



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REPORT OF THE TWENTY-FIRST MEETING
OF THE MIDDLE EAST REGIONAL
MONITORING AGENCY BOARD**

MIDRMA Board/21

(Cairo, Egypt, 14 – 15 January 2026)

The views expressed in this Report should be taken as those of the Middle East Regional Monitoring Agency Board (MIDRMA Board) and not of the Organization. MIDANPIRG will be informed of the outcome of this Report and any formal action taken will be included in the Report of the MIDANPIRG.

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

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PART I - HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Twenty-first meeting of the Middle East Regional Monitoring Agency Board (MIDRMA Board/21) was held at the ICAO MID Office in Cairo, Egypt, on 14 and 15 January 2026.

2. OPENING

2.1 The meeting was opened by Mr. Mohamed Smaoui, Deputy Regional Director, ICAO MID Office who extended a warm welcome to all participants and wished them a pleasant stay in Cairo. Mr. Smaoui recalled briefly the main duties and responsibilities of the MIDRMA Board. He gave a brief overview of the agenda of the meeting. He reassured the commitment of ICAO to support safety enhancement activities and efficiency initiatives.

2.2 In closing, Mr. Smaoui thanked all the participants for their attendance and wished the meeting every success in its deliberations.

3. ATTENDANCE

3.1 The meeting was attended by a total of twenty-three (23) participants from eight (8) States (Bahrain, Egypt, Jordan, Libya, Qatar, Saudi Arabia, Sudan and Yemen) in addition to the MIDRMA. The list of participants is at **Attachment A**.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by Mr. Mr. Ahmed Yousif Al Malki, Director Aviation Safety and Security, Civil Aviation Authority, Bahrain.

4.2 Mr. Ahmad Amireh, Regional Officer, Air Traffic and Management and Search and Rescue (RO/ATM/SAR) and Mr. Ahmed Kavehfiroz, Regional Officer, Air Traffic Management (RO/ATM), ICAO Middle East Office, were the Secretaries of the meeting, supported by Mr. Mohamed Smaoui, ICAO MID Regional Office Deputy Regional Director. Ms. Dina El Karimy provided the technical support.

5. LANGUAGE

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

6. AGENDA

6.1 The following revised Agenda was adopted:

Agenda Item 1: Election of MIDRMA Board Chairperson

Agenda Item 2: Adoption of the revised Provisional Agenda

Agenda Item 3: Follow-up on MIDANPIRG/22 and MIDRMA Board/20 Conclusions and Decisions

Agenda Item 4: Progress Report on the MIDRMA Project

- Agenda Item 5: RVSM Monitoring and related Technical Issues
- Agenda Item 6: Future Work Programme
- Agenda Item 7: Any other Business

7. CONCLUSIONS AND DECISIONS – DEFINITION

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

- a) **Conclusions** deal with matters that, according to the Group’s terms of reference, merit directly the attention of States, or on which further action will be initiated by the Secretary in accordance with established procedures; and
- b) **Decisions** relate solely to matters dealing with the internal working arrangements of the Group and its Sub-Groups.

8. LIST OF DRAFT CONCLUSIONS AND DECISIONS

<i>MIDRMA CONCLUSION 21/1:</i>	<i>PAYMENT OF ARREARS TO THE MIDRMA PROJECT (RAB/05/802)</i>
<i>MIDRMA CONCLUSION 21/2:</i>	<i>REQUEST FOR THE TRANSFER OF USD 200,000 TO THE MIDRMA ACCOUNT IN BAHRAIN</i>
<i>MIDRMA CONCLUSION 21/3:</i>	<i>UPGRADE OF THE MIDRAS SOFTWARE TO ADD THE CAPABILITY TO PROCESS ADS-B DATA</i>
<i>DRAFT CONCLUSION 21/4:</i>	<i>MID RVSM SMR2025</i>
<i>DRAFT CONCLUSION 21/5:</i>	<i>MAINTAIN COMPLIANCE WITH MINIMUM MONITORING REQUIREMENTS (MMRS)</i>
<i>DRAFT CONCLUSION 21/6:</i>	<i>MID RVSM SMR 2026</i>
<i>DRAFT DECISION 21/7:</i>	<i>PROCEDURE OF HANDING THE ARCHIVED ADS-B DATA FOR RVSM HEIGHT MONITORING</i>
<i>DRAFT DECISION 21/8:</i>	<i>MID ADS-B HEIGHT MONITORING SYSTEM (MID AHMS)</i>
<i>DRAFT CONCLUSION 21/9:</i>	<i>MONITORING OF INTERNATIONAL STUDIES ON IMPLEMENTATION OF RVSM ABOVE FL410</i>

REPORT ON AGENDA ITEM 1: ELECTION OF CHAIRPERSON

1.1 The meeting unanimously elected Mr. Ahmed Yousif Al Malki, Director Aviation Safety and Security, Bahrain Civil Aviation Authority, as the MIDRMA Board Chairperson, in replacement of Mr. Abdullah Hassan Al Qadhi.

1.2 The meeting extended gratitude to Mr. Abdullah Hassan Al Qadhi, for his support provided to the MIDRMA since MIDRMA Board/19 meeting (Manama, Bahrain, 10 - 11 October 2023) and for the excellent management of the programme.

REPORT ON AGENDA ITEM 2: ADOPTION OF THE REVISED PROVISIONAL AGENDA

2.1 The meeting reviewed and adopted the revised Provisional Agenda as at Paragraph 6 of the History of the Meeting.

**REPORT ON AGENDA ITEM 3: FOLLOW-UP ON MIDANPIRG/22 AND MIDRMA BOARD/20
CONCLUSIONS AND DECISIONS**

3.1 The subject was addressed in WP/3 presented by the Secretariat. The meeting noted the status of relevant MIDANPIRG/22 and MIDRMA Board/20 meetings Conclusions and Decisions and the follow-up actions taken by States, ICAO and other parties concerned as at **Appendix 3A**.

REPORT ON AGENDA ITEM 4: PROGRESS REPORT ON THE MIDRMA PROJECT
MIDRMA Project (RAB/05/802) Financial Report

4.1 The subject was addressed in WP/4 presented by the Secretariat and WP/5 presented by the MIDRMA.

4.2 The meeting noted that payment requests related to the States' contributions to the MIDRMA project (RAB/05/802) for the year 2026 have been issued and circulated to Member States. The meeting reviewed the current status of States' contributions to the MIDRMA Project, as reflected at **Appendix 4A**.

