regional procedures.

2.2. Note, an MWO is at liberty to issue SIGMET test messages for local reasons (i.e. testing of local systems/routing etc.). Whilst such tests may not involve other MWOs or agencies directly, it is recommended that the general principles of this guide be followed with regard to local, ad hoc testing.

2.3. Hereafter, references to 'SIGMET tests' or 'tests' should be understood to refer to regional SIGMET tests.

2.4. The scope of the tests is to check also the interaction (where appropriate, depending on regional requirements) between the tropical cyclone advisory centres (TCAC) and volcanic ash advisory centres (VAAC), and the MWOs in their areas of responsibility. Therefore, where the issuance of **WC** and **WV** SIGMET is being tested, the TEST SIGMET messages initiated by the MWO should normally be triggered by a test advisory issued by the respective TCAC or VAAC.

2.5. The regional OPMET data banks (RODB) will monitor the dissemination by filing all TEST SIGMETs and advisories and the corresponding reception times. The monitoring results for **WC**, **WV** and **WS** SIGMET will be provided in the form of summaries to the SIGMET test focal points given in section 3.4.1.3 with a copy to the Regional Office concerned

2.6. A consolidated summary report will be prepared by both the SIGMET test focal points and submitted to the ICAO regional office concerned. The report will include recommendations for improvement of the SIGMET exchange and availability. The results of the tests should be reported to the appropriate regional OPMET bulletin exchange/data management group and MET Sub-group meetings.

2.7. Participating States, for which discrepancies of the procedures or other findings are identified by the tests, will be advised by the ICAO Regional Office and requested to take necessary corrective action.

3. SIGMET test procedures

3.1. Procedures for WC and WV SIGMET tests

3.1.1. Participating units

3.1.1.1. **Tropical Cyclone Advisory Centres (TCAC):**
New Delhi

3.1.1.2. **Volcanic Ash Advisory Centres (VAAC):**
Toulouse

3.1.1.3. **Regional OPMET Data Banks (RODB):**
ROC Jeddah and back-up ROC Bahrain

3.1.1.4. **Meteorological Watch Offices (MWO):**
Reference MID eANP Volume II, Table MET II-1

3.1.1.5 **World Area Forecast Centres (WAFCs):**
London
Washington

3.1.2. WV/WC SIGMET test messages

3.1.2.1. On the specified date for the test <<Time (UTC) to be agreed appropriate to Region>> the participating VAAC and TCAC should issue a TEST VA or TC advisory. The structure of the TEST advisories should follow the standard format given in Annex 3 with indication that it is a test message as shown on page C-6.

3.1.2.2. MWOs, upon receipt of the TEST VA or TC advisory, should issue a TEST SIGMET for volcanic ash (**WV**) or tropical cyclone (**WC**), respectively, and send it to all participating RODBs. The WMO AHL, the first line of the SIGMET, and the FIR reference in the second line of the SIGMET should be valid entries. The remainder of the body of the message should contain only the specified text informing recipients in plain language that the message is a test. TEST SIGMETs should normally have short validity periods (10 minutes), but where appropriate TEST SIGMET may be issued with validity periods up to the maximum allowed (4 hours for **WS**, 6 hours for **WC** and **WV**').

3.1.2.3. If the MWO does not receive the TEST VA or TCA advisory within 30 minutes of the commencement time of the test then they should still issue a TEST SIGMET indicating that the VAA or TCA was not received. See C-7 for an example of the test message.

3.1.2.4. To avoid over-writing of a valid SIGMET, a TEST SIGMET for VA or TC should not be sent in the case where there is a valid SIGMET of the same type for the MWO's area of responsibility. However, in this case the responsible MWO should notify the WV/WC SIGMET test focal point as given in 3.4.1.3 so that they can be excluded from the analysis.

3.2. Procedures for WS SIGMET tests

Note. — The WS SIGMET is initiated by the MWO at the designated time in 3.2.2. It is not initiated by an advisory as in the WC and WV SIGMET tests.

3.2.1. Participating units

Each Regional Office should develop its own list of participating units, using the template below:

3.2.1.1. **Regional OPMET Data Banks (RODB):**
ROC Jeddah and back-up ROC Bahrain

3.2.1.2. **Meteorological Watch Offices (MWO):**
Reference MID eANP Volume II, Table MET II-1

3.2.2. WS SIGMET Test Message

3.2.2.1. The MWOs should issue a TEST SIGMET during the 10-minute period between <<Time (UTC) to be agreed appropriate to Region>>.

3.2.2.2. The WMO AHL, the first line of the SIGMET, and the FIR reference in the second line of the SIGMET should be valid. The remainder of the body of the message should contain only the specified text informing recipients in plain language that the message is a test. TEST SIGMETs should normally have short validity periods (10 minutes), but where appropriate TEST SIGMET may be issued with validity periods up to the maximum allowed (4 hours for **WS**, 6 hours for **WC** and **WV**'.

