INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SIXTH MEETING OF THE MIDANPIRG ATM SUB-GROUP

ATM SG/6

(Virtual Meeting, 9 – 12 November 2020)

The views expressed in this Report should be taken as those of the MIDANPIRG ATM Sub-Group and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be published in due course as a Supplement to the Report.

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

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PART I - HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Sixth meeting of the MIDANPIRG ATM Sub-Group (ATM SG/6) was held virtually, from 9 to 12 November 2020, using MS Teams.

2. OPENING

2.1 The meeting was opened by Mr. Mohamed Smaoui, Acting Regional Director, Middle East Office, who welcomed all participants, and highlighted the importance of the subjects addressed under the ATM SG and its subsidiary bodies.

2.2 Mr. Smaoui recalled that the outcome of the MSG/7 meeting held virtually from 1 to 3 September 2020 related to the Global Air Navigation Plan 6th Edition and the need for a revised version of the MID Region Air Navigation Strategy.

2.3 In this respect, Mr. Smaoui highlighted the main outcomes of the MID ASBU Webinar, held on 13 – 15 October 2020, including the identification of an initial list of KPIs which could be monitored at regional level region.

2.4 Mr. Smaoui thanked all the participants for their attendance and wished the meeting every success in its deliberations.

3. ATTENDANCE

3.1 The meeting was attended by a total of one-hundred (100) participants from thirteen (13) States (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Sudan, UAE, United States of America/FAA and Yemen) and four (4) Organizations (ACAO, CANSO, IATA and MIDRMA). The list of participants is at **Attachment A**.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by Mr. Khaled Ahmed Arabiyat, ATM Director, Civil Aviation Regulatory Commission (CARC), Jordan.

4.2 Mr. Ahmad Amireh, RO/ATM/SAR was the Secretary of the meeting, assisted by Mr. Ahmad Kavehfirouz, RO/ATM and Mr. Radhouan Aissaoui, RO/IM. Mr. Mohamed Smaoui, Acting Regional Director, supported also the meeting.

5. LANGUAGE

5.1 Discussions were conducted in English and documentation was issued in English.

6. AGENDA

6.1 The following Agenda was adopted:

Agenda Item 1: Adoption of the Provisional Agenda

Agenda Item 2: Follow-up on MIDANPIRG/17 and MSG/7 Conclusions and Decisions related to ATM

Agenda Item 3: Global and Regional Developments

Agenda Item 4: ATM Planning and Implementation Issues:

- Follow-up on ATM SG/5 Draft Conclusions and Decisions
- Revised MID Air Navigation Strategy
- RVSM Implementation
- Review of the Outcomes of ATFM TF/4 Meeting
- Review of the Outcomes of FWC2022 TF/4 Meeting
- Other ATM Issues
- Air Navigation Deficiencies related to ATM and SAR

Agenda Item 5: Future Work Programme

Agenda Item 6: Any other Business

7. CONCLUSIONS AND DECISIONS – DEFINITION

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

a) **Conclusions** deal with matters that, according to the Group's terms of reference, merit directly the attention of States, or on which further action will be initiated by the Secretary in accordance with established procedures; and

b) **Decisions** relate solely to matters dealing with the internal working arrangements of the Group and its Sub-Groups.

8. LIST OF DRAFT CONCLUSIONS AND DECISIONS

DRAFT CONCLUSION 6/1: *ANS PERFORMANCE MONITORING*

DRAFT CONCLUSION 6/2: *MID RVSM SAFETY MONITORING REPORT (SMR-2019)*

DRAFT DECISION 6/1: *ESTABLISHMENT OF ACTION GROUP FOR THE DEVELOPMENT OF GUIDANCE MATERIAL ON CIVIL/MILITARY COOPERATION AND IMPLEMENTATION OF FUA CONCEPT*

DRAFT DECISION 6/2: *ESTABLISHMENT OF ACTION GROUP TO REVIEW AND PREPARE A REVISED VERSION OF THE MID REGION HIGH LEVEL AIRSPACE CONCEPT (MID DOC004)*

DRAFT CONCLUSION 6/3: *ATM OPERATIONAL DATA EXCHANGE*

DRAFT CONCLUSION 6/4: *MID ATFM CONOPS*

DRAFT DECISION 6/3: *REVISED TERMS OF REFERENCE OF THE ATM SG*

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA

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

REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG/17 AND MSG/7 CONCLUSIONS AND DECISIONS RELEVANT TO ATM

2.1 The meeting noted the status of the MIDANPIRG/17 and MSG/7 Conclusions and Decisions and the follow-up actions taken by States, the Secretariat and other parties concerned as at **Appendix 2A**. The meeting agreed also to review the Conclusions and Decisions, which are still current, under the associated Agenda Items with a view to propose to MIDANPIRG/18 appropriate follow-up actions.

REPORT ON AGENDA ITEM 3: GLOBAL AND REGIONAL DEVELOPMENTS RELATED TO ATM

Global Developments related to ATM

3.1 The subject was addressed in PPT/3 presented by the Secretariat. The meeting was apprised of the ICAO global developments related to COVID-19, namely CART Document and Take-off Guidance, and the implementation support tools (GIR, CRRIC iPACKs), and the ICAO Air Transport Dashboard; furthermore, the changes to applicability dates of SARPs and PANS due to COVID-19.

3.2 The meeting noted the progress made on the CRRIC platform by the MID States on both parts the gap analysis tool and Public Health Risk Mitigation Measures.

3.3 The meeting encouraged States to review and update the CRRIC, in particular the items related to Public Health Risk Mitigation Measures related to each State, as part of CART recommendation 11: information sharing and exchange.

Regional Developments

3.4 The subject was addressed in PPT/3 presented by the Secretariat. The meeting was provided with an overview of the MID CART Implementation Plan, which is planned to be presented to the DGCA-MID virtual meeting on 7 December 2020 to support the restart and recovery of the civil aviation system in the MID Region through an established framework.

3.5 The meeting was provided with a progress report related to the MID Recovery Planning Task Force (MID RPTF) activities, in particular those pertaining to Work Stream 4: ANS/ATM which was endorsed by MSG/7 as MIDANPIRG CART Plan of Actions, as at **Appendix 3A**.

REPORT ON AGENDA ITEM 4: ATM PLANNING AND IMPLEMENTATION ISSUES

Follow-up on ATM SG/5 Draft Conclusions and Decisions

4.1 The subject was addressed in PPT/4 presented by the Secretariat. The meeting reviewed the ATM SG/5 Draft Conclusions and Decisions.

4.2 The meeting re-iterated MIDANPIRG Conclusion 17/12 related to the population of the Tables ATM I-1 MID Region Flight Information Regions (FIRs)/ Upper Information Regions (UIRs) and SAR I-1 MID Region Search and Rescue Regions (SRRs); and ATM SG/5 Draft Conclusion 5/1 and urged States to review the relevant Tables in the MID ANP and provide the ICAO MID Office with feedback by **15 February 2021**, including the designation of Focal Points for effective follow-up and coordination related to the population of Tables ATM I-1 and SAR I-1.

4.3 With regard to the ATM SG/5 Draft Conclusion 5/2, the meeting noted that the work did not progress as planned due to the COVID-19; and agreed that a comprehensive review of the Table ATM II-MID-1 of the MID eANP should be carried out taking into consideration the significant changes to the MID Region ATS Route Network. Accordingly, the meeting agreed to extend the deadline of the above-mentioned Draft Conclusion to **1 February 2021**.

Revised MID Air Navigation Strategy

4.4 The subject was addressed in PPT/9 presented by the Secretariat.

4.5 The meeting recalled that the MSG/7 virtual meeting (1 to 3 September 2020) noted that the Global Air Navigation Plan 6th Edition endorsed by 40th session of the ICAO General Assembly brought major changes, which need to be reflected in the next version of the MID Region Air Navigation Strategy. The MSG/7 meeting agreed also that the MIDANPIRG Sub-Groups should conduct virtual meetings in the 4th quarter of 2020 to review the GANP 6th Edition and identify ASBU priority 1 Threads and Elements and associated monitoring elements, considering the Secretariat proposal and States' and stakeholders' inputs.

4.6 The meeting noted that the MID ASBU Webinar (13 – 15 October 2020) provided an opportunity to familiarize the participants from States and stakeholders with the 6th Edition of the GANP (multi-layer Structure, Performance Framework, Basic Building Block (BBB) Framework); and showcase the different ASBU Threads through online demonstration using the GANP Portal, for harmonization purpose and an increased efficiency of the planned MIDANPIRG Sub-Groups during the discussion of the subject.

4.7 The meeting noted also that the MID ASBU Webinar identified the ASBU Threads and elements, which would be proposed to MIDANPIRG/18 as priority 1 subject to the review, agreement or amendment by the relevant MIDANPIRG Sub-Groups.

4.8 The meeting reviewed the ATM related Threads and agreed to the prioritization of the different elements of Block 0 and 1 as at **Appendix 4A**. The meeting reviewed and updated the monitoring table of priority 1 elements related to ATM, including the applicability areas, indicators, metrics, targets and timelines, as at **Appendix 4B**.

4.9 The meeting noted that the ICAO MID Office would develop and circulate a questionnaire to acquire States' inputs regarding the status of implementation and/or plans for each ASBU Thread/Element.

4.10 The meeting noted that States' inputs will be consolidated by the Secretariat and reviewed by the ACAO/ICAO ASBU Webinar (19 – 20 January 2021) before presentation to MIDANPIRG/18 for endorsement.

4.11 The meeting was apprised of the MID ASBU Webinar discussions related to the initial list of Key Performance Indicators (KPIs) to be used for performance monitoring, and agreed on an initial set of KPIs to be monitored at regional level, starting from 2021. The meeting agreed that the month of June 2021 will be used for the collection of required data for measuring the KPIs as shown in **Appendix 4C**.

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

DRAFT CONCLUSION 6/1: ANS PERFORMANCE MONITORING

That, in order to optimize allocation and use of resources in the modernization of the air navigation system, States:

a) be urged to:

i. embrace a performance based approach in line with the 6th Edition of the Global Air Navigation Plan and the six-step performance management process, as described in the Manual on Global Performance of the Air Navigation System (Doc 9883);

*ii. follow-up a phased approach in the performance monitoring of their air navigation system using as an initial phase the list of KPIs at **Appendix 4C**; and*

iii. provide ICAO with the results of the KPIs monitoring for the agreed period, as part of the data necessary for the development of the Annual Air Navigation Report, starting with the Report for 2021.

b) be encouraged to start as soon as possible, on an experimental basis, to establish the necessary processes, procedures and systems for the collection of necessary data to measure the selected KPIs; and

c) ICAO MID Office to develop and circulate a questionnaire on States' ASBU Threads and Elements implementation and Planning for the priority 1 ASBU elements.

RVSM Implementation

4.13 The subject was addressed in PPT/5 presented by the Secretariat on behalf of the MIDRMA. The meeting recalled MSG/7 Conclusion 7/5, related to Training/Awareness on RVSM LHD Reporting.

4.14 The meeting noted with appreciation that the RVSM LHD Reporting Webinar was held on 4 November 2020 with the attendance of 128 Participants from 14 MID States. The Webinar addressed many subjects related to RVSM safety monitoring, in particular the requirement for LHD reporting for the development of the Annual RVSM Safety Monitoring Reports and the use of the MIDRMA online LHD Reporting tool for that purpose.

4.15 The meeting noted with appreciation the improvement in the reporting of LHDs further to the RVSM LHD reporting webinar, namely from Egypt, Iran, Oman and Saudi Arabia.

4.16 The meeting urged States to continue providing the LHD reports on regular basis for the development of the annual SMR report.

4.17 The meeting reviewed the Draft MID RVSM Safety Monitoring Report (SMR-2019) at **Appendix 4D**. The meeting noted that Tripoli FIR was excluded from the SMR 2019 due to non-provision of required data.

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

DRAFT CONCLUSION 6/2: MID RVSM SAFETY MONITORING REPORT (SMR-2019)

*That, the MID RVSM Safety Monitoring Report (SMR-2019) at **Appendix 4D** be presented to MIDANPIRG/18 for endorsement.*

Civil/Military Cooperation and Flexible Use of Airspace

4.19 The meeting recalled MIDANPIRG Conclusion 17/21 related to the development of MID Guidance Material related to Civil/Military cooperation and implementation of FUA Concept, including State aircraft operations under Due Regard in particular over the high seas, based on the EUR Doc 032.

4.20 The meeting noted the increased need for regional guidelines, due to repetitive occurrences/concerns raised mainly by Iran and Egypt.

4.21 The meeting noted that the Action Group was established and started drafting the document.

4.22 Accordingly, the meeting agreed to the following Draft Decision to replace and supersede the ATM SG/5 Draft Decision 5/3:

DRAFT DECISION 6/1: ESTABLISHMENT OF ACTION GROUP FOR THE DEVELOPMENT OF GUIDANCE MATERIAL ON CIVIL/MILITARY COOPERATION AND IMPLEMENTATION OF FUA CONCEPT

*That, the Action Group composed of experts from Bahrain, Egypt, Iraq, Jordan, Oman, Qatar, Saudi Arabia, UAE and ICAO be established to draft, by **30 April 2021**, guidance material related to Civil/Military Cooperation and implementation of FUA Concept, including State aircraft operations under Due Regard in particular over the high seas.*

High Level Airspace Concept

4.23 The meeting recalled the MIDANPIRG/17 Conclusion 17/25 related to the review and preparation of revised version of the MID Region High level Airspace Concept (MID Doc 004). Accordingly, the meeting agreed to the following Draft Decision:

DRAFT DECISION 6/2: ESTABLISHMENT OF ACTION GROUP TO REVIEW AND PREPARE A REVISED VERSION OF THE MID REGION HIGH LEVEL AIRSPACE CONCEPT (MID DOC004)

*That, the Action Group composed of experts from Bahrain, Egypt, Jordan, Oman, Saudi Arabia, UAE IATA and ICAO be established to review and prepare a revised version of the MID Region high level airspace concept (MID Doc 004), by **31 January 2021**.*

Review of the Outcomes of ATFM TF/4 Meeting

4.24 The subject was addressed in PPT/7 presented by the Secretariat on behalf of the Chairman of the ATFM Task Force. The meeting was provided with an update on the work carried out by the ATFM Task Force.

4.25 The meeting recalled MSG/7 Conclusion 7/2 related to MIDANPIRG CART implementation "Plan of Actions", in particular the action items related to ATM SG and ATFM TF.

4.26 The meeting noted MSG/7 Conclusion 7/10 related to the amended ATFM TF Terms of Reference to enable the Task Force to process the assigned tasks contained in the MIDANPIRG CART implementation "Plan of Actions".

4.27 The meeting was apprised of the progress made in the implementation of the MIDANPIRG CART implementation "Plan of Actions" Key Activities related to ATM SG and ATFM TF, in particular the establishment of the ITO secure webpage to share the Airspace users forecasted data with MID States and ANSPs, which provide increased visibility for ATS and related services planning.

4.28 The meeting reviewed the outcomes of the ATFM TF/4 related to the exchange of ATM operational data using MID Region process based on ICAO ATM/CDM process, and agreed to start the periodic coordination meetings between MID States\ANSPs starting from Q1-2021.

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

DRAFT CONCLUSION 6/3: ATM OPERATIONAL DATA EXCHANGE

That, in order to ensure better coordination between ANSPs and improve ATS planning:

a) Airspace users are invited to share their forecasted demand through the provision of their Intention To Operate (ITO) data, on regular basis,

b) States be urged to nominate Focal Points/Coordinators for ATM data exchange; in order to be granted access to the ITO data available on ICAO MID secure portal (group "RO-MIDITO"), and

c) ICAO MID to organize periodic coordination meetings for ANSPs to exchange ATM operational data, starting Q1-2021.

4.30 The meeting reviewed version v.03 of the MID ATFM CONOPS, and agreed to the following Draft Conclusion:

DRAFT CONCLUSION 6/4: MID ATFM CONOPS

That, the MID ATFM CONOPS V0.3 at ***Appendix 4E*** *be presented to MIDANPIRG/18 for endorsement.*

4.31 The meeting was apprised also of the progress made in the development of the initial version of the MID ATFM Framework and Common Operating procedures.

4.32 The meeting reviewed and updated the ATFM Action Plan, as at **Appendix 4F**.

Review of the Outcomes of FWC2022 TF/4 Meeting

4.33 The subject was addressed in PPT/6 presented by Qatar on behalf of the Chairman of the FWC2022 Task Force. The meeting was provided with an update on the ongoing work carried out by Qatar related to the development of FWC2022 Roadmap and Operational Plan.

4.34 The meeting recalled MIDANPIRG/17 Conclusion 24, related to the development of Airspace assessment based on the expected traffic movement during FWC2022 event.

4.35 The meeting noted that the MIDRMA, in coordination with the MIDRAS developer/vendor, explored the required modifications to the MIDRAS to meet the requirements and received an offer from the vendor, including technical and financial details; which was provided to Qatar for review and agreement on the way forward.

4.36 The meeting noted that –with the current tool/software (MIDRAS) and based on the forecasted traffic movements provided by Qatar, the MIDRMA would be able to assess only the technical risk, while the processing of the operational risk would need the LHD reports, which could not be available beforehand and the only way would be to try to further discuss with the MIDRAS developer if it would be possible to provide probabilistic LHDs.

4.37 The meeting agreed that the MIDRMA, Qatar and the MID Office to continue coordination with the MIDRAS developer/supplier to further elaborate on the features and expected deliverables and agree on all details including financial offer and timelines.

4.38 The meeting reviewed and updated the FWC2022 Action Plan as at **Appendix 4G**.

Other ATM Issues: Risk Management in Conflict Zones

4.39 The subject was addressed in PPT/8 presented by the Secretariat. The meeting was apprised of the ICAO HQ State Letter Ref. SMM1/4-20/110 dated 23 October 2020) regarding Risk management in Conflict Zones and urged States, that have not yet done so, to complete the questionnaire attached to the State Letter and send it to ICAO HQ, as required.

Air Navigation Deficiencies related to ATM and SAR

4.40 The subject was addressed in PPT/10 presented by the Secretariat.

4.41 It was highlighted that in the ATM field, most of the deficiencies are related to the non-implementation of regional ATS Routes, uncompleted signature of contingency agreements and unsatisfactory reporting of Large Height Deviations (LHD) to the MIDRMA. In the SAR field, the deficiencies are related mainly to the lack of implementation of SAR provisions and non-compliance with the carriage of Emergency Locator Transmitter (ELT) requirements.

4.42 The meeting reviewed and updated the list of deficiencies in the ATM and SAR fields as at **Appendices 4H** and **4I**; respectively, and urged States to take necessary measures to implement the provisions of the MIDANPIRG/15 Conclusion 15/35, in particular the submission of a specific Corrective Action Plan (CAP) for each deficiency.

REPORT ON AGENDA ITEM 5: **FUTURE WORK PROGRAMME**

5.1 The subject was addressed in PPT/11 presented by the Secretariat.

5.2 The meeting reviewed and updated the Terms of Reference (TOR) of the ATM Sub-Group as at **Appendix 5A**, and agreed to the following Draft Decision:

DRAFT DECISION 6/3: REVISED TERMS OF REFERENCE OF THE ATM SG

*That, the ATM SG Terms of Reference (ToRs), be updated as at **Appendix 5A**.*

5.3 Taking into consideration the planned ICAO MID Regional events which are of relevance to the activity of the ATM Sub-Group, the meeting agreed that the ATM SG/7 meeting be scheduled during the fourth quarter of 2021.

REPORT ON AGENDA ITEM 6: ANY OTHER BUSINESS

6.1 The meeting encouraged States to provide relevant ATM data whenever an event occurs in the State that has impact or possibility to impact the provisions of ANS and supporting services, in order to allow the MID Office to share the information with ICAO HQ, adjacent FIRs, airspace users and other concerned parties, the soonest possible by any available communication means.

6.2 The meeting encouraged States to share success stories and achievements related to ATM to be reflected in the Annual Air Navigation Reports.

Update from Saudi Arabia

6.3 The subject was addressed in PPT/12 presented by Saudi Arabia. The meeting noted the progress made in Jeddah FIR, related to the new ATM system implemented in Riyadh Control Centre.

APPENDICES

FOLLOW-UP ACTION PLAN ON MIDANPIRG/17 CONCLUSIONS & DECISIONS

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 17/5	**MID RVSM SMR 2019** That, a) the FPL/traffic data for the period **1 – 31 August 2019** be used for the development of the MID RVSM Safety Monitoring Report (SMR 2019); b) only the appropriate Flight Data form available on the MIDRMA website (www.midrma.com) should be used for the provision of FPL/traffic data to the MIDRMA; and c) the final version of the MID RVSM SMR 2019 be ready for presentation to and endorsement by MIDANPIRG/18 or ATM SG/6 meetings.	To develop the MID SMR 2019	State Letter Traffic Data MID SMR 2019	ICAO States MIDRMA	Aug 2019 30 Sep. 2019 Feb 2021	**Actioned (To be Closed)** SL AN 6/5.10.15A-19/230 dated 25 July 2019 Replies (Egypt, Jordan and UAE) (Replaced and superseded by MSG Conclusion 7/4)
C. 17/6	**RVSM MINIMUM MONITORING REQUIREMENTS AND CONDITIONS** That, the MIDRMA Member States be urged to: a) take necessary measures to ensure their aircraft operators fully comply with ICAO Annex 6 provisions related to long-term height monitoring requirements, based on the MMR Tables; b) comply with the MID RVSM MMR Conditions published in the MIDRMA website; and c) withdraw the RVSM Approvals of aircraft not complying with the State MMR before 1 July 2019.	States to comply with Anne 6 6 provisions related to long-term height monitoring requirements	State Letter	ICAO	Jul. 2019	**Actioned** SL AN 6/5.10.15A-19/199 dated 1 July 2019 (Bahrain)
C. 17/7	**MIDRMA BULLETIN OF NON-RVSM APPROVED AIRCRAFT** That, a) the MIDRMA post on the MIDRMA website and share with the MIDRMA Board Members and focal points the Bulletin of non-RVSM approved aircraft on monthly basis; and	To identify the non-RVSM approved aircraft operating in the RVSM Airspace	State Letter	ICAO	Jul 2019	**Actioned** SL AN 6/5.10.15A-19/199 dated 1 July 2019 (Bahrain)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	b) States be encouraged to: i. develop a mechanism to identify the non-RVSM approved aircraft operating in the RVSM Airspace without compliance with Annex 6 provisions; ii. submit their RVSM traffic data including aircraft registrations to be used for the RVSM risk analysis; and iii. coordinate with the MIDRMA in case they are able to provide their RVSM traffic data on a monthly basis.	without compliance with Annex 6 provisions and that the MIDRMA to share the Bulletin of non-RVSM approved aircraft on monthly basis				

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 17/10	**MID REGION AIR NAVIGATION REPORT (2019)** That, a) States be urged to provide the ICAO MID Office, with relevant data necessary for the development of the Fourth Edition of the MID Region Air Navigation Report (2019), by 1 December 2019; and b) the MID Region Air Navigation Report (2019) be presented to the MSG/7 for endorsement.	Monitoring and Reporting of ASBU implementation in the MID Region	State Letter Data for AN Report 2017 Air Navigation Report (2019)	ICAO States MSG/7	Dec. 2019 Apr. 2019	**Completed** SL AN 1/7 – 20/008 dated 9 January 2020 (Bahrain, Egypt, Jordan Qatar, Saudi Arabia) AN Report 2019 endorsed by MSG/7 Conclusion 7/7
C. 17/11	**JOINT ACAO/ICAO ASBU SYMPOSIUM** That, a Joint ACAO/ICAO ASBU Symposium be organized beginning of 2020.	Raise awareness about the 6th Edition of the GANP and align the MID AN Strategy	Draft Revised MID AN Strategy	ICAO/ACAO	~~Mar. 2020~~ Q1 2021	**Ongoing** Postponed to beginning of 2021 due to COVID-19 19-20 Jan 2021
C. 17/12	**PUBLICATION OF FIR BOUNDARY POINTS** That, States be urged to: a) take into consideration the Guidelines at **Appendix 6.2B** for the description of their FIR boundaries; b) review the Table ATM I-1 MID Region Flight Information Regions (FIRs)/Upper Information Regions (UIRs) at **Appendix 6.2C** 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 August 2019.**	To populate the MID ANP Table ATM I-1	State Letter Feedback from States	ICAO States	Jul 2019 Aug 2019	**Actioned** SL AN 6/10-19/206 dated 2 July 2019 (Bahrain, Egypt)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 17/18	**MID RDWG AND MID REGION ATS ROUTE CATALOGUE** That, States be urged to: a) use the MID Route Development Working Group (MID RDWG) as the main platform to facilitate bilateral and multilateral coordination related to the improvement of the ATS Route Network and airspace management in the MID Region; and b) review the MID Region ATS Route Catalogue and take actions related to the implementation of the ATS proposals relevant to their FIRs.	To use the RDWG as a platform for ATS route improvements	State Letter	ICAO	Jul 2019	**Actioned** SL AN 6/5.8-19/205 dated 2 July 2019 Replies: None
C. 17/19	**SAFETY ASSESSMENTS DUE TO CONTINGENCY WITH IMPACT ON ATS ROUTE NETWORK** That**,** a) Bahrain, Iran, Oman, Qatar and UAE be urged to provide the outcomes of their safety assessment of the contingency routes and/or changes to the ATS Routes Network to the ICAO MID Office by **15 June 2019**, as well as the relevant data for the analysis of the disruption and its impact to the network; b) the ATM SG/5, with the MIDRMA support, carry out analyses of the data/inputs received form States to identify the challenges and agree on necessary measures to mitigate any safety risk; and c) conduct a lessons-learned session during the ATM SG/5 meeting with the participation of affected stakeholders reviewing the impact of the disruption to the network, allowing all stakeholders to present their views and feedback.		State Letter	ICAO	Jul 2019	**Actioned/ongoing** SL AN 6/1.2.1-19/200 dated 2 Jul 2019 (Bahrain)
C. 17/20	**ENHANCED FRAMEWORK FOR THE MID CCT** That, a) States intending to restrict traffic or close all or part of their airspace	To enhance the CCT framework	Interim guidance	ATM SG	Dec 2019	**Ongoing** This will be part of the work of the MID ATM Contingency Plan Action Group

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	be urged to consider adequate time before affecting the required change to minimize traffic disruption; b) States, under the framework of the CCT, in coordination with airspace users, agree on interim guidance with a progressive set of flow measures to address the current Air Traffic Flow disruption caused by the closure of Pakistan airspace; and c) the ATM SG/5: i. develop guidelines on how extended disruptions in the network are to be managed in a balanced manner; and ii. enhance the notification and coordination process of contingency operations in the frame of the MID CCT, particularly for: - consistency of interrelated contingency information promulgated by more than one State; and - agreement on recovery plan for each contingency situation.					
C. 17/21	**MID REGION GUIDANCE MATERIAL ON CIVIL/MILITARY COOPERATION AND IMPLEMENTATION OF FUA CONCEPT** That, the ATM SG/5 develop draft guidance material related to Civil/Military Cooperation and implementation of FUA Concept, including State aircraft operations under Due Regard in particular over the high seas, to be coordinated with States before presentation to MIDANPIRG for endorsement.	Guidance material for CIV/MIL Cooperation, FUA and due regard over high seas	Guidance material	ATM SG/5	Dec 2019	**Ongoing** An Action Group composed of experts from Bahrain, Egypt, Iraq, Jordan, Oman, Qatar, Saudi Arabia, UAE and ICAO was established by the ATM SG/5 meeting through Decision 5/3 to draft the guidance material
C. 17/22	**MULTI-NODAL ATFM SOLUTION FOR THE MID REGION** That, a) the Multi-Nodal Concept be implemented in the MID Region, as a	ATFM Multi-Nodal Concept	ATFM Multi-Nodal Concept	MIDANPIRG	Apr. 2019	**Actioned** Completed

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	first phase, which would be evolved to a centralized ATFM system in the future; and b) the ATFM Task Force develop the ATFM Concept of Operations for MID Region, accordingly, including the minimum flight data that should be exchanged by ATFM Units.					Ongoing
C. 17/23	**ACTION PLAN FOR THE IMPLEMENTATION OF ATFM IN THE MID REGION** That, a) the Action Plan for the implementation of ATFM in the MID Region at Appendix 6.2J is endorsed; and b) States and Stakeholders to support the work of the ATFM Task Force and implement the actions relevant to them.	The Action Plan for the implementation of ATFM	the Action Plan for the implementation of ATFM	MIDANPIRG	Apr. 2019	**Completed**
C. 17/24	**ASSESSMENT OF THE MID REGION RVSM AIRSPACE STRUCTURE BASED ON THE EXPECTED TRAFFIC MOVEMENT FROM 1 NOVEMBER TO 31 DECEMBER 2022** That, the MIDRMA assess the MID Region RVSM airspace structure based on the expected traffic movement during FWC2022 to identify peak periods, Hotspots, Bottlenecks, etc. based on the FPL/traffic data provided by Qatar.	To assess the impact of the forecast increase of traffic due to FWC2022	Assessment	Qatar MIDRMA	May 2019 Aug 2019	**Ongoing (To be closed)** (Outcome of the MIDRMA Board/16 and FWC2022 TF/4 meetings, refer)
C. 17/25	**AMENDMENT OF THE MID REGION HIGH LEVEL AIRSPACE CONCEPT (MID DOC 004)** That, the ATM SG/5 review and prepare a revised version of the MID Region High level Airspace Concept (MID Doc 004) taking into consideration the latest developments, in particular the outcome of MSG/6 and MIDANPIRG/16 and 17 meetings, for presentation to MIDANPIRG/18.	Revised version of the MID Region High level Airspace Concept	Draft Revised version of the MID Region High level Airspace Concept	ATM SG/5	Dec 2019	**Ongoing**