4.3 The meeting noted with concern that several States had arrears related to the contribution to the project which reached USD 670,000. The meeting agreed that the MIDRMA Board Chairman, in coordination with the ICAO MID Office and the MIDRMA Team, will discuss and explore the necessary follow-up and mitigation measures with each of the States having arrears to expedite the payment of these arrears. Specifically for Iran, considering the coordination between Iran CAA and the MIDRMA Team, the meeting agreed that the MIDRMA Board Chairman coordinate with Bahrain CAA to authorize the MIDRMA Team to agree with Iran on the most effective option for the collection of Iran's arrears to the MIDRMA project. Accordingly, the meeting agreed to the following Conclusion:

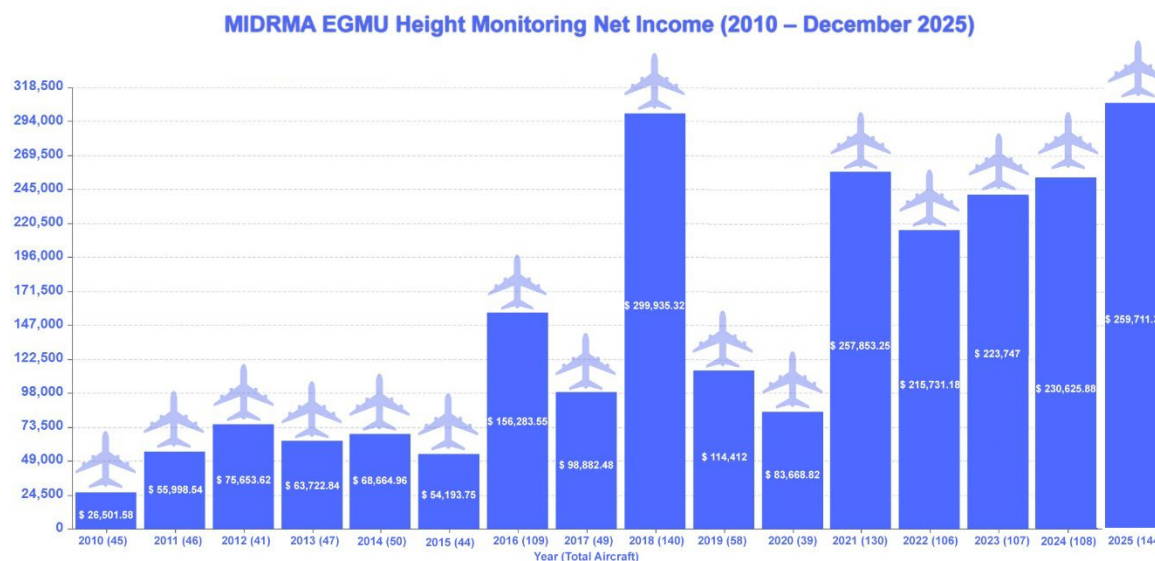
MIDRMA CONCLUSION 21/1: PAYMENT OF ARREARS TO THE MIDRMA PROJECT (RAB/05/802)

That:

- a) *the MIDRMA Board Chairman, in coordination with the ICAO MID Office and the MIDRMA Team, discuss and explore the necessary follow-up and mitigation measures with each one of the States having arrears to expedite the payment of these arrears;*
- b) *the MIDRMA Board Chairman coordinate with Bahrain CAA to authorize the MIDRMA Team to agree with Iran on the most effective option for the collection of Iran's arrears to the MIDRMA project; and*
- c) *Iran, Iraq, Kuwait, Lebanon, Sudan, Syria and Yemen be urged to pay their contributions/arrears to the MIDRMA Project prior to 31 May 2026.*

4.4 The meeting noted that during the period of 1 January to 31 October 2025, the MIDRMA conducted GMU monitoring for 144 Aircraft, generating a total revenue of USD 259,711.37, which was a new record for the MIDRMA GMU monitoring.

4.5 The meeting noted that since 2010, MIDRMA has managed to generate income from successful GMU height monitoring missions for 1227 aircraft, as reflected in Graph 1. The total amount credited to the MIDRMA account is used in the development of tools for the MIDRMA activities and covers some of the operational expenses. In accordance with the **2026** Plan for GMU monitoring activities, and due to the implementation of ADS-B and the commencement of processing ADS-B data from certain States, estimating expected income has become challenging. Current projections indicate an approximate income of USD 62,000.00, though this figure may vary significantly.



Graph 1: Income generated from the EGMU RVSM height monitoring missions

4.6 The meeting recalled the planning for new MIDRMA Staff members and the associated training requirements. In this respect, the meeting noted with appreciation that Bahrain CAA provided (seconded) potential ATCO candidates to be trained on the MIDRMA duties and activities; accordingly, the MIDRMA started the training leading for a transition handover.

4.7 The meeting appreciated the support provided by Bahrain CAA, that will continue to pay the salaries of the Staff who will be trained and assigned to the MIDRMA at a later stage; and authorized the MIDRMA Chairperson to cover the additional training costs/allowance for the trainees (including travel missions to attend the relevant meetings) from the MIDRMA budget, if deemed necessary.

4.8 The meeting noted that the current balance available in the MIDRMA bank accounts was as follows:

- the fund balance of the MIDRMA account managed by ICAO HQ (RAB/05/802) as of 31 December 2025: **USD 808,478.**
- the fund balance of the MIDRMA bank account in Bahrain as of 31 December 2025: **USD 296,310.02**

4.9 Based on all the above, the meeting reviewed and approved the financial report of the MIDRMA project (RAB/05/802) for the years 2024 and 2025.

4.10 Additionally, the meeting reviewed and approved the MIDRMA preliminary budget estimation for the year 2026.

4.11 The meeting recalled the discussion during the last Board meeting, particularly the MIDRMA DECISION 20/3: MIDRMA Financial Documentation.

4.12 The meeting noted with appreciation the proposed financial form developed by the MIDRMA in consultation with the accounting department in Bahrain CAA, incorporating the simple presentation of the expenditure and budget estimates for a cycle of 3 years. The form has been populated with the available data to provide a more comprehensive and presentable financial overview for the Board members, covering all operational expenditures and all sources of income from member States'

contributions and EGMU missions. The meeting reviewed the forms and requested the MIDRMA team to implement the forms in the coming cycles to be presented to the Board members.

4.13 The meeting appreciated that the financial documentations including expenses for the previous cycles and estimated expenses for the upcoming cycle were shared with the Board members prior to the meeting for revision.

4.14 Based on all the above, and considering the expected budget limitations during the coming cycle, the meeting agreed on the following Conclusion:

***MIDRMA CONCLUSION 21/2: REQUEST FOR THE TRANSFER OF USD 200,000
TO THE MIDRMA ACCOUNT IN BAHRAIN***

That, the MIDRMA Board Chairperson is delegated the authority to request the transfer of the amount of USD 200,000 from the MIDRMA account managed by ICAO HQ to the MIDRMA Bank account in Bahrain by March 2026.

Project Proposal for the Middle East Risk Assessment Software with ADS-B Integration and Response (MIDRAS AIR)

4.15 The subject was addressed in WP/6, presented by the MIDRMA.

4.16 The meeting recalled that the collision risk assessments within the Middle East RVSM airspace have relied primarily on Traffic Data Samples (TDS) submitted by member States. While this approach has enabled MIDRMA to meet its safety monitoring obligations, the air traffic volumes in the ICAO MID Region continue to grow in complexity and density, increased challenges related to the availability of accurate, timely, and representative traffic data remains a critical factor in maintaining acceptable levels of safety. In addition, the manually collected traffic data might be subject to limitations, including missing records, data inconsistencies, and processing delays, which can affect the precision of risk calculations.

4.17 The meeting noted that the MIDRMA proposes the enhancement of the existing Middle East Risk Assessment Software (MIDRAS) through the integration of Automatic Dependent Surveillance–Broadcast (ADS-B) technology, resulting in the upgraded system referred to as ADS-B Integration and Response (MIDRAS AIR). The integration of ADS-B would enable the use of high-frequency, four-dimensional (4D) trajectory data, providing a more accurate and operationally representative basis for collision risk assessment in RVSM airspace.

