International Civil Aviation Organization

Middle East Regional Monitoring Agency Board

Twentieth Meeting (MIDRMA Board/20)
(Muscat, Oman, 10 – 11 November 2024)

Agenda Item 4: RVSM Monitoring and related Technical Issues

PRELIMINARY RESULTS OF THE MID RVSM SMR 2024

(Presented by the MIDRMA)

SUMMARY

This working paper details the preliminary results of the MID RVSM Safety Monitoring Report 2024 and tries to demonstrate according to the data used that the key safety objectives of the SMR in accordance with ICAO Doc 9574 second edition so far were met in operational service but with some reservations. The technical risk of en-route mid-air collision in RVSM airspace is estimated to be **7.2614 x 10^{-11}** fatal accidents per flight hour which satisfies the Target Level of Safety and Safety Objective 1. The overall risk of en-route mid-air collision in RVSM airspace is estimated to be **9.1872 x 10^{-11}** fatal accidents per flight hour which satisfies the Target Level of Safety and Safety Objective 2. 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.

Action by the meeting is in paragraph 3.

REFERENCES

- MIDRMA Board/19 Report
- MIDANPIRG/20 & RASGMID/10 Report

1. INTRODUCTION

1.1 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 report's purpose 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.

1.2 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.

2. DISCUSSION

2.1 Preliminary results of the MID RVSM SMR 2024 (first draft version):

2.1 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.

2.1.2 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}**	**2.5×10^{-9}**	**Below ICAO TLS**
Overall Risk	**9.1872×10^{-11}**	**5×10^{-9}**	**Below ICAO TLS**

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 **5×10^{-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.

2.1.3 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.

2.1.4 Scope:

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

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

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

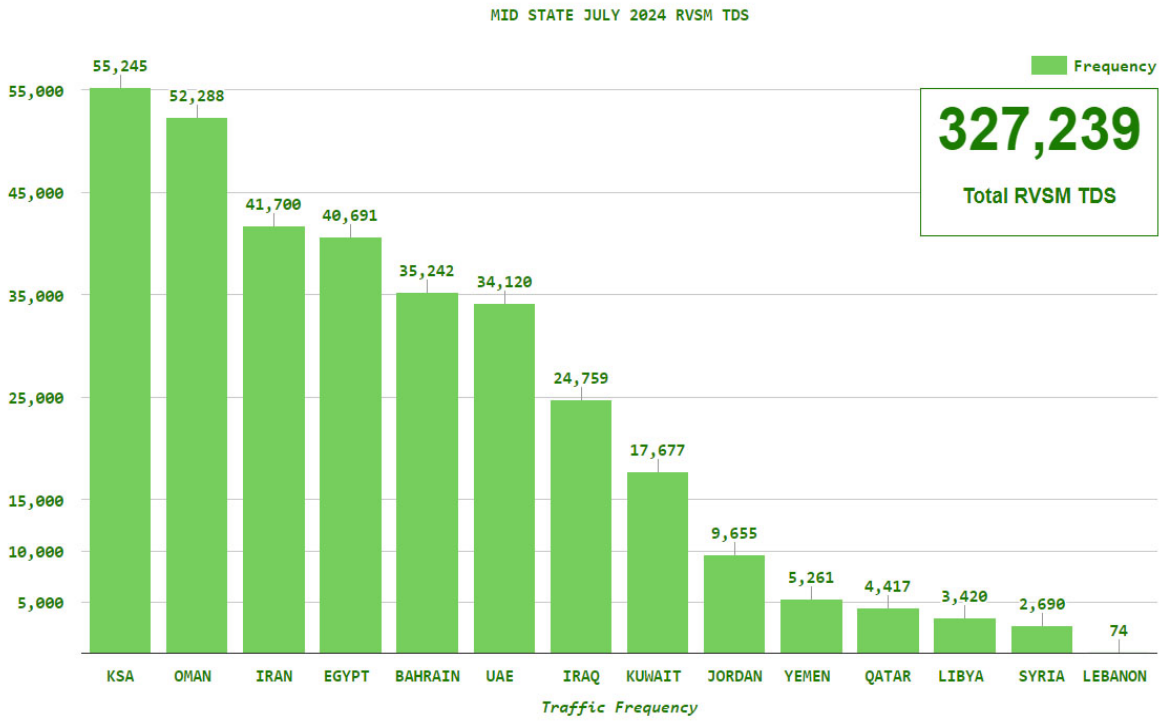
**Note:* *Khartoum FIR excluded from the RVSM safety analysis due to lack of TDS and LHD reports.*

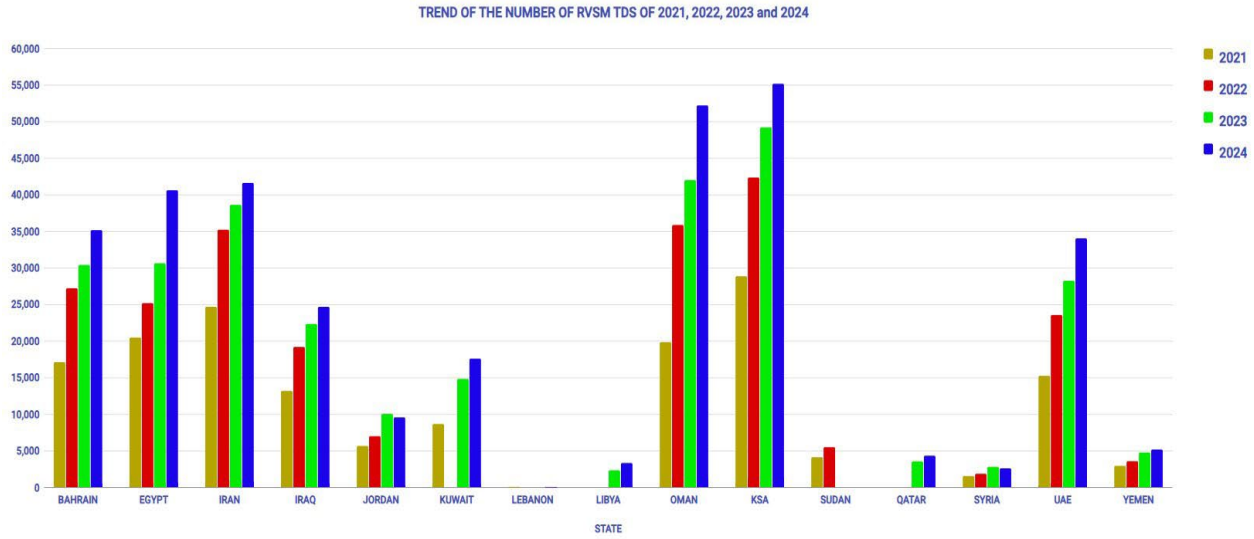
2.1.5 The Data Sampling periods covered by SMR 2024 are as displayed in the below table:

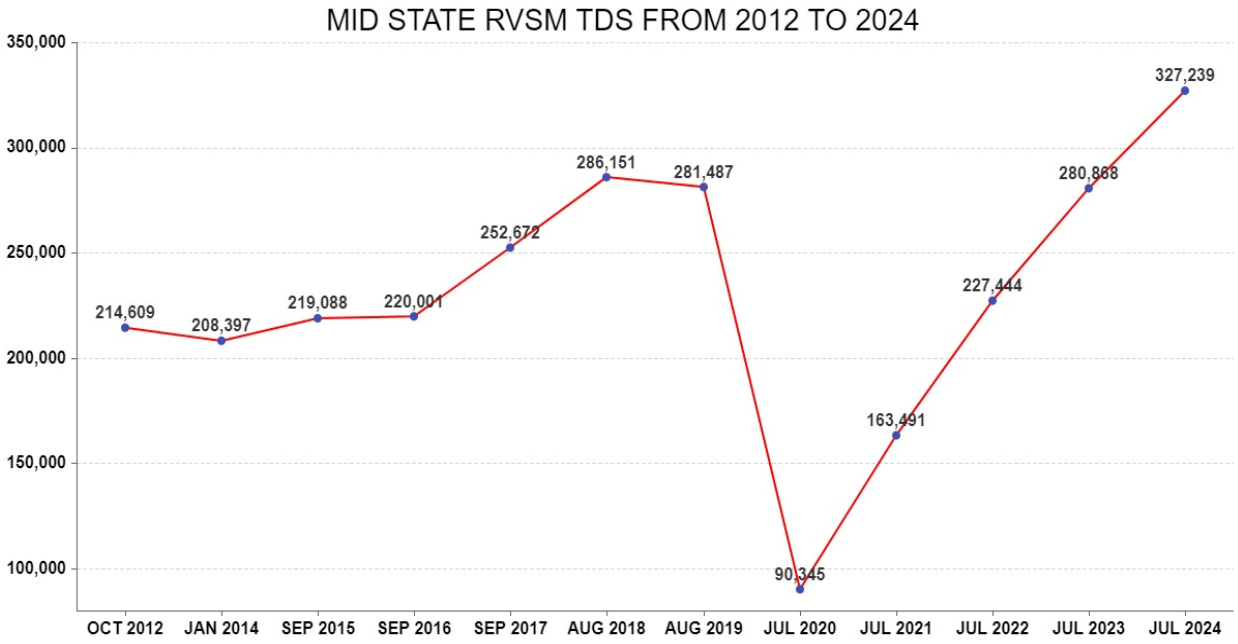
Report Elements	Time Period
Traffic Data Sample	15/05/2024 - 15/06/2024
Operational & Technical Errors	01/01/2024 - 31/10/2024

2.1.6 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**		


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



2.2 Large Height Deviation (LHD) reports 2024

2.2.1 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.