FOLLOW-UP ACTION PLAN ON MSG/7 CONCLUSIONS & DECISIONS

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
MSG/7 C. 7/ 1	**REGIONAL CART IMPLEMENTATION** That, in order to support States in their implementation efforts of the CART Report and Take-off guidance, amid COVID-19 and during the recovery phase, States that have not yet done so: a) are urged to nominate CRRIC State Focal points and upload/populate the data in the CRRIC (Gap analysis and Public Health Measure Risk Mitigation Measures); and b) are encouraged to coordinate with the ICAO MID Office for the deployment of the I-Packs for the benefit of their CAA and service providers personnel.					**Ongoing**
MSG/7 C. 7/2	**MIDANPIRG CART IMPLEMENTATION "PLANS OF ACTIONS"** That, in order to ensure States' ANS and related services provisions continuity, and the preparedness for the recovery phases: a) the MIDANPIRG CART Implementation "Plan of Actions" at **Appendix 3A** is endorsed; and *b)* States, ANSPs, Airspace users, airport operators and all concerned stakeholders are urged to support the implementation of the Plan of Actions at Appendix 3A, and exchange relevant operational data.					**Ongoing**
MSG/7 C. 7/4	**RVSM DATA PROVISION TO THE MIDRMA** That, in order to allow the MIDRMA to finalize the development of the SMR-2019 & 2020: a) States are urged to comply with the provisions of the MIDANPIRG Conclusion 14/35; and					**Ongoing**

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	b) States with high volume of traffic be included in the list of air navigation deficiencies, if LHD reports are not provided before **15 October 2020**.					
MSG/7 C. 7/5	**TRAINING/AWARENESS ON RVSM LHD REPORTING** That, d) the MIDRMA to organize, as soon as possible and in any case before December 2020, a Webinar on LHD reporting; e) States are encouraged to participate actively in the Webinar on LHD Reporting; and coordinate with the MIDRMA for the provision of additional training/assistance on any RVSM safety assessment issues (including LHD reporting), as required; and f) the MIDRMA to develop and distribute relevant training/awareness guidance on LHD reporting (leaflets, brochures, posters, etc.).					**Actioned (to be closed)** 4 Nov 2020
MSG/7 C. 7/6	**UPDATE OF MID REGION AIR NAVIGATION STRATEGY** That, , in order to improve the Initial Draft of the revised MID Region Air Navigation Strategy at **Appendix 5.1A**, with States and stakeholders inputs: d) States be invited to provide the MID Office by **15 October 2020** with their Air Navigation priorities and updated National Plan considering the provisions of the 6th Edition of the GANP endorsed by the 40th Session of the General Assembly (A40); e) MIDANPIRG Sub-Groups provide proposals of amendment of the MID Region Air Navigation Strategy, considering the 6th Edition of the GANP, the inputs of States and Stakeholders, and agreed					**Actioned** SL AN 1/5-20/178 dated 1 October 2020 Replies (Bahrain, Iran, Jordan, Qatar and UAE)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	priorities, before **15 Dec 2020**; and f) the joint ACAO/ICAO ASBU Symposium review the inputs of States, Stakeholders and MIDANPIRG Sub-Groups for consolidation of the revised version of the MID Region Air Navigation Strategy to be presented to MIDANPIRG for endorsement.					
MSG/7 C. 7/7	**MID REGION AIR NAVIGATION REPORT - 2019** That, the MID Region Air Navigation Report – 2019 at **Appendix 5.1B** is endorsed and be posted on the ICAO MID Website.					
MSG/7 C. 7/8	***MID REGION AIR NAVIGATION REPORT - 2020*** That, a) States be urged to provide the ICAO MID Office, with relevant data necessary for the development of the MID Region Air Navigation Report - 2020, by **1 December 2020;** and b) the MID Region Air Navigation Report-2020 be presented to the MIDANPIRG/18 for endorsement.					**Actioned** SL AN 1/7-20/176 dated 23 September 2020 Replies (Lebanon, Saudi, UAE)
MSG/7 D.7/10	***REVISED ATFM TF TERMS OF REFERENCE*** *That, the ATFM TF Terms of Reference are amended as at **Appendix 5.2A**.*					
MSG/7 D. 7/14	***NEW EDITION OF THE MIDANPIRG PROCEDURAL HANDBOOK*** *That,* *a) the Secretariat, in coordination with the Chairpersons of the Group and its Sub-Groups, develop a new Edition of the MIDANPIRG*					

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	Procedural Handbook, to be presented to MIDANPIRG/18 for endorsement; and *b) the authority given to the MIDANPIRG Sub-Groups be reconsidered, especially with regard to the technical issues, which do not raise any concern/controversy.*					

MIDANPIRG CART Implementation "Plan of Actions"

Updated: 09/11/2020

Key activity	Action	Pillars	Priority	Champion	Indicators If applicable	Timelines Target	Status
Air Navigation Services Business Continuity & Recovery	Provide the necessary support and assistance to concerned States (AIM, ATM, CNS, MET and SAR) to ensure the continuity of service during COVID-19 crisis and recovery phases.	Implementation Support	High	AIM SG ATM SG MET SG CNS SG	Percentage of continued provision of ANS services within the MID region	Continuous	Survey circulated to States to monitor the BCPs and continuous availability of ANS services. Another survey will follow up to monitor readiness / preparedness to the recovery phase.
ATFM Operational Flexibility	Coordinate with States to alleviate non required ATFM restrictions during current, restart and recovery phases.	Communication and Implementation Support	High	ATFM TF ATM SG	Number of States that apply ATFM restrictions alleviations	September 2020	Airlines are providing operational issues to IATA AME to be addressed with the concerned state, if required via the ATFM TF
Aeronautical Information Management	Monitor the implementation of the standardized COVD-19 related NOTAM templates and related Aeronautical information publications and report to DGCA-MID and MIDANPIRG, as appropriate.	Monitoring and Reporting	High	AIM SG	Number of States implemented the NOTAM template	Continuous	On daily bases, monitor and updated summaries on ICAO MID webpage with the measures and publications by all MID States.
Regional Network Operations Recovery	Coordinate with States to provide support to ensure measures are in place to handle the growth of traffic during the recovery phase. Exchange information about intention to operate and Airspaces/Aerodromes operational status, between Air Operators and States/ANSPs up to normal situation.	Communication	High	ATFM TF ATM SG	Platform of sharing/exchange of the operational data	Continuous	IATA providing ITO Data to ICAO MID on a Biweekly Basis. ICAO MID Team established the Platform for data sharing. List of State nominated FPs will be granted access to the secure portal.
Overflight Permissions	Monitor the regional implementation of the relief and facilitation of overflight permissions for non-scheduled flights in response to the SL: AN 8/0 & ME 6-20/144 (12 July 2020) and report to the DGCA-MID and MIDANPIRG, as appropriate.	Monitoring and Reporting	Medium	ACAO	Percentage of timely issuance of OVFC permissions	Continuous	Following ACAO executive Committee, States to provide implementation plan (end of Dec). Teleconference planned for Q1- 2021.

MID REGION ASBU Threads & Elements (Block 0 & 1) Prioritization Table

Priority 1: Elements that have the highest contribution to the improvement of air navigation safety, capacity and/or efficiency in the MID Region. These elements should be implemented where applicable and will be used for the purpose of regional air navigation monitoring and reporting.

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

Priority 1 Thread: Any thread with at least 1 priority 1 element.

Thread	Element code	Title	Priority	Start Date	Monitoring		Remarks
					Main	Supporting	
Technology Threads							
ASUR	**B0/1**	ADS-B	1	2020	CNS SG	ATM SG ASPIG	
	B0/2	MLAT	1	2020	CNS SG	ATM SG ASPIG	
	B0/3	SSR-DAPS	1	2020	CNS SG	ATM SG ASPIG	
	B1/1	SB ADS-B	2				
NAVS	**B0/1**	Ground Based Augmentation Systems (GBAS)	2				
	B0/2	Satellite Based Augmentation Systems (SBAS)	2				
	B0/3	Aircraft Based Augmentation Systems (ABAS)	1	2020	CNS SG	PBN SG ATM SG AIM SG	
	B0/4	Navigation Minimal Operating Networks (Nav. MON)	1	2020	CNS SG	PBN SG	
	B1/1	Extended GBAS	2				
COMI	**B0/1**	Aircraft Communication Addressing and Reporting System (ACARS)	2				
	B0/2	Aeronautical Telecommunication	2				

		Network/Open System Interconnection (ATN/OSI)					
	B0/3	VHF Data Link (VDL) Mode 0/A	2				
	B0/4	VHF Data Link (VDL) Mode 2 Basic	2				
	B0/5	Satellite communications (SATCOM) Class C Data	2				
	B0/6	High Frequency Data Link (HFDL)	2				
	B0/7	AMHS	1	2014	CNS SG		
	B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS)	1	2020	CNS SG		
	B1/2	VHF Data Link (VDL) Mode 2 Multi-Frequency	2				
	B1/3	SATCOM Class B Voice and Data	2				
	B1/4	Aeronautical Mobile Airport Communication System (AeroMACS) Ground-Ground	2				
Information Threads							
DAIM	**B1/1**	Provision of quality-assured aeronautical data and information	1	2020	AIM SG		It was B0, monitored earlier
	B1/2	Provision of digital Aeronautical Information Publication (AIP) data sets	2				
	B1/3	Provision of digital terrain data sets	1	2020	AIM SG		It was B0, monitored earlier
	B1/4	Provision of digital obstacle data sets	1	2020	AIM SG		It was B0, monitored earlier
	B1/5	Provision of digital aerodrome mapping data sets	2				

	B1/6	Provision of digital instrument flight procedure data sets	2				
	B1/7	NOTAM improvements	2				
FICE	**B0/1**	Automated basic inter facility data exchange (AIDC)	1	2014	CNS SG ATM SG		
AMET	**B0/1**	Meteorological observations products	1	2014	MET SG		
	B0/2	Meteorological forecast and warning products	1	2014	MET SG		
	B0/3	Climatological and historical meteorological products	1	2014	MET SG		
	B0/4	Dissemination of meteorological products	1	2014	MET SG	CNS SG	
	B1/1	Meteorological observations information	2				
	B1/2	Meteorological forecast and warning information	2				
	B1/3	Climatological and historical meteorological information	2				
	B1/4	Dissemination of meteorological information	2				
Operational Threads							
APTA	**B0/1**	PBN Approaches (with basic capabilities)	1	2014	PBN SG	ATM SG AIM SG CNS SG	
	B0/2	PBN SID and STAR procedures (with basic capabilities)	1	2014	PBN SG	ATM SG AIM SG	

	B0/3	SBAS/GBAS CAT I precision approach procedures	2				
	B0/4	CDO (Basic)	1	2014	PBN SG	ATM SG	
	B0/5	CCO (Basic)	1	2014	PBN SG	ATM SG	
	B0/6	PBN Helicopter Point in Space (PinS) Operations	2				
	B0/7	Performance based aerodrome operating minima – Advanced aircraft	1	2020	ATM SG PBN SG	AIM SG	
	B0/8	Performance based aerodrome operating minima – Basic aircraft	2				
	B1/1	PBN Approaches (with advanced capabilities)	2				
	B1/2	PBN SID and STAR procedures (with advanced capabilities)	2				
	B1/3	Performance based aerodrome operating minima – Advanced aircraft with SVGS	2				
	B1/4	CDO (Advanced)	2				
	B1/5	CCO (Advanced)	2				
B0-FRTO	**B0/1**	Direct routing (DCT)	2				
	B0/2	Airspace planning and Flexible Use of Airspace (FUA)	1	2014	ATM SG	AIM SG	

		Level 1 Strategic	1	2014	ATM SG	AIM SG	
		Airspace planning and Flexible Use of Airspace (FUA) Level 2	1	2014	ATM SG	AIM SG	
	B0/3	Pre-validated and coordinated ATS routes to support flight and flow	2				
	B0/4	Basic conflict detection and conformance monitoring	1	2014	ATM SG	CNS SG	
	B1/1	Free Route Airspace (FRA)	2				
	B1/2	Required Navigation Performance (RNP) routes	2				
	B1/3	Advanced Flexible Use of Airspace (FUA) and management of real time airspace data	2				
	B1/4	Dynamic sectorization	2				
	B1/5	Enhanced Conflict Detection Tools and Conformance Monitoring	2				
	B1/6	Multi-Sector Planning	2				
	B1/7	Trajectory Options Set (TOS)	2				
NOPS	**B0/1**	Initial integration of collaborative airspace management with air traffic flow management	1	2015	ATM SG		
	B0/2	Collaborative Network Flight Updates	2				

	B0/3	Network Operation Planning basic features	2				
	B0/4	Initial Airport/ATFM slots and A-CDM Network Interface	2				
	B0/5	Dynamic ATFM slot allocation	2				
	B1/1	Short Term ATFM measures	2				
	B1/2	Enhanced Network Operations Planning	2				
	B1/3	Enhanced integration of Airport operations planning with network operations planning	2				
	B1/4	Dynamic Traffic Complexity Management	2				
	B1/5	Full integration of airspace management with air traffic flow management	2				
	B1/6	Initial Dynamic Airspace configurations	2				
	B1/7	Enhanced ATFM slot swapping	2				
	B1/8	Extended Arrival Management supported by the ATM Network function	2				
	B1/9	Target Times for ATFM purposes	2				

	B1/10	Collaborative Trajectory Options Program (CTOP)	2				
ACAS	**B1/1**	ACAS Improvements	1	2014	ATM SG CNS SG		It was B0, monitored earlier
SNET	**B0/1**	Short Term Conflict Alert (STCA)	1	2017	ATM SG	CNS SG	
	B0/2	Minimum Safe Altitude Warning (MSAW)	1	2017	ATM SG	CNS SG	
	B0/3	Area Proximity Warning (APW)	1	2020	ATM SG	CNS SG	
	B0/4	Approach Path Monitoring (APM)	2				
	B1/1	Enhanced STCA with aircraft parameters	2				
	B1/2	Enhanced STCA in complex TMA	2				
SURF	**B0/1**	Basic ATCO tools to manage traffic during ground operations	1	2014	ASPIG	ATM SG CNS SG	
	B0/2	Comprehensive situational awareness of surface operations	1	2014	ASPIG	ATM SG CNS SG	
	B0/3	Initial ATCO alerting service for surface operations	1	2020	ASPIG	ATM SG CNS SG	
	B1/1	Advanced features using visual aids to support traffic management during ground operations	2		ASPIG	ATM SG CNS SG	

	B1/2	Comprehensive pilot situational awareness on the airport surface	2		ASPIG	ATM SG CNS SG	
	B1/3	Enhanced ATCO alerting service for surface operations	2		ASPIG	ATM SG CNS SG	
	B1/4	Routing service to support ATCO surface operations management	2		ASPIG	ATM SG CNS SG	
	B1/5	Enhanced vision systems for taxi operations	2		ASPIG	ATM SG CNS SG	
ACDM	**B0/1**	Airport CDM Information Sharing (ACIS)	1	2014	ASPIG	CNS SG, AIM SG, ATM SG	
	B0/2	Integration with ATM Network function	1	2014	ASPIG	CNS SG, AIM SG, ATM SG	
	B1/1	Airport Operations Plan (AOP)	1	2020	ASPIG	CNS SG, AIM SG, ATM SG	
	B1/2	Airport Operations Centre (APOC)	2		ASPIG	CNS SG, AIM SG, ATM SG	
GADS	**B1/1**	Aircraft Tracking	2				
	B1/2	Contact directory service	1	2020	CNS ATM		
RSEQ	**B0/1**	Arrival Management	1	2020	ASPIG ATM	CNS SG	
	B0/2	Departure Management	2				
	B0/3	Point merge	2				
	B1/1	Extended arrival metering	2				

MID REGION ASBU Threads & Elements (Block 0 & 1) Monitoring Table

Priority 1: Elements that have the highest contribution to the improvement of air navigation safety, capacity and/or efficiency in the MID Region. These elements should be implemented where applicable and will be used for the purpose of regional air navigation monitoring and reporting.

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

Priority 1 Thread: Any thread with at least 1 priority 1 element.

THREAD	Element code	Title	Priority	Applicability	Performance Indicators/Supporting Metrics	Targets	Timelines
APTA	B0/1	PBN Approaches (with basic capabilities)	1	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)	100%	Dec. 2017
	B0/2	PBN SID and STAR procedures (with basic capabilities)	1	All RWYs ENDs at International Aerodromes	Indicator: % of runway ends at international aerodromes provided with PBN SID and STAR (basic capabilities). Supporting Metric: Number of runways ends at international aerodromes provided with PBN SIDs and STAR (basic capabilities).	70%	Dec. 2022
	B0/4	CDO (Basic)	1	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 with CDO implemented as required. Supporting Metric: Number of International Aerodromes with CDO implemented as required.	100% (for the identified AD/TMAs)	Dec. 2018
	B0/5	CCO (Basic)	1	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OIKB, OIFM, ORER, ORNI, OJAM,	Indicator: % of International Aerodromes with CCO implemented as required.	100% (for the identified	Dec. 2018

				OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Supporting Metric: Number of International Aerodromes with CCO implemented as required.	Aerodromes/ TMAs)	
	B0/7	Performance based aerodrome operating minima – Advanced aircraft	1	All States	Indicator: % of States authorizing Performance-based Aerodrome Operating Minima for Air operators operating Advanced aircraft. Supporting Metric: Number of States authorizing Performance-based Aerodrome Operating Minima for Air operators operating Advanced aircraft.	50%	Dec. 2021
FRTO	**B0/2**	Airspace planning and Flexible Use of Airspace (FUA)	1	All ACCs in the region	Indicator: % of ACCs/APPs using and implementing appropriates means (procedures and tools (automation)) to support Airspace planning and FUA and improved Data exchange between Civil and military to improve efficiency of Airspace. Supporting metric: Number of ACCs/APPs using and implementing appropriates means (procedures and tools (automation)) to support Airspace planning and FUA and improved Data exchange between Civil and military to improve efficiency of Airspace.	50%	Dec 2022
	B0/4	Basic conflict detection and conformance monitoring	1	Bahrain, Egypt, Jordan, Oman, Saudi Arabia, UAE	Indicator: % States that implemented MTCD and MONA, for ACCs, as required. Supporting metric*: The number of States that implemented MTCD and MONA for ACCs, as required.	50%	Dec. 2022
NOPS	**B0/1**	Initial integration of collaborative airspace management with air traffic flow management	1	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE.	Indicator: % of States implementing ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process Supporting metric*: number of States implementing ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace	50%	Dec 2022

					management and air traffic flow and capacity management process		
SNET	**B0/1**	Short Term Conflict Alert (STCA)	1	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 %	Dec. 2018
	B0/2	Minimum Safe Altitude Warning (MSAW)	1	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 %	Dec. 2018
	B0/3	Area Proximity Warning (APW)	1	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Oman, Saudi Arabia, UAE	Indicator: % of States that have implemented Area Proximity Warning (APW) for ACCs/APPs, as required Supporting metric*: number of States that have Implemented Area Proximity Warning (APW) for ACCs/APPs, as required	70%	Dec 2021
FICE	**B0/1**	Automated basic interfacility data exchange (AIDC)	1	According to the MID Region AIDC/OLDI Applicability Area*	Indicator: % of priority 1 AIDC/OLDI Interconnection have been implemented Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70%	Dec 2020
GADS	**B1/2**	Contact directory service		All States	Indicator: % of States that provided Point of Contact PoC information Supporting Metric: Number of States that provided Point of Contact information ICAO MID: create online GADSS POC repository	100%	Dec 2021
RSEQ	**B0/1**	Arrival Management	1	OTBD, OBBI, HECA, OMDB	Indicator: % of Aerodromes that have implemented arrival manager, where required (applicable) Supporting Metric: Number of Aerodrome that have implemented arrival manager, where required (applicable)	80%	Dec 2021

ACAS	**B1/1**	ACAS Improvements	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%	Dec. 2017
ASUR	**B0/1**	Automatic Dependent Surveillance – Broadcast (ADS-B)	1	HECC, OMAA, OKAC, OEJD.	TBD by CNS SG	TBD by CNS SG	TBD by CNS SG
	B0/2	Multi-lateration cooperative surveillance systems (M-LAT)	1		TBD by CNS SG	TBD by CNS SG	TBD by CNS SG
	B0/3	Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)	1		TBD by CNS SG	TBD by CNS SG	TBD by CNS SG

INITIAL LIST OF MID REGION Air Navigation KPIs

KPI	Title	Definition	Measurement Units	Variants	Parameters	Objects Characterized	Data Requirement	Formula / Algorithm	Timeframe	Data Feed Providers
01	Departure punctuality	Percentage of flights departing from the gate on-time (compared to schedule).	% of scheduled flights	**Variant 2A** – % of departures within ± 15 minutes of scheduled time of departure	On-time threshold (maximum positive or negative deviation from scheduled departure time) which defines whether a flight is counted as on-time or not.	The KPI is typically computed for traffic flows, individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each departing scheduled flight: - Scheduled time of departure (STD) or Scheduled off-block time (SOBT) - Actual off-block time (AOBT)	***At the level of individual flights:*** 1. Exclude non-scheduled departures 2. Categorize each scheduled departure as on-time or not ***At aggregated level:*** 3. Compute the KPI: number of on-time departures divided by total number of scheduled departures	1 month	Schedule database(s), airports, airlines and/or ANSPs

KPI	Title	Definition	Measurement Units	Variants	Parameters	Objects Characterized	Data Requirement	Formula / Algorithm	Timeframe	Data Feed Providers
02	Taxi-out additional time	Actual taxi-out time compared to an unimpeded/reference taxi-out time.	Minutes/flight	**Variant 1** – basic (computed without departure gate and runway data)	Unimpeded/reference taxi-out time: ***Recommended approach for the basic variant of the KPI***: a single value at airport level, e.g. the 20th percentile of actual taxi times recorded at an airport, sorted from the shortest to the longest. ***Recommended approach for the advanced variant of the KPI:*** a separate value for each gate/runway combination, e.g. the average actual taxi-out time recorded during periods of non-congestion (needs to be periodically reassessed).	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each departing flight: - Actual off-block time (AOBT) - Actual take-off time (ATOT) In addition, for the advanced KPI variant: - Departure gate ID - Take-off runway ID	***At the level of individual flights:*** 1. Select departing flights, exclude helicopters 2. Compute actual taxi-out duration: ATOT minus AOBT 3. Compute additional taxi-out time: actual taxi-out duration minus unimpeded taxi-out time ***At aggregated level:*** 4. Compute the KPI: sum of additional taxi-out times divided by number of IFR departures	1 month	Airports (airport operations, A-CDM), airlines (OOOI data), ADS-B data providers and/or ANSPs

KPI	Title	Definition	Measurement Units	Variants	Parameters	Objects Characterized	Data Requirement	Formula / Algorithm	Timeframe	Data Feed Providers
13	Taxi-in additional time	Actual taxi-in time compared to an unimpeded/reference taxi-in time	Minutes/flight	**Variant 1** – basic (computed without landing runway and arrival gate data)	Unimpeded/reference taxi-in time: ***Recommended approach for the basic variant of the KPI:*** a single value at airport level, e.g. the 20th percentile of actual taxi times recorded at an airport, sorted from the shortest to the longest ***Recommended approach for the advanced variant of the KPI:*** a separate value for each runway/gate combination, e.g. the average actual taxi-in time recorded during periods of non-congestion (needs to be periodically reassessed)	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each arriving flight: Actual landing time (ALDT) Actual in-block time (AIBT) In addition, for the advanced KPI variant: Landing runway ID Arrival gate ID	***At the level of individual flights:*** 1. Select arriving flights, exclude helicopters 2. Compute actual taxi-in duration: AIBT minus ALDT 3. Compute additional taxi-in time: actual taxi-in duration minus unimpeded taxi-in time ***At aggregated level:*** 4. Compute the KPI: sum of additional taxi-in times divided by number of IFR arrivals	1 month	Airports (airport operations), airlines (OOOI data), ADS-B data providers and/or ANSPs

KPI	Title	Definition	Measurement Units	Variants	Parameters	Objects Characterized	Data Requirement	Formula / Algorithm	Timeframe	Data Feed Providers
14	Arrival punctuality	Percentage of flights arriving at the gate on-time (compared to schedule)	% of scheduled flights	**Variant 2A** – % of arrivals within ± 15 minutes of scheduled time of arrival	On-time threshold (maximum positive or negative deviation from scheduled arrival time) which defines whether a flight is counted as on-time or not.	The KPI is typically computed for traffic flows, individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each arriving scheduled flight: - Scheduled time of arrival (STA) or Scheduled in-block time (SIBT) - Actual in-block time (AIBT)	***At the level of individual flights:*** 1. Exclude non-scheduled arrivals 2. Categorize each scheduled arrival as on-time or not ***At aggregated level:*** 3. Compute the KPI: number of on-time arrivals divided by total number of scheduled arrivals	1 month	Schedule database(s), airports, airlines and/or ANSPs

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MID RVSM SAFETY MONITORING REPORT 2019 (SMR 2019)

Prepared by the Middle East Regional Monitoring Agency (MIDRMA)

SUMMARY

The aim of the MID RVSM Safety Monitoring Report 2019 is to provide airspace safety review of the MID RVSM airspace and to highlight by means of arguments and supporting evidence that the implementation of RVSM in the Middle East is acceptably safe.

1. Introduction:

1.1 Executive Summary

The MID RVSM Safety Monitoring Report is issued by the Middle East Regional Monitoring Agency (MIDRMA) for endorsement by the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG).

The report presents evidence that according to the data and methods used, all safety objectives set out in the MID RVSM Safety Policy in accordance with ICAO Doc 9574 (2nd Edition) continue to be met in operational services within the Middle East RVSM airspace, however there are some remarks concerning Safety Objective No.2 which are addressed in the recommendations section of this objective.

To conclude on the current safety of RVSM operations, the three key safety objectives endorsed by MIDANPIRG have to be met:

Objective 1 The risk of collision in MID RVSM airspace due solely to technical height-keeping performance meets the ICAO target level of safety (TLS) of **2.5×10^{-9}** fatal accidents per flight hour.

The value computed for technical height risk is estimated **2.012×10^{-13}** this meets RVSM Safety Objective 1.

Objective 2 The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace meets the ICAO overall TLS of **5×10^{-9}** fatal accidents per flight hour.

The value computed for the overall risk is estimated **8.345×10^{-10}** this meets RVSM Safety Objective 2.

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Objective 3 Address any safety-related issues raised in the SMR by recommending improved procedures and practices; and propose safety level improvements to ensure that any identified serious or risk-bearing situations do not increase and, where possible, that they decrease. This should set the basis for a continuous assurance that the operation of RVSM will not adversely affect the risk of en-route mid-air collision over the years.

Middle East RVSM Airspace Estimated Annual Flying Hours = (2,389,128) Average Aircraft Speed = 450.07 kts			
Risk Type	**Risk Estimation**	**ICAO TLS**	**Remarks**
Technical Risk	**$2.012x10^{-13}$**	**$2.5x10^{-9}$**	**Below ICAO TLS**
Overall Risk	**$8.345x10^{-10}$**	**$5x10^{-9}$**	**Below ICAO TLS**

1.2 Conclusions:

(i) The estimated risk of collision associated with aircraft height- keeping performance is **$2.012x10^{-13}$** and meets the ICAO TLS of **2.5×10^{-9}** fatal accidents per flight hour (RVSM Safety Objective 1),

(ii) The estimated overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies is **$8.345x10^{-10}$** meets the ICAO overall TLS of **$5x10^{-9}$** fatal accidents per flight hour (RVSM Safety Objective 2),

(iii) Based on currently-available information (Except for Tripoli FIR), there is no evidence available to MIDRMA that the continued operations of RVSM adversely affects the overall vertical risk of collision.

1.3 Considerations on the RVSM Safety Objectives for MID RVSM SMRs

When considering the three safety objectives for RVSM, the following considerations should be borne in mind:

1. The assessment of risk against the TLS, both for technical and overall risk estimates, relies on height keeping performance data to assess the risk in the vertical plane and studies of traffic density to calculate the risk in the horizontal plane. There are numbers of assumptions that must be verified to satisfy the reliability of the risk assessment, the verification of these assumptions deals primarily with monitoring of aircraft performance issues.
2. The Aircraft performance is assessed by individual airframe and by monitoring group. A monitoring group consists of aircraft that are nominally of the same type with identical performance characteristics that are made technically RVSM compliant using a common compliance method. Monitoring group analysis is necessary to verify that the Minimum Aviation System Performance Standards (MASPS) for that group is valid. Aircraft that are made RVSM compliant on an individual basis are termed non-group.

