INTERNATIONAL CIVIL AVIATION ORGANIZATION

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

ATM SG/10

(Jeddah, Saudi Arabia, 20 – 23 October 2024)

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

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1. PLACE AND DURATION

1.1 The Tenth meeting of the MIDANPIRG Air Traffic Management Sub-Group (ATM SG/10) and the Thirteenth meeting of the Communication, Navigation and Surveillance Sub-Group (CNS SG/13) were kindly hosted by the Saudi Air Navigation Services (SANS). The meetings were successfully held in parallel in Jeddah, Saudi Arabia, at the Ritz-Carlton Hotel, from 20 to 23 October 2024. A plenary session was organised at the first day of the meetings to discuss common subjects between both Sub-Groups.

2. OPENING

2.1 The Meetings were opened by Mr. Saleh Alzahrani, Chief Operations Officer (COO), SANS, Saudi Arabia; who thanked ICAO for organizing these important meetings in Saudi Arabia. He extended a warm welcome to all participants and wished them a pleasant stay in Jeddah. Mr. Alzahrani highlighted that the conduct of such important meetings in parallel will enable productive discussion between operational and technical experts to enhance the coordination and cooperation between both teams to address of the common subjects and will enhance the Safety and efficiency levels of Air Navigation Services.

2.2 In his opening address, Mr. Ahmad Amireh, Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR), ICAO Middle East Office, Cairo, welcomed all the participants to the meeting and highlighted the importance of the subjects addressed under the ATM SG. He expressed his gratitude and appreciation to SANS for hosting the meetings. Mr. Amireh extended special thanks to the organizing team from SANS for the preparation and facilitation of these meetings and for the excellent hospitality extended to the ICAO team and all participants. He highlighted that the support to the ICAO MID Regional Office activities is evidence of the active role of Saudi Arabia and SANS and reflects the commitment to enhancing the overall safety and efficiency of air navigation in the MID Region.

2.3 Mr. Amireh provided an overview of the subjects that will be addressed during the ATM SG meeting and highlighted the main expected outcomes. Mr. Amireh indicated that the Agenda of the meeting includes subjects related Air Navigation Plans, ATS routes, Contingency Arrangements and performance monitoring, which will be reflected in the Annual Air Navigation Report end of the year. In this respect, he thanked the participants from States and Organizations for their attendance and active participation in the discussion of the subjects through the submitted Working Papers and Presentations.

2.4 Mr. Amireh recalled the Terms of Reference of the ATM SG, related to the review and enhancement of the MID Region ATS Route network, to meet the changing demand of operators and other constraints within the MID Region, and the need for the availability of different routing options and alternates, including readily available contingency measures, to support the international traffic flows. He also highlighted the priority of other implementations that support the overall traffic operations, including ATFM, CMC/FUA and RVSM implementation.

2.5 In closing, Mr. Amireh thanked all the participants for their presence and appreciated the efforts made by the States who provided Working Papers and Presentations on the developments at national level during the last period and on the plans for the coming years. He wished the meeting success in its deliberations.

3. ATTENDANCE

3.1 The meeting was attended by a total of sixty (60) participants from nine (9) States (Bahrain, Egypt, Iraq, Jordan, Libya, Oman, Qatar, Saudi Arabia, and UAE) and one (1) Organization (IATA). The list of participants is at **Attachment A**.

4. CHAIRPERSON AND SECRETARIAT

4.1 The meeting was chaired by Mr. Khalid Hussain Alharbi, Airspace Management Director, General Authority of Civil Aviation (GACA), Saudi Arabia.

4.2 Mr. Ahmad Amireh, Regional Officer, Air Traffic Management and Search and Rescue (RO/ATM/SAR) and Mr. Ahmad Kavehfirouz, Regional Officer, Air Traffic Management (RO/ATM) were the Secretaries of the meeting. Ms. Dina El Karimy provided Technical Assistance.

5. LANGUAGE

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

6. AGENDA

6.1 The following Revised Agenda was adopted:

Agenda Item 1: Adoption of the Provisional Agenda

Agenda Item 2: Follow-up on MIDANPIRG/21 Conclusions and Decisions related to ATM/SAR

Agenda Item 3: Planning and implementation issues related to ATM/SAR

- Updates from MID States/Airspace Users on ATM/SAR Implementation
- Air Navigation Plan items related to ATM/SAR (FIR Boundaries, ATS Route Network, SSR Code Management Plan etc.)
- Regional Contingency Planning
- Other ATM issues (ATFM, CMC/FUA, RVSM implementations)
- SAR Implementation

Agenda Item 4: MID Air Navigation Priorities and Targets related to ATM/SAR

Agenda Item 5: Air Navigation Deficiencies in the ATM/SAR fields

Agenda Item 6: Future Work Programme

Agenda Item 7: Any other Business

7. CONCLUSIONS AND DECISIONS – DEFINITION

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

a) **Conclusions** deal with matters 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 10/1:	*MID REGION KPI TO MONITOR PROGRESS OF REDUCTION LONGITUDINAL SEPARATION*
DRAFT CONCLUSION 10/2:	*IMPLEMENTATION OF REDUCED LONGITUDINAL SEPARATION IN THE MID REGION*
DRAFT DECISION 10/3:	*AIRSPACE MANAGEMENT WORKING GROUP (ASM WG) TERMS OF REFERENCE*
DRAFT CONCLUSION 10/4:	*NATIONAL ATM CONTINGENCY PLAN/ARRANGEMENT*
DRAFT CONCLUSION 10/5:	*MID RVSM SMR 2025*
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PART II: REPORT ON AGENDA ITEMS

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REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA

1.1 The subject was addressed in WP/1, presented by the Secretariat. The meeting reviewed and adopted the Provisional Agenda as at paragraph 6 of the History of the Meeting.

1.2 The meeting was organized in parallel with the CNS SG/13 meeting, both meetings had a plenary day, to exchange views between the operational (ATM) and technical (CNS) perspectives. Working Papers WP/1 to WP/9 and the common part of WP/26 were presented during the Plenary Session.

REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG/21 CONCLUSIONS AND DECISIONS RELEVANT TO ATM/SAR

2.1 The subject was addressed in WP/2, presented by the Secretariat. The meeting noted that the ATM Sub-Group is tasked with the follow-up on the implementation process related to ATM and SAR to inform MIDANPIRG on the progress, achievement, and problems being encountered.

2.2 The meeting was updated on the status of MIDANPIRG/21 Conclusions and Decisions related to ATM and SAR as well as the follow-up actions taken by concerned parties as at **Appendix 2A**.

REPORT ON AGENDA ITEM 3: PLANNING AND IMPLEMENTATION ISSUES RELATED TO ATM/SAR

MID Air Navigation Report-2023

3.1 The subject was addressed in WP/3, presented by the Secretariat.

3.2 The meeting was apprised with the reported level of implementation of the MID priority one ASBU Threads/Elements available in the MID Air Navigation Report-2023. The Report was published under the ICAO MID Website at the link: https://www.icao.int/MID/ANR2023.

3.3 The meeting noted with concern the low level of implementation (less than 50%) of the following Priority 1 items:

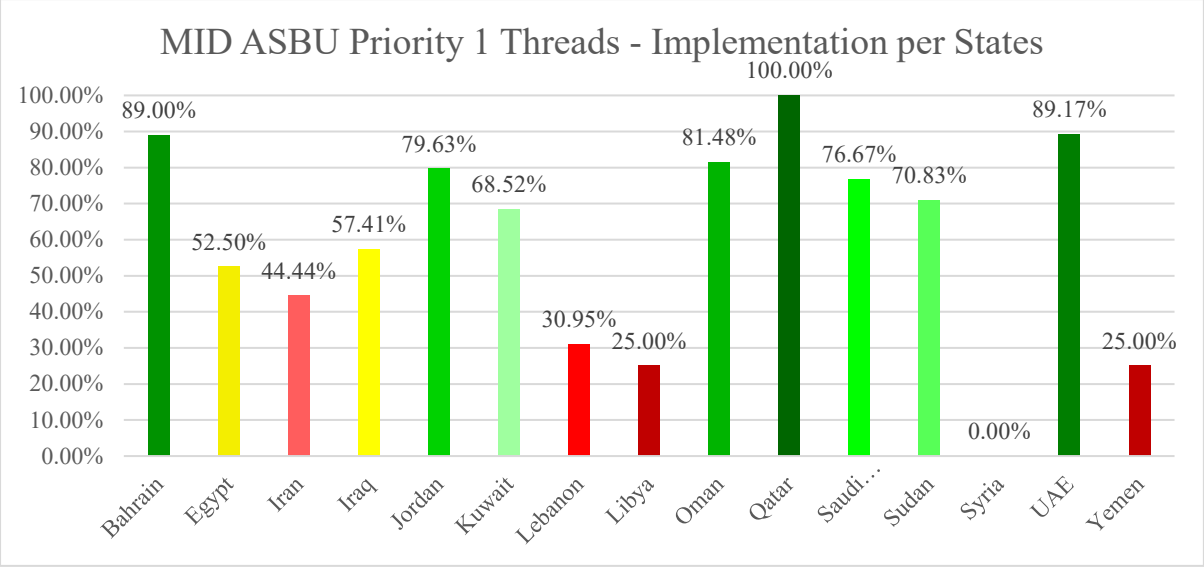
a) FICE(B0/1), the level of implementation was increased to 39.39% compared to 26.19% in 2022;

b) NOPS(B0/1), the level of implementation was 41.67%, the same as the year 2022;

c) RSEQ(B0/1), the level of implementation was 35.71%, the same as the year 2022;

d) ASUR(B0/2), the level of implementation was decreased to 37.5% compared to 75% in 2022; and

e) NAVS(B0/4), the level of implementation was decreased to 40% compared to 46.67% in 2022.



3.4 The meeting underlined that States are required to establish a national multidisciplinary team from all Air Navigation Services (ANS) areas to submit progress reports to ICAO MID in response to the inquiry from the ICAO regarding the Air Navigation Report for 2024.

MID ANP, Volume I: FIR Boundaries PfA

3.5 The subject was addressed in WP/11, presented by the Secretariat.

3.6 The meeting noted that despite MIDANPIRG conclusions and ICAO MID follow up since 2017, so far, the progress of development of PfAs to incorporate MID FIRs/SRRs in MID ANP Volume I was not progressing as planned. The Secretariat provided updated status as follows:

a) One FIR coordinates included in the MID ANP Volume I table related to Doha FIR; and

b) Three entries were ongoing coordination with the support of the MID Office (Iraq, Libya and Syria).

3.7 The meeting summarized the following key issues and challenges as the main barriers to develop PfA related to FIR and SRR boundaries:

a) lack of procedure to follow up the progress of development of FIR and SRR boundary coordinates PfA;

b) no consideration for the FIR/SRR boundary coordinates published in ANP, Volume I, Chart ATS – 1 as a reference by the States to develop required PfA and publish FIR/SRR description in their respective AIPs;

c) non-adherence with MIDANPIRG Conclusion 17/12 related to the guidelines for the publication of FIR boundary coordinates by States;

d) lack of coordination between adjacent States to publish a common FIR coordinates;

e) lack of relevant focal point to ensure awareness of this requirement and to facilitate appropriate follow-up actions; and

f) lack of publication of FIR description in national publication.

3.8 The meeting agreed that the matter will be subject to further coordination and agreements between State authorities.

MID ATS Route PfA and Optimization of MID Region ATS Route Designator

3.9 The subject was addressed in WP/17, presented by the Secretariat.

3.10 The meeting recalled the MIDANPIRG Conclusions 19/13 and 20/27 regarding proposal for amendment to the MID eANP VOL II Table ATM II-MID-I. additionally, recalled PfAs: MID.II.2201-ATM and MID.II.2302-ATM developed to eliminate the identified issues and challenges related to ATS route network.

3.11 The meeting noted that as result of two PfAs, the Secretariat has updated the ATS route table in MID ANP Volume II. As a result, MID States are required to adjust the ATS route designators as outlined in the PfAs above, and in accordance with the table provided below:

State	Change route designator PfA MID.II.2201-ATM & MID.II.2302-ATM
Bahrain	T557 to L557, Y604 to L704, Y856 to M556, T308 to M708, Z622 to M722, T872 to N572, T602 to N702, T319 to P319, T430 to P550, T444 to P700, T934 to P713
Oman	L695, M303, M681, M877, N430, P304, P316, P513, R402 to non-regional T507 to L559, T980 to L700, Q620 to M700, Z515 to M717, T970 to N570, Q978 to N718
Qatar	Y604 to L704, T665 to N700, T430 to P550, T444 to P700
Saudi Arabia	G674, G799, M309 to non-regional H732 to M553, H741 to M320, J735 to P703, J749 to N709, J852 to M702, J874 to N704, T136 to L716, Y415 to M705, Y511 to M711, Z515 to M717, Q332 to N323, V13 to N703, J874 to N704, Y517 to N707, J749 to N709, T513 to N713, V975 to P705, Q510 to P710, T100 to P711, Q212 to P712, Q21 to P721, Q143 to P723, Q615 to P753, Q624 to P752
UAE	T665 to N700, Q415 to N715
Yemen	L566 to Y101, P552 to Y103, R799 to Y105, Z515 to M717 and establish LADLI-PUTSO

3.12 The meeting also recalled the MSG meeting conclusion 6/9 regarding removal of the prefix "U" from ATS route designators and noted with concern the low implementation level within Baghdad, Beirut and Muscat FIRs. Accordingly, the meeting encouraged the States to take required action to remove ATS Route designator prefix "U" from their AIPs and inform ICAO MID Office.

3.13 The meeting recalled MIDANPIRG Conclusion 21/5 regarding optimization of the use of ATS route designator. In this respect, the Secretariat proposed, that based on the main traffic flow identified within the MID Region using the Traffic Data Sample (TDS) provided by the MIDRMA for the year 2024, a draft proposal of designators optimization plan would be developed.

3.14 The meeting tasked the Secretariat to develop the plan and present it to the ASM ASM WG for review prior to the processing of the PfA.

Air Navigation Plan (Vol. II): Homogenous Areas and Major Traffic Flow

3.15 The subject was addressed in WP/18, presented by the Secretariat.

3.16 The meeting recalled the content of the Air Navigation Plan Vol. II, in particular the Table GEN II-1 - Homogeneous ATM Areas and/or Major traffic flows identified in the MID Region.

3.17 The meeting recognized the necessity to update the Table GEN II-1 at **Appendix 3A** based on the current main traffic flows in the MID Region. Accordingly, the meeting agreed that the MID Office review and update aforementioned table and present a draft to ASM WG for further review before processing the required PfA.

Reduction of Longitudinal Separation between FIRs

3.18 The subject was addressed in WP/20, presented by the Secretariat and IP/3,

3.19 The meeting noted that in response to the long lasting MIDANPIRG Conclusion 13/5, the ATM SG/8 meeting requested MID States to provide necessary information for evaluating the status of longitudinal separation reduction in the MID Region. Consequently, MID States supplied the needed information, the Secretariat carried out an analysis as outlined in the table below:

State	Inside FIR	Reference	At interface (range)	Remark
Bahrain	5 NM	AIP, ENR 1.6	8-20 NM	20 transfer points
Egypt	10 NM	AIP, ENR 1.6	15-120 NM	22 transfer points
Iran	20 NM	AIP, ENR 1.6	10-50 NM	55 transfer points
Iraq	5 NM	AIP, ENR 1.6	10-80 NM	12 transfer points
Jordan	10 NM (5 NM in the TMAs)	AIP, ENR 1.6	10-80 NM	15 transfer points
Kuwait	5 NM	AIP, ENR 1.6	10-20 NM	16 transfer points
Lebanon	-	-	30 NM	No procedure in ENR 1.6 for separation 2 transfer points
Libya	-	-	80-120 NM	Procedural service 22 transfer points
Oman	5 NM	AIP, ENR 1.6	8-80 NM	43 transfer points
Qatar	10 NM	AIP, ENR 1.6	8-20 NM	21 transfer points
Saudi Arabia	10 NM	AIP, ENR 1.6	10-80 NM	44 transfer points * Eretria / Asmara FIR
Sudan	10 NM	AIP, ENR 1.6	30-120 NM	29 transfer points
Syria	20 NM	AIP, ENR 1.6	30 NM	Procedural service 13 transfer points
UAE	5 NM (-FL195 3NM)	AIP, ENR 1.6	8-20 NM	37 transfer points
Yemen	80 NM	-	80 NM	Procedural service 33 transfer points

3.20 Based on the above, the meeting noted the following observations:

a) the longitudinal separation calculated based on State AIPs, 9 out of 15 States (60%) have implemented longitudinal separation of 10 NM or lower; and

b) the longitudinal separation calculated based on LoAs, 4 out of 15 States (27%) have implemented longitudinal separation of 20 NM or lower. Consequently, the present average longitudinal separation at the regional level stands at 35.07 nautical miles.

3.21 The meeting agreed that the calculation of longitudinal separation should consider the operational weight (i.e. number of flight movement), to ensure more representative data and enhance the effectiveness of implementation.

3.22 Based on the above, the meeting agreed on the below Draft Conclusion:

DRAFT CONCLUSION 10/1: MID REGION KPI TO MONITOR PROGRESS OF REDUCTION LONGITUDINAL SEPARATION

That,

a) MID States submit statistical data to the ICAO MID office on the Entry/Exit points;

b) ICAO MID Office measure the longitudinal separation applied in the MID Region, taking into account Letters of Agreement (LOAs) and the operational weight of traffic; and

c) MID Office present the results and progress to ATM SG and ASM WG to be included in the Annual Air Navigation Report.

3.23 The meeting noted that MIDANPIRG Conclusion 13/5 was exclusively concerned with the reduction of longitudinal separation in radar environments. Accordingly, the meeting agreed on the following Conclusion to supersede the Conclusion 13/5, thus expanding its applicability area to include procedural environments as well:

DRAFT CONCLUSION 10/2: IMPLEMENTATION OF REDUCED LONGITUDINAL SEPARATION IN THE MID REGION

That,

a) States, that have not yet done so:

i. be urged to implement reduction of longitudinal separation where appropriate:

- *reduce longitudinal separation down to 10 NM; where ATS surveillance service is provided; and*
- *reduce longitudinal separation down to 30 NM, where ATS surveillance service is not applicable.*

ii. be invited to agree with their adjacent FIRs/States on the date of implementation and updating of the LoAs.

b) the ASM Working Group monitor the progress of implementation and undertakes necessary measures to promote its advancement.

Outcomes of the ASM WG/1 Meeting and Free Route Airspace Workshop

3.24 The subject was addressed in WP/12, presented by the Secretariat.

3.25 The meeting recalled MIDANPIRG Conclusion 21/10 and Decision 21/22, related to the establishment of Airspace Management Working Group (ASM WG) and the need to conduct Free Route Airspace (FRA) Implementation Workshop. The meeting noted that ASM WG conducted the first meeting in Doha, Qatar; during the period 1 – 2 October 2024 back-to-back with the Free Route Airspace Workshop. 65 participants from 10 States and 2 International Organizations attended the events. The ASM WG/1 meeting elected the Chairpersons and drafted the Terms of Reference of the ASM Working Group as at **Appendix 3B.** The ASM WG/1 meeting emphasized that the involvement and cooperation of States and stakeholders were vital for the achievement of the ASM WG mandate; and encouraged the States and international organizations to support the activities of the ASM WG.

3.26 The meeting noted that the ASM WG agreed on a working methodology to identify specific subjects that need to be addressed by specific States/stakeholders, with clear deliverables and agreed timeframe, for improved efficiency and in order to achieve tangible results in a timely manner.

3.27 Accordingly, the meeting reviewed and agreed on the initial action plan at **Appendix 3C** proposed by ASM WG for airspace management enhancement initiatives as a live document to be used as the main tool for advancement of the activities.

3.28 The meeting also noted the Outcomes (key takeaways) of the FRA Workshop at **Appendix 3D** which was reviewed and supported by the ASM WG.

3.29 The meeting was informed that Qatar, Saudi Arabia and UAE shared their experience related to the implementation of FRA within their Airspaces; and encouraged States to use the key takeaways to support further implementation of the FRA within the MID Region.

3.30 Based on the above, the meeting agreed on the following Draft Decision:

DRAFT DECISION 10/3: AIRSPACE MANAGEMENT WORKING GROUP (ASM WG) TERMS OF REFERENCE

*That, the Terms of Reference of the Airspace Management Working Group, at **Appendix 3B**, is endorsed.*

3.31 The meeting highlighted that the number of Airspace enhancements projects has been conducted recently and agreed to establish a base line to enable monitoring and tracking of the achievements. The meeting tasked the Secretariat to collect the achievements related to Airspaces within the MID Region since 2017 to be presented to the ATM SG meeting to measure performance improvement level.

Free Route Airspace (FRA) Implementation within Jeddah FIR

3.32 The subject was addressed in WP/21, presented by Oman and Saudi Arabia.

3.33 The meeting recalled the outcomes of the MID Region Free Route Airspace Workshop (FRA) conducted on 30 September 2024.

3.34 The meeting noted with appreciation the implementation of FRA within Jeddah FIR above FL290 at the South-East sector of Jeddah FIR; and the plan to implement cross border FRA with Oman to maximize the benefits of FRA implementation.

3.35 The meeting encouraged the States and ANSPs to measure and provide the benefits and savings, in order to start measuring the efficiency performance level for the Region.

Route Availability Document (RAD)

3.36 The subject was addressed in WP/25, presented by Oman and Saudi Arabia.

3.37 The meeting appreciated the coordination and sharing the experience for the development and publication of Route Availability Document (RAD) including the process, procedure, and lessons learned. Additionally, the meeting noted the offer from Saudi Arabia to share the access to the portal.

Regional and Inter-regional Collaboration on the Optimization of Major Traffic Flows

3.38 The subject was addressed in WP/22, presented by Oman.

3.39 The meeting recalled the Working papers presented by Oman and UAE to the 14th Air Navigation Conference (AN Conf/14) related to the procedure for the minimum level of service over oceanic and remote airspace supporting the major traffic flows.

3.40 The meeting recognized the need to establish a uniformed application of different procedures supported by modern ATM solutions that would be application across large portion of

airspaces that have similar traffic flow and automation characteristics, including ATFM, FUA, FRA CMC, 30/10nm longitudinal separation.

3.41 The meeting noted with appreciation the initiative by Oman and encourage the ICAO MID Office to facilitate the regional and inter-regional coordination with the States and ANSPs to support the initiative.

Foster the Implementation of CMC/FUA within the MID Region

3.42 The subject was addressed in WP/23, presented by Oman.

3.43 The meeting recalled ICAO Doc 10088 and the CMC/FUA Action group established within the MID Region, and the requirements to establish a national CMC committee to coordinate the activities and maintain the highest level of safety while introducing flexibility.

3.44 The meeting noted that need to conduct a regional CMC/FUA Workshop, and to include the military authorities to enable common understanding of the CMC process.

3.45 The meeting noted that ICAO MID could provide State specific workshop, upon request; to provide the required assistance in training to foster the national implementation.

3.46 The meeting was informed about a CMC/FUA Workshop conducted in Jeddah on 3 – 4 September 2024; hosted by SANS the invitation was extended to other States within the Region.

Harmonization of Regional and National ATM Contingency Plans and Letters of Agreements

3.47 The subject was addressed in WP/13, presented by Saudi Arabia.

3.48 The meeting recalled Annex 11 requirements related to the Contingency Planning, and the importance of the development of National Contingency plan to mitigate any disruption of the provisions of ATS, ensure timely, planned and appropriate response to contingency situations, and ensure business sustainability.

3.49 The meeting was apprised with the development of the Jeddah FIR ATM Contingency Plan and the categories established to address many scenarios.

3.50 The meeting commended the efforts of Saudi Arabia and requested to provide ICAO MID with a copy of the relevant part of the plan to be included in the MID CPs Repository.

3.51 Considering the experience of Saudi Arabia and to support the development of further plans the meeting agreed on the following Draft Conclusion:

DRAFT CONCLUSION 10/4: NATIONAL ATM CONTINGENCY PLAN/ARRANGEMENT

That,

a) the ICAO MID Office assist MID States, where required; in the development of their National ATM Contingency Plans in a harmonized manner by organizing tailored workshops for each State upon request;

b) States be encouraged to coordinate with IATA and Airspace Users on the planning and implementation of contingency measures within the National ATM Contingency Plans; and

c) *IATA provide the operational data and users' requirements to enable proper planning.*

MID Region ATM Contingency Plan

3.52 The subject was addressed in PPT/14, presented by the Secretariat.

3.53 The meeting recalled MIDANPIRG Conclusion 21/17 as follows:

MIDANPIRG CONCLUSION 21/17: MID REGIONAL ATM CONTINGENCY PLAN (V5.0)

That,

a) *the MID Regional ATM Contingency Plan (V5.0), at Appendix 5J is endorsed and be published as the MID Regional ATM Contingency Plan (V5.0);*

b) *ICAO MID Office develop the required structure on ICAO MID website and keep it up to date regarding MID States contingency plans, agreement, SOD of CCT meetings, contact list and etc.;*

c) *based on the guidelines and template provided in regional contingency plan (V5.0), MID States develop their respective contingency plan and arrangement with adjacent FIRs and share them with ICAO MID; and*

d) *by organizing individual workshops, ICAO MID supports the development of National Contingency Plans by the MID States.*

3.54 The meeting noted that ICAO has organized the APAC/MID ATM Contingency Planning Workshop and Tabletop Exercise at ICAO Asia and Pacific Regional Office, Bangkok, Thailand, during the period 25 – 28 June 2024.

3.55 The meeting noted the progress of current contingency situation in the MID region associated with the Khartoum FIR, which has been ongoing since 17 April 2023, as well as the political tensions in the MID region that have arisen since April 13, 2024.

3.56 In light of the above and in recognition of the prompt response of MID States to the contingency situations within the MID Region, as well as the assistance extended to the CCTs, the meeting urged the MID States, if not yet done so, develop their national Contingency plans, in coordination with the MID Office, and publish contingency routing options, if necessary, in the respective AIPs based on ASBU Element FRTO B0/3.

ATFM Daily Plan (ADP)

3.57 The subject was addressed in WP/16, presented by Qatar and Saudi Arabia.

3.58 The meeting recalled the MID Region ATFM requirements, in particular Phase 1A and the need to establish a channel between ATFM units and Airspace users.

3.59 The meeting was apprised with the development of Saudi ATFM Daily Plan (ADP), which includes the operational information form the relevant stakeholders related to Airspaces, NOTAM, Weather, Special events and ATFM measures when implemented.

3.60 The meeting also noted that Qatar ADP has been established since 2022 and organizing daily ADP call to share the information.

3.61 The meeting noted with appreciation, the plan of Qatar and Saudi Arabia to conduct jointly ATFM conference call to share individual state ADP including operational information between both FIRs; and encouraged the other States to join the call and if not yet done so, establish their ATFM plan, to meet the requirements of Phase 1A.

3.62 Iraq indicated the intention to join the conference call to exchange the data.

GNSS Vulnerabilities

3.63 The subject was addressed in WP/4, presented by the Secretariat.

3.64 The meeting recalled the benefits gained from the implementation of the Global Navigation Satellite System (GNSS) which were essential for the implementation of Performance Based Navigation (PBN) and Automatic Dependent Surveillance-Broadcast (ADS-B), and many other tools that enhances safety, capacity and environmental benefits of the ATM operations.

3.65 The meeting recalled that the GNSS vulnerabilities related to radio frequency interference (RFI) such as jamming, and cyber-attacks (e.g. spoofing). Therefore, it was essential to mitigate GNSS vulnerabilities adequately, to ensure continued Safety operations.

3.66 The meeting was updated about the GPS Spoofing reports within the MID Region, which in some cases led to complete loss of navigation capabilities.

3.67 The meeting noted the regional activities to mitigate the GPS Vulnerabilities, including the recommended actions by States and ANSPs, CMC Coordination, RFI mitigation Plan and the GNSS NOTAM Templates. Additionally, the meeting recalled the RASG-MID Safety Advisory – 14 and noted the need to update it, to include operational measures for timely response by ATC units when receiving Spoofing reports.

3.68 Based on the operational experience of ANSPs within the MID Region, the meeting reviewed and updated the RSA-14 as at **Appendix 3E**. The proposed amendments would be coordinated with the CNS SG for presentation to the MIDANPIRG/RASG-MID meeting.

NAV MON

3.69 The subject was addressed in WP/5, presented by the Secretariat.

3.70 The meeting recalled that the ASBU element "Navigation Minimal Operating Networks" (NAVS B0/4) has been classified as Priority 1 in the revised MID Region Air Navigation Strategy (MID Doc 002) aiming to:

- adjust conventional NAVAIDs networks through the increased deployment of satellite-based navigation systems and procedures to ensure the necessary levels of resilience for navigation;
- provide a minimum level of capabilities to accommodate aircraft operations in mixed operation mode environments (aircraft equipage); and
- make a more efficient use of the frequency spectrum.

3.71 The meeting noted that MIDANPIRG established the NAV MON AD-HOC Action Group to develop a template for Navigation Minimal Operating Networks (NAV MON) plan in line with ICAO SARPs and Regional requirements. The template was drafted and reviewed by the CNS and PBN SGs.

3.72 The meeting reviewed the draft NAV MON template, at **Appendix 3F**; and proposed to include the ATM operational view to ensure the availability of sufficient NAVAIDs network to support the enroute phase of flight, particularly to provide sufficient Navigational guidance to the regional ATS route network, available at MID ANP Vol II Table ATS – 1; the requirements would be coordinated on national level between ATM and CNS personnel.

Note: careful planning should be considered where RNAV5 routes implemented compared to the availability of surveillance coverage.

Operational Inputs to AIDC-OLDI Applicability Area

3.73 The subject was addressed in WP/6, presented by the Secretariat.

3.74 The meeting recalled the discussion during the MIDANPIRG/21 meeting related to extension of the timeline for implementation of AIDC/OLDI Priority 1 in the MID Region to the end of December 2026. Accordingly, the list of deficiencies was modified to eliminate the deficiencies associated with the AIDC/OLDI implementation, allowing the States additional time to fulfils this requirement within the applicability area.

3.75 The meeting reviewed the current Applicability Area for the AIDC/OLDI implementation, and found out that a criterion should be established based on the operational needs to identify the applicability area, the meeting reviewed the proposal by the Secretariat based on operational data at **Appendix 3G** agreed on the following criteria:

a) if the traffic exchange rate between two adjacent ACCs has exceeded 30 flights per hour; or

b) if two consecutive FIRs implemented longitudinal separation 10 NM or less at common FIR boundary point(s); or

c) if two adjacent FIRs implemented cross border Free Route Airspace (FRA); or

d) if the number of LHD recorded by MIDRMA related to adjacent ACCs has exceeded 10 reports per month and it lasts for more than 6 months; or

e) if traffic movement at the common FIR boundary significant increased during contingency situations. or

f) where decided by both concerned States.

3.76 The meeting agreed that based on the criteria above, and matrix in **Appendix 3H**, ICAO MID develop draft AIDC/OLDI applicability area to be reviewed by the ASM WG.

3.77 Based on that, the meeting encouraged the relevant States to undertake the necessary measures to establish AIDC/OLDI connections before end of December 2026.

Status of Implementation of Automated Data Exchange Systems (ADE) in Muscat FIR

3.78 The subject was addressed in WP/7, presented by Oman.

3.79 The meeting noted with appreciation that Oman CAA initiated the implementation of Automatic Data Exchange (ADE) System. to enhance cross-FIR flight safety and efficiency, which improve coordination, flight notification, and transfer of control, by reducing ATC workload and minimize coordination errors.