2.2.2 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

2.2.3 **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 2.2.2, 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.

b. **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.

c. **Nature of reported LHDs**:

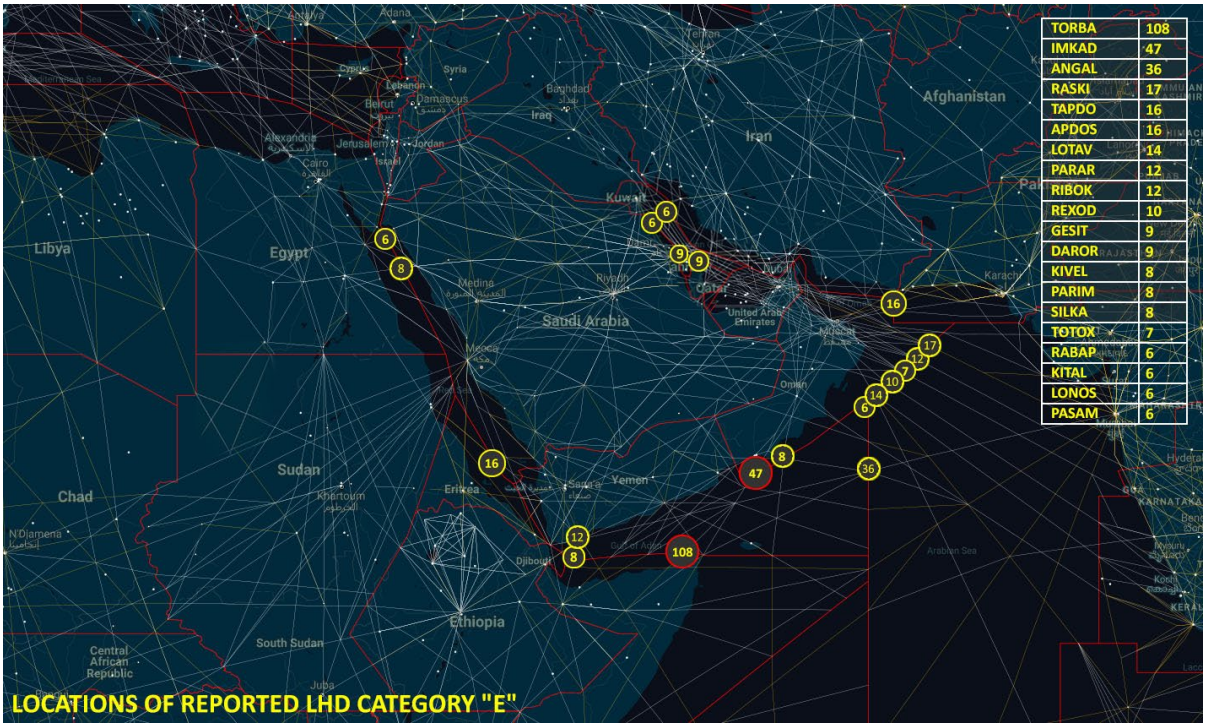
The vast majority of LHD reports received to date are related to ATC transfer of control coordination errors (Category E), largely due to human factors. While these reports are essential, they have not had a severe impact on RVSM airspace operations. However, the ongoing lack of reporting for more critical 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.

2.2.4 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 2025 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



2.2.5 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:

2.2.5.1 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 (till October)

2.2.5.2 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

2.2.5.3 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.

2.2.5.4 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.

2.2.5.5 Appendix A of this working paper 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.

2.3 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.

2.3.1 The tables in Appendix B of this working paper 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.

2.4 The hotspots and the airways occupancy of all MIDRMA member states are available for review in Appendix C of this working paper.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and discuss the preliminary results of the MID RVSM SMR 2024;

b) discuss the issue of the lack of LHD reports from some member states and the absence of LHD report categories related to operational issues, such as Categories A, B, C, D, K, and J;

c) review Appendix A of this working paper and request Oman Board Member to provide update concerning the connection of OLDI/AIDC with Mumbai ACC; and

d) encourage Member States, apart from those already doing so, to submit their RVSM Traffic Data Samples (TDS) monthly. This submission will facilitate the assessment of non-RVSM approved aircraft operating within the MID RVSM airspace.

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

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

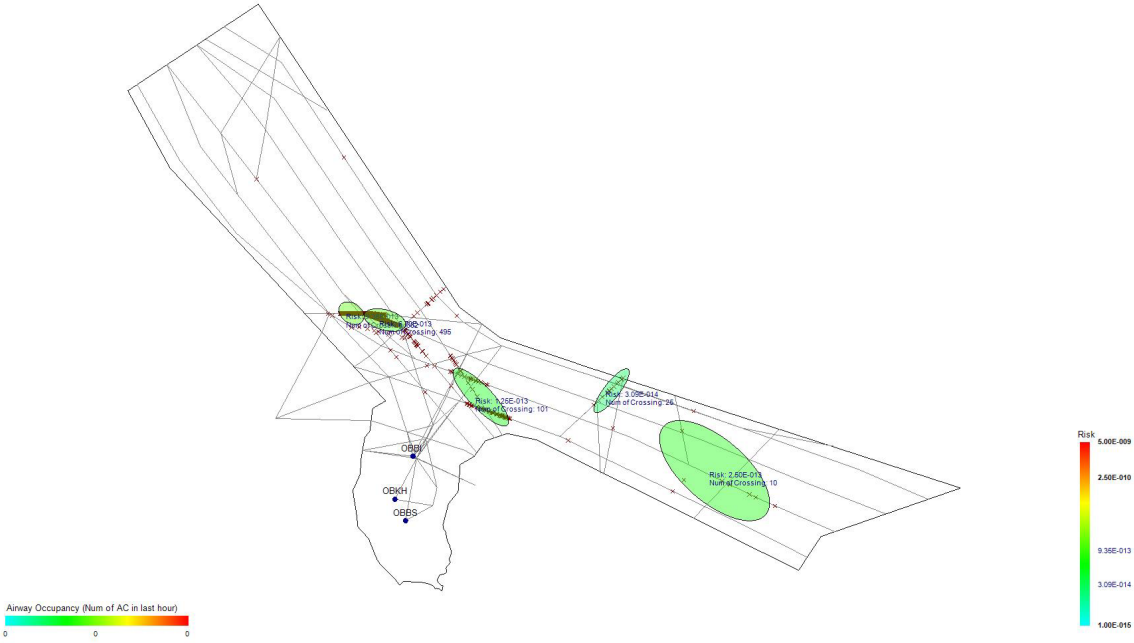
Non-RVSM approved Aircraft – Responsibility of other RMAs

#	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

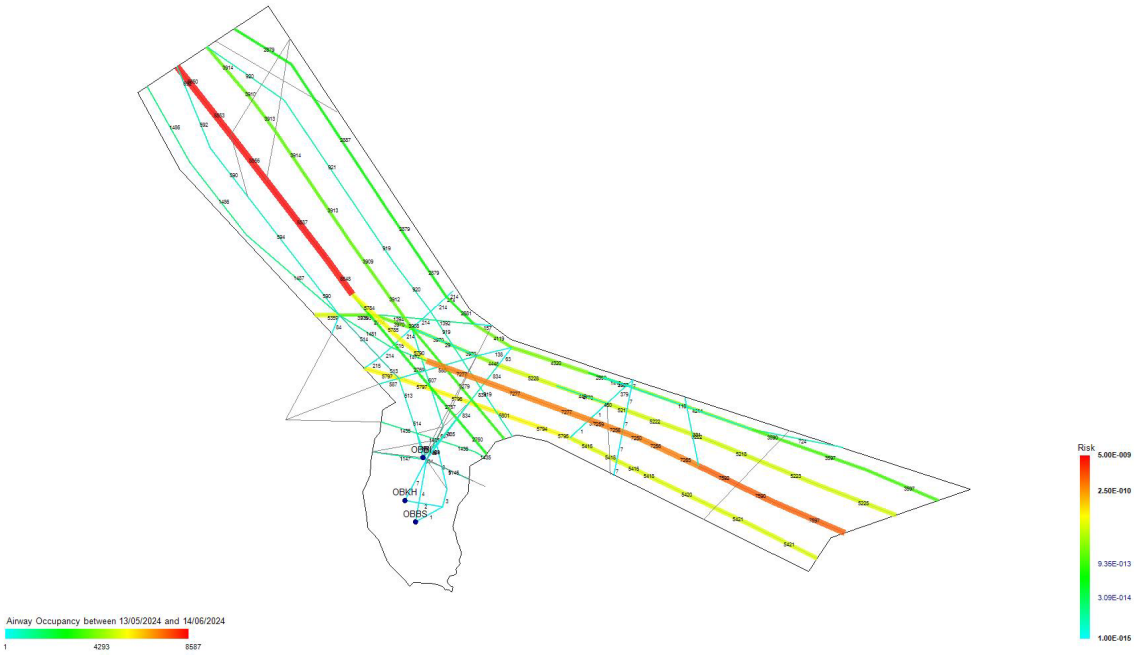
32	ZSCQP	CRJ9	7-7-2020	AFIRMA
33	CCBGV	B789	8-6-2022	CARSAM
34	FAB2857	KC39	22-05-2022	CARSAM
35	21140	IL76	19-06-2022	CHINARMA
36	EW550TH	IL76	4-12-2021	EURRMA
37	ICJSN	C25C	15-05-2023	EURRMA
38	UR11316	AN12	22-07-2020	EURRMA
39	URAZN	B753	1-2-2022	EURRMA
40	URAZO	B753	1-2-2022	EURRMA
41	URAZR	B77W	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

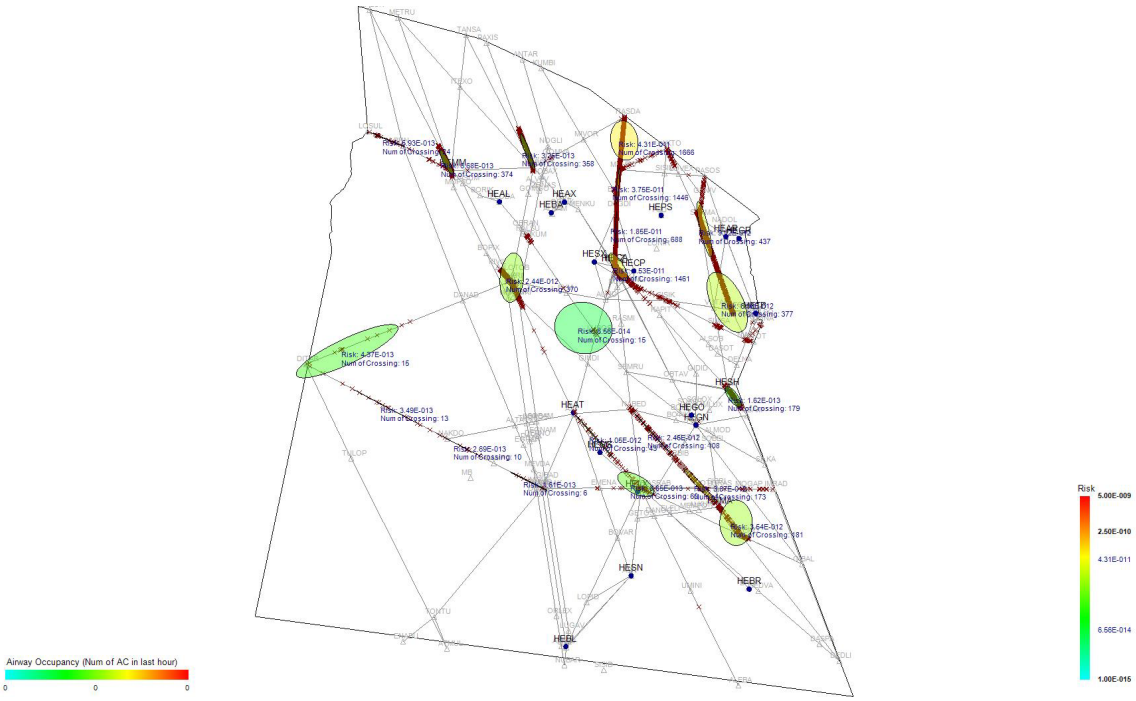
MIDRMA Member States FIRs Hotspots and Airways Occupancy