3.3. Common procedures

3.3.1. Special procedure to avoid overwriting of a valid WV/WC/WS SIGMET

3.3.1.1. It is vital to ensure that TEST SIGMET is unique so that it is not confused with operational SIGMET and avoid overwriting a valid operational SIGMET in an automated system. In order to prevent this it is suggested that the test SIGMET sequence number should be Z99.

For example, a SIGMET test is scheduled for 0200 UTC on the 29th. The TEST SIGMET is issued as follows:

WSAU01 YBRF 290200
YBBB SIGMET Z99 VALID 290200/290210 YBRF-

YBBB BRISBANE FIR TEST SIGMET PLEASE DISREGARD=

3.3.2. The test date and time

3.3.2.1. ICAO Regional Office will set a date and time for each SIGMET test after consultation with the participating VAACs, TCACs and RODBs. The information about the agreed date and time will be sent to all States concerned by a State letter and copied to the States' SIGMET Tests Focal Points.

3.3.2.2. Tests for different types of SIGMET should preferably be conducted on separate dates.

3.3.2.3. SIGMET tests for **WC**, **WV** and **WS** should be conducted at least yearly.

3.3.3. Dissemination of test SIGMETs and advisories

3.3.3.1. All TEST TC/VA advisories should be sent by the TCACs and VAACs to the participating units, as specified in the Regional Air Navigation Plan. The relevant AFTN addresses should be identified as part of the Region specific documentation.

3.3.3.2. All TEST SIGMETs should be sent by the MWOs to the participating units, as specified in the Regional Air Navigation Plan identified by each Regional Office. The relevant AFTN addresses should be identified as part of the Region specific documentation.

3.3.3.3. RODBs that are nominated as IROGs will relay the test bulletins to their corresponding IROG.

3.3.3.4. SIGMET tests should be terminated within 2 hours of the test start time. Exceptionally, where the test requires SIGMETs to be valid for up to 4 hours, then tests may be extended to a maximum of 4 hours for WS SIGMET and 6 hours for WC and WV SIGMET.

3.3.4. Coordination with the ATS units

3.3.4.1. MWOs should inform the associated ATS units of the forthcoming SIGMET tests by a suitable advanced notice.

3.4. Processing of the test messages and results

3.4.1. The RODBs should file all incoming TEST advisories and SIGMETs and perform an analysis of the availability, timeliness of arrival and the correctness of the WMO bulletin headings. A SIGMET TEST Summary Table, as shown on pages C-8 and C-9 of this guide, should be prepared by each RODB and sent to the regional SIGMET test focal point given in section 3.4.3, with a copy to the ICAO Regional Office.

3.4.2. The SIGMET test focal points should prepare the final report of the test and present to the ICAO Regional Office. A summary report should be submitted to the next regional OPMET bulletin exchange/data management group and MET Sub-group meetings.

3.4.3. The current SIGMET test focal points for the MID Region are as follows:

MID Region

State	Contact	Numbers	e-mail
Bahrain	Anwar Yusuf Al-Mulla Operation Supervisor Meteorological Directorate Civil Aviation Affairs Ministry of Transportation P.O. Box 586	+973 17 321109 (tel) +973 17 320630 (fax)	aalmulla@caa.gov.bh
	Basim Salman Al Asfoor Head of Research and Information Meteorological Directorate Civil Aviation Affairs Ministry of Transportation P.O. Box 586	+973 17 329043 (tel) +973 17 320630 (fax)	balasfoor@caa.gov.bh
Egypt			
Iran, Isalamic Republic of	Ahad Vazifeh Director of Forecasting Center in Meteorological Organization	+98 21 66070023(tel) +98 21 66070007(fax) +98 91 23851049 (mb)	vazife@gmail.com
Iraq	Sallam S. Nadhim Iraqi Meteorological Organization & Seismology Dept. : Weather Forecasting		Sallam_omery@yahoo.com (for backup use – info@meteoseism.gov.iq)
Jordan	Eng. Sahim AL-Shraideh		Sahim_Faisal@yahoo.com
Kuwait			
Lebanon			
Libya	Mr. Mokhtar R. ALGhaiag Senior Forecaster National Meteorological Centre/Forecasting Department	+218-92-6009697 mob +218-215-621772 fax	alghaiag@yahoo.com
Oman			
Qatar			
Saudi Arabia			
Sudan			
Syrian Arab Republic			
United Arab Emirates	Ahmed Al Obeidli Sr. Air Navigation Inspector – CNS –AIRS General Civil Aviation Authority P.O. Box: 6558 Abu Dhabi United Arab Emirates	00971 240 54410 (tel)	aobaidli@gcaa.gov.ae
Yemen			