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3. The RVSM Safety Objective 2, dealing with overall risk, takes into account the technical risk together with the risk from all other causes. In practice, this relates to the human influence and assessment of this parameter relies on adequate reporting of Large Height Deviation (LHD) Reports, and the correct interpretation of events for input to the CRM.
4. RVSM Safety Objective 3 requires the RMA to monitor long-term trends and to identify potential future safety issues, this compare the level of risk bearing incidents for the current reporting period. It also highlights if there are issues that should be carried forward as recommendations to be adopted for future reports.

2.1 Discussion

Scope:

The geographic scope of the MID RVSM Safety Monitoring Report covers the MID RVSM airspace, which comprises the following FIRs/UIRs:

Amman	Bahrain	Beirut	Baghdad	Cairo	Damascus	Emirates
Jeddah	Kuwait	Khartoum	Muscat	Sana'a	Tehran	Tripoli*

T-1: FIRs/UIRs of the Middle East RVSM Airspace

***Note:** **Tripoli FIR excluded from the RVSM safety analysis due to lack of data.**

The Data Sampling periods covered by SMR 2018 are as displayed in the below table

Report Elements	**Time Period**
Traffic Data Sample	01/08/2019 - 31/08/2019
Operational & Technical Errors	01/08/2019 - 31/07/2020

T-2: Time Period for the Reported Elements

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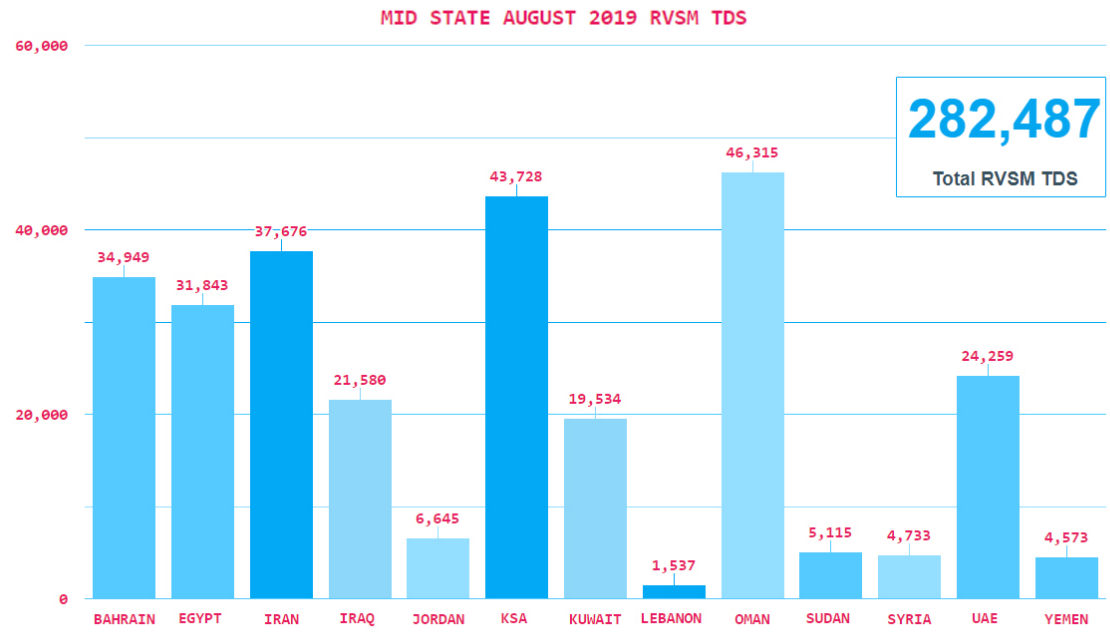
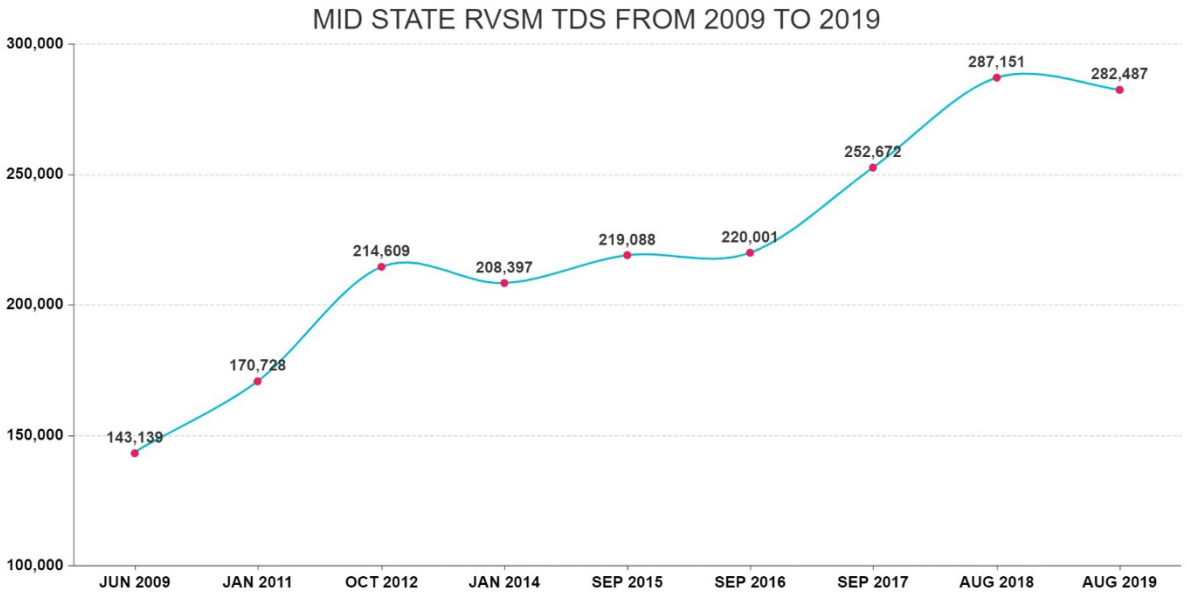
MID States	Status	Remarks
Bahrain FIR	Accepted	-
Cairo FIR	Accepted	-
Amman FIR	Accepted	-
Muscat FIR	Accepted	-
Tehran FIR	Accepted	-
Khartoum FIR	Accepted	-
Emirates FIR	Accepted	-
Damascus FIR	Accepted	-
Sana'a FIR	Accepted	-
Jeddah FIR	Accepted	-
Beirut FIR	Accepted	-
Baghdad FIR	Accepted	-
Kuwait FIR	Accepted	-
Tripoli FIR	**No TDS**	**Excluded**
Total	13 FIRs	

Table 1; Status of the MID States RVSM Traffic Data Sample (TDS) for August 2019

2.1.1 The description of the traffic data processed for each MIDRMA member state by the MID Risk Analysis Software (MIDRAS) is depicted in the graph below, a total of **282,487** flights were processed for the 13 FIRs, these flights were evaluated and processed very carefully to ensure accurate results according to the data submitted.





SN	MID FIRs	No of TDS Aug 2018	No of TDS Aug 2019	Sep 2018 vs Aug 2019
1	Bahrain FIR	30703	**34949**	**+ 13.83**
2	Cairo FIR	31094	**31843**	**+ 2.41**
3	Amman FIR	6845	**6645**	**- 2.92**
4	Muscat FIR	40403	**46315**	**+ 14.63**
5	Tehran FIR	55628	**37676**	**- 32.27**
6	Khartoum FIR	7303	**5115**	**- 29.96**
7	Emirates FIR	23457	**24259**	**+ 3.42**
8	Damascus FIR	No TDS	**4733**	**-**
9	Sana'a FIR	4498	**4573**	**+ 1.67**
10	Jeddah FIR	48926	**43728**	**- 10.62**
11	Beirut FIR	No TDS	**1537**	**-**
12	Baghdad FIR	21621	**21580**	**- 0.19**
13	Kuwait FIR	16673	**19534**	**+ 17.16**
14	Tripoli FIR	No TDS	**No TDS**	**-**
Total		**287,151**	**282,487**	**- 1.62**

MID States RVSM TDS 2018 VS 2019

SN	Reporting Point	FIRs	No of Flights
1	**SIDAD**	BAGHDAD/KUWAIT	**9447**
2	**TASMI**	BAGHDAD/KUWAIT	**9298**
3	**DAVUS**	KUWAIT/BAHRAIN	**8941**
4	**NINVA**	ANKARA/BAGHDAD	**8326**
5	**RATVO**	ANKARA/BAGHDAD	**7748**
6	**TUMAK**	BAHRAIN/EMIRATES	**7234**
7	**LONOS**	KUWAIT/BAHRAIN	**5918**
8	**PASAM**	JEDDAH/CAIRO	**5166**
9	**ULADA**	BAHRAIN/JEDDAH	**5137**
10	**OBNET**	BAHRAIN/EMIRATES	**5106**
11	**RABAP**	KUWAIT/BAHRAIN	**5106**
12	**TAPDO**	MUSCAT/KARACHI	**5042**
13	**ALPOB**	BAHRAIN/EMIRATES	**4774**
14	**PASOV**	MUSCAT/EMIRATES	**4502**
15	**ULINA**	AMMAN/CAIRO	**4496**
16	**SALUN**	ATHINAI/CAIRO	**4470**
17	**ALPOR**	MUSCAT/KARACHI	**4402**
18	**TARDI**	EMIRATES/MUSCAT	**4345**
19	**DASUT**	BAHRAIN/TEHRAN	**4019**
20	**RASKI**	MUSCAT/MUMBAI	**3848**

TDS 2019 Top 20 Busiest FIR Entry / Exit Points

2.1.3 For the fifth consecutive Safety Monitoring Reports, Tripoli FIR excluded temporary from the RVSM safety analysis due to lack of TDS and LHD reports, taking into consideration the MIDRMA never done any risk analysis for Tripoli FIR RVSM airspace since Libya joint the MIDRMA, this issue require MIDANPIRG to decide what action should be taken if RVSM operations resume again within Tripoli FIR in the future.

2.2 The Collision Risk Model (CRM)

2.2.1 The risk of collision to be modelled is that due to the loss of vertical separation between aircraft flying between FL290 and FL410 in a given portion of an airspace. One collision between two aircraft is counted as the occurrence of two accidents. The risk of collision depends both on the total number and types of aircraft flying in the system and the system characteristics.

2.2.2 The CRM provides an estimate of the number of accidents within an airspace system that might occur per aircraft flight hour due to aircraft collisions resulting from the loss of vertical separation in an RVSM environment analysis, is expressed in terms of quantifiable parameters. In the vertical dimension the CRM can be broken down in order to separately model a single route on which aircraft are flying in the same or opposite directions at adjacent flight levels, pairs of crossing routes and combinations of individual and intersecting routes, this model is applied equivalently to vertical, lateral and longitudinal separation.

2.2.3 Three parameters used within the CRM:

a. The Vertical Overlap Probability, denoted as Pz(1000).

b. The Lateral Overlap Probability, denoted as Py(0).

c. The aircraft Passing Frequency are the most important quantities in determining the vertical collision risk. Of these, the vertical overlap probability is also an important parameter to calculate.

2.3 TECHNICAL HEIGHT KEEPING PERFORMANCE RISK ASSESSMENT

RVSM Safety Objective 1

The risk of collision in MID RVSM airspace due solely to technical height-keeping performance meets the ICAO target level of safety (TLS) of **2.5 x 10^{-9}** fatal accidents per flight hour.

2.3.1. Direct evidence of compliance with TLS for Technical Height-Keeping Error

The result shows the risk of collision due to technical height-keeping performance is estimated to be **2.012x10^{-13}** fatal accidents per flight hour, which is less than the ICAO TLS **2.5 x 10^{-9}**.

2.3.2 Supporting evidence of compliance with TLS for technical height-keeping performance

To demonstrate that the result is reliable, it is necessary to demonstrate that the following assumptions are true:

a. The estimated value of the frequency of horizontal overlap, used in the computations of vertical-collision risk, is valid,

b. Pz(1000) – the probability of vertical overlap due to technical height-keeping performance, between aircraft flying 1000 ft. separation in MID RVSM airspace is estimated 3.257 x 10-11 valid and is less than the ICAO requirement of 1.7 x 10-8,

c. All aircraft flying with 1000ft vertical separation in MID RVSM airspace meet the ICAO Global Height Keeping Performance specifications for RVSM(All MID RVSM approved aircraft are part of the MID RVSM Height keeping Performance Program),

d. All aircraft flying 1000ft vertical separation in MID RVSM airspace meet the individual ICAO performance specification for the components of total vertical error (TVE),

e. The monitoring target for the MID RVSM height-monitoring programme is an on-going process,

f. The input data used by the CRM is valid,

g. An adequate process is in place to investigate and correct problems in aircraft technical height-keeping performance.

2.3.3 Calculating the Probability of Lateral Overlap (P_y (0))

The probability of lateral overlap $P_y(0)$ is the probability of two aircraft being in lateral overlap which are nominally flying on (adjacent flight levels of) the same route. The calculation of the Py (0) for the SMR 2018 has the following to consider:

a. The MIDRMA continued to calculate the probability of lateral overlap $\boldsymbol{P_y(0)}$ for all the MID RVSM airspace as per the ICAO methodology developed for this purpose and derived by the MID Risk Analysis Software (MIDRAS).

b. The MIDRMA calculated the average of the probability of lateral overlap $\boldsymbol{P_y(0)}$ for the whole MID RVSM airspace is estimated to be **1.145 x10^{-10}**

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c. Overall, the results are considered to be valid.

2.3.4 Pz(1000) Compliance

The Pz(1000) is the probability that two aircraft at adjacent RVSM flight levels will lose vertical separation due to technical height keeping errors. The value of the probability of vertical overlap Pz(1000), based on the actual observed ASE and typical AAD data is estimated to be of **3.257×10^{-11}** . This value meets the Global System Performance Specification that the probability that two aircraft will lose procedural vertical separation of 1000ft should be no greater than **1.7×10^{-8}**.

The MIDRMA continue to issue the minimum monitoring requirements (MMRs) through the automated MMR software which is programmed to address the MIDRMA member states with their updated requirements according to the latest RVSM approvals received, the MMR table valid for October 2020 is available in **Appendix B**.

Note: All member states are required to check and comply with their MMR through the MIDRMA website (www.midrma.com).

MID RVSM SMRs Technical Risk Values				
Year 2006	**Year 2008**	**Year 2010**	**Year 2011**	**Year 2012/13**
2.17×10^{-14}	1.93×10^{-13}	3.96×10^{-15}	5.08×10^{-14}	6.37×10^{-12}
Year 2014	**Year 2015**	**Year 2016**	**Year 2017**	**Year 2018**
3.18×10^{-12}	3.056×10^{-10}	6.347×10^{-11}	4.966×10^{-11}	1.562×10^{-11}
		Year 2019		
		2.012×10^{-13}		

According to the technical risk values as shown in the above table the TLS values still, meet the ICAO TLS.

2.3.5 Conclusions on Technical Vertical Collision Risk:

a. The current computed vertical-collision risk due to technical height-keeping performance meets the ICAO TLS.

b. The probability of vertical-overlap estimate, Pz(1000), satisfies the global system performance specification.

c. Most monitoring groups are complying with ICAO TVE component requirements (also known as technical height-keeping group requirements).

2.3.6 Recommendations for Safety Objective 1:

a. The MIDRMA shall continue to review the content and structure of its aircraft monitoring groups.

b. The MIDRMA will continue to keep the methods of calculating the technical CRM parameters and the risk due to technical height keeping errors under review and explore more options to enhance the MID Risk Analysis Software (MIDRAS).

c. The MIDRMA shall carry out continuous survey and investigation concerning aircraft flying within the MID RVSM airspace by collecting the TDS from member states offered to submit their RVSM TDS on a monthly basis.

2.4 ASSESSMENT OF OVERALL RISK DUE TO ALL CAUSES AGAINST THE TLS OF 5 X 10^{-9} FATAL ACCIDENTS PER FLIGHT HOUR

RVSM Safety Objective 2

The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace meets the ICAO overall TLS of **5 x 10^{-9}** fatal accidents per flight hour.

The computed value for the overall risk is **8.345 x10^{-10}** this meets RVSM Safety Objective 2.

Overall Risk Values				
Year 2006	**Year 2008**	**Year 2010**	**Year 2011**	**Year 2012/13**
Not calculated	4.19x10^{-13}	6.92x10^{-12}	1.04x10^{-11}	3.63x10^{-11}
Year 2014	**Year 2015**	**Year 2016**	**Year 2017**	**Year 2018**
4.91x10^{-11}	7.351x10^{-10}	5.691x10^{-10}	4.518 x10^{-11}	9.845 x10^{-11}
		Year 2019		
		8.345x10^{-10}		

2.4.1 The vertical risk estimation due to atypical errors has been demonstrated to be the major contributor in the overall vertical-risk estimation for the MID RVSM airspace, In the previous SMRs the processed data were severely influenced by either NIL reporting of Large Height Deviations (LHDs) and no reports of categories A, B, C, D, J and K as without these data (especially from FIRs with high volume of traffic) which was impossible to assess compliance with the ICAO overall TLS of **5 x 10^{-9}** fatal accidents per flight hour.

2.4.2 The MIDRMA presented the progress made in the development of the SMR 2019 to MSG/7 Virtual meeting (01 - 03 September 2020), and highlighted serious concerns due to the lack of LHD Reports Categories A, B C, D, H, J and K, especially from the States/FIRs with high volume of Traffic. Therefore, the MIDRMA was unable to calculate the overall risk related to RVSM Safety Objective 2 before MSG/7. Accordingly, the meeting urged States to provide the MIDRMA with the required LHD Reports before 15 October 2020, in order for the MIDRMA to finalize the SMR-2019 and present it to the ATM SG (Virtual Meeting) before presentation to MIDANPIRG/18 for endorsement and agreed to the following conclusion:

MSG CONCLUSION 7/4: RVSM DATA PROVISION TO THE MIDRMA

That,

in order to allow the MIDRMA to finalize the development of the SMR-2019 & 2020:

a) States are urged to comply with the provisions of the MIDANPIRG Conclusion 14/35; and

b) States with high volume of traffic be included in the list of air navigation deficiencies, if LHD reports are not provided before 15 October 2020.

2.4.3 The extreme majority of the MIDRMA Member States complied with the above conclusion and coordinated with the MIDRMA to file all LHD reports from various categories for the reporting cycle of SMR 2019. The MIDRMA was able for the first time to calculate the overall risk for the MID RVSM airspace with LHD reports covering nearly most of its area of responsibility.

2.4.4 The MIDRMA continued to monitor the LHD reports at the eastern FIR boundary of Muscat FIR filed by Mumbai, the MIDRMA indicated in SMR 2017 the level of LHD reports filed by Muscat, Mumbai and Karachi ATCUs related to each other at their transfer of control points reached to a dangerous level and started to effect the ICAO TLS of RVSM implementation in the MID and APAC regions, therefore the MIDRMA requested from MIDRMA Board/15 meeting (Muscat – Oman 29 – 31 January 2018) to open a Safety Protocol for the purpose of resolving this issue as soon as possible.

2.4.5 However, the MIDRMA can't see much improvement for SMR 2019 as the level of reporting LHDs between Mumbai and Muscat remain high and the safety concern still exist at the common FIR boundary points while the level of reporting LHDs between Karachi and Muscat remain in its normal reporting level.

Note: A Safety Protocol is a critical safety issue effecting the implementation of RVSM operations which require the concerned authority an immediate action to rectify/resolve the problem in a certain period of time under the supervision of MIDRMA and ICAO MID Office.

2.4.6 The Safety Protocol is under continuous review by MIDRMA and MAAR and the LHD reports filed by all concerned ATC Units are investigated and evaluated through the MIDRMA online LHD system and further update will be addressed to the next MIDRMA Board meeting.

2.4.7 The Table below presents a summary of operational risk associated with Large Height Deviation (LHD) reports by LHD categories, these reports used to calculate the overall vertical collision risk for the MID RVSM airspace.

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LHD Cat. Code	Large Height Deviation (LHD) Category	No. of LHDs	LHD Duration (Sec.)
A	Flight crew fails to climb or descend the aircraft as cleared	**5**	**174**
B	Flight crew climbing or descending without ATC clearance	**3**	**81**
C	Incorrect operation or interpretation of airborne equipment		
D	ATC system loop error	**1**	**120**
E	ATC transfer of control coordination errors due to human factors	**8**	**295**
F	ATC transfer of control coordination errors due to technical issues		
G	Aircraft contingency leading to sudden inability to maintain level		
H	Airborne equip. failure and unintentional or undetected FL change	**2**	**50**
I	Turbulence or other weather related cause	**1**	**20**
J	TCAS resolution advisory and flight crew correctly responds	**2**	**50**
K	TCAS resolution advisory and flight crew incorrectly responds		
L	An aircraft being provided with RVSM separation is not RVSM approved		
M	Other	**2**	**50**
Total		**24**	**840**

Summary of Operational Risk associated with Large Height Deviation

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SIDAD	9447
TASMI	9298
DAVUS	8941
NINVA	8326
RATVO	7748
TUMAK	7234
LONOS	5918
PASAM	5166
ULADA	5137
OBNET	5106
RABAP	5106
TAPDO	5042
ALPOB	4774
PASOV	4502
ULINA	4496
SALUN	4470
ALPOR	4402
TARDI	4345
DASUT	4019
RASKI	3848

2.4.8 Effects of Future Traffic Growth

The effect of future traffic growth on the vertical collision risk can be evaluated on the assumption of a linear relationship between traffic growth and frequency of horizontal overlap, which will directly affect the two components of the risk: the risk due to technical height-keeping performance and due to atypical operational errors.

It is clear that even for the most optimistic forecast range of 13%, the overall risk of collision will continue to meet the TLS at least until 2022. With the current uncertainty over traffic growth this issue will be revisited when the Middle East economic conditions return to more normal growth.

2.4.9 Conclusions on the overall vertical risk:

a. The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace, estimated from the operational and technical vertical risks calculated with LHD reports from most of the member states, the computed result for this SMR is considered to be representative for the MID RVSM airspace.

b. The effect of future traffic growth on the vertical collision risk can be evaluated on the assumption of a linear relationship between traffic growth and frequency of horizontal overlap, which will directly affect the two components of the risk: the risk due to technical height-keeping performance and due to atypical operational errors. It is clear that even for the most optimistic forecast range of 13%, the overall risk of collision will continue to meet the TLS at least until 2022.

2.4.10 Recommendations Applicable to Safety Objective 2:

a. MIDRMA to present the successful progress made concerning the receipt of the LHD reports other than category E to the next MIDANPIRG and MIDRMA board meetings

b. The MIDRMA shall continue to encourage States to provide Large Height Deviation Reports (LHD) of all categories and not only related to handover issues.

c. The MIDRMA, in coordination with concerned States, assure that incidents and violations which have direct impact on the implementation of RVSM within the MID Region are reported in a continuous basis through the MIDRMA LHD online reporting system in due time for operational safety assessment analysis.

2.5 ASSESSMENT OF SAFETY-RELATED ISSUES RAISED IN THIS REPORT

RVSM Safety Objective 3

Address any safety-related issues raised in the SMR by recommending improved procedures and practices; and propose safety level improvements to ensure that any identified serious or risk-bearing situations do not increase and, where possible, that they decrease. This should set the basis for a continuous assurance that the operation of RVSM will not adversely affect the risk of en-route mid-air collision over the years.

2.5.1 The identified safety-related issues are:

a. Confirmation of the approval status of aircraft filling RVSM flight plan (W in field 10), this is done through Bahrain and Emirates TDS received on a monthly basis.

b. Identification of operators requiring monitoring and address the minimum monitoring requirements to all MIDRMA member states.

2.5.2 Conclusions for Safety Objective 3

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a. The MIDRMA started to conduct studies and researches for implementing height monitoring using ADSB data.

b. The MIDRMA address the Hot Spots of each MID FIR generated by the (MIDRAS) Software (for information only).

c. Current risk-bearing situations have been identified by using the MIDRAS and the MID Visualization and Simulation of Air Traffic and actions will be taken to ensure resolving all violations to RVSM airspace by non-approved aircraft.

2.5.3 Recommendations for Safety Objective 3

a. The MIDRMA will continue to coordinate with Member States, which have ADSB to provide the ADSB archived data for RVSM height monitoring.

b. MIDRMA will continue to enhance the (MIDRAS) Software and shall include new features to overcome the issue of corrupted TDS (Traffic Data Sample).

c. The MIDRMA will coordinate with ICAO MID Office to include in its work program to deliver awareness courses concerning RVSM risk analysis to brief Air Traffic Controllers and Airworthiness Inspectors of MIDRMA Member States to ensure their follow up with ICAO requirements for RVSM implementation and give briefing of updated ICAO requirements, these courses will be delivered as necessary or when requested by any Member State.

d. The MIDRMA shall continue to carry out continuous survey and investigation on the number and causes of non-approved aircraft operating in the MID RVSM airspace.

e. The MIDRMA will continue to encourage States to submit their Large Height Deviation Reports using the MIDRMA online reporting tool which has been upgraded to improve the level of reporting.

Therefore, it is concluded that this Safety Objective is currently met.

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THE MID MMR as of October 2020

STATE	RVSM APPROVED A/C	NOT COVERED
BAHRAIN	54	1
EGYPT	167	15
IRAN	233	50
IRAQ	39	8
JORDAN	44	5
KSA	269	7
KUWAIT	65	6
LEBANON	31	0
LIBYA	30	13
OMAN	72	8
QATAR	280	0
SUDAN	29	15
SYRIA	15	8
UAE	589	16
YEMEN	6	3

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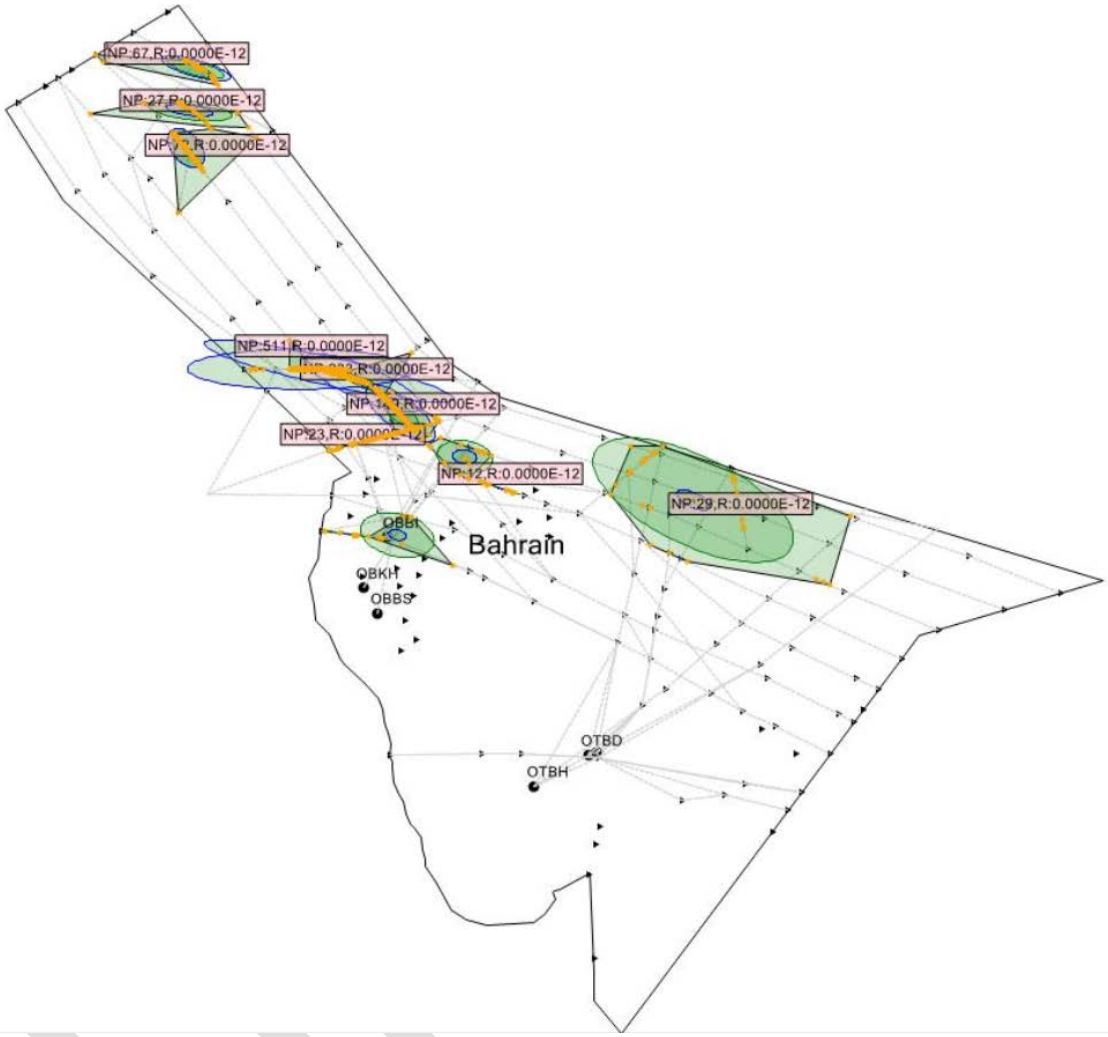
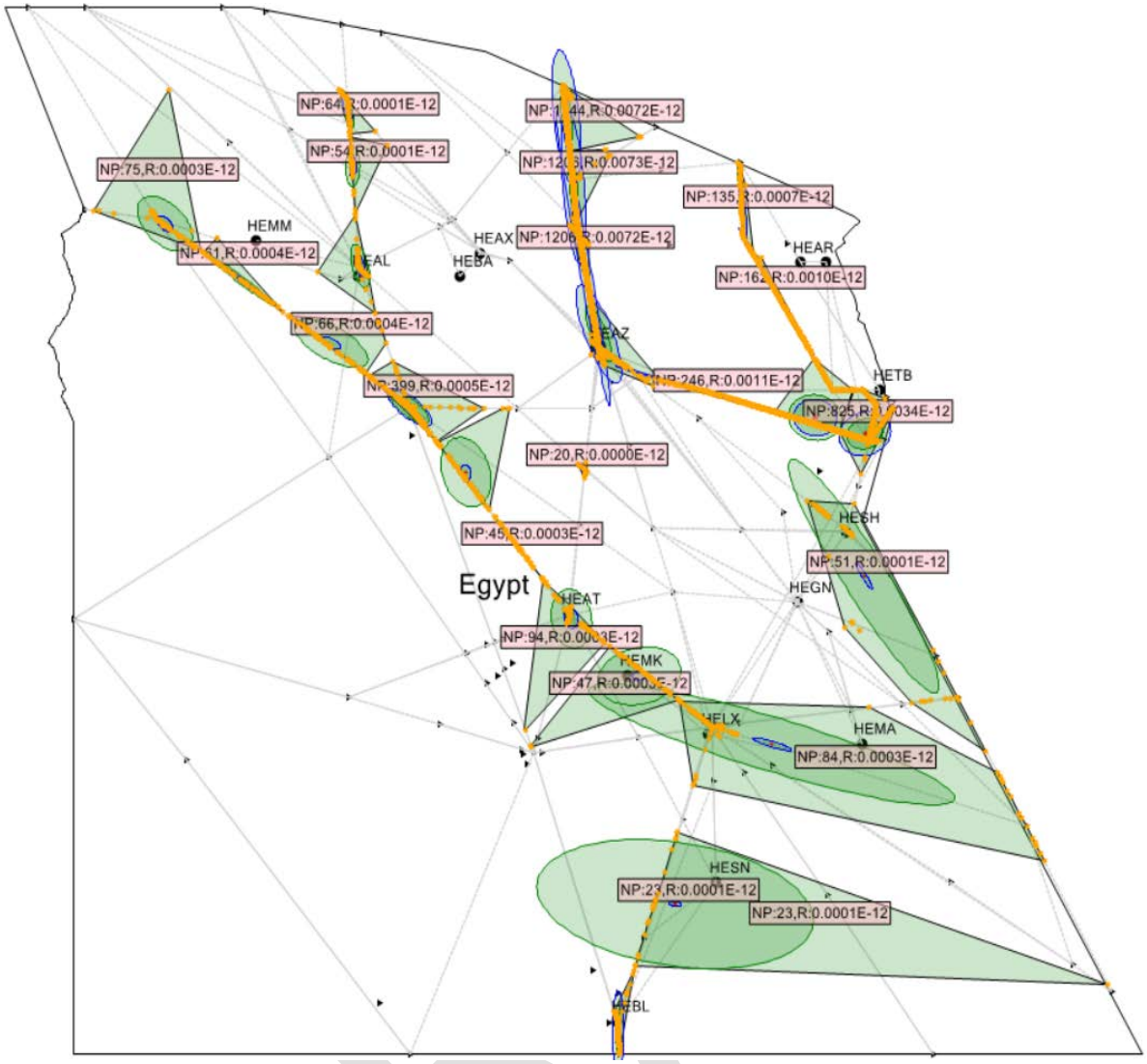
Appendix C –MIDRMA Member States Hot Spots Generated from September 2019 TDS (for information ONLY)