3.80 The meeting noted that the connection was successfully established with UAE and testing was ongoing with Jeddah, Mumbai, Karachi; communication started with Tehran.

ADS-B Integration and Implementation Initiatives of Oman

3.81 The subject was addressed in WP/24, presented by Oman.

3.82 The meeting was informed that during 2022-2023, Oman deployed 8 ADS-B stations, supported by Data Processing Systems, to enhance surveillance coverage, optimize data analysis, and improve ATCO decision-making for greater safety and situational awareness.

3.83 Oman elaborated that upon successful completion of the installation plan, the enhanced surveillance will be integrated into ATC operation in phased manner to ensure the confidence in the system, as follows:

- *Phase 1*. Use of ADS-B data for situational awareness
- *Phase 2*. Use of ADS-B data for Surveillance Monitoring Service only
- *Phase 3*. Use of ADS-B data for full-fledged Surveillance Service together with current Radar System

3.84 The meeting agreed that provision of ATS based on ADS-B solely was subject to regional agreements and prior coordinated, including the publication of coordinated AIP SUP or AIC in advance to inform Airline Operators and Airspace Users of the equipage requirements and procedures to be complied within the applicability area. States were encouraged to share their experience in this regard on both regulatory and operational aspects.

Flight and Flow — Information for a Collaborative Environment (FF-ICE)

3.85 The subject was addressed in WP/8, presented by UAE.

3.86 The meeting recalled the critical role of the FF-ICE initiative in modernizing air traffic management (ATM). FF-ICE offers an advanced mechanism for managing flight planning and air traffic flow by enabling real-time data exchange between aviation stakeholders, including air traffic controllers, airline operators, and airport authorities.

3.87 The meeting also noted that the current flight planning mechanisms limit the efficiency of airspace management, particularly in regions with rapidly growing air traffic, such as the Middle East. The transition to FF-ICE will provide substantial benefits by offering stakeholders access to more accurate, real-time data, which will enhance decision-making and improve the efficiency of operations. The Middle East's strategic geographic location makes it imperative for the region to align with global trends in air traffic management modernization.

3.88 The meeting recalled the Abu Dhabi declaration (UAE initiative to support the ANS within the MID Region) and UAE commitment to support the early planning for the FF-ICE implementation and cessation of the current Flight Planning (FPL2012) system early 2030s.

3.89 The meeting was informed about the benefits and challenges for implementation of FF-ICE and agreed on the following:

a) consider early planning of FF-ICE implementation at Regional level;

b) consider the inclusion of FF-ICE implementation as a priority for implementation at regional level; and

c) encourage member states to consider the inclusion of FF-ICE on their national air navigation plans (NANPs) and ensure their readiness for the transition.

3.90 The meeting received a tentative offer from UAE to host a multidisciplinary FF-ICE Workshop back-to-back with the ATFM TF during 2025, aiming to build the capacity of the Region to enable proper understanding and planning for the FF-ICE implementation. Exact details will be communicated in due time in coordination with the MID Office.

Use of Mode S Conspicuity Code for Transit Flights

3.91 The subject was addressed in WP/9, presented by UAE and Oman.

3.92 The meeting acknowledged the importance and advantages of utilizing the conspicuity code alongside Mode S technology for the identification of aircraft and the correlation of radar targets with flight plans, particularly in contrast to the challenges and limitations associated with traditional SSR codes (Mode 3/A).

3.93 The meeting noted that the proposed solution was viable and proven but relies on consistent Mode S support across neighboring States to be effective over extensive flight segments.

3.94 Accordingly, the meeting agreed on the following:

a) the use of the conspicuity code A1000 for transit flights and Mode S aircraft identification and coupling with flight plans would support addressing the challenge related to the limited number of available SSR code within the region;

b) the use of a conspicuity code for transit flight is best addressed in a coordinated manner of States to have a joined planning to assure operational and technical readiness of all stakeholders; and

c) encourage States interested to use conspicuity code for transit flights and Mode S aircraft identification and coupling with flight plans to initiate joint discussions to update the bilateral agreements for the implementation and trials, in coordination with the CNS SG; and provide update to the next SG meeting.

RVSM Implementation and Monitoring

3.95 The subject was addressed in WP/10, presented by the Secretariat on behalf of the MIDRMA.

3.96 The meeting recalled MIDANPIRG/21 conclusion related to the development of Safety Monitoring Report (SMR) 2024, the meeting reviewed the preliminary results of the SMR2024 at **Appendix 3I**.

3.97 The meeting noted that based on the data provided to the MIDRMA (TDS and LHDs), the Safety Objectives continue to be met. The value computed for the overall risk was estimated, and found below the ICAO overall TLS. It was highlighted that the LHD period for SMR2024 extends to the end of the year 2024, accordingly the preliminary results are subject to changes according to the submission of further LHD.

3.98 The meeting noted that Khartoum FIRs were excluded from the SMR 2024 due to the non-provision of required data.

3.99 The meeting noted with appreciation that Tripoli has submitted the TDS data for the first time and included in the SMR2024 for the first time; as a result of the training provided by the MIDRMA to the assigned MIDRMA Focal point and ATC at the Libyan CAA.

3.100 The meeting noted with concern the low level of LHD Reporting by the MID States and noted that the MIDRMA will continue the development of the final version of SMR-2024, until the end of the reporting cycle (31 December 2024) and encouraged the States to provide the MIDRMA with the LHD Reports, if any.

3.101 The meeting noted that both Safety protocols at the regional interface between Muscat – Mumbai and Sana'a – Mogadishu were still open; the MIDRMA requested the relevant States to provide updates and improvements to enable the progress of the Safety Protocol. Oman provided updated progress on the AIDC/OLDI implementation with Mumbai which will reduce the number of coordination failures between both ACCs (Para 24 refers).

3.102 The meeting received the updated Hotspot and Air way occupancy rate within the FIRs of the MID Region and encouraged the States to consider the report in Airspace planning and design.

3.103 Based on all the above, the meeting agreed to present the final results of the SMR2024 to the MIDANPIRG/22 for endorsement.

Development of SMR2025

3.104 The meeting highlighted that for the reporting cycle for SMR2025 was agreed be from 01st January till 31st December 2025, the Traffic Data Sample (TDS) should be submitted in the prescribed format, utilizing the dedicated Excel sheet designed for the MIDRMA Risk Analysis Software (MIDRAS). MIDRMA members are encouraged to use the Excel sheet template, conveniently available on the MIDRMA website (www.midrma.com). This sheet has been meticulously crafted to gather the requisite real-time flight plan data for aircraft operating within the RVSM airspace (FL 290 to FL 410 inclusive).

3.105 Accordingly, the MIDRMA proposed the following timeline for the collection of RVSM Traffic Data Sample (TDS) for SMR 2025 from all MIDRMA Member States:

a. Collect RVSM Traffic Data Sample (TDS) for the period of 01st May till 31st May 2025 (during the Haj season) for SMR 2025 development and submit it to the MIDRMA by 30th June 2025.

b. Collect Large Height Deviation Reports for the SMR2025 reporting cycle from 01st January till 31st December 2025.

3.106 Based on the above, the meeting agreed on the following Draft Conclusion:

DRAFT CONCLUSION 10/5: MID RVSM SMR 2025

That,

a) the FPL/traffic data for the period 01 May – 31 May 2025 to be used for the development of the MID RVSM Safety Monitoring Report (SMR 2025);

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 2025 be ready for presentation and endorsement by the MIDANPIRG/23 meeting.

3.107 The meeting noted that the MIDANPIRG/21 endorsed the draft decision emanating from the previous ATM SG meeting, related to the establishment of MID ADS-B height Monitoring System (MID AHMS), and the MIDRMA has initiated the implementation plan.

3.108 The meeting requested the MIDRMA to explore the possibility to expand the scope of the SMR and LHD reporting below the RVSM layer; which would support the ATM planning and monitoring of traffic exchange trends.

SAR Implementation Status

3.109 The subject was addressed in WP/19, presented by the Secretariat.

3.110 The meeting recalled the SAR related Standards, Recommended Practices and Procedures and guidance material related to the implementation of Search and Rescue (SAR) mainly contained in ICAO Annex 12, International Aeronautical and Maritime Search and Rescue Manual (IAMSAR - Doc 9731). And the regional requirements available in the MID SAR Implementation Plan which was endorsed and published as MID Doc 010, in 2018.

3.111 The meeting noted that the challenges related to SAR Implementation in the MID Region were standing for long period.

3.112 The meeting reviewed the contact lists for the SAR Focal Points of the MID States and encouraged States to coordinate with the MID Office the required update and contact details.

3.113 The meeting recalled MIDANPIRG Conclusion 20/34, related to the need to conduct SAR workshop within the MID Region.

3.114 The meeting noted with appreciation the conduct of the MID Search and Rescue Workshop at the MID Office in Cairo during the period 6 – 7 May 2024; 30 participants attended the Workshop from the MID States.

3.115 The Workshop reviewed ICAO Provisions related to SAR and the current implementation status within the MID Region, additionally, a brief on Amendment 19 to Annex 12 and USOAP CMA PQs related to SAR implementation; also, the workshop provided a detailed description on the GADSS components and implementation plan in particular the Autonomous Distress Tracking (ADT) and SIT185 messages format. The workshop was considered as venue for SAR experts from the MID Region to share their experience and success stories related to SAR. The meeting commended Saudi Arabia, Oman and UAE shared their SAR experience during the Workshop.

3.116 The meeting encouraged the MID States to use the MID Doc 010 to support the SAR implementation and provide the ICAO MID updates on the status of implementation and the conduct of SAR Exercise (SAREx), achievements and challenges.

3.117 The meeting Commended the efforts of Saudi Arabia in hosting the 71st meeting of COSPAS-SARSAT organized by General Authority of Civil Aviation (GACA) in Riyadh, 45 participants from States and international organizations attended the meeting.

3.118 The meeting was apprised with the updates from Saudi Arabia in conducting awareness sessions regarding the implementation of GADSS/LADR to Saudi registered Aircraft operators, RCCs and ATCOs.

MID States Presentations

<u>Updates from Tripoli FIR</u>

3.119 Libya CAA (LYCAA) provided an update on the developments introduced within Tripoli FIR, subsequent to the ICAO MID visit to Libya during the period 3 – 7 April 2024, including the airspace users briefing conducted on 14 August 2024, the MIDRMA training delivered on 22 August 2024 and the completion of monitoring (testing) of the Libyan aircraft. The meeting noted that

participation of LYCAA in the regional meeting and activities was recently notable and the interaction with the LYCAA personnel will enable the normalization of Tripoli FIR. It was noticed that operators started using Tripoli FIR for overflying towards destinations in Africa.

3.120 The meeting encouraged the MID States to support capacity building activities for the Libyan CAA towards the normalization of the Libya FIR. The participating States offered the Libyan CAA to approach them for any required assistance under the technical cooperation programme.

Updates from Amman FIR

3.121 Jordan reported that Jordan Air Navigation Services (JANS) was established to improve accountability, and safety and compliance with the requirements to separate the regulatory functions of CARC from Service provisions. JANS will be more focusing on operational efficiency.

3.122 JANS provided updated progress on the Air Navigation Infrastructure upgrade projects, including WAM, DVOR and ILS installations, and on the flight procedures review project within Amman FIR, the establishment of AIDC/OLDI with Cairo and Jeddah ACCs, and the development of Amman FIR ATM Contingency Plan.

3.123 Jordan appreciated the support provided by ICAO MID Office by conducting the RANP/NANP Workshop to support the development of NANP.

3.124 Jordan highlighted the challenges within the Region related to political tension, conflict zones, GNSS jamming and spoofing, and commended the support provided by the CCT.

Updates from Jeddah FIR

3.125 Saudi Arabia reported the progress and development within the Jeddah FIR related to ATM/SAR implementation updates.

3.126 The meeting noted the progress on the establishment of AIDC/OLDI with adjacent FIRs, as well as the reduction in the longitudinal separation within the Jeddah FIR. Saudi Arabia emphasized the efforts of completion the NANP as part of Saudi National Air Navigation Plan (SNAP) and presented the most recent plans and enhancements planned for the next 15 years in Saudi Future Airspace Concept project (SFAC).

Update from Emirates FIR (NGATM)

3.127 Emirates provided updates on the implementation on the Next Generation Air Traffic Management System installation at Seikh Zaid Center (SZC) and the new features and benefits, which will further enhance the traffic handing and coordination. Additionally, the transition timelines.

Update from Cairo FIR

3.128 Egypt presented the optimization and Civil-military coordination/FUA implementation interduce within Cairo FIR, including:

- ATS route network developments and proposals for additional interfaces Entry/Exit Points with adjacent FIRs to support the regional and international traffic flow;

- implementation phases of Cairo FIR optimization project, including the dualization (establishment of parallel routes) to improve the regional interface with EUR Region;

- the plan for wholistic restructure of Cairo FIR to support the operational needs of airspace users;

- advanced Civil-Military Coordination procedures;

- modernization of the ATM automation systems in Cairo ACC as well as Cairo Approach and Tower units; and

- support provided to the adjacent States during contingency situations.

3.129 The meeting invited the States, airspace users and IATA to coordinate and collaborate with Egypt through Airspace restructuring process.

3.130 The meeting noted with appreciation the efforts made by Egypt to support the contingency situation in Libya and Sudan through the CCT process.

3.131 The meeting noted with appreciation the efforts made by Egypt to support the international traffic flow during the increased demand on the ATS Route network within Cairo FIR due to the heightened tension within the MID Region recently, and the implemented measures to increase the capacity to support the shift of major streams within Cairo FIR.

Update from Baghdad FIR

3.132 Iraq recalled the critical location and layout of Baghdad FIR, and the trajectories of the main regional traffic flows, which could exceed 700 movement/day.

3.133 Iraq highlighted the recent achievements within Baghdad FIR, including the plan for AIDC/OLDI implementation, implementation of ATFM and enhanced CMC; which would supported the high demand traffic operations, particularly during the frequent contingency situations within the Region.

3.134 Iraq provided a list of challenges, including:

a. Coordination with Ankara FIR related to the coordination of traffic and the military operations near the interface, which significantly impacts the traffic management and airspace capacity within Baghdad FIR.

b. Increased number of GNSS jamming and spoofing events within Baghdad FIR, which dramatically reduce the capacity.

3.135 The meeting noted with appreciation the coordination and signature of Agreements during side meetings between Iraq and adjacent States within the MID Region, and requested the Secretariat to further plan cross regional meetings coordination to address the challenges reported by Iraq.

REPORT ON AGENDA ITEM 4: MID AIR NAVIGATION PRIORITIES AND TARGETS RELATED TO ATM/SAR

ASBU Threads and Elements relevant to ATM/SAR

4.1 The subject was addressed in WP/26, presented by the Secretariat.

4.2 The meeting recalled MIDANPIRG/21 meeting discussion regarding the need for the MIDANPIRG subsidiary body to allocate enough time in their meeting agenda for the detailed discussion of the ASBU Threads relevant to their technical areas, including the identification of priorities, definition of applicability areas, performance indicators, metrics, targets, etc.

4.3 Based on the above, the meeting reviewed the current MID ASBU Threads/Elements priority 1 and proposed the following changes related to ATM/SAR to ANP Volume III and ICAO MID Doc 002:

a) New elements:

i. FRTO B0/1: Direct routing (DCT);

ii. FRTO B0/3: Pre-validated and coordinated ATS routes to support flight and flow;

iii. FRTO-B0/4: Basic conflict detection and conformance monitoring;

iv. FRTO B1/1: Free Route Airspace (FRA);

v. FRTO B1/4: Dynamic sectorization; and

vi. NOPS B1/6: Initial Dynamic Airspace configurations.

b) New KPIs:

i. KPI 04: Filed flight plan en-route extension; and

ii. MID Region KPI: Reduction of longitudinal separation in En-route.

c) Change in applicability areas:

i. FFICE B0/1 (Automated basic inter facility data exchange (AIDC)): ICAO MID based on agreed criteria in WP/6 will develop draft of applicability area and present to ASM WG for further review; and

ii. FRTO B0/2 (Airspace planning and Flexible Use of Airspace (FUA)): Iran, Iraq, Kuwait and Oman are proposed to add the current applicability area.

REPORT ON AGENDA ITEM 5: AIR NAVIGATION DEFICIENCIES IN THE CNS/ATM/SAR FIELDS

Air Navigation Deficiencies in the CNS/ATM/SAR fields

5.1 The subject was addressed in WP/27, presented by the Secretariat.

5.2 The meeting reviewed the list of deficiencies in the MANDD under the ATM and SAR fields as at **Appendices 5A** and **5B** 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 and update the status accordingly.

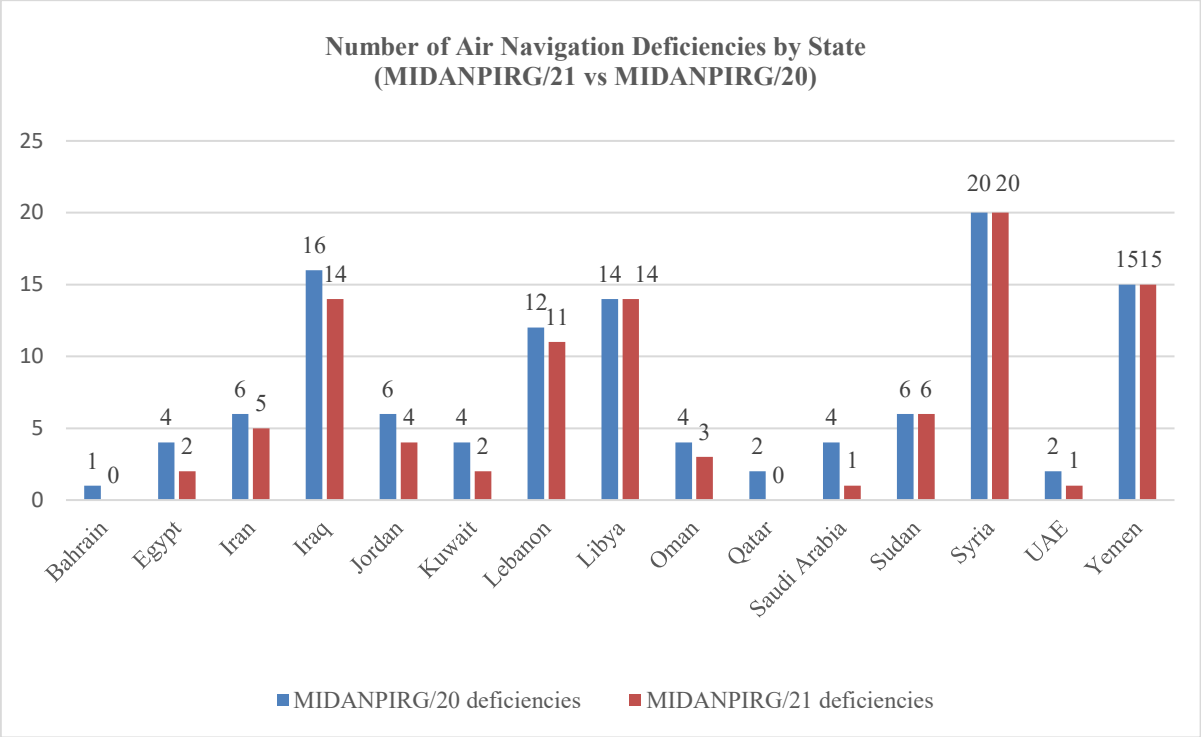
5.3 The meeting noted that the list of deficiencies in the CNS, ATM, and SAR fields are reflected in the MID Air Navigation Deficiency Database (MANDD) at: https://mandd.icao.int/. The current number of Air Navigation Deficiencies in MANDD reported to MIDANPIRG/21 meeting was 98 deficiencies compared to 116 deficiencies reported to the MIDANPIRG/20 meeting, shown in Graphs 1 and 2 below, and distributed as follows:

a) *In the ATM field:* as reported by Qatar, the MIDANPIRG 21 meeting agreed to remove the deficiency reported against Qatar related to contingency agreement. Also as reported by MIDRMA SMR 2023, new deficiency added against Sudan related to lack of provision of required data to MIDRMA; the total number of deficiencies is seventeen (17); ten (10) priority "A" and seven (7) priority "B". Seven (7) related to the uncompleted signature of contingency agreements; seven (7) related to the non-implementation of planned regional ATS Routes, and three (3) related to unsatisfactory reporting of large Height deviation (LHD) and Traffic Data Sample (TDS) to the MIDRMA.

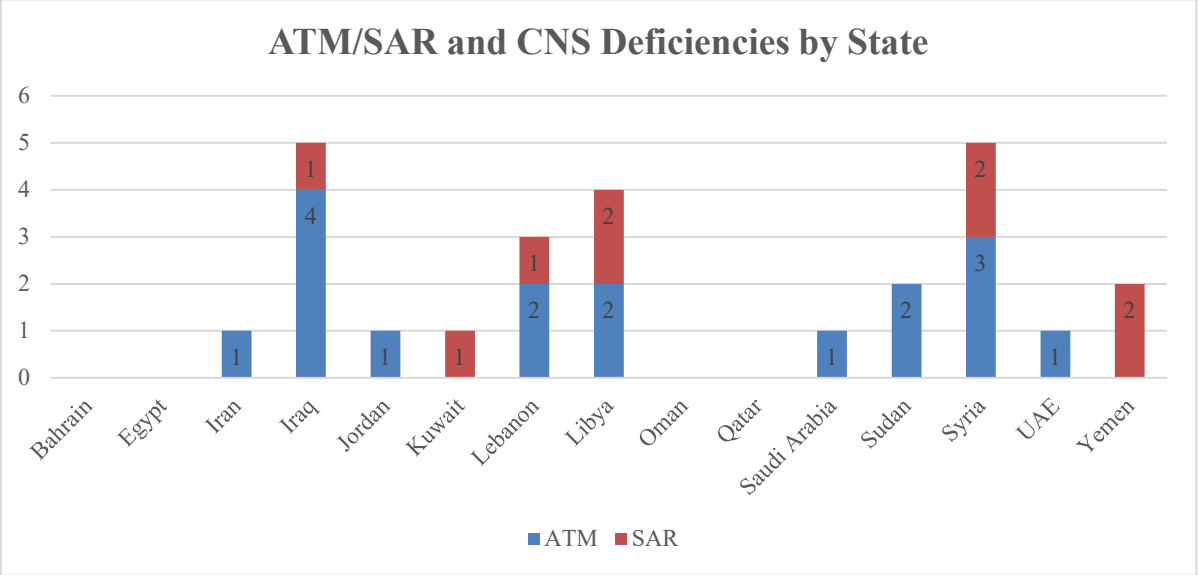
b) *In the SAR field:* the total number of deficiencies is nine (9) priority "A". Five (5) related to the lack of implementation of SAR provisions; and four (4) related to non-compliance with the carriage of Emergency Locator Transmitter (ELT) requirements.

5.4 The meeting noted that the MIDANPIRG/21 meeting highlighted lack of implementation of Priority 1 interconnection will result in additional ANS deficiency to the MID Air Navigation Deficiency Database (MANDD). Therefore, it was agreed that deficiencies related to the lack of implementation of Priority 1 AIDC/OLDI connections will be added by end of December 2026.

5.5 The meeting noted that certain deficiencies have been rectified by the States, which are required to formally notify the ICAO MID Office in order to initiate the process for the removal of the associated deficiencies from MANDD, following the MIDANPIRG/22 meeting agreement.



Graph 1



Graph 2

REPORT ON AGENDA ITEM 6: FUTURE WORK PROGRAMME

Revision of Terms of Reference (ToRs) and Future Work Programme

6.1 The subject was addressed in WP/28, presented by the Secretariat.

6.2 The meeting noted that the Airspace Management Working Group has conducted its first meeting and developed the ASM WG Terms of Reference (Para 3.30 refers). Accordingly, the meeting reviewed and amended the ATM SG terms of reference at **Appendix 6A**.

6.3 Accordingly, the meeting agreed to the following Draft Decision:

DRAFT DECISION 10/6: AIR TRAFFIC MANAGEMENT SUB-GROUP (ATM SG) TERMS OF REFERENCE

*That, the Terms of Reference of the Air Traffic Management Sub-Group, at **Appendix 6A**, is endorsed.*

6.4 The meeting agreed that the ATM SG/11 meeting will be held during the period 20 – 23 October 2025. The meeting noted with appreciation the tentative offer received from UAE to host the ATM SG/11 and CNS/14 meetings in parallel, further details will be communicated in due course.

6.5 Furthermore, the meeting invited the States and Organizations to review and support the conduct of the ICAO MID Tentative Working Programme for 2025, which will be posted under the ICAO MID website by the end of 2024; and to include the regional activities in the national planning of the year.

REPORT ON AGENDA ITEM 7: ANY OTHER BUSINESS

MID Region ATM Monitoring Dashboard

7.1 The meeting recalled the Chairman's offer to develop a dashboard to support the activities of the ATM SG and the monitoring of implementation levels, using the available expertise within GACA and SANS in Saudi Arabia.

7.2 The meeting received an update on the initial version of the Dashboard including the monitoring items of the ATM SG and ASM WG.

7.3 The meeting appreciated the efforts of GACA and SANS and tasked the Secretariat to populate the relevant data to be presented to the MIDANPIRG/22 meeting.

IFATCA 64th Conference

7.4 The meeting noted the information paper submitted by UAE regarding the IFATCA annual conference hosted by GCAA UAE and invited the participant to attend the event planed in Abu Dhabi during the period 28 April to 2 May 2025.

APPENDICES

FOLLOW-UP ON MIDANPIRG/21 CONCLUSIONS & DECISIONS

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C.20/34	**SAR WORKSHOP** That, the ICAO MID Office organize a SAR Workshop in 2024, to address the challenges related to SAR in the MID Region.	Raise awareness related to newly introduced SAR services	Workshop	ICAO MID	2024	**Completed** (WP/19 refer)
C.21/2	**MID REGION AIR NAVIGATION STRATEGY, EDITION, FEBRUARY 2024** That, the MID Region Air Navigation Strategy, Edition February 2024 (ICAO MID DOC 002), is endorsed and be published by the ICAO MID Office.	To harmonize the implementation within the Region	Revised version of MID Doc 002	ICAO MID	Feb 2024	**Completed**
C.21/3	**NATIONAL AIR NAVIGATION PLAN (NANP)** That, the MID States with support of ICAO MID Office develop their National Air Navigation Plan (NANP) by end of December 2024.	Implementation of RANP within the MID Region	National Air Navigation Plans	MID States	Dec 2024	**Completed** Kuwait ANP developed Jordan ANP ongoing Requests from Iran and Qatar
C.21/4	**MID AIR NAVIGATION REPORT - 2023** That, the MID Air Navigation Report-2023 is endorsed and be published by the ICAO MID Office.	Reflect the implementation Status of RANP within the MID Region	MID Air Navigation Report 2023	ICAO MID	March 2024	**Completed**
C.21/5	**OPTIMIZATION OF MID REGION ATS ROUTE DESIGNATOR** That, the ICAO MID Office: a) based on Traffic Data Sample (TDS) identify the main flows of the region to maintain their ATS route designators as much as possible through various consecutive FIRs and regions with coordination of relevant States and ICAO Regional Offices; and b) process required Proposal for Amendment (PfA) to the MID eANP Vol II, Table ATM II-MID-I	Harmonize the use of ATS Route designators	PfA for revised ANP Vol II table ATM II-MID-1	MID States	2024	On going (WP/17 refer)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
D.21/10	**MID AIRSPACE MANAGEMENT WORKING GROUP (ASMWG)** *That,* *a) MID Airspace Management Working Group (ASM WG) be established to ensure the continuous development of airspace structure, Free Route Airspace, GNSS vulnerability and FF-ICE implementation at regional level in the most efficient and harmonized manner;* *b) The ASM TF to elect Chairperson and develop Terms of Reference during the first meeting of MID ASM Task Force; and* *c) States support the MID ASM WG through:* *assignment of Focal Point to contribute to the work of the Task Force; and* *sharing states' experience and provision of required data in timely manner.*	establish a centralized entity to address the Airspace management challenges and further enhance the coordination on regional level.	ASM WG	MID States	2024	Completed (WP/12 Refers)
D.21/11	**DISSOLUTION OF THE MID ROUTE DEVELOPMENT ACTION GROUP (RDWG)** *That, the MID Route Development Action Group (RDWG) is dissolved.*	Tasks included in ASM WG ToR				Completed
C.21/12	**MID RVSM SMR 2023** *That, the MID RVSM Safety Monitoring Report (SMR) 2023 at Appendix 5I, is endorsed.*	Safety Monitoring report	SMR2023	MIDRMA/State	2024	Completed

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C.21/13	**NON-SUBMISSION OF REQUIRED DATA FOR THE DEVELOPMENT OF SMR2023** *That, Lebanon, Libya and Sudan be included in the list of MID Air Navigation Deficiency.*	Non-submission of required data	Updated list of Deficiency	MIDANPIRG	2024	Completed
C.21/14	**MID RVSM SMR 2024** *That,* *a) the FPL/traffic data for the period 15 May – 15 June 2024 to be used for the development of the MID RVSM Safety Monitoring Report (SMR 2024);* *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, by 15 July 2024; and* *c) the final version of the MID RVSM SMR 2024 be ready for presentation and endorsement by the MIDANPIRG/22 Meeting.*	Development of Safety Monitoring Report	SMR2024	MIDRMA/States	2025	Actioned (WP/10 refer)
D.21/16	**MID ADS-B HEIGHT MONITORING SYSTEM (MID AHMS)** *That,* *a) States implementing ADS-B to share the archived data with the MIDRMA for evaluation and analysis;* *b) MIDRMA to coordinate with MAAR for:* *i. sharing their experience in evaluating and analyzing samples of the received ADS-B data; and* *ii. providing required training related to AHMS implementation for MIDRMA Staff.*	introduced ADS-B height monitoring within the services provided by the MIDRMA	MID-AHMS	MIDRMA	2025	On going (WP/10 refer)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	c) MIDRMA to develop a mechanism and tools for submitting the ADS-B data by States; *d) MIDRMA provides the required training for CNS engineers from member states responsible for extracting ADS-B data from their systems and submitting it to MIDRMA at regular, mutually agreed intervals;* *e) MIDRMA to develop and document all required processes and procedures to be reflected in the training Manuals for the AHMS implementation, to be incorporated in the MIDRMA Tasks and responsibilities;* *f) MIDRMA shall continue to provide GMU monitoring service until the AHMS is fully operational, and for the Aircraft not included in the MID-AHMS; and* *g) the funding mechanism (including services charges) might be revised accordingly (based on cost -recovery basis). In accordance with ICAO Policies on charges for Airports and Air Navigation Services (Doc 9082), in coordination with IATA.*					
D.21/18	**MID REGIONAL ATM CONTINGENCY PLAN (V5.0)** *That,* *a) the MID Regional ATM Contingency Plan (V5.0), at **Appendix 5J** is endorsed and be published as the MID Regional ATM Contingency Plan (V5.0);* *b) ICAO MID Office develop required structure on ICAO MID website and keep it up to date regarding MID States contingency plans, agreement, SOD of CCT meetings, contact list and etc.;*	Support the timely response to contingency situations	Revised version of MID Doc 003 and support the development of national ATM Contingency Plans	ICAO MID/ States	2025	On going (WP/14 refers)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	c) based on the guidelines and template provided in regional contingency plan (V5.0), MID States develop their respective contingency plan and arrangement with adjacent FIRs and share them with ICAO MID; and *d) by organizing individual workshops, ICAO MID supports the development of National Contingency Plans by the MID States.*					
D.21/18	**DISSOLUTION OF THE CONTINGENCY PLAN ACTION GROUP** *That, the Contingency Plan Action Group is dissolved.*		Revised version of MID Doc 003	CP AG	2024	Completed
C.21/19	**DEVELOPMENT OF MID STATES ATFM PLAN** *That,* *a) based on the guidelines provided in ICAO MID Doc 014: ATFM Plan (V2.0), MID States develop their respective ATFM implementation plan and agreements with adjacent FIRs and share them with ICAO MID;* *b) by organizing individual workshops, ICAO MID supports the development of States National ATFM Plans and implementation of ICAO Doc 014 requirements for Phase I (including Phase IA & IB), where requested; and* *c) the MID ATFM Task Force is tasked with the identification of Priority ATFM Implementation Areas within the MID Region, to enable further implementation support activities.*	Enhance the level of ATFM implementation within the Region	National ATFM Plan	MID States	2025	On going