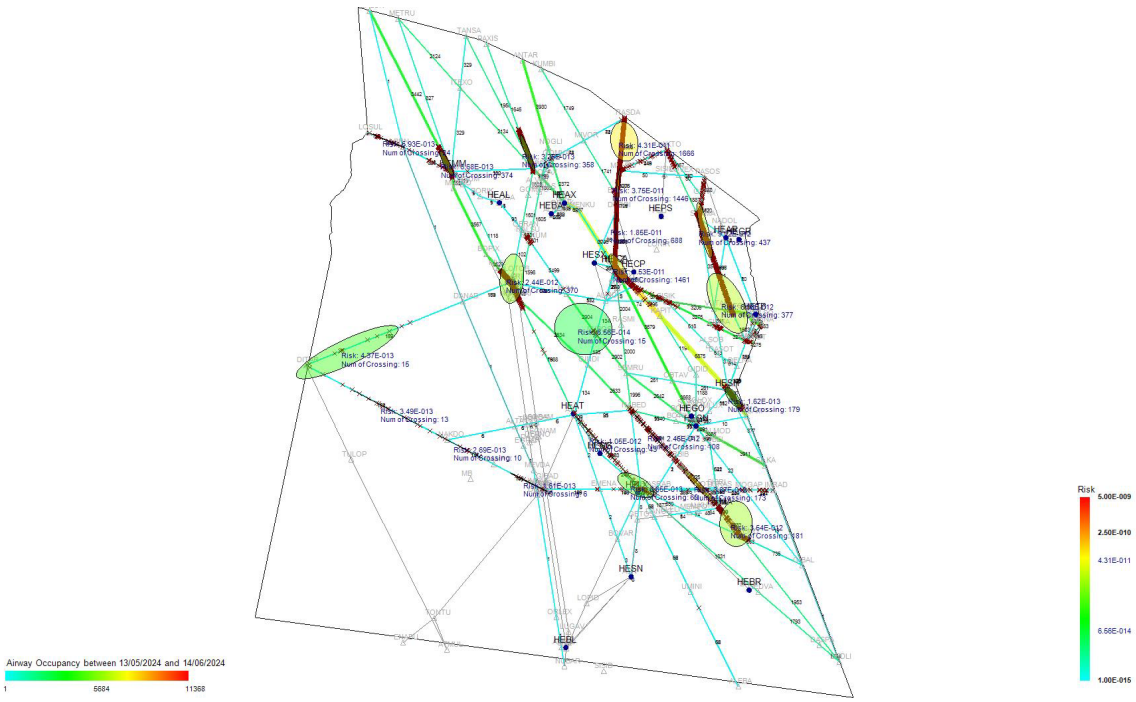
Bahrain FIR SMR 2024 Hotspots



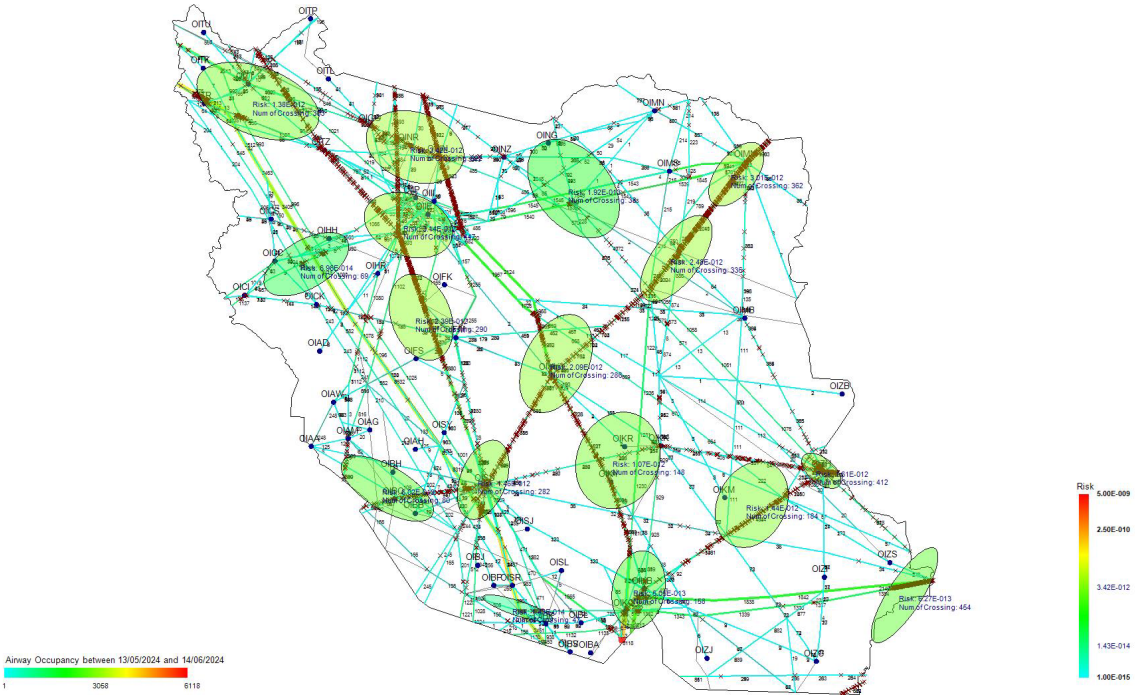
Bahrain FIR SMR 2024 AWYs Occupancy



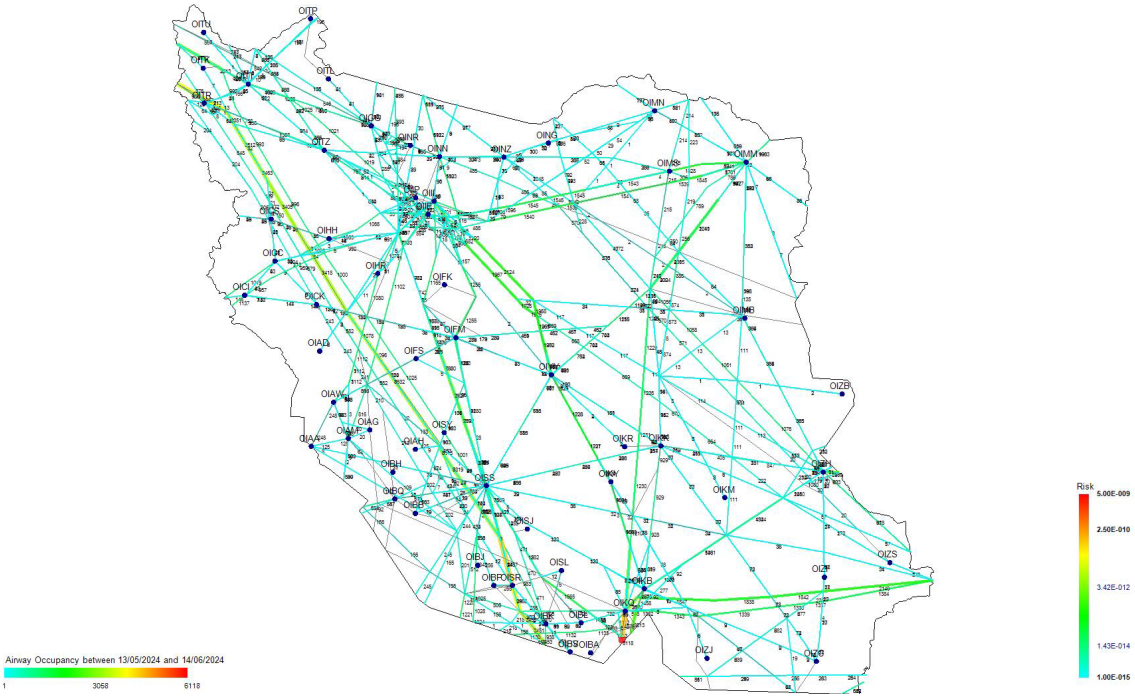
Cairo FIR SMR 2024 Hotspots



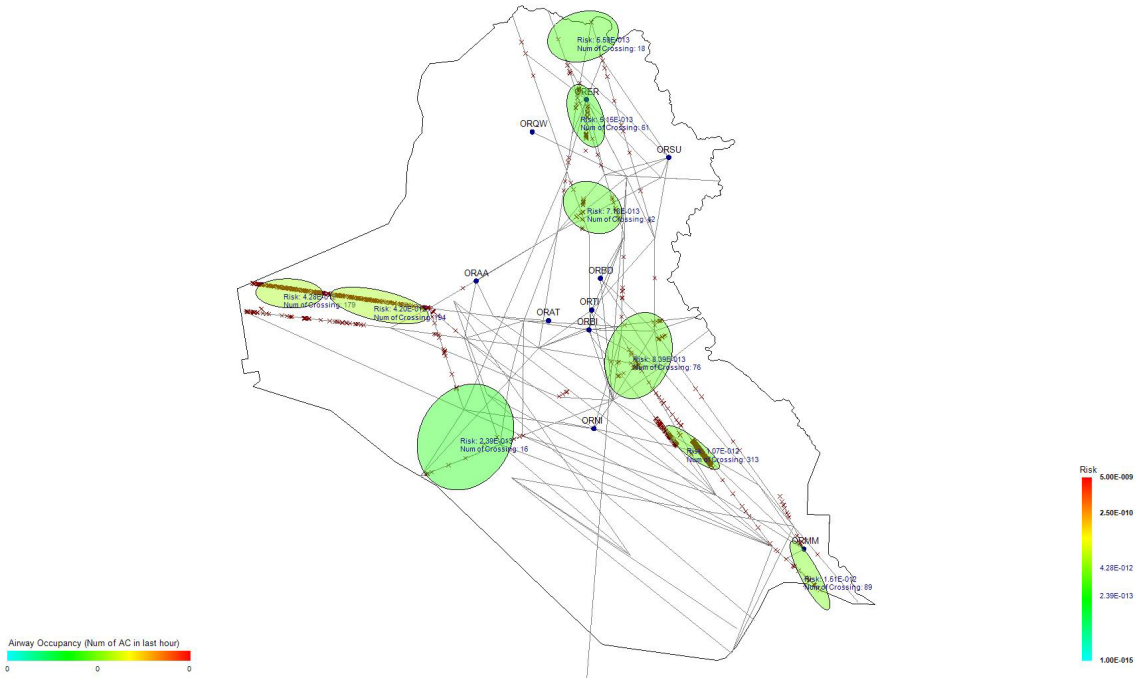
Cairo FIR SMR 2024 AWYs Occupancy



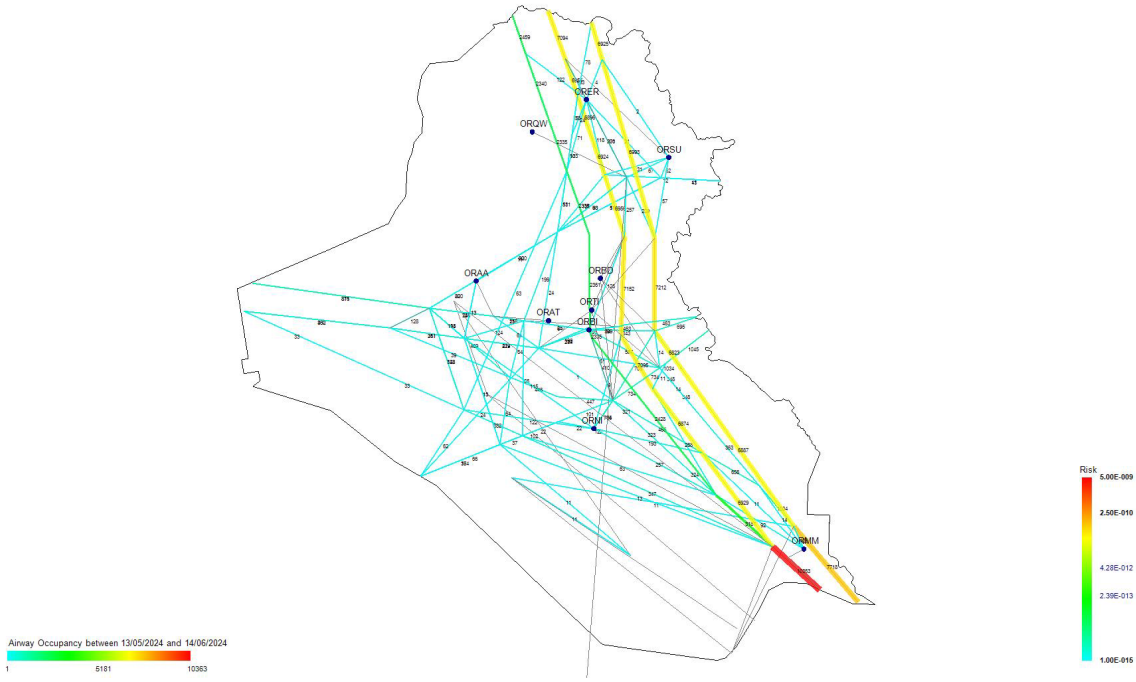