Bahrain FIR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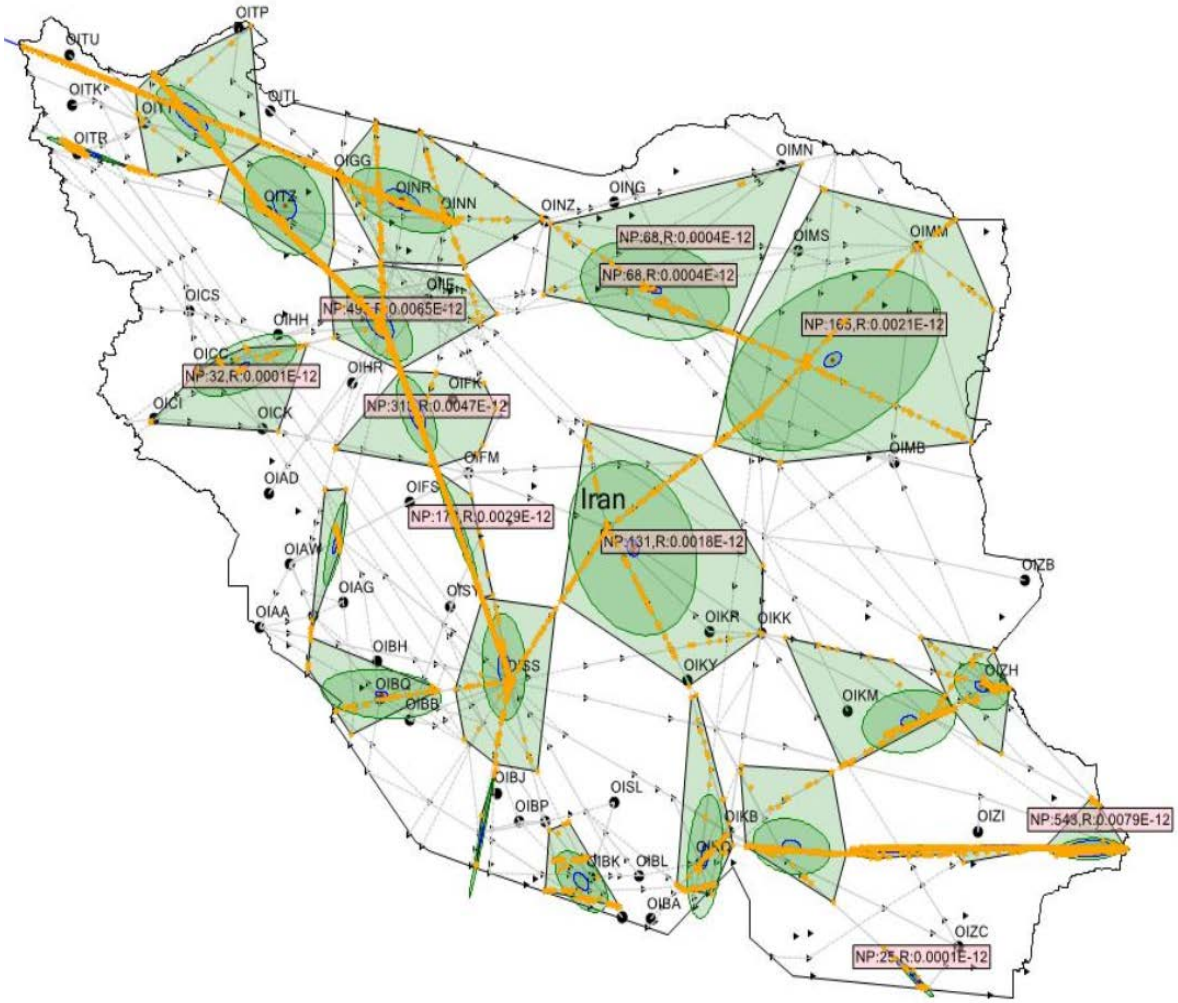
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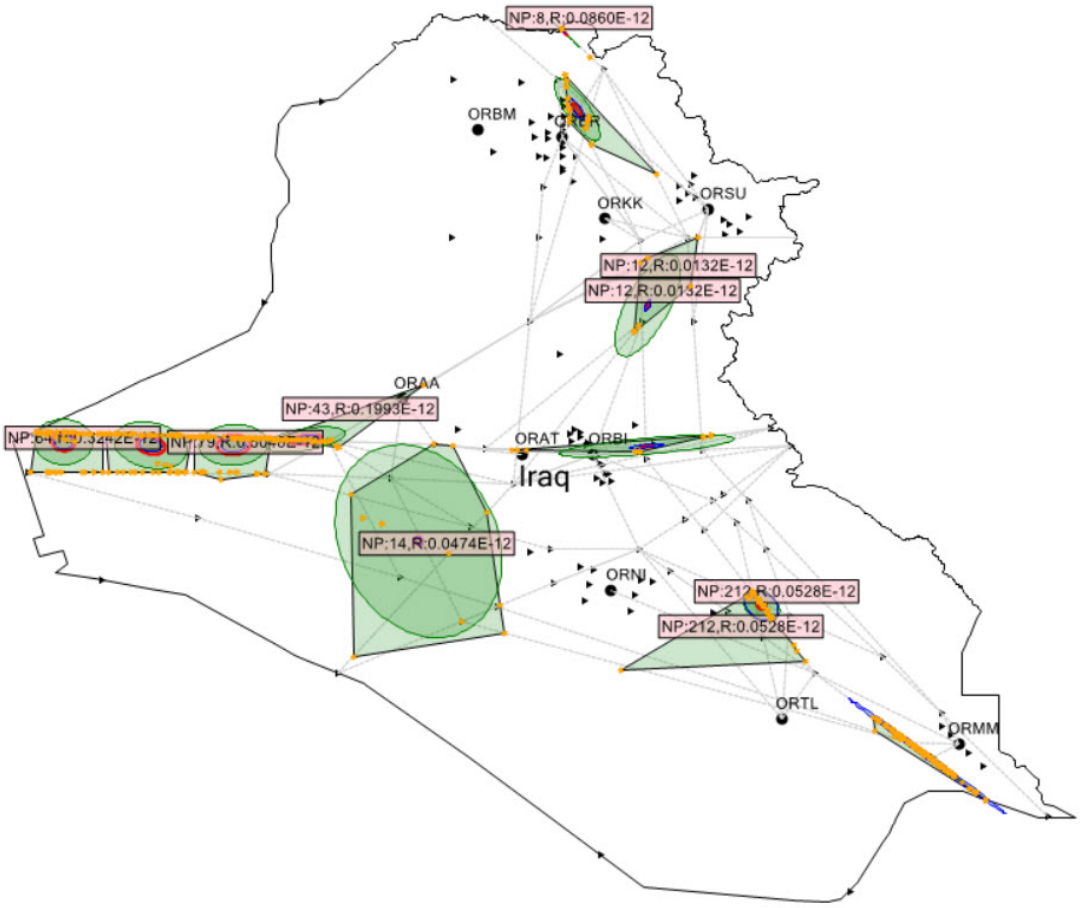
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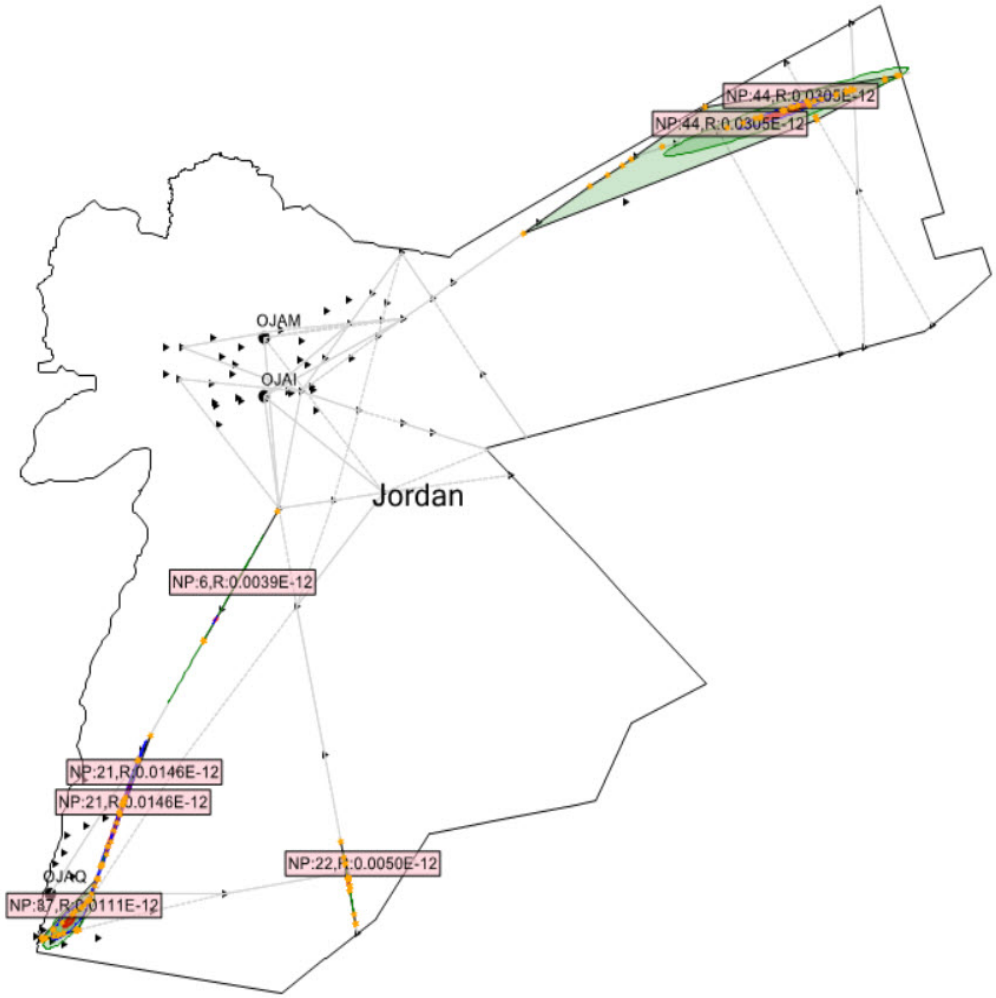
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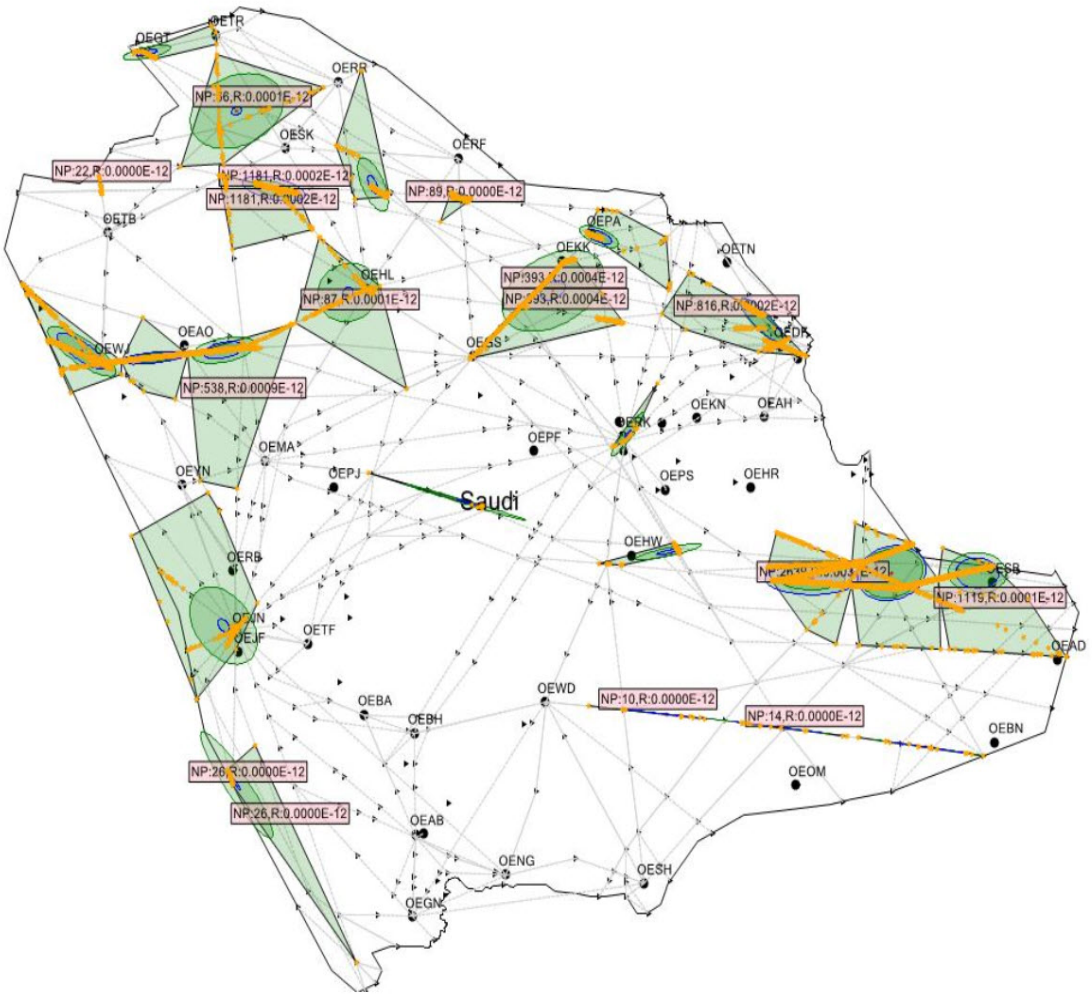
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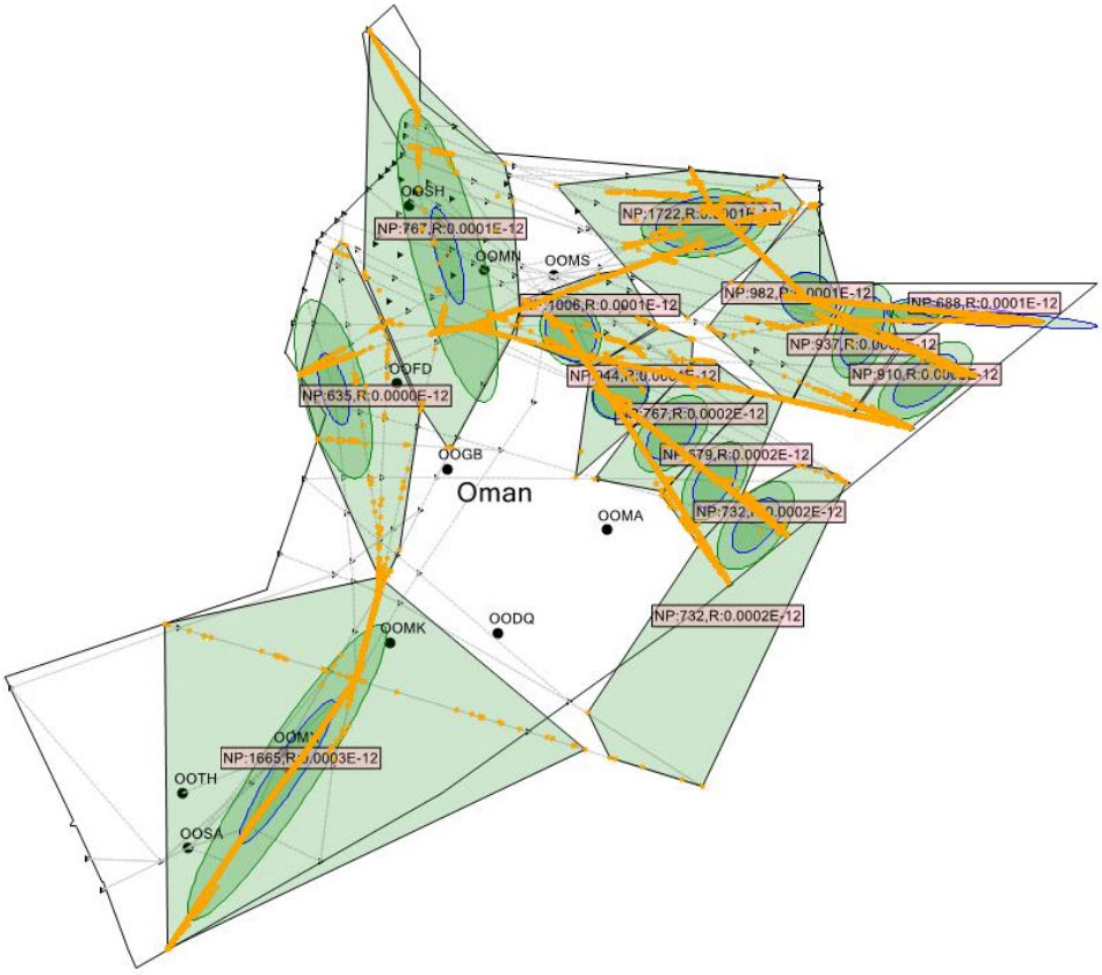
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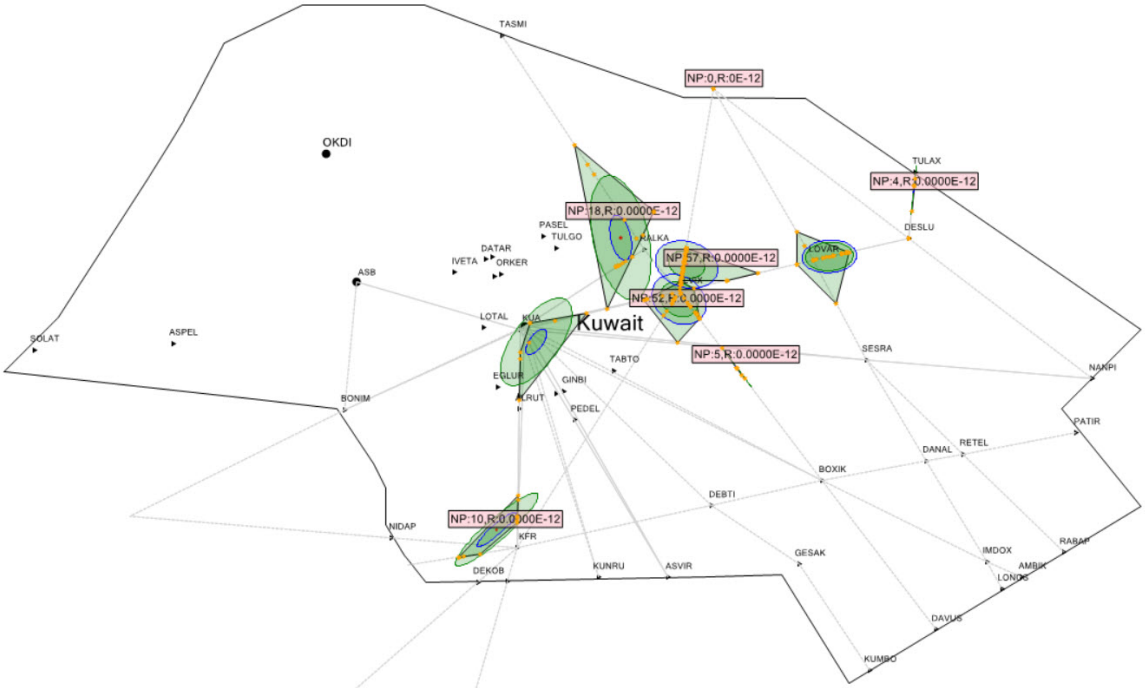
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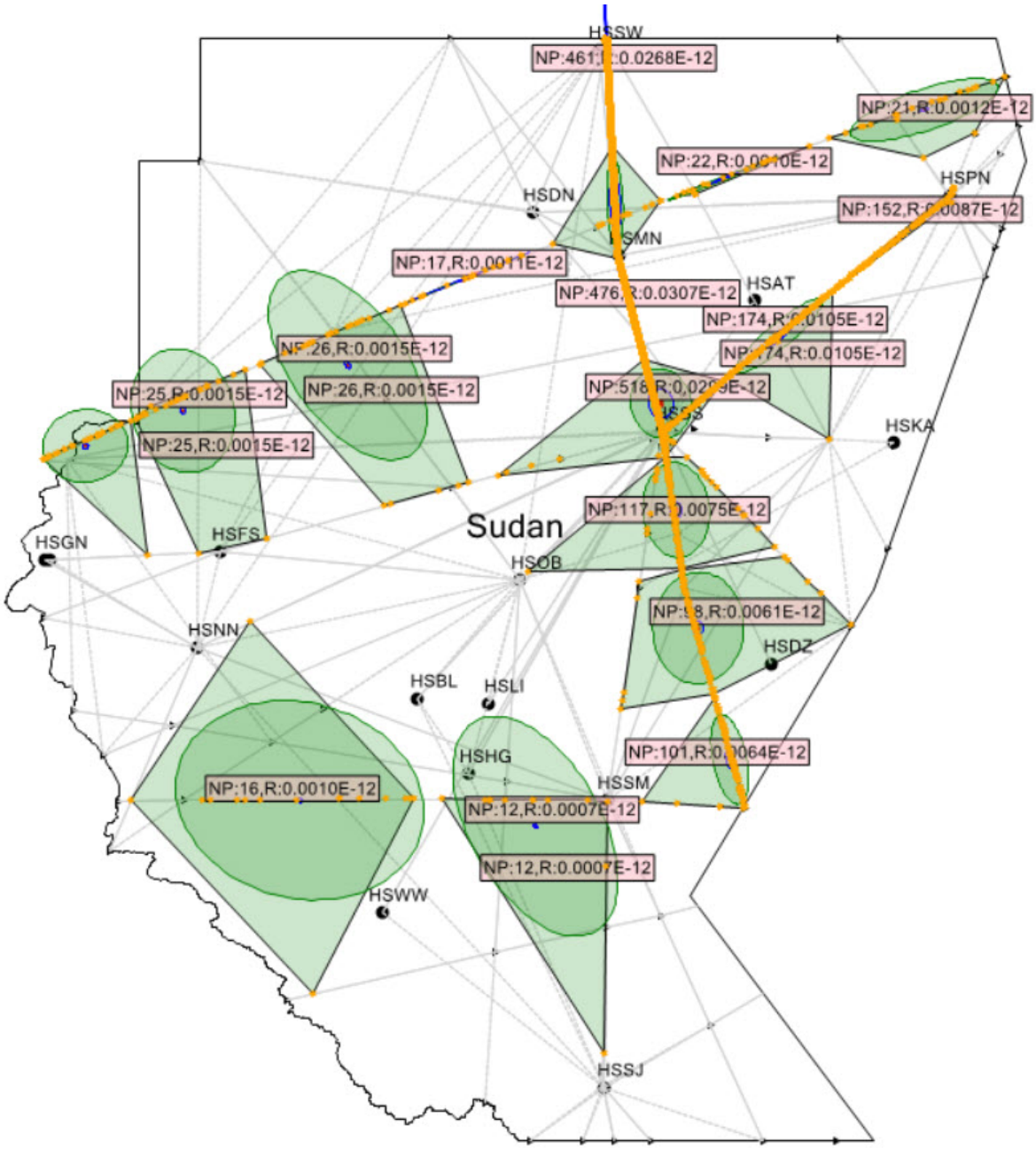

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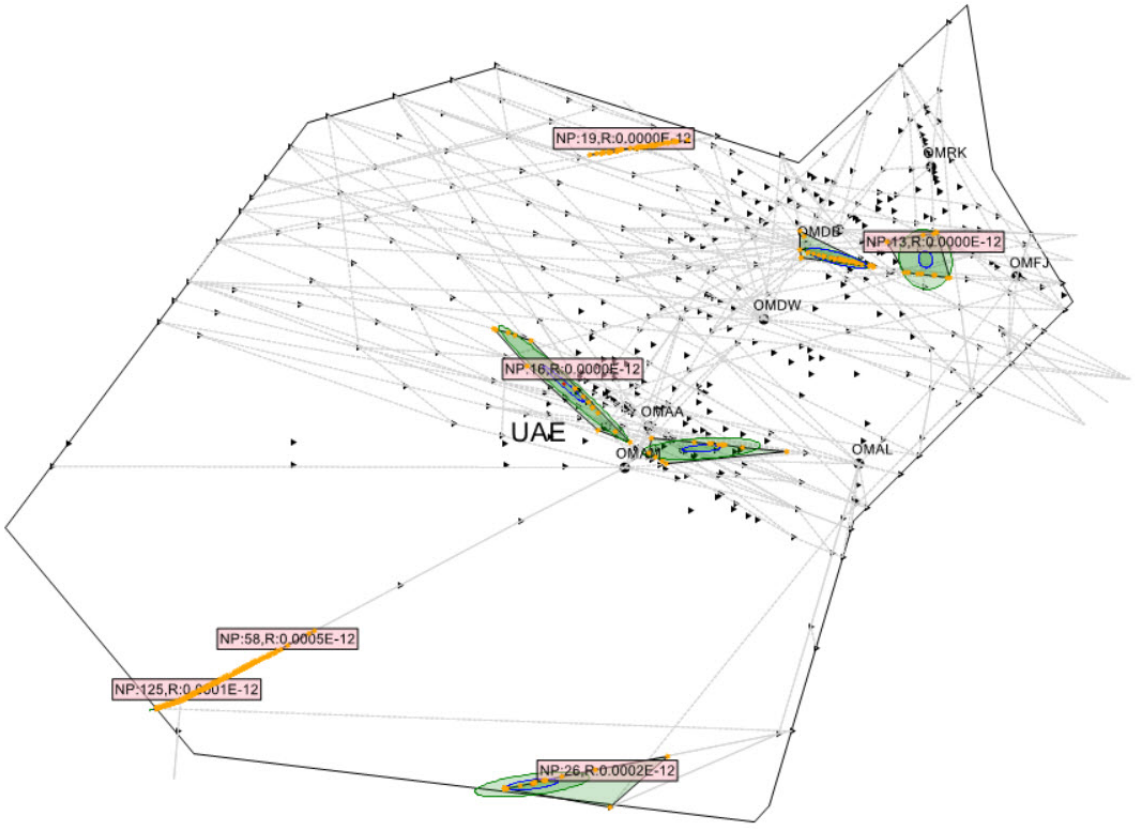

Emirates FIR

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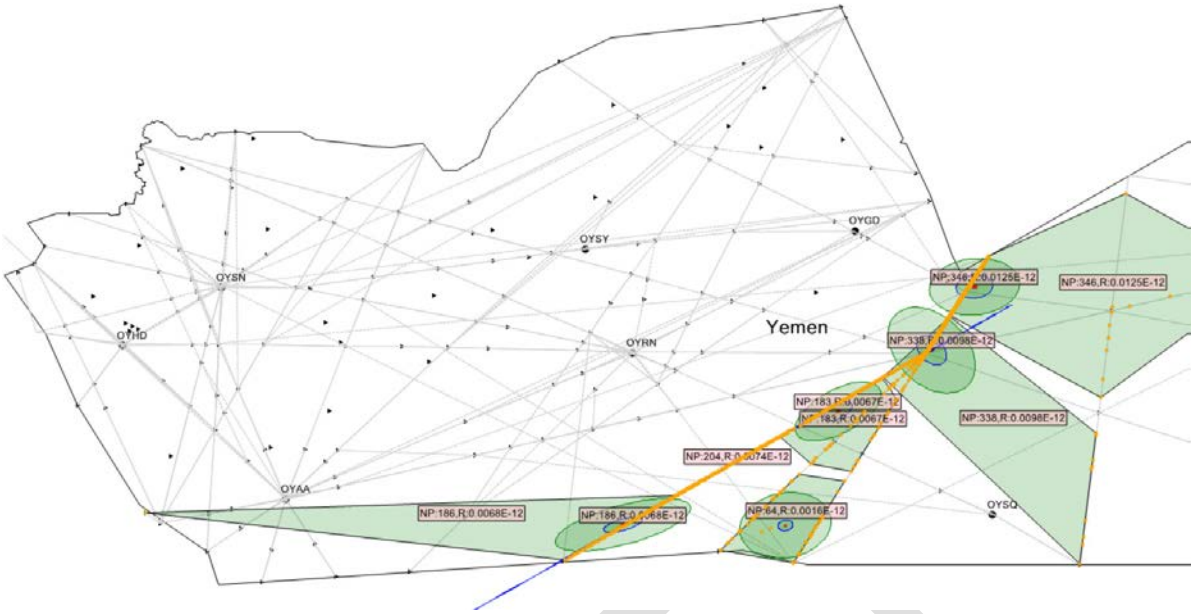

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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MID REGION

AIR TRAFFIC FLOW MANAGEMENT

CONCEPT OF OPERATIONS

Version 0.3 November 2020

This document was developed by the MIDANPIRG Air Traffic Flow Management Task Force (ATFM TF) and reviewed by the ATM SG.