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C.21/20	**MID FF-ICE WORKSHOPS 2024-2025** *That the FF-ICE Workshops be conducted in 2025, with the support of the ATFM TF and the relevant Subgroups to address the FF-ICE planning and implementation in the MID Region.*	Regional plan to ensure the readiness of ANSPs and operators for a smooth transition to FF-ICE	FF-ICE implementation plan/roadmap	MID States	2025	On going WP/8 refer
D.21/21	**DISSOLUTION OF THE CMC/FUA ACTION GROUP** *That, the CMC/FUA Action Group is dissolved.*	Task completed	CMC/FUA Action Group	MID States	2024	**Completed**
C.21/22	**FREE ROUTE AIRSPACE (FRA) IMPLEMENTATION WORKSHOP** *That, the ICAO MID Office organize Workshop in 2024 with support of IATA and concerned States and Stakeholder, to foster the implementation of FRA in the MID Region.*	Foster the implementation of FRA within the Region	FRA Workshop	ICAO MID	2024	**Completed** (WP/12 refer)
C.21/26	**NAV MON PLAN TEMPLATE** *That, the CNS SG in coordination with ATM SG and PBN SG review and update, as deem necessary, the NAV MON Plan Template to be presented to MIDANPIRG/22 for endorsement.*	Consultation for the implementation methodology and criteria related to the regional Navigation MON.	Updated MON NAV plan template	States	2025	On going (WP/5 refer)
C.21/27	**GNSS RFI Mitigation** *That,* *a) States affected with GNSS RFI take necessary mitigation measures and provide update to the ICAO MID Office by **30 May 2024**; and*	Safety risk associated with GNSS interference	Revise MID RSA014	States	2025	On going (WP/4 refer)

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	b) *the ATM SG in coordination with AIM, CNS and PBN SGs to address the reported occurrences and review the MID RSA 014 on GNSS Vulnerabilities as deemed necessary to be presented to MIDANPIRG/22 – RASG-MID/12 for endorsement*					
D.21/33	**MIDANPIRG REVISED STRUCTURE** *That, the revised MIDANPIRG Structure 2024 is endorsed to be included in MIDANPIRG Procedural Handbook.*	Consistency in establishment of experts groups	Revised MIDANPIRG structure	MIDANPIRG	2025	On going

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TABLE GEN II-1 - HOMOGENEOUS ATM AREAS AND/OR MAJOR TRAFFIC FLOWS IDENTIFIED IN THE MID REGION

Column

1	Area of routing (AR)	Sequential number of area of routing
2	Homogeneous Areas and/or Traffic flows/ routing areas	Brief description and/or name
3	FIRs involved	List of FIRs concerned
4	Type of area covered	Brief description of type of area, examples: Oceanic or Continental High or low density Oceanic en-route or Continental en-route
5	Remarks	Homogeneous ATM Area and/or Major Traffic Flow and Region(s) concerned

Area of routing (AR)	Homogeneous Areas and/or Traffic flows/ routing areas	FIRs involved	Type of area covered	Remarks
1	2	3	4	5
AR1	Asia and Europe, Asia and the Middle East, Europe and the Middle East, via the northern Arabian Peninsula and Eastern Mediterranean	Amman, Bahrain, Beirut, Damascus, Emirates, Jeddah, Kuwait, Muscat	Continental high density	Mainly intraregional and MID to/from ASIA and EUR. Some overflying EUR/ASIA traffic
AR2	Libya, Egypt and the southern Arabian Peninsula to/from Europe, Africa, Asia and North Africa	Bahrain, Cairo, Emirates, Jeddah, Muscat, Sana'a, Tripoli	Remote continental and oceanic low density (but seasonally high density)	Major traffic flow mainly landing and departing the MID region. Some EUR/AFI traffic and North Africa
AR3	Asia and Europe, Asia and the Middle East, Europe and the Middle East, north of the Gulf	Emirates, Teheran	Continental high density	Major traffic flow ASIA/EUR
AR4	Gulf, Asia (Indian subcontinent) to/from North of Europe	Baghdad, Bahrain, Emirates, Kuwait, Muscat	Continental high density	MID to/from Asia and EUR
AR5	Gulf Area to/from Eastern, Central and West Africa	Bahrain, Emirates, Jeddah, Khartoum, Muscat	Continental low density (Seasonal high density)	Traffic flow Intraregional. Seasonal pilgrim flights to/from, East, Central, and West AFI

TERMS OF REFERENCE (TOR) OF THE MIDANPIRG AIRSPACE MANAGEMENT WORKING GROUP (ASM WG)

I. TERMS OF REFERENCE

1.1 The Airspace Management Working Group was established by the MIDANPIRG/21 meeting to address the challenges in Airspace Management and provide a forum for the ATM specialists in the Region to work together to improve safety and efficiency, increase airspace capacity to meet future demand requirements; and reduce the environmental impact of increasing air traffic by offering improved ATM operations. Therefore, the **Airspace Management Working Group (ASM WG)** Terms of Reference are as follows:

a) Address the MID Region Airspace Management challenges:

   i. conduct a holistic review and perform gap analysis of the MID ATS Routes Network in order to assess the regional capacity, hotspots and constraints;

   ii. identify requirements and improvements for enhancing safety and achieving an efficient airspace structure within the MID Region;

   iii. support states on coordinating the identified airspace and ATS route network requirements with relevant stakeholders (International Organizations, airspace user representative organizations and other ICAO Regions);

   iv. address areas of conflicting traffic highlighted in the MIDRMA Annual Safety Monitoring Report (SMR);

   v. support States in resolving interface issues with adjacent ICAO Regions;

   vi. identify the Priority 1 ASBU elements with low level of implementation and support the States to overcome the challenges for the implementation of these elements; and

   vii. address MID ATS route designators and 5LNCs challenges.

b) Support the enhancements of MID airspace structure and ATS route network:

   i. improve connectivity and accessibility (specification, trajectory, spacing, etc.), considering the ability to offer additional routing options, to support operational requests, including contingency situations;

   ii. foster a harmonized implementation of Performance Based Navigation (PBN) within the enroute environment;

   iii. coordinate with the MIDRMA and IATA/airspace users to collect and analyse traffic data related to the proposed changes to the ATS Routes Network, as required;

   iv. develop a working repository for route proposals to be used as a dynamic reference for the establishment / modification of ATS routes; and

v. support the development, coordination and submission of Proposals for Amendment (PfA) for processing to ensure the continuous and coherent development and update of the MID ANP in the respective subjects.

c) Endeavour to enhance safety and efficiency; increase capacity and reduce the environmental impact of increasing air traffic through the implementation of improved ATM operations:

i. support States to review and update their Letter of Agreement with adjacent FIRs to optimize utilization of the MID airspace in a harmonized manner;

ii. develop regional procedure to regulate and harmonize implementation of TOS, RAD and FLAS;

iii. foster the implementation of reduced Longitudinal Separation between FIRs;

iv. foster the implementation of Civil-Military Cooperation (CMC) and Flexible Use of Airspace (FUA);

v. support the planning and harmonized implementation of Free Route Airspace (FRA); and

vi. foster the implementation of (FF-ICE).

d) Support the planning for the operation/integration of new entrants such as Remotely Piloted Aircraft System (RPAS)/Unmanned Traffic Management (UTM) into the MID Region airspace;

e) Considering global and regional developments related to ATM, identify/propose necessary amendments to the MID Air Navigation Strategy for review by the ATM SG;

f) Report its activities to the ATM SG; and

g) Review periodically its Terms of Reference and propose amendments, as necessary.

h) The ASM AG would review and amend accordingly the action items and timelines based on the developments and progress.

II. COMPOSITION

2.1 The Working Group is composed of:

a) MIDANPIRG Member States;

b) concerned International and Regional Organizations; and

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

III. WORKING ARRANGEMENTS

3.1 The Chairperson, in close co-operation with the Secretariat, shall make all necessary arrangements for the most efficient working of the Working Group. The Working 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 Working Group to advance the work. Best advantage should be taken of modern communications facilities, particularly videoconferencing (Virtual Meetings) and e-mails.

3.2 In person meetings will be conducted once a year and when deemed necessary.

Action Plan for ASM Enhancement Initiatives

List of ASM priority focus areas:

1. *Implementation of PBN in Enroute*
2. *Implementation of reduction of longitudinal separation*
3. *ATS route network (including ATS route designators and 5LNCs)*
4. *ASM improvements (CMC and FUA, FRA, RAD, TOS, FLAS & LoA)*
5. *RPAS/UTM*
6. *FF-ICE implementation*

Focus area number	Action		Target date	Deliverable	Champion	Reference	Status / RMK
	No.	Description					
1	**1.1**	Publish implementation of RNAV 5 in their FIRs		RNAV 5 routes should be published in the AIP, ENR 3.2.	Lebanon		
					Libya		
					Syria		
	1.2	Implement RNAV 5 in the level band FL160 - FL460		Update State AIP, ENR 3.3 to indicate implementation of the RNAV 5 in the level band FL160 - FL460 (inclusive).	Iran		
					Lebanon		
					Libya		
					Syria		
					Sudan		
	1.3	Publish RNAV routes in relevant part in the AIP		All RNAV routes either defined by RNAV designator or non-RNAV designator publish in ENR 3.2	Egypt		
					Kuwait		
					Yemen		
2	**2.1**	Coordinate with neighboring States to reduce surveillance longitudinal separation down to 10 NM		Detailed implementation plan	**Iran** – Turkey & Pakistan		
					Iraq – Turkey, **Kuwait** & **Jordan**		
					Libya – Chad		
					Oman – Pakistan & India		
					Yemen – Somalia		
3	**3.1**	Remove prefix “U” from ATS route designators		Revise AIP, ENR 3 to remove prefix “U”	**Iraq** (UL602, UM860, UP975, etc.)		

Focus area number	Action		Target date	Deliverable	Champion	Reference	Status / RMK
	No.	**Description**					
					Jordan (UM690, UR785, UB544, etc.)		
					Lebanon (UM425, UL620, UN438, etc.)		
					Oman (UB424, UL425, UB535, etc.)		
	3.2	Change ATS route designators		Revise AIP, ENR 3 to change the required ATS route designators in accordance with ANP volume II.	**Bahrain** (T557 to L557, Y604 to L704, Y856 to M556, T308 to M708, Z622 to M722, T872 to N572, T602 to N702, T319 to P319, T430 to P550, T444 to P700, T934 to P713)		
					Oman (L695, M303, M681, M877, N430, P304, P316, P513, R402 to non-regional T507 to L559, T980 to L700, Q620 to M700, Z515 to M717, T970 to N570, Q978 to N718)		
					Qatar (Y604 to L704, T665 to N700, T430 to P550, T444 to P700)		
					Saudi Arabia (G674, G799, M309 to non-regional H732 to M553, H741 to M320, J735 to P703, J749 to N709, J852 to M702, J874 to N704, T136 to L716, Y415 to M705, Y511 to M711, Z515 to M717, Q332 to N323, V13 to N703, J874 to N704, Y517 to N707, J749 to N709, T513 to N713, V975 to P705, Q510 to P710, T100 to P711, Q212 to P712, Q21 to		

Focus area number	Action		Target date	Deliverable	Champion	Reference	Status / RMK
	No.	**Description**					
					P721, Q143 to P723, Q615 to P753, Q624 to P752)		
					UAE (T665 to N700, Q415 to N715)		
					Yemen (L566 to Y101, P552 to Y103, R799 to Y105, Z515 to M717 and establish LADLI-PUTSO)		
4	**4.1**	Continuation of FRA volume between UAE and Qatar		Detailed implementation plan	Qatar and UAE		
	4.2	Explore the feasibility of Development of Regional RAD/routing concept		RAD portal	Oman and Saudi Arabia. Other interested States		
	4.3	Regional cooperation of optimization of major traffic flows			Oman and MID States	ATM WP/22 Oman	

FRA Workshop Key-Takeaways

- *Implementation of FRA at national level:*

1) Implementation of FRA contributes to operational efficiency by allowing for more flexible route planning and reducing air traffic complexity, enhances airspace utilization and contributes to the reduction of emissions.

2) States planning to implement FRA are encouraged to:

a) follow a step-by-step approach;

b) collect required data and coordinate with concerned stakeholders, including Military Authorities, ATCOs, flight procedure designers, airspace planners and airspace users, to assess the needs for implementation of FRA;

c) consider the traffic flows in adjacent FIRs and the impact of the FRA implementation;

d) in determining the vertical and horizontal dimensions of the airspace where FRA would be implemented, ensure that the selected airspace is able to accommodate the main traffic flows and the needs of airspace users (civil and Military);

e) foster the implementation of the pre-requisites for FRA implementation (FUA, ASBU FRTO B0/1 Direct Route, FICE B0/1 (AIDC/OLDI);

f) consider the neighboring ANSP's requirements in regards to use of certain routes/waypoints for certain destinations;

g) study and determine the most suitable flight level for the transition between FRA and non-FRA;

h) conduct necessary safety assessments and change management studies;

i) conduct necessary testing including through the use of simulators;

j) conduct a benchmarking exercise with a leading ANSP that has successfully implemented FRA;

k) consider the capabilities/upgrade of their ATM systems to accommodate the flight planning in a FRA environment and Medium-Term Conflict Detection (FRTO B0/4 Basic conflict detection and conformance monitoring (MTCD);

l) develop training package for ATCOs and concerned stakeholders and provide appropriate training to ATC personnel to acquire the skills necessary to properly conduct FRA operations (before implementation);

m) develop specific procedures for air traffic controllers and assistants to manage FRA operations effectively; and publish these procedures for all operational staff to ensure uniform understanding and application;

n) use real-time simulations to test and validate FRA procedures; and

o) coordinate with the ICAO MID Office and concerned AIS data service providers for the publication of the FRA related sections/parts in the AIP in a harmonized manner.

3) FRA implementation (ASBU FRTO B1/1):

In order to ensure a seamless and safe implementation/integration of FRA, States are encouraged to:

a) finalize the FRA design and ensure the readiness of all operational staff through comprehensive training and coordination with stakeholders;

b) monitor initial operations closely to identify and address any emerging issues;

c) maintain regular communication with stakeholders to provide updates and address any emerging challenge;

d) consider the implementation of Dynamic sectorization (ASBU FRTO B1/4 Dynamic Sectorization); and

e) measure the benefits accrued from FRA implementation using specific KPIs.

- Implementation of FRA at regional level:

The expansion of FRA implementation cross borders and ultimately across regions will increase operational efficiency and contribute to reduced fuel consumption.

Example for implementation of cross-border implementation of FRA.

1- Based on traffic statistic, identify the main flow which will bring maximum efficiency with minimum complexity;

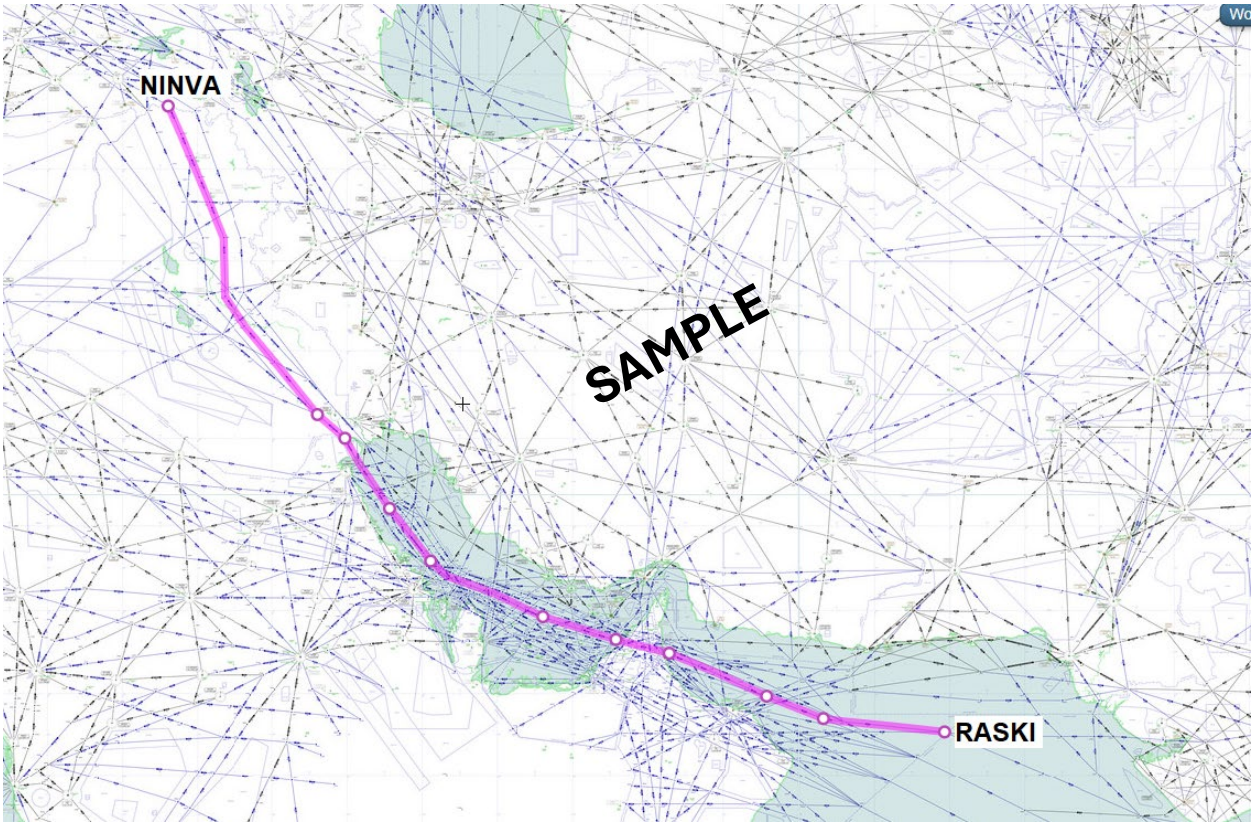
2- Determine the horizontal delineation of the FRA in each consecutive FIRs to cover operational needs including buffer;

3- Determine the vertical dimension of the volume in a coordinated manner considering that this portion of airspace should be free from conflict;

4- Make sure that FRA implementation prerequisites have been implemented and required enablers are available to support implementation of FRA at concerned FIRs;

5- Amend relevant agreements and procedures such as LoAs including longitudinal separation to be considered; and

6- Publish required procedures and FRA specifications in the AIPs of the concerned States in a harmonized manner and agree on a common implementation date in accordance with the AIRAC procedures.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RASG-MID SAFETY ADVISORY – 14

(RSA-14)

October 2024

MID-Region

GUIDANCE MATERIAL REALTED TO GNSS VULNERABILITIES

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Disclaimer

This document has been compiled by the MID Region civil aviation stakeholders to mitigate the safety and operational impact of GNSS service disruptions. It is not intended to supersede or replace existing materials produced by the National Regulator or in ICAO SARPs. The distribution or publication of this document does not prejudice the National Regulator's ability to enforce existing National regulations. To the extent of any inconsistency between this document and the National/International regulations, standards, recommendations or advisory publications, the content of the National/International regulations, standards, recommendations and advisory publications shall prevail**.**

TABLE OF CONTENTS

ACRONYMS

ABAS	AIRCRAFT BASED AUGMENTATION SYSTEM
ADS-B	AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST
AHRS	ATTITUDE AND HEADING REFERENCE SYSTEMS
ANS	AIR NAVIGATION SERVICES
ATC	AIR TRAFFIC CONTROLLER
DME	DISTANCE MEASURING EQUIPMENT
EGPWS	ENHANCED GROUND PROXIMITY WARNING SYSTEM
FIR	FLIGHT INFORMATION REGION
FMS	FLIGHT MANAGEMENT SYSTEM
GBAS	GROUND BASED AUGMENTATION SYSTEM
GLONASS	GLOBAL NAVIGATION SATELLITE SYSTEM
GNSS	GLOBAL NAVOGATION SATELLITE SYSTEM
GPS	GLOBAL POSITION SYSTEM
HAL	HORIZONTAL ALERT LIMIT
ILS	INSTRUMENT LANDING SYSTEM
IRS	INERTIAL REFERENCE SYSTEM
ITU	INTERATIONAL TELECOMMUNICATION UNION
MIDANPIRG	MID AIR NAVIGATION PLANNING AND IMPLEMENTATION GROUP
NAV	NAVIGATION
NOTAM	NOTICE TO AIRMEN
PBN	PERFORMANCE BASED NAVIGATION
POS	POSITION
RAIM	RECEIVER AUTONOMOUS INTEGRITY MONITORING
RF	RADIO FREQUENCY
RNAV	AREA NAVIGATION
RNP	REQUIRED NAVIGATION PERFORMANCE
SBAS	SPACE BASED AUGMENTATION SYSTEM
TAWS	TERRAIN AVOIDANCE WARNING SYSTEM
TSO	TECHNICAL STANDARD ORDER
VHF	VERY HIGH FREQYENCY
VNAV	VERTICAL NAVIGATION
VOR	VERY HIGH OMNI DIRECTIONAL RADIO RANGE
WAAS	WIDE AREA AUGMENTATION SYSTEM

GNSS VULNERABILITIES

1. INTRODUCTION

GNSS supports positioning, navigation and timing (PNT) applications. GNSS is the foundation of Performance Based Navigation (PBN), Automatic Dependent Surveillance – Broadcast (ADS-B) and Automatic Dependent Surveillance – Contract (ADS-C). GNSS also provides a common time reference used to synchronize systems, avionics, communication networks and operations, and supports a wide range of non-aviation applications.

GNSS Vulnerability has been identified as a safety issue and one of the main challenges impeding the implementation of PBN in the MID Region. The sixteenth meeting of the MID Air Navigation planning and Implementation Regional Group (MIDANPIRG/16 Kuwait, 13-16 February 2017) recognized the impact of the GNSS signal interference and vulnerabilities and agreed that the subject should be addressed by the Regional Aviation Safety Group-Middle East (RASG-MID) in order to agree on measures to ensure effective reporting of GNSS interferences, which could be mandated by the States' regulatory authorities. The meeting invited the RASG-MID to consider the development of a RASG-MID Safety Advisory (RSA) related to GNSS vulnerabilities, highlighting the Standard Operating Procedures (SOP) for pilots, including the reporting procedures.

The RASG-MID/6 (Bahrain, 26 – 28 September 2017) agreed that IATA and ICAO MID Office should develop RSA on GNSS vulnerabilities.

With the increasing dependence on GNSS, it is important that GNSS vulnerabilities be properly addressed. This Safety Advisory provides guidance on mitigation measures that States would deploy to minimize the GNSS vulnerabilities impact on safety and air operation. The RSA also includes the regional reporting and monitoring procedures of GNSS anomaly with the aim to analyze the threat and its impact on performance, and assess the effectiveness of the mitigation measures in place.

2. DESCRIPTION

Dependence on GNSS is increasing, as GNSS is used for an ever-expanding range of safety, security, business and policy critical applications. GNSS functionality is being embedded into many parts of critical infrastructures. Aviation is now dependent on uninterrupted access to GNSS positioning, navigation and timing (PNT) services.

Aviation relies heavily on GNSS for area navigation and precision approach. Aircraft avionics such as the Flight Management Systems (FMS) require GNSS timing for a large number of onboard functions including Terrain Avoidance Warning System (TAWS) or Enhanced Ground Proximity Warning Systems (EGPWS). Onboard avionics are highly integrated into commercial aircraft and are very dependent on GNSS timing data. At the same time, GNSS vulnerabilities are being exposed and threats to denial of GNSS services are increasing.

There are several types of threat that can interfere with a GNSS receiver's ability to receive and process GNSS signals, giving rise to inaccurate readings, or no reading at all, such as radio frequency interference, space weather induced ionospheric interference, solar storm, jamming and spoofing. The disruption of GNSS, either performance degradation in terms of accuracy, availability and integrity or a complete shutdown of the system, has a big consequence in critical infrastructure. For example, local interference in

an airport could degrade position accuracy or lead to a total loss of the GNSS based services, which could put safety of passengers in jeopardy.

There are two types of GNSS Interference Sources; Intentional and Unintentional sources, the latter is not considered a significant threat provided that States exercise proper control and protection over the electromagnetic spectrum for both existing and new frequency allocations. Solar Effect, Radio Frequency Interference and On-board systems are examples of Unintentional GNSS interference sources. However, the Intentional sources such as Jamming and spoofing are considered as serious threats to the continued safety of air transport.

GNSS Jamming occurs when broadcasting a strong signal that overrides or obscures the signal being jammed. The GNSS jamming might occur deliberately by a military activity or by Personal Privacy Devices (PPDs). GNSS jamming has caused several GNSS outages in the MID Region.

In some States, military authorities test the capabilities of their equipment and systems occasionally by transmitting jamming signals that deny GNSS service in a specific area. This activity should be coordinated with State spectrum offices, Civil Aviation Authorities and ANS providers. Military and other authorities operating jamming devices should coordinate with State/ANS providers to enable them to determine the airspace affected, advise aircraft operators and develop any required procedures.

Spoofing is another source of intentional interference, which is a deliberate interference that aims to mislead receivers into general false positioning solution.

Detailed information about the GNSS Implementation and Vulnerabilities can be found in MID DOC 011 – The Guidance on GNSS implementation in the MID Region.

3. RISK ASSESSMENT

The risk assessment covers affected operations during en-routre, terminal, and approach phase of flights. In addition, the aircraft impact at table (1), which presents an overview of different potential impacts from GNSS interference, needs to be considered for risk assessment.

Understanding the different types of threat and how likely they are to occur is key to conducting an accurate risk assessment. Broadly, the threat types break down as follows:

Threat Source	Threat Type	Description	Impact on the User
Solar Storms	Unintentional	Electromagnetic interference from solar flares and other solar activity "drowns out" the satellite signals in space.	Loss of signal, or range errors affecting the accuracy of the location or timing information.
Jamming	Intentional	Locally-generated RF interference is used to "drown out" satellite signals.	Loss of signal (if the jammer is blocking out all satellite signals) or range errors affecting the accuracy of the location or timing information

Spoofing	Intentional	Fake signals are broadcast to the device to fool it into believing it is somewhere else, or at a different point in time.	False location and time readings, with potentially severe impacts on automated and autonomous devices and devices that rely on precise GNSS timing.
RF Interference	Unintentional	Noise from nearby RF transmitters (inside or outside the device) obscures the satellite signals.	Loss of signal (if the transmitter is blocking out all satellite signals) or range errors affecting the accuracy of the location reading (if the receiver is at the edge of the transmitter's range).
Signal Reflection	Unintentional	Reflection due objects such as buildings	GNSS signals can reflect off relatively due to distant objects, such as buildings, which would cause gross errors in position accuracy if the receiver falsely locks onto the reflected signal instead of the direct signal
User Error	Unintentional	Users over-rely on the GNSS data they are presented with, ignoring evidence from other systems or what they can see.	Can lead to poor decision-making in a range of scenarios

Table 1: Threats types

Depending on the nature of the interference and the nature of the application, a user may be affected in several ways; the impact may range from a small nuisance to an economic, operational or a safety impact. The detailed risk assessment methodology is addressed at **Appendix B**.

4. MITIGATION STRATEGIES

To minimize the risks associated with GNSS vulnerabilities, several mitigation strategies can be deployed to reduce the likelihood and impact of the threat.

Operational / ATC mitigation procedures:

1. Provide familiarization for ATCo about the spoofing and jamming; including awareness of the possible impact,
2. If navigation performance degradation reported by pilot, ATCOs shall acknowledge and verify the aircraft position, if required, correlation with other ground NAVAIDS,
3. Monitor the traffic lateral adherence to the route centerline, and inform pilots in case they observed any significant deviation from the intended route,
4. Ensure adequate separation implemented and maintained with other traffic,
5. If deviation is significant, inform the flight crew to verify aircraft position,
6. Offer alternate navigation assistance (RADAR Vector, conventional navigation),
7. Inform adjacent ACCs/ATS Units, and relevant ATS supervisor to coordinate with relevant internal and external authorities,
8. Promulgate the information, advise other pilots, announce on ATS/ATIS Frequency, and if extended period consider issuing NOTAM,

9. Inform pilots of nearby ground NAVAIDs,
10. Coordinate with military authority to eliminate the possibility of interception and miss-identification of stray aircraft,
11. Coordinate with adjacent ACCs to apply longer separation and inform them regarding possibility of deviation, miss identification and strayed aircraft at common border;
12. Fill in incident report and provide brief to operations supervisor,
13. Sharing the information with Airspace users and operators.

4.1 REDUCING THE LIKELIHOOD OF GNSS INTERFERENCES

The likelihood of interference depends on many factors such as population density and the motivation of individuals or groups in an area to disrupt aviation and non-aviation services. To reduce the likelihood of GNSS interference, the following measures may be applied:

a) Effective spectrum management; this comprises creating and enforcing regulations/laws that control the use of spectrum and carefully assessing applications for new spectrum allocations.

b) The introduction of GNSS signals on new frequencies will ensure that unintentional interference does not cause the complete loss of GNSS service (outage) although enhanced services depending upon the availability of both frequencies might be degraded by such interference.

c) State should forbid the use of jamming and spoofing devices and regulate their importation, exportation, manufacture, sale, purchase, ownership and use; they should develop and enforce a strong regulatory framework governing the use of intentional radiators, including GNSS repeaters, pseudolites, spoofers and jammers. The enforcement measures include:

- detection and removal of jammers / interference sources; and
- direct or indirect detection (e.g. use of dedicated interference detection equipment).

d) Education activities to raise awareness about legislation and to point out that 'personal' jammers can have unintended consequences.

e) Multi-constellation GNSS would allow the receiver to track more satellites, reducing the likelihood of service disruption.

4.2 REDUCING THE IMPACT OF THE GNSS VULNERABILITIES

The GNSS signal disruption cannot be ruled out completely and States/ANSPs must be prepared to deal with loss of GNSS signals, and that States conduct risk assessment and implement mitigation strategies. The risk and impacts from these threats can be managed by evaluating the growing threat of GNSS interference, jamming and spoofing.

The disruption of GNSS signals will require the application of realistic and effective mitigation strategies to both ensure the safety and regularity of air services and discourage those who would consider disrupting aircraft operations. There are three principal methods, which can be applied in combination:

a) taking advantage of on-board equipment, such as Inertial Reference System (IRS);

IRS provides a short-term area navigation capability after the loss of GNSS updating. Many air transport aircraft are equipped with IRS and these systems are becoming more affordable and accessible to operators with smaller, regional aircraft. Most of these systems are also updated by DME.

b) Development of contingency procedures and processes to enable operations in a fallback mode in case of loss of GNSS (aircrew and/or ATC), using alternate NAVAIDS (ground-based).