4.18 The meeting recognized that the surveillance environment within the Middle East Region is diverse, including the level of equipage of aircraft operating in RVSM airspace with ADS-B transmissions. Certain categories of traffic operations, including State, military, VIP, private, or non-equipped aircraft, may not be fully captured through ADS-B surveillance alone. A comprehensive safety assessment framework must therefore ensure that all relevant air traffic is appropriately represented, irrespective of the surveillance source.

4.19 The meeting underlined that the proposed MIDRAS-AIR solution should be designed to support the use of multiple traffic data sources. While prioritizing ADS-B data where available for its superior accuracy and timeliness, the system would retain the capability to incorporate conventional flight plan and legacy traffic data (TDS) to ensure complete traffic representation. This integrated approach enables MIDRMA to enhance risk assessment accuracy while preserving the completeness, resilience, and regulatory integrity of RVSM safety monitoring activities.

4.20 The meeting reviewed the technical proposal, at **Appendix 4B**, including the proposed scope, technical approach, implementation plan, and the associated cost effectiveness of the project, at **Appendix 4C**.

4.21 The meeting underlined that for effective implementation of the proposed MIDRAS AIR analysis software, the States should be committed to the submission of ADS-B data for analysis. While the conventional TDS would remain available. Accordingly, the MIDRMA should be equipped with appropriate tool/software to process ADS-B data for risk assessment/monitoring activities. Accordingly, the meeting agreed to go ahead with the upgrade of the MIDRAS as per the **Appendices 4B** and **4C**; and requested the MIDRMA Team and Board Chairman to keep the Board members apprised of the progress. An update and progress Report should be presented to the MIDRMA Board/22 meeting. Accordingly, the meeting agreed to the following Conclusion:

**MIDRMA CONCLUSION 21/3: UPGRADE OF THE MIDRAS SOFTWARE TO
ADD THE CAPABILITY TO PROCESS ADS-B
DATA**

That:

- a) *the MIDRMA team is authorized to proceed with the upgrade of the MIDRAS to add the capability to process ADS-B data, as per the Appendices 4B and 4C; and*
 - b) *a progress Report on the subject be presented to the MIDRMA Board/22 meeting.*
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REPORT ON AGENDA ITEM 5: RVSM MONITORING AND RELATED TECHNICAL ISSUES***MID RVSM Safety Monitoring Activities***

5.1 The subject was addressed in WP/7, presented by the MIDRMA.

5.2 The meeting noted that throughout 2025, the MIDRMA continued to enhance its coordination with Member States, operators, and airworthiness authorities, while maintaining transparency through the publication of Minimum Monitoring Requirements and monitoring results on the MIDRMA website. These efforts contribute directly to sustaining an acceptable level of safety within RVSM airspace across the Middle East Region and beyond.

Operational Complexity of EGMU Height Monitoring

5.3 Although EGMU height monitoring is a highly effective and globally accepted method for verifying RVSM height-keeping performance, the practical execution of EGMU monitoring missions is not routine work. Each mission requires extensive preparations by the MIDRMA team and strong, coordinated support from multiple stakeholders to ensure safe, secure, and timely completion of monitoring activities. In addition to technical readiness, MIDRMA missions require prior coordination with:

- i. The Civil Aviation Authority and the designated Airworthiness/Flight Safety focal points.
- ii. Airline operators and engineering/maintenance teams.
- iii. Airport authorities and ramp access control, and
- iv. Airport security and airport customs.

5.4 Handling EGMU equipment, gaining airside access, and arranging movement of technical devices through airports is challenging, particularly when procedures differ from one airport to another. In many cases, the process requires patience, clear official facilitation, and continuous follow-up to prevent delays that could jeopardize the mission schedule.

Overview of 2025 EGMU Monitoring missions

5.5 The meeting noted with appreciation, that during the period 1 January to 31 December 2025, the MIDRMA has conducted a total of 144 EGMU monitoring missions. This represents a very intensive operational year requiring careful mission planning, travel coordination, technical readiness, and sustained engagement with States and operators to meet RVSM Minimum Monitoring Requirements (MMR).

Height Monitoring Missions of Iran RVSM-Approved Aircraft

5.6 The MIDRMA reported the successful monitoring of 71 Iranian-registered RVSM-approved aircraft using EGMU. This figure constitutes the largest single-State RVSM monitoring effort undertaken by MIDRMA during the year. By this achievement the total number of Iranian-registered RVSM-approved aircraft height-monitored since the granting of the OFAC licence renewal has reached 107 aircraft. This leaves only six (6) remaining Iranian RVSM-approved aircraft to be height-monitored in order for Iran to achieve full compliance with RVSM height monitoring requirements, which is considered as a historic achievement of the level of RVSM monitoring for Iranian-registered aircraft. The meeting appreciated the efforts by Iran CAA officials in facilitating the aircraft monitoring.

OFAC Licence Renewal and Proposal to Remove the OFAC Requirement

5.7 The MIDRMA highlighted that the ability to conduct monitoring of Iranian-registered aircraft remains directly linked to the OFAC licence issued by the United States Department of the Treasury. Noting that the current licence is valid until 31 July 2026. The MIDRMA has already initiated the renewal process through the official OFAC website. This renewal process is complex and time-consuming, and despite submitting the request, MIDRMA has not yet received confirmation or feedback.

5.8 The MIDRMA underlined that any interruption or delay in receiving the licence renewal would immediately be reflected into a growing number of unmonitored aircraft, which would negatively affect RVSM compliance levels and could ultimately impact RVSM safety performance in the MID Region and beyond.

5.9 The meeting was informed about the planned meeting between the MIDRMA and the US Department of Treasury to discuss the subject of OFAC Licence.

5.10 The meeting supported the MIDRMA efforts aimed at eliminating any administrative barriers, noting that RVSM monitoring is a safety-driven requirement, and that the Region's ability to verify compliance should not be exposed to uncertainty, long delays, or potential disruptions caused by external administrative processes.

Height Monitoring Missions of Iraq RVSM-Approved Aircraft

5.11 The meeting noted that during 2025, MIDRMA successfully conducted several height monitoring missions for Aircraft registered in Iraq, Saudi Arabia and Syria. The MIDRMA appreciated the support provided from the relevant CAA Authorities in keeping the MMR up to date and in facilitating the GMU missions.

