International Civil Aviation Organization

MIDANPIRG/22 & RASG-MID/12 Meetings

(Doha, Qatar, 4 – 8 May 2025)

Agenda Item 5.3: ANS (AIM, PBN, AGA-AOP, ATM-SAR, CNS and MET)

RVSM Operations and Monitoring Activities in the MID Region

(Presented by MIDRMA)

SUMMARY

This paper presents the activities of the MIDRMA including the results of the Safety Monitoring report 2024.

Action by the meeting is at paragraph 3

REFERENCE

- MIDANPIRG/21 & RASG-MID/11 (Abu Dhabi, UAE, 4 – 8 March 2024) meeting report
- MIDRMA Board/20 (Muscat, Oman, 11 – 12 November 2024) meeting report

1. INTRODUCTION

1.1 The Middle East Regional Monitoring Agency (MIDRMA) issues the MID RVSM Safety Monitoring Report (SMR) on an annual basis, with endorsement from the MID Air Navigation Planning and Implementation Regional Group (MIDANPIRG).

1.2 The report aims to present evidence that all safety objectives outlined in the MID RVSM Safety Policy, in accordance with ICAO Doc 9574 (2nd Edition), continue to be met in operational services. Noting that, for the SMR 2024, the MIDRMA did not receive the required traffic data sample from Sudan, forcing MIDRMA to exclude Khartoum FIR from the RVSM risk analysis.

2. DISCUSSION

2.1 The meeting may wish to note that the results of the MID RVSM SMR 2024 reflect the success in achieving the three RVSM safety objectives within the MID Region, as follows:

Objective 1 The risk of collision in MID-RVSM airspace due solely to technical height-keeping performance meets the ICAO target level of safety (TLS) of **2.5 x10^{-9}** fatal accidents per flight hour.

The value computed for technical height risk is estimated at **7.184 x 10^{-11},** which meets RVSM Safety Objective 1.

Objective 2 The overall risk of collision due to all causes, which includes the technical risk and all risks 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 at **6.6399×10^{-10},** which 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.

Middle East RVSM Airspace Average Aircraft Speed = **464.44 kts**			
Risk Type	**Risk Estimation**	**ICAO TLS**	**Remarks**
Technical Risk	**7.184×10^{-11}**	**$2.5x10^{-9}$**	**Below ICAO TLS**
Overall Risk	**6.6399×10^{-10}**	**$5x10^{-9}$**	**Below ICAO TLS**

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

Scope of SMR 2024						
Amman	Bahrain	Beirut	Baghdad	Cairo	Damascus	Emirates
Jeddah	Kuwait	Khartoum*	Muscat	Sana'a	Tehran	Tripoli
			Doha			

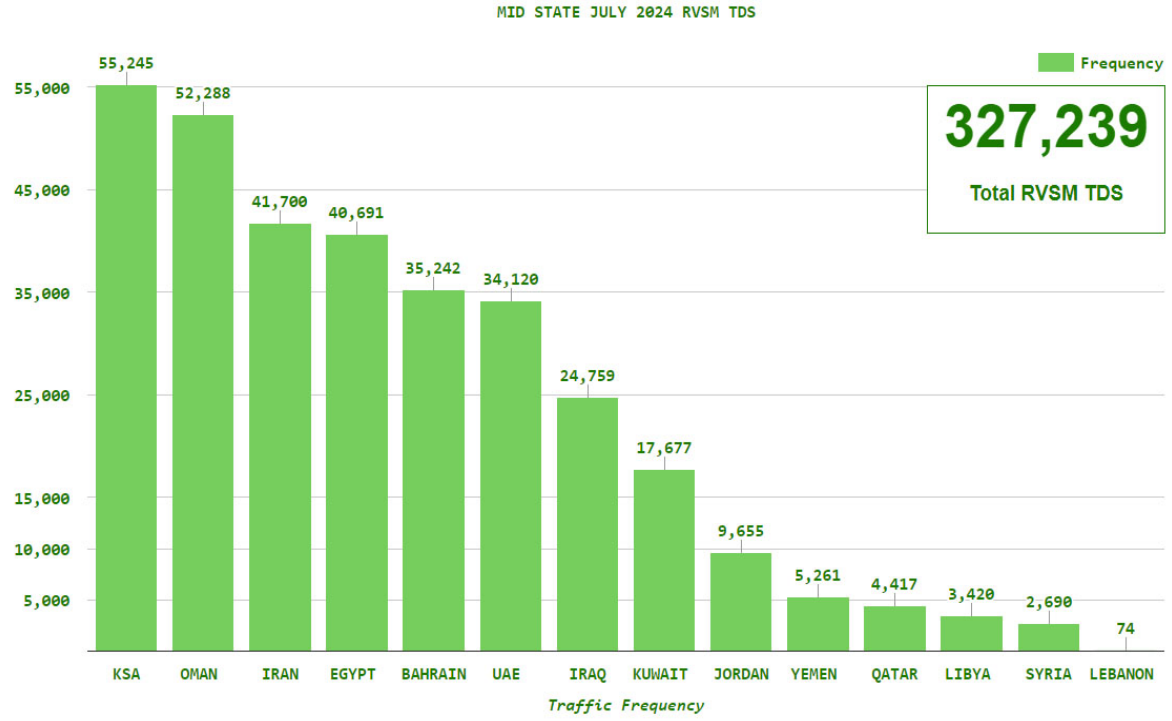
FIRs of the Middle East RVSM Airspace

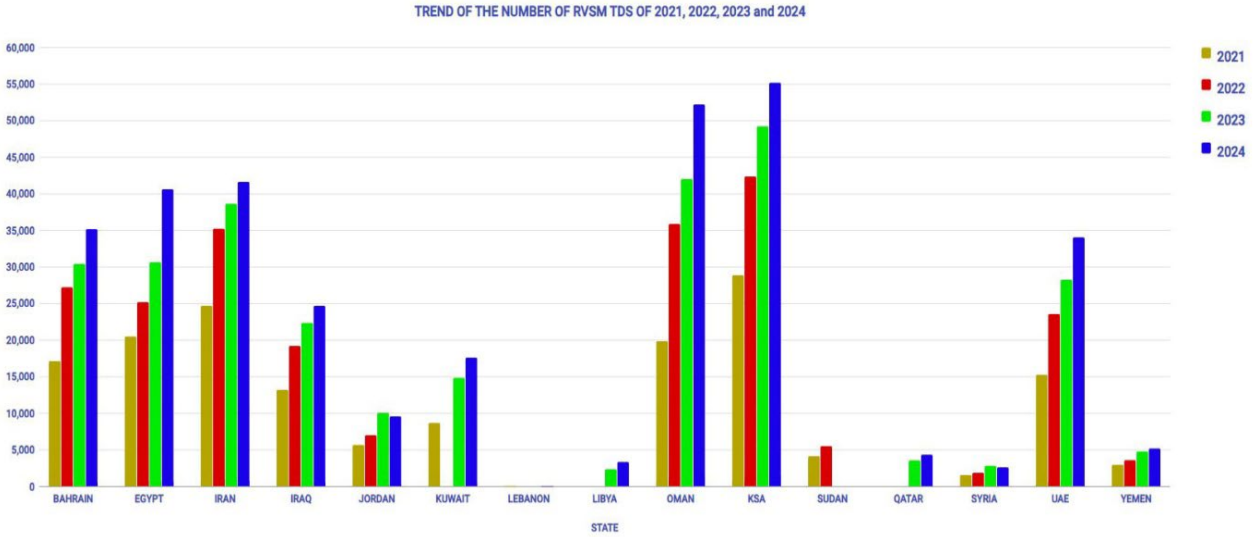
***Note:** **Khartoum FIR excluded from the RVSM safety analysis due to lack of data**

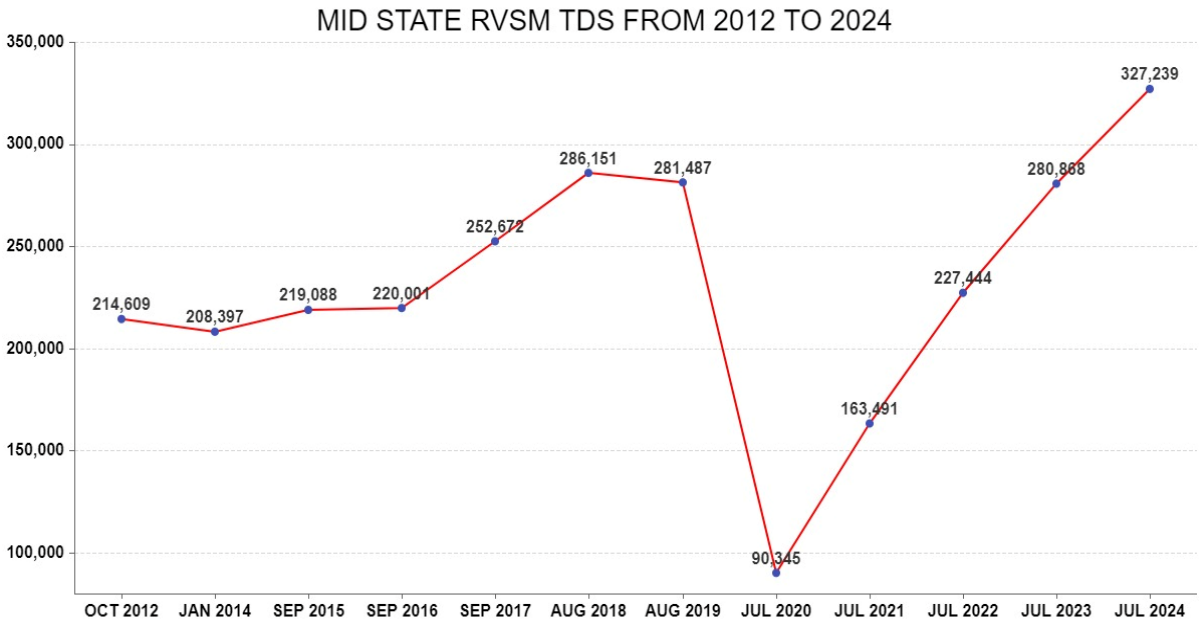
2.3 The Data Sampling periods covered by SMR 2024 according to the MIDANPIRG/21 conclusion were as displayed in the table below:

Report Elements	Time Period
Traffic Data Sample	15/05/2024 - 15/06/2024
Operational & Technical Errors	01/01/2024 - 31/12/2024

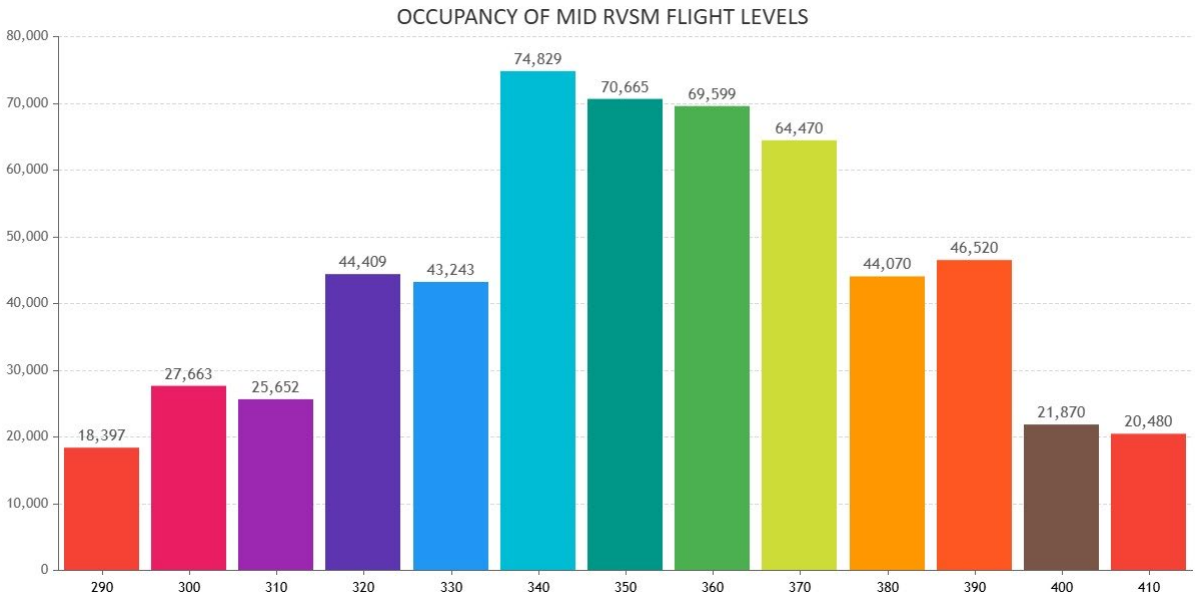
2.4 The descriptions of the traffic data collected from each MIDRMA Member State are depicted in the graph below:


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
QATAR
SYRIA
UAE
YEMEN
STATE



Note: compared to SMR 2023, SMR 2024 reported 16.5% additional flights.



POINT	FIRs	FREQUENCY
TASMI	BAGHDAD/KUWAIT	**10557**
DAVUS	BAHRAIN/KUWAIT	**9337**
SIDAD	BAGHDAD/KUWAIT	**8204**
TUMAK	BAHRAIN/EMIRATES	**7831**
RATVO	BAGHDAD/ANKARA	**7566**
NINVA	BAGHDAD/ANKARA	**7370**
MENSA	EMIRATES/MUSCAT	**7327**

RASKI	MUSCAT/MUMBAI	**6431**
GABKO	EMIRATES/TEHRAN	**6329**
ULADA	BAHRAIN/JEDDAH	**6222**
PASAM	CAIRO/JEDDAH	**6145**
ULINA	CAIRO/AMMAN	**5741**
ALPOB	BAHRAIN/EMIRATES	**5626**
DAROR	BAHRAIN/JEDDAH	**5561**
NALPO	BAHRAIN/EMIRATES	**5323**
SODEX	EMIRATES/MUSCAT	**5276**
TONVO	EMIRATES/MUSCAT	**5140**
BONAM	TEHRAN/ANKARA	**5014**
LONOS	BAHRAIN/KUWAIT	**4996**
PASOV	EMIRATES/MUSCAT	**4762**

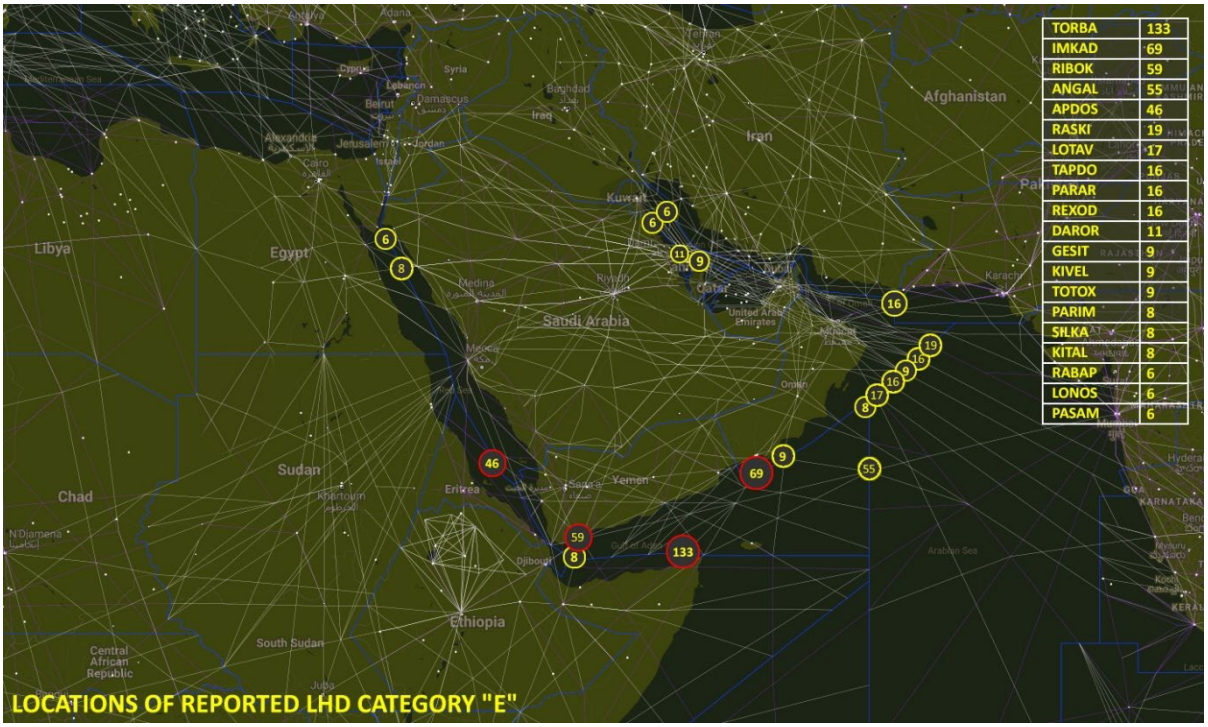
Waypoints usage

2.5 The meeting may wish to recall, that to enable the estimation of total risk, the MIDRMA had to incorporate the results of Safety Objective 1 and the evaluated risk arising from varouis factors referred to as operational risk by analyzing the operational incident reports (LHDs) submitted by the States. however, the MIDRMA continues to receive decreased number of LHD Reports, particularly from those states with high traffic volumes. The MIDRMA received uring the sampling period of LHD (1 January to 31 December 2024 a total of 294 LHD Report from within the Region and a total of 240 on the interface, as follows:

MID FIRs	No. of Reported LHDs	No. of Related LHDs
Bahrain	26	18
Baghdad	17	1
Amman	-	1
Tehran	-	5
Beirut	-	-
Cairo	12	14
Damascus	-	11
Khartoum	-	-
Kuwait	-	14
Doha	**23**	1
Muscat	**136**	61
Jeddah/ Riyadh	**23**	**143**
Tripoli	-	1
Emirates	-	7
Sana'a	**358**	17

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



2.6 The meeting may wish to note, that two safety protocols are still open at the interface of the MID Region, between Muscat and Mumbai and for Sanaa FIR and its adjacent FIRs. Despite the efforts of the relevant States and the MIDRMA, including enhanced and timely LHD reporting, internal investigation mechanisms ongoing coordination including the establishment and testing of the AIDC connection.