Procedural (aircrew or ATC) methods can provide effective mitigation in combination with those described above, taking due consideration of:

- the avionics onboard
- aircrew and air traffic controller workload implications (consideration to ATC damand/capacity);
- the impact that the loss of GNSS will have on other functions, such as ADS-B based surveillance; and
- the potential for providing the necessary increase in separation between aircraft in the affected airspace.

c) taking advantage of conventional navigation aids and radar, conventional aids can provide alternative sources of guidance.

The regulator should conduct safety oversight of the service provider's GNSS based Services and validate the safety aspects of mitigation strategies, considering the impact on ATM operations. Details on Risk assessment process including some examples are at **Appendix B.**

The data analysis of the reported GNSS vulnerabilities for the period January 2015to June 2018 showed that the impact of the GNSS interference on Aircraft Operations in the MID Region were as follows:

1. Loss of GPS1 (fault)/ Loss of GPS2 (fault)
2. Observation of "Map shift" on Navigation display
3. Switching to an alternative navigation mode (IRS displayed, VOR/DME)
4. Degraded PBN Capability (NAV Unable RNP)
5. GPS POS Disagree
6. EGPWS warning
7. ADS-B Traffic triggered

5. MONITORING

The success of many of countermeasures is dependent on having a detailed understanding of the threats. In order to establish this understanding and to maintain an up-to-date knowledge of the threats - in terms of both types and number of threats – it is necessary to States to monitor the threat environment and the impact on performance.

Monitoring and reporting is required to inform stakeholders of the threats that exist. This would help directly with enforcement (detecting and removing sources of interference) as well as monitoring the response to changes in legislation or education activities.

Receiver autonomous integrity Monitoring (RAIM) provides integrity monitoring by detecting the failure of a GNSS satellite. It is a software function incorporated into GNSS receivers.

In the event of GNSS performance degrading to the point where an alert is raised, or other cause to doubt the integrity of GNSS information exists, the pilot in command must discontinue its use and carry out appropriate navigation aid failure procedures. Should RAIM detect an out-of-tolerance situation, an immediate warning will be provided. When data integrity or RAIM is lost, aircraft tracking must be closely monitored against other available navigation systems.

States may consider the deployment of GNSS threat monitoring system, which allows monitoring of local GNSS interference environment; signal recording and monitoring for situational awareness of any drop in signal quality or signal outage and ground validation of GNSS-based flight procedures. The detection equipment may include localization utilities.

With reference to ICAO Doc 9849:

Given the variety of avionics designs, one service status model cannot meet all operators' requirements. A conservative model would produce false alarms for some aircraft. A less conservative model would lead to missed detection of a service outage for some and false alarms for others. Regardless, only the aircrew, not ATC, is in a position to determine whether, for example, it is possible to continue an ABAS-based instrument approach. In contrast, ATC has access to ILS monitor data and can deny an ILS approach clearance based on a failure indication. The real time monitor concept is neither practical nor required for GNSS ABAS operations. It may be practical for SBAS and GBAS, but implementation would depend on a valid operational requirement.

Aircraft operators with access to prediction software specific to their particular ABAS/RAIM avionics will find it advantageous to employ that software rather than use the general notification service. In the case of SBAS and GBAS, operators will rely on service status notifications.

6. REPORTING

ANSP must be prepared to act when anomaly reports from aircraft or ground-based units suggest signal interference. If an analysis concludes that interference is present, ANS providers must identify the area affected and issue an appropriate NOTAM.

From the perspective of the aircrew, a GNSS anomaly occurs when navigation guidance is lost or when it is not possible to trust GNSS guidance. In this respect, an anomaly is similar to a service outage. An anomaly may be associated with a receiver or antenna malfunction, insufficient satellites in view, poor satellite geometry or masking of signals by the airframe. The perceived anomaly may also be due to signal interference, but such a determination requires detailed analysis based on all available information.

In case of GNSS anomaly detected by aircrew, **Pilot** action(s) should include:

a) reporting the situation to ATC as soon as practicable and requesting special handling as required;
b) filing a GNSS Interference Report using the Template at **Appendix A**, and forwarding information to the IATA MENA (sfomena@iata.org) and ICAO MID Office (icaomid@icao.int) as soon as possible, including a description of the event (e.g. how the avionics failed/reacted during the anomaly).

Air Traffic Controller action(s) should include:

a) recording minimum information, including aircraft call sign, type, location, altitude and date/time of the occurrence;
b) cross check with other aircraft in the vicinity;

broadcasting the anomaly report to other aircraft and adjacent ATS units, as necessary;

ANSP action(s) should include:

a) ensuring the issuance of appropriate advisories and NOTAM, as necessary;
b) attempting to locate/determine the source of the interference, if possible;
c) notifying the agency responsible for frequency management (the Telecommunication Regulatory Authority);
d) locate and eliminate source in cooperation with local regulatory & enforcement Authorities;
e) tracking and reporting all activities relating to the anomaly until it is resolved; and
f) review the effectiveness of the mitigation measures for improvement.

ICAO MID Office action(s) should include:

a) collect anomaly related information and determine the course of action required to resolve reported anomalies;
b) follow-up with State having interference incident to ensure implementation of required corrective actions;
c) coordinate with concerned adjacent ICAO Regional Office(s) to follow-up with States under their accreditation areas, when needed; and
d) Communicate with ITU Arab Office and Arab Spectrum Management Group to resolve frequent interference incidents, when needed.

7. REFERENCES:

- Annex 10 Aeronautical Telecommunications, Volume I ─ Radio Navigation Aids
- Annex 11 Air Traffic Services
- ICAO Doc 4444 PANS-ATM,
- ICAO Doc 9613 PBN Manual
- ICAO Electronic Bulletin 2011/56, Interference to Global Navigation Satellite System (GNSS) Signals.
- GNSS Manual, ICAO Doc 9849
- Standardization of GNSS Threat reporting and Receiver testing through International Knowledge Exchange, Experimentation and Exploitation, STRIKE3 EUROPEAN Initiative, Paper 74
- The report of Vulnerabilities Assessment of the Transportation Infrastructure relying on the Global Position System, US Department of Transportation.
- Operational Impacts of Intentional GPS Interference. (A Report of the Tactical Operations Committee in Response to Tasking from the Federal Aviation Administration. March 2018.
- CANSO Cyber security and Risk Assessment guide.
- ICAO GNSS RFI Mitigation Plan and associated EUROCONTROL Efforts, 8 Nov 2016
- European Global Satellite Agency System, GNSS Market Report issue 4, March 2015
- MID Doc 007 (MID Region PBN Implementation Plan
- MID Doc 011 (The Guidance on GNSS implementation in the MID Region)

Appendix A

1. **GNSS interference reporting form to be used by pilots**
   ** Mandatory field*

Originator of this Report:	
Organisation:	
Department:	
Street / No.:	
Zip-Code / Town:	
Name / Surname:	
Phone No.:	
E-Mail:	
Date and time of report	
Description of Interference	
*Affected GNSS Element	[ ] GPS [ ] GLONASS [ ] other constellation [ ] EGNOS [ ] WAAS [ ] other SBAS [ ] GBAS (VHF data-link for GBAS)
Aircraft Type and Registration:	
Flight Number:	
*Airway/route flown:	

Coordinates of the first point of occurrence / Time (UTC):	UTC: Lat: Long:
Coordinates of the last point of occurrence / Time (UTC):	UTC: Lat: Long:
*Flight level or Altitude at which it was detected and phase of flight:	
Affected ground station (if applicable)	Name/Indicator; [e.g. GBAS]
*Degradation of GNSS performance:	[ ] Large position errors (details): [ ] Loss of integrity (RAIM warning/alert): [ ] Complete outage (Both GPSs), [ ] Loss of GPS1 or Loss of GPS 2 [ ] Loss of satellites in view/details: [ ] Lateral indicated performance level changed from:___to ___ [ ]Vertical indicated performance level changed from: __ to __ [ ] Indicated Dilution of Precision changed from __ to__ [ ] information on PRN of affected satellites (if applicable) [ ] Low Signal-to-Noise (Density) ratio [ ] Others
*Problem duration:	[ ] continuous for 20 minutes [ ] intermittent

Note: Only applicable fields need to be filled!

Appendix B

Risk Assessment

Threats and vulnerabilities

A threat assessment should be performed to determine the best approaches to securing a GNSS against a particular threat. Penetration testing exercises should be conducted to assess threat profiles and help develop effective countermeasures.

Table (B1) presents an overview of different potential impacts from GNSS interference. This is a snapshot of impacts based on input from two manufacturers and not intended to be a comprehensive list of all impacts:

Effect	Affected Operation	Impact
Loss of GNSS-based navigation	Enroute/ Terminal/ Approach	Aircraft with Inertial Reference Unit (IRU) or Distance Measuring Equipment (DME)/DME may have degraded RNP/RNAV. Aircraft may deviate from the nominal track May increase workload on aircrew and ATC May result in missed approach or diverting to other runway in case the aerodrome operating minima cannot be met through conventional precision or visual approaches. Conventional ATS routes, SIDs and STARs would be used.
Larger than normal GNSS position errors prior to loss of GNSS	Enroute/ Terminal/ Approach	Interference could cause the GNSS position to be pulled off but not exceed the HAL (2NM , 1NM, 0.3NM for enroute, terminal and approach phases, respectively).
Loss of EGPWS/ TAWS	Enroute/ Terminal/ Approach	Reduced situational awareness and safety for equipped aircraft. Terrain Awareness and Warning System (TAWS) is required equipment for turbine-powered airplanes > 6 passengers. Loss of GPS results in loss of terrain/obstacle alerting. Position errors as GPS degrades can result in false or missed alerts.
Loss of GPS aiding to AHRS	Flight Control	Can result in degradation of AHRS pitch and roll accuracy with potential downstream effects such as was experienced by a Phenom 300 flight.

Loss of GNSS to PFD/MFD	All flight phases	Can result in: -Loss of synthetic vision display and flight path marker on PFD -Loss of airplane icon on lateral and vertical electronic map displays, georeferenced charts, and airport surface maps without DME-DME or IRU -Loss of airspace alerting and nearest waypoint information without DME-DME or IRU Overall loss of situational awareness to flight crew and increased workload.
No GNSS position for ELT	Search and Rescue	Loss of GNSS signal could result in larger search areas for the Emergency Locator Transmitters (ELTs)

Table B1: Potential Impact from GNSS

Consequence/Impact of risk occurring

Category	Effect on Aircrew and Passengers	Overall ATM System effect
Catastrophic 1	Multiple fatalities due to collision with other aircraft, obstacles or terrain	Sustained inability to provide any service.
Major 2	Large reduction in safety margin; serious or fatal injury to small number; serious physical distress to air crew.	Inability to provide any degree of service (including contingency measures) within one or more airspace sectors for a significant time.
Moderate 3	Significant reduction in safety margin.	The ability to provide a service is severely compromised within one or more airspace sectors without warning for a significant time.
Minor 4	Slight reduction in safety margin.	The ability to provide a service is impaired within one or more airspace sectors without warning for a significant time
Negligible 5	Potential for some inconvenience.	No effect on the ability to provide a service in the short term, but the situation needs to be monitored and reviewed for the need to apply some form of contingency measures if the condition prevails.

Table B2: Impact of Risk Occurring

Likelihood of risk occurring

The definitions in the table (B3) were adopted for estimating the likelihood of an identified risk occurring, for this purpose, five situations are considered:

Event is expected to occur	
1	More frequently than hourly
2	Between hourly and daily
3	Between daily and yearly
4	Between yearly and 5 yearly
5	Between 5 and 50 years
6	Less frequently than once every 50 years

Table B3: Likelihood of risk occurring

Assessment of the level of risk and risk tolerance

All identified risks were reviewed and provided for each an overall risk ranking which is a combination of the two characteristics of consequence and likelihood. For example, a risk with a major consequence but a "5" likelihood would be described as having an "A" or "unacceptable" risk rating. The conversion of the combination of consequence and likelihood into a risk rating has been achieved by use of the following matrix.

Likelihood Criteria		**Consequence Criteria**				
Event expected to occur:		**Catastrophic 1**	**Major 2**	**Moderate 3**	**Minor 4**	**Insignificant 5**
1	**More frequently than hourly**	**A**	**A**	**A**	**A**	**C**
2	**Between hourly and daily**	**A**	**A**	**A**	**B**	**D**
3	**Between daily and yearly**	**A**	**A**	**B**	**C**	**D**
4	**Between yearly and 5 yearly**	**A**	**B**	**C**	**C**	**D**
5	**Between 5 and 50 years**	**A**	**B**	**C**	**D**	**D**
6	**Less frequently than once every 50 years**	**B**	**C**	**D**	**D**	**D**

Table B4: Risk Assessment Table

The previous matrix provides a guide to determine which risks are the highest priorities from the perspective of the timeliness of the corrective action required. The following table outlines the position in more definitive terms.

Safety tolerability risk matrix

Risk Index Range	Description	Recommended Action
A	Unacceptable	Stop or cut back operation promptly if necessary. Perform priority/immediate risk mitigation to ensure that additional or enhanced preventive controls are put in place to bring down the risk index to the moderate or low range
B	High Risk	Urgent action. Perform priority/immediate risk mitigation to ensure that additional or enhanced preventive controls are put in place to bring down the risk index to the moderate or low range
C	Moderate Risk	Countermeasures actions to mitigate these risks should be implemented.
D	Low Risk	Acceptable as is. No further risk mitigation required

Table B5: Risk Tolerability Matrix

Sample risk assessment

The risk assessment table (B6) could be used to identify and capture the threats, select the risk rating based on the risk matrix above considering the existing controls. In addition, recommended actions could be selected to minimize the risk.

L = Likelihood
C = Consequence
R = Risk

Threat	Initial Risk			Existing controls	Accept/Reduce	Recommended controls	Residual Risk		
	L	C	R				L	C	R

Table B6: Sample Risk Assessment tables

The table (B7) below is an example of risk assessment for approach phase of flight, the detailed Risk assessment process is at Appendix B

L = Likelihood
C = Consequence
R = Risk

Threat	Initial Risk			Existing controls	Accept/ Reduce	Recommended controls	Residual Risk		
	L	C	R				L	C	R
Between daily and yearly	**3**	**2**	A	-Error message notification by avionic	Reduce	1)using of on-board equipment (IRS); 2)Interference detector by ANSPs 3) executing miss-approach	3	4	C

Table B7: Example Risk Assessment for Approach phase of flight

Another example risk assessment for en-route phase of flight at table (B8)

L = Likelihood
C = Consequence
R = Risk

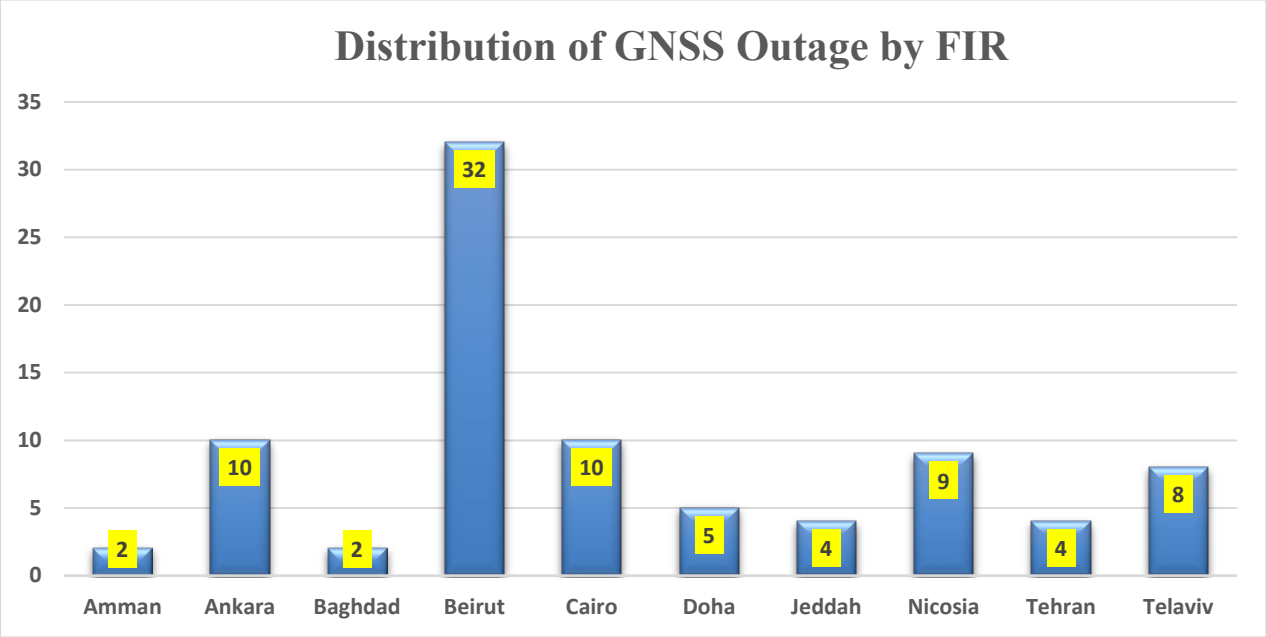
Threat	Initial Risk			Existing controls	Accept/Reduce	Recommended controls	Residual Risk		
	L	C	R				L	C	R
Between 5 and 50 years (short time GNSS Outage)	5	5	D	-Error message notification by avionic -Regulations/ law to protect the GNSS signal	Accept	-			

Table B8: Example risk assessment for enroute phase of flight

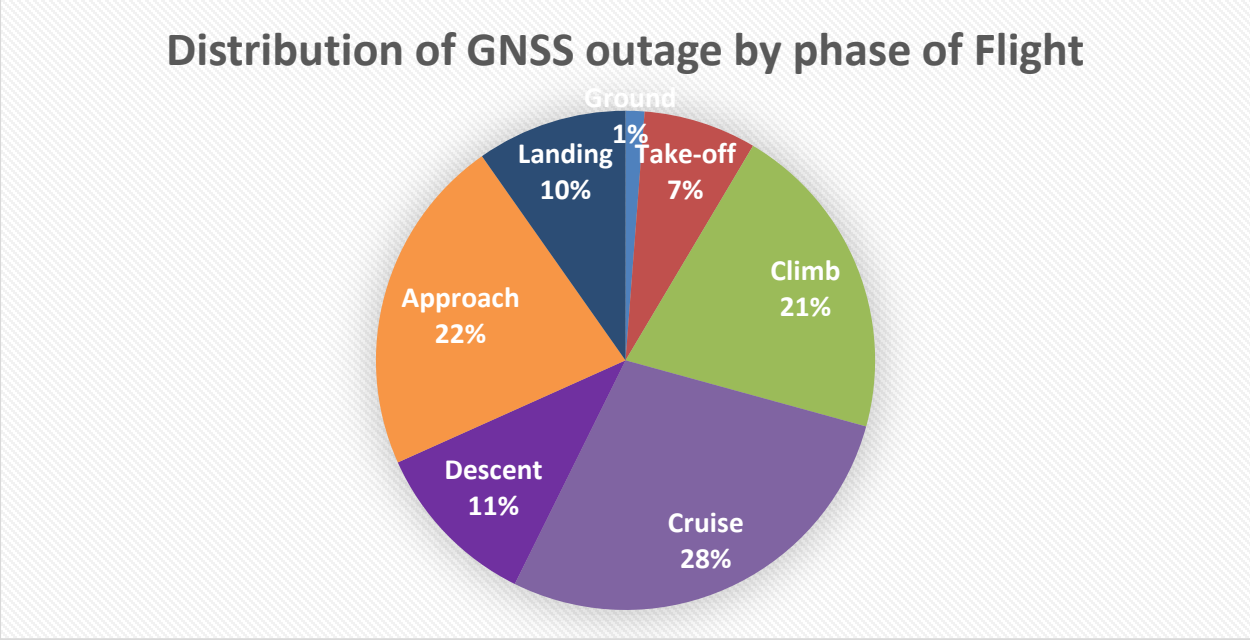
Appendix C

GNSS Anomaly for the Period January 2015- June2018

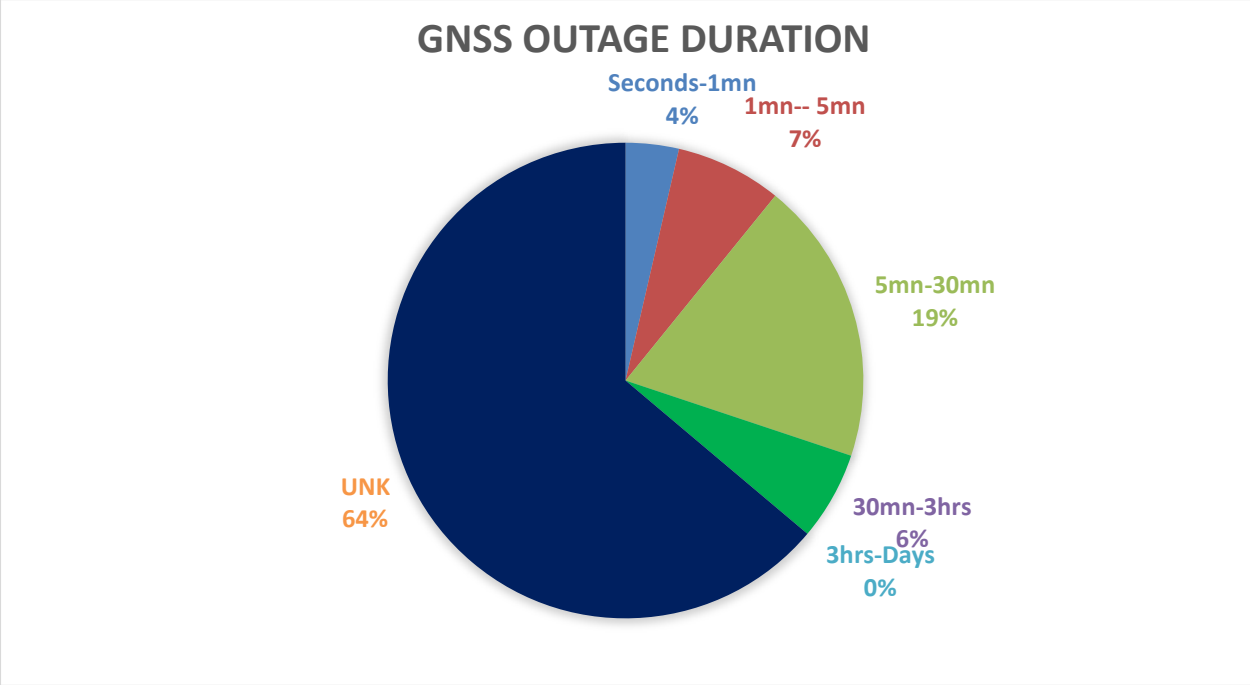
Brief data analysis of the incidents reported during Brief data analysis of the incidents reported by Air Operator is as follows:



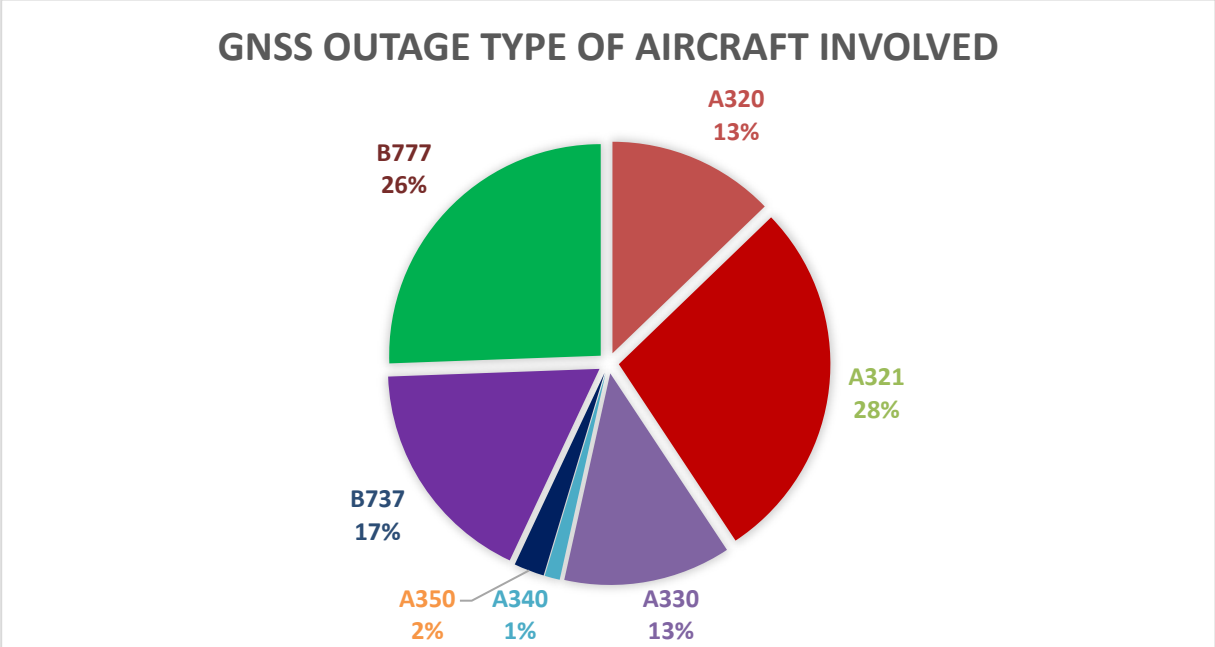
The data revealed that the most significant Flight Information Regions (FIRs) affected Beirut, followed by Cairo, Ankara, and Nicosia.



The data shows that the highest GNSS Outage occurred during the phase of flights cruise, approach, climb, and descent.



The data shows the highest GNSS outage duration was between 5 minutes- 30 minutes. Regarding the Unknown (UNK) it could not be determined as the data was not provided.



The A321, B777, and B737 were most flown aircraft type in areas most affected.

Navigation Minimal Operating Networks

(NAV MON) Template

State Name

Table of Contents

TBA

Executive Summary

The shift from facility-referenced navigation to coordinate-based navigation enabled by performance-based navigation (PBN) provides significant benefits, in particular by supplying the flexibility required to design airspace and associated routes and procedures according to operational needs. The most suitable navigation infrastructure to support PBN is GNSS. Consequently, the role of conventional navigation aids is currently evolving towards that of a reversionary terrestrial infrastructure capable of maintaining safety and an adequate level of operations in case of unavailability of GNSS (for example due to outages). During this evolution, terrestrial aids may also enable PBN operations for users not yet equipped with GNSS.

Until a solution to ensure adequate GNSS resilience is available, it is essential that a terrestrial navigation infrastructure, suitably dimensioned to be capable of maintaining safety and continuity of aircraft operations, be provided.

In line with the ASBU elements NAVS-B0/4 element, this plan encompasses the definition of the Minimum Operating Network (MON) of legacy Navaids to sustain the system in case of PBN disruption or degraded operations and addresses the PBN contingency modes.

This plan, developed in partnership with the national authorities (ANSP, Operators and Airspace users), should be revisited with the introduction of new navigation capabilities and frequently updated and considered as a living document.

1. Introduction

The implementation of Performance-Based Navigation (PBN) on a wide scale in all phases of flight is well under way and is itself a prerequisite for ground-based navigation aids (navaids) rationalization. This is because PBN procedures are enabled by GNSS as the primary navigation means. While some of the ground systems can also support PBN operations (e.g. DME), the role of the ground based navigation infrastructure will evolve towards providing a reversion capability for GNSS and supporting contingency operations in the case of GNSS becoming unusable. This offers the opportunity to rationalize some of the terrestrial infrastructure while retaining a Minimal Operational Network to maintain ATM operations using only ground-based Navaids.

This plan supports the evolution of PBN as the preferred means of navigation by sustaining and expanding the use of GNSS, providing a PBN-capable backup with the DME, and a minimum operational network of VORs to ensure aircraft can navigate safely during GNSS outages.

2. NAVS-B0/4 Navigation Minimal Operating Networks (Nav. MON):

The new element "Navigation Minimal Operating Networks" (NAVS B0/4) has been classified as priority 1 in the MID Region Air Navigation Strategy (MID Doc 002). The main purposes of the NAV MON Element (NAVS B0/4) are:

- To adjust conventional navaids networks through the increased deployment of satellite based navigation systems and procedures to ensure the necessary levels of resilience for navigation.
- To provide a minimum level of capabilities to accommodate State aircraft operations where there is a mismatch in terms of aircraft equipage.
- To make a more efficient use of the frequency spectrum

3. ICAO Strategy

The role of the ground-based Navaids will evolve towards providing a reversion for GNSS and supporting contingency operations in case of GNSS becoming unusable. This evolution offers the opportunity for the rationalization of some of the terrestrial infrastructure and retaining only a Minimum Operational Network (MON) which is designed to efficiently provide reversion service.

However, each Navaid can fulfil different operational roles irrespective of the availability of ATS Surveillance:

- During normal ATM operations, ground-based Navaids support

  – PBN applications as a primary positioning source;
  – PBN applications as a secondary positioning source to GNSS

- Conventional procedures (e.g. either in an environment where there are no PBN procedures; or to accommodate non-PBN capable aircraft.)

  - During ATM contingency operations, ground-based Navaids support

- PBN applications as a back up positioning source due to GNSS outage;
- Conventional procedures as a means of reversion during a GNSS outage;

In order to plan the evolution of the navigation infrastructure in MID Region, it is important to have a thorough picture of the type of operations that can be supported by each type of terrestrial Navaid as per MID PBN Implementation Plan. This understanding will enable States to develop both an optimization and decommissioning plan of Navaids as well as a coordinated evolution to a reversionary terrestrial infrastructure. Table below identifies which ground-based Navaid support which PBN specification.

MID Navigation Specifications and (**R**equired or **O**ptional) Navaid Infrastructure

	GNSS	IRU	DME/DME	DME/DME/ IRU	VOR/DME
RNAV 10[1]	O	O			
RNAV 5[1]	O	O	O	O	O
RNAV 1[1]	O		O	O	
RNP 1	R		TBD[2]	TBD[2]	
RNP APCH	R				
RNP AR	R	O			

Note 1: For this navigation specification without required navaid infrastructure at least one navaid is requested for the associated navigation application.

Note 2: the use of DME/DME for this navigation specification requires a specific State authorization.

Note 3: IRU may be integrated with the GNSS sensor to improve performance and continuity of the operation.

3.1 ICAO reversion strategy

Annex 10 Attachment H defines a global "Strategy for rationalization of conventional radio navigation aids and evolution toward supporting performance based navigation". The objective of Attachment H is to provide guidance to the States for both the rationalization and reversion of the terrestrial Navaid infrastructure. The recommendations included in this high-level strategy are based on the residual roles foreseen for each type of Navaid to support PBN operations and/or conventional procedures.

Furthermore, consideration of this strategy should be given when deciding investments into new facilities or on facility renewals. As this strategy is highly relevant to the objectives of this plan, key points of this strategy are included below, customized for the MID region.