Tehran FIR SMR 2024 Hotspots



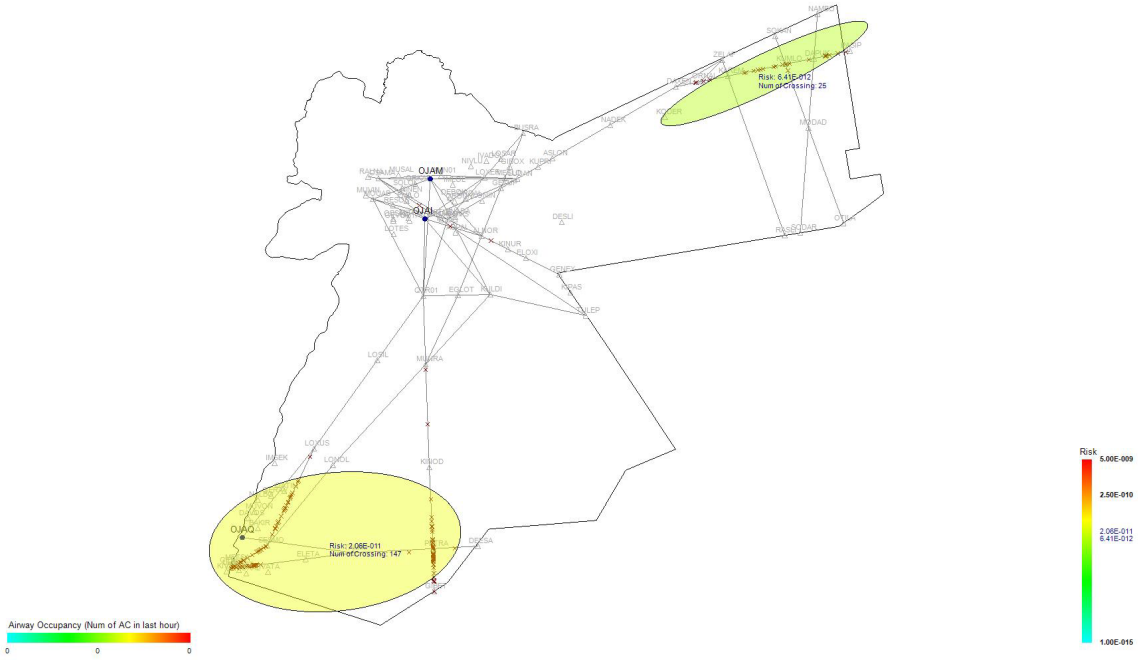
Tehran FIR SMR 2024 AWYs Occupancy



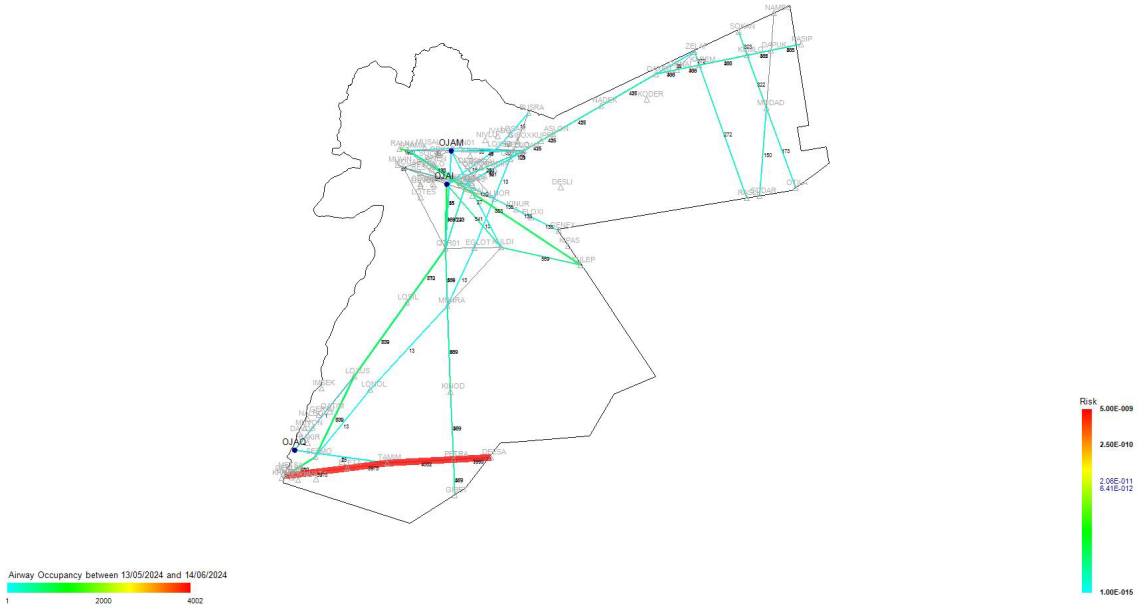
Baghdad FIR SMR 2024 Hotspots



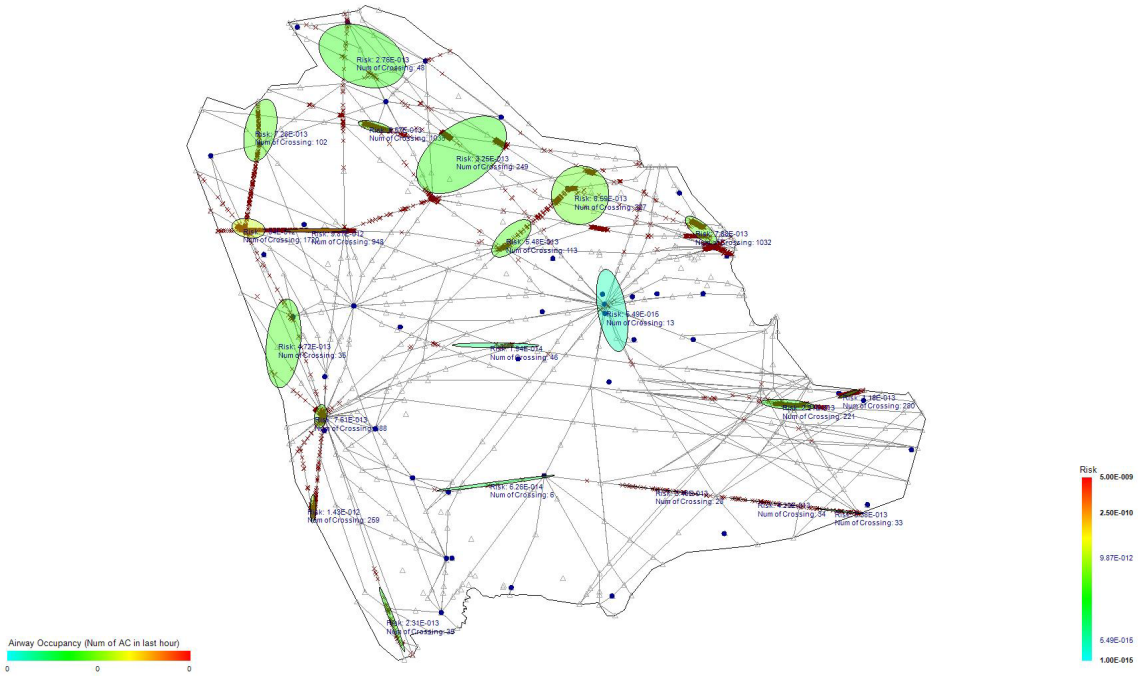
Baghdad FIR SMR 2024 AWYs Occupancy



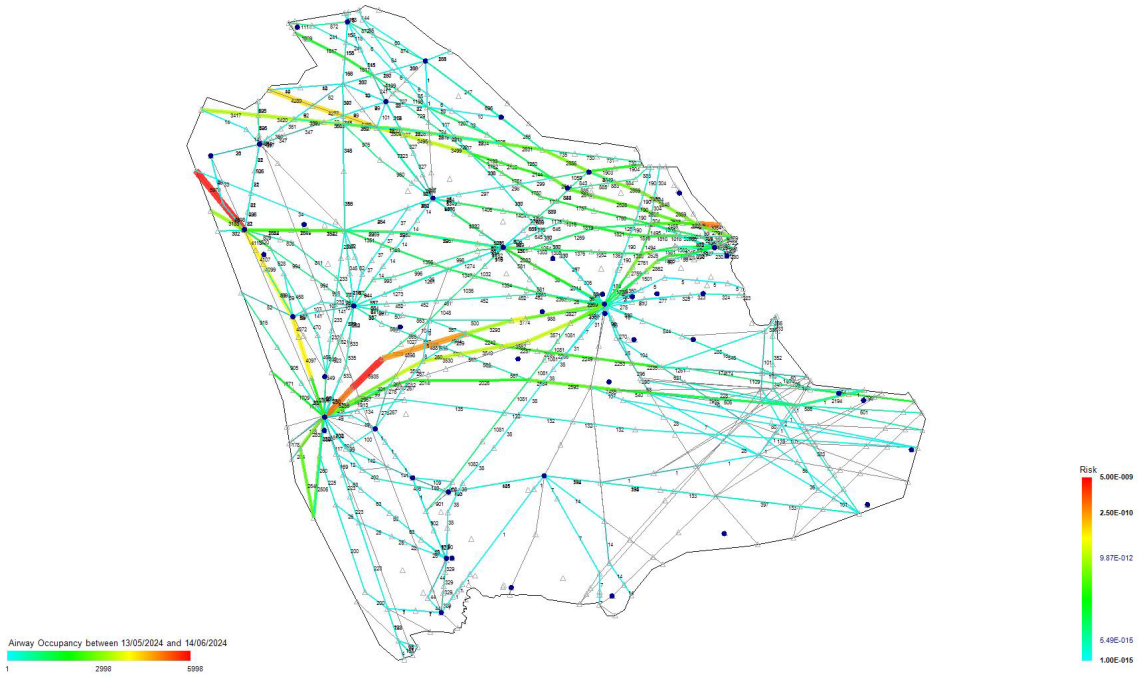