2.7 The details of the technical height keeping performance Risk assessment are included in SMR 2024 is at **Appendix A**.

2.8 The meeting may wish to note the RVSM height monitoring activities conducted by the MIDRMA, summarized as follows:

a. Monitoring of 17 RVSM approved Aircraft register in Saudi Arabia,
b. Monitoring of 15 RVSM approved Aircraft register in Iraq,
c. Monitoring of 23 RVSM approved Aircraft register in Libya,
d. Monitoring of 30 RVSM approved Aircraft register in Iran, after the obtaining of OFAC license in July 2024, valid for two years.

2.9 The meeting may wish to recall the MIDRMA duties in safeguarding the safety of RVSM Airspace, by conducting systematic reviews to ensure operators compliance with the State RVSM approval requirements and to identify any aircraft operating within the RVSM airspace without

the required approvals. Accordingly, the MIDRMA continues to monitor the compliance, based on the data collected, and provides a list of non-compliance Aircraft operating within RVSM Airspace. And invited the States to exercise proactive oversight to address any approval deficiencies in timely manner, and to present the report any detected unauthorized operations within their relevant FIR.

2.10 The meeting may wish to note, that the MIDRMA continues to collect and distribute the current list of MMR, also accessible thought the MIDRMA website: www.midrma.com, the current MMR list for the MID States is a s follows:

STATE	RVSM APPROVED A/C	HAVE RESULTS /COVERED	NOT COVERED	NOT COVERED IN %	A/C MMR
Bahrain	72	71	1	1%	1
Egypt	163	148	15	9%	9
Iran	199	125	74	37%	40
Iraq	55	53	12	22%	2
Jordan	47	46	1	2%	1
KSA	358	357	1	0%	1
Kuwait	72	68	4	6%	3
Lebanon	29	29	0	0%	0
Libya	48	29	19	40%	16
Oman	67	66	1	1%	1
Qatar	304	304	0	0%	0
Sudan	16	1	15	94%	11
Syria	17	11	6	35%	2
UAE	603	568	35	6%	19
Yemen	8	1	7	88%	4
TOTAL	**2058**	**1877**	**191**	**9%**	**110**

MIDRMA Member States ICAO RVSM Minimum Monitoring Requirement (MMR) Table, valid as of 01 March 2025

2.11 The meeting may wish to recall the MIDANPIRG Decision 21/16, related to the MID ADS-B Height Monitoring System (MID AHMS). The meeting may wish to note that the MIDRMA has completed the capacity building of the MIDRMA personnel to gain the technical expertise required for the ADS-B data processing and analysis; by completing a training programme, to enable accurate and efficient monitoring using the ADS-B data. And started experimental monitoring using archived ADS-B data provided by Bahrain. The MIDRMA is currently developing the training and operating manuals and in the process of obtaining the analysis software in cooperation with NARMO and FAA. The MIDRMA invites the meeting to urge State to provide ADS-B data, training the engineers on extracting the data and ensure regular submission of the data.

2.12 The meeting may wish to note that the MIDRMA continues to provide the MID FIR RVSM Airspace Hotspots diagrams and Airways occupancy frequency, to be reviewed by the States and include in their ATS route network evaluation, if required.

2.13 Based on all the above, the meeting is invited to review and endorse the following Conclusions:

MIDANPIRG DRAFT CONCLUSION 22/XX: MID RVSM SMR 2024

*That, the MID RVSM Safety Monitoring Report (SMR) 2024 at **Appendix A**, is endorsed.*

MIDANPIRG DRAFT CONCLUSION 22/XX: REPORTING OF LHDS

That, in order to assess compliance with Safety Objective 2, the MIDRMA Member States be urged to:

a) take necessary measures to ensure that LHDs (Categories A, B, C, D, E, H, J and K) are reported in timely manner to the MIDRMA using the LHD Online LHD Reporting Tool available on the MIDRMA website (https://midrma.com/lhd/home/login);

b) provide, on timely bases, their reported LHDs (related to the above LHD Categories) to the MIDRMA for the development of the MID RVSM Safety Monitoring Reports and to ensure that RVSM implementation continue to be safe in the MID Region;

c) coordinate with MIDRMA, as required;

d) MIDRMA conduct periodic meetings (vis web conference), at least once every 3 months, with the ATC Focal Points; and

e) MIDRMA presents the ATM-technical matters to the ATM SG for appropriate actions.

MIDANPIRG DRAFT CONCLUSION 22/XX: 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); before 1 July 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. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss the subject of decreased number of LHD Reporting;

c) Urge States to provide the ADS-B data required for the MID AHMS; and

d) review and agree on the draft conclusions in para 2.13 above.

MID-RVSM SAFETY MONITORING REPORT 2024 (SMR 2024)

Prepared by the Middle East Regional Monitoring Agency (MIDRMA)

1. Executive Summary

The MID-RVSM Safety Monitoring Report (SMR) is prepared annually by the Middle East Regional Monitoring Agency (MIDRMA) for endorsement by the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG). This report provides evidence that all safety objectives outlined in the MID-RVSM Safety Policy, in accordance with ICAO Doc 9574 (3rd Edition), continue to be met within the operational services of the Middle East RVSM airspace.

The report demonstrates that the risk of collision due to technical height-keeping performance and operational errors remains below the ICAO Target Level of Safety (TLS). The findings confirm that MID-RVSM airspace continues to operate safely, with no significant adverse effects on the overall vertical risk of collision.

Results of the MID RVSM SMR 2024:

Implementation of RVSM in the Middle East must continue to be based on safety assessments that confirm compliance with all RVSM safety objectives, as set in ICAO Doc 9574 (3rd Edition).

To assess the current safety of RVSM operations, the three key safety objectives endorsed by MIDANPIRG must be achieved:

Objective 1 The risk of collision in MID-RVSM airspace due solely to technical height-keeping performance meets the ICAO target level of safety (TLS) of **2.5 x10^{-9}** fatal accidents per flight hour.

The value computed for technical height risk is estimated at **7.184 x 10^{-11},** which meets RVSM Safety Objective 1.

Objective 2 The overall risk of collision due to all causes, which includes the technical risk and all risks 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 at **6.6399 x 10^{-10},** which 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.

Middle East RVSM Airspace Average Aircraft Speed = **464.44 kts**			
Risk Type	**Risk Estimation**	**ICAO TLS**	**Remarks**
Technical Risk	**7.184×10^{-11}**	**2.5×10^{-9}**	**Below ICAO TLS**
Overall Risk	**6.6399×10^{-10}**	**5×10^{-9}**	**Below ICAO TLS**

1.1 Conclusions:

a. The estimated risk of collision associated with aircraft height-keeping performance is **7.184×10^{-11}** and meets the ICAO TLS of **2.5×10^{-9}** fatal accidents per flight hour (RVSM Safety Objective1).

b. 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 **6.6399×10^{-10}**; this value is below the ICAO overall TLS of **5×10^{-9}** fatal accidents per flight hour (RVSM Safety Objective 2).

c. based on currently available information (Except for Khartoum FIR), there is no evidence available to MIDRMA that the continued operations of RVSM adversely affect the overall vertical risk of collision during the reporting cycle of the SMR.

d. In 2024, member states were required to submit Large Height Deviation (LHD) reports as part of RVSM safety monitoring. However, only Category E reports were submitted, which primarily relate to coordination failures between member states at FIR boundaries. While these reports are important, the majority of these incidents did not significantly impact RVSM operations in the Middle East region. Notably, no reports were submitted for critical LHD categories such as A, B, C, or D despite over 3.5 million RVSM movements in the region. This lack of reporting, especially for the high-risk categories, limits the accuracy and confidence of the overall risk analysis. MIDRMA emphasizes the importance of submitting all LHD reports, particularly from FIRs with high traffic volumes, to ensure a comprehensive and reliable risk assessment.

1.2 Considerations on the Safety Objectives for MID RVSM SMRs

1.2.1 When evaluating the three safety objectives for RVSM, the following key considerations should be taken into account:

1.2.1.1 **Risk Assessment Against TLS**:

The evaluation of risk, both technical and overall, in relation to the Target Level of Safety (TLS) depends on two primary factors:

a. Height-keeping performance data to assess vertical risk.
b. Traffic density studies calculating horizontal risk.
c. To ensure the reliability of the risk assessment, several assumptions must be validated. This validation primarily involves monitoring aircraft performance to confirm compliance with expected standards.

1.2.1.2 **Aircraft Performance Evaluation**:

Aircraft performance is assessed in two ways:

a. By individual airframe: Each aircraft is evaluated on its own merits.
b. By monitoring group: A monitoring group consists of aircraft of the same type with identical performance characteristics made compliant with RVSM technical requirements through a common method. Monitoring group analysis is essential to validate that that group's Minimum Aviation System Performance Standards (MASPS) remain accurate. Aircraft that achieve RVSM compliance individually rather than as part of a group are classified as non-group aircraft.

1.2.1.3 **RVSM Safety Objective 2 (Overall Risk)**: This objective encompasses technical risk and risks arising from all other causes, such as human factors. Accurate assessment of this parameter relies on the following:

a. Comprehensive reporting of Large Height Deviations (LHDs).
b. Proper interpretation of events for use in Collision Risk Modeling (CRM) analysis.

1.2.1.4 **RVSM Safety Objective 3**: This objective requires the Regional Monitoring Agency (RMA) to:

a. Monitor long-term trends to identify potential future safety concerns.
b. Highlight any emerging issues that should be addressed and carried forward as recommendations for future reports.

1.2.2 MIDRMA has consistently emphasized that all member states must 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.

2 Scope:

2.1 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			

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

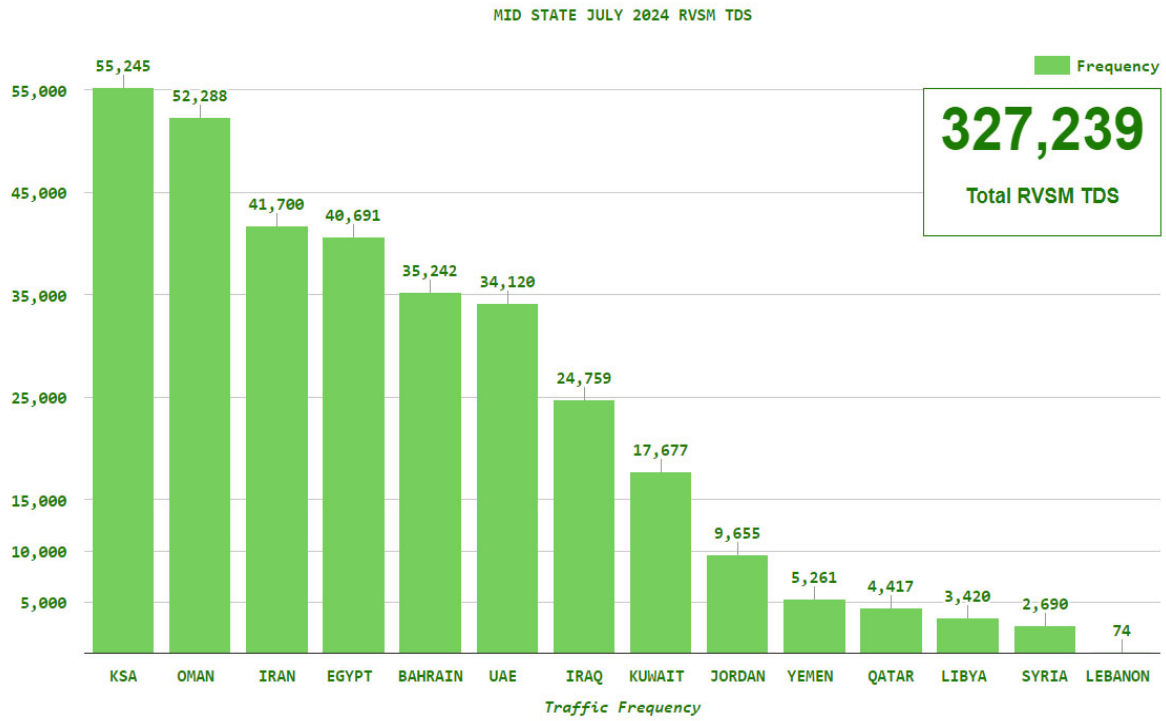
***Note: Khartoum FIR excluded from the RVSM safety analysis due to lack of data**

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

Report Elements	Time Period
Traffic Data Sample	15/05/2024 - 15/06/2024
Operational & Technical Errors	01/01/2024 - 31/12/2024

2.3 The descriptions of the traffic data collected from each MIDRMA Member State are depicted in the 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**		


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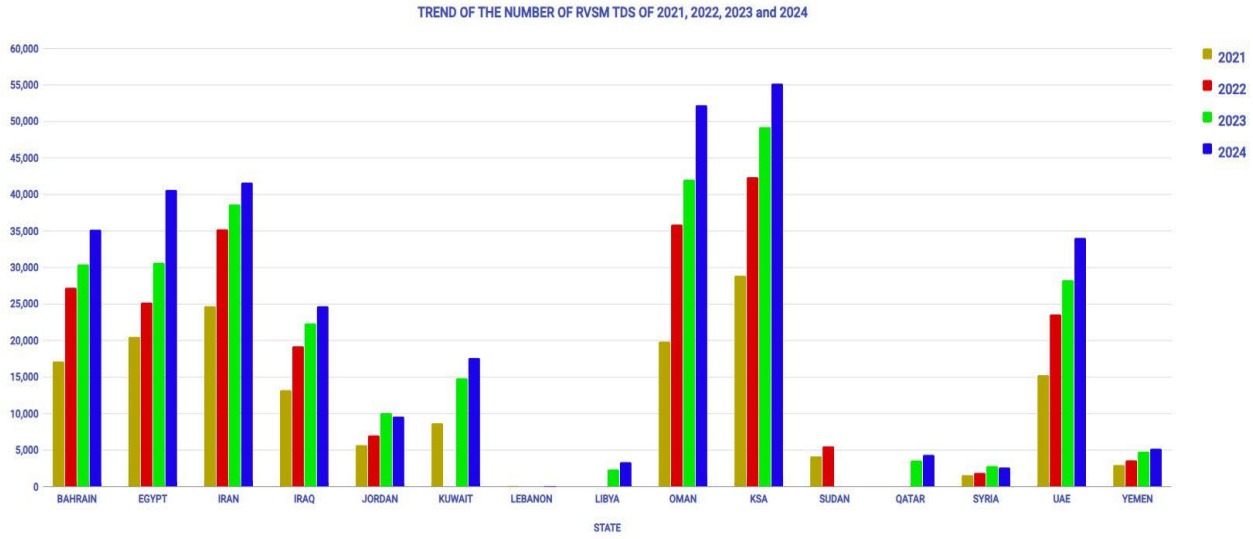
41,700
40,691
35,242
34,120
24,759
17,677
9,655
5,261
4,417
3,420
2,690
74
KSA
OMAN
IRAN
EGYPT
BAHRAIN
UAE
IRAQ
KUWAIT
JORDAN
YEMEN
QATAR
LIBYA
SYRIA
LEBANON
Traffic Frequency