Operational Considerations for terrestrial Navaids and reversion strategy

		Operational Roles	Navigation Performance	Specific Limitations	Opportunities And Solutions (Residual roles – PBN/conventional)
NDB	**PBN**	Exceptionally, can be used for extraction on the missed approach for RNP APCH. This operation is not encouraged.	None	N/A	Rationalize NDB and associated conventional procedures and if NDBs are used to define PBN ATS Routes they should be replaced by RNAV waypoints. Non—Precision Approaches based on NDB should be replaced by RNP APCH. Similarly, if NDBs are used as ILS locators associated with an RNAV procedure intercept, RNAV Waypoints should replace these.
	CONV	Can support en route operations and ATS Routes, SIDS/STARs and NPAs. This is not encouraged. NDB may be paired with a DME.	Can enable homing to a beacon. When co-located with a DME, ranging information is also available.	Ref Annex 10, Chapter3	
VOR	**PBN**	Can be used in the en-route phase of flight and arrival segment of an IFP. On the missed approach it can be used for extraction of an RNP APCH.	Can support a position estimation for RNAV 5. This enables operations in FRA and on RNAV 5 ATS Routes.	(*) Maximum range of conventional VOR typically 60 NM; Doppler VOR, typically 75 NM.	The opportunity arises to rationalize some VORs providing cost savings. Introduction of new VORs is not encouraged, but existing ones may be needed to support reversion operations; enhance situational; provide limited inertial updating if DME/DME not available; exceptionally to be used for NPAs if no other option is available; to support aircraft only able to navigate conventionally (this may include state aircraft) and support procedural separation. The use of VOR(/DME) to support RNAV 5 should be considered only in exceptional cases:
	CONV	Paired (or not) with a DME can support en route operations and SIDS/STARs and NPA	Can provide bearing information and enable homing to a beacon. When co-located with a DME,	Ref Annex 10, Chapter3	

		and intercept to the ILS or missed approach.	range and bearing information is available.		• in areas where DME/DME coverage is not possible (e.g. islands environment) • in areas where DME/DME coverage is achievable only with high investment and operational cost (e.g. near the bottom of enroute airspace in terrain rich environment)
DME	**PBN**	Can be used in all phases of flight except final approach. On the missed approach it can be used for extraction.	Can support a position estimation for RNAV 5 and RNAV 1 operations. This enables operations in FRA, RNAV 5 ATS Routes and RNAV 1 SIDS/STARs.	Minimum range of 3NM and maximum range of 160 NM for RNAV 1; Below 40° above the horizon as viewed from the DME facility; geometric limitations between DME pairs of 30° to 150°;	DME/DME provides a fully redundant capability to GNSS for RNAV applications, and a suitable reversionary capability to RNAV 1 for RNP applications requiring a lateral accuracy performance of ±1 NM (95%), providing there is an adequate DME infrastructure. Many DMEs are co-located with VORs which creates certain limitations. When VORs are decommissioned, this can be an opportunity to optimise the DME network. In such instances, to save costs or to improve DME/DME performance, DME's can be re-located (ideally with other CNS assets) if a co-located VOR is withdrawn. To be operationally robust, efficient DME network design should fill gaps and provide DME/DME coverage as low as possible without requiring more investment unless needed for safety reasons. (Other solutions such as requiring on-board IRU, reliance on ATS surveillance and/or military TACANS may be viable alternatives). Cross-border use of DME facilities is encouraged supported by the necessary authorisations and/or agreements. Deployment of new DME stations should avoid that part of the
	CONV	Paired with a VOR, ILS or NDB, it can support conventional operations. Stand-alone it can enable the flying of DME arcs.	Can provide range when co-located with a VOR, NDB or ILS.	Ref Annex 10, Chapter3	

					frequency spectrum close to the GNSS L5/E5 band (1164 – 1 215 MHz). CONCLUSION: The application of the above principles should enable uniformity of DME deployment across the MID region; It is recognized that in some areas, the provision of D/D navigation is not possible or practical, such as at very low altitudes, in terrain-constrained environments, or on small islands, remote areas and airspace over the water. Finally, it is possible that in some countries there could be an increase in the number of DMEs to support A-PNT. Note: Some FMS may exclude the use of ILS-associated DMEs. Consequently, it is not possible to ensure consistent D/D service is available to all D/D-equipped users based on ILS-associated DMEs. Therefore, those facilities should not be planned in the provision of such D/D service (regardless of whether they are published in the en-route section of the AIP), without an appropriate fleet assessment.

(*) If a State wished to use a VOR in excess of the typical ranges stated, then an implementation safety assessment based on a flight inspection demonstration may enable such non-standard use, subject to approval by the competent authority.

Note: Due consideration should be given to evaluate the dependency of conventional ATS route network on Ground NAVAIDs particularly the Regional ATS Route network available at MID ANP Vol II table ATS – 1, coordination with ATM personnel (on national level) would support the evaluation.

3.2 Evolution Strategy

There is a need to consult aircraft operators and international organizations, and to ensure safety, efficiency and cost-effectiveness of the proposed infrastructure solutions. Based on the above, the global strategy is to:

a) Rationalize NDB and VOR and associated conventional procedures;

b) Align rationalization planning with equipment life cycles and PBN implementation planning;

c) Replace conventional approaches without vertical guidance with vertically guided approaches;

d) Where a terrestrial navigation reversion capability is required, evolve the existing DME infrastructure
towards providing a PBN infrastructure complementary to GNSS; and

e) Provide a residual capability based on VOR (or VOR/DME, if possible) to cater to airspace users not
equipped with suitable DME/DME avionics, where required.

4. National Navigation Minimal Operating Networks

4.1 Main operations supported by VORs in the GNSS contingency concept

VOR ID	Location	Main operations supported in the GNSS contingency concept								
		IAP	TMA			EN-ROUTE				
		IAP - intercept - Final - Missed	Conventional SIDs/STARs	cross-checking and situational awareness	Conventional Holding	RNAV 5 and FRA	Conventional Routes and procedural separation	Situational Awareness & Reach Alternate A/D	RNAV Holding	Conventional Holding

Description to be

4.2 Evolution of the ground infrastructure towards MON configuration

Type of NAV facility	**Location**	**ID**	**Facility life cycle**		**Rationalization plan**		**relocation of existing facilities or installation of new facilities**
			Start	**End**	Decommissioning	Replacement	

4.3 Future components of the National Navigation Minimal Operating Networks

Description to be added

Type of NAV facility	Location	ID	Phase of flight (enroute, terminal, approach)	Range	Purpose of operation	
					Normal operation	Contingency operation

MID Region AIDC/OLDI Applicability Area

(Priority 1 and 2 for Implementation)

MID Region AIDC/OLDI Applicability Area (Priority 1 and 2 for Implementation)

ACC	Adjacent ACCs						
Amman	Cairo (1)	Baghdad (2)	Damascus (2)	Jeddah (1)	Tel Aviv (2)		
Baghdad	Amman (2)	Ankara (1)	Damascus (2)	Jeddah (2)	Tehran (2)	Kuwait (1)	
Bahrain	Doha (1)	Emirates (1)	Jeddah (1)	Kuwait (1)	Riyadh (1)	Tehran (2) AFTN MSG	Dammam (2)
Beirut	Damascus (2)		Nicosia (1)				
Cairo	Amman (1)	Athena (2)	Jeddah (1)	Khartoum (1)	Nicosia (1)	Tel Aviv (2)	Tripoli (2)
Damascus	Amman (2)	Ankara (2)	Baghdad (2)	Beirut (2)	Nicosia (2)		
Doha*	Bahrain (1)	Emirates (1)	Jeddah (2)	Riyadh (2)			
Emiratis	Bahrain (1)	Doha (1)	Jeddah (1)	Muscat (1)	Tehran (2) AFTN MSG		
Jeddah	Amman (1)	Asmara (2)	Baghdad (2)	Bahrain (1) Riyadh (1)	Cairo (1)	Doha (2)	Emirates (1)
	Khartoum (1)	Kuwait (2)	Muscat (1)			Sana'a (2)	
Riyadh	Bahrain (1)	Doha (2)	Kuwait (2)	Jeddah (1)			
Khartoum	Addis (1)	Asmara (2)	Brazzaville (2)	Cairo (1)	Entebbe (2)	Jeddah (1)	Juba (1)
	Kinshasa (2)	N'Djamena (2)	Nairobi (2)	Tripoli (2)			
Kuwait	Baghdad (1)	Bahrain (1)	Jeddah (2)	Tehran (2)			
Muscat	Emirates (1)	Jeddah (1)	Karachi (2)	Mumbai (1)	Sana'a (2)	Tehran (1)	
Sana'a	Addis Ababa (2)	Asmara (2)	Jeddah (2)	Mogadishu (2)	Mumbai (2)	Muscat (2)	
Tehran	Ankara (1)	Ashgabat (2)	Baghdad (2)	Bahrain (1)	Baku (2)	Emirates (2) AFTN MSG	Kabul (2)
	Karachi (1)	Kuwait (2)	Muscat (1)	Yerevan (2)			
Tripoli	Algiers (2)	Cairo (2)	Khartoum (2)	Malta (2)	N'Djamena (2)	Niamey (2)	Tunis (2)

(1) = Priority 1 for implementation based on the number of traffic movements and/or operational needs (green color means already implemented)

(2) = Priority 2 for implementation based on the number of traffic movements or if other solution is in place such as exchange of information via AFTN

ACC	Amman	Addis Ababa	Algiers	Ankara	Ashgabat	Asmara	Athens	Baghdad	Bahrain	Baku	Beirut	Cairo	Damascus	Doha	Emirates	Jeddah	Juba	Kabul	Karachi	Khartoum	Kuwait	Malta	Mogadishu	Mumbai	Muscat	N'djamena	Niamey	Nicosia	Riyadh	Sana'a	Tehran	Tel Aviv	Tripoli	Tunis	Yerevan
Amman								Separation: Traffic: LHD: Contingency: Priority:			Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:			Separation: Traffic: LHD: Contingency: Priority:														Separation: Traffic: LHD: Contingency: Priority:			Separation: Traffic: LHD: Contingency: Priority:				
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Tehran				Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:			Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:				Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:			Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:			Separation: Traffic: LHD: Contingency: Priority:												Separation: Traffic: LHD: Contingency: Priority:
Tripoli			Separation: Traffic: LHD: Contingency: Priority:																	Separation: Traffic: LHD: Contingency: Priority:		Separation: Traffic: LHD: Contingency: Priority:						Separation: Traffic: LHD: Contingency: Priority:	Separation: Traffic: LHD: Contingency: Priority:									Separation: Traffic: LHD: Contingency: Priority:	

Preliminary results of SMR2023

(developed by the MIDRMA)

1. SUMMARY

1.1 This report presents the progress on the RVSM Implementation and monitoring activities within the MID Region, including details of the preliminary results of the MID RVSM Safety Monitoring Report (SMR) 2024 and other activities related to the MIDRMA.

1.2 Based on the available data, and in accordance with the requirements of ICAO Doc 9574, the preliminary results show the key safety objectives of the SMR were met. The technical risk of en-route mid-air collision in RVSM airspace is estimated to be **7.2614×10^{-11}** fatal accidents per flight hour which satisfies the Target Level of Safety and Safety Objective 1.

1.3 The overall risk of en-route mid-air collision in RVSM airspace is estimated to be **9.1872×10^{-11}** fatal accidents per flight hour which satisfies the Target Level of Safety and Safety Objective 2.

1.4 However, the final conclusions of the processed data have been significantly limited by the continued NIL reporting of Large Height Deviations (LHDs) from some member states, and the absence of valid LHD reports in the categories contributing to the overall risk calculations, which undermines confidence in this result.

2. INTRODUCTION

2.1 The Middle East Regional Monitoring Agency (MIDRMA) produces the MID RVSM Safety Monitoring Report (SMR) annually, which is submitted to the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG) for endorsement. The purpose of the report is to demonstrate, through data and analysis, that the safety objectives specified in the MID RVSM Safety Policy (in line with ICAO Doc 9574 second edition) continued to be satisfied.

2.2 However, for the 2024 SMR, challenges remain due to delays in receiving Traffic Data Samples (TDS) from some member states. In some cases, the submitted data did not adhere to the required format or were insufficient for risk analysis, in addition the lack of LHD reports received so far for the first ten months indicated that the calculations for the overall risk does not support high confidence. Despite these challenges, the initial calculations indicate that the MID RVSM airspace continues to meet the ICAO Target Levels of Safety (TLS) for overall risk.

3. PRELIMINARY RESULTS OF THE MID RVSM SMR 2024 (FIRST DRAFT VERSION)

3.1 The implementation of RVSM (Reduced Vertical Separation Minimum) must be supported by a safety assessment that confirms compliance with the safety objectives defined by the MID RVSM Safety Policy in ICAO Doc 9574. This ensures the continued safe operation of RVSM airspace within the ICAO Middle East Region.

3.2 The initial results from the 2024 SMR provide evidence that the safety objectives have been met, based on the available data and methodologies. However, the lack of consistent LHD reporting from several member states, particularly those with high traffic volumes, undermines the confidence in these results. The MIDRMA will await additional data as the SMR reporting cycle completes by the end of 2024.

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 $2.5x10^{-9}$ fatal accidents per flight hour.

The value computed for technical height risk is estimated **7.2614×10^{-11}** 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 **$5x10^{-9}$** fatal accidents per flight hour.

The value computed for the overall risk is estimated **9.1872×10^{-11}** this is below the ICAO overall TLS.

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.

• **Technical Risk**: The risk of collision due solely to technical height-keeping performance within MID RVSM airspace is in compliance with the ICAO TLS of 2.5×10^{-9} fatal accidents per flight hour. The current estimated technical risk stands at **7.2614×10^{-11}**, well below the ICAO threshold, meeting Safety Objective 1.

• **Overall Risk:** The overall risk of collision, which includes technical risks as well as operational errors and in-flight contingencies, also meets the ICAO TLS of 5×10^{-9} fatal accidents per flight hour. The estimated overall risk is **9.1872×10^{-11}** , which is below the allowable limit. These results emphasize the importance of addressing identified safety issues through improved procedures to ensure continuous improvement in airspace safety.

Middle East RVSM Airspace Average Aircraft Speed = **440.3 kts**			
Risk Type	**Risk Estimation**	**ICAO TLS**	**Remarks**
Technical Risk	**7.2614×10^{-11}**	**$2.5x10^{-9}$**	**Below ICAO TLS**
Overall Risk	**9.1872×10^{-11}**	**$5x10^{-9}$**	**Below ICAO TLS**

4. CONCLUSIONS

(i) The estimated risk of collision associated with aircraft height- keeping performance is **7.2614×10^{-11}** and meets the ICAO TLS of **2.5×10^{-9}** fatal accidents per flight hour (RVSM Safety Objective1).

(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 **9.1872×10^{-11}** this value is below the ICAO overall TLS of **$5x10^{-9}$** fatal accidents per flight hour (RVSM Safety Objective 2).

(iii) The minimal difference between the Technical and Overall risk values is due to the very limited number of LHD reports submitted by MIDRMA member states, which directly impacts RVSM operations within the RVSM airspace.

(iv) based on currently available information (Except for Khartoum FIR), there is no evidence available to MIDRMA that the continued operations of RVSM adversely affects the overall vertical risk of collision in the first 10 months of the reporting cycle.

(v) 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, The final conclusions of the data processed so far have been severely limited by the continued NIL reporting of Large Height Deviations (LHDs) from some members which does not support a high confidence in the result, the MIDRMA is reiterating the importance of submitting such reports especially from FIRs with high volume of traffic.

4.1 MIDRMA has consistently emphasized the need for all member states to submit the required data for proper assessment and calculation of safety parameters. Despite addressing this issue last year and in nearly every SMR, some states continue to submit traffic data late or provide corrupted data, causing significant delays in calculating the SMR safety parameters. This ongoing problem remains frustrating, as little improvement has been made.

5. SCOPE

5.1 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
			Doha			

Table 1: FIRs of the Middle East RVSM Airspace

**Note: Khartoum FIR was excluded from the RVSM safety analysis due to lack of TDS and LHD reports.*

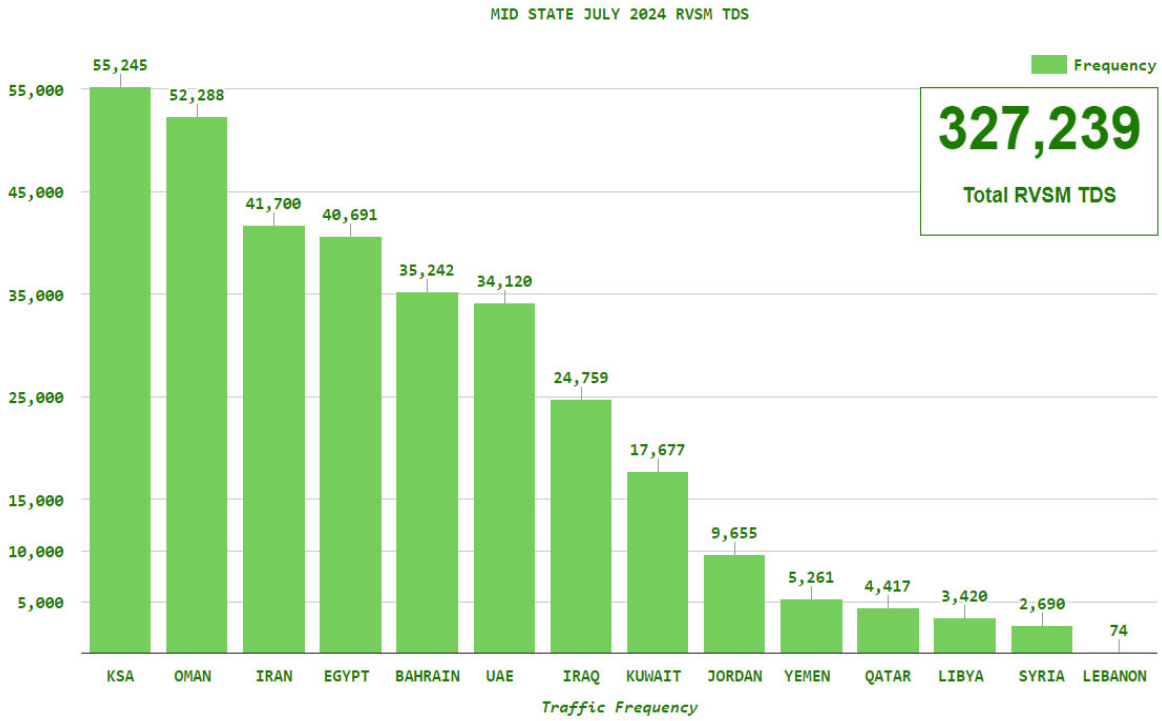
5.2 The Data Sampling periods covered by SMR 2024 are as displayed in the below table

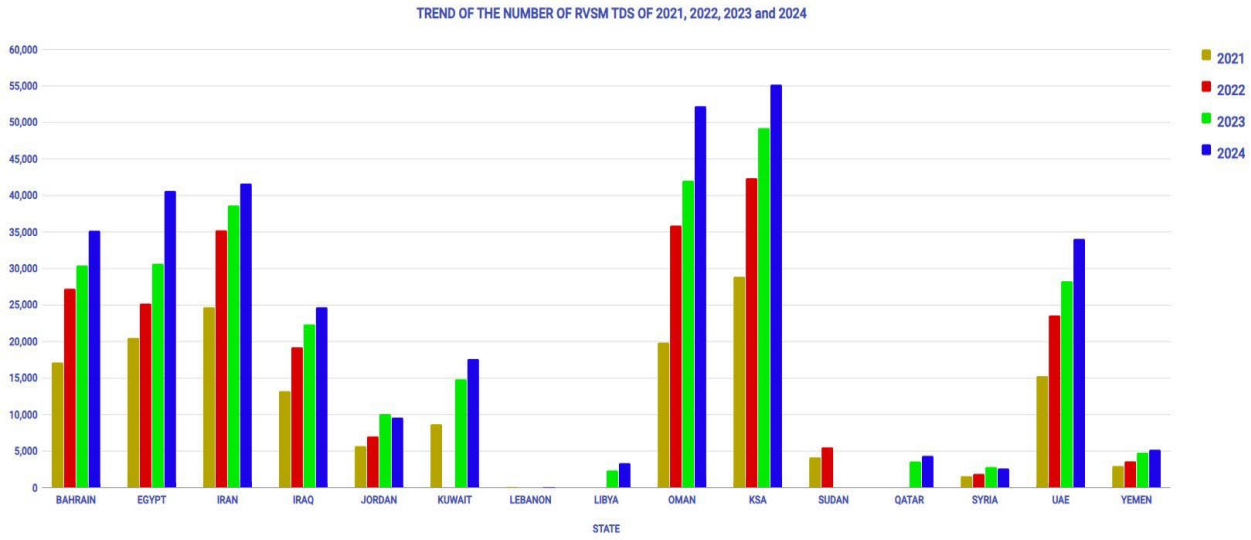
Report Elements	Time Period
Traffic Data Sample	15/05/2024 - 15/06/2024
Operational & Technical Errors	01/01/2024 - 31/10/2024

5.3 The descriptions of the traffic data collected from each MIDRMA Member State are depicted in table below:

MID States	No. of Flights	Received Date	Status
BAHRAIN	**35242**	7/11/2024	
EGYPT	**40691**	7/15/2024	
IRAN	**41700**	7/20/2024	
IRAQ	**24759**	6/23/2024	
JORDAN	**9655**	7/18/2024	
KUWAIT	**17677**	6/19/2024	
LEBANON	**74**	7/10/2024	
LIBYA	**3420**	7/14/2024	
OMAN	**52288**	8/1/2024	
KSA	**55245**	7/10/2024	
QATAR	**4417**	7/4/2024	
SUDAN	**-**	-	No Data Submitted
SYRIA	**2690**	6/26/2024	
UAE	**34120**	7/10/2024	
YEMEN	**5261**	7/15/2024	
Total	**327239**		

SMR 2024 TDS


MID STATE JULY 2024 RVSM TDS
Frequency
327,239
Total RVSM TDS
55,245
52,288
41,700
40,691
35,242
34,120
24,759
17,677
9,655
5,261
4,417
3,420
2,690
74
55,000
45,000
35,000
25,000
15,000
10,000
5,000
KSA
OMAN
IRAN
EGYPT
BAHRAIN
UAE
IRAQ
KUWAIT
JORDAN
YEMEN
QATAR
LIBYA
SYRIA
LEBANON
Traffic Frequency


TREND OF THE NUMBER OF RVSM TDS OF 2021, 2022, 2023 and 2024
2021
2022
2023
2024
60,000
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
BAHRAIN
EGYPT
IRAN
IRAQ
JORDAN
KUWAIT
LEBANON
LIBYA
OMAN
KSA
SUDAN
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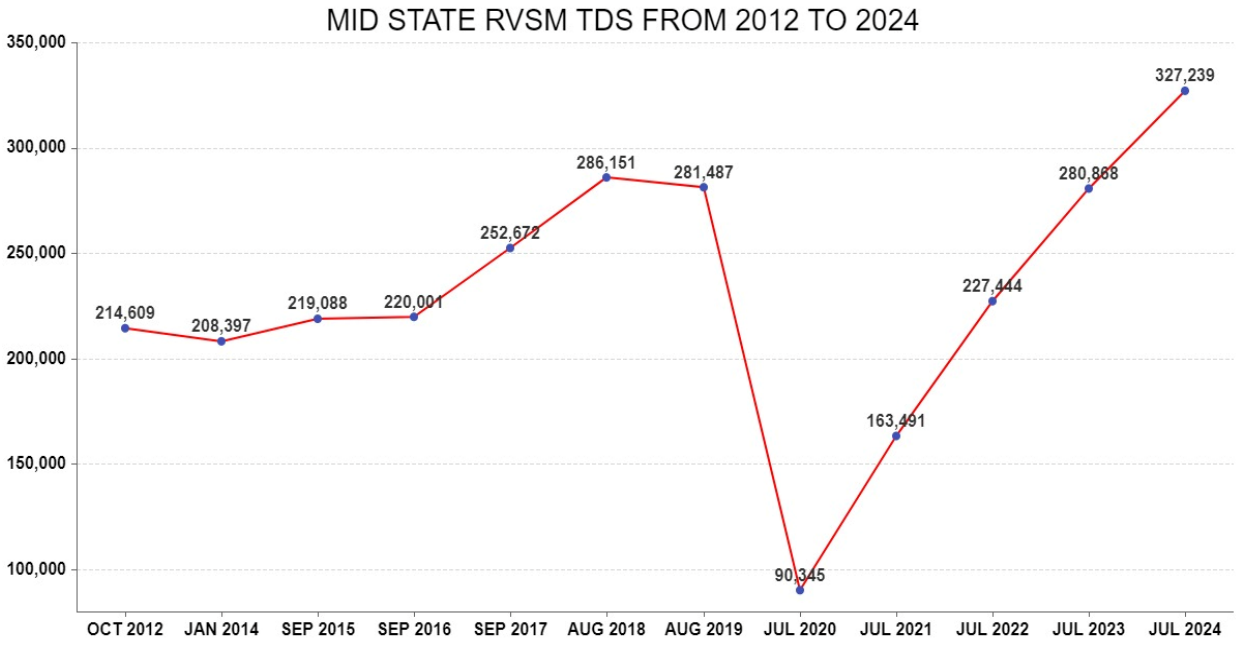


6. LARGE HEIGHT DEVIATION REPORTS (LHDS) 2024

6.1 The estimation of total risk, which includes Safety Objective 2, incorporates the results of Safety Objective 1 and evaluates risks arising from various other factors. This important component, commonly referred to as operational risk, depends on numerous factors such as airspace configuration, traffic density, ATC procedures, actions of individual controllers and pilots, and the specific operational characteristics of sectors. The assessment of operational risk is based on the analysis of event magnitude and duration, derived from operational incident reports, which are then transformed into Large Height Deviation (LHD) reports.

6.2 MIDRMA has noted a significant and alarming decrease in Large Height Deviation (LHD) reporting from certain member states, particularly those with high traffic volumes. This reduction persists despite the ongoing issuance of monthly reminders to all member states. The lack of comprehensive reporting is especially concerning in relation to LHD categories that involve loss or breakdown in separation between aircraft, which have been highlighted in nearly every report as critical safety risks. Without accurate and timely reporting, the integrity and reliability of safety assessments are compromised, undermining the trust in the overall results. The table below shows the reports received from all member states for the period from January 1 to October 17, 2024.

MID FIRs	No. of Reported LHDs	No. of Related LHDs
Bahrain	26	17
Baghdad	5	1
Amman	-	1
Tehran	-	6
Beirut	-	-
Cairo	13	14
Damascus	-	-

Khartoum	-	-
Kuwait	-	14
Doha	23	1
Muscat	**109**	37
Jeddah/ Riyadh	21	**61**
Tripoli	-	1
Emirates	-	8
Sana'a	**208**	15

MID FIRs	Related to other Adjacent FIRs	No. of Related LHDs
Sana'a	Addis Ababa	85
Sana'a	Asmara	8
Sana'a	Djibouti	10
Cairo	Athens	2
Muscat	Karachi	16
Muscat	Mumbai	118
Baghdad	Ankara	1

7. CRITICAL OBSERVATIONS ON LHD REPORTING GAPS AND THEIR IMPACT ON SAFETY ASSESSMENTS

7.1 Member States Failing to Report LHDs:

As shown in the table in section 2.2.2, several member states, such as Kuwait and Iran, have not reported any Large Height Deviations (LHD) for an extended period. Notably, Emirates ATC has not reported any LHD since the beginning of 2024. This lack of reporting is a serious concern as it suggests a potential underreporting of critical safety incidents, particularly in airspaces with significant traffic.

7.2 Results of Safety Objective No. 2 with Low Level of Reporting LHDs:

Although the number of LHD reports submitted by MIDRMA member states so far has been low, there remains the potential for changes in the results for Safety Objective No. 2. With three months left in the SMR (Safety Monitoring Report) cycle, it is possible that critical LHD reports, if submitted, could significantly alter the safety risk assessment. The current low reporting, therefore, may not fully reflect the actual operational risks, particularly if key incidents are being missed.

7.3 Nature of Reported LHDs:

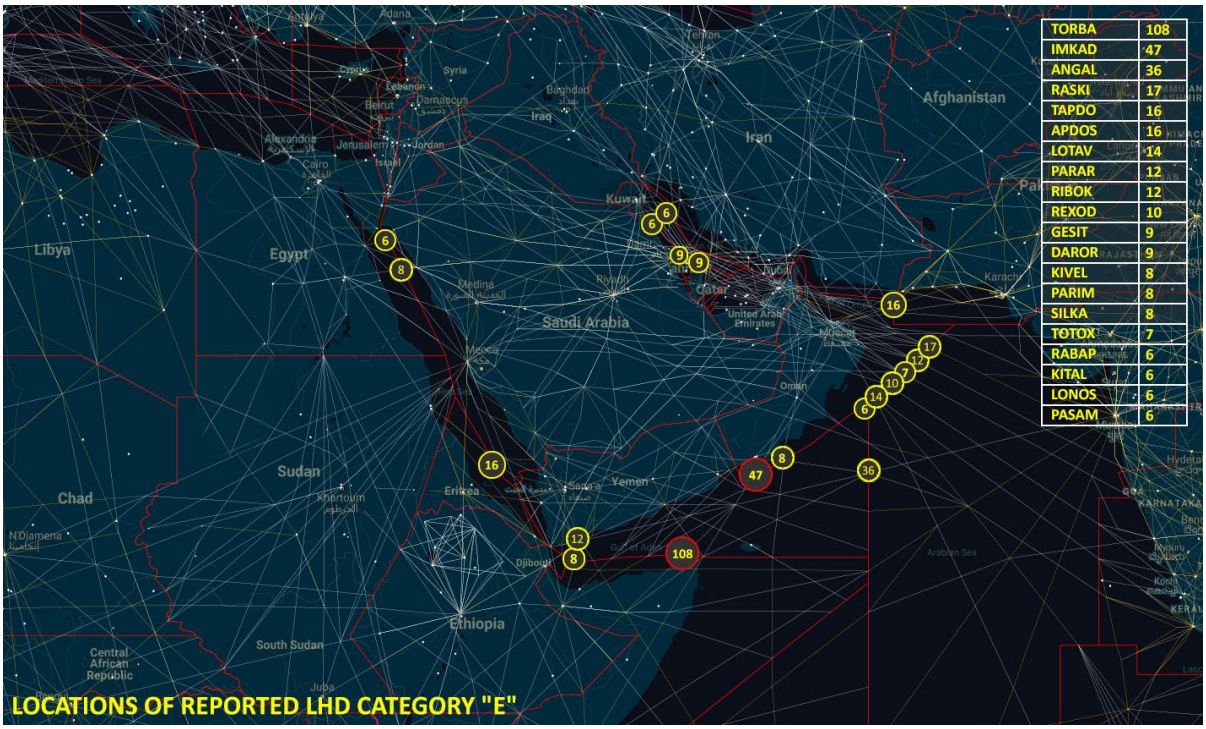
The vast majority of LHD reports received to date are related to ATC transfer of control coordination errors (Category E), largely due to human factors. While these reports are essential, they have not had a severe impact on RVSM airspace operations. However, the ongoing lack of reporting for more critical LHD categories, such as loss or breakdown of separation between aircraft, TCAS resolution advisories, level busts, and other safety-critical events, further exacerbates concerns. These types of LHDs, which have been repeatedly highlighted in annual reports as significant safety risks, have not been reported by some member states for an extended period, raising doubts about the completeness and accuracy of the overall safety assessments.

7.4 The table below provides a summary of operational risk associated with Large Height Deviation (LHD) reports, categorized by LHD categories. These reports are used to calculate the overall vertical collision risk, which is presented for Safety Objective No. 2.