Amman FIR SMR 2024 Hotspots



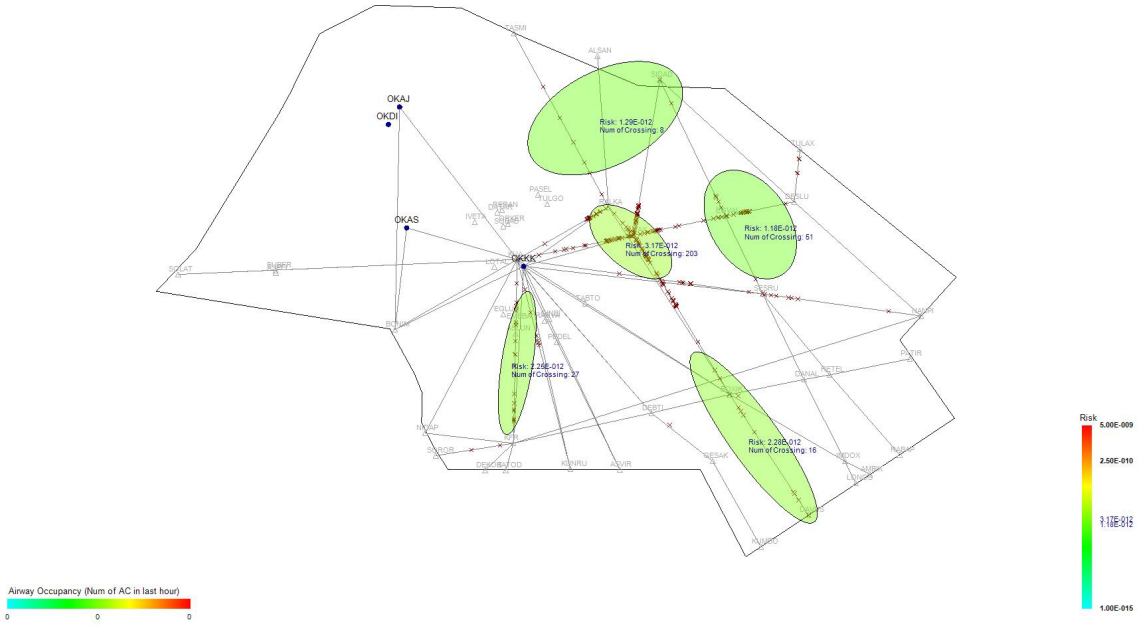
Amman FIR SMR 2024 AWYs Occupancy



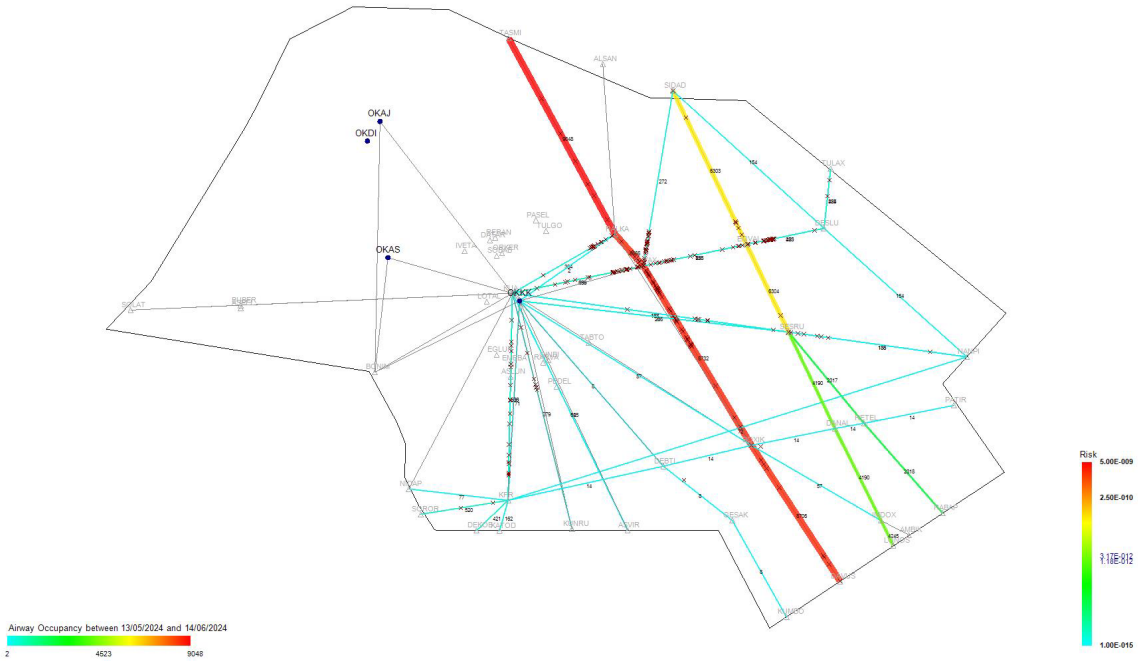
Jeddah FIR SMR 2024 Hotspots



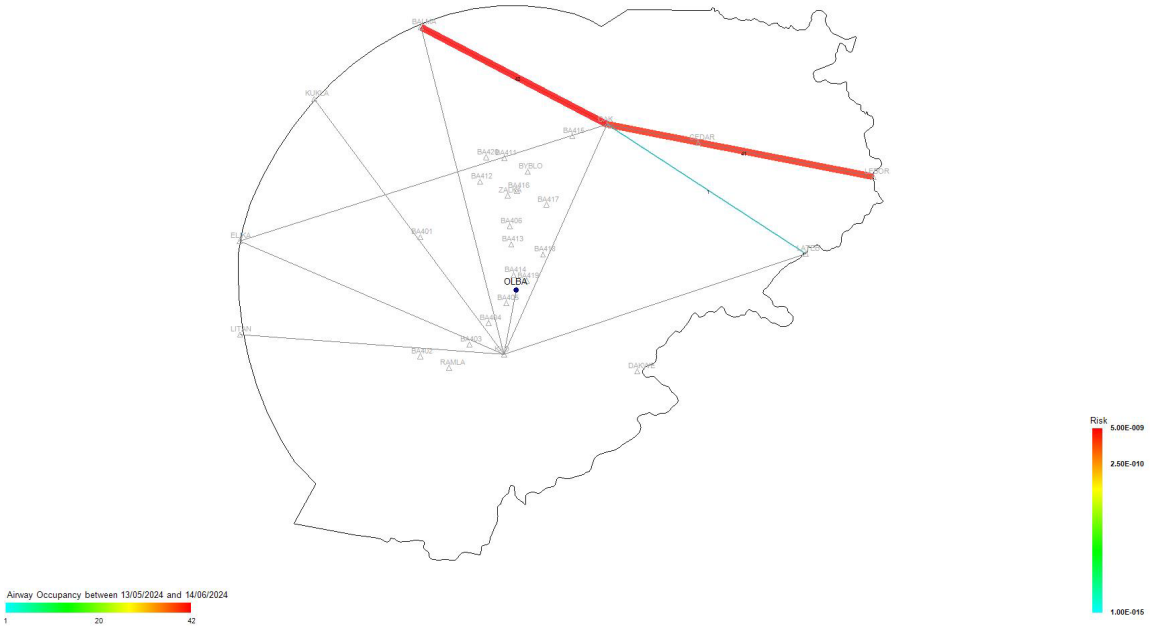
Jeddah FIR SMR 2024 AWYs Occupancy



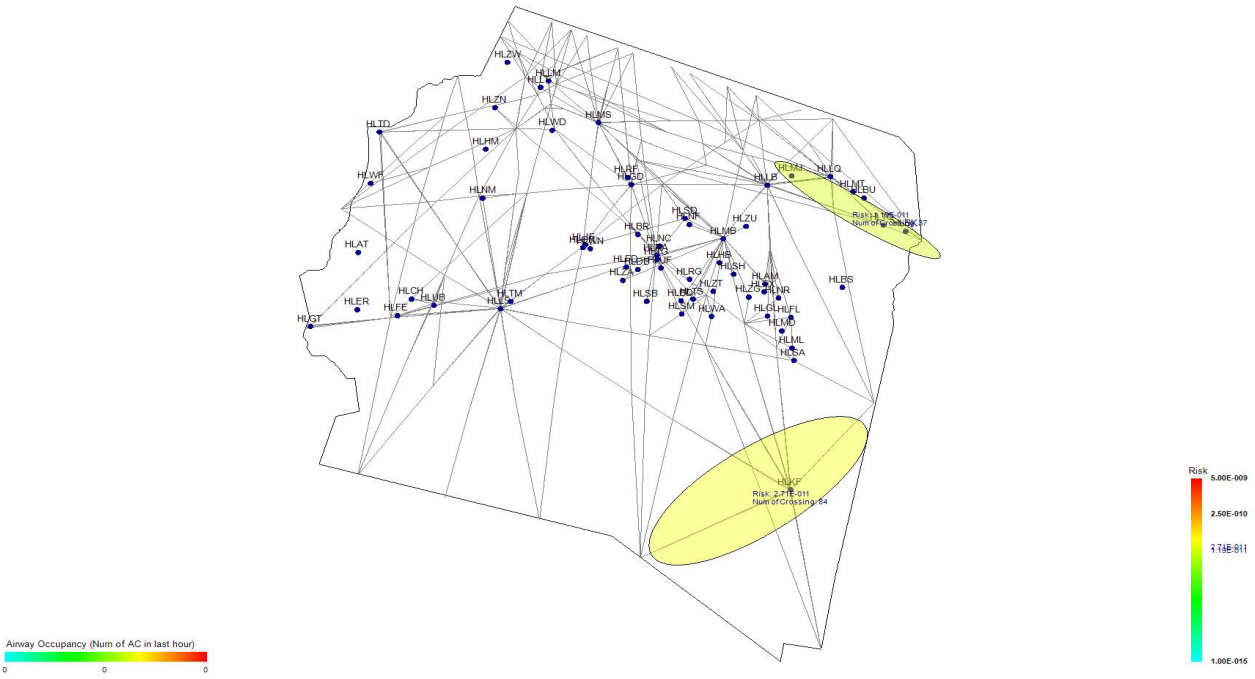
Kuwait FIR SMR 2024 Hotspots