SIGMET TEST PROCEDURES

Format of TEST Advisories and SIGMETs

1. Format of TEST Volcanic Ash Advisory

```
VA ADVISORY
DTG:            YYYYMMDD/1000Z
VAAC:           TOULOUSE
VOLCANO:        TEST
PSN:            UNKNOWN
AREA:           TOULOUSE VAAC AREA
SUMMIT ELEV:    UNKNOWN
ADVISORY NR:    YYYY/nn
INFO SOURCE:    NIL
AVIATION COLOUR CODE: NIL
ERUPTION DETAILS:     NIL
OBS VA DTG:     DD/GGggZ
OBS VA CLD:     ASH NOT IDENTIFIABLE FROM SATELLITE DATA
FCST VA CLD +6 HR:    DD/0800Z SFC/FL600 NO ASH EXP
FCST VA CLD +12 HR:   DD/1400Z SFC/FL600 NO ASH EXP
FCST VA CLD +18 HR:   DD/2000Z SFC/FL600 NO ASH EXP
RMK: THIS IS A TEST VA ADVISORY. MWO SHOULD NOW ISSUE A TEST
SIGMET FOR VA,. PLEASE REFER TO THE LETTER FROM MID REGIONAL
OFFICE DATED xxxxxxxxxx.
NXT ADVISORY: NO FURTHER ADVISORIES=
```

2. Format of TEST Tropical Cyclone Advisory

```
TC ADVISORY
DTG:            YYYYMMDD/0800Z
TCAC:           NEW DELHI
TC:             TEST
NR:             nn (actual number)
PSN:            NIL
MOV:            NIL
C:              NIL
MAX WIND:       NIL
FCST PSN +06HR: NIL
FCST MAX WIND +06HR:  NIL
FCST PSN +12HR: NIL
FCST MAX WIND +12HR:  NIL
FCST PSN +18HR: NIL
FCST MAX WIND +18HR:  NIL
FCST PSN +24HR: NIL
FCST MAX WIND +24HR:  NIL
```

```
RMK: THIS IS A TEST TC ADVISORY. MWO SHOULD NOW ISSUE A TEST
SIGMET FOR TC. PLEASE REFER TO THE LETTER FROM MID REGIONAL
OFFICE DATED xxxxxxxxxx.
NXT MSG: NIL=
```

3. Format of TEST SIGMET for Volcanic Ash

```
WVXXii CCCC YYGGgg
CCCC SIGMET Z99 VALID YYGGgg/YYGGgg CCCC-
CCCC <<NAME>> FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST VA ADVISORY NUMBER xx RECEIVED FM TOULOUSE VAAC AT YYGGggZ=
```

or

```
WVXXii CCCC YYGGgg
CCCC SIGMET Z99 VALID YYGGgg/YYGGgg CCCC-
CCCC <<NAME>> FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST VA ADVISORY NOT RECIEVED FM TOULOUSE VAAC=
```

Example:

```
WVJP31 RJTD 170205
RJJJ SIGMET Z99 VALID 170205/170215 RJTD-
RJJJ FUKUOKA FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST VA ADVISORY NUMBER 1 RECEIVED FM TOKYO VAAC AT 170200Z=

WVJP31 RJTD 170235
RJJJ SIGMET Z99 VALID 170205/170215 RJTD-
RJJJ FUKUOKA FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST VA ADVISORY NOT RECEIVED FM TOKYO VAAC=
```

4. Format of TEST SIGMET for Tropical Cyclone

```
WCXXii CCCC YYGGgg
CCCC SIGMET Z99 VALID YYGGgg/YYGGgg CCCC-
CCCC <<NAME>> FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST TC ADVISORY NUMBER xx RECEIVED FM NEW DELHI TCAC AT YYGGggZ=
```

```
WCXXii CCCC YYGGgg
CCCC SIGMET Z99 VALID YYGGgg/YYGGgg CCCC-
CCCC <<NAME>> FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST TC ADVISORY NOT RECEIVED FM NEW DELHI TCAC=
```

Example:

```
WCJP31 RJTD 100205
RJJJ SIGMET Z99 VALID 100205/100215 RJTD-
```

```
RJJJ FUKUOKA FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST TC ADVISORY NUMBER 1 RECEIVER FM TOKYO TCAC AT 180200Z=

WCJP31 RJTD 100235
RJJJ SIGMET Z99 VALID 100205/100215 RJTD-
RJJJ FUKUOKA FIR THIS IS A TEST SIGMET, PLEASE DISREGARD.
TEST TC ADVISORY NOT RECEVED FM TOKYO TCAC =
```

5. Format of TEST SIGMET for other weather phenomena

```
WSXXii CCCC YYGGgg
CCCC SIGMET Z99 VALID YYGGgg/YYGGgg CCCC-
CCCC <<NAME>> FIR THIS IS A TEST SIGMET, PLEASE DISREGARD=
```

Example:

```
WSJP31 RJTD 240205
RJJJ SIGMET Z99 VALID 240205/240215 RJTD-
RJJJ FUKUOKA FIR THIS IS A TEST SIGMET, PLEASE DISREGARD=
```

CHAPTER 2 — SAMPLE TABLE TO USED BY REGIONAL OPMET DATA BANKS

Name of RODB Tokyo
Date of Test 2011/11/17
Target (VA or TC) VA

VA Advisories (FV)

TTAAii	*CCCC*	*YYGGgg*	*Received Time(UTC)*	*Comments/Remarks*
FVAK23	PAWU	170159	01:59:29	
FVAU01	ADRM	170201	02:01:53	
FVFE01	RJTD	170200	02:00:09	
FVPS01	NZKL	170207	02:08:27	
FVXX02	LFPW	170202	02:02:41	
FVXX25	KNES	170200	02:02:01	