TREND OF THE NUMBER OF RVSM TDS OF 2021, 2022, 2023 and 2024
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
2021
2022
2023
2024
BAHRAIN
EGYPT
IRAN
IRAQ
JORDAN
KUWAIT
LEBANON
LIBYA
OMAN
KSA
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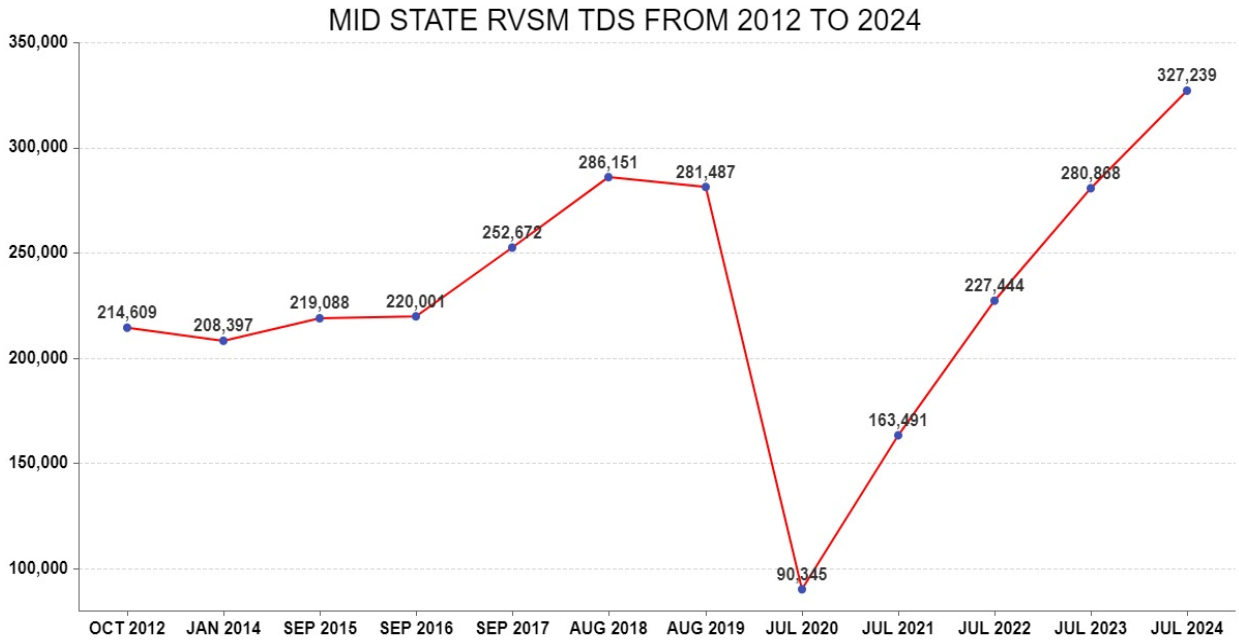
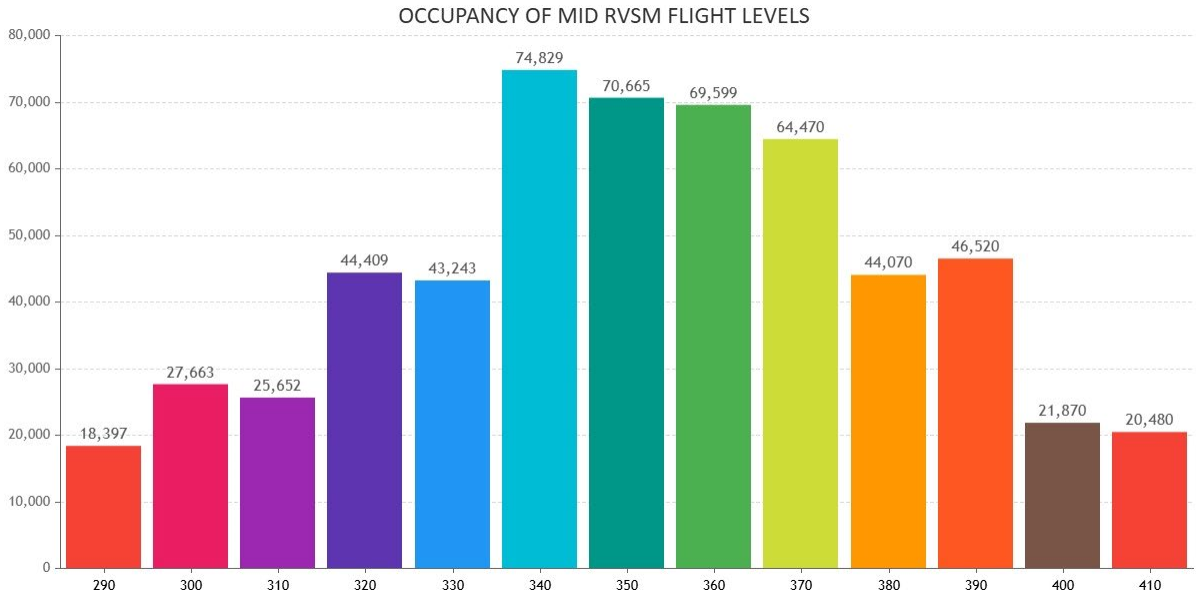
UAE
YEMEN
STATE


MID STATE RVSM TDS FROM 2012 TO 2024
350,000
300,000
250,000
200,000
150,000
100,000
214,609
208,397
219,088
220,001
252,672
286,151
281,487
90,345
163,491
227,444
280,868
327,239
OCT 2012
JAN 2014
SEP 2015
SEP 2016
SEP 2017
AUG 2018
AUG 2019
JUL 2020
JUL 2021
JUL 2022
JUL 2023
JUL 2024


OCCUPANCY OF MID RVSM FLIGHT LEVELS
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
18,397
27,663
25,652
44,409
43,243
74,829
70,665
69,599
64,470
44,070
46,520
21,870
20,480
290
300
310
320
330
340
350
360
370
380
390
400
410

POINT	FIRs	FREQUENCY
TASMI	BAGHDAD/KUWAIT	**10557**
DAVUS	BAHRAIN/KUWAIT	**9337**
SIDAD	BAGHDAD/KUWAIT	**8204**
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RASKI	MUSCAT/MUMBAI	**6431**
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ULADA	BAHRAIN/JEDDAH	**6222**
PASAM	CAIRO/JEDDAH	**6145**
ULINA	CAIRO/AMMAN	**5741**
ALPOB	BAHRAIN/EMIRATES	**5626**
DAROR	BAHRAIN/JEDDAH	**5561**
NALPO	BAHRAIN/EMIRATES	**5323**
SODEX	EMIRATES/MUSCAT	**5276**
TONVO	EMIRATES/MUSCAT	**5140**
BONAM	TEHRAN/ANKARA	**5014**
LONOS	BAHRAIN/KUWAIT	**4996**
PASOV	EMIRATES/MUSCAT	**4762**

Top 20 Busiest Points in the ICAO Middle East RVSM Airspace

2.4 Technical Height Keeping Performance Risk Assessment

2.4.1 RVSM Safety Objective 1

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

2.4.3 The value computed for technical height-keeping performance risk is estimated at **7.184 x 10^{-11}** fatal accidents per flight hour, which meets the ICAO TLS of **2.5 x 10^{-9}**.

2.4.4 From June 2024 TDS, the following were calculated:

- Average Aircraft Diameter (lambda xy): 0.027642 NM (167.96 ft)
- Average Aircraft Wingspan (lambda y): 0.025488 NM (154.87 ft)
- Average Aircraft Height (lambda z): 0.0079406 NM 48.248 ft
- Number of Flights involved: **327,239**
- Flying Time: 226,260 hours
- Flying Distance: 104,448,064 NM
- Average Speed: 464.44 kts
- Average Passing Frequency: 1.17687E-001

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

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

b. Pz(1000) – the probability of vertical overlap due to technical height-keeping performance between aircraft flying 1000 ft. separation in MID-RVSM airspace is **1.819 x 10^{-9}** valid and is less than the ICAO requirement of **1.7 x 10^{-8}**.

c. All aircraft flying 1000ft separation in MID-RVSM airspace meet the ICAO Global Height Keeping Performance specification for RVSM.

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

e. The monitoring target for the MID-RVSM height-monitoring programme is an ongoing process.

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

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

h. The methodology used to assess technical height-keeping performance is aligned with ICAO-approved procedures, is periodically validated and incorporates enhancements to maintain accuracy and compliance with evolving standards.

2.4.6 Calculating the Probability of Lateral Overlap (Py (0))

The probability of lateral overlap, Py (0), represents the likelihood of two aircraft being in lateral overlap while nominally operating at adjacent flight levels along the same route. The calculation of Py (0) for the SMR 2024 takes the following factors into account:

a. The MIDRMA has continued to compute the probability of lateral overlap, Py(0), across the entire MID-RVSM airspace, following the ICAO-approved methodology specifically developed for this purpose and implemented through the MID Risk Analysis Software (MIDRAS AI).

b. The MIDRMA has calculated Py (0) for each MIDRMA Member State, confirming that all obtained results are valid.

1- Bahrain FIR
Passing Frequency (n_equiv): 4.587E-003
Probability of Lateral Overlap (Py(0)): 0.17037

2- Cairo FIR
Passing Frequency (n_equiv): 1.845E-001
Probability of Lateral Overlap (Py(0)): 0.15494

3- Baghdad FIR
Passing Frequency (n_equiv): 2.6901E-002
Probability of Lateral Overlap (Py(0)): 0.1808

4- Doha FIR:
Passing Frequency (n_equiv): 0.00000E+000
Probability of Lateral Overlap (Py(0)): 0.14204

5- Tehran FIR
Passing Frequency (n_equiv): 6.227E-002
Probability of Lateral Overlap (Py(0)): 0.15166

6- Amman FIR
Passing Frequency (n_equiv): 5.543E-002
Probability of Lateral Overlap (Py(0)): 0.14094

7- Muscat FIR
Passing Frequency (n_equiv): 3.835E-001
Probability of Lateral Overlap (Py(0)): 0.16865

8- Jeddah FIR
Passing Frequency (n_equiv): 3.58701E-002
Probability of Lateral Overlap (Py(0)): 0.15286

9- Kuwait FIR
Passing Frequency (n_equiv): 2.090E-002
Probability of Lateral Overlap (Py(0)): 0.18682

10- Damascus FIR
Passing Frequency (n_equiv): 3.884E-001
Probability of Lateral Overlap (Py(0)): 0.12012

11- Emirates FIR
Passing Frequency (n_equiv): 1.845E-002
Probability of Lateral Overlap (Py(0)): 0.16147

12- Sana'a FIR
Passing Frequency (n_equiv): 1.981E-001
Probability of Lateral Overlap (Py(0)): 0.1788

13- Tripoli FIR
Passing Frequency (n_equiv): 6.830E-002

Probability of Lateral Overlap (Py(0)): 0.13073

14- Beirut FIR

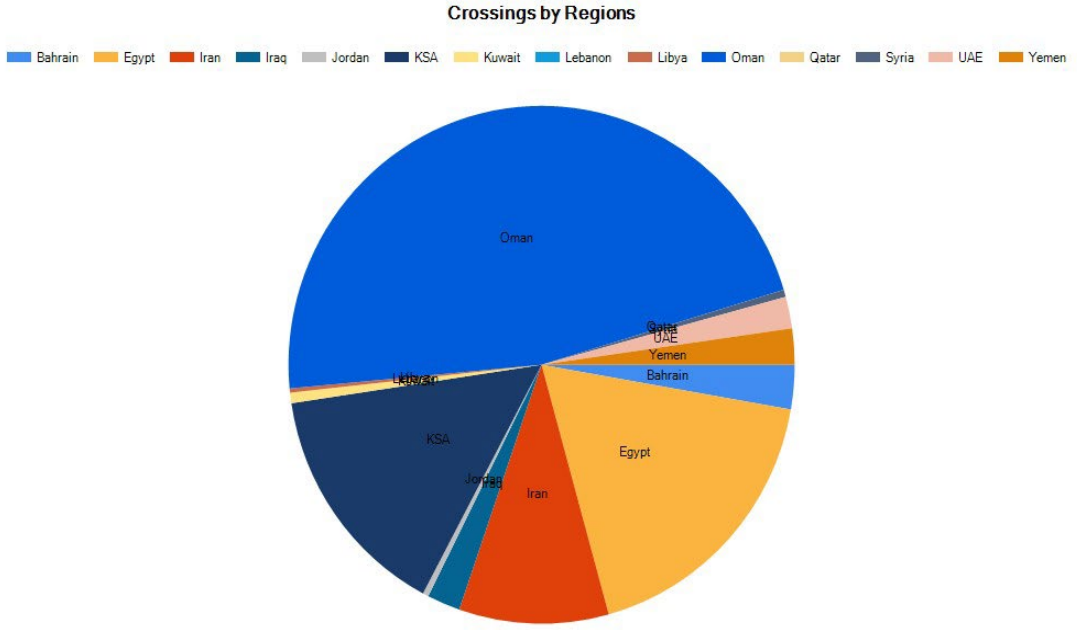
Passing Frequency (n_equiv): 0.00000E+000

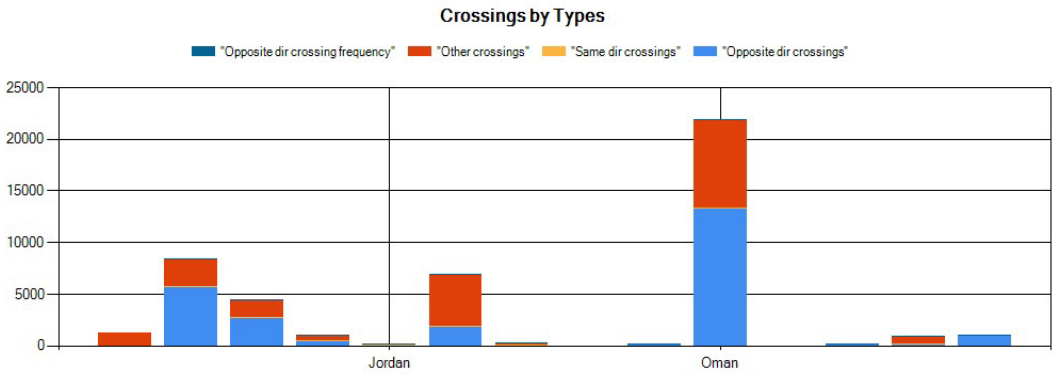
Probability of Lateral Overlap (Py(0)): 0.11332

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

Average Passing Frequency: 1.177E-001

Note: MIDRMA's analysis has determined that Muscat FIR remains the most complex and congested FIR in the ICAO Middle East RVSM airspace. Although it faces significant complexity and high traffic levels, there has been no noticeable rise in risk values. This finding continues to hold true for the year 2024 as well.





2.4.7 Pz(1000) Compliance

2.4.7.1 The Pz(1000) represents the likelihood of two aircraft at adjacent RVSM flight levels losing vertical separation due to technical height-keeping errors. Based on the observed Altimetry System Errors (ASE) and typical Aircraft Altimetry Data (AAD), the estimated probability of vertical overlap Pz(1000) is calculated to be **1.819×10^{-9}**.

2.4.7.2 This result complies with the Global System Performance Specification, which states that the probability of losing the 1000ft procedural vertical separation between two aircraft must not exceed **1.7×10^{-8}**.

2.4.7.3 MIDRMA continues distributing the Minimum Monitoring Requirements (MMRs) using its automated MMR software. This software is designed to provide member states with updated monitoring requirements based on the most recent RVSM approvals. The MMR table, effective from 01st March 2025, is included in Attachment D of the SMR.

Note: All member states must review and adhere to their MMRs, which are accessible on the MIDRMA website (www.midrma.com).

2.4.8 RVSM Height Monitoring Activities

2.4.8.1 Height Monitoring of GACA, Saudi Arabia RVSM Approved Aircraft

2.4.8.1.2 The GACA in Saudi Arabia is very active in tracking the validity of all their RVSM-approved aircraft (a total of 360 RVSM-approved aircraft as of 06th March 2025). This requires continuous follow-up and direct instructions to all operators to perform the necessary checks within a specified time frame and before the RVSM approvals expire. If not, the approval to operate in RVSM airspace will be withdrawn. The MIDRMA extends its deep gratitude and appreciation to the responsible Airworthiness Inspector in KSA GACA for his excellent cooperation and continuous support.

2.4.8.1.2 More than 17 RVSM-approved aircraft registered by GACA, Saudi Arabia, have been checked by MIDRMA EGMUs in 2024. The Airworthiness Inspector is working with MIDRMA to complete the checks for the remaining aircraft to ensure full compliance with RVSM height monitoring.

2.4.8.2 Height Monitoring Missions of Iraq RVSM-Approved Aircraft

2.4.8.2.1 The Iraq CAA Flight Safety Department is one of the best in the MID region at keeping their approval list fully compliant with height monitoring. They are always committed to height monitoring and ensure that none of their approved aircraft operate without confirming their ASEs are within the allowable limits. The MIDRMA would like to thank the responsible ICAA Airworthiness Inspectors for their excellent cooperation and follow-up.

2.4.8.2.2 MIDRMA checked **17** aircraft in Baghdad under the supervision of the ICAA Flight Safety Department. Only **two** aircraft remain to be checked. The Airworthiness Inspector is working with MIDRMA to complete these checks and ensure full compliance with RVSM height monitoring.

2.4.8.3 Height Monitoring to Check Libya CAA RVSM Approved Aircraft

2.4.8.3.1 MIDRMA completed RVSM height monitoring for 23 aircraft registered by the Libyan

CAA in one mission to Tripoli. This was done professionally and smoothly with the support of the Libya CAA Airworthiness Section and the Libyan Wing operator. As of September 2024, the Libyan MMR fully complies with RVSM height monitoring. *(Two aircraft have been removed from the Libyan RVSM approval list because they were under maintenance).*

2.4.8.4 Height Monitoring Missions to Check **IRAN** CAA RVSM Approved Aircraft

2.4.8.4.1 MIDRMA requested the FAA to renew the OFAC License for monitoring Iranian aircraft in October 2021. After more than two years, the license was received on July 23, 2024, and is valid until July 22, 2026. The long wait and many requests have increased the number of non-RVSM compliant aircraft, affecting the safety of RVSM airspace in the Middle East and other regions since Iranian aircraft fly over many areas.

2.4.8.4.2 It's time to cancel the requirement for the OFAC license and use the EGMU equipment/software like the other MIDRMA Member States because this issue concerns RVSM airspace safety.

2.4.8.4.3 So far, MIDRMA has completed RVSM height monitoring for **70** aircraft registered by IRAN CAA in two missions to Tehran. This was done professionally and smoothly by FARSCO and supervised by the IRAN CAA. About **40** more aircraft need to be checked for IRAN CAA to be fully compliant with RVSM height monitoring. The plan is to cover these remaining aircraft in one monitoring mission next month.

2.4.9 ADSB Height Monitoring System (AHMS)

2.4.9.1 The implementation of the ADS-B Height Monitoring System (AHMS) in the ICAO Middle East region marks a transformative advancement in ensuring the safety, compliance, and efficiency of Reduced Vertical Separation Minimum (RVSM) operations. By leveraging Automatic Dependent Surveillance-Broadcast (ADS-B) technology, AHMS enhances the ability of the Middle East Regional Monitoring Agency (MIDRMA) to conduct large-scale and real-time monitoring of RVSM-approved aircraft, providing a significant improvement over traditional height monitoring methods. The system enables continuous surveillance and more accurate detection of Altimetry System Errors (ASE), ultimately strengthening RVSM safety oversight.

2.4.9.2 Enhanced Monitoring and Compliance

2.4.9.2.1 The widespread adoption of ADS-B technology across the aviation industry has allowed MIDRMA to expand its monitoring capabilities beyond conventional ground-based height monitoring stations and airborne GPS-based methods. ADS-B facilitates continuous, real-time data collection, allowing for a comprehensive assessment of aircraft altimetry system performance and RVSM compliance. By implementing AHMS, MIDRMA aligns its operations with ICAO Annex 6, Part I, ensuring regulatory compliance while optimizing air traffic management (ATM) processes.