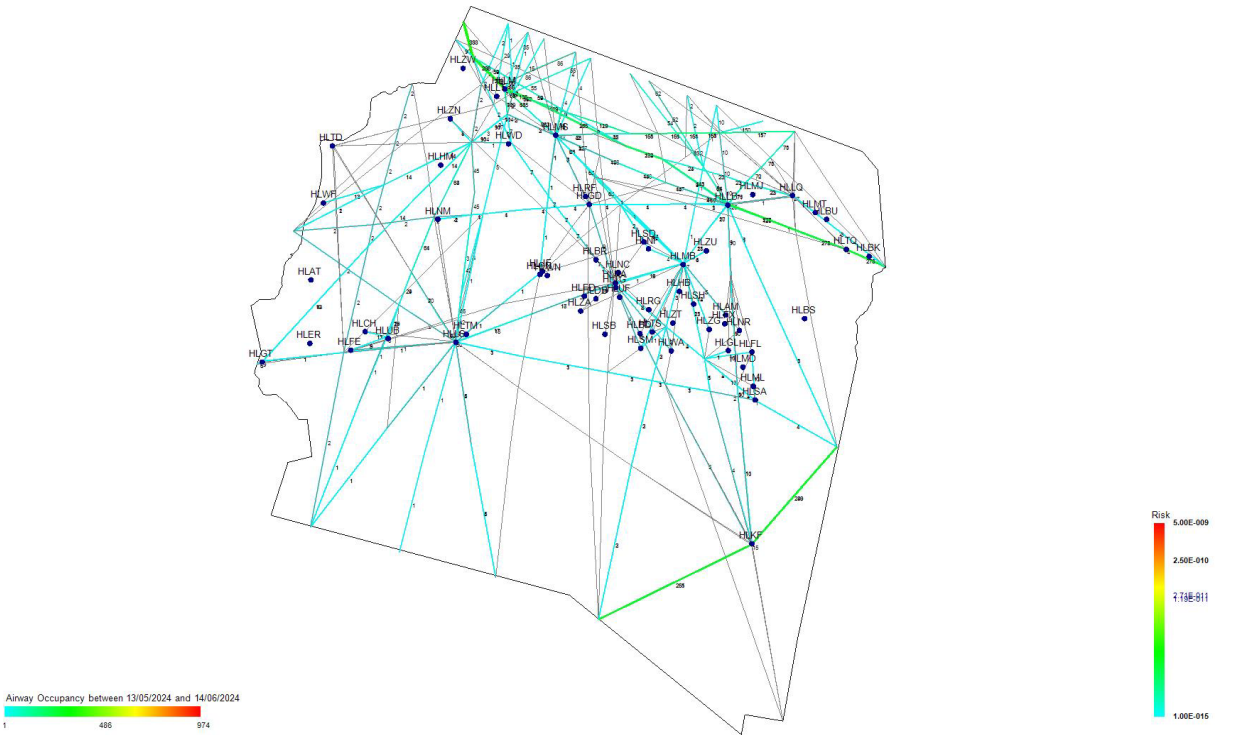
Kuwait FIR SMR 2024 AWYs Occupancy



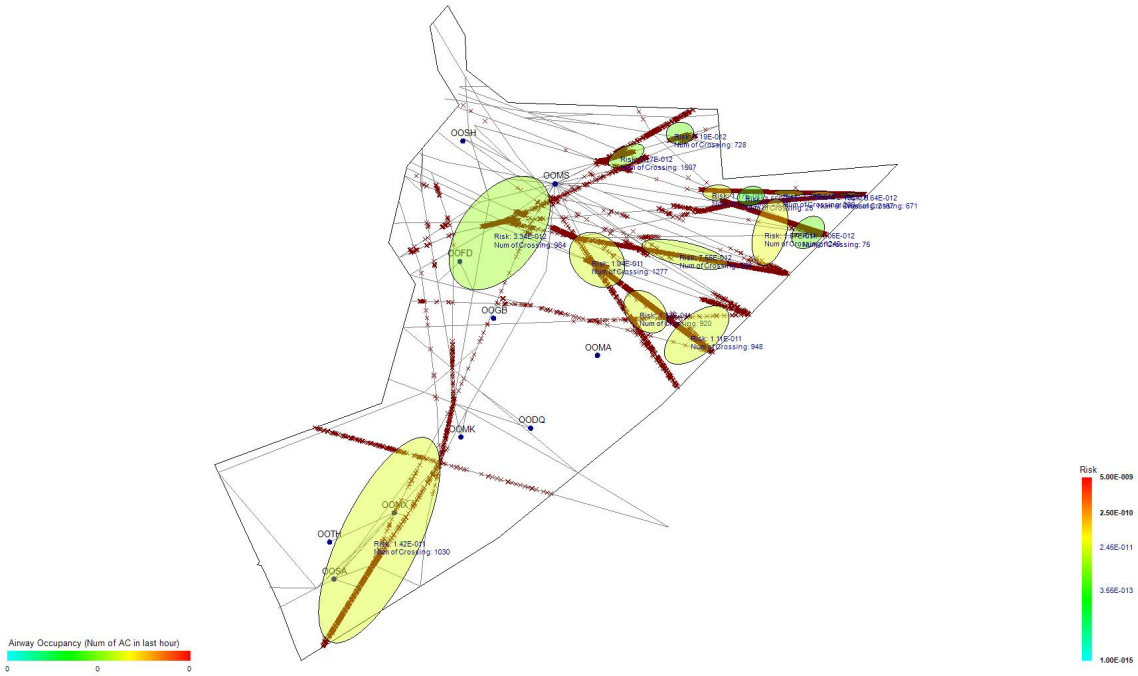
Beirut FIR SMR 2024 AWYs Occupancy



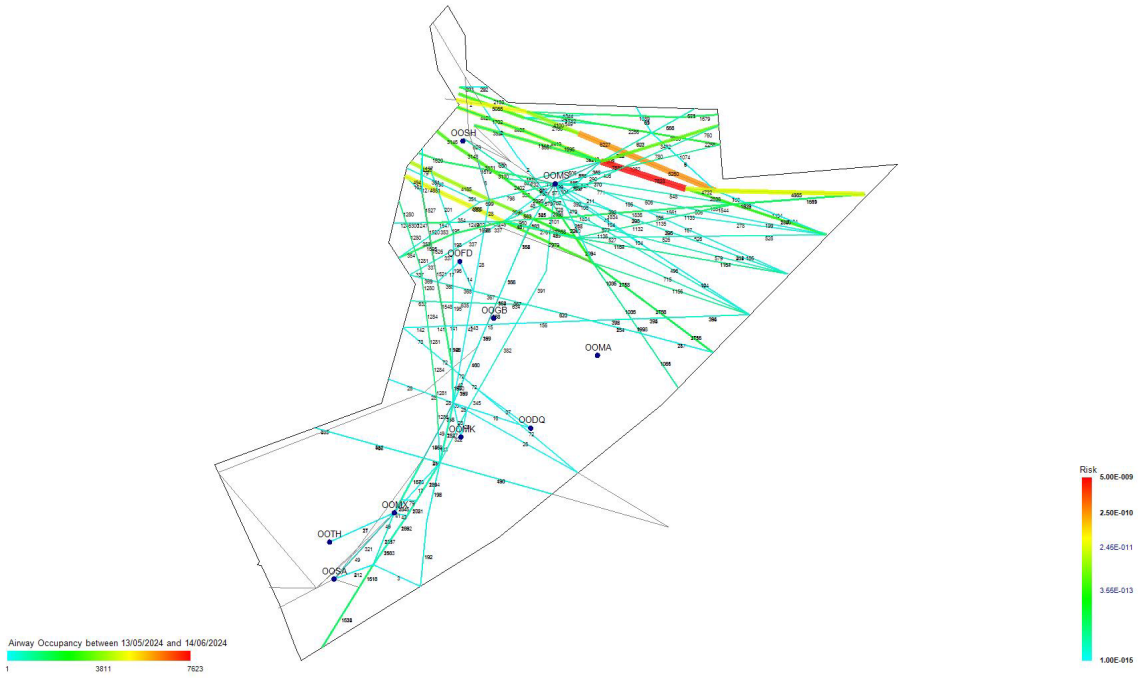
Tripoli FIR SMR 2024 Hotspots



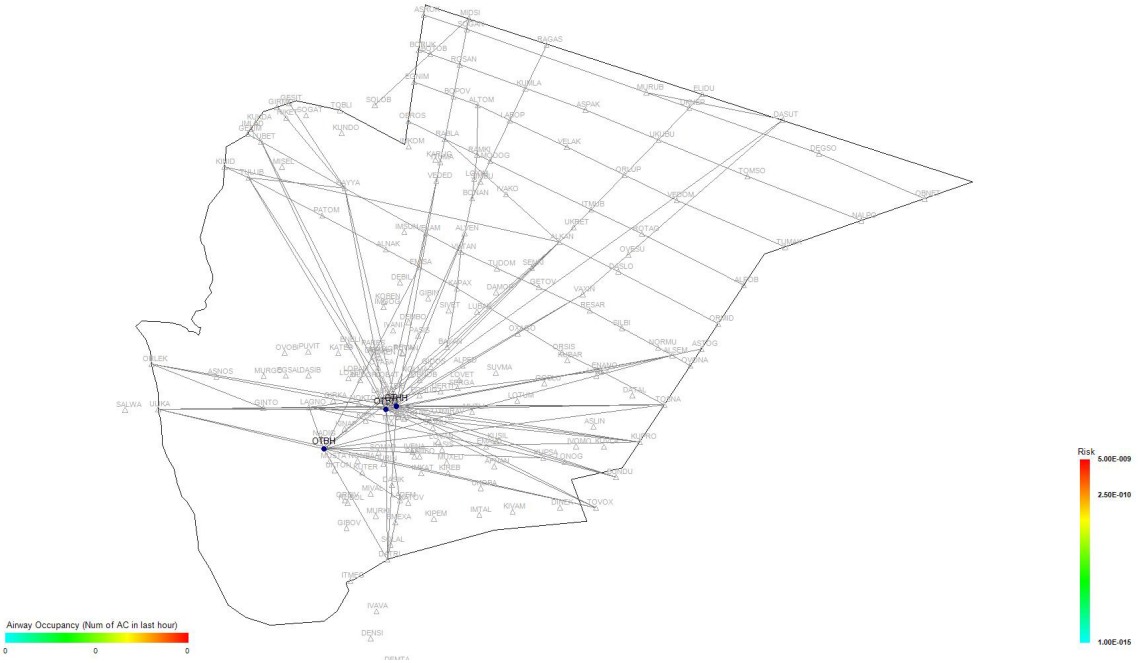
Tripoli FIR SMR 2024 AWYs Occupancy



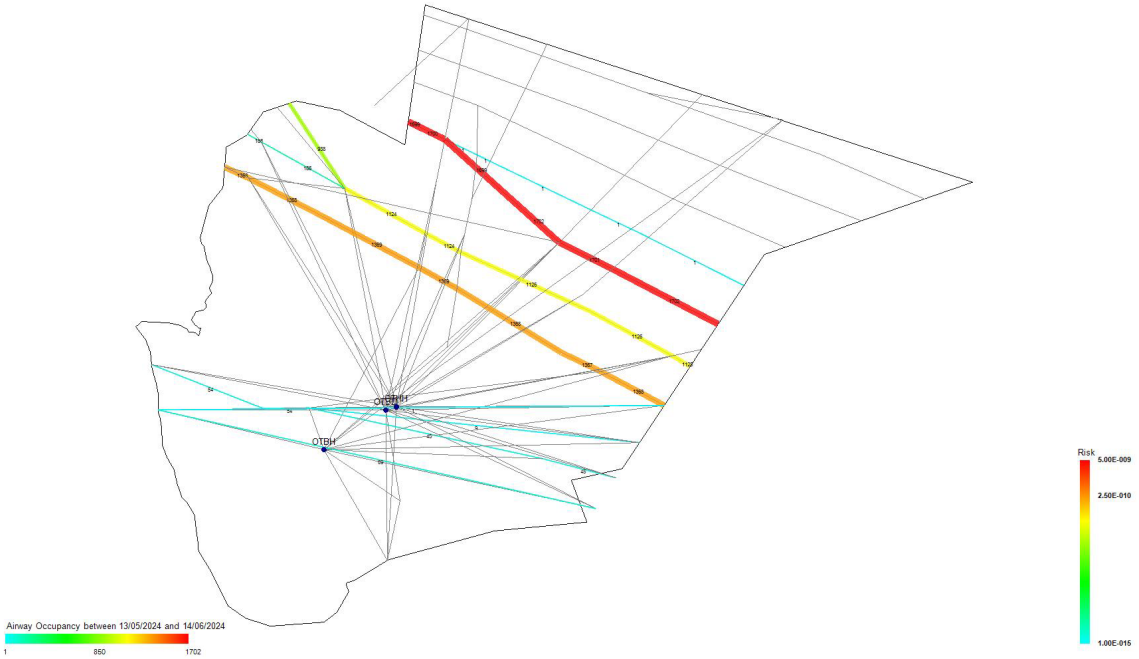