Approved by MIDANPIRG/XX and published by the
ICAO MID Office, Cairo

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1. Overview

Concept Development and references

1.1 This MID Regional Air Traffic Flow Management (ATFM) Concept of Operations (CONOPS) was developed based on ICAO Doc 9971 and the Asia/Pacific Regional ATFM CONOPS

1.2 The Concept was tested in a series of Human-in-the-Loop (HITL) simulation exercises held at various ANSPs. It is based upon operationally proven *ATFM Measures* used to more efficiently manage delays incurred by all aircraft operating to a constrained resource, such as an airport or a sector of airspace, regardless of their point of departure and including flights controlled by ANSPs outside the control authority of ATC at the constrained resource.

Fundamental Concept of ATFM

1.3 Central to this CONOPS is the fundamental concept of balancing air traffic demand and capacity. While ANSPs and airport operators should strive to increase and optimize airspace and airport capacity to meet demand, traffic growth, surges in traffic and capacity constraining events cause imbalances. ATFM measures that may be utilized include *inter-alia* strategic landing slot allocation, miles/minutes in trail, level capping, re-routing and tactical airport slot allocation.

1.4 Implementation of effective ATFM improves predictability, reduces fuel burn / emissions and operating costs, reduces pilot and ATC workload, improves or maintains safety and equity.

ATFM and Collaborative Decision-Making

1.5 The Collaborative Decision Making (CDM) process, a key enabler of ATFM, allows all of its subscribing members, called CDM stakeholders, to participate in decisions that affect them after all relevant information has been made available to them. This applies to all types of decisions in the strategic, pre-tactical, and tactical phases.

1.6 **Figure 1** illustrates the integration of CDM into ATFM functions. The flow shows the independent evaluation of capacity and demand for the resource, the monitoring of the demand and capacity, the evaluation of ATFM measures, the involvement of stakeholders through CDM, and the execution and updating of the ATFM measures. Core functions of shared situational awareness and post-operations analysis are supported across all functions.

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1.7 Using the available data, demand and capacity are monitored throughout the day by close communication and collaboration with other resource managers to identify any imbalances. Flow Managers have tools in order to evaluate various ATFM measures and organize CDM stakeholders participation and agreement before implementation. Once an ATFM measure is implemented, all stakeholders will stick to the planto optimize their operations while monitoring the effectiveness of the measure implemented.

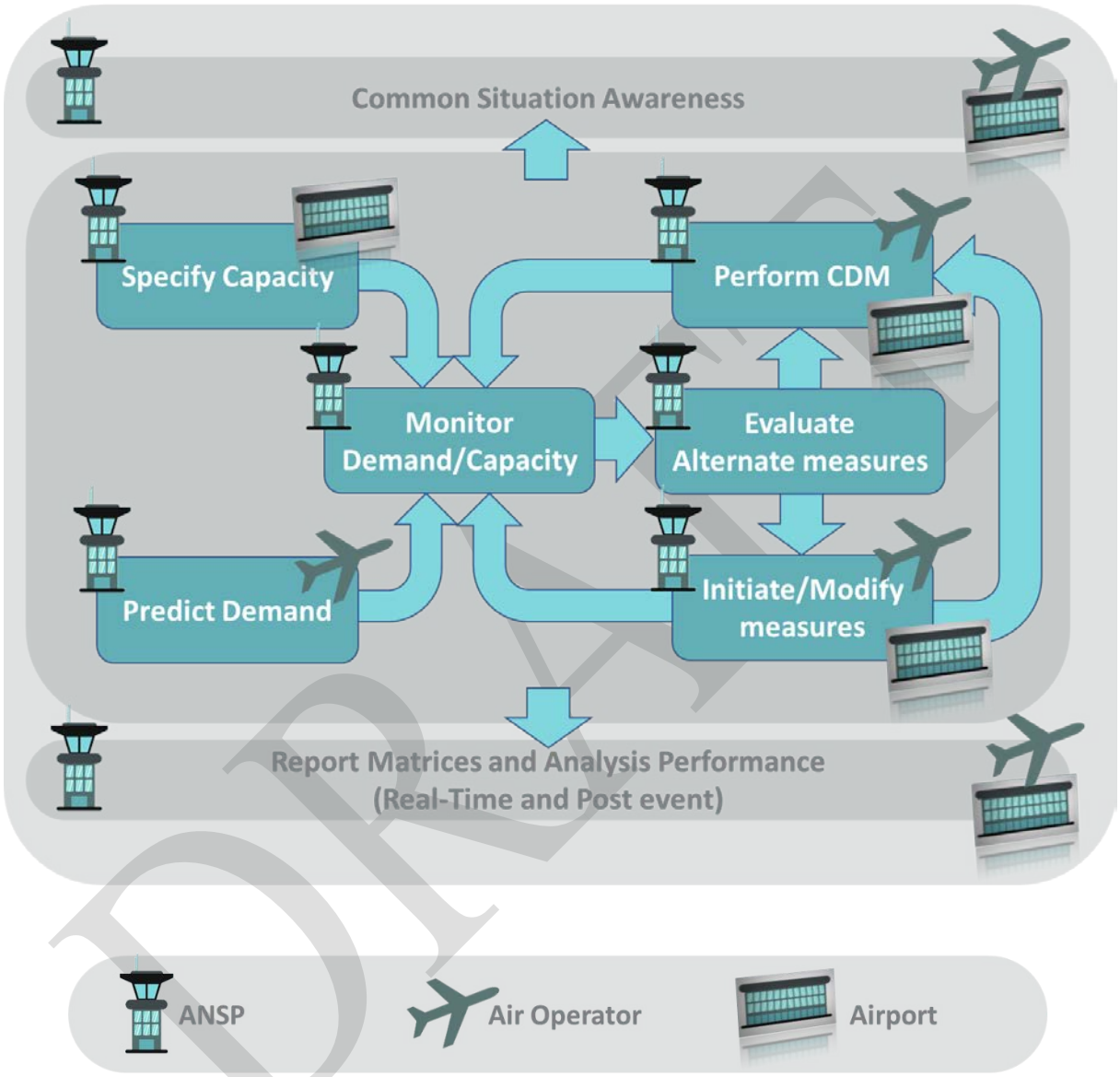

Figure 1: ATFM/CDM Functions

2. Scope

2.1 This document presents the regional ATFM CONOPS, supporting demand and capacity balancing for airports and airspace within the MID Region. The Concept includes existing ATFM/CDM principles that complements the ATFM measures currently in practice, such as conventional Ground Delay Programs (GDPs) or airborne holdings.

2.2 (CDM) is a key component of the CONOPS and is covered throughout this document. The CONOPS may be applied to any airport or airspace within the MID Region or elsewhere, especially in those airports or airspace serving significant number of international flights.

Document Overview

2.3 The document first discusses current operations and providing the justification for the Regional ATFM Concept. The proposed concept is then provided, followed by an operational scenario illustrating the concept, and finally the expected benefits.

2.4 The Concept will affect each stakeholder differently. The specific roles of each stakeholder group are detailed; Flow Management Position (FMP), Aircraft Operators, Airport Operators, ATC Tower , ATC Approach and ATC Area Control Centre roles are explained in Section 4.

The document has the following Sections:

- **Section 3 - Current Operations**, describes the current status of ATFM operations in MID region and the associated need for improvement.
- **Section 4 - Proposed Concept – Regional ATFM**, provides a detailed description of the concept, including assumptions, core capabilities, stakeholder responsibilities, and policy considerations. The section first describes the parts of the concept that must be consistent for any implementation of Regional ATFM. Implementation considerations, adaptable according to the needs of individual ANSPs are also described.
- **Section 5 - Operational Scenario**, illustrates an example of the step-by-step procedures for handling a given capacity reducing event, following the Regional ATFM Concept.
- **Section 6 - Expected Benefits of Proposed Concept**, presents a summary of the expected benefits resulting from the implementation of the proposed concept.

3. Current Operations in the MID Region

3.1 ANSPs in the MID Region currently have limited ATFM/CDM procedures in place to manage the traffic flows within their Flight Information Regions (FIRs). There is also lack of regional agreement to manage traffic flows between ANSPs. Some MID States do have some tools and processes to monitor and predict resource utilization, but the predictions are not always accurate, automated, or cross-border shared.

3.2 Strategic balancing of capacity at airports in the MID Region is currently undertaken through the airport slot allocation process or the application of Minimum Departure Intervals (MDIs). During the pre-tactical and tactical ATFM phases[1], balancing of arrival demand with the available capacity at airports is mostly reactive in nature. Planning ATFM measures ahead of time is difficult because the demand data are not generally accurately predicted and there is limited control of departures. As a result, most of the demand balancing is carried out by ANSPs within their own area of responsibility through tactical flow management in some FIRs with the support of arrival management systems (AMAN). This reactive management of demand often results in inefficient means of balancing flows, such as airborne holding and vectoring.

3.3 A challenge in terms of implementing an advanced ATFM system within the Region is the high percentage of international traffic. This characteristic poses a challenge to implementation due to the cross-border effect of ATFM measures such as Ground Delay Programs (GDPs) that assign flights with Calculated Take-Off Times (CTOTs) to comply with. Current, flights departing from airports outside of the ANSP's controlling authority operate as they originally intended, without absorbing all or even some of the delay. Accordingly, a new cross-FIR boundary concept is proposed to overcome

[1] Strategic, Pre-Tactical and Tactical ATFM Phases are defined in ICAO Doc 9971 – *Manual on Collaborative Air Traffic Flow Management*

this challenge and effectively apply ATFM measures to flights operating into constrained airports and airspace, while operating from airports or in the airspace of a different control authority.

3.4 There are, however, several ANSPs in the MID Region controlling significant domestic traffic, such as Egypt, Iran, Iraq and Saudi Arabia, where GDPs might be effective with only domestic traffic operating in accordance with assigned slots.

Successful Implementation Example 1: Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT)

3.5 International collaboration for demand and capacity balancing has been demonstrated by initiatives such as the Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT).

3.6 BOBCAT is a secure web-based computer system used to manage westbound aircraft operating through Afghanistan airspace from South and Southeast Asia to Europe during the busy nighttime period.

3.7 As a result of the lack of Communication Navigation Surveillance (CNS) facilities and military operations aircraft flying through this airspace are subject to restrictive separation requirements. In 2006 ICAO, upon request of IATA, formed a task force to implement a solution to the restrictions placed on aircraft flying through Afghanistan Airspace. AEROTHAI consequently developed a web-based solution which was implemented in July 2007.

3.8 BOBCAT assigns take-off times (departure slots) and levels for flights crossing the Kabul FIR based on Aircraft Operator requests. The request period is specified and the slot allocation occurs based on the existing requests. Aircraft Operators can request adjustments to the slot allocated based on their operational need and availability.

3.9 Some of the benefits realized since implementation of BOBCAT are:

- Regularity of departures
- Orderly Afghanistan entry
- Optimal FL achieved (80 – 90% in Afghanistan)
- Reroutes and technical stops eliminated
- Reduction of Air Traffic Control Officer and flight crew workloads
- Environmental Outcomes (Annual, based on IATA estimates in 2007):
  - Estimated Airline Cost Savings: US$86 million
  - Estimated Fuel Savings: 85,000 metric tons
  - Estimated Emissions Savings: 356,000 metric tons

Successful Implementation Example 2: ATFM in Australia

3.10 Airservices Australia has an automated ATFM system where projected demand and capacity are balanced through the implementation of ATFM measures, predominantly GDPs, and the assignment of ATFM slot times to aircraft. Aircraft Operators are advised of flight-specific off-block times at the domestic departure airports. These off-block times are calculated to deliver aircraft to the destination airport at the allocated arrival slot time. The ATFM system is used for pre-tactical and tactical planning and managing the arrival flows associated with the major Australian airports of Sydney, Melbourne, Brisbane, and Perth. The system offers effective pre-tactical and tactical decision support for managing demand-capacity imbalances and reducing air traffic saturation. CDM is supported through flight schedule updates, shared situational awareness, and schedule management

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(e.g., substitutions and cancellations).

Successful Implementation Example 3: ATFM in Japan

3.11 In 2005 the Japanese Civil Aviation Bureau (JCAB) established the Air Traffic Management Centre (ATMC) by recomposing the existing ATFM Centre to act as the leading and central function in order to drive forward Japanese Air Traffic Management (ATM). Through this office they are developing and implementing typical ATFM measures such as GDPs with slot swapping capability, re-routing, miles/minutes in trail, and Specifying Calculated Fix Departure Time for Arrival Spacing Program (SCAS). The ATMC has implemented CDM practices through twice-yearly stakeholder meetings and making available dynamic capacity changes every hour using web-based information sharing.

4. Concept – Regional ATFM

4.1 The regional concept was developed specifically for ANSPs in the MID Region based on APAC experience and could also be implemented in other regions. The MID Region is comprised of independent ANSPs, each managing traffic in their respective FIR with no overarching authority for the entire Region such as EUROCONTROL in Europe. The ATFM Concept for the MID Region is based on a model of distributed authority throughout the Region. Each individual ANSP will be responsible for issuing ATFM Measures to balance demand with capacity for airports and airspace within their FIR. Aircraft Operators will adhere to the ATFM policies, rules, and guidelines as defined and shared by the ANSP. Other stakeholders support each ANSP's ATFM measures as further described in this CONOPS.

4.2 The Concept is described from the perspective of a single ANSP managing the flow of traffic to to a constrained resource. These individual ATFM systems will communicate to ATFM systems in other ANSPs and continuously update them, providing the authorized stakeholders with a consistent and up to date network-wide information.

Concept Overview

4.3 ICAO Doc 9971 – Manual on Collaborative Air Traffic Flow Management is the foundation of the Regional ATFM concept. While this document provides guidance for harmonizing ATFM concepts across the world, different States and Regions still have the flexibility to devise policies and procedures to best suit their individual circumstances, at the same time keeping a balance between this and a network-wide seamless flow of traffic. The concept for Regional ATFM considers the unique characteristics of the MID Region, such as high international traffic volume from a wide variety of aircraft operators, and the large number of small FIRs.

4.4 Within the MID Region there is a need to balance demand against capacity at airports with a high concentration of international traffic during the pre-tactical and tactical phases. In the majority of ANSPs that have advanced ATFM capabilities implemented, GDPs are used to effectively match the demand with the airport capacity by redistributing the demand by issuing departure times to flights operating within the control authority of the ANSP, in some cases responding to adjacent FIR requirements. This trades airborne holding for ground delay, which is the fundamental benefit of a GDP. The Regional ATFM concept adopts the GDP as the foundation of operations, but with several key differences.

4.5 One of the parameters for a GDP is the scope of non-exempt and exempt flights. Exempt flights are considered in the demand but are not expected to respond to an ATFM control time. Reasons for exempting flights include flights departing outside of a certain distance or international flights. The longer flights are typically exempted when a GDP is implemented due to a capacity reducing event that has potential to be cancelled early; if many flights are airborne at the time the ATFM measure is cancelled, they will have absorbed delay that cannot be recovered. International flights are normally exempted from GDPs because ANSPs do not have the authority to delay flights departing from airports outside of their control, and due to the fact that international flights generally travel longer

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distances. However, the Regional ATFM concept, which aims to address cross-border ATFM, includes short- and long-haul international flights to achieve optimized demand/capacity balancing at constrained resources.

4.6 When a GDP is implemented, exempt flights are assigned to slots first, followed by non-exempt flights—meaning exempt flights will receive minimal delay. Even though exempt flights are issued a slot, they are not required to absorb any delay assigned by the GDP. As a result, it is important to have sufficient "participation" (i.e. a high volume of non-exempt flights) in order to implement a fair and effective GDP.

4.7 In the region, there are operational models where ANSPs do not allocate slot times for exempted flights and have given the flexibility to aircraft operators to depart at the strategically approved departure times.

4.8 ANSPs set the rules by which flights are exempted based on agreements with airlines, ANSPs, or airports. One of the main challenges is achieving agreements with enough stakeholders to issue effective GDPs. ATFM/CDM models in other parts of the world only include domestic traffic in ATFM measures (GDP and ground stop [GS]). In the majority of the MID States, where majority of traffic is international, this model cannot be applied.

4.9 Data analysis studies were conducted for Singapore's Changi Airport to estimate the percentage of non-exempt traffic needed to implement effective programs. Based on the analysis and operational experience in the U.S., South Africa, and Australia, a participation level of 75% is desirable for effective and equitable AFTM using existing GDP principles (see Attachment B for a summary of the Singapore participation case study).

4.10 The Regional ATFM concept consequently requires participation from many departure airports, ANSPs, and airlines to achieve a high level of non-exempt flights. For this reason, one of the fundamental principles of the Regional ATFM concept is providing Aircraft Operators (i.e. airlines) the ability to specify their delay absorption intent between ground delay and airborne flying time adjustments to achieve their assigned ATFM arrival slot. This overall flexibility is expected to increase participation by giving long-haul flights the ability to take their delay in the air, where the delay can be recovered if the program is cancelled early. Also, flights that are airborne at the time the program is implemented will be able to absorb program delay in this concept, further increasing participation.

Delay Absorption Intent

4.11 One unique aspect of the Regional ATFM concept is that instead of flights being required to take all of the delay on the ground, Aircraft Operators can choose how to distribute the delay assigned via the ATFM measure throughout various phases of flight. The three delay intent fields are described below.

- **Gate Delay Intent:** Delay intended to be taken while parked at the gate. By default, pre-departure flights are assumed to take all program delay at the gate. Before the flight pushes back, the Aircraft Operator has the ability to move all or a portion of the delay to the Airport Surface Delay Intent and/or the Airborne Delay Intent.

- **Airport Surface Delay Intent:** Delay intended to be taken between pushback and takeoff. This allows for flights to plan taking additional ground delay in cases where the airport or ATC requires the parking stand to be vacated prior to the absorption of all intended ground delay.

- **Airborne Delay Intent**: Delay intended to be taken efficiently during the cruise portion of the flight. For flights that are airborne or will soon be airborne when the ATFM measure is implemented, all of the program delay is assigned to the

Airborne Delay Intent. The ability to absorb program delay in the air is not part of any current operational ATFM system.

4.12 **Figure 2** illustrates the opportunity for absorbing delay in various phases of flight.

Figure 2: Opportunity for Absorption of Delay per Phase of Flight

4.13 Permitting flights to absorb ATFM program delay in the air can increase the number of flights participating in the program. In current ATFM systems GDPs generally exempt longer distance flights (e.g. flights traveling more than 2000 NM) due to risk of such flights taking unrecoverable delay; these flights could absorb delay on the ground, depart, and then the constraint at the arrival airport does not materialize, meaning that the flight absorbed delay unnecessarily.

4.14 Under the Regional ATFM concept, these longer flights can fly at a slower speed without any increase in fuel burn. For example, one study has shown that a flight between Rome and Paris can decrease its cruise speed by about 6% without changing altitude or fuel burn (**Figure 3**). The risks of long haul flights either taking unrecoverable delay or not participating in the ATFM program are decreased.

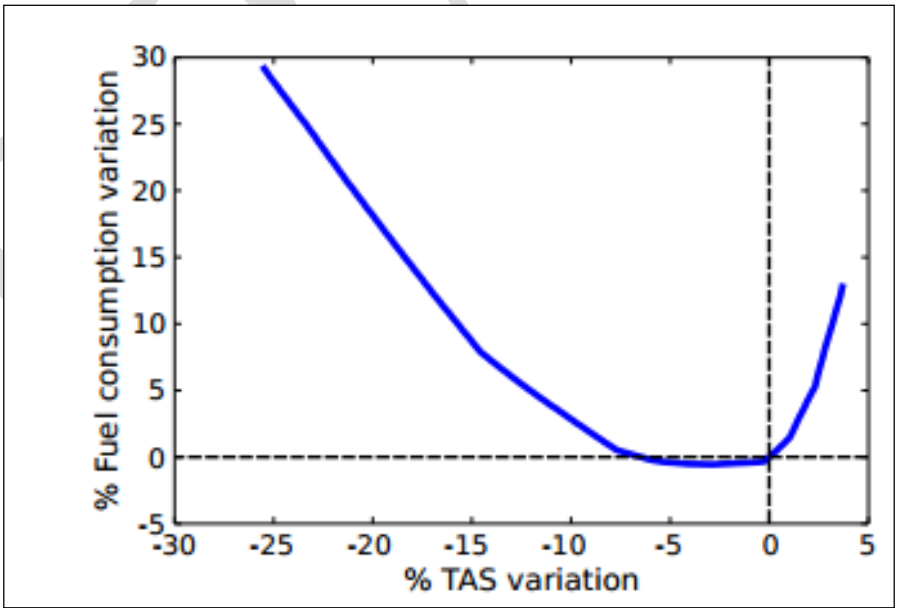

Figure 3: Fuel consumption variation for A320 Rome-Paris, F320, Mach 0.78, Cost Index 25 [Muñoz 2013]

4.15 Aircraft Operators may notify their delay intent by using one of two methods:

- via a web-based interface; or
- via a new flight plan or flight plan amendment.

4.16 When using the web interface, the Aircraft Operator directly enters the delay intent fields demonstrated in **Figure 4**. The aircraft operator may apportion some or all of the total delay to any of the three fields.

4.17 If the flight plan method is used the ATFM system infers the Intended Gate Delay and Intended Airborne Delay based on the filed Estimated Off-Block Time (EOBT) and filed Estimated Elapsed Time (EET) extracted from the new or amended flight plan.

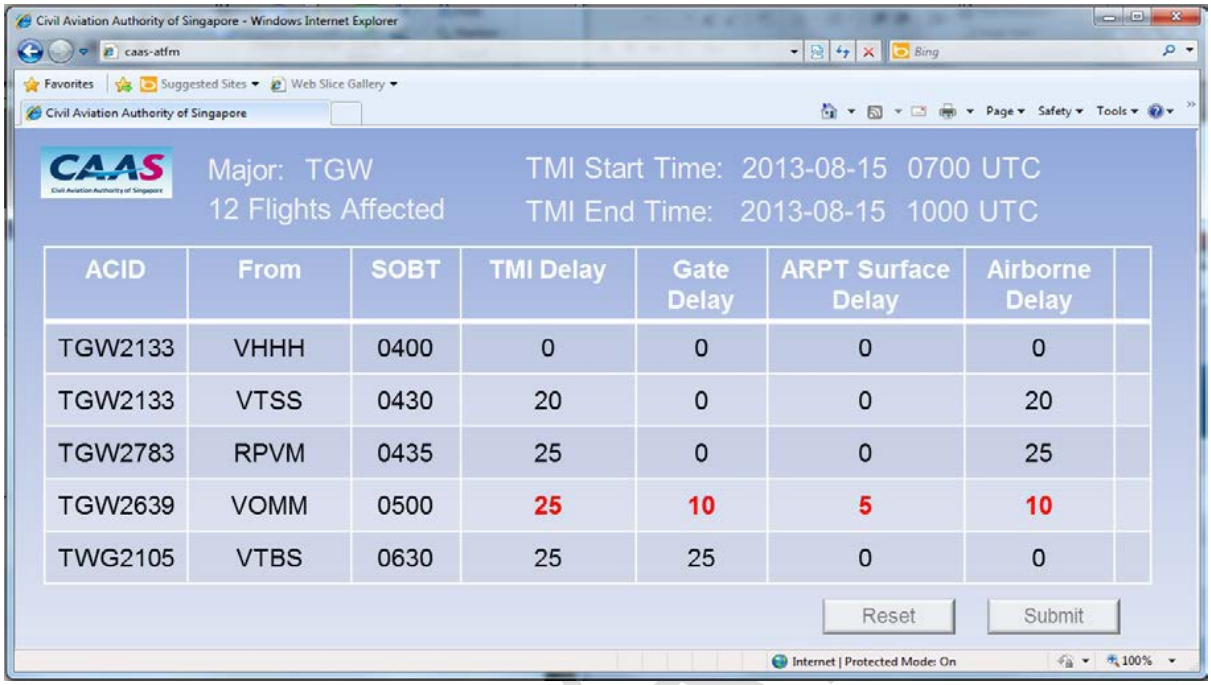

Figure 4: Example of web-based interface for delay absorption intent.

4.18 If the flight plan method is used to submit delay intent, en-route ATC will be aware of the flight-planned cruise speed and will control the flight appropriately. Flights that specify airborne intent via the web interface are expected to communicate their intended cruise speed to en route ATC as a request per current ATC procedures. ATC will continue to control the flight as done in current operations but may assist the pilot in meeting their intended airborne delay. This approach minimizes the required training and involvement of en-route ATC for the deployment of this Regional ATFM concept. Involvement of en-route ATC is a future consideration for the concept.

4.19 Since many of the major airports in the MID Region are IATA level 3 (Slot Controlled Airports), much of the work to balance demand and capacity in the strategic ATFM phase is already taking place. This process requires a rigorous analysis of the airport operations in order to determine the capacity of the airport. The scheduled demand is usually coordinated during bi-annual IATA Slot Conferences.

4.20 Airport Strategic Slot information is used by the ATFM process to transition from the strategic plan to the pre-tactical plan, then to the tactical plan on the day of operations. The flight data from the Strategic Slots is loaded in the ATFM System by the Aircraft Operators or ANSP at least one day prior to the day of operations. **Figure 5** shows a sample of the type of demand graph that should be available to the relevant stakeholders to quickly identify periods of demand-capacity imbalances and decide whether or not an ATFM measure must be implemented.