VA SIGMET (WV)

TTAAii	*CCCC*	*YYGGgg*	*MWO*	*FIR*	*Received Time(UTC)*	*Comments/Remarks*
WVAK01	PAWU	170200	PAWU	PAZA	02:00:11	
WVAU01	ADRM	170201	YDRM	YBBB	02:02:04	
WVCI31	RCTP	170205	RCTP	RCAA	02:04:58	
WVCI33	ZBAA	170205	ZBAA	ZBPE	02:05:26	
WVCI34	ZSSS	170205	ZSSS	ZSHA	02:02:34	
WVCI35	ZJHK	170201	ZJHK	ZJSA	02:03:34	
WVCI36	ZUUU	170205	ZUUU	ZPKM	02:11:04	
WVCI37	ZLXY	170205	ZLXY	ZLHW	02:07:44	
WVCI38	ZYTX	170205	ZYTX	ZYSH	02:01:50	
WVCI39	ZWWW	170202	ZWWW	ZWUQ	02:02:40	

WVCI45	ZHHH	170204	ZHHH	ZHWH	02:08:52
WVFJ01	NFFN	170000	NFFN	NFFF	02:15:46
WVIN31	VOMM	170201	VOMM	VOMF	02:09:57
WVJP31	RJTD	170205	RJTD	RJJJ	02:06:24
WVKP31	ZUUU	170206	ZUUU	VDPP	02:12:23
WVLA31	VLVT	170200	VLVT	VLVT	02:01:03
WVMS31	WMKK	170205	WMKK	WBFC	02:04:28
WVPA01	PHFO	170201	PHFO	KZAK	02:02:09
WVPH31	RPLL	170210	RPLL	RPHI	02:08:43
WVPN01	KKCI	170200	KKCI	KZAK	02:00:11
WVRA31	RUCH	170205	RUCH	UIAA	02:08:01
WVRA31	RUHB	170206	RUHB	UHHH	02:07:57
WVRA31	RUMG	170205	RUMG	UHMM	02:08:59
WVRA31	RUPV	170200	RUPV	UHMP	02:09:13
WVRA31	RUSH	170205	RUSH	UHSS	02:04:22
WVRA31	RUVV	170202	RUVV	UHWW	02:03:13
WVRA32	RUPV	170200	RUPV	UHMA	02:06:01
WVRA32	RUYK	170207	RUYK	UELL	02:07:28
WVRA33	RUHB	170202	RUHB	UHBB	02:02:49
WVSR20	WSSS	170205	WSSS	WSJC	02:05:38
WVSS20	VHHH	170202	VHHH	VHHK	02:03:05
WVTH31	VTBS	170211	VTBS	VTBB	02:13:53
WVVS31	VVGL	170200	VVGL	VVNB	02:05:06
WVVS31	VVGL	170208	VVGL	VVTS	02:14:38

— END —

APPENDIX D

SIGMET WMO HEADERS - MID

State	MWO name (Doc 7910)	MWO Loc. Ind.	WS AHL	WV AHL	WC AHL	FIR Name (Doc 7910)	FIR Loc. Ind.	ATSU serving the FIR
BAHRAIN	BAHRAIN INTERNATIONAL	OBBI	WSBN31 OBBI	WVBN31 OBBI	WCBN31 OBBI	BAHRAIN	OBBB	OBBB
EGYPT	CAIRO/INTL	HECA	WSEG31 HECA	WVEG31 HECA	N/A	CAIRO	HECC	HECC
IRAN	TEHRAN/MEHRABAD INTL	OIII	WSIR31 OIII	WVIR31 OIII	WCIR31 OIII	TEHRAN	OIIX	OIIX
IRAQ	BAGHDAD INTERNATIONAL AIRPORT	ORBI	WSIQ31 ORBI	WVIQ31 ORBI	N/A	BAGHDAD	ORBB	ORBS
JORDAN	AMMAN/QUEEN ALIA	OJAI	WSJD01 OJAM	WVJD01 OJAM	N/A	AMMAN	OJAC	OJAC
KUWAIT	KUWAIT/INTL AIRPORT	OKBK	WSKW10 OKBK	WVKW10 OKBK	WCKW10 OKBK	KUWAIT	OKAC	OKAC
LEBANON	BEIRUT/BEIRUT INTL	OLBA	WSLB31 OLBA	WVLB31 OLBA	N/A	BEIRUT	OLBB	OLBA
LYBIA	Libya MWO	HLMC*	WSLY31 HLMC	WVLY31 HLMC	N/A	TRIPOLI	HLMC	HLMC
OMAN	MUSCAT/MUSCAT INTL	OOMS	WSOM31 OOMS	WVOM31 OOMS	WCOM31 OOMS	MUSCAT	OOMM	OOMM
SAUDI ARABIA	JEDDAH/KING ABDULAZIZ INTL	OEJN	WSSD20 OEJD	WVSD20 OEJD	WCSD20 OEJD	JEDDAH	OEJD	OEJD
SUDAN	KHARTOUM	HSSS	WSSU31 HSSS	WVSU31 HSSS	N/A	KHARTOUM	HSSS	HSSS
SYRIA	DAMASCUS/INTL	OSDI	WSSY31 OSDI	WVSY31 OSDI	N/A	DAMASCUS	OSTT	OSDI
UNITED ARAB EMIRATES	ABU DHABI INTERNATIONAL	OMAA	WSER31 OMAA	WVER31 OMAA	WCER31 OMAA	EMIRATES	OMAE	OMAE
YEMEN	SANAA/INTL	OYSN	WSYE31 OYSN	WVYE31 OYSN	WCYE31 OYSN	SANAA	OYSC	OYSN