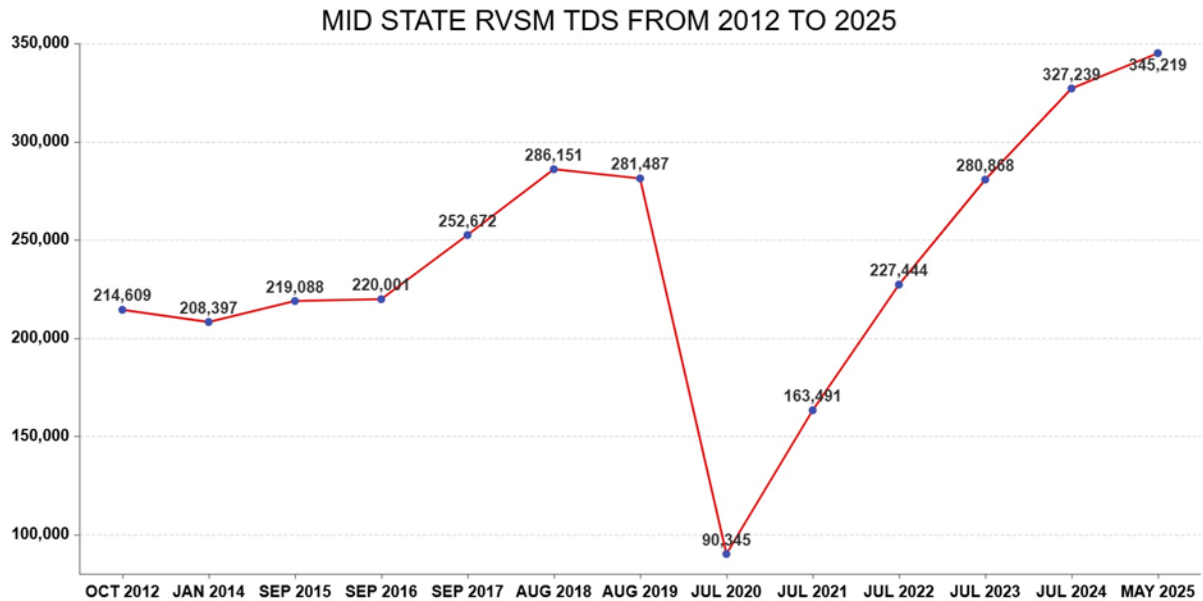
Results of the MID RVSM SMR 2025

5.12 The subject was addressed in WP/8, presented by the MIDRMA.

5.13 The meeting reviewed the results of the SMR 2025 developed by the MIDRMA as at **Appendix 5A**. The meeting noted that RVSM Safety Objective No. 1 (technical height-keeping performance) and Safety Objective No. 2 (overall collision risk) have been achieved. The calculated technical risk and overall risk values remain significantly below the ICAO Target Levels of Safety, indicating that aircraft height-keeping performance and regional RVSM operations remain stable and safe.

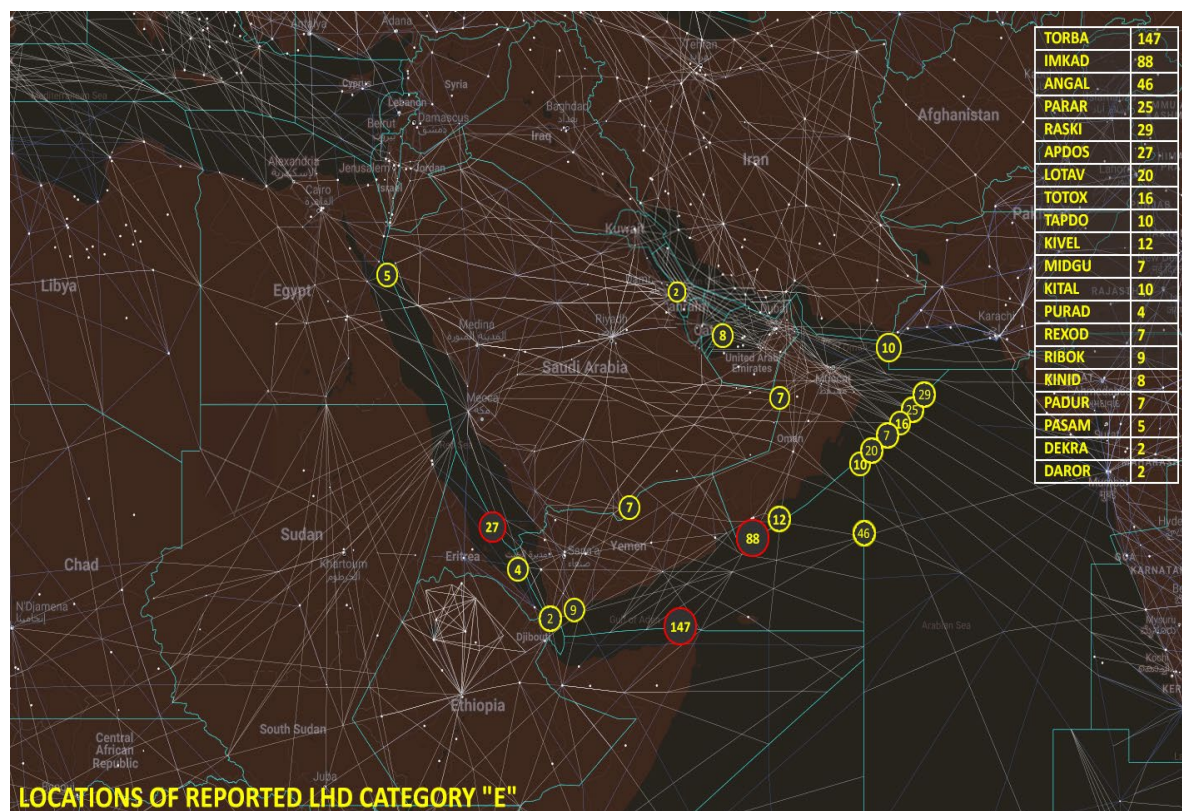
Note: Damascus FIR was excluded from the RVSM safety analysis due to lack of data submission.

5.14 The meeting noted that the amount of traffic in the MID Region continues to increase, as reflected in the graph below:



5.15 The meeting noted the increasingly complex and highly congested traffic within Muscat FIR, which for the fourth consecutive year, remains the most complex and congested FIR in the Middle East Region. During the reporting period, a noticeable increase in technical risk indicators has been observed within the Muscat FIR, largely attributable to the sustained growth in traffic density and operational complexity. Notwithstanding these challenges, the overall safety performance of the airspace remains robust, reflecting the continued commitment and professionalism of Oman's Air Traffic Services in maintaining RVSM operations at a high standard. The observed trends highlight the importance of continued vigilance, proactive risk mitigation measures, and close coordination among all stakeholders, to ensure that safety levels are preserved as traffic demand continues to evolve.

5.16 The meeting noted that the SMR2025 report identifies continued deficiency in the submission of Large Height Deviation (LHD) reports, particularly in operationally critical categories related to flight crew actions, ATC errors, and TCAS events (LHD Categories other than Cat E). This low level of reporting significantly reduces the confidence level of the operational risk component and limits the ability to identify emerging safety trends. Similar challenges persist with incomplete or late Traffic Data Sample (TDS) submissions, especially from high-traffic FIRs, which affects the accuracy of exposure calculations. The reported LHD are reflected geographically below:



5.17 The meeting noted that the SMR2025 also highlighted persistent coordination-related safety issues at specific FIR interfaces, notably at the eastern boundaries of Muscat FIR and within the Sana'a FIR coordination environment. Despite existing safety protocols, these issues continue to generate a high volume of coordination-related deviations, indicating the need for strengthened corrective actions.

5.18 The meeting noted with concern that the increased number of LHDs between Muscat and Mumbai persisted throughout 2025. Although several corrective and preventive measures have been implemented since the introduction of the RVSM safety protocol, the number of exchanged LHD reports remains unacceptably high. While a slight reduction was observed during the first half of 2025 compared with 2024, the figures continue to exceed acceptable safety thresholds.

5.19 This sustained trend indicates that the issue is systemic rather than sporadic, noting that existing mitigation measures have not yet achieved their intended safety outcomes. Without the implementation of more robust and sustained corrective actions, the situation will continue to pose a significant safety risk to RVSM operations at this critical FIR interface.

5.20 Enhanced coordination procedures, improved data-sharing mechanisms, implementation of some airspace management improvements and strengthened monitoring and investigation processes are urgently required to ensure that corrective actions result in measurable and lasting safety improvements.

5.21 The meeting noted the analysis of the LHD reports between Muscat and Mumbai and encouraged Oman to take necessary measures to mitigate the root causes of the reports.