2.4.9.3 Training and Capacity Building

2.4.9.3.1 Recognizing the technical expertise required for ADS-B data processing and analysis, MIDRMA has undertaken training programs to build capacity within its team. These training initiatives have focused on:

a. Data processing and analysis: Extracting, handling, and interpreting ADS-B data for RVSM height monitoring.
b. System architecture and integration: Understanding ADS-B system functionalities to enhance data utilization.
c. Data accuracy and verification: Implementing quality assurance protocols to ensure compliance with ICAO standards.

These efforts have significantly strengthened MIDRMA's ability to conduct RVSM monitoring efficiently and accurately.

2.4.9.4 Experimental Monitoring and Data Analysis

2.4.9.4.1 Following the completion of training programs, MIDRMA conducted extensive studies using archived ADS-B data, particularly from Bahrain's ADS-B data repository. However, it is important to note that we do not yet have the software to process the archived ADS-B data, as we are still waiting to receive it from the developers at AAMA and the FAA. Consequently, all the studies conducted thus far have been carried out with assistance from MAAR. The findings from these experimental monitoring exercises validated the effectiveness of ADS-B technology in detecting ASE in RVSM-approved aircraft. Key insights from these studies include:

b. Reliable ASE Detection: ADS-B consistently provided accurate data, enabling precise identification of altimetry system discrepancies.

a. Real-Time Data Utilization: Continuous monitoring allowed for proactive identification and mitigation of RVSM compliance issues.

These results underscore the capability of ADS-B data to enhance operational efficiency, reduce costs, and improve overall RVSM monitoring processes.

2.4.9.5 Development of Training Manuals

2.4.9.5.1 To standardize the use of ADS-B in RVSM height monitoring, MIDRMA has developed a comprehensive training manual outlining procedures for:

a. Extracting ADS-B data from various sources.
b. Conducting ASE analysis for RVSM compliance.
c. Submitting processed data to MIDRMA's monitoring infrastructure.

2.4.9.5.2 This manual ensures consistency in data handling and enhances the effectiveness of ADS-B-based monitoring across the region.

2.4.9.6 Collaboration with ICAO Member States

2.4.9.6.1 The successful implementation of AHMS requires strong collaboration among ICAO Middle East member states. Access to archived ADS-B data is essential for comprehensive RVSM height monitoring, and MIDRMA urges member states to:

a. Provide archived ADS-B data for aircraft under their jurisdiction.

b. Train engineers to extract and upload ADS-B data per MIDRMA's requirements.
c. Ensure the regular submission of ADS-B data to support ongoing RVSM monitoring.

2.4.9.6.2 By fostering regional cooperation, AHMS will enhance the safety, efficiency, and reliability of RVSM operations, ensuring continuous improvements in airspace safety across the Middle East.

Note: The Middle East Regional Monitoring Agency has officially requested the developers of the software used for processing and analyzing ADS-B data which is NARMO - FAA to grant approval for its handover. This step is crucial for the full-scale implementation of the ADS-B Height Monitoring System (AHMS) in the Middle East region. All concerned stakeholders eagerly anticipating the operationalization of this advanced monitoring method are assured that MIDRMA remains committed to expediting this process. Once the official approval is received, MIDRMA will proceed with the system's deployment, further enhancing RVSM safety and compliance in the region.

2.4.10 Conclusions on Technical Vertical Collision Risk:

a. The assessed vertical collision risk resulting from technical height-keeping performance remains within the ICAO Target Level of Safety (TLS).

b. The estimated probability of vertical overlap, Pz(1000), continues to comply with global system performance requirements.

c. Most monitoring groups are adhering to the ICAO Technical Vertical Error (TVE) component standards, also referred to as technical height-keeping group criteria.

2.4.11 Recommendations for Safety Objective 1:

a. The MIDRMA shall persist in reviewing and refining the classification and structure of aircraft monitoring groups as part of its ongoing efforts.

b. The MIDRMA will continuously oversee the methodologies used to compute technical Collision Risk Model (CRM) parameters and the risk linked to technical height-keeping errors. It will also update all parameters and datasets utilized in the MID Risk Analysis Software (MIDRAS AI), including those relevant to the newly

established Doha FIR.

Note: The newly upgraded MIDRAS AI is fully operational and actively utilized by the MIDRMA for risk analysis.

c. The MIDRMA shall continue conducting systematic height-monitoring surveys and investigations on aircraft operating within the MID-RVSM airspace, gathering TDS data from member states that voluntarily submit their RVSM TDS reports monthly.

d. More MIDRMA member states beyond Bahrain, Iraq, and the UAE are encouraged to provide their monthly RVSM traffic data to facilitate the identification of additional potential violations within the MID-RVSM airspace.

e. The MIDRMA should explore the feasibility of implementing enhanced data-sharing mechanisms with member states to improve the accuracy and efficiency of receiving TDS.

2.5 Assessment of the Overall Risk

2.5.1 RVSM Safety Objective 2

The overall risk of collision due to all causes, which includes the technical risk and all risks 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.

2.5.2 The value computed for the overall risk is estimated at **6.6399×10^{-10}**, below the ICAO overall TLS.

2.5.3 Large Height Deviation Reports (LHDs) 2024

2.5.3.1 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 operational risk assessment is based on the event magnitude and duration analysis derived from operational incident reports, which are then transformed into Large Height Deviation (LHD) reports.

2.5.3.2 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 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 from January 1 to December 31st, 2024.

MID FIRs	No. of Reported LHDs	No. of Related LHDs
Bahrain	26	18
Baghdad	17	1
Amman	-	1
Tehran	-	5
Beirut	-	-
Cairo	12	14
Damascus	-	11
Khartoum	-	-
Kuwait	-	14
Doha	**23**	1
Muscat	**136**	61
Jeddah/ Riyadh	**23**	**143**
Tripoli	-	1
Emirates	-	7
Sana'a	**358**	17

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

2.5.3.3 **Critical Observations on LHD Reporting Gaps and Their Impact on Safety Assessments:**

a. **Member States Failing to Report LHDs**:
As shown in the table in section 2.5.3.2, 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 during 2024, especially from Category E. This may be attributed to the fact that Emirates ACC is connected via OLDI with most of its neighboring FIRs, significantly reducing coordination failures and ensuring a smoother traffic flow to and from Emirates FIR. However, while this connectivity has likely minimized Category E occurrences, it is important to note that none of the other critical LHD categories have been reported by Emirates ATC

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

The absence or very low reporting of Large Height Deviations (LHDs) severely impacts RVSM operations by undermining the reliability of safety assessments and risk evaluations. Without sufficient LHD data, particularly for critical events such as loss of separation and TCAS resolution advisories, the accuracy of overall risk calculations is compromised. This lack of comprehensive reporting weakens confidence in the risk assessment process, potentially leading to an underestimation of actual safety threats within RVSM airspace.

c. **Nature of Reported LHDs**:
The vast majority of LHD reports received during 2024 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.

2.5.3.4 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 were validated for the whole SMR 2024 reporting cycle:

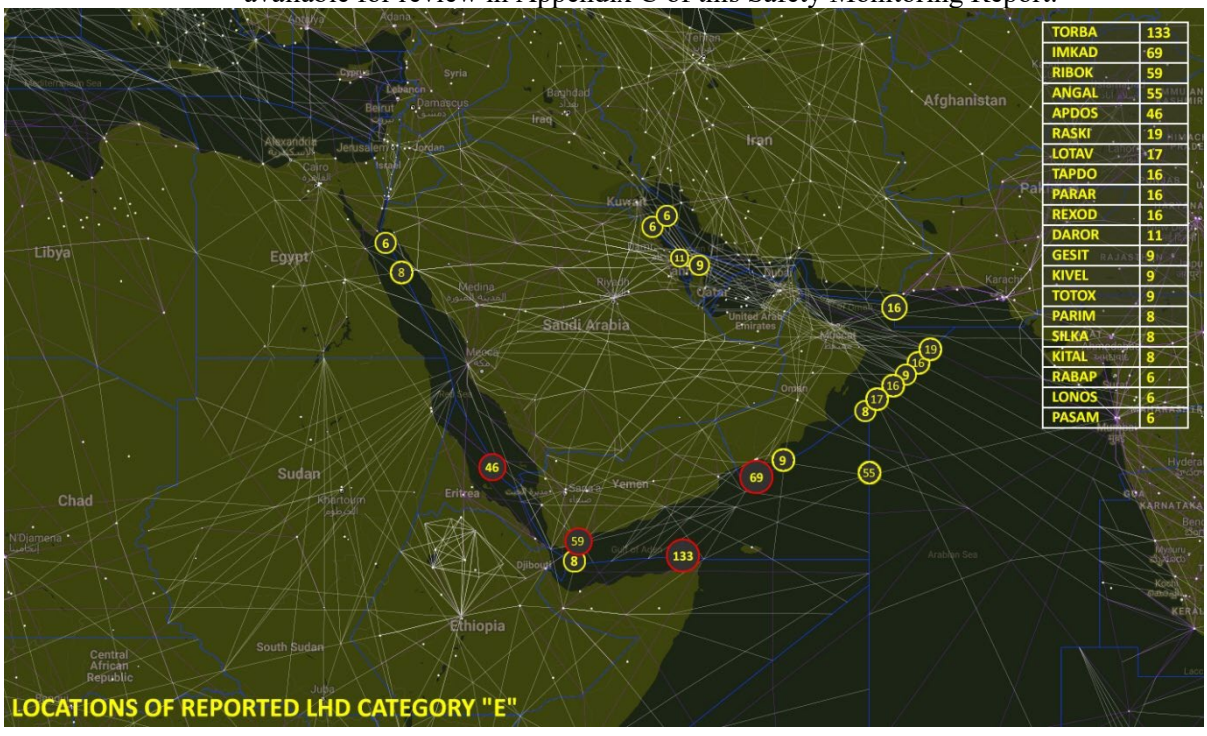
LHD Cat.	Large Height Deviation (LHD) Categories	No. of LHDs	LHD Duration (Sec.)
A	The flight crew fails to climb or descend the aircraft as cleared.	-	-
B	Flight crew climbing or descending without ATC clearance.	-	-
C	Incorrect operation or interpretation of airborne equipment	-	-

D	ATC system loop error	-	-
E	ATC transfer of control coordination errors due to human factors	**4**	**450**
F	ATC transfer of control coordination errors due to technical issues	-	-
G	Aircraft contingency leading to a 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	**5**	**480**

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

Note 1: For the first time ever, an RVSM Safety Monitoring Report (SMR) has been issued with such a low number of Large Height Deviation (LHD) reports, raising serious concerns about the accuracy of the overall risk assessments. Particularly alarming is the complete absence of reports for LHD categories that have a severe impact on RVSM operations.

Note 2: The hotspots and the airways occupancy of all MIDRMA member states are available for review in Appendix C of this Safety Monitoring Report.



Locations of Reported LHD Category “E” by all Member States

2.5.3.5 RVSM Safety Protocols

2.5.3.5.1 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:

2.5.3.5.1.1 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

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

2.5.3.5.1.2 Despite the concerted efforts and measures taken since the initiation of the RVSM safety protocol at the eastern boundaries 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 above, the number of reported LHDs has steadily increased, which poses a serious and escalating risk to the RVSM airspace at the Eastern Boundaries of Muscat FIR and the western FIR boundaries of Mumbai FIR.

2.5.3.5.1.3 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.

2.5.3.5.1.4 Oman CAA 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:

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.

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

2.5.3.5.2 RVSM Safety Protocol for Sanaa FIR.

2.5.3.5.2.1 A comparative analysis of Large Height Deviation (LHD) reports between 2023 and 2024 highlights a significant increase in reported deviations, indicating a deterioration in RVSM airspace safety. In 2023, a total of 181 LHD reports were recorded, whereas in 2024, this number surged to 380, more than doubling the previous year's total. The most notable increase was observed in Jeddah, where reports skyrocketed from 35 in 2023 to 116 in 2024. Similarly, Addis Ababa experienced a drastic rise from 22 to 132, and Mumbai increased from 25 to 56. Muscat also saw a notable rise from 44 to 60 reports. This upward trend suggests that, after a period of improvement in 2023, the situation has worsened significantly in 2024. The spike in LHD incidents, particularly in the latter half of 2024, underscores the urgent need for reinforced safety measures, enhanced monitoring, and stricter adherence to RVSM protocols to prevent further degradation of airspace safety.

2.5.3.5.2.2 The two tables below display all the LHD reports filed by Sanaa ACC related to its neighboring ACCs for years 2023 and 2024, indicating a significant increase in the number of reports compared to the year 2023, especially related to Addis Ababa, Jeddah, Muscat, and Mumbai FIRs.

Months	Addis Ababa	Asmara	Djibouti	Jeddah	Mogadishu	Mumbai	Muscat	Total
1-2023	1	0	2	1	0	1	9	14
2-2023	2	1	0	3	0	4	3	13
3-2023	0	1	4	3	0	0	16	24
4-2023	2	2	2	1	0	3	2	12
5-2023	2	2	2	1	0	0	0	7
6-2023	2	5	2	5	0	1	0	15
7-2023	3	10	2	6	0	4	0	25
8-2023	4	3	5	3	0	3	0	18
9-2023	4	1	2	4	0	1	4	16
10-2023	1	3	2	2	0	3	4	15
11-2023	0	2	1	2	0	3	3	11
12-2023	1	1	0	4	0	2	3	11
Total	**22**	**31**	**24**	**35**	**0**	**25**	**44**	**181**

Months 2024	Addis Ababa	Asmara	Djibouti	Jeddah	Mogadishu	Mumbai	Muscat	Total

01-2024	1	0	1	8	0	0	3	**13**
02-2024	1	0	1	3	0	4	2	**11**
03-2024	6	1	1	3	0	5	3	**19**
04-2024	1	1	2	2	0	3	4	**13**
05-2024	5	2	1	1	0	0	0	**9**
06-2024	8	0	3	3	0	2	6	**22**
07-2024	39	0	0	3	0	2	8	**52**
08-2024	29	0	1	6	0	11	7	**54**
09-2024	17	1	0	4	0	10	3	**35**
10-2024	8	1	0	5	0	5	6	**25**
11-2024	7	0	0	63	0	7	7	**84**
12-2024	10	0	0	15	0	7	11	**43**
Total	132	6	10	116	0	56	60	**380**

2.5.4 RVSM Approvals

2.5.4.1 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.

2.5.4.2 The tables in Appendix B of this SMR 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.

2.5.4.3 Assessment of Non-RVSM Approved Aircraft 2024

2.5.4.3.1 The MIDRMA continues to conduct comprehensive evaluations of all RVSM-approved aircraft operating within the ICAO Middle East Region's RVSM airspace to ensure they hold the necessary State approvals. This monitoring serves as a critical safety measure, enabling the identification of non-compliant aircraft and the mitigation of risks associated with unauthorized operations in RVSM-designated airspace.

2.5.4.3.2 Ongoing Compliance Monitoring Efforts:

While continuous, real-time compliance monitoring across the entire Middle East RVSM airspace would be the ideal approach, challenges in acquiring complete traffic data make this unfeasible. To align with ICAO Doc 9937 requirements, RMAs must conduct a comprehensive compliance assessment covering a minimum period of 30 days each year; this required assessment is carried out

during the annual submission of the RVSM Traffic Data Sample (TDS) by all member states.

2.5.4.3.2 Data Collection and Collaboration:

To facilitate the identification of non-RVSM-approved aircraft, MIDRMA primarily relies on RVSM traffic data collected on a monthly basis from Bahrain, Baghdad, and Emirates FIRs. This reliance is due to the ongoing challenge of obtaining consistent traffic data from all Member States. In this context, MIDRMA acknowledges and deeply appreciates the continued commitment of the Bahrain Civil Aviation Authority, the Iraq Civil Aviation Authority, and the UAE General Civil Aviation Authority. Their consistent submission of comprehensive, properly formatted RVSM traffic data plays a crucial role in ensuring effective assessment.

2.5.4.3.3 Proactive Measures for Non-Compliant Aircraft:

The tables in Attachment B of the SMR provide an overview of the MIDRMA's findings regarding non-RVSM approved aircraft operating within both the ICAO Middle East RVSM airspace and that of other RMAs. Based on this analysis, it is imperative that States exercise proactive oversight to address any approval deficiencies in a timely manner. By ensuring that only authorized aircraft enter RVSM-designated airspace, States can prevent operational disruptions and unnecessary regulatory actions against legitimate operators. Additionally, States detecting unauthorized operations within their airspace are encouraged to take appropriate corrective measures to uphold compliance and enhance airspace safety.

2.6 Safety Objective 3

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

2.6.1 Recommendations for Safety Objective 3

1. Strengthening Monthly Traffic Data Submissions:

   Member States with the capability to submit their RVSM traffic data every month are strongly urged to do so. Consistent data submission allows MIDRMA to conduct detailed trend analysis, detect potential violations of RVSM airspace by non-approved aircraft, and assess monthly risk values to identify emerging threats before they escalate.

2. Expanding ADS-B Data Utilization:

   Member States utilizing ADS-B for surveillance are encouraged to share their archived ADS-B data with MIDRMA. This will support ongoing RVSM height monitoring trials and contribute to the refinement of monitoring methodologies. Particular emphasis should be placed on incorporating data from aircraft equipped with ADS-B Out operating within RVSM airspace to enhance real-time monitoring accuracy.

3. Advancing Large Height Deviation (LHD) Reporting Mechanism

To address discrepancies and enhance LHD reporting, MIDRMA should work with regional ATC units to establish standardized reporting formats and training programs. Encouraging timely and accurate LHD submissions will improve data reliability and facilitate proactive intervention measures.

4. Conducting Targeted RVSM Safety Workshops and Training Programs:

Building on the success of previous RVSM seminars, MIDRMA shall coordinate and facilitate additional workshops focused on ATC procedures, pilot awareness, and airworthiness compliance. These initiatives will enhance the understanding of RVSM regulations and foster improved collaboration among stakeholders.