a) *Note 1: Qatar is not indicated in the above table, since it has no FIR area if responsibility.*

b) *Note 2: The AHL for each of the WS, WV and WC SIGMETs (highlighted above) is to be confirmed by the relevant State.*

**not defined in ICAO Doc 7910*

APPENDIX E

SPECIAL AIR-REPORT WMO HEADERS - MID

Under Construction – yellow highlight not confirmed

State	Special Air-Report	Special Air-Report on Volcanic Ash
Bahrain	UABN61 OBBI	UABN71 OBBI
Egypt	UAEG61 HECA	UAEG71 HECA
Iran, Islamic Republic of	UAIR61 OIII	UAIR71 OIII
Iraq	UAIQ61 ORBI	UAIQ71 ORBI
Jordan	UAJD61 OJAM	UAJD71 OJAM
Kuwait	UAKW61 OKBK	UAKW71 OKBK
Lebanon	UALB61 OLBA	UALB71 OLBA
Libya	UALY61 HLMC	UALY71 HLMC
Oman	UAOM61 OOMS	UAOM71 OOMS
Saudi Arabia	UASD61 OEJD	UASD71 OEJD
Sudan	UASU61 HSSS	UASU71 HSSS
Syrian Arab Republic	UASY61 OSDI	UASY71 OSDI
United Arab Emirates	UAER61 OMAA	UAER71 OMAA
Yemen	UAYE61 OYSN	UAYE71 OYSN

a) *Note -1: Qatar is not indicated in the above table, since it has no FIR area of responsibility.*

APPENDIX F

SIGMET EXAMPLES - MID

ISOL EMBD TS
WSKW31 OKBK 030900
OKBK SIGMET 1 VALID 030900/031300 OKBK-
OKAC KUWAIT FIR EMBD TS OBS AT 0850Z N OF N30 TOP FL3000 MOV E 15KT NC=

CANCELLATION SIGMET
WSKW31 OKBK 031030
OKBK SIGMET 2 VALID 031030/031300 OKBK-
OKAC KUWAIT FIR CNL SIGMET 1 030900/031300 NC=

SEV TURB
WSKW31 OKBK 030800
OKBK SIGMET 1 VALID 030900/031300 OKBK-
OKAC KUWAIT FIR SEV TURB FCST AT 0850Z N OF N30 FL300/340 MOV E 15KT NC=

HVY DS
WSKW31 OKBK 030900
OKBK SIGMET 1 VALID 030900/031300 OKBK-
OKAC KUWAIT FIR HVY DS OBS AT 0850Z N OF N30 MOV SE 30KT NC=

CANCELLATION SIGMET
WSKW31 OKBK 031030
OKBK SIGMET 2 VALID 031030/031300 OKBK-
OKAC KUWAIT FIR CNL SIGMET 1 030900/031300 NC=

HVY SS
WSKW31 OKBK 030800
OKBK SIGMET 1 VALID 030900/031300 OKBK-
OKAC KUWAIT FIR HVY SS FCST AT 0900Z N OF N30 MOV SE 30KT NC=

CANCELLATION SIGMET
WSKW31 OKBK 031030
OKBK SIGMET 2 VALID 031030/031300 OKBK-
OKAC KUWAIT FIR CNL SIGMET 1 030900/031300 NC=

APPENDIX 5.2.2R

MID ANP Volume I (MET PART)

eANP proposed changes related to SADIS:

- update paragraph 2.1 of Volume I, Part V (MET) of eANP:
  - In the MID Region, WAFC London has been designated as the centre for the operation of the aeronautical fixed service ~~satellite distribution system / WAFS Internet File Service (SADIS and/or WIFS) and the Internet-based Secure SADIS FTP service~~ Secure Aviation Data Information Service (SADIS). The status of implementation of SADIS~~/WIFS~~ by States in the MID Region is detailed in Volume III.

- update paragraph 2.2 of Volume I, Part V (MET) of eANP:
  - In the MID Region, WAFS products in digital form should be disseminated by WAFC London using the ~~SADIS 2G satellite broadcast and the Secure SADIS FTP service and/or WIFS~~ Secure Aviation Data Information Service (SADIS).