Note: The LHD reports in this table are what validated so far for the first 10 months of the SMR 2024 reporting cycle:

LHD Cat.	Large Height Deviation (LHD) Categories	No. of LHDs	LHD Duration (Sec.)
A	Flight crew fails to climb or descend the aircraft as cleared	-	-
B	Flight crew climbing or descending without ATC clearance	-	-
C	Incorrect operation or interpretation of airborne equipment	-	-
D	ATC system loop error	-	-
E	ATC transfer of control coordination errors due to human factors	**3**	**390**
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	-	-
I	Turbulence or other weather-related cause	**1**	**30**
J	TCAS resolution advisory and flight crew correctly responds	-	-
K	TCAS resolution advisory and flight crew incorrectly responds	-	-
L	ACFT being provided with RVSM separation is not RVSM approved	-	-
M	Other	-	-
	Total	**4**	**420**

Summary of Operational Risk associated with Large Height Deviation Reports for the First 10 Months of SMR 2024 Reporting Cycle



7.5 RVSM Safety Protocol at the Eastern Boundaries of Muscat FIR and the increased Number of LHD reports submitted by Mumbai ATCU related to Muscat ATCU:

7.6 The table below provides a comparison of the number of LHD reports submitted by Mumbai and Muscat ATCUs related to each other in 2022, 2023 and 2024 (till October)

7.7 Despite the concerted efforts and measures taken since the initiation of the safety protocol at the eastern boundary of Muscat Flight Information Region (FIR), there has been no visible improvement in the reduction of Large Height Deviation (LHD) reports between Muscat and Mumbai ATC units. In fact, as shown in the table below, the number of reported LHDs has steadily increased, which poses a serious and escalating risk to air traffic safety in this region.

YEAR	LHD Reported by Muscat	LHD Reported by Mumbai
2022	**16**	**41**
2023	**25**	**79**
2024	**75**	**98**

7.8 This increasing trend is extremely concerning and highlights the urgent need for immediate attention and action from both Muscat and Mumbai ATC units. The measures implemented so far, while well-intentioned, have not been sufficient to mitigate the risks posed by these LHD occurrences. We must focus on strengthening coordination, enhancing real-time reporting mechanisms, and ensuring that corrective actions are not only implemented but also monitored for effectiveness. Given the seriousness of the situation, it is imperative that both ATC units take decisive steps to address the root causes of these LHD incidents to prevent further risk to airspace safety.

7.9 The meeting may wish to note that Oman has made significant progress in addressing the Large Height Deviation (LHD) issues between Muscat and Mumbai ACCs. Following the investigation of LHD occurrences over the RASKI waypoint, Oman CAA implemented several corrective measures as reported in IP/5 during MIDRMA Board/19:

1. **Timely LHD Reporting**: Mumbai ACC now sends monthly LHD reports directly to Muscat ACC via email, ensuring timely reporting and enabling faster responses to address issues. This bypasses the previous delays caused by routing reports through the Monitoring Agency of Asia Region (MAAR) and the MIDRMA.

2. **Internal Investigation Mechanism**: Oman CAA has developed an internal process for regularly investigating LHD reports and following up on corrective actions with the relevant parties.

3. **AIDC Connection Testing**: Automated Interfacility Data Communication (AIDC) tests were conducted between Muscat and Mumbai ACCs in September 2019, March 2021, February 2023, and August 2023. The most recent test showed success in all parameters except ABI (Airborne Initiation). The next phase of AIDC testing is pending Mumbai ACC's readiness. Once fully implemented, AIDC is expected to significantly reduce LHD occurrences by improving flight information exchange.

4. **Ongoing Coordination**: Oman CAA and India's Airports Authority (AAI) have agreed to hold regular coordination meetings to address LHD issues and take timely corrective actions to mitigate the root causes.

7.10 **Appendix A** presents a detailed overview of the Large Height Deviation (LHD) reports submitted by both Air Traffic Control Units (ATCUs) from January to October 2024. Notably, there has been a sharp and significant increase in LHD reports from both ATC Units related to each other during this period.

7.11 As a Regional Monitoring Agency (RMA) under the guidelines of ICAO Docs 9937 and 9574, the MIDRMA plays a crucial role in safeguarding the safety of RVSM airspace in the ICAO Middle East Region. One of its primary responsibilities is conducting systematic reviews to ensure that operators comply with State RVSM approval requirements. Through these reviews, the MIDRMA identifies any aircraft operating in RVSM airspace without the required approvals.

7.12 The tables in **Appendix B** reflect the MIDRMA Bulletin of Non-RVSM Approved aircraft observed operating within the ICAO MID RVSM airspace and within the RVSM airspace of other RMAs.

7.13 The hotspots and the airways occupancy of all MIDRMA member states are available for review in **Appendix C**.

8. DEVELOPMENT OF SMR2025

8.1 The meeting may wish to note that the reporting cycle for SMR2025 will be from 01st January till 31st December 2025. To facilitate this, the Traffic Data Sample (TDS) must be submitted in the prescribed format, utilizing the dedicated Excel sheet designed for the MIDRMA Risk Analysis Software (MIDRAS). MIDRMA members are encouraged to use the Excel sheet template, conveniently available on the MIDRMA website (www.midrma.com). This sheet has been meticulously crafted to gather the requisite real-time flight plan data for aircraft operating within the RVSM airspace (FL 290 to FL 410 inclusive).

8.2 MIDRMA proposes the following timeline for the collection of RVSM Traffic Data Sample (TDS) for SMR 2025 from all MIDRMA Member States:

a. Collect RVSM Traffic Data Sample (TDS) for the period of 01st May till 31st May 2025 (during the Haj season) for SMR 2025 development and submit it to MIDRMA by 30th June 2025.

b. Collect Large Height Deviation Reports for the SMR2025 reporting cycle from 01st January till 31st December 2025.

Appendix A

LHD Reports Submitted by Muscat related to Mumbai

#	ID	Date of Occurrance	Reported By	Related to	Location	nature of the occurrence:	Category
1	11560	07-1-2024	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
2	11561	07-1-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
3	11562	10-1-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
4	11563	11-1-2024	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
5	11564	07-1-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
6	11565	19-1-2024	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
7	11566	23-1-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
8	11567	24-1-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
9	11568	24-1-2024	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
10	11569	31-1-2024	Muscat	Mumbai	ASPUX	Revised FL Not Coordinated	E
11	11615	04-2-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
12	11616	13-2-2024	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
13	11617	13-2-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
14	11618	13-2-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
15	11619	20-2-2024	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
16	11620	24-2-2024	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	E
17	11635	22-2-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
18	11636	24-2-2024	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
19	11637	24-2-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
20	11638	24-2-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
21	11639	28-2-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
22	11671	01-3-2024	Muscat	Mumbai	ASPUX	Revised FL Not Coordinated	E
23	11672	01-3-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
24	11673	02-3-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
25	11674	05-3-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
26	11675	04-4-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
27	11676	05-4-2024	Muscat	Mumbai	PARAR	ACFT Entered FIR Without	E

						Coordination	
28	11677	07-4-2024	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
29	11678	08-4-2024	Muscat	Mumbai	REXOD	Revised Estimate Not Coordinated	E
30	11679	11-4-2024	Muscat	Mumbai	KITAL	Revised FL Not Coordinated	E
31	11680	13-4-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
32	11681	13-4-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
33	11682	20-4-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
34	11683	20-4-2024	Muscat	Mumbai	KUTVI	ACFT Entered FIR Without Coordination	E
35	11684	23-4-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
36	11833	03-6-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
37	11887	03-6-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
38	11888	03-6-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
39	11889	07-6-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
40	11890	05-6-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
41	11891	08-6-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
42	11892	09-6-2024	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
43	11893	09-6-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
44	11894	10-6-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
45	11895	11-6-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
46	11896	12-6-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
47	11897	14-6-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
48	11898	14-6-2024	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
49	11899	14-6-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
50	11900	15-6-2024	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
51	11901	15-6-2024	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
52	11902	16-6-2024	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	E
53	11903	16-6-2024	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
54	11904	16-6-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
55	11905	19-6-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
56	11906	27-6-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E

57	11907	30-6-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
58	11908	02-6-2024	Muscat	Mumbai	IMKAD	ACFT Entered FIR Without Coordination	E
59	11909	02-6-2024	Muscat	Mumbai	IMKAD	ACFT Entered FIR Without Coordination	E
60	11910	02-6-2024	Muscat	Mumbai	IMKAD	ACFT Entered FIR Without Coordination	E
61	11911	07-6-2024	Muscat	Mumbai	IMKAD	Revised FL Not Coordinated	E
62	11912	08-6-2024	Muscat	Mumbai	IMKAD	Revised FL Not Coordinated	E
63	11954	03-7-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
64	11955	07-7-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
65	11956	13-7-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
66	11957	14-7-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
67	11958	14-7-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
68	11959	15-7-2024	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
69	11960	16-7-2024	Muscat	Mumbai	KITAL	Revised FL Not Coordinated	E
70	11961	16-7-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
71	11962	16-7-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
72	11963	16-7-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
73	11964	19-7-2024	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	E
74	11965	22-7-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
75	11966	23-7-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E

LHD Reports Submitted by Mumbai related to Muscat

#	ID	Date of Occ	Reported By	Related to	Location	nature of the occurrence:	Category
1	LHD002404	1-1-2024	Mumbai	Muscat	PARAR	No or late estimate time revision	E
2	LHD002405	5-1-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
3	LHD002406	6-1-2024	Mumbai	Muscat	LOTAV	No or late estimate time revision	E
4	LHD002407	7-1-2024	Mumbai	Muscat	TOTOX	No or late estimate time revision	E
5	LHD002408	7-1-2024	Mumbai	Muscat	RASKI	No transfer information (i.e. 'negative transfer')	E
6	LHD002409	7-1-2024	Mumbai	Muscat	PARAR	No or late estimate time revision	E
7	LHD002410	8-1-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
8	LHD002411	9-1-2024	Mumbai	Muscat	PARAR	No or late estimate time revision	E

9	LHD002412	9-1-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
10	LHD002413	10-1-2024	Mumbai	Muscat	KITAL	No transfer information (i.e. 'negative transfer')	E
11	LHD002414	11-1-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
12	LHD002415	13-1-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
13	LHD002416	14-1-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
14	LHD002417	16-1-2024	Mumbai	Muscat	RASKI	No transfer information (i.e. 'negative transfer')	E
15	LHD002418	19-1-2024	Mumbai	Muscat	RASKI	No transfer information (i.e. 'negative transfer')	E
16	LHD002419	20-1-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
17	LHD002420	21-1-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
18	LHD002421	29-1-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
19	LHD002422	29-1-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
20	LHD002456	5-2-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
21	LHD002457	8-2-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
22	LHD002458	11-2-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
23	LHD002459	12-2-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
24	LHD002460	19-2-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
25	LHD002461	22-2-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
26	LHD002462	24-2-2024	Mumbai	Muscat	KITAL	No or late FL revision	E
27	LHD002463	24-2-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
28	LHD002466	26-2-2024	Mumbai	Muscat	KITAL	No or late FL revision	E
29	LHD002468	22-2-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
30	LHD002519	1-3-2024	Mumbai	Muscat	KITAL	No or late FL revision	E
31	LHD002521	9-3-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
32	LHD002522	11-3-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
33	LHD002523	12-3-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
34	LHD002524	13-3-2024	Mumbai	Muscat	RASKI	No transfer information (i.e. 'negative transfer')	E
35	LHD002525	14-3-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
36	LHD002526	14-3-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
37	LHD002527	16-3-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
38	LHD002528	17-3-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
39	LHD002529	17-3-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
40	LHD002530	20-3-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
41	LHD002531	23-3-2024	Mumbai	Muscat	PARAR	No or late FL revision	E

42	LHD002532	23-3-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
43	LHD002533	24-3-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
44	LHD002534	25-3-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
45	LHD002574	1-4-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
46	LHD002575	2-4-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
47	LHD002576	4-4-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
48	LHD002577	4-4-2024	Mumbai	Muscat	REXOD	No or late FL revision	E
49	LHD002578	7-4-2024	Mumbai	Muscat	REXOD	No or late FL revision	E
50	LHD002579	10-4-2024	Mumbai	Muscat	PARAR	No transfer information (i.e. 'negative transfer')	E
51	LHD002580	10-4-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
52	LHD002581	13-4-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
53	LHD002582	14-4-2024	Mumbai	Muscat	LOTAV	No transfer information (i.e. 'negative transfer')	E
54	LHD002583	14-4-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
55	LHD002584	15-4-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
56	LHD002585	18-4-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
57	LHD002586	27-4-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
58	LHD002605	2-5-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
59	LHD002606	5-5-2024	Mumbai	Muscat	PARAR	No transfer information (i.e. 'negative transfer')	E
60	LHD002607	7-5-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
61	LHD002608	9-5-2024	Mumbai	Muscat	REXOD	No or late FL revision	E
62	LHD002609	11-5-2024	Mumbai	Muscat	RASKI	No transfer information (i.e. 'negative transfer')	E
63	LHD002610	15-5-2024	Mumbai	Muscat	ASPUX	No or late FL revision	E
64	LHD002611	16-5-2024	Mumbai	Muscat	REXOD	No or late FL revision	E
65	LHD002612	19-5-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
66	LHD002613	27-5-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
67	LHD002614	27-5-2024	Mumbai	Muscat	REXOD	No transfer information (i.e. 'negative transfer')	E
68	LHD002615	28-5-2024	Mumbai	Muscat	PARAR	No transfer information (i.e. 'negative transfer')	E
69	LHD002616	30-5-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
70	LHD002617	30-5-2024	Mumbai	Muscat	KITAL	No transfer information (i.e. 'negative transfer')	E
71	LHD002618	31-5-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
72	LHD002644	1-6-2024	Mumbai	Muscat	KITAL	No or late FL revision	E

73	LHD002645	1-6-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
74	LHD002646	3-6-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
75	LHD002648	8-6-2024	Mumbai	Muscat	ASPUX	No transfer information (i.e. 'negative transfer')	E
76	LHD002649	8-6-2024	Mumbai	Muscat	LOTAV	No transfer information (i.e. 'negative transfer')	E
77	LHD002650	8-6-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
78	LHD002651	8-6-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
79	LHD002652	9-6-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
80	LHD002653	13-6-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
81	LHD002655	19-6-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
82	LHD002656	20-6-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
83	LHD002657	21-6-2024	Mumbai	Muscat	REXOD	No or late FL revision	E
84	LHD002658	28-6-2024	Mumbai	Muscat	RASKI	No transfer information (i.e. 'negative transfer')	E
85	LHD002680	1-7-2024	Mumbai	Muscat	REXOD	No or late FL revision	E
86	LHD002681	2-7-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
87	LHD002682	7-7-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
88	LHD002683	9-7-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
89	LHD002684	11-7-2024	Mumbai	Muscat	ASPUX	No transfer information (i.e. 'negative transfer')	E
90	LHD002685	12-7-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
91	LHD002687	13-7-2024	Mumbai	Muscat	TOTOX	No transfer information (i.e. 'negative transfer')	E
92	LHD002688	16-7-2024	Mumbai	Muscat	KITAL	No or late FL revision	E
93	LHD002689	19-7-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
94	LHD002690	31-7-2024	Mumbai	Muscat	LOTAV	No transfer information (i.e. 'negative transfer')	E
95	LHD002734	1-8-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
96	LHD002735	3-8-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
97	LHD002736	5-8-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
98	LHD002737	17-8-2024	Mumbai	Muscat	PARAR	No or late FL revision	E

Appendix B

Non-RVSM approved Aircraft – Responsibility of MIDRMA MEMBER STATES

#	ACFT Registration	ICAO Type	First Observed on	STATE Responsible
1	5ALEX	BE200	09-07-2022	LIBYA
2	STALL	CRJ1	11-06-2022	SUDAN

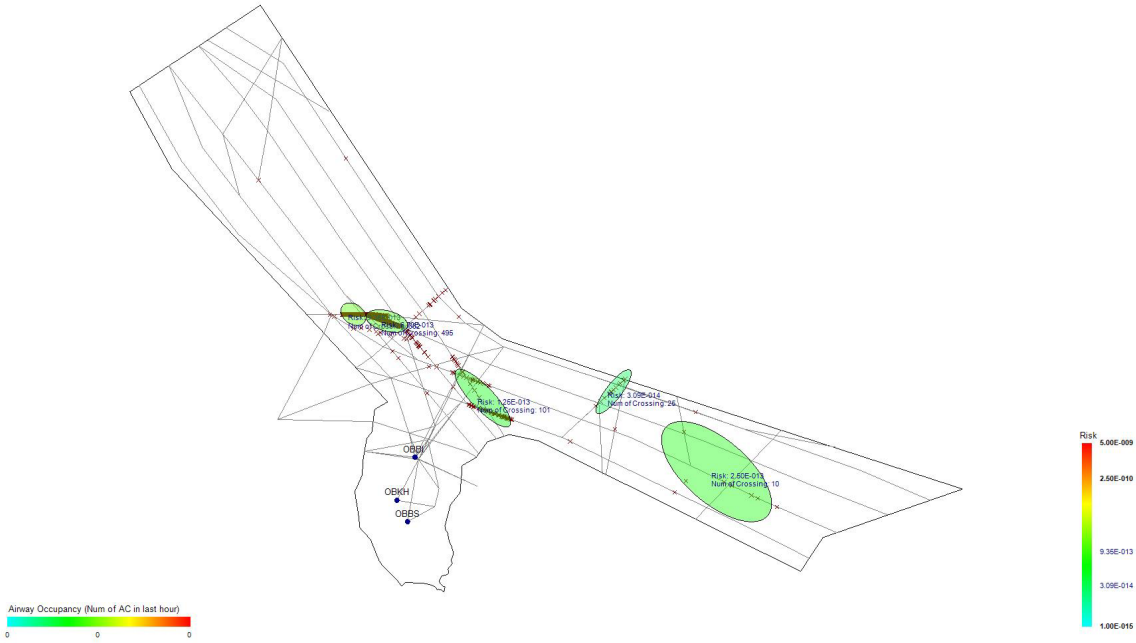
Non-RVSM approved Aircraft – Responsibility of other RMAs

#	Registration	ICAO Type	First Observed on	RMA Responsible
1	5HONE	GLF5	15-05-2024	AFIRMA
2	5HTCP	B39M	19-05-2024	AFIRMA
3	5HTCQ	B39M	15-05-2024	AFIRMA
4	5NADM	B744	28-05-2024	AFIRMA
5	5NBBN	B772	18-05-2024	AFIRMA
6	5NBYJ	E290	6-6-2024	AFIRMA
7	5NHMM	B744	15-05-2024	AFIRMA
8	5YFQA	B734	15-05-2024	AFIRMA
9	5YFQC	B734	20-05-2024	AFIRMA
10	9SPRR	IL76	9-6-2024	AFIRMA
11	TTDAB	H25B	31-05-2024	AFIRMA
12	XTEBO	IL76	7-6-2024	AFIRMA
13	N27GA	FA50	30-05-2024	NAARMO
14	N505MS	C55B	3-6-2024	NAARMO
15	N779CK	B77W	8-6-2024	NAARMO
16	N788DP	B737	25-02-2024	NAARMO
17	40001A	C17	25-01-2020	AAMA
18	60208A	C17	30-03-2020	AAMA
19	PKBGZ	B738	13-12-2022	AAMA
20	PKBKM	A320	30-11-2022	AAMA
21	PKLSU	B739	27-11-2022	AAMA
22	PKLSV	B739	21-12-2022	AAMA
23	PKLSW	B739	8-3-2023	AAMA
24	PKLVF	B739	20-01-2023	AAMA
25	PKSJH	A320	6-11-2022	AAMA
26	PKSTD	A320	19-01-2023	AAMA
27	PKSTH	A320	27-11-2022	AAMA
28	5NBOD	GLF4	28-01-2022	AFIRMA
29	5YFAN	CRJ2	15-07-2020	AFIRMA

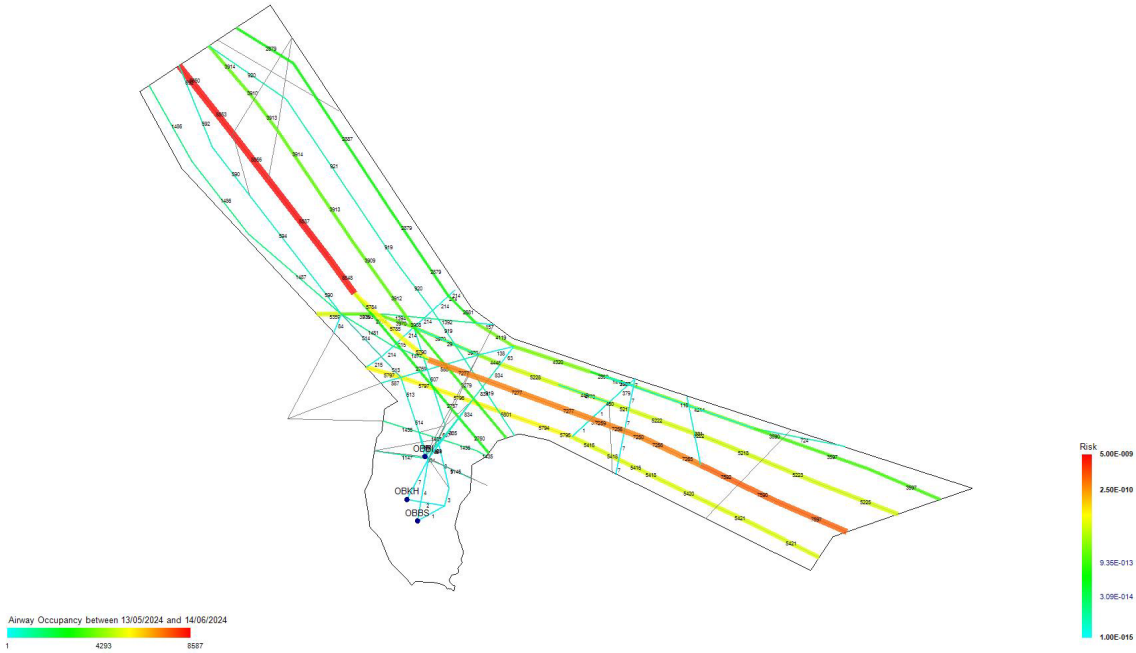
30	5YWBH	C56X	14-07-2020	AFIRMA
31	ETATF	B350	8-7-2020	AFIRMA
32	ZSCQP	CRJ9	7-7-2020	AFIRMA
33	CCBGV	B789	8-6-2022	CARSAM
34	FAB2857	KC39	22-05-2022	CARSAM
35	21140	IL76	19-06-2022	CHINARMA
36	EW550TH	IL76	4-12-2021	EURRMA
37	ICJSN	C25C	15-05-2023	EURRMA
38	UR11316	AN12	22-07-2020	EURRMA
39	URAZN	B753	1-2-2022	EURRMA
40	URAZO	B753	1-2-2022	EURRMA
41	URAZR	B77W	3-2-2022	EURRMA
42	URFSA	IL76	9-5-2021	EURRMA
43	URFSC	IL76	5-12-2021	EURRMA
44	URFSD	IL76	24-12-2021	EURRMA
45	URFSE	IL76	11-12-2022	EURRMA
46	URSQO	B738	2-12-2021	EURRMA
47	80002A	C17	23-07-2020	MAAR
48	CB8001	C17	29-07-2020	MAAR
49	CB8004	C17	24-07-2020	MAAR
50	IN307	IL38	3-12-2020	MAAR
51	K3604	E35L	17-07-2020	MAAR
52	KJ3452	IL76	3-8-2020	MAAR
53	KJ3454	IL76	16-03-2020	MAAR
54	N1112B	B350	16-07-2020	NAARMO
55	N145DB	E35L	22-01-2022	NAARMO
56	N298RB	GLF4	14-05-2021	NAARMO
57	N320MK	GLF3	24-09-2022	NAARMO
58	N411VP	EA50	1-5-2022	NAARMO
59	N44UA	CL60	7-6-2020	NAARMO
60	N46HB	F9000	22-08-2022	NAARMO
61	N604DT	CL60	26-02-2022	NAARMO
62	N605AS	PC12	11-4-2022	NAARMO
63	N651CV	C650	21-11-2022	NAARMO
64	N685MF	GLF4	8-12-2021	NAARMO
65	N800AJ	CL60	10-2-2023	NAARMO
66	N890DA	GLF5	25-02-2023	NAARMO
67	N981DB	H25B	5-4-2022	NAARMO
68	XAASP	CL60	17-11-2022	NAARMO

Appendix C

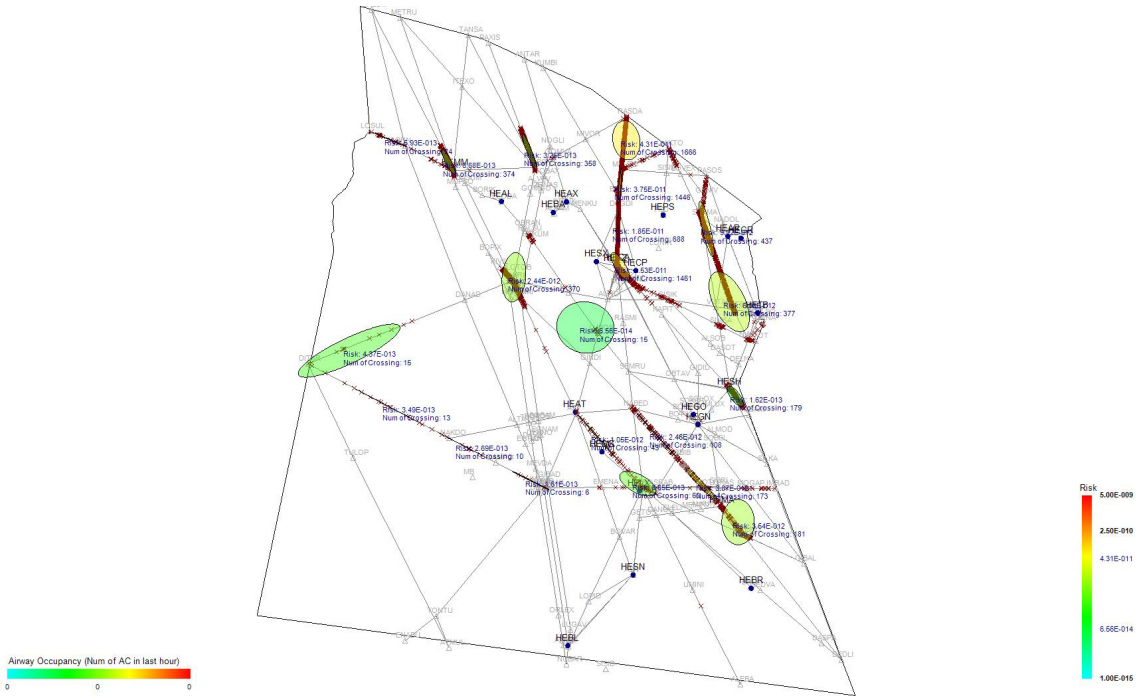
MIDRMA Member States FIRs Hotspots and Airways Occupancy