Note: MIDRMA invites any Member State interested in hosting an RVSM safety seminar to coordinate with the ICAO MID Office and MIDRMA for planning and execution.

5. Implementing a Data-Driven Predictive Risk Assessment Model:

MIDRMA should explore advanced analytics, including artificial intelligence and machine learning, to enhance predictive risk assessments. By integrating real-time operational data, this model can help forecast potential risk-bearing situations, allowing for preemptive corrective actions.

6. Encouraging Regional Collaboration for Cross-Border Safety Monitoring:

To ensure seamless RVSM operations across FIR boundaries, Member States should strengthen data-sharing agreements with neighboring regions. Enhanced coordination with adjacent Regional Monitoring Agencies (RMAs) will improve oversight of RVSM compliance and prevent cross-border operational inconsistencies.

2.6.2 Conclusions of Achieving Safety Objective 3

1. Refined Risk Management and Proactive Mitigation:

Through continuous improvements in data collection, analysis, and real-time surveillance, MIDRMA has strengthened its ability to identify, assess, and mitigate potential RVSM safety risks. The integration of advanced monitoring techniques further ensures the proactive management of airspace safety.

2. Enhanced Transparency and Reporting Culture:

The establishment of more robust reporting mechanisms, including improved LHD submissions and ADS-B data utilization, has led to greater transparency in safety-related matters. This fosters a collaborative safety culture and enables timely interventions to mitigate risks.

3. Sustained Compliance with ICAO Safety Standards:

   The verification of compliance with ICAO RVSM regulations across the MID Region demonstrates that necessary procedural and technical safeguards are in place. The ongoing refinement of monitoring methodologies ensures long-term adherence to RVSM requirements.

4. Greater Stakeholder Involvement in Safety Enhancement Efforts:

   Increased participation in RVSM safety workshops and training programs has fostered stronger engagement from air traffic controllers, airline operators, and regulatory authorities. This collective commitment to RVSM safety enhances the region's ability to stay continuously aware of and aligned with RVSM requirements.

5. Leveraging Technological Innovations for Future Safety Improvements:

   By embracing emerging technologies, including predictive analytics and enhanced real-time data-sharing mechanisms, MIDRMA is well-positioned to address future challenges in RVSM operations. The continued evolution of risk assessment methodologies ensures that safety levels remain stable or improve over time.

6. MIDRMA's continuous monitoring and trend analysis have concluded that, barring any unforeseen geopolitical disturbances, RVSM safety in the MID region is projected to remain stable over the next three years. This proactive approach underscores MIDRMA’s commitment to maintaining long-term operational safety and compliance.

Note: Based on recent evaluations, MIDRMA has concluded that no significant findings or concerns are expected at least for the next three years. However, unforeseen events, such as political conflicts or regional unrest, could introduce unexpected risks requiring reassessment and mitigation strategies.

By implementing these recommendations and demonstrating these positive safety outcomes, Safety Objective 3 has been achieved, ensuring that RVSM operations in the Middle East region remain safe, secure, and aligned with global aviation safety standards.

Appendix A

LHD Reports Submitted by Muscat related to Mumbai

#	ID	Date of Occ	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 Coordination	**E**

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**
75	12021	01-09-2024	Muscat	Mumbai	KITAL	Revised FL Not Coordinated	**E**
75	12022	01-09-2024	Muscat	Mumbai	KUTVI	Revised FL Not Coordinated	**E**
75	12023	02-09-2024	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	**E**
75	12024	02-09-2024	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	**E**
75	12025	05-09-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	**E**
75	12026	05-09-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	**E**
75	12027	05-09-2024	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	**E**
75	12028	14-09-2024	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	**E**
75	12029	18-09-2024	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	**E**
75	12030	19-09-2024	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	**E**
75	12031	20-09-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	**E**
75	12032	20-09-2024	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	**E**
75	12033	21-09-2024	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	**E**
75	12048	21-08-2024	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	**E**
75	12049	21-09-2024	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	**E**
75	12050	22-09-2024	Muscat	Mumbai	KITAL	Revised FL Not Coordinated	**E**
75	12051	24-09-2024	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	**E**
75	12052	25-09-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	**E**
75	12053	25-09-2024	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	**E**
75	12054	25-09-2024	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	**E**
75	12299	01-01-2025	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	**E**

LHD Reports related to Mumbai filed by 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 est. time rev.	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 est. time rev.	E
4	LHD002407	7/1/2024	Mumbai	Muscat	TOTOX	No or late est. time rev.	E
5	LHD002408	7/1/2024	Mumbai	Muscat	RASKI	No transfer information	E
6	LHD002409	7/1/2024	Mumbai	Muscat	PARAR	No or late est. time rev.	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 est. time rev.	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	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	E
15	LHD002418	19-1-2024	Mumbai	Muscat	RASKI	No transfer information	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	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	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	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	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	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	E
68	LHD002615	28-5-2024	Mumbai	Muscat	PARAR	No transfer information	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	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	E
76	LHD002649	8/6/2024	Mumbai	Muscat	LOTAV	No transfer information	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	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	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	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	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
99	LHD002897	5/9/2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
100	LHD002898	6/9/2024	Mumbai	Muscat	RASKI	No or late FL revision	E
101	LHD002899	13-9-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
102	LHD002900	14-9-2024	Mumbai	Muscat	KITAL	No or late FL revision	E
103	LHD002901	18-9-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
104	LHD002902	14-9-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
105	LHD002903	19-9-2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
106	LHD002904	20-9-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
107	LHD002905	20-9-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
108	LHD002906	21-9-2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
109	LHD002907	21-9-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
110	LHD002908	22-9-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
111	LHD002909	5/10/2024	Mumbai	Muscat	TOTOX	No or late FL revision	E
112	LHD002910	7/10/2024	Mumbai	Muscat	LOTAV	No or late FL revision	E
113	LHD002911	9/10/2024	Mumbai	Muscat	LOTAV	No transfer information	E
114	LHD002912	9/10/2024	Mumbai	Muscat	KITAL	No or late FL revision	E
115	LHD002913	9/10/2024	Mumbai	Muscat	REXOD	No or late FL revision	E
116	LHD002914	12/10/2024	Mumbai	Muscat	RASKI	No or late FL revision	E
117	LHD002915	15-10-2024	Mumbai	Muscat	RASKI	No or late FL revision	E
118	LHD002917	27-10-2024	Mumbai	Muscat	PARAR	No or late FL revision	E
119	LHD002918	2/11/2024	Mumbai	Muscat	KITAL	No transfer information	E
120	LHD002919	17-11-2024	Mumbai	Muscat	REXOD	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	9/7/2022	LIBYA
2	STALL	CRJ1	11/6/2022	SUDAN

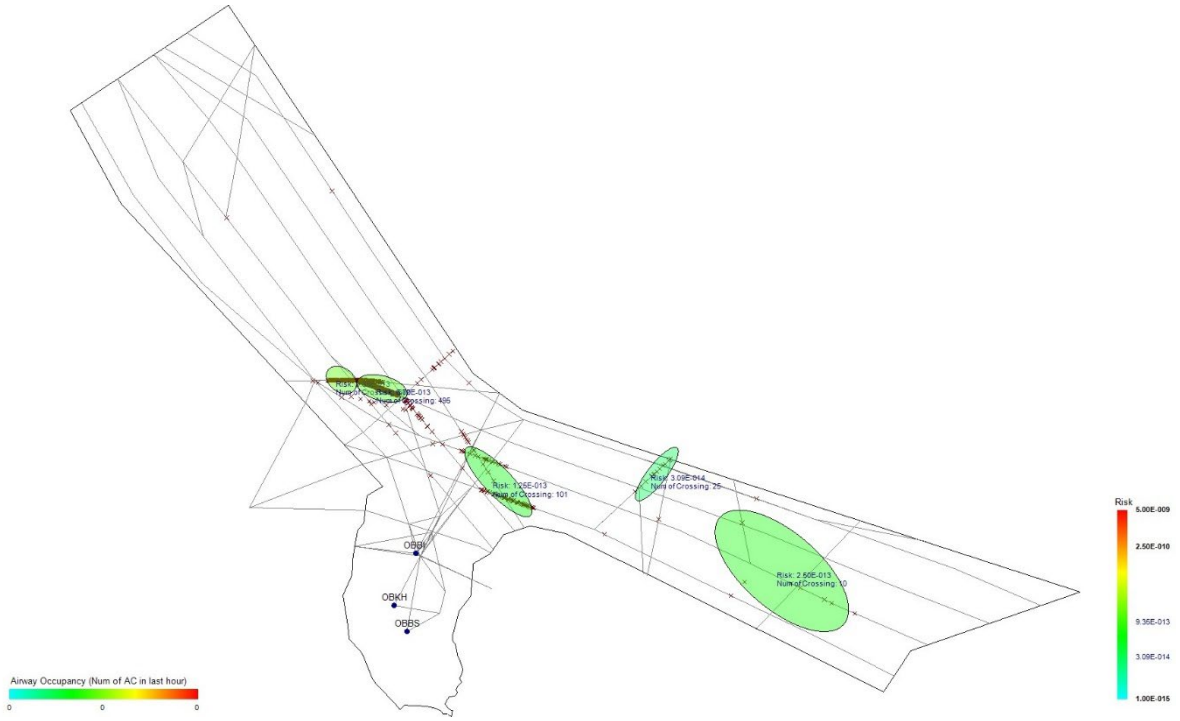
Non-RVSM approved Aircraft – Responsibility of other RMAs

#	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

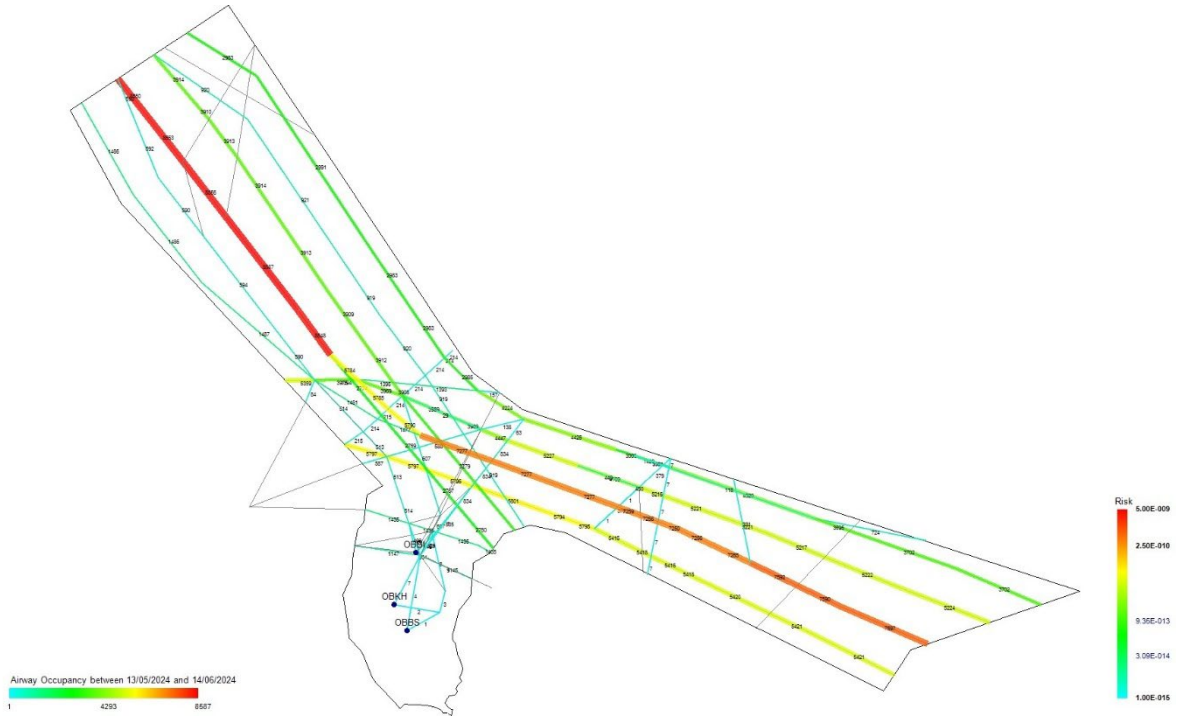
29	5YFAN	CRJ2	15-07-2020	AFIRMA
30	5YWBH	C56X	14-07-2020	AFIRMA
31	ETATF	B350	8/7/2020	AFIRMA
32	ZSCQP	CRJ9	7/7/2020	AFIRMA
33	CCBGV	B789	8/6/2022	CARSAM
34	FAB2857	KC39	22-05-2022	CARSAM
35	21140	IL76	19-06-2022	CHINARMA
36	EW550TH	IL76	4/12/2021	EURRMA
37	ICJSN	C25C	15-05-2023	EURRMA
38	UR11316	AN12	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	N605AS	PC12	11/4/2022	NAARMO
62	N651CV	C650	21-11-2022	NAARMO
63	N685MF	GLF4	8/12/2021	NAARMO
64	N800AJ	CL60	10/2/2023	NAARMO
65	N890DA	GLF5	25-02-2023	NAARMO
66	N981DB	H25B	5/4/2022	NAARMO

Appendix C

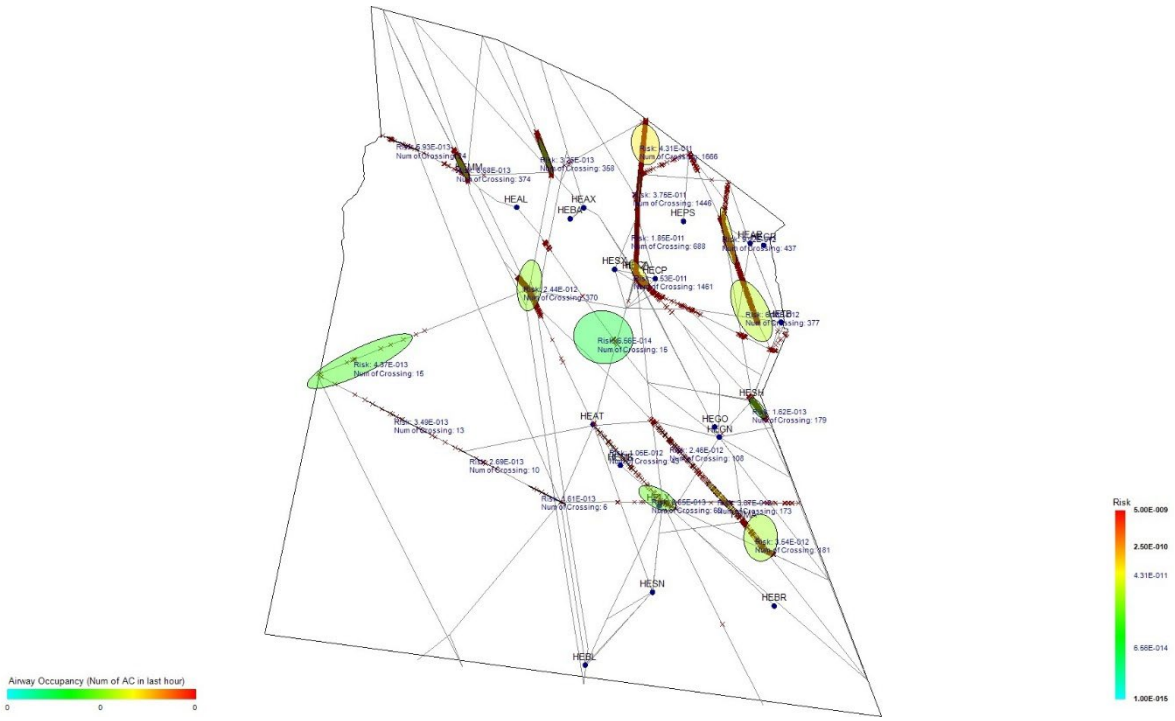
MID FIRs RVSM Airspace Hotspots & AWYs Occupancy