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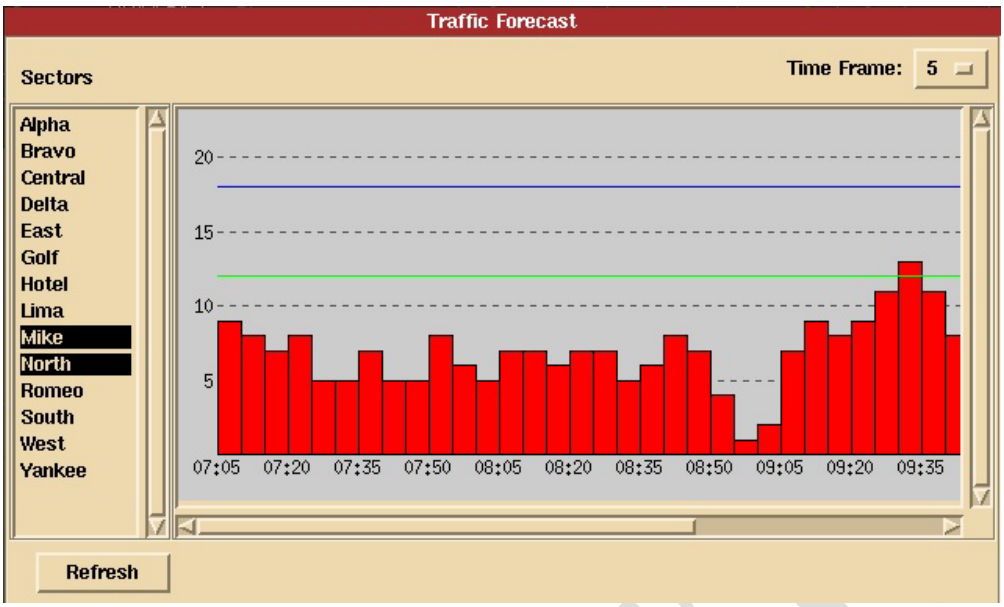

Figure 5: Example of capacity and demand

4.21 The stated capacity may change throughout the day due to operational factors or forecast weather. Capacity rates can be loaded into the ATFM system to reflect the capacity during a specific time period. For example, runway configuration changes could vary the rates in a predictable manner.

Initiating an ATFM measure

4.22 The Flow Management Position (FMP) continuously monitors the demand and capacity. When the current or predicted demand exceeds the capacity, the FMP will determine whether or not an ATFM program is needed based on the severity of the demand-capacity imbalance as well as feedback from CDM stakeholders. Before implementing ATFM measure under an ATFM program, the FMP and CDM stakeholders will have the ability to model with different parameters, including:

- Start and end time
  - Flights with estimated landing times within the start and end time of the program will receive ATFM slots
  - Non-exempt and exempt flight criteria
- Exemption criteria by: airline, airport, distance from arrival airport, or flight
  - Airborne Exemption Horizon: Flights that are airborne when the program is initiated and expected to land within the Airborne Exemption Horizon are exempted from the program
- Airport Acceptance Rate (AAR)
  - Number of aircraft that can land at the airport in a given time bin based on the predicted conditions
- Required Notification Time
  - When an ATFM measure is run, pre-departure flights that are expected to depart sooner than the Required Notification Time will have a default delay intent to absorb all of their delay in the air

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4.23 The FMP will evaluate if the demand is sufficiently smoothed and also consider the average delay, maximum delay, and the number of affected flights to determine the impact of the ATFM program. Once the optimal parameters are set, the FMP runs the program and slot times are sent to Aircraft Operators, air traffic control towers, and other stakeholders.

Maximum Delay concept

4.24 Included in the concept it is the acknowledgment that certain flights will have a limited amount of delay that can be absorbed. For example, an active flight cannot absorb any delay on the ground and will only be able to efficiently absorb a limited amount of delay in the air based on remaining flying time. Also, flights may have a limited amount of delay they can absorb on the ground due to constraints of the departure airport. For example, if some airports have very high gate utilization and very few holding areas, the amount of ground delay for a flight will be limited.

4.25 To address this, the concept includes a component termed Maximum Delay. Maximum Delay is made up of three parameters: *Maximum Gate Hold*, *Maximum Surface Hold*, and *Maximum Airborne Adjustment*. The Maximum Gate Hold can be provided by the associated departure Airport Operator and the Maximum Surface Hold can be provided by the departure tower. Both of these parameters can be set by time frame and by departure terminal. The Maximum Airborne Adjustment is estimated by the ATFM system considering the distance between the departure and arrival airports or remaining flying time for airborne flights.

4.26 The use of the Maximum Delay concept can be tailored for implementation based on the needs of individual ANSPs. The considerations for the use of Maximum Delay are presented in paragraphs 4.76 and 4.77.

Collaborative Decision-Making

4.27 Through the ATFM System, stakeholders will be given a broader view of system constraints that might affect their operation with enough lead time to create a plan of action. This increased situational awareness will facilitate stakeholder collaboration in deciding a course of actions.

4.28 Aircraft Operators are given the flexibility to manage their allocated ATFM delays in order to best meet their business objectives. Aircraft Operators will have the capability to substitute slots between any two flights that they operate. This can be done to reduce the delay of a high priority flight or move a delayed flight (e.g., mechanical delay, crew delay, or delay from a prior flight segment) into a slot that it can meet.

4.29 Aircraft Operators also have the ability to substitute flights into a later slot even if they don't have another flight that they operate to swap into the earlier slot. This is called an Inter-Operator Slot Exchange. The flight requesting a later slot submits the earliest time that it can operate and the system automatically selects one or more flights to move forward. Notifications are then sent to the Aircraft Operators that have flights which had their delay reduced, known as *bridged flights*.

Compliance

4.30 Non-exempt flights will be measured for compliance based on their allocated slot times versus actual time of operation. Medium and long-range flights which can absorb some delay in the air are measured for compliance with reference to the calculated time over (CTO) an arrival fix (AFIX). Short-haul flights that cannot efficiently absorb a significant amount of delay in the air may instead be measured for compliance with either their actual off-block time (AOBT) or actual take-off time (ATOT).

4.31 For ATFM measures relating to airspace demand and capacity balancing, compliance may be measured against the CTO at an en-route fix (RFIX).

4.32 Compliance is measured at a fix rather than at landing as flights have more control over

meeting a fix crossing time prior to initiated tactical ATC sequencing into the arrival airport. ANSPs specify the fixes that are to be used both for ATFM measures and measuring compliance. Flights will attempt to arrive at this fix within a compliance window.

4.33 Exempt flights are not considered for compliance measurement. These exempt flights are determined by the FMP for a given program and could include flights outside a given radius, flights departing from certain airports, and special case flights, for example, very-very important person (VVIP) flights. These flights will be assigned a slot time, which may involve some delay, but the flights will not be expected to comply with their assigned delay.

4.34 Where an exempted flight is not allocated with a tactical departure slot time, the compliance to strategically approved departure time needs to be measured, in order to avoid over demand.

4.35 Additionally, flights will be filtered from compliance consideration in cases where the Aircraft Operator is not at fault. For example, if the pilot does everything in their control to meet assigned slot times yet the flight arrives early or late due to an ATC constraint, then the flight will not be considered non-compliant.

4.36 ANSPs have the flexibility to develop their own policy and procedures for the handling of non-compliant flights. The considerations for the alternatives are explained in paragraphs 4.71 to 4.75.

4.37 Measuring and sharing of compliance statistics must be part of every implementation of the Regional ATFM concept and shall ensure access to all authorized stakeholders.

4.38 An agreed view of the compliance data needs to be availed to the general public to ensure the transparency of the entire process.

Post-Operations Analysis

4.39 A key component of the ATFM system as a data-sharing platform is the analysis capability enabled to study the effectiveness of ATFM programs and ATFM Measures applied and to establish trends over time. Post-operational analysis is indispensable for the FMPs to improve the parameters in the ATFM measures to achieve the desired outcome. The results of these analyses can be shared among FMPs in the region and “best practices” can be established.

4.40 A proposed metrics used for post operations analysis are listed in the tables below. **Table 1** lists the general scenario metrics, which are used to measure the severity of events that occurred, the ATFM measure parameters selected to resolve the issues, and the impact of the ATFM measure on stakeholders during a given time period. **Table 2** lists the CDM action metrics, which are used to determine how active the Aircraft Operators were in managing their flights.

Metric	Description	Type
Number of Flights	The total number of flights that received calculated times	ATFM measure
Start/Stop Time	The Start and End time of the ATFM measure. The time period when the FMP wanted to control the demand	ATFM measure
Lead Time	The number of minutes the ATFM measure was implemented before the Start Time	ATFM measure
Number of Exempt/ Non-Exempt flights	The number of flights that were exempt from the ATFM measure to the number of	ATFM measure

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	non-exempted according to the parameters specified by FMP (percentage)	
Number of ATFM measure Events	The number of FMP actions that reassigned flights in the ATFM measure (i.e. number of revisions and compressions)	Operational Activity
Total Assigned Delay	The sum of the delay assigned by the ATFM measure	Operational Impact
Max/Average Assigned Delay	The maximum and average delay	Operational Impact
Total Gate/Surface/Airborne Delay	The total actual delay taken at the gate, on the airport surface, and in the air	Operational Impact
Number of Cancellations	The number of flights canceled and were part of a given ATFM measure	Operational Impact
Number of Unexpected Flights	The number of flights that appeared after the ATFM measure was already implemented	Operational Impact
Compliance to the assigned times	Percentage of flights complying to assigned departure/fix times	Operational Impact
Utilization of capacity	Percentage of the count difference between the planned flights and the actual flights	Operational Impact
Details of exempted flights	Full details of exempted flights to avoid misuse of this arrangement	Operational Impact
Delay savings	Difference between potential (theoretical) delay and actual delay	Operational Impact
Fuel savings	Fuel savings derived from the delay savings	Operational Impact
Emission savings	Emission savings derived from the fuel savings	Operational Impact

Table 1: General Scenario Metrics

Metric	Description
Number of Evaluations	Total number of CDM stakeholders participation organized before implementation an ATFM measure.
Number of Substitutions	Total number of flights that were substituted
Number of Inter-Operator Slot Exchanges (ISEs)	Total number of ISEs
Number of Bridged Flights	The number of flights that were bridged
Number of Cancellations	Total number of canceled flights for a given time period
Substitution Savings	The amount of the savings in minutes of flights that move forward as a result of a substitution
Bridging Savings	The amount of the savings in minutes of flights that move forward as a result of being bridged
Number of Delay Modifications	Number of modifications made by the Aircraft Operator to their flight event times to show flight would be delayed

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Metric	Description
Number of Delay Intent Modifications	Number of modifications made by the Aircraft Operator to their delay intent values
Number of technical support	Number of operational/technical support provided by the FMP for an any other stakeholder to meet an ad hoc operational needs

Table 2: CDM Action Metrics

4.41 Compliance metrics are useful for reviewing the effectiveness of an ATFM measure and identifying systemic hindrances. There are many ways that users can view compliance metrics. For example, in **Figure 6** compliance is compared at various points in flight progress. The different colors in the pie chart show different levels of compliance, where orange and red are different degrees of late and blue and dark blue are different degrees of early.

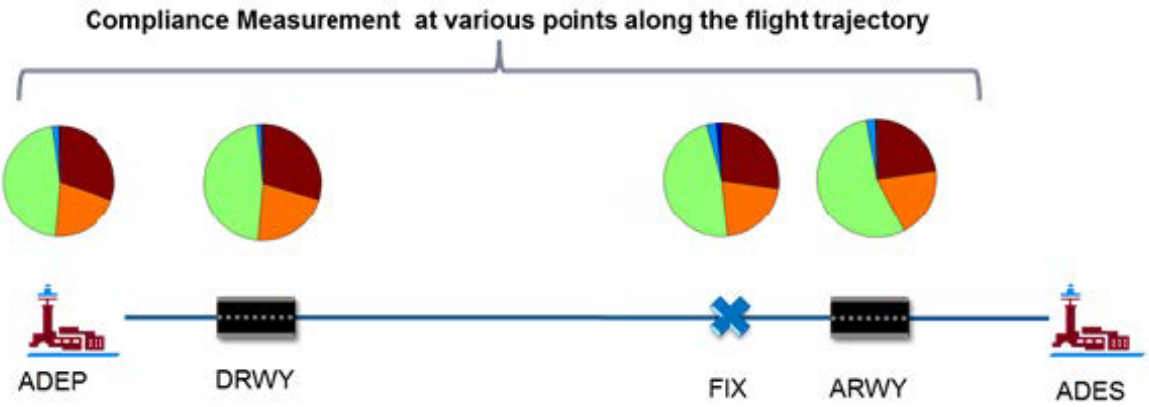

Figure 6: Compliance Metrics

Stakeholder Roles and Responsibilities

4.42 With the exception of the FMP, Regional ATFM stakeholders are the same as in the flight and ATM operations, but with added roles. First of all, stakeholders will collaborate on a daily basis in order to ensure the smoothest operations. This communication is done by sharing data with the ATFM System as well as during virtual/teleconferences organized by the FMP or any stakeholder. This communication will lead to a common view of the most accurate demand and resource capacities. When multiple ANSPs have implemented this concept, the virtual/teleconferences may exist at one or more levels of stakeholder participation to provide the necessary information to all stakeholders in the Region.

4.43 In addition to increased communication among the stakeholders, each stakeholder group has specific changes that result from the concept, described as follows:

Flow Management Position

4.44 Upon implementation of Regional ATFM, an FMP will need to be established within each ANSP. FMPs will be part of a flow management unit that is responsible for managing the operation of the ATFM system and the associated CDM processes within the ANSP.

4.45 The main responsibility of the FMP is to monitor the demand by viewing flight data from the ATFM System and comparing that to the arrival capacity of the airport(s) in their jurisdiction. The FMP collaborates with relevant stakeholders to update the capacity (i.e. AAR) when there is a constraint such as predicted weather or resource maintenance/outage. Whenever the predicted demand exceeds the capacity, the FMP shall organize CDM stakeholder's virtual/teleconferences to determine the best solution for the problem, which will likely involve implementing an ATFM measure. The FMP will have the ability to model various initiatives to smooth the imbalance and, in coordination with local stakeholders, select the solution that suits the best to meet the operational objectives set by the CDM

stakeholders. Additionally, if multiple ANSPs in the region have an ATFM system, the FMP may coordinate with FMPs of other ANSPs to establish the best regional solution taking all the regional requirements into consideration. While ANSPs may have different ATFM systems, they will transmit and receive data in a common way, thereby enabling all regional FMPs to share the same operational information.

4.46 Once the ATFM program is running, the FMP will monitor the performance of the program. The FMP has the ability to revise a program if any of the parameters need to be changed. The FMP also has the ability to perform a compression (optimizing slot allocation) on a program to reassign flights to slots and to fill in any empty slots. Both of these actions involve having new slot times assigned and sent to the Aircraft Operators; therefore, these FMP actions are limited to operational need based on updated flight data or capacity information.

4.47 The FMP will also be responsible for organizing scheduled and ad-hoc virtual/teleconferences. Scheduled teleconferences will be held on a regular basis as agreed by the CDM stakeholders. The daily airspace plan will be discussed and could include: demand anticipated during the day, weather forecasts and constraints, resource availability/non-availability, any degradation of the ATS or its supporting services provisions, special use of airspace, Aircraft Operator operations, proposed ATFM measures modeling and implementation, and post-event analysis. Ad-hoc virtual/teleconferences can also be held should circumstances dictate a need.

Aircraft Operators

4.48 Aircraft Operators will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.49 Aircraft Operators will see changes in the way they manage their flights due to the redistribution of inevitable delay. When a demand and capacity imbalance is predicted, an ATFM program will shift the delay from the more costly airborne holding delay to the more efficient ground delay or airborne adjustment. Both the Flight Operations Center (FOC) and pilot need to be aware of the assigned ATFM measure and work to comply with it in order for the concept to be effective and equitable.

4.50 An additional role of the Aircraft Operator is to provide the demand inputs into the ATFM System in the pre-tactical and tactical time frame. These data could include flight schedule uploads and flight plans. As the time to operate the flight approaches, the Aircraft Operator can update flights' EOBT (e.g. flights delayed due to technical issue) through the ATFM System, making the changes visible to all stakeholders.

> *Note: Delay information input to the ATFM system does not replace the aircraft operator or pilot-in-command obligation to file delay, amendment, or cancellation and new FPL information, as specified in ICAO Doc 4444 PANS-ATM and State AIP.*

4.51 When an ATFM program is implemented, Aircraft Operators have the flexibility to prioritize flights within the pool of slots they have been assigned and to specify the intended delay distribution for their flights. The FOC will communicate this delay intent to pilots and the flights will be measured for compliance with the slot times, as described in paragraphs 4.71 to 4.75.

Airport Operators – Departure Airports

4.52 Airport Operators will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.53 Airport Operators will be impacted by implementation of a ATFM measures as a departure flight may elect to take ground delay at the gate or between pushback and departure (Airport surface delay), which affects gate allocations and movement area and apron and taxiway usage. The Airport Operators' main involvement in the regional concept is to coordinate with Aircraft Operators

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for absorbing delay on the ground whenever necessary.

4.54 Where airport terminal (gate) capacity is constrained, Airport Operators may submit Maximum Gate Delay values to the ATFM system, as described in paragraphs 4.24 to 4.26.

Airport Operators – Arrival Airports

4.55 Airport Operators will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.56 Airport Operators will be responsible for advising the FMP on capacity constraints predicted at the airport. They will be expected to participate in scheduled and ad-hoc teleconferences. The Airport Operator will advise the FMP should the ATFM measures have an adverse effect on operations at the monitored airport.

Airport Collaborative Decision Making (A-CDM) Interface

4.57 A-CDM systems should interface with the ATFM system, using the Regionally agreed terminologies relevant to both ATFM and A-CDM; CTOT and calculated landing time (CLDT).

ATC – Departure Tower

4.58 The ATC Tower will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.59 The Tower ATC can facilitate compliance with ground delay intent as far as operational constraints allow. With access to the flight-specific intended takeoff time, Tower ATC officers can assist flights to have a compliant departure.

4.60 In addition, the Departure Tower ATC can coordinate where to best place the aircraft on the movement area in order to absorb the ground portion of the delay, without affecting the other aircraft movements.

4.61 Lastly, the Tower can submit Maximum Surface Delay values to the ATFM system, as described in paragraphs 4.24 to 4.26. The ATFM system should flag Maximum Surface Delay values input by ATC to identify where ATC or airport surface capacity constraint results in non-compliance with an ATFM measure.

ATC – Arrival Tower

4.62 The ATC Tower will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.63 The ATC Tower supervisor will be required to keep the FMP advised of constraining events at the airport. The Tower supervisor will be required to participate in teleconferences so as to add to the pre-tactical and tactical CDM processes. In addition, the tower supervisor will be required to tactically determine the AAR and advise the FMP if any change in the AAR is required.

ATC – Approach Control Unit (APP)

4.64 The ATC Approach Control Unit (APP) will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.65 Approach Control Unit (APP) will have no requirement to change their operational procedures to accommodate flights subject to an ATFM measure. Pilots may request an altitude or speed change in order to comply with their delay intent distribution. The ATC will follow normal ATC

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operating procedures before approving these changes. Education on the fundamental principles of the Regional ATFM concept will serve to increase controllers' awareness.

4.66 Terminal Area (TMA) ATC units in certain implementations of ATFM may have the authority to de-prioritize non-compliant flights. This model can be adopted but requires compliance status of flights being available to ATC. Adding this function to the terminal ATC depends on the ANSP's decision made in terms of compliance handling described in paragraphs 4.71 to 4.75.

ATC – Area Control Centre (ACC)

4.67 The ATC Area Control Centre (ACC) will participate in CDM stakeholder's virtual/teleconferences and may also organize one in consultation with FMP, when multiple stakeholder's input is required.

4.68 En-route ATC units and centers will have no requirement to change their operational procedures to accommodate flights subject to an ATFM measure. Pilots may request an altitude or speed change in order to comply with their delay intent distribution. The ATC will follow normal ATC operating procedures before approving these changes. Education on the fundamental principles of the Regional ATFM concept will serve to increase controllers' awareness.

4.69 Terminal Area (TMA) ATC units in certain implementations of ATFM may have the authority to de-prioritize non-compliant flights. This model can be adopted but requires compliance status of flights being available to ATC. Adding this function to the terminal ATC depends on the ANSP's decision made in terms of compliance handling described in paragraphs 4.71 to 4.75.

Proposed Changes Resulting from Implementation

4.70 The following Technology and Policy changes supporting the implementation of the Regional ATFM Concept are proposed.

Technology Changes

4.71 Stakeholders will be able to perform demand and capacity balancing during the pre-tactical and tactical phases with the ATFM system. Through this system the FMP can model ATFM programs with participation of CDM stakeholders and with various parameter values to optimize the solution. When the ATFM measure is acceptable to the CDM stakeholders, then the ATFM measure runs and the slot times are automatically calculated and sent to the appropriate Aircraft Operators as well as shared with all stakeholders using a common platform such as a web interface.

4.72 Common situational awareness for all the stakeholders is essential for implementing effective ATFM measures; the ATFM system will bring this situational awareness to ANSPs, Aircraft Operators, Airport Operators, and other stakeholders. The ATFM system will integrate various data sources with the most accurate and up-to-date operational information. Users can connect to the ATFM system to view pertinent information as well as update any changes to their operations. Efficient sharing of more accurate data leads to better decision making in a timely manner. A CDM platform is required where Aircraft Operators are able to carry out advanced CDM processes to optimize schedules.

4.73 Users will be able to access stored data for post-operation analysis. Stakeholders will be able to view metrics for any previous day of operations (for a list of metrics, refer to paragraph 4.37 Tables 1 and 2). Statistical analysis of post operations data will help identify shortfalls in operations and methods to improve operations.

Policy Changes

4.74 Policy changes associated with Regional ATFM include involvement in teleconferences, which will increase information sharing compared with current-day operations. CDM stakeholders may participate in scheduled teleconferences to discuss the plan for the day as well as to

review operations on the previous day. The stakeholders calling into the scheduled teleconferences include the FMP, Aircraft Operators, neighboring ANSP facilities, the ATC tower(s), and the local Airport Operator. If necessary, the FMP will coordinate with the FMPs of other regional ANSPs in a separate teleconference. The FMP may also convene and chair ad-hoc teleconferences to handle unforeseen demand and capacity imbalances.

4.75 Policy in terms of data sharing will have to change with the implementation of ATFM since sharing of data is the foundation of CDM. Aircraft Operators will have the ability to view delay metrics associated with their flights as well as aggregate metrics for all flights. ATC stakeholders will have unlimited situational awareness with regard to slot assignments. Access, security, and data integrity must all be addressed in single ATFM System instances and in the connectivity and data sharing between multiple ATFM System instances.

4.76 Aircraft Operators and third-party agencies generally measure on-time performance (OTP) by comparing flights' actual off-block times (AOBT) with their scheduled off-block times (SOBT). With the implementation of ATFM, the policy for measuring OTP should consider flights impacted by an ATFM measure. For these flights, on-time performance should be determined by comparing flights' actual off-block times and actual landing times with their intended off-block times. This is a challenge for ATFM systems since Aircraft Operator on-time performance is often defined by legislative action. To date, the impact of an ATFM initiative on a departure OTP metric has not been formalized.

Justification for Changes

4.77 Table 3 summarizes the major changes resulting from the Concept, and their justifications.

Change	Justification
Introduce a Flow Management Position	• A smoother transition of strategic demand and capacity balancing to pre-tactical and tactical demand and capacity balancing • A means of evaluating proposed ATFM measures in collaboration with the stakeholders prior to implementation • A communication position within the ANSP to keep stakeholders apprised of the operational conditions
Assign slot times to flights to manage demand-capacity imbalances	• Reduced fuel burn / emissions • Reduced controller workload • Increased predictability of operations • Enhanced safety due to reduced congestion
Aircraft Operators share flight data with ATFM system	• Accurate and common picture of demand
FMP specifies capacity	• Accurate and common picture of capacity
Aircraft Operators specify delay absorption intent	• Increased participation improves ATFM measure effectiveness and results in a more equitable delay assignment • Increased flexibility for Aircraft Operators to manage flights • Reduced risk of absorbing unrecoverable delay
International and airborne flights	• Increased participation improves ATFM measure effectiveness and results in a more equitable delay assignment

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Change	Justification
participate in ATFM measures	
Aircraft Operators have the ability to substitute flight slots	• Flexibility for Aircraft Operators to manage flights based on their business models
Airport Operators and ATC Tower specify Maximum Ground Hold	• Increased situational awareness - Aircraft Operators: aware of flights which may have received more delay than they can absorb - FMP: more accurate picture of when flights will actually arrive at the terminal area
Measure compliance at a fix prior to landing	• Ensure a smooth flow of traffic to the constrained airport • Move Aircraft Operator compliance point beyond tactical terminal control area.
Post-Operations Reporting	• Provide a means to discover ways to improve operations
Teleconferences	• Increased situational awareness • Operational data exchange

Table 3: Changes and their Justifications Arising from the Concept

Impacts During Deployment

4.78 The participation of stakeholders has contributed to the development of the concept of operations; this participation will need to continue for successful operational deployments. This participation would include:

- Participation in stakeholder meetings establishing business rules specific to an ANSP's implementation;
- Development of operational procedures;
- Training of staff;
- Participate/organize operational daily and ad-hoc virtual/teleconferences; and
- Active participation in data sharing and ATFM measure execution.

Multi-Nodal Concept

The Regional ATFM concept has been described in the above from the perspective of a single ANSP. The concept readily applies to multiple ANSPs in the same region all implementing this form of ATFM/CDM. A key to the concept is that each ANSP would be responsible for implementing ATFM programs to airports and airspace within their area of responsibility according to the concept illustrated in this document. Information sharing between the ATFM systems would allow the users from any of the systems to have access to network-wide information. This includes Aircraft Operator access to controlled flights arriving at airports within the areas of responsibility of multiple ANSPs, and Air Traffic Control Tower access to ATFM information on departure flights bound to airspace and airports within the areas of responsibility of multiple ANSPs with CTOT and CTO reflecting delay intent from their respective ATFM measures. Details of the concept and procedures could be customized in each ANSP based on their individual operational requirements, but it is strongly recommended to keep the concept as consistent as possible across the region. Refer to paragraphs 4.70 to 4.78 for the details that

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can be adapted. **Figure 7** provides an example of the networked ATFM nodes under the MID Regional ATFM concept.

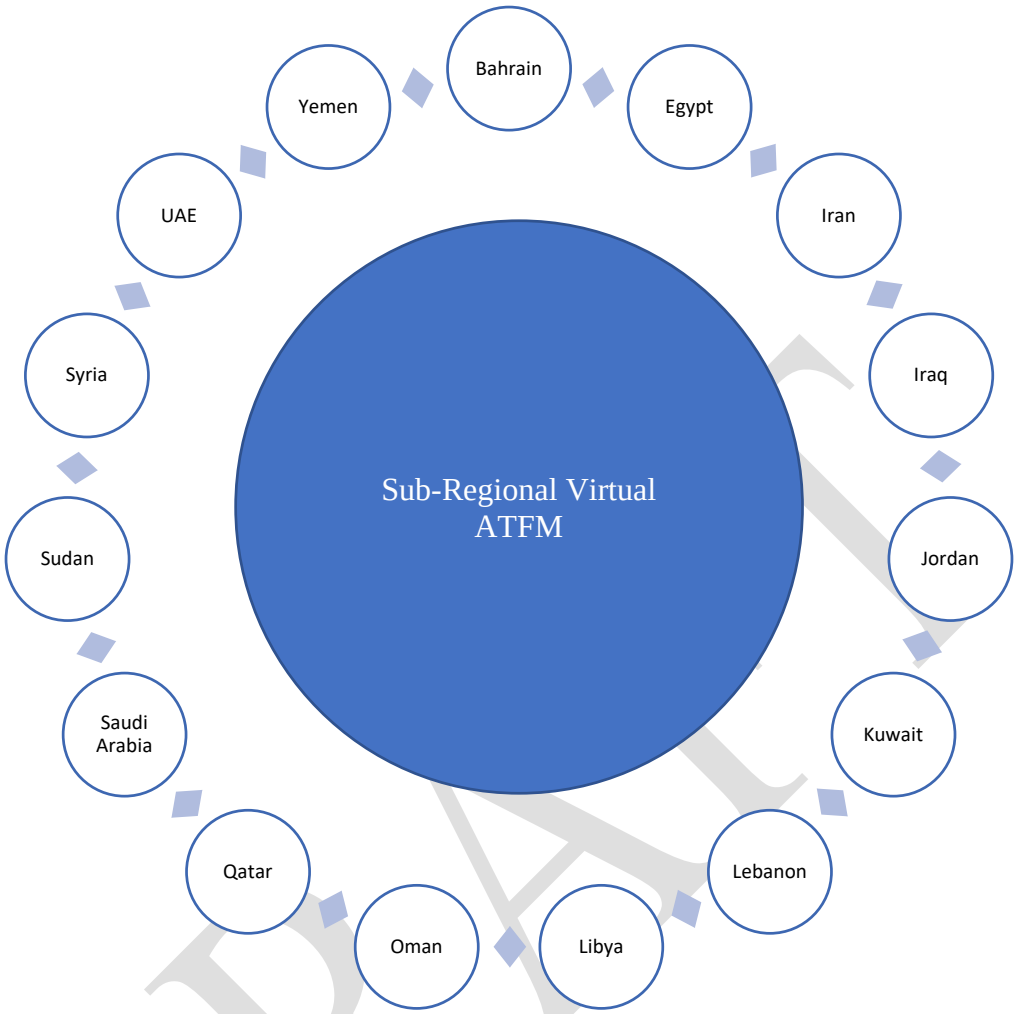

Figure 7: Distributed Multi-nodal ATFM Network

Implementation Considerations

4.79 The following concept elements can be addressed to meet the needs of a specific ANSP. The variations on the elements are described below to provide the full breadth of the concept without indicating a preference for a specific implementation.