Muscat FIR SMR 2024 Hotspots



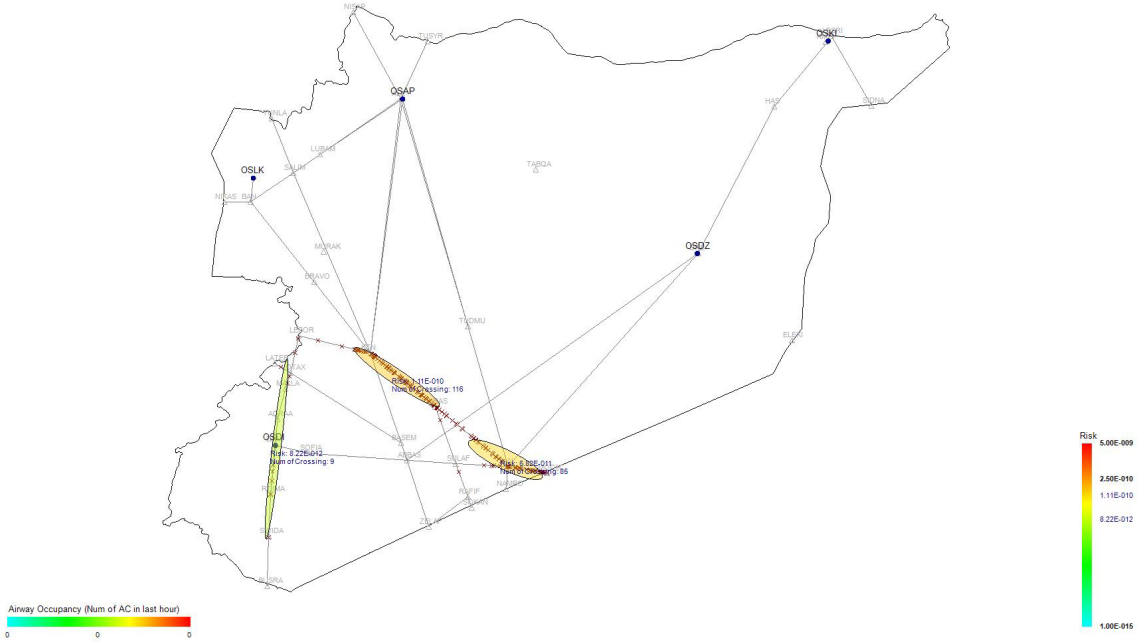
Muscat FIR SMR 2024 AWYs Occupancy



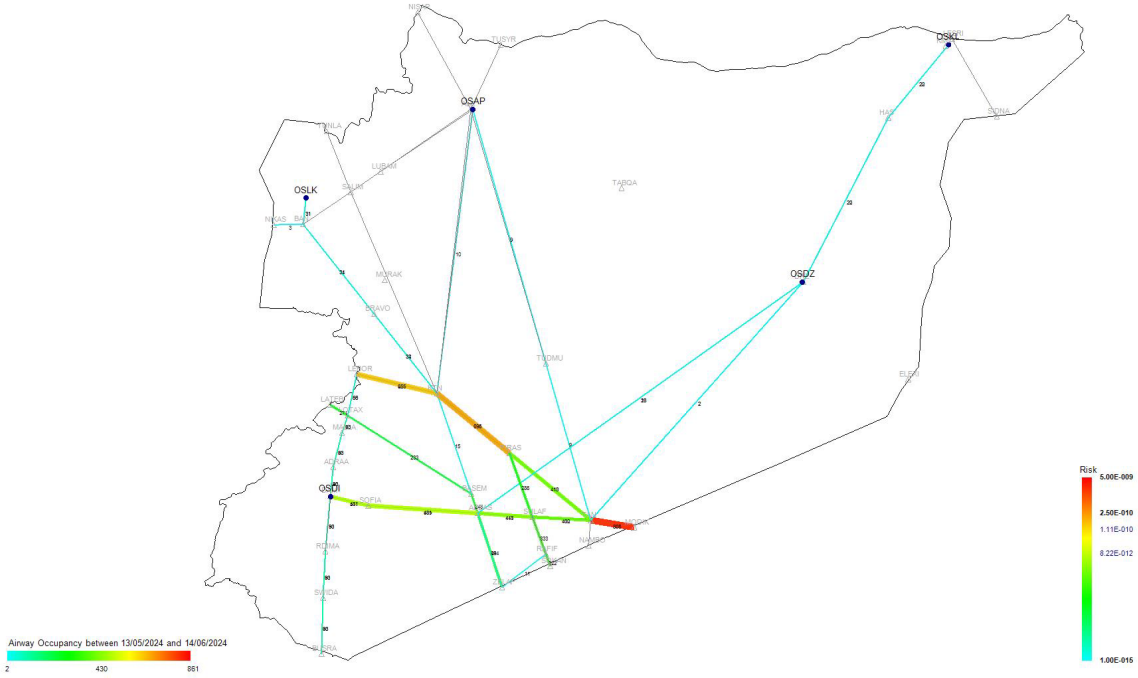
Doha FIR SMR 2024 Hotspots



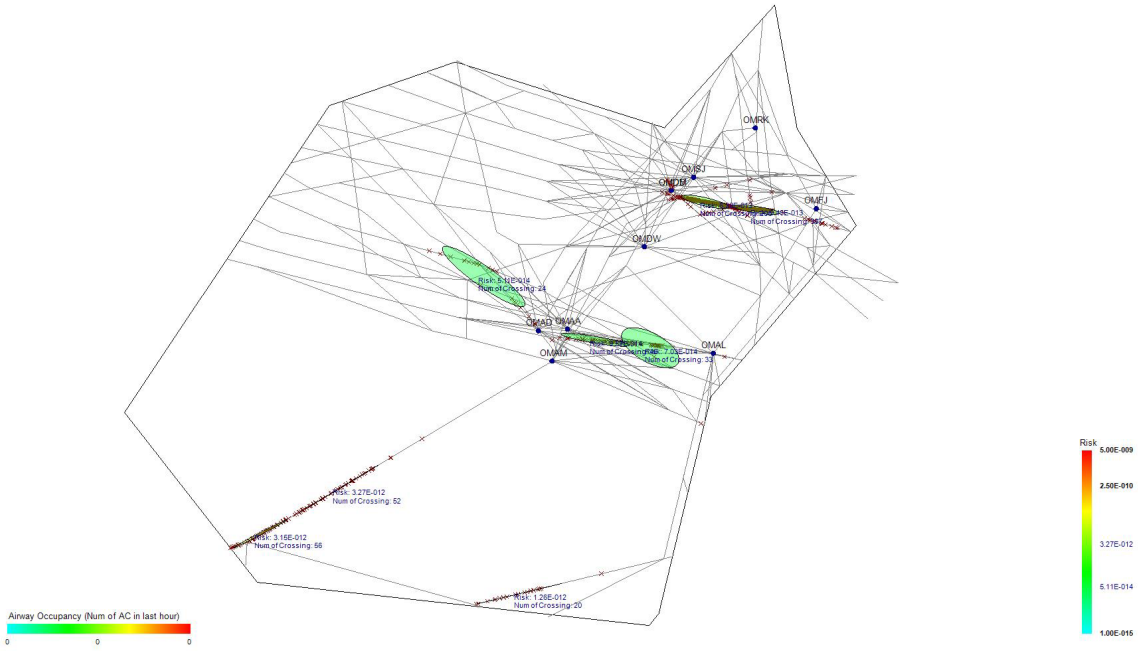
Doha FIR SMR 2024 AWYs Occupancy



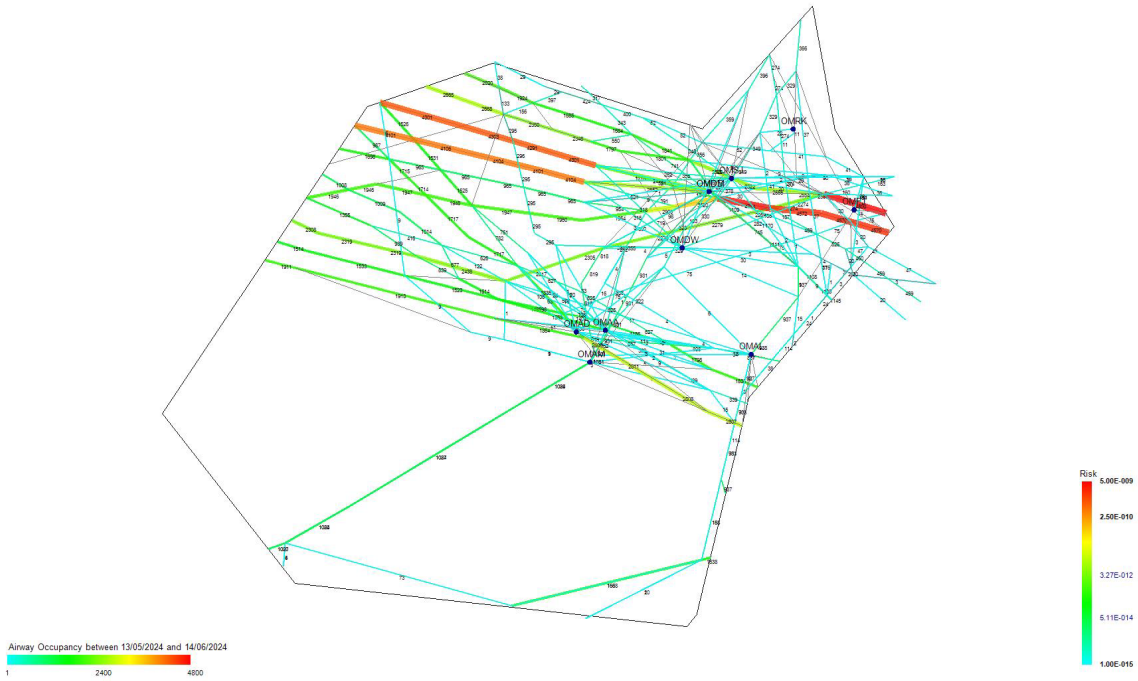
Damascus FIR SMR 2024 Hotspots