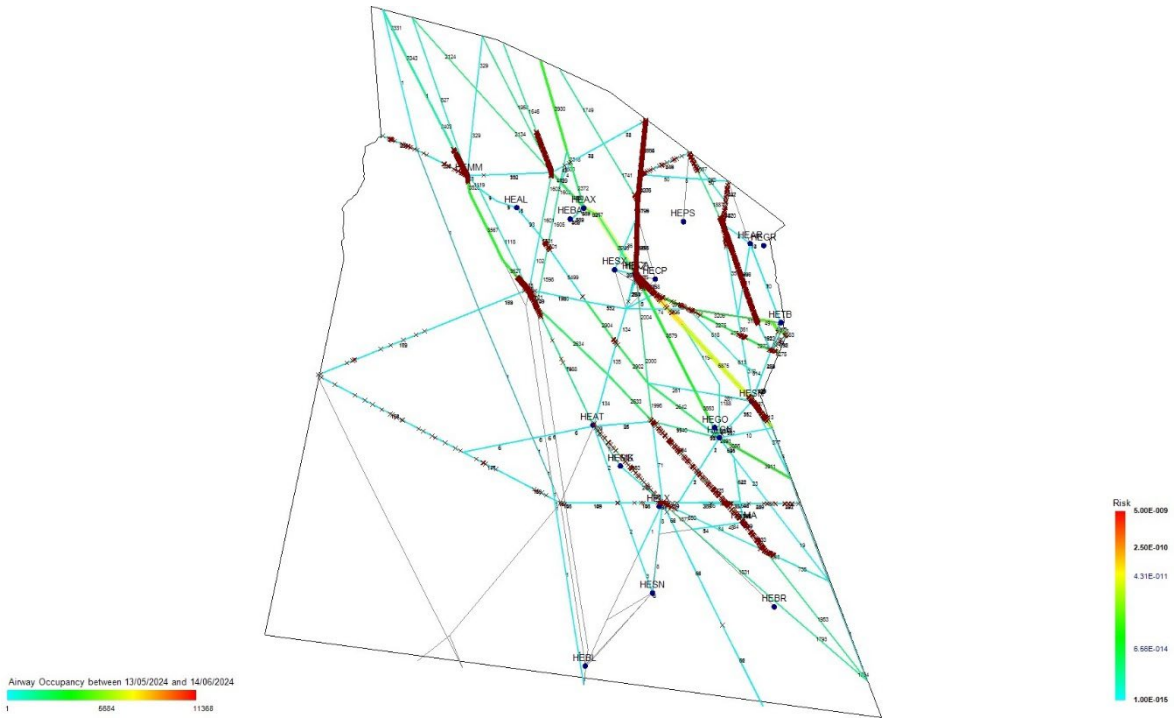
Bahrain FIR Hotspots – SMR 2024



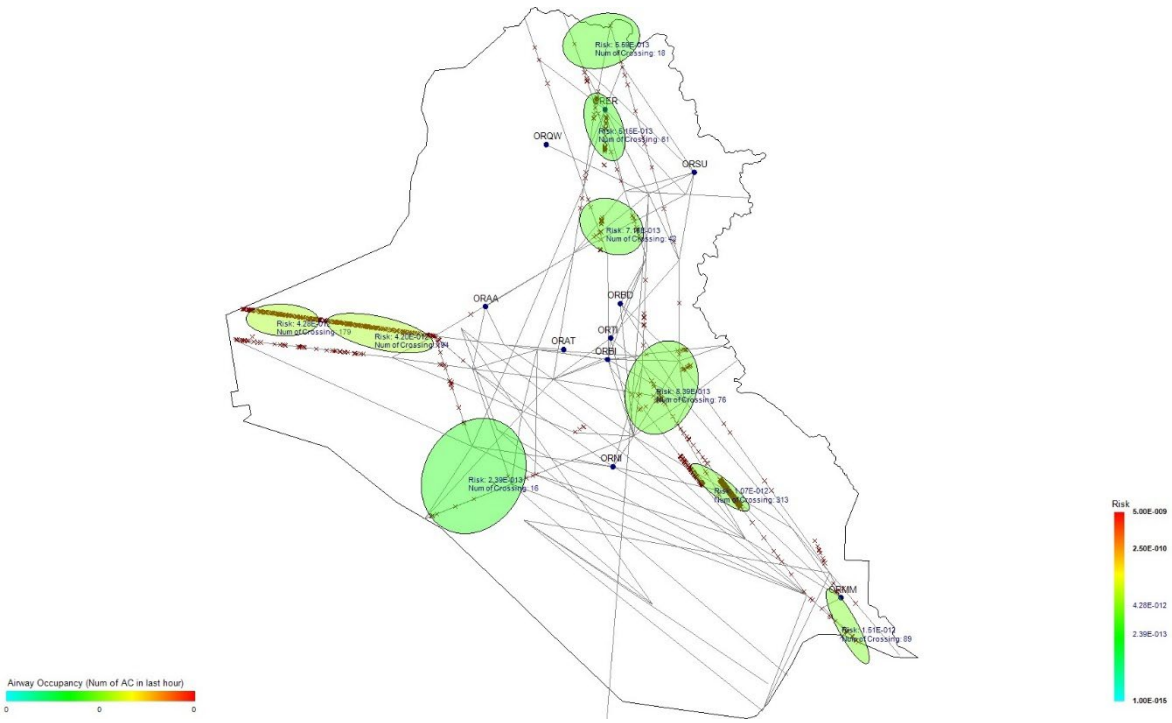
Bahrain FIR AWYs Occupancy – SMR 2024



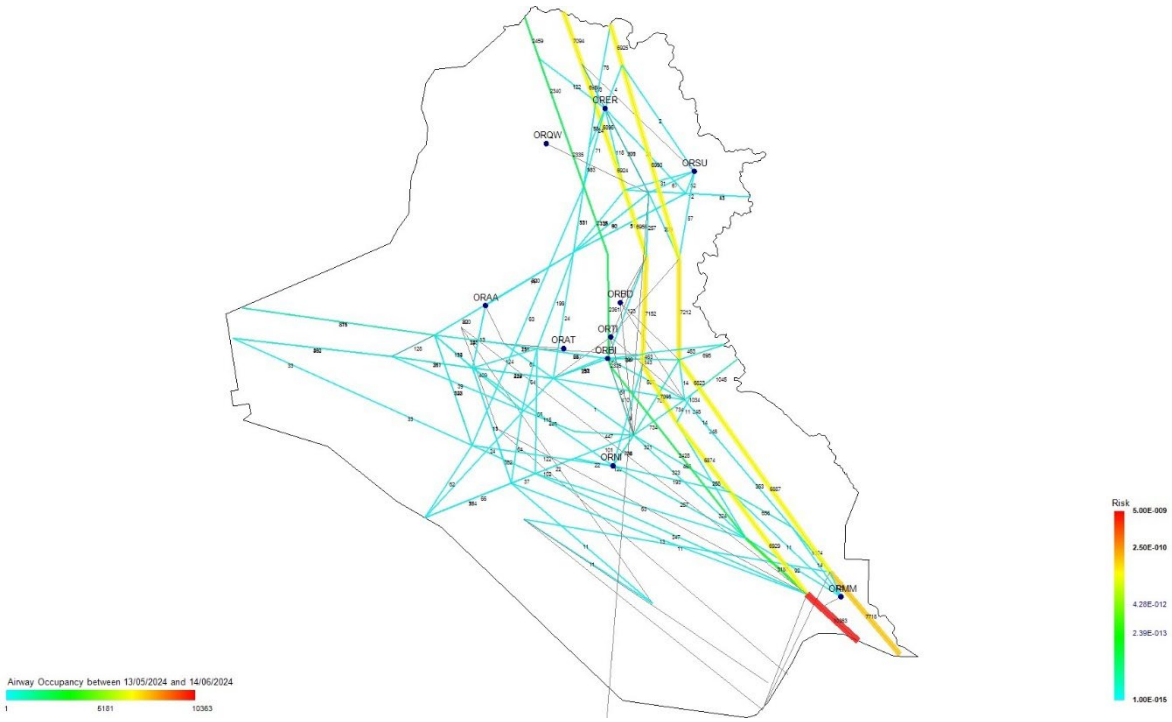
Cairo FIR Hotspots – SMR 2024



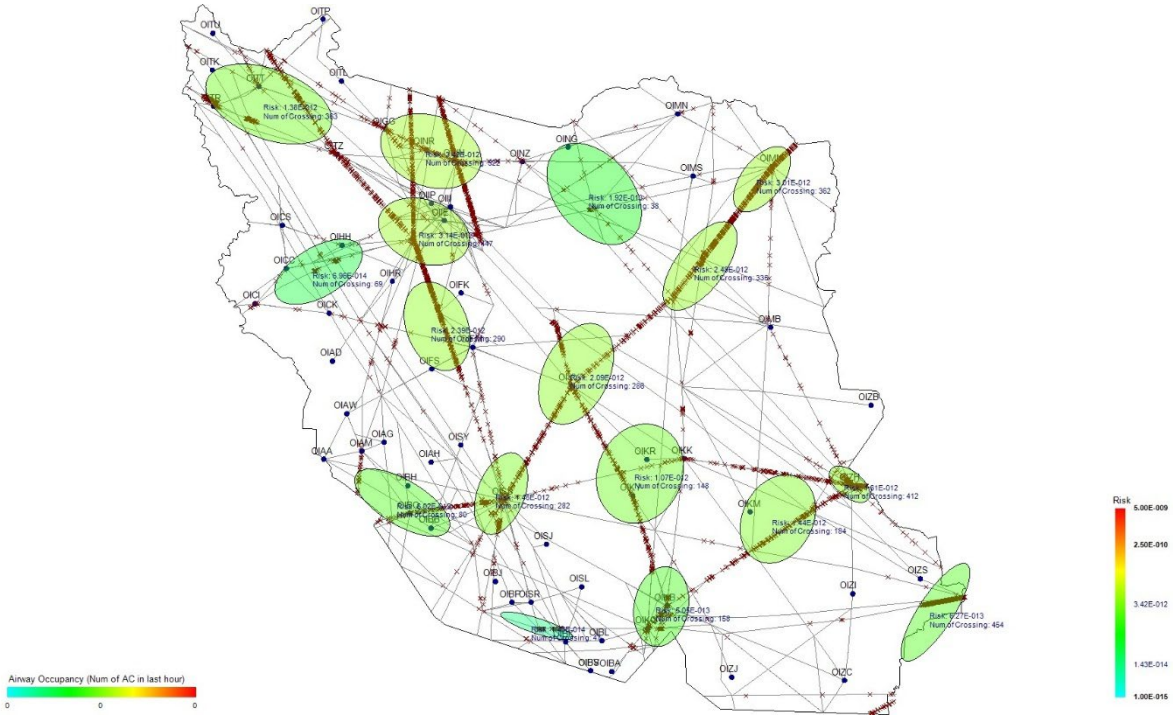
Cairo FIR AWYs Occupancy – SMR 2024



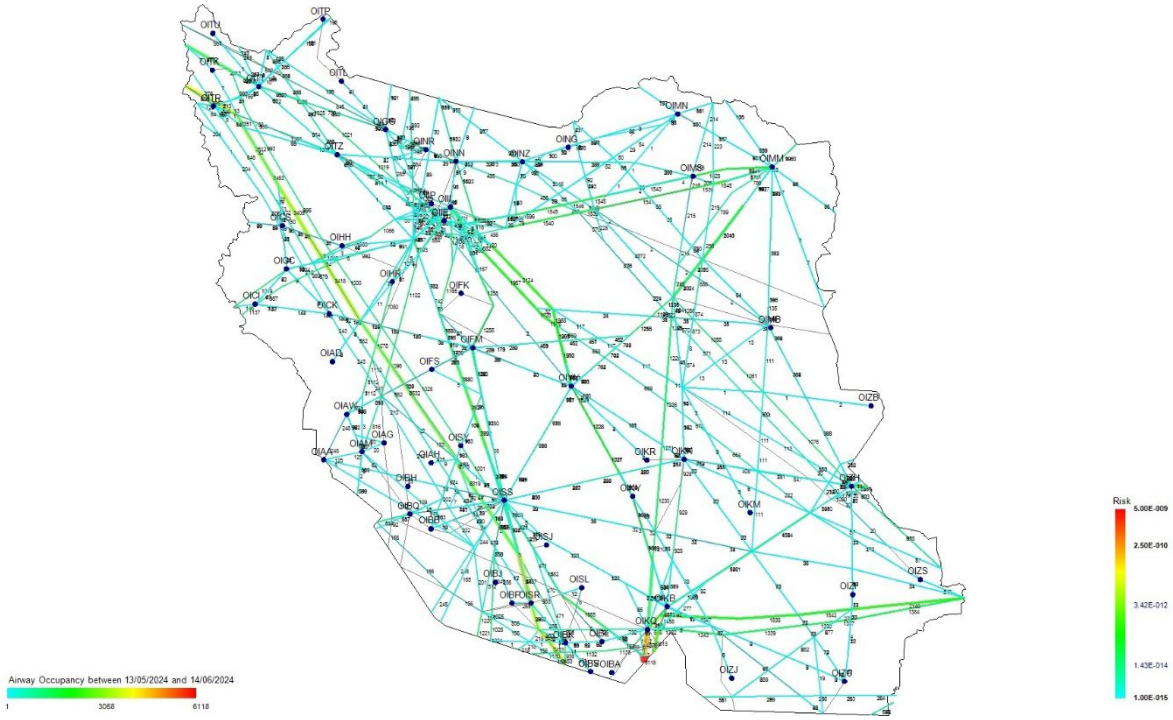
Baghdad FIR Hotspots – SMR 2024



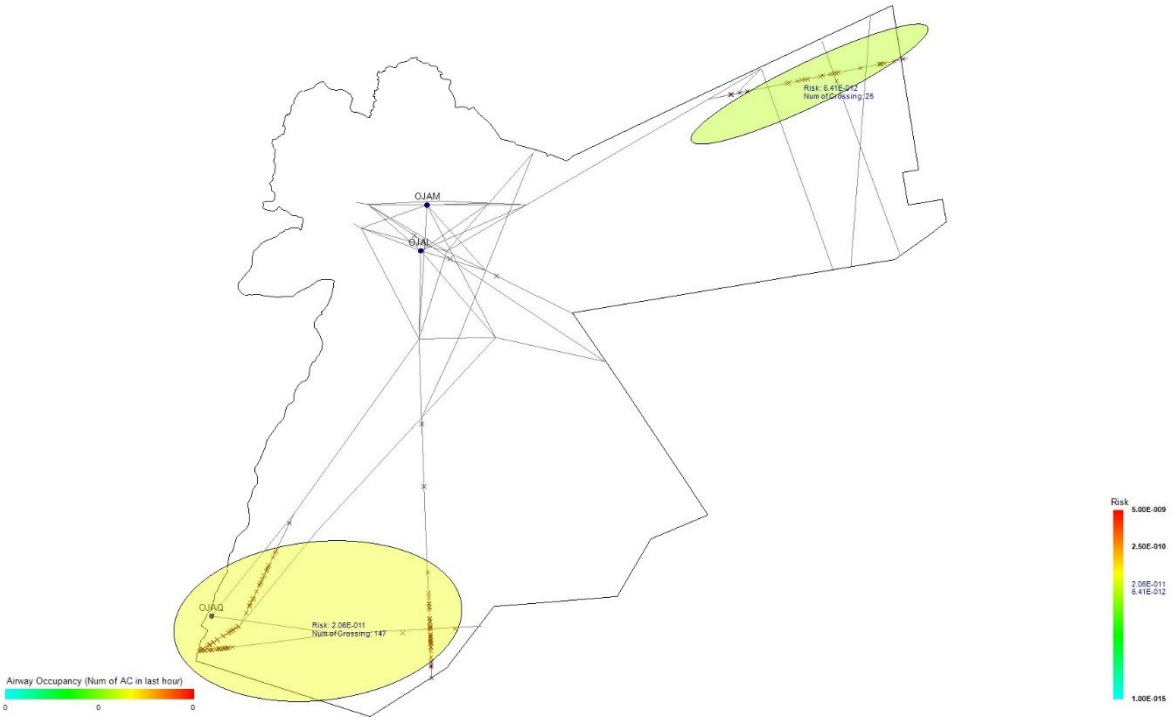
Baghdad FIR AWYs Occupancy – SMR 2024



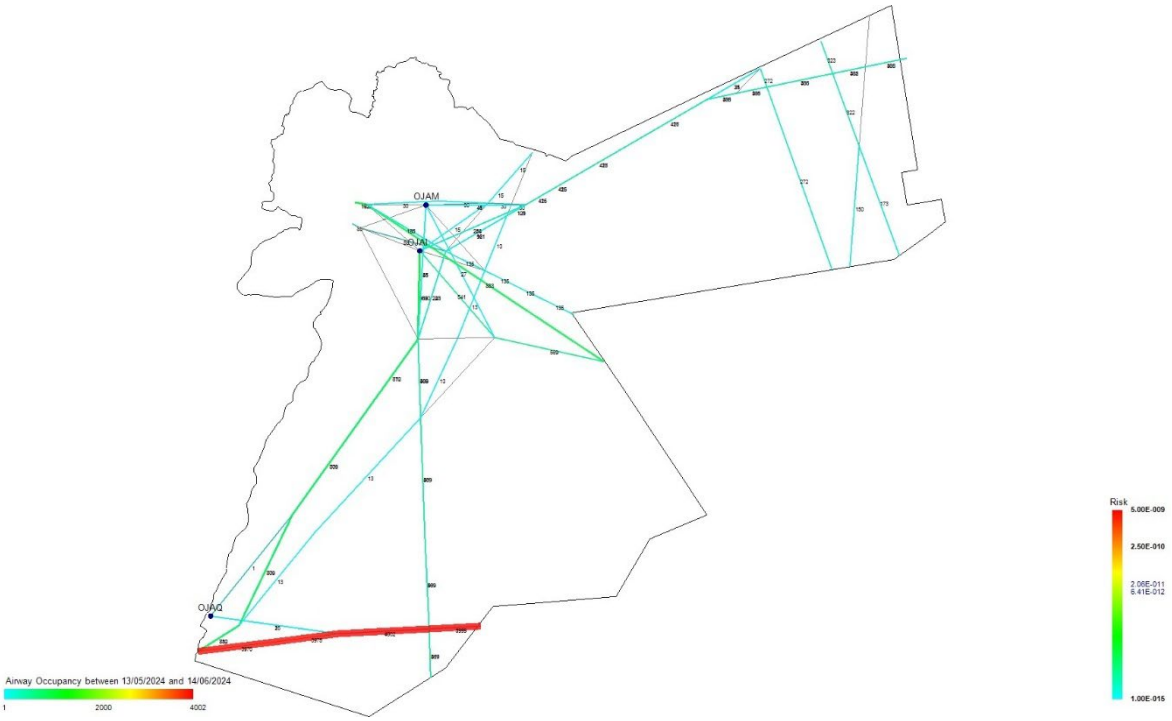
Tehran FIR Hotspots – SMR 2024



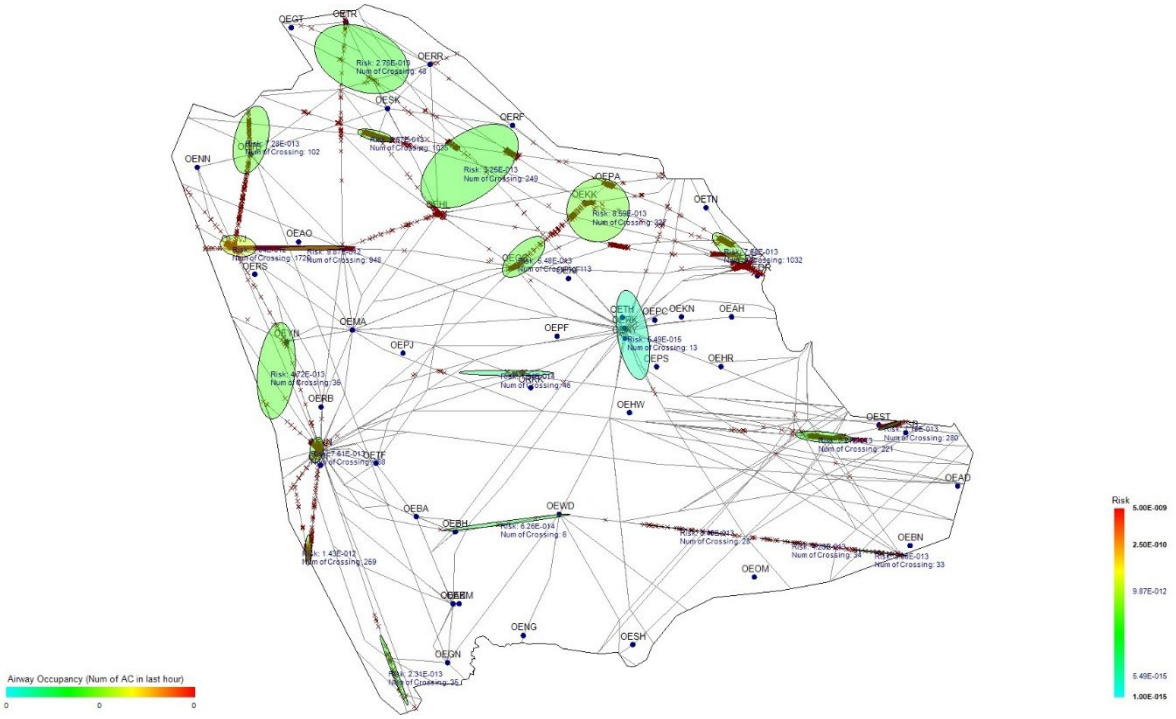
Tehran FIR AWYs Occupancy – SMR 2024



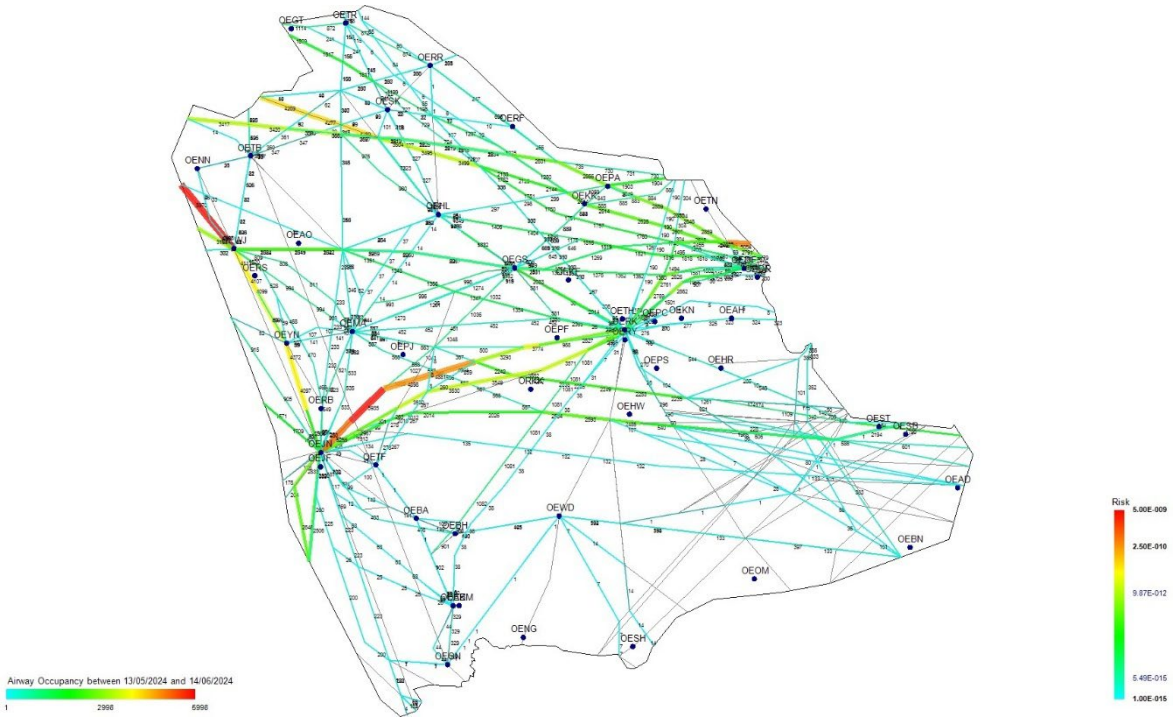
Amman FIR Hotspots – SMR 2024



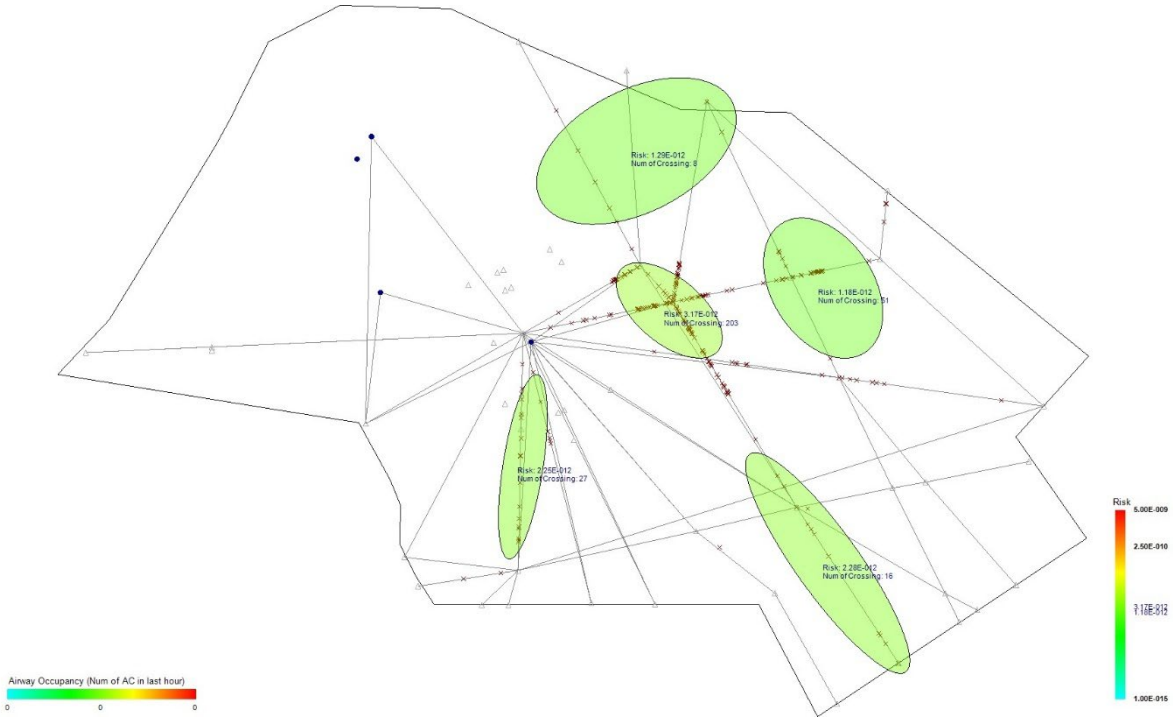
Amman FIR AWYs Occupancy – SMR 2024