Compliance Handling

4.80 High levels of compliance are critical for ATFM measures to have a predictable and efficient flow of traffic. Non-compliant flights could cause bunching in the arrival flow, requiring ATC to impose airborne holding or other tactical interventions on compliant flights. Non-compliance could consequently result in loss of trust among Aircraft Operators in the efficiency and equity of the Concept.

4.81 In current ATFM implementations, ANSPs have developed a range of procedures for preventing non-compliance. The options, together with their advantages and disadvantages are presented below along with their advantages and disadvantages. Note that the options are not mutually exclusive.

- Sharing of compliance statistics with stakeholders

  - Advantages

        - Promotes CDM principles through the transparency of data;
        - Aircraft Operators will strive for high compliance to maintain/improve the airline's reputation;
        - Flights that are unable to absorb delay (e.g. VVIP flights and emergencies) will not be penalized for non-compliance.
    - Disadvantages
        - No direct consequences for non-compliance
- Departure ATC prevents pushbacks or departures if flights will be non-compliant with their assigned CTOTs
    - Advantages
        - Little if any non-compliance with CTOTs
    - Disadvantages
        - Increased workload for ground movement controllers
        - Operational challenges associated with pilots absorbing delay at a holding pad
        - No penalty for non-compliance with intended airborne delay
- Deprioritize non-compliant flights in the arrival airspace
    - Advantages
        - Equitable amounts of delay taken for compliant and non-compliant flights
        - Compliant flights are not penalized when other flights are non-compliant
    - Disadvantages
        - Technical and procedural challenges associated with integrating the ATFM system and AMAN
        - Increased workload for approach controllers

4.82 Tactically deprioritizing flights in the approach airspace would require the ANSP to define fixes outside of the approach area that would be used to measure the compliance. If the ANSP has an AMAN, it would be best to measure compliance prior to the AMAN handoff point. This would ensure smooth delivery of the flow into the AMAN, which would then be used to sequence flights to the runway. It would also provide sufficient time for a Flow Manager or supervisor to decide which flights to deprioritize if the ANSP decides to deprioritize non-compliant flights. Due to the unique geometry of the airspaces, the distance from the airport at which compliance is measured will be adapted to each ANSP.

4.83 The size of the window at which flights are considered compliant is dependent on implementation and stakeholder involvement. An asymmetric (e.g. -5, +10 minutes) window could be used because Aircraft Operators have more control over not arriving early than not arriving late. In other words, Aircraft Operators could be late due to a variety of reasons such as weather deviations or

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an ATC constraint. Pilots generally have enough control over the flight to prevent an early arrival.

4.84 Individual ANSPs in the region will set compliance standards within their areas of responsibility; however, a standard procedure for handling non-compliance is recommended in the region for operating consistency.

Performance Metrics and Post-Operational Analysis

4.85 The metrics for post-operation analysis described in paragraphs 4.37 to 4.39 should be applied to all the ANSPs in the region because they are metrics related to the broader Regional ATFM concept and not the specific implementations. The common set of metrics will help the international ATFM community develop a method for comparison with operations around the world. In addition to those metrics, the concept allows for ANSPs to develop their own metrics and statistics particular to their operations. Some possible metrics/statistics to consider are:

- Program Delivery – Shows how effective the ATFM measure was at balancing the capacity and demand. It compares the expected demand after the ATFM measure was implemented with the actual demand. This is useful in identifying periods of non-compliance.
- On-Time Performance Metrics – Typically ATFM only considers whether ATFM measures were successful in balancing demand with resource capacity. On-Time performance represents another aspect of national airspace operations that is a good indicator of efficiency and is directly tied with impacts to the passengers. It is important to track the impact on passengers because it gives an insight on whether ATFM measures were able to provide benefits to more passengers rather than more aircraft.
- Environmental Metrics – Shifting air delay to ground delay has a positive impact on the environment through emissions reduction. Fuel burn metrics could be developed to study and track positive impacts of implementing an ATFM measure. The metrics could also support achieving the environmental goals any government may have.

Additional metrics could delve deeper into airport and airspace operations. They would be useful in identifying root causes of inefficiencies that have been exposed by higher-level aggregate metrics.

Maximum Delay

4.86 The implementation of the Maximum Delay to flights will be determined by each ANSP. Three options are:

1. Added as a parameter for the Aircraft Operators to compare to assigned delay
2. Incorporated into FMP demand predictions
3. Maximum Delay is incorporated in slot assignment

4.87 The first use will help Aircraft Operators manage their flights by ensuring the assigned delay is not greater than the Maximum Delay via delay intent adjustments and substitutions. The second use will help the FMP determine the effectiveness of a modeled ATFM measure. For example, if many flights are receiving more delay than their Maximum Delays, the FMP could increase the participation to reduce the average delay of participating flights. Maximum Delay during slot assignment could limit the delay assigned to flights such that their assigned delay is less than or equal to their Maximum Delay. This approach is not recommended for initial implementation, because it requires very accurate calculations of Maximum Delay.

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Future Considerations – Role of En-route ATC

4.88 **Role of En-Route ATC**: The Concept of Operations states that the FOC will communicate delays associated with ATFM measures to their pilots. If the pilot needs to absorb some delay in the air in order to be compliant, the pilot will request speed and altitude changes to ATC, and the controller will approve the request if possible. With this tactic, en-route ATC will operate under the same procedures used currently.

4.89 Increasing the involvement of en-route ATC is possible based on ANSP involvement, controller training, and the desire to be actively involved in supporting airborne adjustments. For example, the en-route ATC could be aware of controlled flights' calculated times and actively direct flights to ensure compliance. This involvement increases the workload of en-route controllers but increases the likelihood that flights are compliant with the ATFM assigned delays. Due to the required time to add this role and the large number of stakeholders impacted, this role is not considered for the current concept, but may be considered in the future.

5. Operational Scenario

5.1 The initial conditions for this scenario are illustrated in **Figure 8**. The FMP views the demand and capacity predictions at the arrival airport. The FMP sets the runway configuration and AAR after coordinating with the tower and terminal supervisors. The pre-tactical demand is lower than the nominal capacity, so there is no need for any arrival airport ATFM measures.

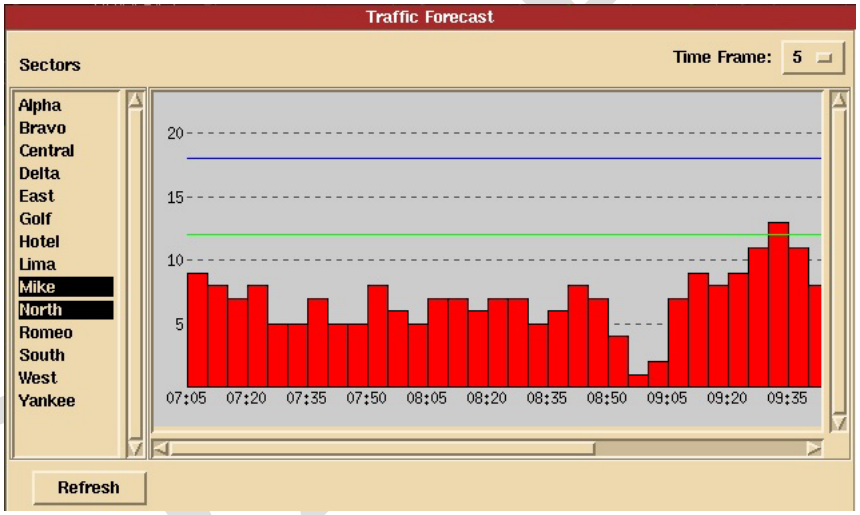

Figure 8: Demand and Capacity Prediction

5.2 At 0000 UTC, the military informs the FMP of a military exercise that will impact the operations at the airport. The reduced capacity will likely cause a demand and capacity imbalance, which can be managed by running an ATFM measure. The parameters for the ATFM measure are selected such that the capacity reducing event will have the least possible impact on all of the stakeholders. The result of the modeled ATFM measure is shown in **Figure 9**, with the parameters listed below:

- AAR based on the capacity reducing event: 25 between 0500 and 1100 UTC
- ATFM measure start time: 0500
- ATFM measure end time: 1100
  - Flights with estimated landing times between the start and time of the program will receive a slot, or Calculated Landing Time (CLDT), at the arrival airport.

- Non-exempt flights: 15 major airlines from the region
  - The major airlines will attempt to comply with their assigned slot times, regardless of their departure airport.
  - The few remaining flights from other airlines are exempt and will receive priority in slot assignments.
  - Exempt/Non-exempt status can also be set for specific airports and flights and based on distance.
- Active Flight Exemption Horizon: 1 hour
  - Airborne flights estimated to land within the next hour will be exempt from the program and receive priority in slot assignments because they will not be able to efficiently absorb any delay.
- Required Notification Time: 1 hour
  - The default intent for pre-departures that are estimated to depart within the next hour is to absorb all of their delay in the air because the FOCs require approximately one hour to notify pilots of the ATFM measure.

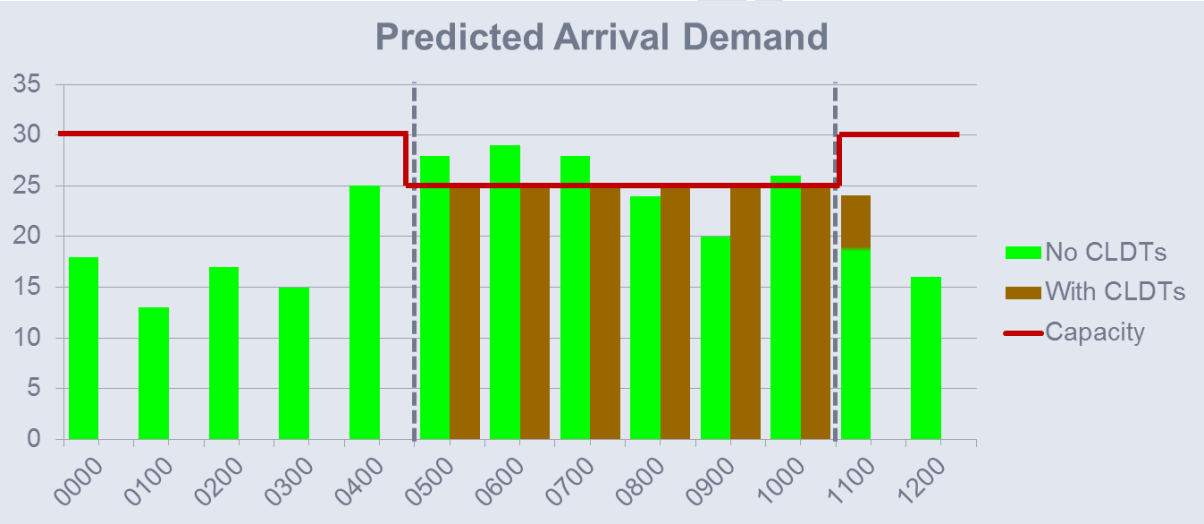

Figure 9: Modelled ATFM program

5.3 The FMP coordinates with CDM stakeholders via teleconference to coordinate the potential impact of implementing the ATFM measure. While all stakeholders can provide input on the program parameters and suggest alternative solutions, the FMP is the ultimate decision-maker.

5.4 The FMP runs the proposed ATFM measure, and slot assignments are sent to Aircraft Operators. The slot assignment event times are prefixed with the letter C for Calculated and include:

- Calculated Off-Block Time (COBT)
- Calculated Take-Off Time (CTOT)
- Calculated Time Over (CTO)
- Calculated Landing Time (CLDT) (arrival slot time)

5.5 Aircraft Operators have the flexibility to distribute the delay intent of pre-departure

flights into three attributes: Intended Gate Delay, Intended Surface Delay and Intended Airborne Delay. In certain cases, Aircraft Operators will coordinate gate and surface delay intents with the Airport Operator to manage gate turnaround times and gate conflicts.

5.6 The Thai Airways FOC decides to absorb a portion of the assigned delay of flight THA641 in the air (**Figure 10**). Of the 20 minutes of the assigned delay, THA641 intends to absorb 10 minutes at the gate and 10 minutes in the air. The FOC submits the delay intent to the ATFM system via the web interface. The FOC then informs the pilot of the intended delay.

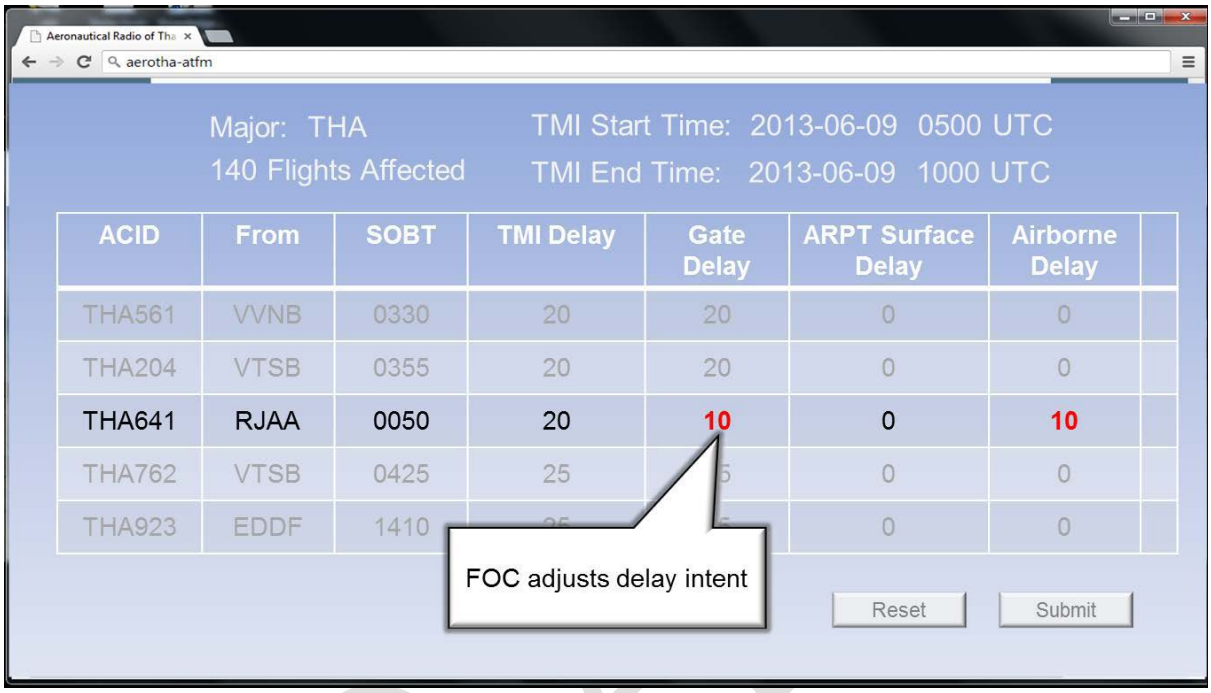

Figure 10: Delay Absorption Intent

5.7 The event times associated with the intended delay are prefixed with the letters “DL”. For flights that intend to absorb some delay on the airport surface or the air, their DL Off-Block Time (DLOBT) and DL Take-Off Time (DLTOT) will be different from the Calculated “C” times associated with the slot. **Table 3** shows the updated DL-times for THA641 based on ten minutes of gate delay and ten minutes of airborne delay. Notice the DLOBT and DLTOT are both ten minutes earlier than the COBT and CTOT because the flight intends to make up that additional ten minutes delay in the air.

ACID	DLOBT	COBT	DLTOT	CTOT	DLLDT	CLDT
THA641	0100	0110	0110	0120	0600	0600

Table 3: the updated DL-times

5.8 Aircraft Operators also have the ability to substitute flight slots in order to meet their business objectives. For example, CPA713 is a high-priority flight, so the Cathay Pacific FOC substitutes it with CPA739. The CLDTs of the two flights are swapped and the CTOTs are recalculated based on the new slot times. The result of the substitution is shown in **Figure 11**.

Figure 11: Pre- and Post- Flight Substitution

5.9 Pilots request pushback clearance at the departure airport at the Delayed Off-Block Time (DLOBT). Following the departure airport's procedures, flights receive clearance for pushback. At certain departure airports, procedures may be altered such that flights can only receive pushback approval if the request is within a compliance window.

5.10 Approach and en-route controllers will operate as they do in current operations and may have a basic understanding of the Regional ATFM concept. Flights that intend to absorb some delay in the air may request speed and or altitude changes en-route in order to meet the intent. The en-route controller may accept or reject the speed or altitude request based on ATC operational requirements.

5.11 Arriving flights will be measured for compliance at an AFIX prior to landing. If a flight's actual time over (ATO) the fix is within the compliance window of the flight's CTO for the fix, the flight will be considered compliant. In addition, flights that are late to the fix due to an ATC constraint will not be considered non-compliant.

6. Expected Benefits of the Concept

6.1 There are many expected benefits with the implementation of the Regional ATFM concept. The major areas of improvements upon the current procedures include:

- A smoother transition of demand and capacity balancing from strategic to pre-tactical and tactical phases of ATFM.
- Reduced fuel burn and emissions.
- Accurate and common view of demand and capacity predictions.
- A means of modeling and evaluating proposed ATFM measures in collaboration with the stakeholders prior to implementation.
- Flexibility for Aircraft Operators to optimize their schedules through a web-based CDM platform.
- Flexibility for flights to absorb inevitable delay on the ground or efficiently through the en-route portion of the flight rather than by holding in the terminal area.
- A more reliable data source of stakeholder intent—this applies to Aircraft Operators sharing how they intend to operate the flights, as well as ANSPs and airports sharing any resource constraints.
- Enhanced safety by ensuring safe traffic densities.

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- A data platform that integrates various flight data sources and provides common situational awareness to the stakeholders.
- An environment in which ATFM measures and other operational procedures can be improved through post-operational trend analysis.

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Attachment A: ATFM Background

ATFM Measures

A.1. There are a wide variety of ATFM measures that resolve demand-capacity imbalances by shifting demand either spatially or temporally. These measures can be classified into the following three groups

- Spacing Restrictions—Require consecutive flights in a common flow to be separated by a specified time or distance.
  - Miles-in-Trail (MIT)
  - Minutes-in-Trail (MINIT)
  - Minimum Departure Intervals
- Rerouting: Shifts demand around a weather constraint to create a spatially balanced flow of traffic.
  - Fix balancing
  - Collaborative Trajectory Options Diversion of flows
  - Level capping (i.e. restricting the altitude of certain flight plans)
  - Re-route
- Ground Holding: Shifts predicted airborne holding delays to ground holding at the departure airport by controlling flights' departure times.
  - Ground Delay Program (GDP)
  - Ground Stop (GS)

Some actions that would be used to mitigate the impact of ATFM Measures:

A.2. Some measures can be taken by the Airspace User to mitigate the impact of a proposed ATFM measure based on their business model: slot swapping is the most commonly used method. Re-routings, even though they are ATFM measures, may also be used by Airspace User(s) to that end, when, for example, an Airspace User opts for a longer route or a speed reduction in order to avoid a congested area at a specific time. In all cases, such mitigations can only be chosen following an established CDM process.

A.3. Slot swapping can be applied either manually or via automated means. The ability to swap ATFM departure slots gives Airspace Users the possibility to change the order of departure of the flights that should fly in a constrained area. This action provides Airspace Users with the ability to manage and adapt their business model to a constrained environment.

A.4. Airborne holding may be complementary to ground delay programs and ground stops. Airspace Users may, in collaboration with the ANSP, choose to use this program to keep a small inventory of holding aircraft during periods of congestion, to maintain demand pressure on the approach. The supply of available aircraft can prevent losing opportunities when departure demand is not constant or when meteorological conditions vary. Airborne Holding, in general, is costlier than other methods, but Air Traffic Managers may plan for airborne holding when required delays are predicted to be low.

A.5. It is recognized that airborne holding is a last-resort measure, as in-flight holding places a hefty burden on both Airspace Users and ANSPs. In the event that the arrival of a given flow of traffic needs to be delayed, measures such as slowing aircraft well before the planned top of descent, and making use of the required time of arrival (RTA) have proven to be effective. Most of these techniques make good

use of aircraft capabilities and usually reduce operating costs and environmental impacts without increasing the workload of the ATC.

ICAO Guidance on ATFM

A.6. The ICAO Doc 9971- *Manual on Collaborative Air Traffic Flow Management (ATFM)* provides recommendations for ATFM implementation. ATFM should be implemented in phases in order to build stakeholder knowledge as operations become more complex. It is also important for procedures to be developed in a harmonious manner among states in the region to reduce operational differences. ICAO also recommends three communication methods for information sharing: scheduled telephone or web conferences, tactical telephone conferences, and an automated web page or ATFM operational information system.

A.7. The list below is a summary of the ICAO document's suggested initial steps to implement ATFM:

- Establish objectives, project management plan, and oversight of ATFM
- Identify personnel who will lead the development of ATFM
- Brief stakeholder groups on ATFM principles
- Define the ATFM structure that will be established
- Consider the facilities and equipment that will need to be procured
- Develop a model for establishing AAR
- Identify points of contact for dealing with ATFM issues
- Define the elements of common situational awareness including: Meteorological information
- Traffic display tools
- Identify the appropriate means of ATFM communication
- Develop Letters of Agreement between adjacent FIRs
- Develop user manuals and training materials

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Attachment B: Participation Analysis – Changi Case Study

B.1. This following is a summary of an analysis conducted to determine a required participation level for effective implementation of ATFM measures.

B.2. A fast-time simulation was created to simulate the impact of various participation levels on ATFM measure effectiveness, using scheduled takeoff times were from Changi arrival data. The flight progress was simulated with GDPs implemented with various reduced capacities at two participation levels. 1400 NM and 2400 NM radii around Changi provide approximately 50% and 75% participation levels, respectively. The map in **Figure B1** shows the airports that are included in the two radii explored.

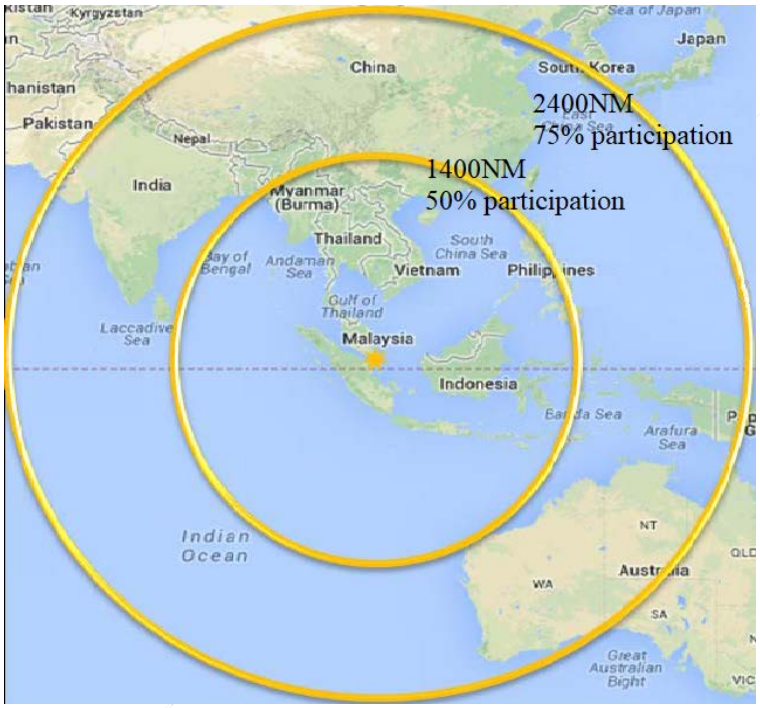

Figure B1: Airports within Participation Radius

B.3. The results for the two participation levels are compared in **Figure B2**. As indicated by the plots, the total delay increases exponentially as the capacity is reduced. In the severe case of a 16 flights/hour airport capacity (about half of the nominal arrival capacity), participating flights receive an average of 2.3 hours of delay when participation is 50% and about 1.6 hours of delay when participation is 75%. Therefore, increasing the participating flights reduces the delay per participating flight by 0.7 hours. The reason for this reduction is that there are fewer exempt flights that get priority in the slot assignment.

Figure B2: Participation Analysis

B.4. The delays for the non-participating flights are also reduced when the participation level is increased. In the example below, the airborne delay for non-participating flights is reduced from 0.3 hours to about 0 hours when increasing participation from 50% to 75%. This is because the demand of participating flights is generally lower than the capacity of 16 when the participation is 75%, whereas when the participation level is 50% there are a significant number of non-participating flights that need to be delayed in order to bring the total demand below capacity.

B.5. When the capacity reduction is less significant, the difference between the two participation levels is less pronounced. For example, when capacity is reduced to 20, the average delay for participating flights is reduced from 0.4 hours to 0.3 hours for 50% and 75% participation, respectively. The reason for this reduction in the difference between the two participation levels is due to the fewer flights that receive delay. As shown in **Figure B2**, the demand is below 20 for most of the day, meaning an ATFM measure is not needed for most of the day.

B.6. Based on these results and knowledge from currently implemented ATFM systems, high participation (>75%) is necessary to manage the flow of traffic during events with a relatively high reduction in capacity. If the capacity reducing event induces minor delays, the flow may be managed with less than 75% participation.