5.22 The meeting was informed about the planned ATM Special Coordination Meeting scheduled for 1 – 5 February 2026 in Muscat, to discuss the increased number of LHD Reports between Muscat and Mumbai; and to discuss further mitigation measures to reduce complexity of the operations at the interface.

5.23 The meeting noted with concern that a continued and concerning increase in LHD reports between Sana'a FIR and its adjacent FIRs. The continuing rise in LHD occurrences, particularly between Sana'a and Muscat FIRs, reflects unresolved deficiencies in handover coordination, flight level verification, and real-time communication procedures. Unless decisive corrective actions are implemented, these deviations may compromise the long-term safety of RVSM operations within the affected airspace.

5.24 The meeting noted that a limited number of non-RVSM-approved aircraft were identified during the 2025 monitoring cycle. The MIDRMA reported that these cases were generally attributed to administrative delays or temporary lapses in approval validity, rather than intentional non-compliance. Member States were therefore urged to ensure that RVSM approval databases are maintained accurately and updated promptly.

5.25 The meeting noted the MID RVSM SMR2025 Hotspots and Airways occupancy rate; and encouraged the relevant States to consider the results in the planning of their airspace structures and operations.

5.26 The meeting noted the MID RVSM Minimum Monitoring Requirements (MMRs) for the Aircraft registered in the MID States, and appreciated the efforts of the States and the MIDRMA for reaching 96% of compliance.

5.27 Based on all the above, the meeting agreed on the following Draft Conclusions:

DRAFT CONCLUSION 21/4: MID RVSM SMR2025

That, the MID RVSM Safety Monitoring Report (SMR) 2025 at Appendix 5A, be presented to MIDANPIRG for endorsement.

DRAFT CONCLUSION 21/5: MAINTAIN COMPLIANCE WITH MINIMUM MONITORING REQUIREMENTS (MMRs)

That Iraq, Libya, Sudan, and Syria be urged to ensure that all aircraft subject to monitoring obligations are complying with the RVSM minimum monitoring requirements in timely manner.

5.28 The meeting urged States to take necessary measures to implement the recommendations included in the SMR2025.

5.29 The meeting expressed appreciation to the Civil Aviation Authorities of Bahrain, Iraq, and the UAE for their consistent and high-quality data submissions on monthly basis, which remain essential for effective regional safety oversight.

Development of MID RVSM SMR 2026

5.30 The subject was addressed in WP/9, presented by the MIDRMA.

5.31 The meeting agreed that the reporting cycle for the development of SMR 2026 spans from 1st January till 31st December 2026. To facilitate this, the Traffic Data Sample (TDS) must be submitted in the prescribed format, utilizing the dedicated Excel sheet designed for the MIDRMA Risk Analysis Software (MIDRAS AI).

5.32 The meeting agreed to the following timelines for the collection of RVSM Traffic Data Sample (TDS) for the development of SMR 2026 from all MIDRMA Member States:

- a. Collect RVSM Traffic Data Sample (TDS) for the period of **15th April till 15th May 2026** (during the Haj season) for SMR 2026 development and submit it to MIDRMA by 15th June 2026.
- b. Collect Large Height Deviation (LHD) Reports for the SMR 2026 reporting cycle spanning from 01st January till 31st December 2026.
- c. Collect from each member State the list of FIR waypoints and their FIR routing options valid for the same TDS period.

5.33 The meeting stressed on the importance of timely submission of accurate and complete TDS as a critical requirement for maintaining confidence in the regional safety assessment results. Repeated delays or incomplete data submissions adversely affect the accuracy of the calculations and may cause postponement of the report's issuance.

5.34 The meeting also urged States to continue submitting Large Height Deviation (LHD) reports in accordance with ICAO Doc 9937, particularly those in categories A, B, C, D, J, and K, which directly affect RVSM safety performance.

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

DRAFT CONCLUSION 21/6: MID RVSM SMR 2026

That,

- a) *the FPL/traffic data for the period 15th April – 15th May 2026 be used for the development of the MID RVSM Safety Monitoring Report (SMR 2026);*
- b) *all member States are required to submit the required Traffic Data Sample (TDS), the LHD Reports and the FIR waypoints and the routing options valid for the same period of the TDS in a), in a timely manner;*
- c) *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*
- d) *the final version of the MID RVSM SMR 2026 be ready for presentation and endorsement by MIDANPIRG/24 meeting.*

Use of Archived ADS-B Data for the ADS-B Height Monitoring System (AHMS)

5.36 This subject was addressed in WP/10, presented by the MIDRMA.

5.37 The meeting recalled MIDANPIRG Decision 21/16 related to the implementation plan of the MID ADS-B height Monitoring System (MID AHMS):

*MIDANPIRG DECISION 21/16: MID ADS-B HEIGHT MONITORING SYSTEM
(MID AHMS)*

That,

- a) States implementing ADS-B to share the archived data with the MIDRMA for evaluation and analysis;*
- b) MIDRMA to coordinate with MAAR for:

 - i. sharing their experience in evaluating and analyzing samples of the received ADS-B data; and*
 - ii. providing required training related to AHMS implementation for MIDRMA Staff;**
- c) MIDRMA to develop a mechanism and tools for submitting the ADS-B data by States;*
- d) MIDRMA provides the required training for CNS engineers from member states responsible for extracting ADS-B data from their systems and submitting it to MIDRMA at regular, mutually agreed intervals;*
- e) MIDRMA to develop and document all required processes and procedures to be reflected in the training Manuals for the AHMS implementation, to be incorporated in the MIDRMA Tasks and responsibilities;*
- f) MIDRMA shall continue to provide GMU monitoring service until the AHMS is fully operational, and for the Aircraft not included in the MID-AHMS; and*
- g) the funding mechanism (including services charges) might be revised accordingly (based on cost -recovery basis). In accordance with ICAO Policies on charges for Airports and Air Navigation Services (Doc 9082), in coordination with IATA.*

5.38 The meeting noted with appreciation that the MIDRMA has achieved notable progress in the implementation of the Regional ADS-B Height Monitoring System (AHMS) requirements, particularly the implementation and technical validation of AHMS methodology in cooperation with several Civil Aviation Authorities (CAAs) in the Region. The validation demonstrated the system capability to generate reliable and repeatable height-monitoring results across a wide range of aircraft types and operational environments.

5.39 The meeting expressed appreciation to the CAAs of Bahrain, Kuwait and Oman, for the valuable cooperation and contribution to the success of the AHMS validation phase. The results confirmed the effectiveness of ADS-B data in monitoring aircraft height-keeping performance and in supporting ICAO's global safety objectives.

5.40 The meeting noted the challenges of requesting, transferring, and handling archived ADS-B data submitted by the States, including the data ownership, protection, and the lack of legal framework. In some cases, administrative delays and differing national data-handling regulations have hindered the timely receipt of data required for analysis.

5.41 The meeting underlined the need of uniformity in AHMS implementation across the MID Region, and to establish a common understanding and formal agreement among all MIDRMA Member States regarding the use of archived ADS-B data. Accordingly, it was agreed that the same terms and conditions applicable to the Traffic Data Sample (TDS) submitted by the States for the use of RVSM risk analysis be applicable for the use of ADS-B data, to ensure that the ADS-B data is used solely for RVSM height monitoring, safety and risk analysis purposes, under the same data-handling and confidentiality provisions currently applied for TDS.