APPENDIX 5.2.2S

MID ANP, VOLUME II (MET and CNS PARTS)

eANP proposed changes related to SADIS:

- update paragraph 2.1 b) of Volume II, Part III (CNS) of eANP:
  - meteorological operational circuits, networks and broadcast systems, including World Area Forecast System – Internet File Service (WIFS) and/or ~~Satellite Distribution System for Information Relating to Air Navigation~~ Secure Aviation Data Information Service (SADIS);

eANP proposed changes related to ROC:

- update paragraph 2.8 of Volume II, Part V (MET) of eANP:
  - Operational meteorological information prepared as METAR, SPECI and TAF for aerodromes indicated in **Table MET II-2**, and SIGMET messages prepared for flight information regions or control areas indicated in **Table MET II-1**, should be disseminated to the ~~international OPMET databanks~~ Regional OPMET Centres (ROC) designated for the MID Region (namely Jeddah and Bahrain (backup) Regional OPMET Centres). ~~and~~ The ROCs will take care of the further dissemination to the centre designated for the operation of the aeronautical fixed service ~~satellite distribution system (SADIS) and the Internet-based service (Secure SADIS FTP)~~ Secure Aviation Data Information Service (SADIS) ~~and/or WIFS~~ in the MID Region. The data will be forwarded to other international databanks and to the WIFS Provider State in accordance with regional OPMET data exchange schemes.

eANP proposed changes related to half-hourly METAR requirements:

- update paragraph 2.2 of Volume II, Part V (MET) of eANP (reference **MSG Conclusion 5/12** which was derived and adapted from **MET SG Draft Conclusion 6/4**):
  - In the MID Region, routine observations, issued as a METAR as indicated in Table MET II-2, should be made throughout the 24 hours of each day at intervals of one hour or, ~~for RS and AS designated aerodromes[1],~~ at intervals of one half-hour where warranted using criteria such as number of operations at an aerodrome, frequency of weather change and use of METAR in VOLMET ~~at aerodromes as indicated in Table MET II-2~~. For aerodromes included on the VHF VOLMET broadcast as indicated in Table MET II-3, routine observations, issued as METAR, should be made throughout the 24 hours of each day.

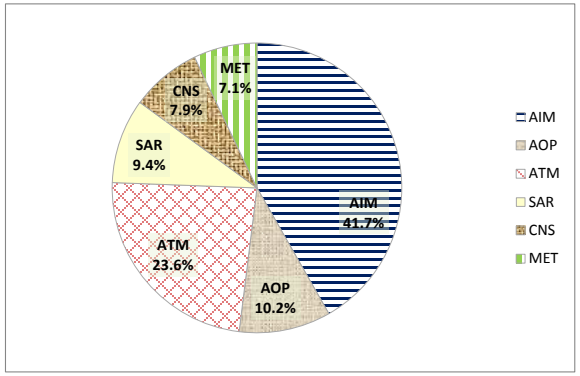
APPENDIX 6A

AIR NAVIGATION DEFICIENCIES IN THE THE MID REGION

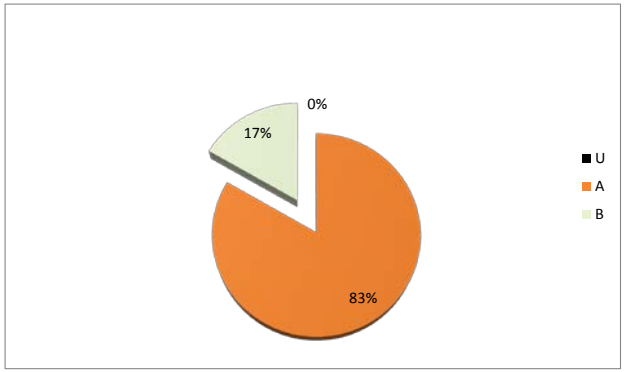
STATE	AIM							Total AIM	AOP							Total AOP	ATM							Total ATM	SAR							Total SAR	CNS							Total CNS	MET							Total MET
	Priority			Rational					Priority			Rational					Priority			Rational					Priority			Rational					Priority			Rational					Priority			Rational				
	U	A	B	F	H	S	O		U	A	B	F	H	S	O		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								0
Egypt		1					1	1		2		2	1		1	2			2			2		2								0								0								0
Iran		1					1	1		1		1	1			1		1	2			1	2	3								0								0								0
Iraq		6	1	5	5	1	6	7		1		1	1		1	1		1	4			4	1	5		2					2	2		2				2	2		1					1	1
Jordan		2	1	3	3			3		1	1	2	1			2		1			1			1								0								0								0
Kuwait								0								0		1				1		1		1					1	1								0								0
Lebanon		4	1		3		2	5		1		1	1			1		1				1		1		1					1	1								0		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
Oman		4					4	4								0		1				1		1								0			1				1	1		1					1	1
Qatar								0								0		1				1		1		2					2	2								0								0
Saudi Arabia		1					1	1								0		1				1		1								0								0								0
Sudan		3					3	3		1		1	1			1		1			1	1	1	1								0								0								0
Syria		8	1	6	7	1	2	9		3		3	3			3		2	2		2	2	1	4		2					2	2		1					1		2					2	2
UAE								0								0		1	1			1	1	2								0								0								0
Yemen		7	1	4	2		4	8		1		1	1			1		3			3		2	3		2					2	2		1					1		1					1	1
Total	0	42	6	18	20	2	30	48	0	12	1	13	11	1	2	13	0	17	11	0	8	17	12	28	0	12	0	0	2	2	12	12	0	4	1	0	0	0	5	5	0	8	0	0	0	0	8	8