ACTION PLAN FOR IMPLEMENTATION OF ATFM IN THE MID REGION

Key Activities	Action		Target date	Deliverable	Champion	Supported by	Status / RMK
	No	**Description**					
Key Activity 1 Agreement on the ATFM Regional Framework	**1.1**	Recommending the best Scenario for a regional ATFM framework	20 Mar 2019	Recommendation	ATFM TF/2 meeting		Completed
	1.2	Presentation to the ACAO ANC/40	21 Mar 2019	Support	ACAO		Completed
	1.3	Preparing a Working Paper to MIDANPIRG/17	30 Mar 2019	WP	Secretariat	Chairman	Completed
	1.4	Agreement on the regional ATFM framework by MIDANPIRG	18 Apr 2019	MIDANPIRG Conclusion	MIDANPIRG/17	Secretariat	Completed
	1.5	Presentation to the ACAO Executive Council	28-29 Apr 2019	For support	ACAO		Completed
	1.6	Notifying States about MIDANPIRG/17 Conclusion and that the development of ATFM CONOPS started	30 Apr 2019	State Letter	ICAO	Chairman	Completed
Key Activity 2 Development of CONOPS	**2.1**	Review of the CONOPS V0.1 during ATFM TF/3	12 Jan 2020	ATFM CONOPS draft V0.1	ATFM TF/3		Completed
	2.2	Further review V0.1 and develop V0.2 for presentation to the ATFM TF/4	20 Feb 2020	ATFM CONOPS draft V0.2	ATFM Core Team		Completed
	2.3	Review V0.2 by the ATFM TF/4	20 Sep 2020	ATFM CONOPS draft V0.2			Completed
	2.4	Presentation to ACAO ANC	28 Sep 2020	For Info and Support	ACAO		Completed
	2.5	Development of the CONOPS draft V0.3	20 Oct 2020	Chairperson and Secretariat			Completed
	2.6	Circulate the MID ATFM CONOPS draft V0.3 to ATFM TF members	20 Oct 2020	email to TF members for final comments	Secretariat	ACAO	Completed
	2.7	Feedback form Task Force members on the MID ATFM CONOPS draft V 0.3	31 Oct 2020	Feedback/comments	Task Force members		Completed
	2.8	Presentation of MID ATFM CONOPS draft V0.3 to ATM SG/6 for review	9 Nov 2020	Consolidated version of ATFM CONOPS V0.3	Chairman and Secretariat	ATFM Core Team	Completed
	2.9	Endorsement of the MID ATFM CONOPS V1.0 by MIDANPIRG/18	Feb 2021	ATFM CONOPS V1.0	MIDANPIRG/18		
	2.10	Circulation of the MID ATFM CONOPS V1.0 to States	Mar 2021	State Letter	ICAO MID		
	2.11	Presentation to ACAO Executive Council	May 2021	For Info and Support	ACAO		

Key Activity 3 Development of ATFM Regional Framework and Common Operating Procedures	**3.1**	Development of ATFM Regional Framework and Common Operating Procedures initial draft V0.1 to be presented to the ATM SG/6	1 Nov 2020	ATFM Regional Framework and Common Operating Procedures initial draft V0.1	Chairperson and Secretariat		On going
	3.2	Circulation of the ATFM Regional Framework and Common Operating Procedures initial draft V0.1 to ATFM TF members	15 Nov 2020	email to ATFM TF members for comments	Secretariat		On going
	3.3	Feedback form Task Force members on ATFM Regional Framework and Common Operating Procedures initial draft V0.1	15 Dec 2020	Feedback/comments			
	3.4	Development of: - ATFM Regional Framework draft V0.2, - ATFM Common Operating Procedures draft V0.2.	Jan 2021 Feb 2021	- ATFM Regional Framework draft V0.2, - ATFM Common Operating Procedures draft V0.2.	ATFM Core Team	Volunteers (States/ ANSPs/ ORGs)	
	3.5	Presentation to ATFM TF/5 VTC of: - ATFM Regional Framework draft V0.3, - ATFM Common Operating Procedures draft V0.3.	Apr 2021	- ATFM Regional Framework draft V0.3, - ATFM Common Operating Procedures draft V0.3.	ATFM TF/5 Virtual meeting		
	3.6	Presentation to ACAO ANC	Mar 2021	For Info and Support	ACAO		
	3.7	Circulation of the: - ATFM Regional Framework draft V0.3, - ATFM Common Operating Procedures draft V0.3. to ATFM TF members.	May 2021	email to ATFM TF members	ICAO	ACAO	
	3.8	Feedback on V0.3.	July 2021	Feedback/comments	ATFM TF members		
	3.9	Consolidation of: - ATFM Regional Framework draft V0.4, - ATFM Common Operating Procedures draft V0.4. for presentation to ATM SG meeting.	Nov 2021	Consolidated version of Draft ATFM Regional Framework and draft Common Operating Procedures	Chairman and Secretariat	Chairman ATFM Core Team	

	3.10	Presentation to ACAO Executive Council.	Dec 2021	For Info and Support	ACAO		
	3.11	Endorsement of MID ATFM Regional Framework and Common Operating Procedures V1.0 by MIDANPIRG/19	Q1 2022	ATFM Regional Framework and Common Operating Procedures V1.0	MIDANPIRG/19		
	3.12	Circulation of the endorsed versions of CONOPS, Regional Framework and Common Operating Procedures and posting on the ICAO MID Website.	Q1 2022	State Letter	ICAO	ACAO	
	3.13	Presentation to ACAO Executive Council	May 2022	For Info and Support	ACAO		
Key Activity 4 Implementation of ATFM in the MID Region	**4.1**	Development of MID ATM/CDM	9 Nov 2020	MID ATM/CDM	Chairperson and Secretariat		On going
	4.2	Teleconferences between concerned stakeholders to exchange ATM related info	Q1 2021	Teleconferences to exchange info	ICAO MID	States - ORGs	
	4.3	Implementation of the MID ATFM Regional Framework and Common Operating Procedures	Cont.	Implementation roadmap	States		
	4.4	Implementation of ATFM framework at national level	Cont.	National ATFM framework	States		
Key Activity 5 Post Implementation Review of the MID ATFM Regional Framework	**5.1**	Post implementation review	Each 3 months	Post Implementation review	ATFM Core Team		
	5.2	Improvement of the ATFM Regional Framework and Common Operating Procedures	TBD 2022	Proposal for improved ATFM Regional Framework and Common Operating Procedures	ATFM TF	ATFM Core Team	
	5.3	Review and continuous improvement of the ATFM Implementation in the MID Region with consideration of establishment of centralized ATFM system for the MID Region	TBD	Continuous improvement	ATFM TF	ATFM Core Team	

Key Activity 6 Training and raising awareness related to ATFM	**6.1**	Development of National ATFM Implementation Plan and Training Programme Template for qualifying ATFM Specialist	TBD 2021	Training Programme Template for ATFM Specialist	ATFM TF / ATFM Core Team		
	6.2	Development of working arrangement for the ATFM Visits to States that would include ATFM Workshop and/or training courses	TBD 2021	working arrangement for the ATFM Visits	ATFM TF / ATFM Core Team		
	6.3	Organizing an ATFM Workshop with the planned A-CDM Workshop	21-23 Oct 2019	A-CDM/ATFM Workshop	ICAO/ACAO	ATFM TF	Completed
	6.4	Organizing of ATFM Workshop/Training Courses	TBD 2021	ATFM Training Courses	ICAO/ACAO	TBD	
	6.5	Conduct ATFM Support visits to States	TBD 2021	ATFM Support visits	ATFM support Team	TBD	
	6.6	Conduct familiarization visits/webinars of ICAO ATM/CDM CADENA, Singapore, India, EUROCONTROL, FAA, etc.	TBD	ATFM Familiarization Visits	ACAO ICAO		

FWC2022 PLAN OF ACTIONS

Action		Target date	Deliverable	Champion	Supported by	Status / remarks
No.	**Description**					
1.	Prepare a working paper on the outcome of the FWC2022 to MIDANPIRG/17	30 Mar 2019	WP to MIDANPIRG Combined with ATFM WP	Secretariat	Chairman	Completed
2.	Task the MIDRMA to carry out an airspace assessment for the MID Region based on the anticipated traffic flow during the FWC2022	18 Apr 2019	MIDANPIRG Conclusion	MIDANPIRG	ICAO MID	Completed Conclusion 17/24
3.	Initial FWC2022 Roadmap and Operation plan principles to be presented on FWC2022 TF/4 meeting	22 Sep 2020		Qatar		Completed
4.	Airspace assessment study and tool developer meeting to review the offer and agree on the details	1 Oct 2020	Detailed requirements, deliverables and timelines. Legal and financial responsibilities	Qatar, MIDRMA	ICAO MID	Completed
5.	Provide the forecasted FWC2022 FPL/Traffic data to the MIDRMA using the Traffic Data Sample template	15 Oct 2020	Forecasted FWC2022 FPL/Traffic data for at least 10 days	Qatar	MIDRMA	Completed
6.	Assess the potential impact on traffic flows **within the RVSM Airspace** based on the projected Traffic Data using the current MIDRMA tool capabilities	29 Oct 2020	FWC2022 RVSM Airspace assessment	MIDRMA	Qatar	On-going
7.	Follow up meeting regarding the developer offer for beyond RVSM Airspace Assessment	Nov 2020	Final decision for Airspace assessment study and tool offer	Qatar	MIDRMA, ICAO MID	On-going
8.	Present Qatar decision to MIDRMA board meeting, to agree on financial and legal agreements / arrangements	Nov 2020	Conclusion related to the contract (Developer – MIDRMA – Qatar)	Chairman	MIDRMA	Depending on item #7 Qatar decision
9.	Assess the potential impact on traffic flows **beyond the RVSM Airspace** based on the projected Traffic Data using the developed MIDRMA tool capabilities	Start: TBD Delivery: 6 months period	FWC2022 beyond RVSM Airspace assessment results	MIDRMA		Depending on item #7 Qatar decision

Action		Target date	Deliverable	Champion	Supported by	Status / remarks
No.	**Description**					
10.	Present the results of the airspace assessment to the FWC2022 TF/5 meeting	Q2 2020	WP/PPT	MIDRMA	ICAO MID	On-going
11.	Prepare an initial FWC2022 Roadmap and Operational Plan to be shared with ATFM Core Team that includes all required procedures, action plan, contingency measures, etc.	31 Oct 2020	Initial FWC2022 Roadmap and Operational Plan	Qatar	Core team	On-going
12.	draft FWC2022 Roadmap and Operational Plan to be presented to the ATM SG/6 meeting	9 - 12 Nov 2020	WP/PPT Draft FWC2022 Roadmap and Operational Plan	FWC2022 Chairman		On-going
13.	Enhance the draft FWC2022 Roadmap and Operational Plan	15 Dec 2020	Enhanced the draft FWC2022 Roadmap and Operational Plan	Core Team		
14.	Present FWC2022 Roadmap and Operational Plan and progress on Airspace structure assessment to MIDANPIRG/18	Feb 2021	WP	Chairman	ICAO	
15.	Present the final FWC2022 final Roadmap and Operational Plan and airspace structure assessment to MIDANPIRG/19 meeting	Feb 2022				
16.	Conduct familiarization visit(s) to State(s) or Organizations that would be managing major events	TBD	Familiarization visit(s)	Qatar and Members of FWC2022 TF, as required	FAA EUROCONTROL CANSO AEROTHAI	

Total Number of Deficiencies is: 26

Deficiencies in the ATM field

IRAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Still to sign with Kuwait	H	Corrective Action Plan has not been formally provided by the State	Iran	~~Dec 2018~~ Dec 2020 To be closed	A
2	MID ANP TABLE ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS routes A418/UP574 not implemented	Dec 2006	KUMUN-PAPAR segment not implemented.	S O	Corrective Action Plan has not been formally provided by the State	Iran- UAE	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	B
3	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS Route G202 is restricted to certain defined airspace users	Jun 2014	Not all Operators are authorized to fly G202	O	Corrective Action Plan has not been formally provided by the State	Iran	~~Dec 2018~~ ~~Dec 2020~~ Feb 2021	B

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Deficiencies in the ATM field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G667 not implemented	Sep 2006	Segment ALSAN-ABD not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq- Iran-Kuwait	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	B
2	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency Agreement to be signed with Syria	S	Corrective Action Plan has not been formally provided by the State	Iraq	~~Dec 2018~~ ~~Dec 2020~~ Aug 2021	A
3	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route A424 not implemented	May 2008	LOTAN-LOVEK segment not implemented	O	Corrective Action Plan has not been formally provided by the State	Iraq	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	B
4	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G795 not implemented	May 2008	RAF-BSR segment not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq- Saudi Arabia	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	B
5	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	ATS route	ATS Route G669 not implemented	May 2008	segment RAF - SOLAT not implemented	S	Corrective Action Plan has not been formally provided by the State	Iraq	~~Dec 2018~~ ~~Dec 2020~~ To be closed	B

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Deficiencies in the ATM field

JORDAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency agreements not signed with Syria.	H	Corrective Action Plan has not been formally provided by the State. State comment: due to political impact in the region Jordan is not able to complete the signature of contingency agreements with all adjacent States	Jordan	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	A

Deficiencies in the ATM field KUWAIT										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency Plan to be signed with Iran	S	Corrective Action Plan has not been formally provided by the State	Kuwait	~~Dec 2018~~ ~~Dec 2020~~ To be closed	A

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Deficiencies in the ATM field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency agreements not signed with Syria	S	Corrective Action Plan has not been formally provided by the State	Lebanon	~~Dec 2018~~ ~~Dec 2020~~	A

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Deficiencies in the ATM field LIBYA										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para 3.3.5.1	-	Not reporting the required data to the MIDRMA in a timely manner.	Dec 2013	-	HO	Corrective Action Plan has not been formally provided by the State	Libya	~~Dec 2018~~ ~~Dec 2020~~	A
2	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs	Dec 2014	Agreement signed only with Egypt	SO	Corrective Action Plan has not been formally provided by the State	Libya	~~Dec 2018~~ ~~Dec 2020~~	A

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Deficiencies in the ATM field

OMAN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	~~Annex 11 Para. 2.31~~	~~-~~	~~Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.~~	~~Nov 2006~~	~~Contingency Agreements to be signed with Saudi Arabia.~~	~~S~~	~~Corrective Action Plan has not been formally provided by the State~~	~~Oman~~	~~Dec 2018~~	~~A~~

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Deficiencies in the ATM field QATAR											
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Contingency agreements not signed with UAE.	S	Corrective Action Plan has not been formally provided by the State	Qatar-Bahrain	~~Dec 2018~~ ~~Dec 2020~~	A

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Deficiencies in the ATM field

SAUDI ARABIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	~~Contingency Agreements not signed with Iraq, Qatar, Sudan and Yemen.~~ Contingency Agreements not signed with Iraq, Qatar and Sudan.	S	Corrective Action Plan has not been formally provided by the State	Saudi Arabia	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	A

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Deficiencies in the ATM field SUDAN										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Dec 2014	Contingency Agreement signed only with Egypt	HSO	Corrective Action Plan has not been formally provided by the State	Sudan	~~Dec 2018~~ ~~Dec 2020~~	A

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Deficiencies in the ATM field

SYRIA

Item No	Identification		Deficiencies					Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**			**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route G202 not implemented	Dec 1997	Segment DAKWE - Damascus not implemented	S		Corrective Action Plan has not been formally provided by the State	Syria	~~Dec 2018~~ Dec 2020	B
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route UL602 not implemented	Dec 2003	Segments ELEXI-DRZ-GAZ not implemented.	S		Corrective Action Plan has not been formally provided by the State	Syria	~~Dec 2018~~ Dec 2020	B
3	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	No signed agreement yet	H	O	Corrective Action Plan has not been formally provided by the State	Syria	Dec 2018	A
4	Annex 11 Para 3.3.5.1	-	Reporting unsatisfactory LHDs to MIDRMA	Oct 2013	Syria to coordinate with MIDRMA.	H		Corrective Action Plan has not been formally provided by the State	Syria	~~Dec 2018~~ Dec 2020	A

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Deficiencies in the ATM field UAE											
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 11 Para. 2.31	-	Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs.	Nov 2006	Plan completed and Agreements signed with Bahrain, Iran, Oman and Saudi Arabia. The plan next is to sign with Qatar after the finalisation of the LoA.	O	Corrective Action Plan has not been formally provided by the State	UAE	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	A
2	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS routes A418/UP574 not implemented	Dec 2006	KUMUN-PAPAR segment not implemented.	S	Corrective Action Plan has not been formally provided by the State	Iran- UAE	~~Dec 2018~~ ~~Dec 2020~~ Dec 2021	B

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Deficiencies in the ATM field

YEMEN

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	~~Annex 11 Para. 2.31~~	~~-~~	~~Development of **contingency plan for implementation** in the event of disruption or potential disruption of ATS and related supporting services. The Plan should also address natural disasters and public health emergencies. Contingency agreements should be signed with all adjacent ACCs~~	~~Nov 2006~~	~~Contingency Agreement signed only with Oman.~~	~~H O~~	~~Corrective Action Plan has not been formally provided by the State~~	~~Yemen~~	~~Dec 2018~~	~~A~~
2	Annex 11 Para 3.3.5.1	-	Granting RVSM approvals for aircraft without known hight-keeping monitoring results	Dec 2012	-	H O	Corrective Action Plan has not been formally provided by the State	Yemen	~~Dec 2018~~ Dec 2020	A
3	Annex 11 Para 3.3.5.1	-	Reporting Unsatisfactory LHDs to MIDRMA	Oct 2013	Yemen to coordinate with MIDRMA.	H	Corrective Action Plan has not been formally provided by the State	Yemen	~~Dec 2018~~ Dec 2020	A

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Total Number of Deficiencies is: 10

Deficiencies in the SAR field

IRAQ

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 12 Para. 2.1	-	Lack of provision of required **SAR services**	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	~~Dec 2018~~ Jun 2020	A
2	Annex 6 Part I, Chap.6 and Part II Chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with **carriage of Emergency Locator Transmitter (ELT)** requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Iraq	~~Dec 2018~~ Jun 2020	A

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Deficiencies in the SAR field

KUWAIT

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	ELT	Non-compliance with **carriage of Emergency Locator Transmitter (ELT)** requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Kuwait	~~Dec 2018~~ Jun 2020	A

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Deficiencies in the SAR field

LEBANON

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 12 Para. 2.1	-	Lack of provision of required **SAR services**	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Lebanon	~~Dec 2018~~ Dec 2020	A

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Deficiencies in the SAR field

LIBYA

Item No	Identification		Deficiencies			Corrective Action			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**	**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of **Emergency Locator Transmitter (ELT)** requirements	Dec 2014	- H S O	Corrective Action Plan has not been formally provided by the State	Libya	~~Dec 2018~~ Dec 2020	A
2	Annex 12 Para. 2.1	-	Lack of provision of required **SAR services**	Dec 2014	- H S O	Corrective Action Plan has not been formally provided by the State	Libya	~~Dec 2018~~ Dec 2020	A

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Deficiencies in the SAR field

SYRIA

Item No	Identification		Deficiencies				Corrective Action			
	Requirement	Facilities/ Services	Description	Date first reported	Remarks/ Rationale for non-elimination		Facilities/ Services	Executing body	Date of completion	Priority for action
1	Annex 12 Para. 2.1	-	Lack of provision of required **SAR services**	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Syria	~~Dec 2018~~ Dec 2020	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of **Emergency Locator Transmitter (ELT)** requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Syria	~~Dec 2018~~ Dec 2020	A

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Deficiencies in the SAR field YEMEN										
Item No	**Identification**		**Deficiencies**				**Corrective Action**			
	Requirement	**Facilities/ Services**	**Description**	**Date first reported**	**Remarks/ Rationale for non-elimination**		**Facilities/ Services**	**Executing body**	**Date of completion**	**Priority for action**
1	Annex 12 Para. 2.1	-	Lack of provision of required **SAR services**	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	~~Dec 2018~~ Dec 2020	A
2	Annex 6 Part I chap. 6 and Part II chap. 2 Annex 10, Vol III, Chap. 5 Annex 12 para. 2.6.4	-	Non-compliance with carriage of **Emergency Locator Transmitter (ELT)** requirements	Apr 2012	-	O	Corrective Action Plan has not been formally provided by the State	Yemen	~~Dec 2018~~ Dec 2020	A

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TERMS OF REFERENCE (TOR) OF AIR TRAFFIC MANAGEMENT SUB-GROUP (ATM SG)

1. TERMS OF REFERENCE

1.1 **The Terms of Reference of the ATM Sub-Group are:**

a) ensure that the planning and implementation of ATM in the MID Region is coherent and compatible with developments in adjacent regions, and is in line with the Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) methodology and the MID Region Air Navigation Strategy;

b) monitor the status of implementation of the MID Region ATM-related ASBU ~~Modules~~ threads/elements included in the MID Region Air Navigation Strategy as well as other required ATM facilities and services, identify the associated difficulties and deficiencies and provide progress reports, as required;

c) keep under review the MID Region ATM performance objectives/priorities, develop action plans to achieve the agreed performance targets and propose changes to the MID Region ATM plans/priorities~~, through the ANSIG~~;

d) seek to achieve common understanding and support from all stakeholders involved in or affected by the ATM developments/activities in the MID Region;

e) provide a platform for harmonization of developments and deployments in the ATM domain;

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

g) foster and initiate actions aimed at improving civil/military cooperation and Flexible Use of Airspace (FUA) implementation;

h) keep under review the adequacy of requirements in Search and Rescue field, taking into account, *inter alia*, changes to aircraft operations and new operational requirements or technological developments;

i) ensure the effectiveness of the SSR code allocation system in the MID Region;

j) identify, State by State, those specific deficiencies that constitute major obstacles to the provision of efficient air traffic management and recommend specific measures to eliminate them;

k) develop the MID Region ATM Contingency Plan and ensure that its maintained up to date;

l) monitor the implementation of the MID Region ASBU Modules included in the MID Region Air Navigation Strategy related to the ATM, provide expert inputs for ATM related issues; and propose solutions for meeting ATM operational requirements;

m) monitor and review the latest developments in the area of ATM;

n) Coordinate with relevant MIDANPIRG and RASG-MID Subsidiary bodies issues with common interests.

~~n)~~o) provide regular progress reports to the ~~ANSIG Group and~~ MIDANPIRG concerning its work programme; and

~~o)~~p) review periodically its Terms of Reference and propose amendments as necessary.

1.2 **In order to meet the Terms of Reference, the ATM Sub-Group shall**:

a) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU methodology;

b) provide necessary inputs to the MID Air Navigation Strategy through the monitoring of the agreed Key Performance Indicators related to ATM;

c) review the MID ATS Routes Network in order to assess its capacity and constraints;

d) identify requirements and improvements for achieving and maintaining an efficient ATS route network in the MID Region;

e) propose a strategy and prioritized plan for development of improvements to the route network, highlighting:

- areas that require immediate attention
- interface issues with adjacent ICAO Regions

f) 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;

g) engage the necessary parties regarding routes under consideration, especially the Military Authorities;

h) promote civil/military cooperation and the implementation of the concepts of Flexible Use of Airspace (FUA), free flight, flexible tracks;

i) facilitate effective civil/military cooperation and joint use of airspace in the MID Region;

j) in coordination with the MIDRMA, carry out safety assessment of the proposed changes to the ATS Routes Network;

k) submit completed route proposals for amendment of the Basic ANP Table ATS-1, to the ICAO MID Regional Office for processing;

l) monitor the RVSM operations and support the continued safe use of RVSM in the MID Region;

m) review and maintain the MID Region SSR Code Allocation Plan and monitor the implementation of the SSR codes allocation procedures in the Region;

n) assist States in the development and co-ordination of contingency plans and ensure that the Regional contingency plan is maintained up-to-date;

o) assess the effectiveness of the agreed Contingency measures/procedures and propose mitigation measures, as appropriate;

p) address ATM and SAR interface issues with other regions and make specific recommendations to achieve seamlessness and harmonization;

q) review the requirements and monitor the status of implementation of ATM and SAR services;

r) analyse, review and monitor deficiencies in the ATM and SAR fields;

s) develop proposals for the updating of relevant ICAO documentation, including the amendment of relevant parts of the MID ANP, as deemed necessary;

t) establish and monitor ATM performance objectives for the MID Region; and

u) taking into account human factors studies and available guidance material, make operational recommendations related to ATM personnel in the changing technological environment.

2. COMPOSITION

2.1 The Sub-Group is composed of:

a) MIDANPIRG Member States;

b) experts nominated by Middle East Provider States from both Civil Aviation Authority and Military Authority;

c) concerned International and Regional Organizations as observers; and

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

3. WORKING ARRANGEMENTS

3.1 The Chairperson, in close co-operation with the Secretary, shall make all necessary arrangements for the most efficient working of the Sub-Group. The Sub-Group shall at all times conduct its activities in the most efficient manner possible with a minimum of formality and paperwork (paperless meetings). Permanent contact shall be maintained between the Chairperson, Secretary and Members of the

Sub-Group to advance the work. Best advantage should be taken of modern communications facilities, particularly video-conferencing (Virtual Meetings) and e-mails.

3.2 Face-to-face meetings will be conducted when it is necessary to do so.

ATTACHMENT A

LIST OF PARTICIPANTS

State	Name	Title
BAHRAIN	Mr. Abdulla Hasan Al Qadhi	Chief, Aeronautical Information Management & Airspace Planning
	Mr. Ahmed Mohammed Bucheery	Chief Air Traffic Management
	Mr. Ahmed Mohammed Al-Shamlan	Head of Search and Rescue
	Mr. Ahmed Yousif Al Malky	ATC Supervisor
	Mr. Isa Mohammed Al-Khamiri	Head of Safety
EGYPT	Capt. Hesham Abdelfatah Ibrahim	Vice Chairman of NANSC
	Mr. Abdelazim Talaat Abdelazim	Senior ATCO – NANSC
	Mr. Amr Ibrahim Abdel Latiff Ibrahim	ATS Inspector – ECAA
	Mr. Amr Mokhtar M. Abdalla	ATS Inspector – ECAA
	Mr. Ehab Raslan Mohamed	G.M of R&D - NANSC
	Ms. Gillan Elsayed Yasser	Senior ATCO – NANSC
	Mr. Mahmoud Ahmed Nabil	Senior ATCO – NANSC
	Mr. Mesbah Aly Mohamed	Senior ATCO – NANSC
	Mr. Mohamed Mostafa	Senior ATCO – NANSC
	Mr. Mostafa Assem	R&D specialist – NANSC
	Mr. Mostafa Sadek Abuelkasem	Senior ATCO – NANSC
	Nav. Tayseer M. Abdel Kareem	ATS G.M. – ECAA
	Mr. Walid Rawash	R&D specialist – NANSC

State	Name	Title
	Mr. Yasser Mohamedin Hafez	G.M of Cairo ACC – NANSC
IRAN	Mr. Amirhosein Sadeghcheh	Director General of ATM
	Mr. Behzad Soheil	Deputy Director General of ATM
	Mr. Ghasem Rahmani	CAO/ANS Expert
	Mr. Hassan Ghorbani	Chief of Surveillance and ATM Automation Systems Dep.
	Mr. Masoud Nikbakht	Deputy Director General of ATM
	Ms. Nazanin Nazemzadeh	Aviation Electronics Expert
	Mr. Shahram Amini	CAO/ATC Expert
IRAQ	Mr. Ali Bander	CNS Manager
	Mr. Allayth Mahmmod	Procedures Manager – GCANS
	Mr. Ahamed Saadi Manji	ATFM Manager – GCANS
	Mr. Fadhil Gatea	ATC Manager
	Ms. Fatimah Hasan Mohammed	ATM Inspector
	Mr. Haider Dhafir	ACC Manager – GCANS
	Mr. Mahmood Hashim	Operations Manager
	Mr. Mohammed Ahmed Mahmood	Air Traffic system Manager – GCANS
JORDAN	Mr. Khaled Arabiyat	Director, Legal Affairs Directorate & Air Traffic Management (ATM)
	Mr. Ahmad Atallah Odetallah (krimeen Khsabah)	Air Traffic Controller

State	Name	Title
	Mr. Ali Taleb	Chief of Amman Terminal Area Control Center
	Ms. Batool Mohammad Harasees	Air Traffic Control Officer - Amman Marka Airport
	Mr. Marwan Hani AlMasri	Air Traffic Control Officer Amman TACC Terminal Area Control Center, Jordan MIDRMA Focal Point
	Mr. Mohammad Abu-salah	ATCO
	Mr. Mohammad Farouq Doqa	Air Traffic Control Officer ATCO Amman Terminal Area Control Center
	Ms. Narman Izzat As'ad	Chief of ATM Training Division
	Mr. Nart Omar Bzadogh	Acting Director / Quality & Safety Management System
	Mr. Sameer Mohamed Abu Khadra	Air Traffic Controller
	Mr. Tamer Ahmad Alnabelsi	ATM Specialist (ATM Division)
KUWAIT	Mr. Faisal Adel Alsousi	Superintendent of Air Traffic Control
	Mr. Tareq F. Alghareeb	Head of Radar Operations
OMAN	Mr. Abdullah Said Al-Hasani	Standard Officer – ATFM
	Mr. Ahmed Mohammed Al Hinai	Standard Officer – ATSE
	Mr. Nasser Salim Al-Mazroui	Act. Director Air Traffic Control
	Mr. Sulaiman Nasser Al-Salmi	Standard Officer – Airspace
QATAR	Mr. Dhiraj Ramdoyal	Head of ANS Inspectorate
	Mr. Kevin Cooper	Consultant

State	Name	Title
	Mr. Ramy Saad	ANS Inspector
	Mr. Saleh Mohammed Alnisf	Head of IMS/Senior ATC
	Mr. Yousuf Al-Mohannadi	SATCO
SAUDI ARABIA	Mr. Abdullah Mohammed Albathi	GM, Airspace Standards – GACA
	Mr. Ahmad Sami Abu-Ghallab	Air Traffic Flow Management Section Head – Saudi Air Navigation Services
	Mr. Alwaleed Abdulaziz Alenzi	Air Traffic Standards Manager
	Mr. Mazen Mohammed Alshehri	Airspace Management and Planning Manager – SANS
	Mr. Moh'dTaysir R. Khawaj	Air Traffic Services Safety Expert
	Mr. Ridha Dridi	ANS Technical and Safety Advisor
	Mr. Saleh Awad Al-Zahrani	ATM Executive Director – SANS
	Mr. Terad Ali Alghamedi	Analysis and Planning Supervisor –SANS
SUDAN	Mr. Yasir Rabih Hassan Mudathir	ATM Director
UAE	Mr. Ahmed Saleh Al Shehhi	Senior Airspace Coordinator Officer
	Mr. Ali Jaffar Talib Ibrahim	Air Traffic Control Officer
	Mr. Hamad Rashid Al Belushi	Air Navigation Services Specialist
	Mr. Mohammed Khamis Al Baloushi	Senior Research and Dataset Officer
	Mr. Muayyed Al Teneiji	Director Air Traffic Management
	Mr. Muhammad Farook Bismi	ANS Research & Systems Adaptation Officer
	Mr. Nasser Saleh AL Kharusi	Senior Airspace Coordinator

State	Name	Title
	Mr. Odd Erik Kjersem	Senior Air Traffic Control Supervisor
	Mr. Omar Abdouli	Manager Air Traffic Control
	Mr. Rovshan Sultanov	Senior Procedure Design Officer
	Mr. Sultan Abdul Aziz Lootah	Air Navigation Inspector
	Mr. Waleed Al Ryaimi	Air Navigation Inspector
	Mr. Werner Pitz	Head of ANS Research & Dataset
USA/FAA	Mr. Travis Fiebelkorn	Senior International ATC Operations Officer Air Traffic Organization, System Operations - Europe, Africa, Middle East Group
	Mr. Robert Roxbrough	Senior Representative – Abu Dhabi Office of International Affairs
YEMEN	Mr. Abdullah A. Al-Eryani	Air Navigation – ANS Sector
	Mr. Abdul Malek Saeed	Air Traffic Management
	Mr. Ahmed Mohamed Al-Kobati	ANS Advisor
	Mr. Mahmood A. Razak	Consultant to Director Gen Air Nav.
	Mr. Younis Al-Khader	Director General of Air Navigation

Org.	Name	Title
ACAO	Mr. Mohamed Rejeb	Air Navigation Safety Expert
CANSO	Mr. Shayne Campbell	CANSO Safety Programme Manager
IATA SFO AME	Mr. Jehad Faqir	Assistant Director Safety & Flight Operations
	Ms. Sharron Caunt	Regional Director Safety & Flight Operations (Africa & Middle East)
	Mr. Yassine El Charkaoui	Manager Safety & Flight Operations, ATM Infrastructure, Africa & Middle East
MIDRMA	Mr. Fareed Al Alawi	MIDRMA Manager
	Mr. Fathi Al-thawadi	MIDRMA Officer / IT Admin
	Mr. Amal Jo Antony	MIDRMA Data Analyst
ICAO MID	Mr. Mohamed Smaoui	Acting Regional Director (ARD)
	Mrs. Muna Alnadaf	Regional Officer, Communications, Navigation and Surveillance (RO/CNS)
	Mr. Radhouan Aissaoui	Regional Officer, Information Management (RO/IM)
	Mr. Ahmad Amireh	Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR)
	Mr. Ahmad Kavehfirouz	Regional Officer, Air Traffic Management (RO/ATM)
	Ms. Dina El karimy	Technical Assistant (ATM/SAR/ASF)
	Mr. Mohamed Hamed	Marketing Assistant
	Mr. Ayman Ramadan	ICT Assistant