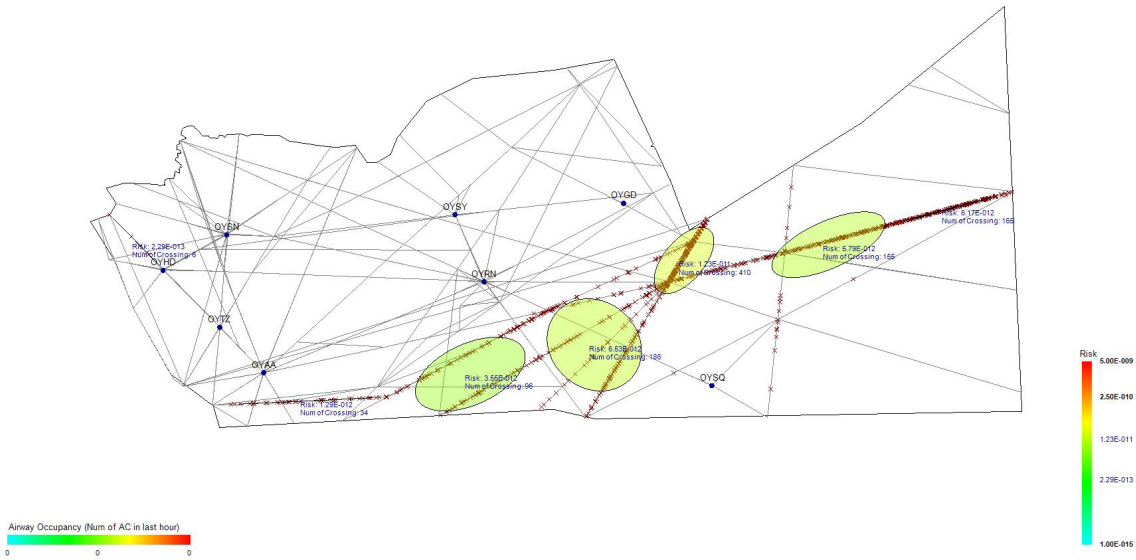
Damascus FIR SMR 2024 AWYs Occupancy



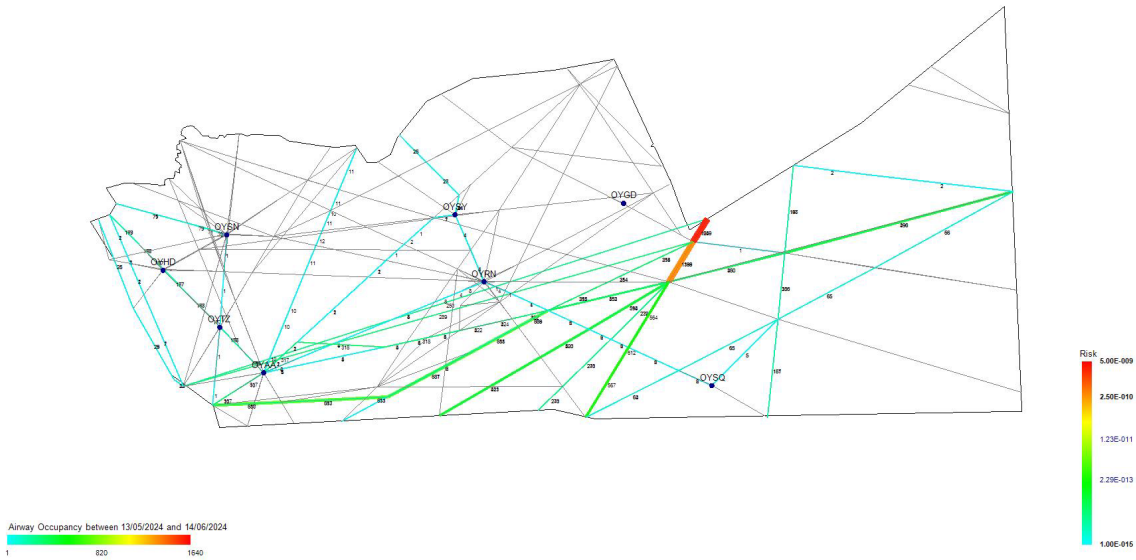
Emirates FIR SMR 2024 Hotspots



Emirates FIR SMR 2024 AWYs Occupancy



Sana'a FIR SMR 2024 Hotspots



Sana'a FIR SMR 2024 AWYs Occupancy

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