TOTAL DEFICIENCIES:114

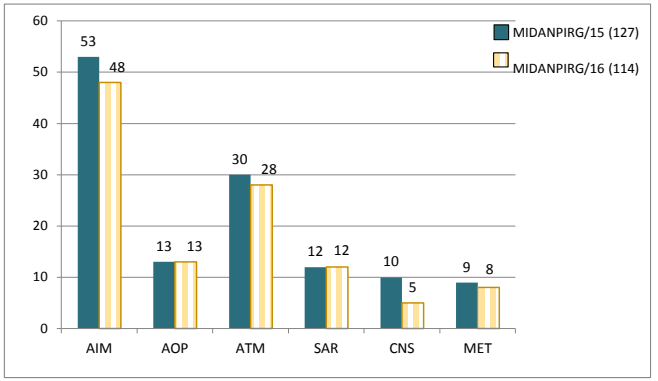
Distribution of Air Navigation deficiencies by field



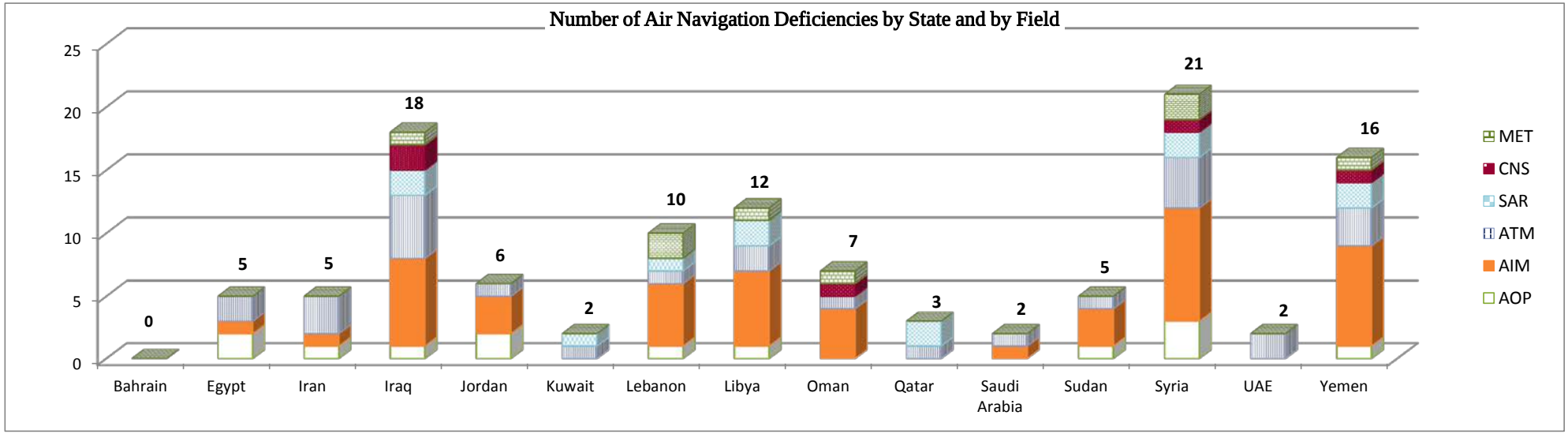
Distribution of Air navigation deficiencies by priority



Deficiencies by field (MIDANPIRG/16 vs MIDANPIRG/15)