5.42 Based on the above, the meeting agreed on the following Decision:

DRAFT DECISION 21/7: PROCEDURE OF HANDING THE ARCHIVED ADS-B DATA FOR RVSM HEIGHT MONITORING

That,

- a) archived ADS-B data provided to the MIDRMA be used under the same terms and conditions applicable to the RVSM Traffic Data Samples (TDS) for the purpose of RVSM risk and safety analysis, solely;*
- b) such data shall be used exclusively for MIDRMA analytical purposes and shall not be shared with any third party unless prior written approval is obtained by the concerned Civil Aviation Authority (CAA); and*
- c) the MIDRMA shall ensure the confidentiality and secure handling of all received data.*

5.43 The meeting underlined the need to retain the conventional height keeping mechanism (GMU) for the Aircraft not included in the MID-AHMS.

Establishment of a regional criteria for valid Height Monitoring using the ADS-B Height Monitoring System (AHMS)

5.44 This subject was addressed in WP/11, presented by the MIDRMA.

5.45 The meeting recalled the benefits of the AHMS monitoring, which were confirmed during the testing and validation phases. The AHMS was found capable of supporting large-scale, routine RVSM monitoring activities. AHMS enables the accumulation of multiple independent monitoring results for individual aircraft through normal flight operations, thereby enhancing the statistical confidence in the assessment of long-term aircraft height-keeping performance. In addition, AHMS was able to collect monitoring results through routine flight operations, without requiring special flight planning or dedicated airborne equipment, makes it a highly efficient and cost-effective solution for long-term RVSM compliance monitoring across the Middle East Region.

5.46 Notwithstanding, the meeting noted that there is currently no globally defined requirement specifying the minimum number of valid AHMS monitoring observations/records necessary for an aircraft to be formally recognized as successfully height-monitored for RVSM purposes. In the absence of such guidance, Regional Monitoring Agencies (RMAs) were required to establish their own operational criteria to ensure consistency, reliability, and transparency in the application of AHMS.

5.47 To address this gap and promote harmonized implementation within the ICAO Middle East Region, the MIDRMA proposed the establishment of a standard regional criteria defining the minimum number of valid AHMS monitoring results required to confirm an aircraft's RVSM height-keeping performance. This proposed criteria is based on MIDRMA technical studies, operational experience, and statistical analysis and is intended to ensure an appropriate balance between data sufficiency, monitoring reliability, and operational practicality.

5.48 The results of the MIDRMA study demonstrated that a minimum of five (5) valid AHMS monitoring results per aircraft provides an optimal balance between statistical reliability and operational practicality. This threshold ensures sufficient independent samples to confirm the long-term stability of an aircraft's height-keeping performance while allowing results to be accumulated naturally through normal flight operations.

5.49 When five (5) such valid monitoring results are obtained, preferably within a defined operational time window and across varied traffic conditions or routes, the aircraft might be considered applicable for height-monitored using AHMS.

5.50 Based on all the above the meeting agreed on the following Draft Conclusion, to supersede the MIDANPIRG DECISION 21/16:

***DRAFT DECISION 21/8: MID ADS-B HEIGHT MONITORING SYSTEM
(MID AHMS)***

That, AHMS be implemented by the MIDRMA for RVSM Height Monitoring of Aircraft, using the ADS-B data submitted by the States, considering the following Criteria:

- a) minimum of five (5) valid AHMS observations meeting ASE and TVE validation thresholds should be established during a maximum period of ninety (90) days; and*
- b) MIDRMA to:*
 - i. coordinate with Member States for the collection of the available archived ADS-B data from their CNS/ATM systems, in accordance with the procedure of handing archived ADS-B data;*
 - ii. maintain active record keeping system of the aircraft registered within the MID Region;*
 - iii. provide the required training to the ATM/CNS personnel on the extract and submission of the data; and*
 - iv. provide the required briefing to the responsible CAA airworthiness inspectors and aircraft operators*
- c) MIDRMA member States be:*
 - i. encouraged to regularly submit the archived ADS-B data to the MIDRMA; and*
 - ii. inform the concerned aircraft operators of this standard criteria and its application for RVSM height-monitoring recognition using AHMS.*

Exploring RVSM Expansion above FL410

- 5.51 This subject was addressed in WP/12, presented by the MIDRMA.
- 5.52 The meeting recalled that the Reduced Vertical Separation Minimum (RVSM) has been successfully implemented between FL290 and FL410 across all ICAO regions, providing significant airspace capacity and fuel-efficiency benefits while maintaining the Target Level of Safety (TLS).
- 5.53 The meeting recalled the discussion at the ICAO Separation and Airspace Safety Panel (SASP) and within the North American region regarding the evolution of aircraft capabilities, and the potential to expand RVSM above FL410, where separation currently reverts to 2,000 ft.
- 5.54 The meeting noted that FAA, NAARMO, and NAV/CANADA have initiated detailed analyses and data-collection efforts to assess ASE performance and operational feasibility above FL410. The meeting was informed about the outcomes of the ASE Technical Interchange Meeting (TIM) which was conducted in Seattle, USA in September 2025 to consolidate results from these studies and to identify challenges, including aircraft certification, flight-planning codes, and meteorological modelling at higher altitudes.
- 5.55 The meeting recognized the importance for the MIDRMA, as the Regional Monitoring Agency for the ICAO Middle East Region, to remain informed and technically aligned with these global studies, as any future expansion of RVSM levels will directly influence regional monitoring procedures, risk modelling, and height-keeping methodologies (including the AHMS).
- 5.56 The MIDRMA informed the meeting that the ongoing development of the ADS-B Height Monitoring System (AHMS), would enable the analysis to cover higher levels than FL410. Additionally, the MIDRMA highlighted additional challenges including:
- a. Aircraft types not originally certified for RVSM above FL410 may require re-certification or additional airworthiness demonstration; and
 - b. Air traffic management systems and flight-planning tools may need to recognize a distinct RVSM filing code for aircraft authorized above FL410; and
 - c. Controller training and airspace design would need review to ensure correct vertical separation logic is maintained.
- 5.57 The meeting encouraged the MIDRMA to coordinate with the ICAO SASP and relevant RMAs on this subject; and to develop a regional study using the available data and tools to support the expansion of RVSM layer.
- 5.58 The meeting also encouraged the MID States to provide the required data regarding operations above FL410 to the MIDRMA (in particular ADS-B data) to support the development of the Study.
- 5.59 Based on the above, the meeting agreed to the following Draft Conclusion:
- DRAFT CONCLUSION 21/9: MONITORING OF INTERNATIONAL STUDIES ON IMPLEMENTATION OF RVSM ABOVE FL410***
- That,*
- a) *the MIDRMA continue to coordinate with the ICAO SASP, FAA/NAARMO, and other RMAs to remain informed on the progress and potential implications*

for the Middle East Region related to the implementation of RVSM above FL 410; and

- b) the MIDRMA Member States are strongly encouraged to provide on a monthly basis the ADS-B data or if not possible, the traffic data (TDS), for the aircraft operating above FL410 to support the MIDRMA's research and analysis activities in this domain.*

REPORT ON AGENDA ITEM 6: FUTURE WORK PROGRAMME***Date and Venue of the next Meeting***

6.1 The meeting recalled that the MIDRMA Board meetings should be hosted by the MIDRMA Member States on rotational basis.

6.2 The meeting agreed that the MIDRMA Board/22 meeting be held during Q1/2027 taking into account the Regional and Global events.