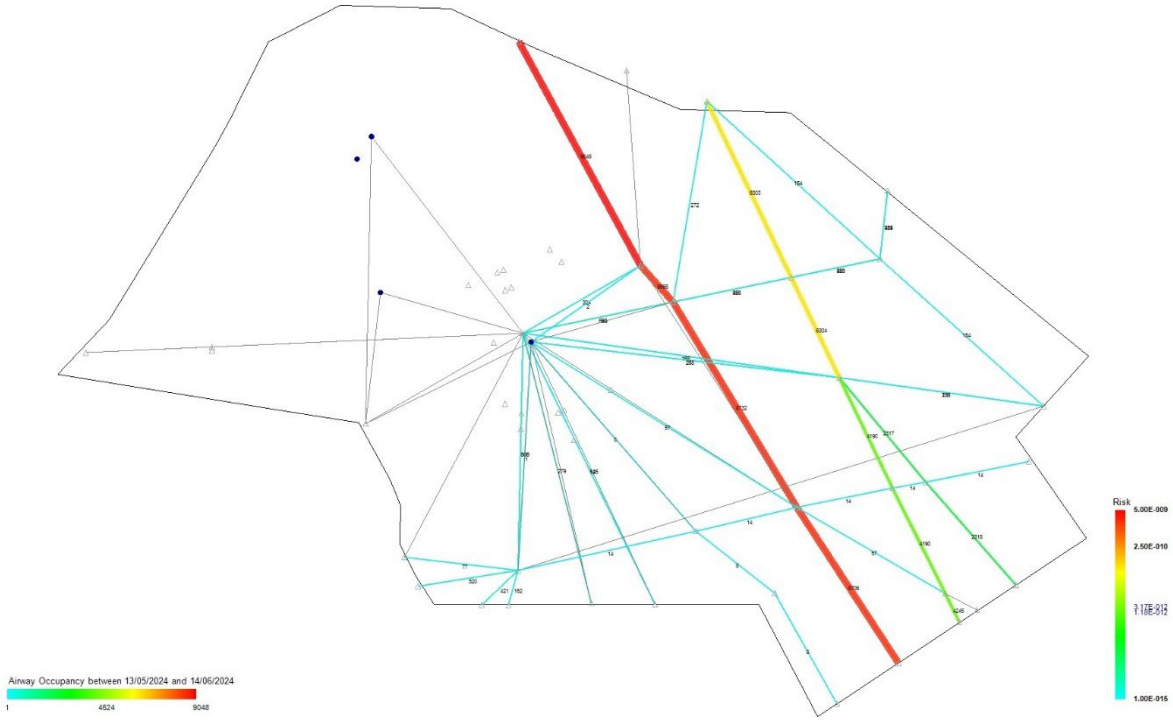
Jeddah FIR Hotspots – SMR 2024



Jeddah FIR AWYs Occupancy – SMR 2024



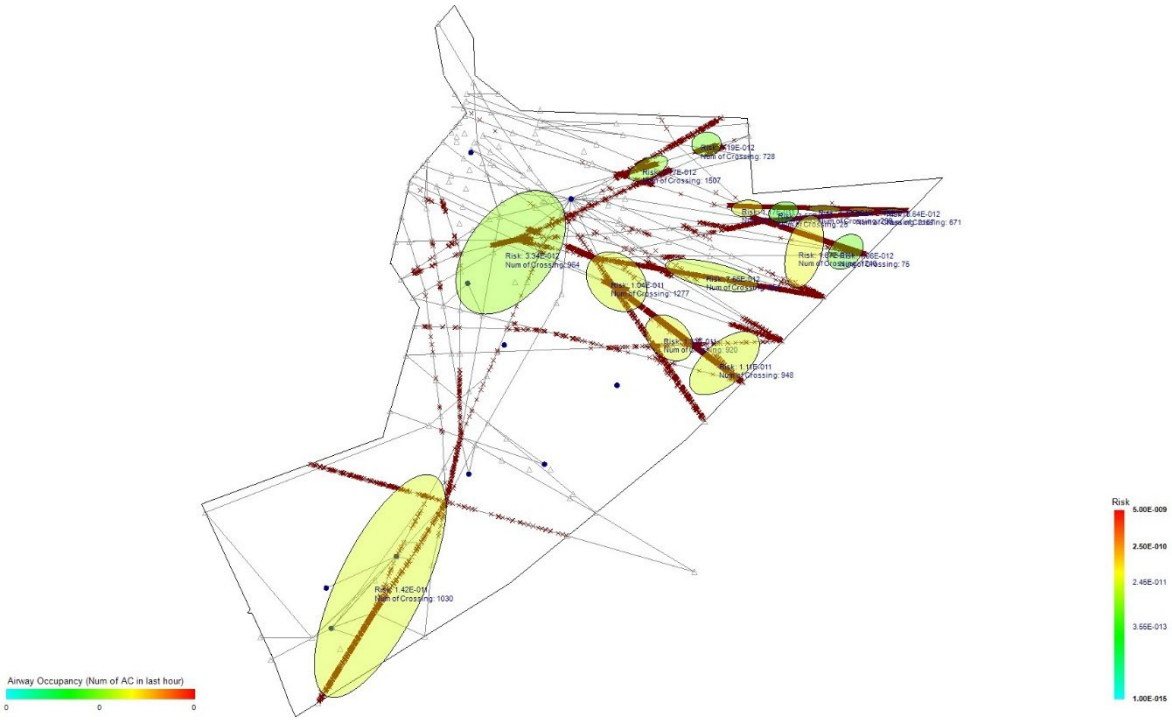
Kuwait FIR Hotspots – SMR 2024



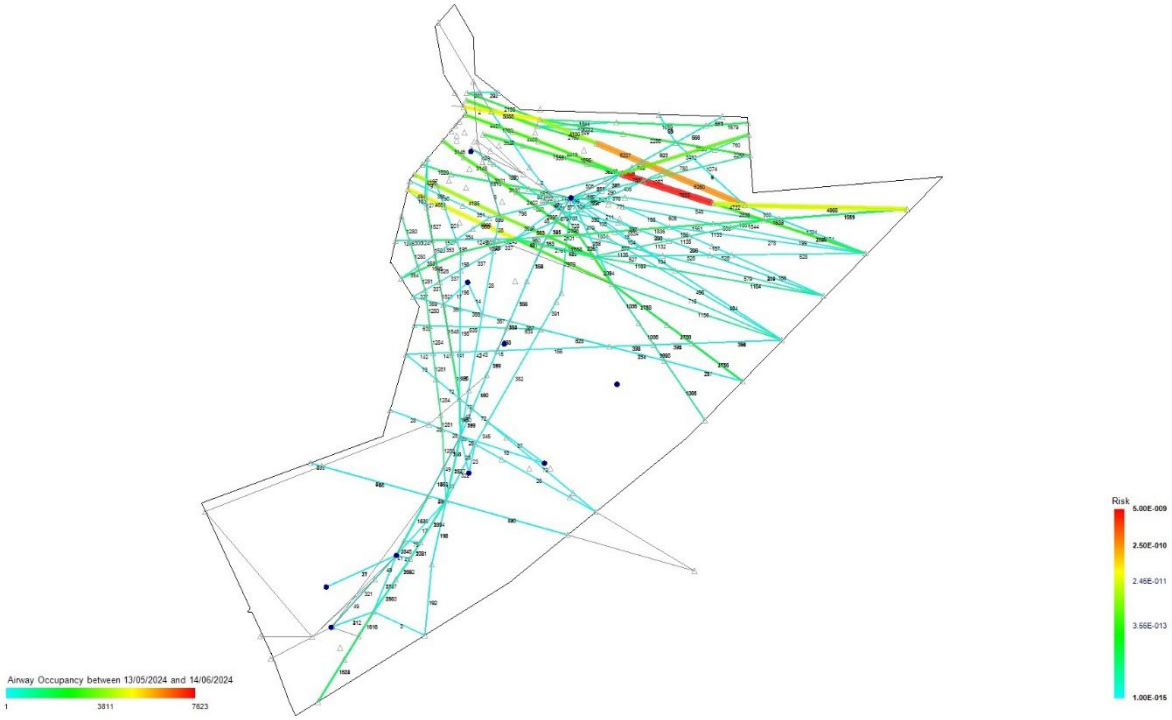
Kuwait FIR AWYs Occupancy – SMR 2024

No Hotspots observed within Beirut FIR

Beirut FIR AWYs Occupancy – SMR 2024

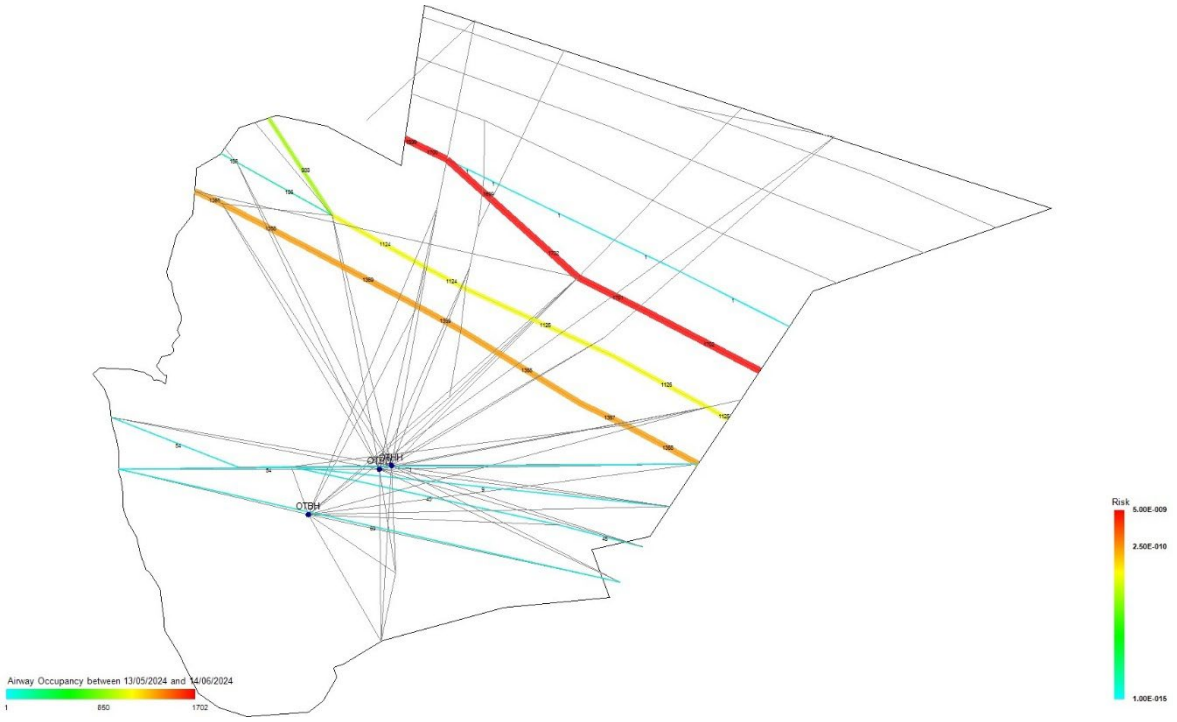


Muscat FIR Hotspots – SMR 2024

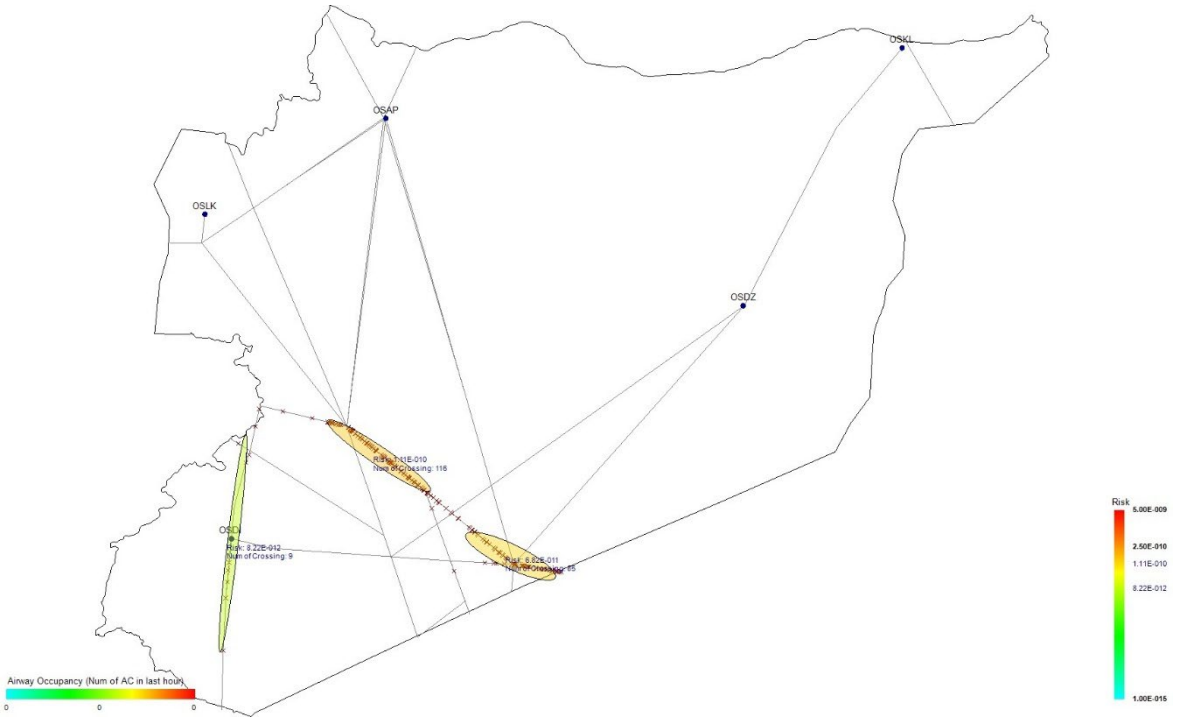


Muscat FIR AWYs Occupancy – SMR 2024

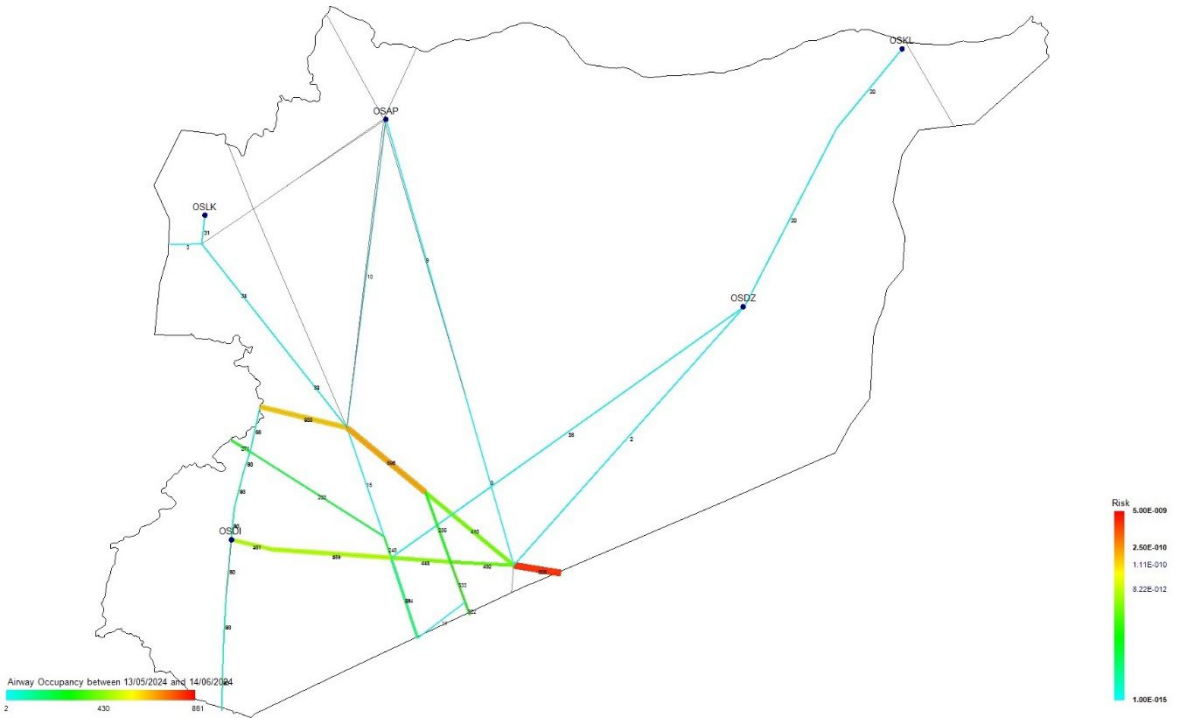
No Hotspots observed within Doha FIR



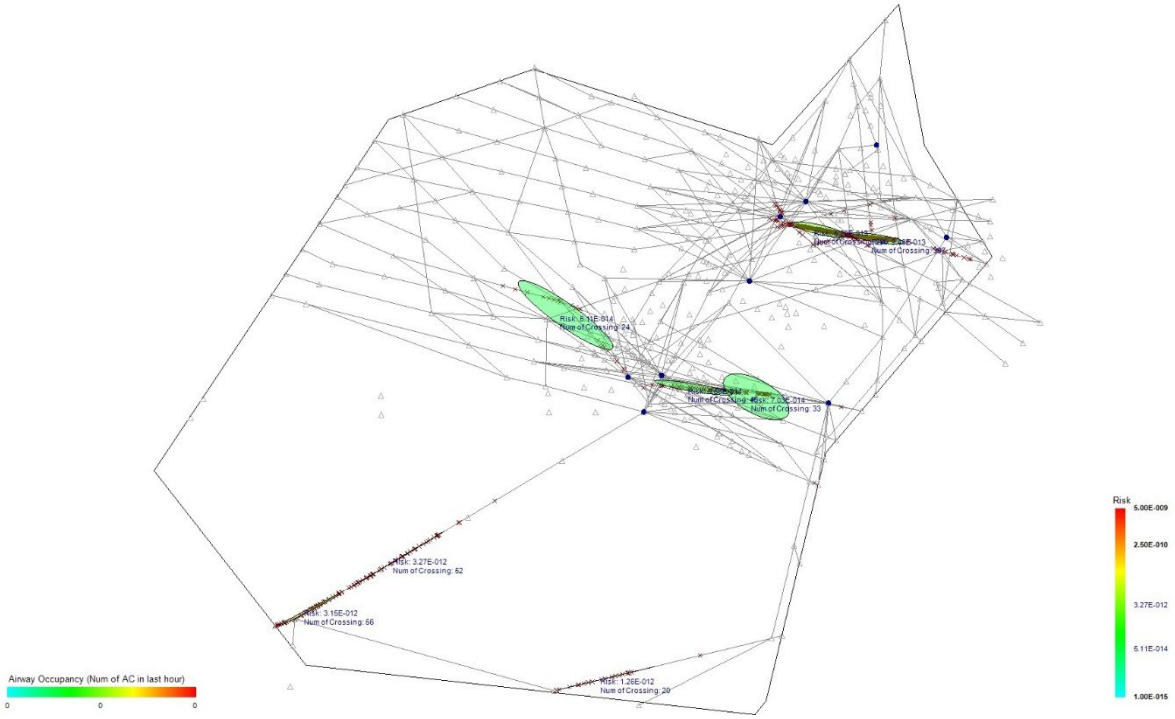
Doha FIR AWYs Occupancy – SMR 2024



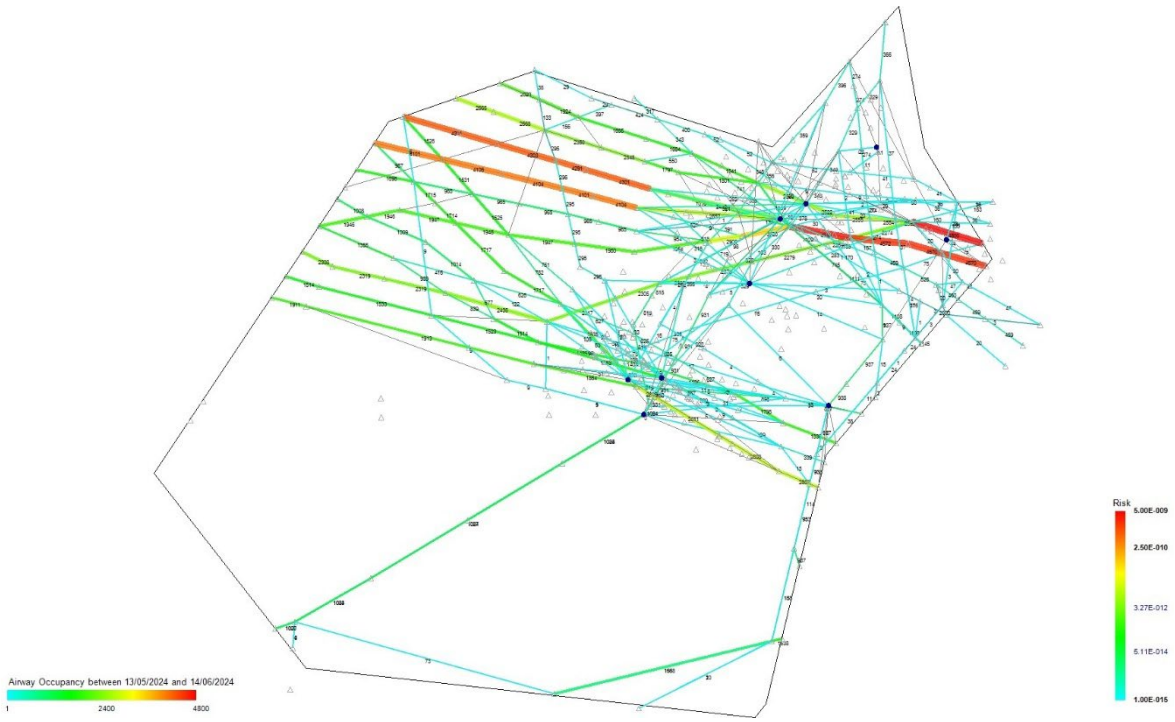
Damascus FIR Hotspots – SMR 2024



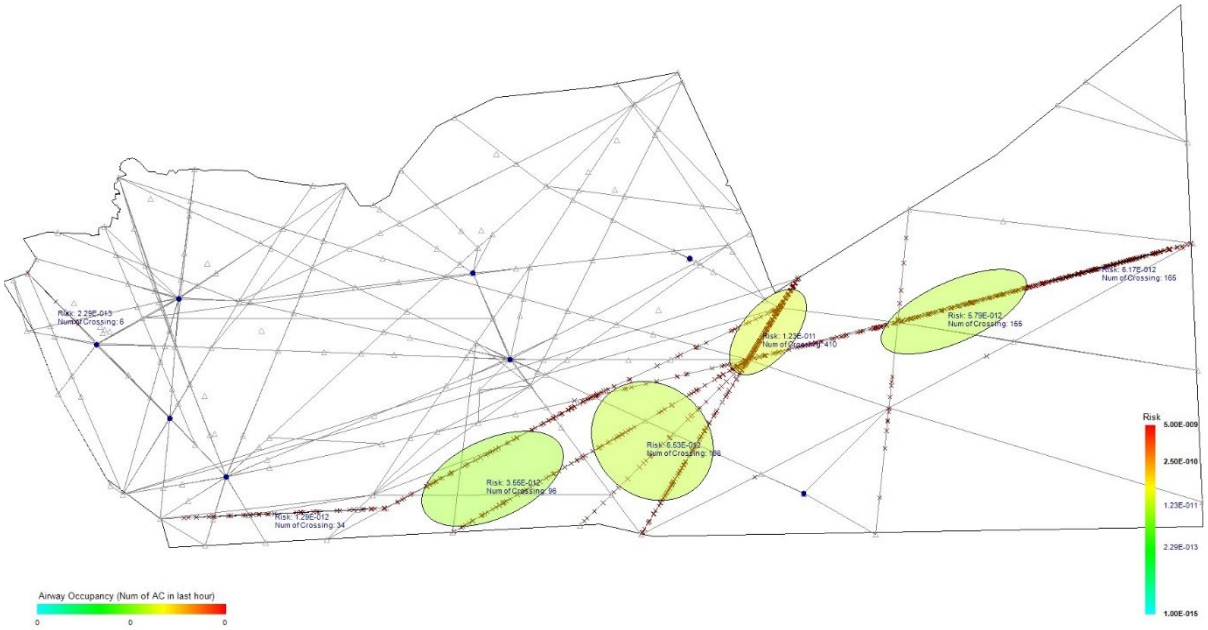