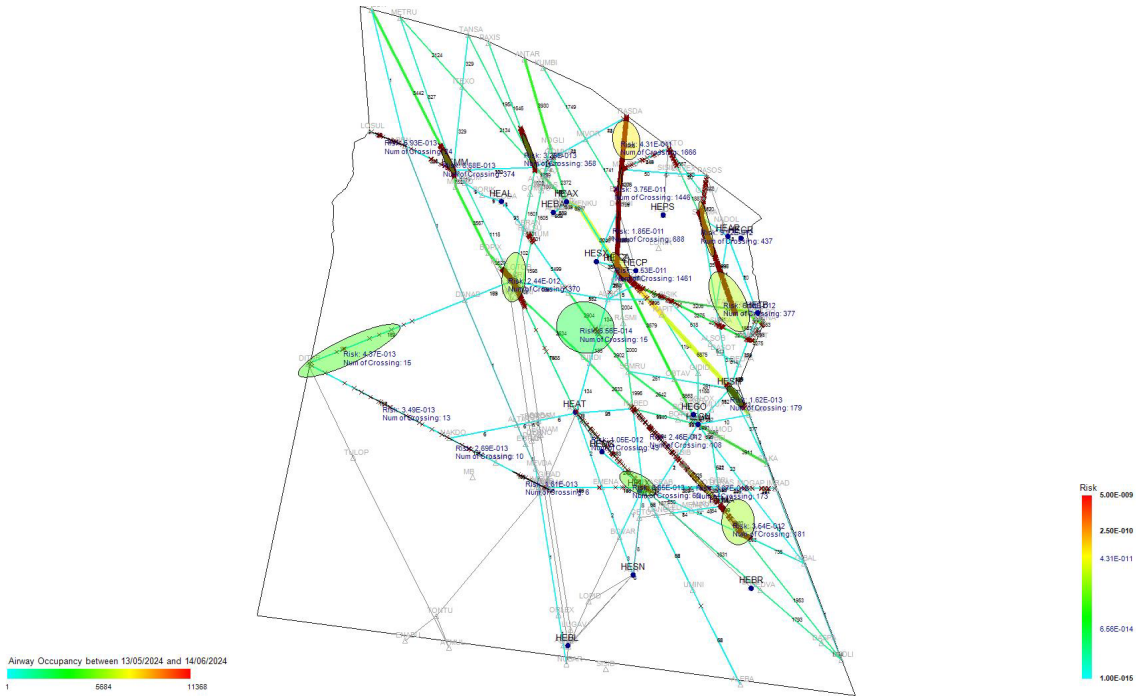
Bahrain FIR SMR 2024 Hotspots



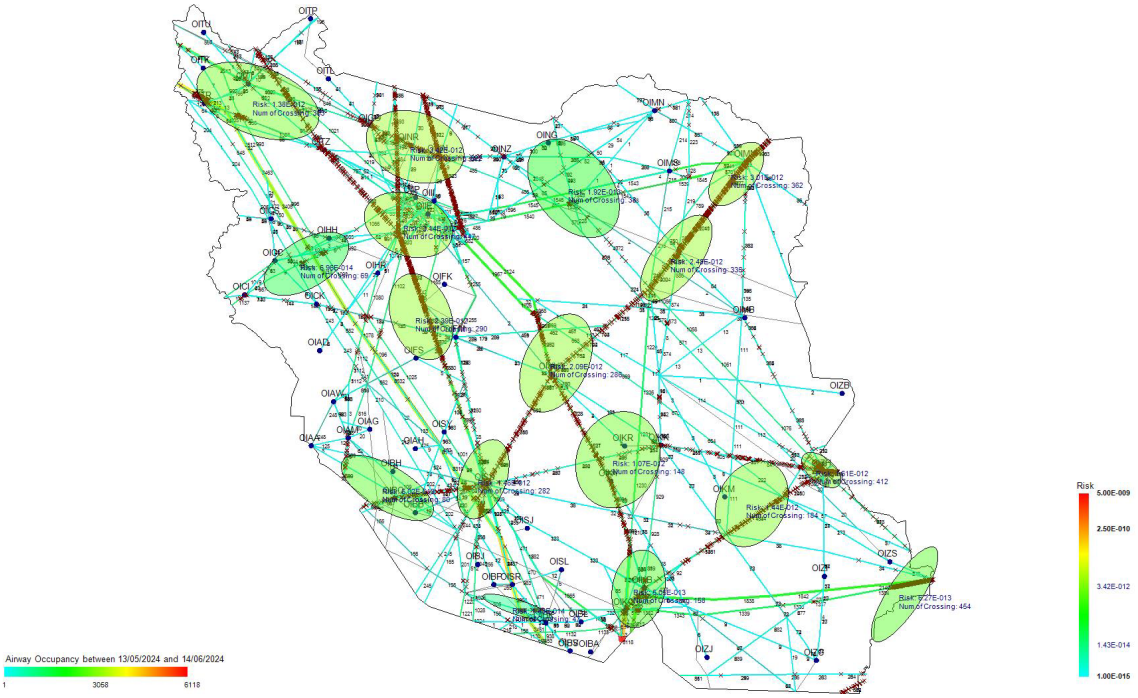
Bahrain FIR SMR 2024 AWYs Occupancy



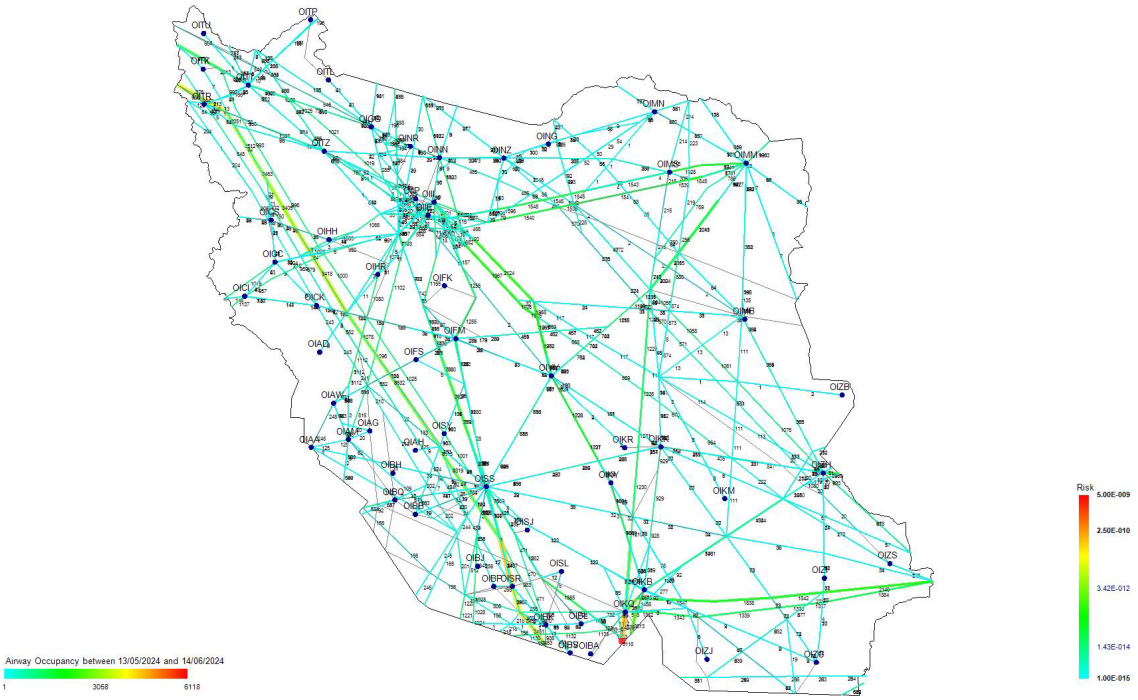
Cairo FIR SMR 2024 Hotspots



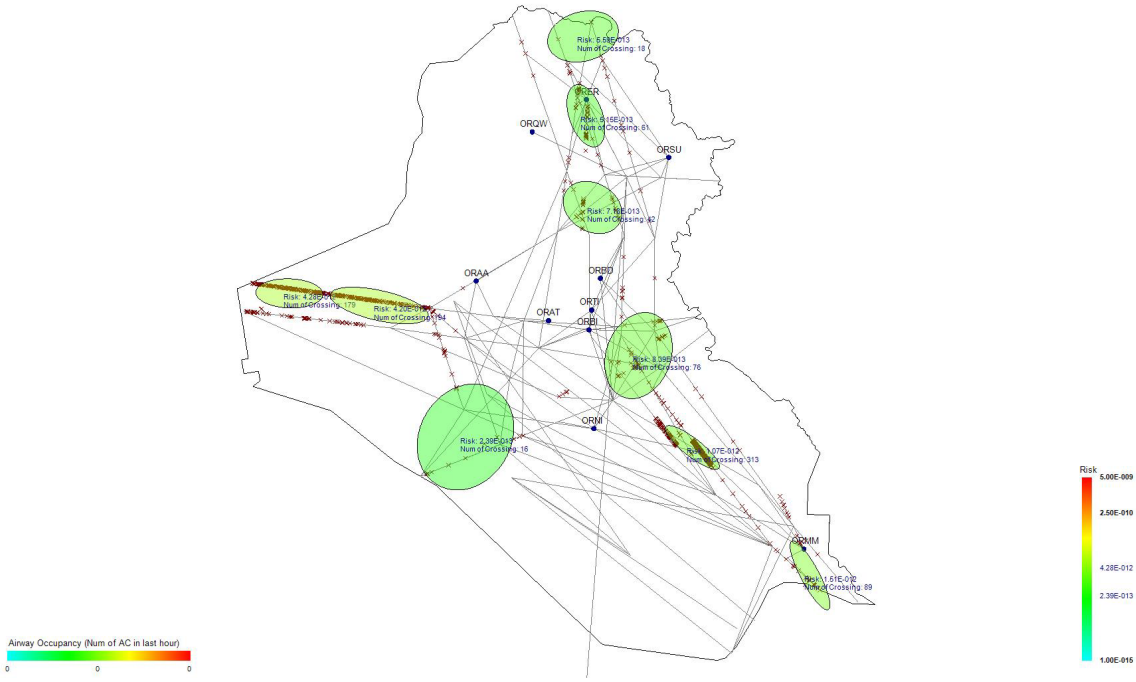
Cairo FIR SMR 2024 AWYs Occupancy



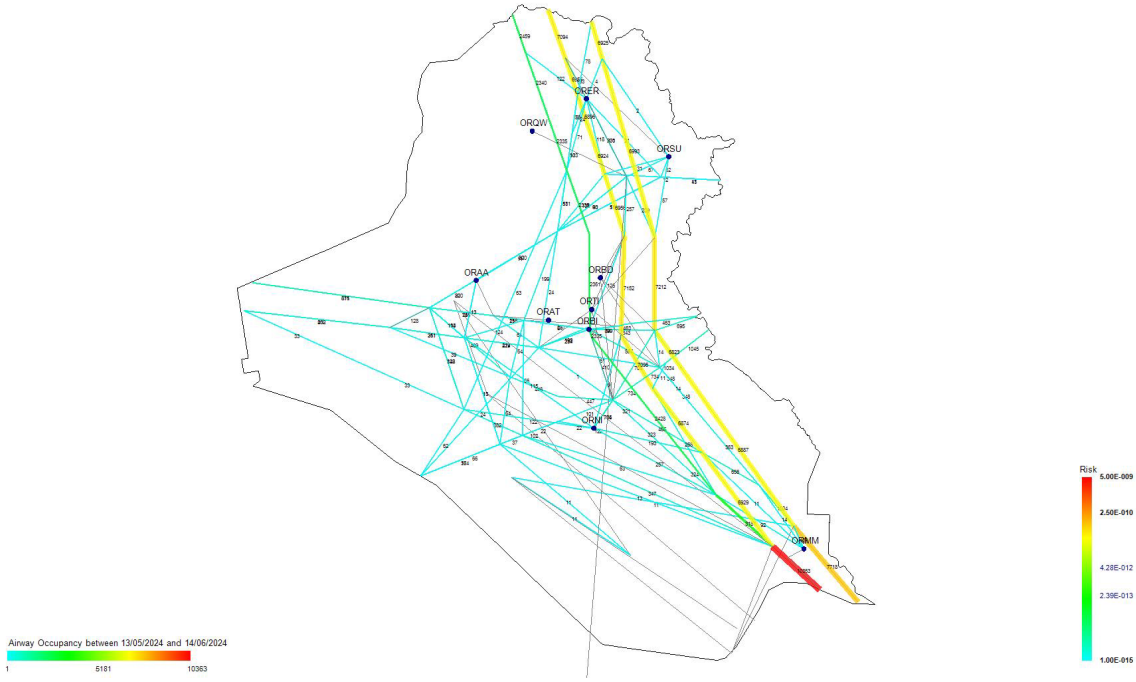
Tehran FIR SMR 2024 Hotspots



Tehran FIR SMR 2024 AWYs Occupancy



Baghdad FIR SMR 2024 Hotspots



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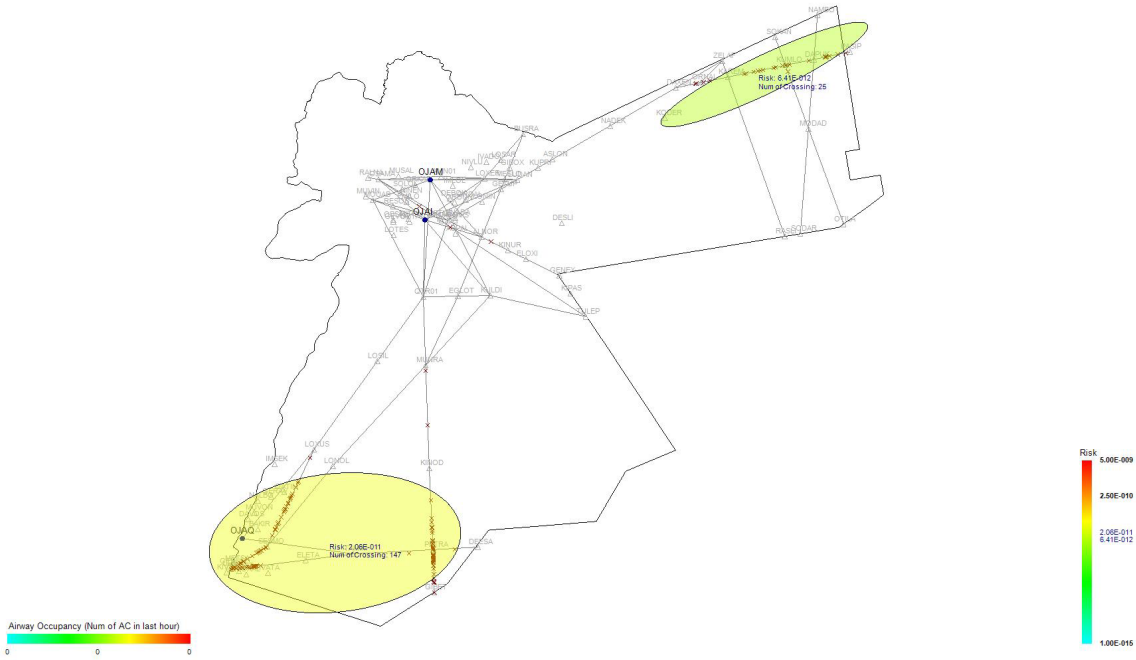

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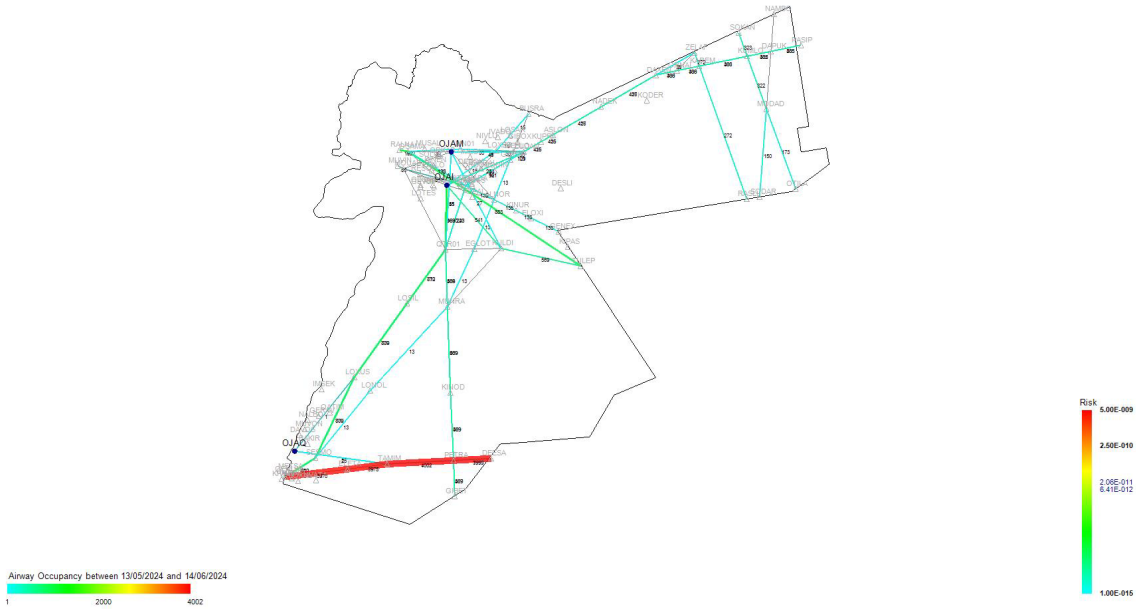

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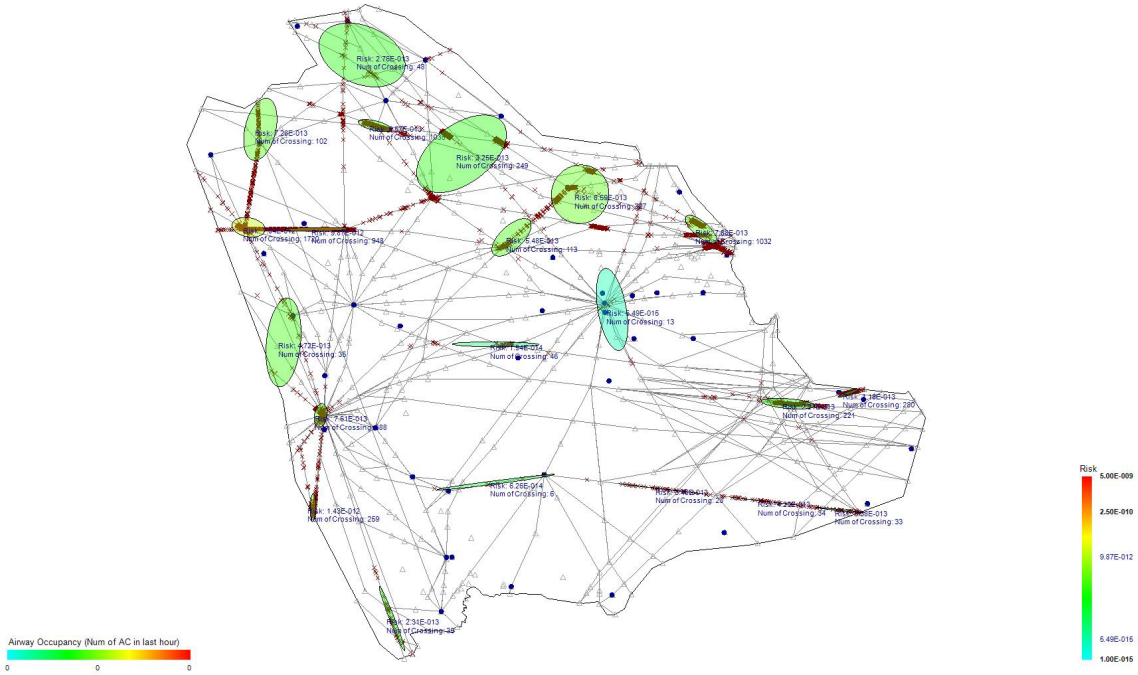
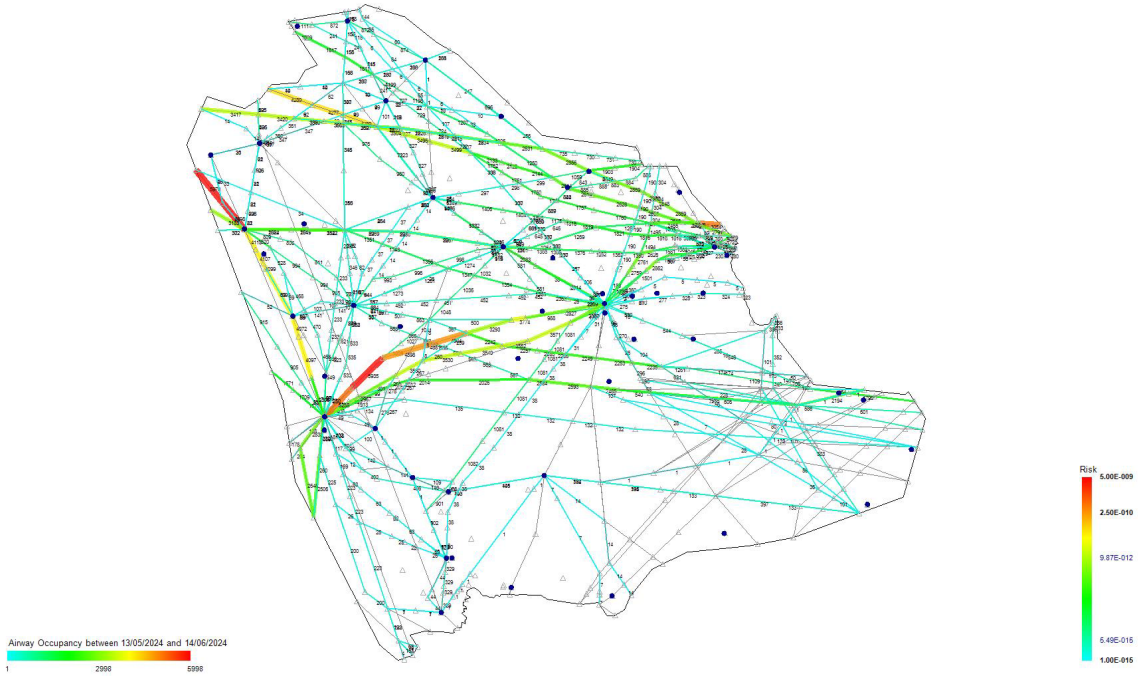


Jeddah FIR SMR 2024 Hotspots



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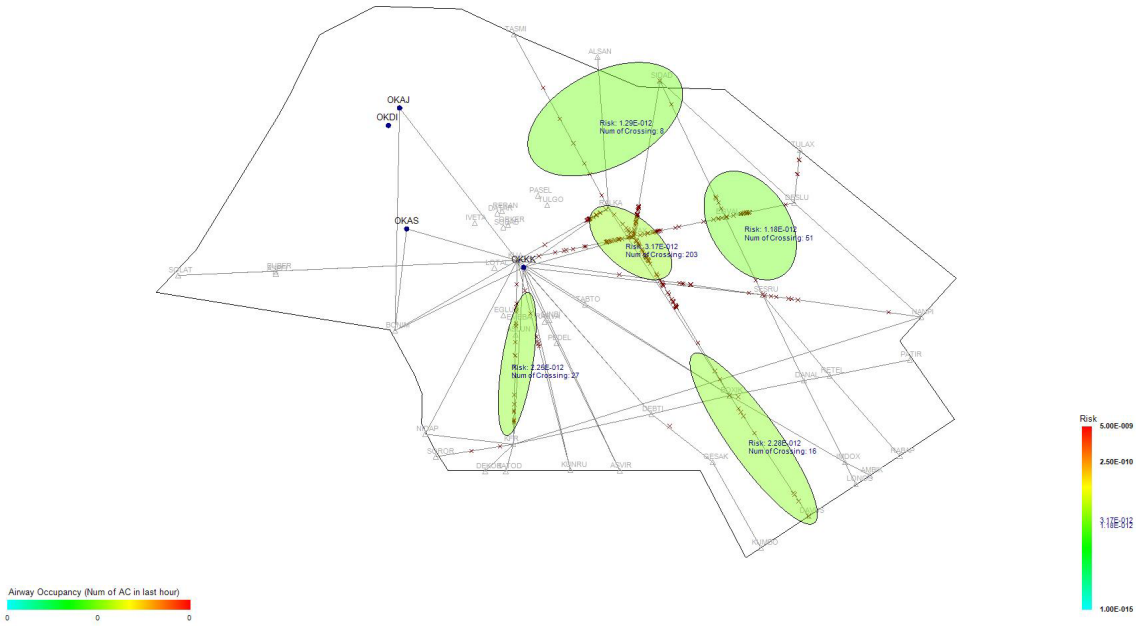
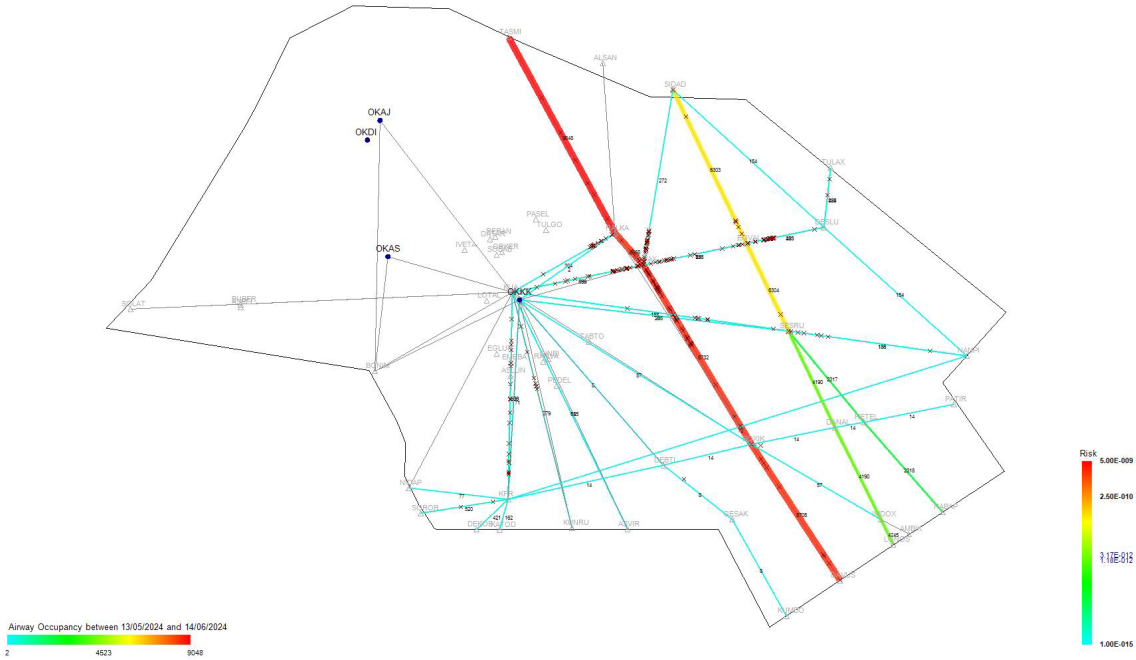
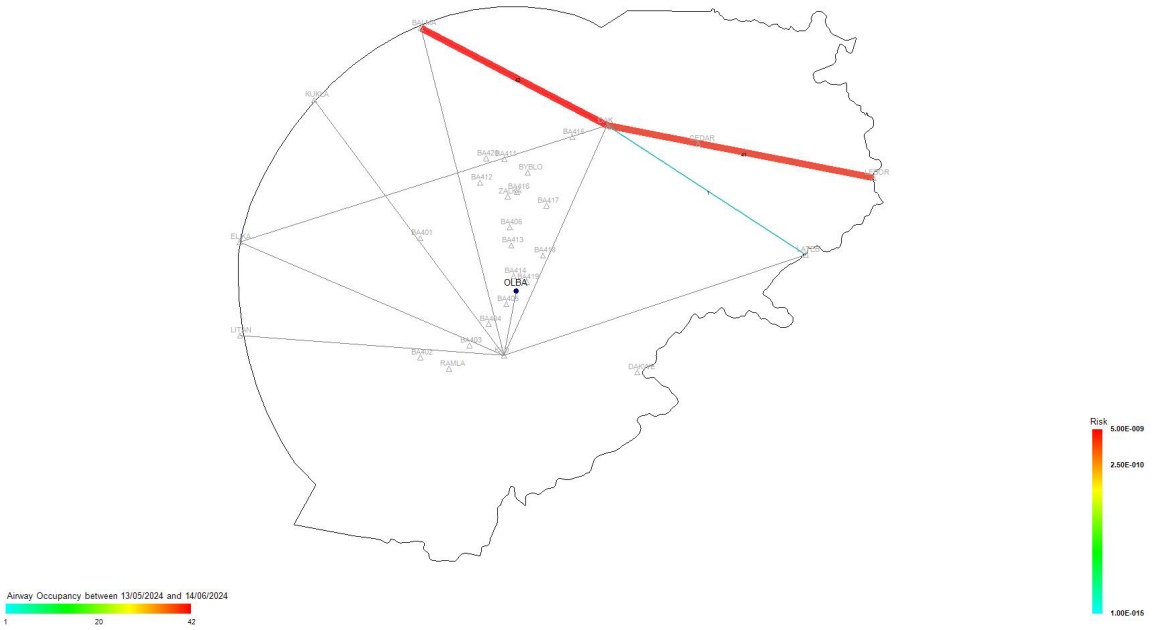


Kuwait FIR SMR 2024 Hotspots



Kuwait FIR SMR 2024 AWYs Occupancy



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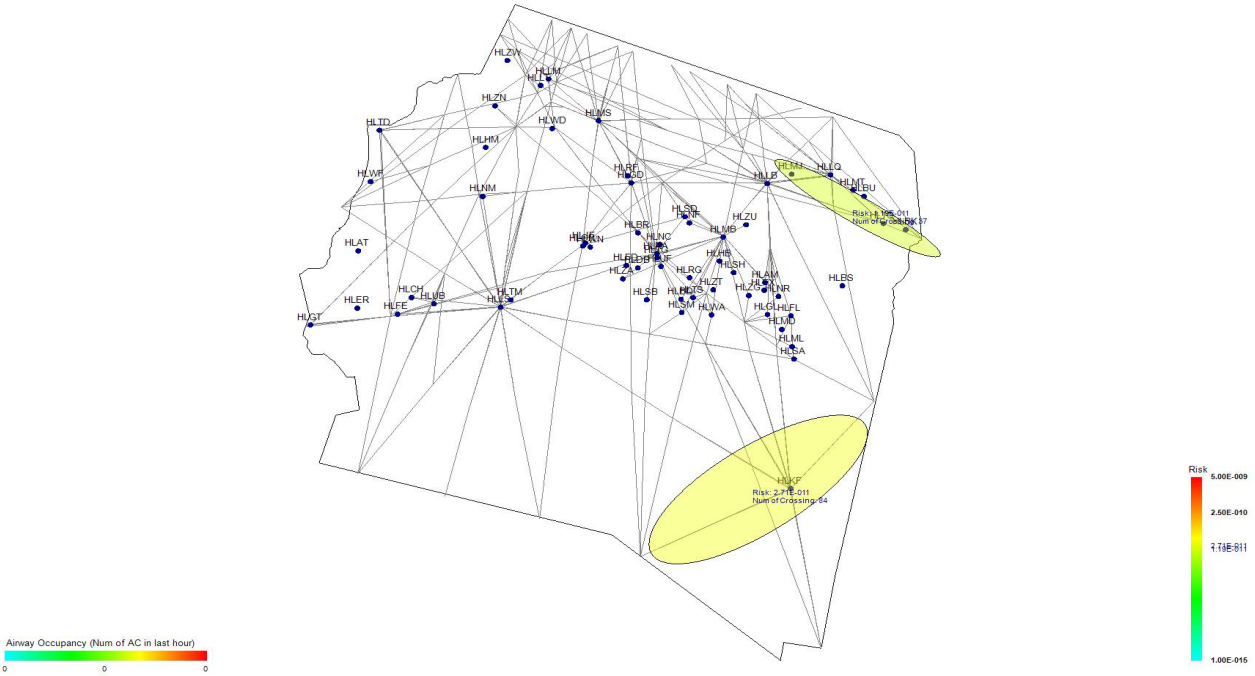
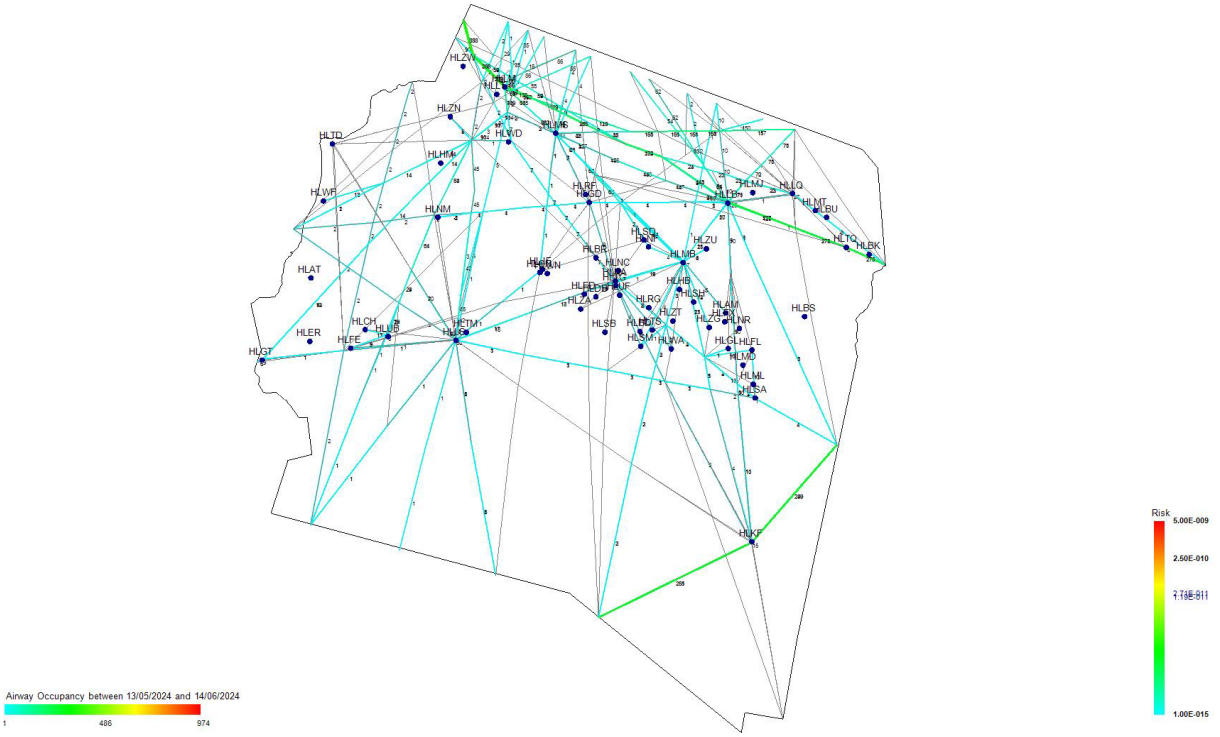