6.3 The meeting noted with appreciation the offer received from Egypt to host the MIDRMA Board/22 meeting. The exact date would be coordinated between the ICAO MID Office, the MIDRMA Board Chairman and the MIDRMA team.

REPORT ON AGENDA ITEM 7: ANY OTHER BUSINESS

Update of the List of MIDRMA Board Members and Alternates

7.1 The meeting reviewed and updated the list of MIDRMA Board Members, Alternates and Focal Points (ATC and Airworthiness/Flight Operations) as at **Appendix 7A**.

7.2 The meeting requested the ICAO MID Office to send reminders to the concerned States to update their list of Focal Points.

APPENDICES

FOLLOW-UP ACTION PLAN ON MIDRMA BOARD/20 CONCLUSIONS AND DECISIONS

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY DELIVERABLE		TARGET DATE	STATUS/REMARKS
<p><i>MIDRMA CONCLUSION 20/1: PAYMENT OF ARREARS TO THE MIDRMA PROJECT (RAB/05/802)</i></p> <p><i>That, States, that have not yet done so, be urged to pay their contributions/arrears to the MIDRMA Project prior to 31 January 2025.</i></p>	<p>To urge States to pay the contributions/arrears to the MIDRMA Project</p>	<p>Payments of contribution/arrears</p>	<p>MID States</p>	<p>31 January 2025</p>	<p>Completed</p> <p>Payment requests have been issued and circulated to the member states</p>
<p><i>DRAFT CONCLUSION 20/2: REQUEST FOR THE TRANSFER OF USD 200'000 TO THE MIDRMA ACCOUNT IN BAHRAIN</i></p> <p><i>That the MIDRMA Board Chairperson has delegated the authority to request the transfer of the amount of US\$ 200,000 from the MIDRMA account managed by ICAO HQ to the MIDRMA Bank account in Bahrain by March 2025.</i></p>	<p>To support the MIDRMA account in Bahrain</p>	<p>Transfer of the amount to the MIDRMA bank account in Bahrain</p>	<p>ICAO HQ/CDI</p>	<p>March 2025</p>	<p>Completed</p> <p>Secretariat communicated with ICAO HQ/CDI for the transfer</p>
<p><i>MIDRMA DECISION 20/3: MIDRMA FINANCIAL DOCUMENTATION</i></p> <p><i>That, the MIDRMA consult an accountant to develop necessary financial process and documentation that support the MIDRMA Board fulfilling its mandate.</i></p>	<p>To support the MIDRMA board in fulfilling its mandate</p>	<p>Consult accredited accountant</p>	<p>MIDRMA Chairperson</p>		<p>Closed</p>
<p><i>MIDRMA CONCLUSION 20/4: MIDRMA BUSINESS CONTINUITY AND SUSTAINABILITY STRATEGIC PLAN, VER: 1.0</i></p> <p><i>That, the "MIDRMA Business Continuity and sustainability Strategic Plan" Ver.: 1.0, at Appendix 3B, is endorsed.</i></p>	<p>To ensure the MIDRMA project continuity and sustainability</p>				<p>Completed</p>
<p><i>DRAFT CONCLUSION 20/5: REPORTING OF LHDS</i></p> <p><i>That, in order to assess compliance with Safety Objective 2, the MIDRMA Member States be urged to:</i></p> <p><i>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</i></p>					<p>Superseded by MIDANPIRG CONCLUSION 22/8</p>

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY DELIVERABLE		TARGET DATE	STATUS/REMARKS
<p><i>the LHD Online LHD Reporting Tool available on the MIDRMA website (https://midrma.com/lhd/home/login);</i></p> <p><i>b) b) provide urgently, not later than 15 January 2025, their reported LHDs at least from 1 January 2024 (related to the above LHD Categories) to the MIDRMA for the development of the MID RVSM Safety Monitoring Report – 2024 and to ensure that RVSM implementation continue to be safe in the MID Region;</i></p> <p><i>c) coordinate with MIDRMA, as required;</i></p> <p><i>d) MIDRMA conduct periodic meetings (vis web conference), at least once every 3 months, with the ATC Focal Points; and</i></p> <p><i>e) MIDRMA presents the ATM-technical matters to the ATM SG for appropriate actions.</i></p>					
<p><i>DRAFT CONCLUSION 20/6: MID RVSM SMR 2025</i></p> <p><i>That,</i></p> <p><i>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;</i></p> <p><i>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</i></p> <p><i>c) the final version of the MID RVSM SMR 2025 be ready for presentation and endorsement by the MIDANPIRG/23 Meeting.</i></p>					<p>Superseded by MIDANPIRG CONCLUSION 22/9: MID RVSM SMR 2025</p>

FOLLOW-UP ACTION PLAN ON MIDANPIRG/22 CONCLUSIONS & DECISIONS

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY DELIVERABLE		TARGET DATE	STATUS/REMARKS
<p><i>MIDANPIRG CONCLUSION 22/7: MID RVSM SMR 2024</i></p> <p><i>That, the MID RVSM Safety Monitoring Report (SMR) 2024 at Appendix 5E, be endorsed.</i></p>	<p>Endorse the results of the MID RVSM SMR 2024</p>	SMR2024	MIDRMA	2025	Completed
<p><i>MIDANPIRG CONCLUSION 22/8: REPORTING OF LHDS</i></p> <p><i>That, in order to assess compliance with Safety Objective 2, the MIDRMA Member States be urged to:</i></p> <p><i>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);</i></p> <p><i>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;</i></p> <p><i>c) coordinate with MIDRMA, as required;</i></p> <p><i>d) MIDRMA conduct periodic meetings (vis web conference), at least once every 3 months, with the ATC Focal Points; and</i></p> <p><i>e) MIDRMA presents the ATM-technical matters to the ATM SG for appropriate actions.</i></p>	<p>To encourage the submission of LHDs and to raise awareness of the RVSM implementation requirements in terms of data submission to the MIDRMA.</p>	<p>Submission of LHD</p> <p>Periodic meetings with ATC FPs</p> <p>ATM Technical matters presented to the ATM SG</p>	<p>MID STATES</p> <p>MIDRMA</p> <p>MIDRMA</p>		Completed

CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY DELIVERABLE		TARGET DATE	STATUS/REMARKS
<p><i>MIDANPIRG CONCLUSION 22/9: MID RVSM SMR 2025</i></p> <p><i>That,</i></p> <p><i>a) the FPL/traffic data for the period 01 – 31 May 2025 to be used for the development of the MID RVSM Safety Monitoring Report (SMR 2025); before 1 July 2025;</i></p> <p><i>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</i></p> <p><i>c) the final version of the MID RVSM SMR 2025 be ready for presentation and endorsement by the MIDANPIRG/23 Meeting.</i></p>	<p>To support the development of the MID RVSM SMR 2026</p>	<p>SMR2026</p>	<p>MIDRMA</p>	<p>1 July 2025</p>	<p>Completed</p>