Damascus FIR AWYs Occupancy – SMR 2024



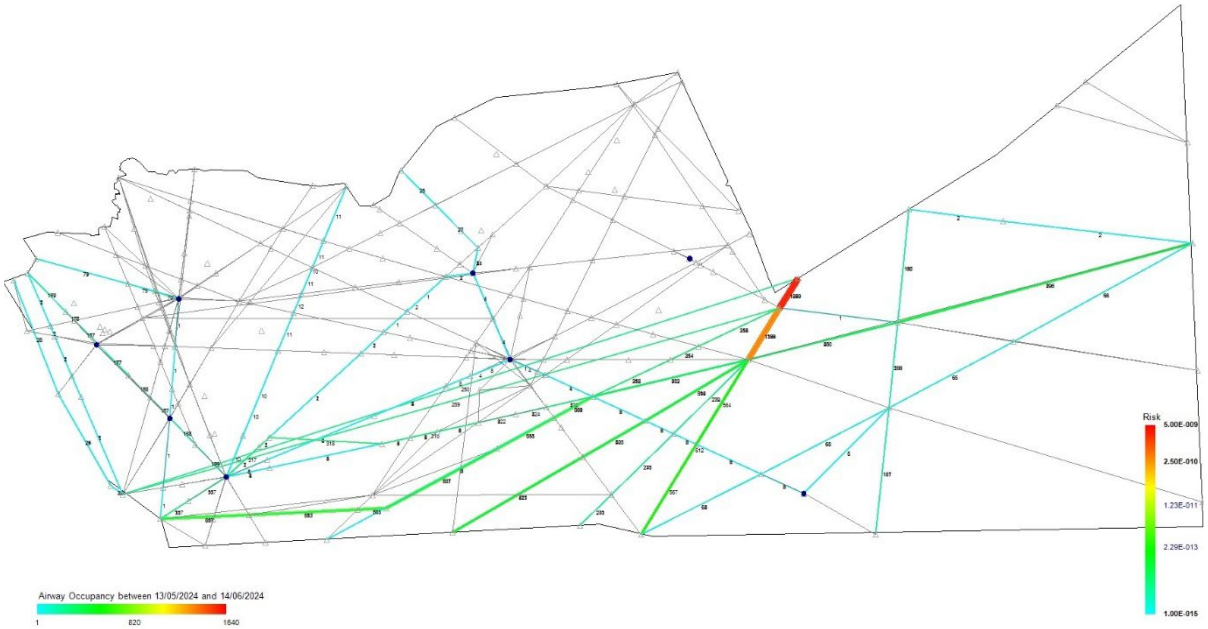
Emirates FIR Hotspots – SMR 2024



Emirates FIR AWYs Occupancy – SMR 2024



Sanaa FIR Hotspots – SMR 2024



Sanaa FIR AWYs Occupancy – SMR 2024

Appendix D

MIDRMA Member States ICAO RVSM Minimum Monitoring Requirement (MMR) Table, valid as of 01st March 2025

STATE	RVSM APPROVED A/C	HAVE RESULTS /COVERED	NOT COVERED	NOT COVERED IN %	A/C MMR
Bahrain	72	71	1	1%	1
Egypt	163	148	15	9%	9
Iran	199	125	74	37%	40
Iraq	55	53	12	22%	2
Jordan	47	46	1	2%	1
KSA	358	357	1	0%	1
Kuwait	72	68	4	6%	3
Lebanon	29	29	0	0%	0
Libya	48	29	19	40%	16
Oman	67	66	1	1%	1
Qatar	304	304	0	0%	0
Sudan	16	1	15	94%	11
Syria	17	11	6	35%	2
UAE	603	568	35	6%	19
Yemen	8	1	7	88%	4
TOTAL	2058	1877	191	9%	110

- END -