Tripoli FIR SMR 2024 Hotspots



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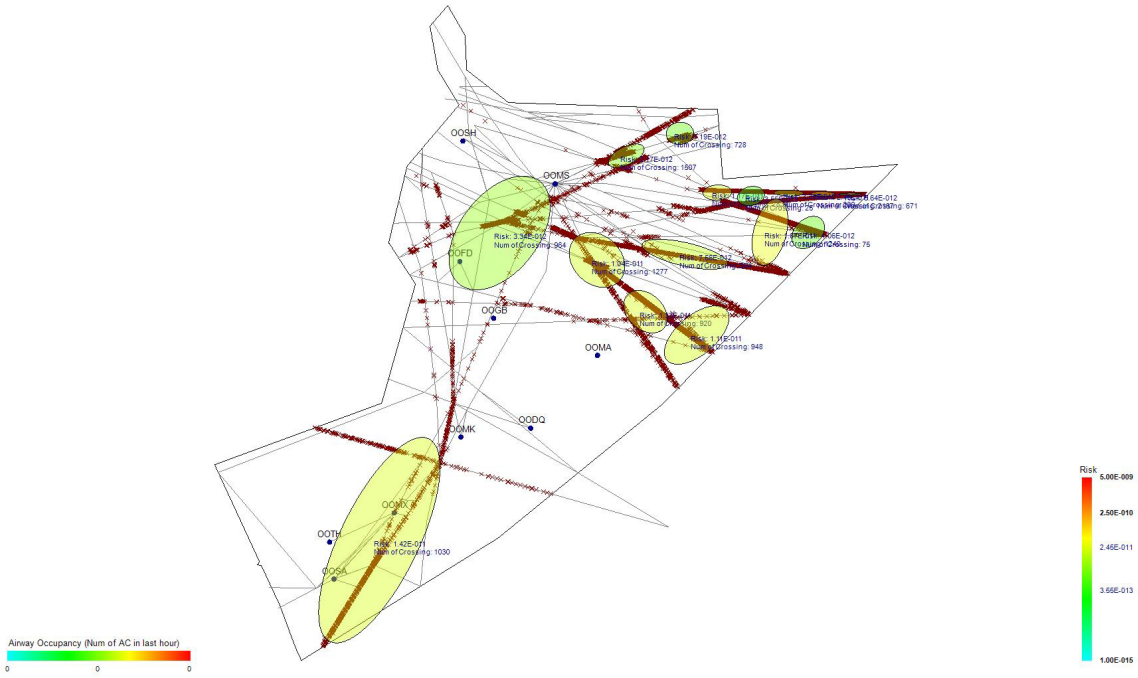
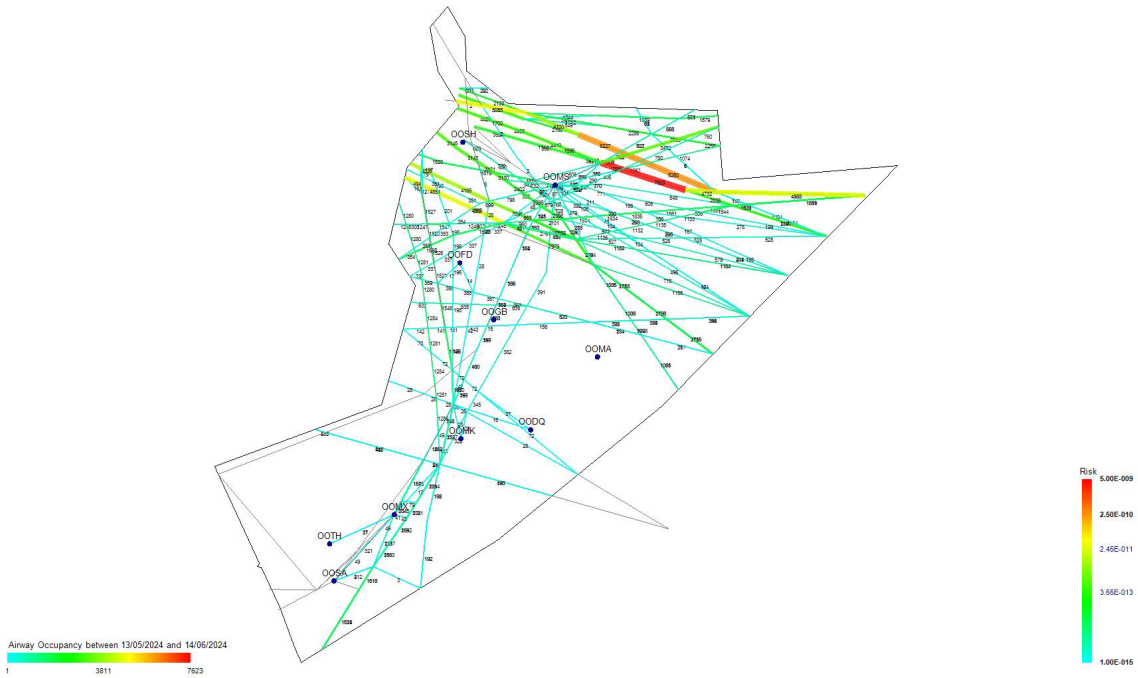
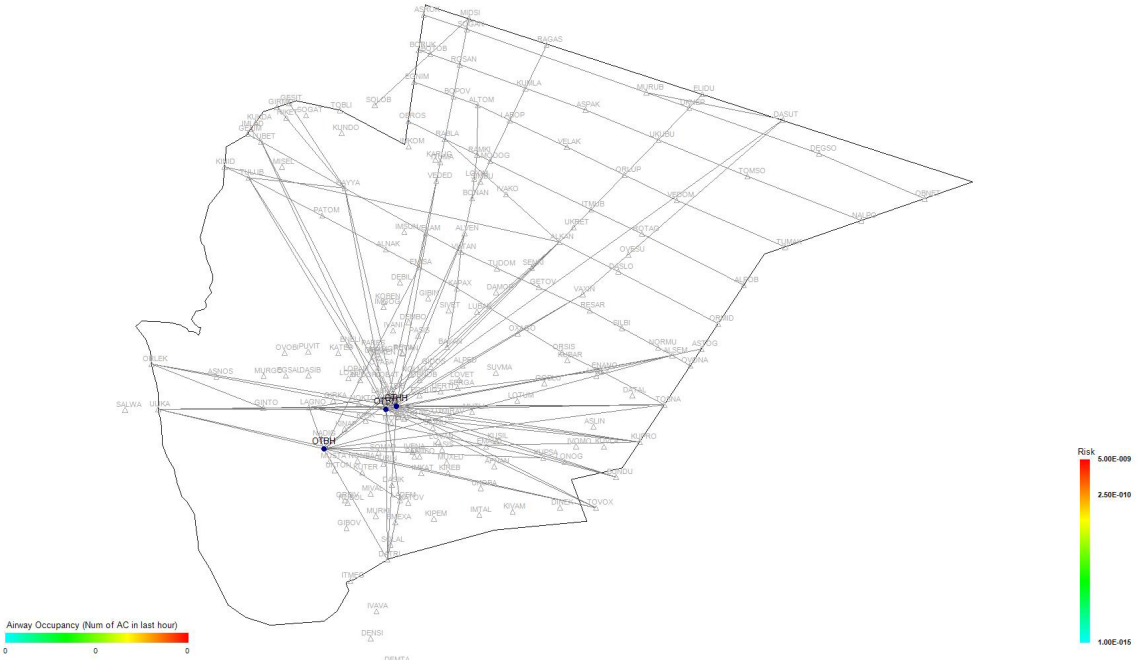


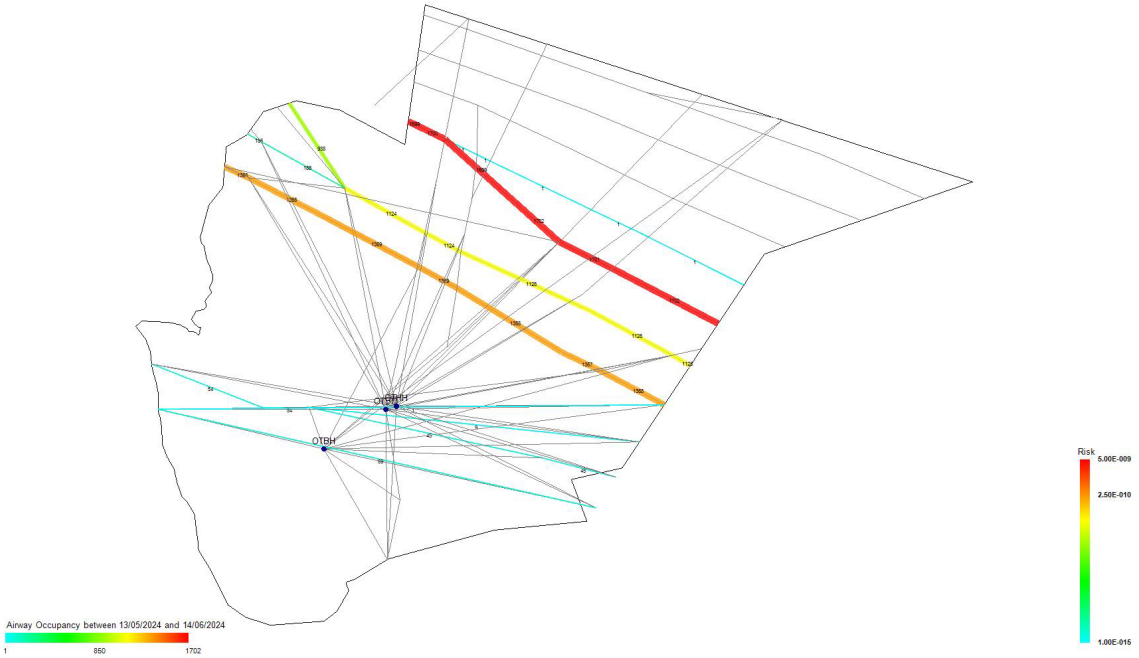
Muscat FIR SMR 2024 Hotspots



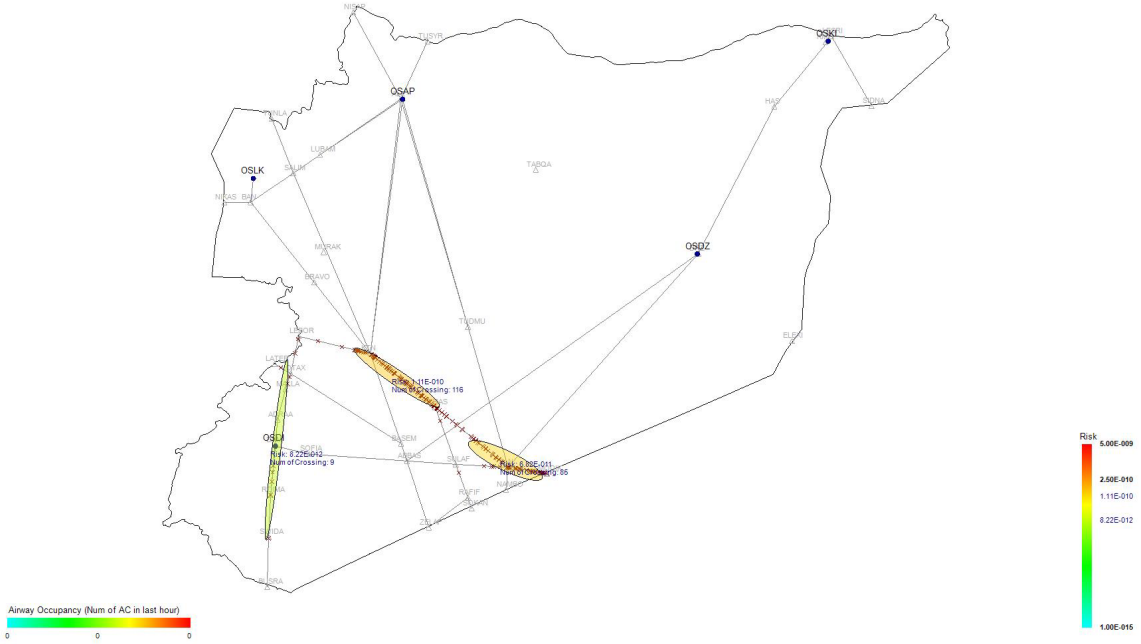
Muscat FIR SMR 2024 AWYs Occupancy



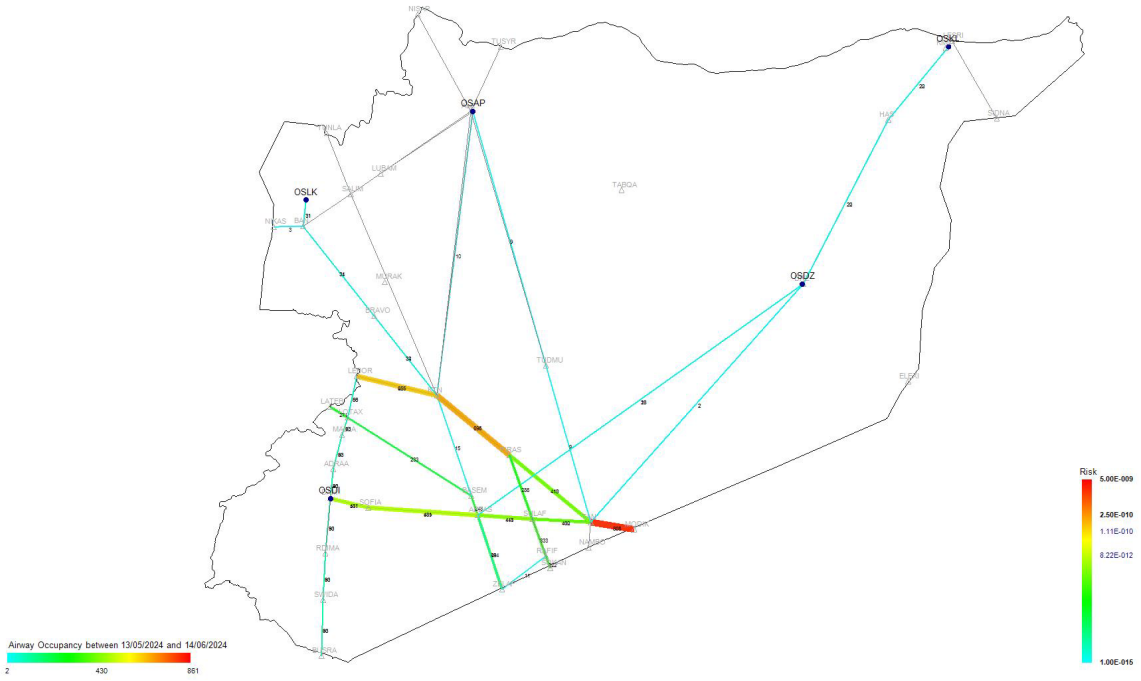
Doha FIR SMR 2024 Hotspots



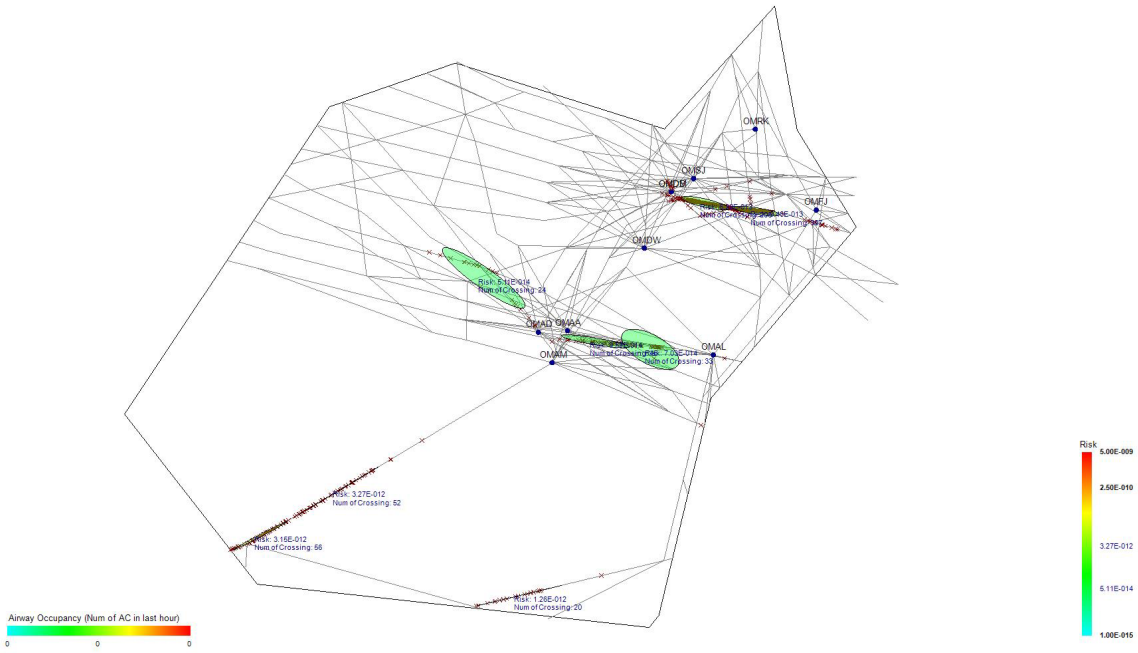
Doha FIR SMR 2024 AWYs Occupancy



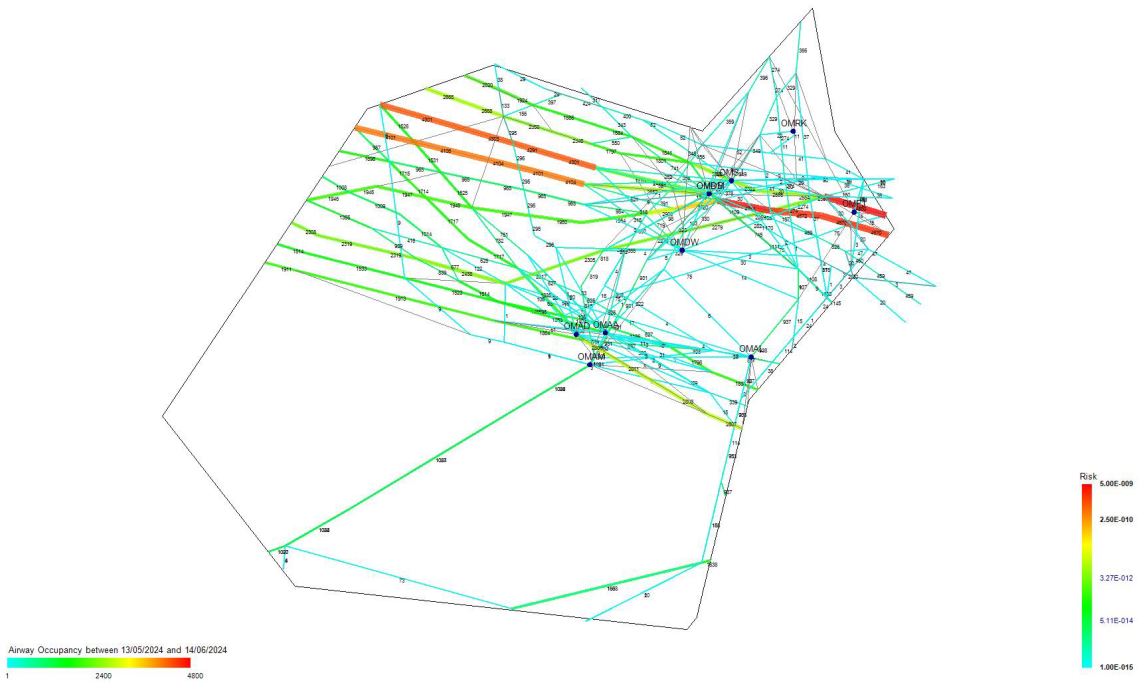
Damascus FIR SMR 2024 Hotspots



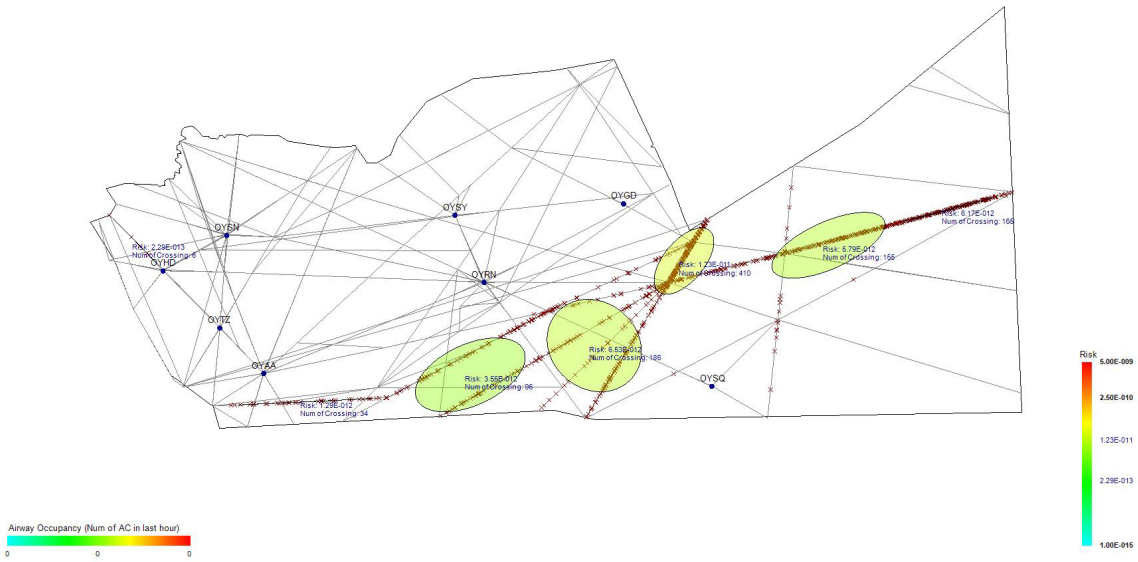
Damascus FIR SMR 2024 AWYs Occupancy



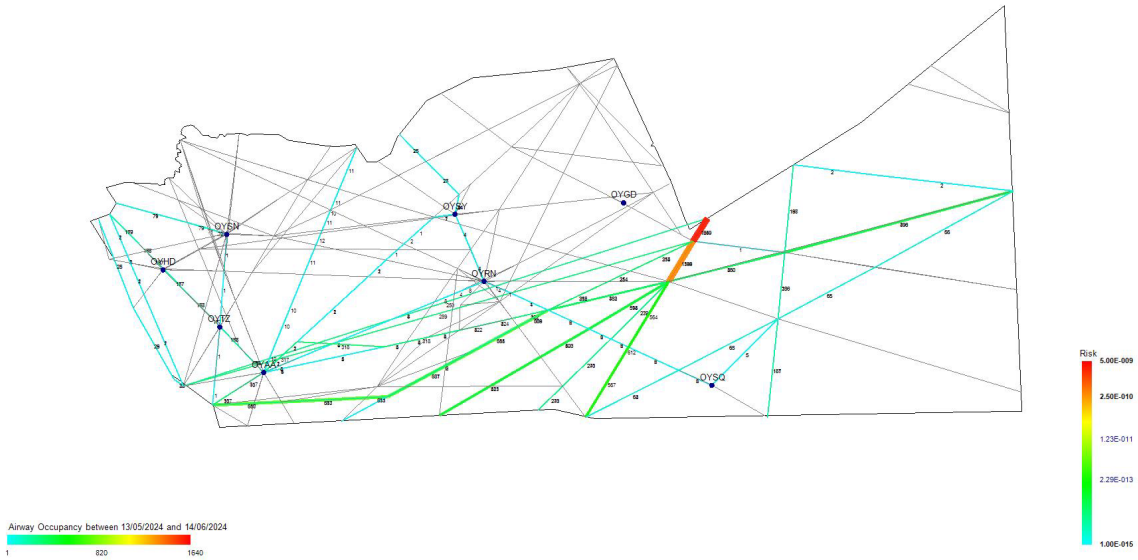
Emirates FIR SMR 2024 Hotspots



Emirates FIR SMR 2024 AWYs Occupancy



Sana'a FIR SMR 2024 Hotspots



Sana'a FIR SMR 2024 AWYs Occupancy

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	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.	SO	Corrective Action Plan has not been formally provided by the State	Iran- UAE	Dec 2021	B

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 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 2021	A
3	MID ANP Table ATM II-MID-1 MID REGION	-	ATS route G795 not implemented	May 2008	RAF-BSR segment not implemented	S	Corrective Action Plan has not been formally	Iraq- Saudi Arabia	Dec 2021	B

	ATS ROUTE NETWORK						provided by the State			
4	MID ANP Table ATM II-MID-1 MID REGION ATS ROUTE NETWORK	-	ATS route A424 not implemented	May 2008	LOTAN-LOVEK segment not implemented	O	Corrective Action Plan has not been formally provided by the State	Iraq	Dec 2021	B

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 2021	A

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 2021	A
2	Annex 11 Para 3.3.5.1	-	Not reporting the required data to the MIDRMA in a timely manner.	March 2023	-	HO	Corrective Action Plan has not been formally provided by the State	Lebanon		A

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 2021	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 2021	A

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 Sudan.	S	Corrective Action Plan has not been formally provided by the State	Saudi Arabia	Dec 2021	A

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 2021	A
2	Annex 11 Para 3.3.5.1	-	Not reporting the required data to the MIDRMA in a timely manner.	March 2024	-	HO	Corrective Action Plan has not been formally provided by the State	Sudan		A

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 2021	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 2021	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 2021	A

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	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 2021	B

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 2021	A

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 2021	A

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 2021	A

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 2021	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 2021	A

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 2021	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 2021	A

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 2021	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 2021	A

Terms of Reference (ToR)
AIR TRAFFIC MANAGEMENT SUB-GROUP (ATM SG)

(Ref. MIDANPIRG Handbook, Feb 2022)

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) framework and the MID Region Air Navigation Strategy;

b) supports and follow up on the tasks of the ASM action plan;

c) monitor the status of implementation of the MID Region ATM-related ASBU 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;

d) 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;

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

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

g) 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;

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

i) 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;

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

k) 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;

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

m) 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;

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

o) coordinate with relevant MIDANPIRG and RASG-MID Subsidiary bodies issues with common interests;

p) provide regular progress reports to the MIDANPIRG concerning its work programme; and

q) review periodically its Terms of Reference and propose amendments as necessary.

r) review, maintain and keep up to date within the ATM Monitoring Dashboard.

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 framework;

b) provide necessary inputs to the MID Region 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) submit completed route proposals for amendment of the Basic ANP Table ATS-1, to the ICAO MID Regional Office for processing;

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

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 / Organization:	Administration:	Name	Full Name:	Job Title / Official Position:
Bahrain	CAA	Mr.	Ahmed Al Malki	Chief Air Traffic Management
Egypt	National Air Navigation Services Company (NANSC)	Capt.	Mohamed Farghaly Mohamed	General Manager of R&D Directorate
Egypt	National Air Navigation Services Company (NANSC)	Capt.	Tarek ELghazaly ELsayed Awwad	Head of the Technical Secretariat Sector
Egypt	Egyptian Civil Aviation Authority (ECAA)	Mr.	Hossam Mohamed Abdelsadek Omran	Head of Air Navigation Central Administration
Egypt	Egyptian Civil Aviation Authority (ECAA)	Mr.	Mohamed Ali Mohamed Ali	General Manager of Air Traffic Services
Egypt	National Airspace Management Centre (NASMC)	Mr.	Wael Ezzat Ammar	Senior Vice CEO NASMC
Iraq	GCAAN	Mr.	Fadhil Gatea	ATS Diretcor
Iraq	GCAAN	Mr.	Mohammed Alaa Majeed Albakri	ATS - Approach Manager
Iraq	GCAAN	Mr.	Muntadher abdulkareem ali	Atco / GCAAN Area Control Center (ACC) Manager
Iraq	GCAAN	Mr.	Maher Hasan Mohammed	Search and Rescue Unit Officer/Senior Chief Air Traffic Controller
Jordan	CARC	Mr.	Ali Taleb Nemer Emrazeeq	Director ANS Operations
Jordan	CARC	Mr.	Ahmad Mahmoud Haidar Odeh	Director of ANS Administration
Libya	Libyan civil aviation authority (LYCAA)	Mr.	Mohamed Khalifa Ramadan Greiba	Chief of ANS Systemes and Standards in ANS
Libya	Libyan civil aviation authority (LYCAA)	Mr.	Fateh M A Said	Head of Air Traffic Control Department
Oman	Civil Aviation Authority (CAA)	Mr.	Mustafa Salam Marhoun Al mahruqi	Air Traffic Controller - ATM
Oman	Civil Aviation Authority (CAA)	Mr.	Ali Mohammed Bani Oraba	Area Control Chief - Directorate of Air Navigation
Oman	Civil Aviation Authority (CAA)	Mr.	Hilal Ali Mohammed Al Maqbali	ATM Director - Directorate of Air Navigation
Oman	Pilot - Royal Air Force of Oman	Mr.	Mubarak Faiz Sanour Al dhafri	Chief of SAR Committe
Oman	Civil Aviation Authority (CAA)	Mr.	Nasser Salim Al-Mazroui	Oman Airspace Strategic Project Manager - DGAN
Oman	Civil Aviation Authority (CAA)	Mr.	Moosa Abdul Azizi Al-Bulushi	Director of Air Navigation Safety Department, (DGCAR)
Oman	Civil Aviation Authority (CAA)	Mr.	Omar Al Shehri	ATC Supervisor
Qatar	Qatar Civil Aviation Authority	Mr.	Eissa Abdulrahman Al-Meabid	Head of ATC, Air Navigation Department
Qatar	Qatar Civil Aviation Authority	Mr.	Mohammed Abdul Qader Al-Asmakh	Head of Radar Operation, Air Navigation Department
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Mazen M Alshihri	Airspace Management Manager
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ahmed S Abughallab	Air Traffic Flow Management Chief
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ali M Alshihri	ATM Executive Director
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Anas M Aljohani	Operation Standard Specialist
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Nasser A Alottaibi	Airspace Operation Chief
Saudi Arabia	General Authority of Civil Aviation (GACA)	Mr.	Khalid Al Harbi	Airspace Management Director and ATM SG Chairperson
Saudi Arabia	General Authority of Civil Aviation (GACA)	Mr.	Abdullah H. Alrshedee	Air Traffic Services Inspector - Air Navigation Safety
Saudi Arabia	General Authority of Civil Aviation (GACA)	Mr.	Bassam Ahmed Alghamdi	Head of Air Traffic Services
Saudi Arabia	General Authority of Civil Aviation (GACA)	Mr.	Ahmed Alkhader	Air Navigation Safety Inspector
Saudi Arabia	General Authority of Civil Aviation (GACA)	Mr.	Basem Talal Shawesh	Head of ANS Training & ELP
Saudi Arabia	General Authority of Civil Aviation (GACA)	Mr.	Homoud Ahmed Al-Zahrani	Manager of Academic Training
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Terad Alghamedi	ATFM Supervisor
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Abdulqader A. Katouah	ATM Department Specialist
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ahmad A. Alnatour	ATM P + D Supervisor
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Giovanni Lenti	ATM Expert/Advisor
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ibrahim Alkhamisi	Towers Training Chief
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ahmed Fattah	Operation Planning Specialist
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ahmad A. Basaad	Operation Planning Specialist
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Mohammed S. Alqdier	Operations Specialist
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Abdulaziz Alzahrani	Riyadh Tower Chief
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ibrahim M. Al-nashri	Riyadh Control Center
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Khalid H. Alotaibi	Riyadh Control Center
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Faisal Alshehri	Riyadh Center Training Head
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Abdalmaged Alhabry	Jeddah ATC Tower
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ali Alkhaibari	Jeddah ATC Tower
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Hossam Farran	Jeddah Control Center
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Mutaz Kabli	Jeddah Control Center
Saudi Arabia	Saudi Air Navigation Services (SANS)	Mr.	Ahmed Saigal	Jeddah Control Center
Saudi Arabia	Saudi Air Navigation Services (SANS)	Ms.	Reem Almutaini	Jeddah Control Center
Saudi Arabia	Saudi Air Navigation Services (SANS)	Ms.	Rayan Abdulmajeed	Safety, Quality and Environment

State / Organization:	Administration:	Name	Full Name:	Job Title / Official Position:
United Arab Emirates	General Civil Aviation Authority (GCAA) - Regulator	Mr.	Ahmed Saleh Al Shehhi	Acting Senior Manager Airspace
United Arab Emirates	General Civil Aviation Authority (GCAA)	Mr.	Ahmed Rahma Al Shamsi	Analyst - Air Space
United Arab Emirates	General Civil Aviation Authority (GCAA)	Mr.	Muayyed Al Teneiji	Director Air Traffic Management
IATA	IATA	Ms.	Zainab Khudhair	Manager Operations, ATM and Infrastructure - AME
ICAO	MID Office	Mr.	Ahmad Amireh	Regional Officer, ATM/SAR
ICAO	MID Office	Mr.	Ahmad Kaveh	Regional Officer, ATM
ICAO	MID Office	Ms.	Dina EL Karimy	Technical Assistant, ATM/SAR & ASF

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