APPENDIX 6B



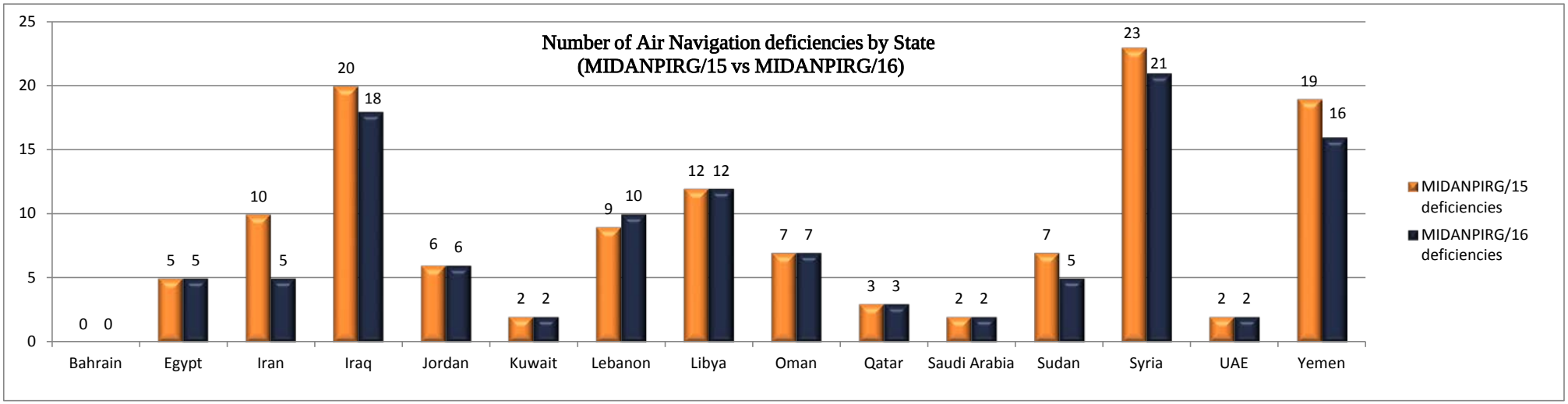
Deficiencies approved by MIDANPIRG/16

	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**

Deficiencies approved by MIDANPIRG/15

	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**
AIS/MAP	0	1	2	8	3	0	5	6	4	0	1	5	10	0	8	**53**
ATM	0	2	4	5	1	1	2	2	1	1	1	1	4	2	3	**30**
SAR	0	0	0	2	0	1	1	2	0	2	0	0	2	0	2	**12**
CNS	0	0	1	3	0	0	0	0	1	0	0	0	1	0	4	**10**
MET	0	0	2	1	0	0	0	1	1	0	0	0	3	0	1	**9**
TOTAL	**0**	**5**	**10**	**20**	**6**	**2**	**9**	**12**	**7**	**3**	**2**	**7**	**23**	**2**	**19**	**127**

	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen	Total
MIDANPIRG/15 deficiencies	**0**	**5**	**10**	**20**	**6**	**2**	**9**	**12**	**7**	**3**	**2**	**7**	**23**	**2**	**19**	**127**
MIDANPIRG/16 deficiencies	**0**	**5**	**5**	**18**	**6**	**2**	**10**	**12**	**7**	**3**	**2**	**5**	**21**	**2**	**16**	**114**



APPENDIX 7A

AIR NAVIGATION SYSTEMS IMPLEMENTATION GROUP (ANSIG)

1. Terms of Reference

1.1 The terms of reference of the ANSIG are:

a) ensure that the implementation of Air Navigation Systems in the MID Region is coherent and compatible with developments in adjacent regions, and is in line with the ATM Operational Concept (Doc 9854), Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) methodology and the MID Region Air Navigation Plan/Strategy;

b) monitor the status of implementation of the MID Region Air Navigation Systems and related ASBU Modules included in the MID Region Air Navigation Plan/Strategy as well as other required Air Navigation facilities and services, identify the associated difficulties and deficiencies and provide progress reports, as required;

c) keep under review the MID Region Air Navigation Strategy, and propose changes to the MID Region Air Navigation Plan/Strategy and Air Navigation priorities, as appropriate;

d) seek to achieve common understanding and support from all stakeholders involved in or affected by the Air Navigation Systems developments/activities in the MID Region;

e) provide a platform for harmonization of developments and deployments of the MID Air Navigation Systems;

f) monitor and review the latest Air Navigation developments and provide expert inputs for the implementation of the Air Navigation Systems based on ATM operational requirements;

g) ensure that the work programmes of all Subsidiary Bodies reporting to ANSIG are harmonized and coordinated, achieving the agreed air navigation performance targets;

h) keep under review the air navigation environmental issues and the State's CO2 action plans;

i) provide regular progress reports to the MSG and MIDANPIRG concerning its work programme; and

j) review periodically its Terms of Reference and propose amendments, as necessary.

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

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

b) monitor the status of implementation of the different ASBU Module elements included in the MID Air Navigation Plan/Strategy; develop associated progress reports and update the performance dashboards;

c) ensure that the agreed performance targets are achieved, identify the associated challenges and difficulties; and agree on necessary mitigation measures, as required;

d) consolidate inputs from all Subsidiary Bodies and propose changes to the Plan/Strategy and Air Navigation priorities, as appropriate;

e) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU methodology;

f) review and identify intra and inter-regional co-ordination issues and where appropriate recommend actions to address those issues;

g) identify the environmental effect and use the guidance provided by the Committee on Aviation Environmental Protection (CAEP) in the analysis of environmental benefits of implementing Air Navigation Systems;

h) collect and analyse the data related to the implementation of operational improvements provided by States and users;

i) follow-up the implementation of the operational improvements required in the MID Air Navigation Strategy and Regional Air Navigation Plan (ANP) or in national plans and estimate the associated environmental benefits;

j) support the implementation of the performance framework and propose new technical elements for the continuous improvement of the performance framework; and

k) foster the integrated improvement of MID Air Navigation systems implementation through proper training and qualification of the personnel.

2. Composition:

2.1 The ANSIG is composed of:

a) MIDANPIRG Member States;

b) concerned International and Regional Organizations as observers; and

c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

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Mr. Fathi Ibrahim Al-Thawadi	MIDRMA Officer MIDRMA KINGDOM OF BAHRAIN

- END -