Status of States' Contributions to the MIDRMA Project

Note. Currency in US Dollars

State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bahrain	Paid 30,000	Paid 20,000	Paid 30,000	Paid 30,000	Paid 30,000	Paid 29,978 27 Oct 11	Paid 30,000 29 Aug 12	Paid 30,000 15 Apr 13	Paid 29,975 6 May 15	Paid 29,975 13 May 15	Paid 30,000 18 Feb 16	Paid 30,000 16 May 17	Paid 29,975 12 Mar 18	Paid 29,975 13 Jan 20	Paid 30,000 2 July 20	Paid 30,000 9 Sep 21	Paid 30,000 31 Mar 22
Egypt	Paid 30,000	Paid 20,000	Paid 30,000	Paid 30,000	Paid 30,000	Paid 29,960 9 Sep 10	Paid 29,960 17 Jan 12	Paid 29,983 30 Jan 13	Paid 29,940 8 Apr 14	Paid 29,940 24 Feb 15	Paid 29,935 24 Dec 15	Paid 29,935 2 Jun 17	Paid 29,935 16 Jan 18	Paid 29,965 18 Feb 20	Paid 29,965 18 Feb 20	Paid 30,000 11 Aug 21	Paid 29,935 19 Jan 22
Iran	Paid 30,000	Paid 20,000	Paid 30,000	Paid 30,000	Paid 30,000	Paid 29,946 27 Jul 13	Paid 29,935 27 Jul 13	Paid 89,965 4 Apr 16			Paid 29,960 12 May 16	Paid* 29,960 10 Mar 17 not Paid	Not Paid 30,000	Not Paid 30,000	Not Paid 30,000	Not Paid 30,000	Not Paid 30,000
Iraq	N/A	N/A	N/A	N/A	N/A	Paid 10,000 on 16 Sep 11	Paid 10,000 on 5 Jul 12	Paid 10,000 5 Sep 13	Paid 10,000 22 Sep 14	Paid 10,000 23 Apr 15	Paid 10,000 1 Sep 16	Paid 10,000 20 Jun 17	Paid 10,000 20 Aug 18	Paid 10,000 20 Aug 19	Paid 10,000 07 Dec 20	Not Paid 10,000	Not Paid 10,000
Jordan	Paid 30,000	N/A	Paid 1,250	Paid 10,000	Paid 10,000	Paid 10,000 on 10 Aug 10	Paid 10,000 on 28 Nov 11	Paid 10,000 04 Dec 12	Paid 9,924 4 Aug 14	Paid 9,924 3 Feb 15	Paid 9,924 11 Dec 15	Paid 10,000 19 May 17	Paid 9,921 16 Mar 18	Paid 9,984.93 6 Dec 19	Paid 9,984.93 4 June 20	Paid 9,984.93 12 Nov 21	Paid 9,984.93 30 Dec 21
Kuwait	Paid 30,000	N/A	Paid 1,250	Paid 10,000	Paid 10,000	Paid 10,000 on 27 Sep 10	Paid 9,849 on 21 Feb 12	Paid 10,000 20 Mar 13	Paid 10,000 5 May 14	Paid 10,000 12 Mar 15	Not Paid 10,000	Paid 10,000 28 Jul 17	Paid 10,000 14 Feb 18	Paid 10,000 4 Dec 19	Not Paid 10,000	Paid 10,000 27 Sep 21	Not Paid 10,000
Lebanon	Paid 30,000	N/A	Paid 1,250	Paid 10,000	Paid 10,000	Paid 10,000 on 4 Feb 11	Paid 9,960 18 Dec 12	Paid 9,960 10 May 13	Paid 10,000 25 Jul 14	Paid 9,970 15 Dec 15	Paid 9,970 18 Oct 16	Paid 9,915 30 Jul 18	Not Paid 10,000	Paid 10,000 29 Dec 20	Paid 10,000 1 Apr 21	Paid 10,000 1 Apr 21	Not Paid 10,000
Libya	Libya didn't sign the MIDRMA MOA yet.																
Oman	Paid 30,000	Paid 20,000	Paid 30,000	Paid 30,000	Paid 30,000	Paid 30,000 13 Sep 11	Paid 30,000 11 Jan 12	Paid 30,000 28 Feb 13	Paid 30,000 14 Mar 14	Paid 30,000 16 Dec 15	Paid 30,000 9 Mar 16	Paid 30,000 27 Apr 17	Paid 30,000 12 Feb 18	Paid 30,000 16 Dec 19	Paid 30,000 24 June 20	Paid 30,000 29 July 21	Paid 30,000 24 Oct 23
Qatar	Qatar joined the MIDRMA on 28 April 2015										Paid 9,978 19 Nov 15	Paid 9,970 10 Apr 17	Paid 9,978 20 Feb 18	Paid 10,000 7 Oct 19	Paid 10,000 14 Apr 20	Paid 9,978.00 18 Oct 21	Paid 10,000 25 Sep 23
Saudi Arabia	Paid 30,000	Paid 20,000	Paid 30,000	Paid 30,000	Paid 30,000	Paid 30,000 4 Mar 11	Paid 30,000 12 Jan 12	Paid 30,000 13 Mar 13	Paid 30,000 21 May 14	Paid 30,000 21 May 15	Paid 30,000 13 Apr 16	Paid 30,000 16 June 17	Paid 30,000 20 May 22	Paid 30,000 27 Nov 19	Paid 30,000 20 May 22	Paid 30,000 13 Aug 21	Paid 30,000 18 Mar 22
Sudan	Sudan joined the MIDRMA on 26 May 2014									Paid 9,607 17 Feb 15	Paid 9,278 10 Nov 15	Paid 10,000 16 May 17	Paid 9,863 2 Mar 18	Paid 9,974.73 20 Nov 19	Paid 10,133.86 11 June 20	Paid 20,265.61 8 Nov 22	
Syria^(*)	Paid 30,000	N/A	Paid 1,250	Paid (US\$ 1,250 + 42,789 +11,862+10,374 +7,778+9,970) = 84,023								Not Paid 10,000	Not Paid 10,000	Not Paid 10,000	Not Paid 10,000	Not Paid 10,000	Not Paid 10,000
UAE	Exempted from payment up-to end of 2015										Paid 29,933 26 Apr 16	Paid 29,933 26 Apr 17	Paid 29,931 26 Feb 18	Paid 29,931 9 Oct 19	Paid 30,000 16 July 20	Paid 30,000 9 July 21	Paid 30,000 21 July 22
Yemen	Paid 30,000	N/A	Paid 1,250	Paid 10,000	Paid 10,000	Paid 10,000 17Aug10	Paid 9,975 17Apr12	Paid 19,973 for 2 years 26 Mar 15		Paid 9,987 26 Mar 15	Paid 69,044.70 for 7 years 14 Oct 22						

State	2023	2024	2025	2026													
Bahrain	Paid 30,000 7 Sep 23	Paid 30,000 27 June 24	Paid 30,000 26 Nov 25														
Egypt	Paid 29,935 10 May 23	Paid 29,935 10 Dec 24	Paid 29,910 8 Jan 26														
Iran	Not Paid 30,000																
Iraq	Paid 10,000 30 May 23																
Jordan	Paid 9,984.22 14 July 23	Paid 9,984.93 15 Dec 23	Paid 10,000 24 Dec 25	Paid 10,000 12 Feb 26													
Kuwait	Not Paid 10,000		Paid 30,000 14 Apr 25														
Lebanon	Not Paid 10,000																
Libya	MOA Signed 8Aug2023	Paid 10,000 26 Sept 24															
Oman	Paid 30,000 13 Apr 23	Paid 30,000 20 Feb 24	Paid 30,000 17 Dec 25	Paid 30,000 5 Feb 26													
Qatar	Paid 9,978 25 Sep 23	Paid 9 Feb 26 29,978	Paid 29,978 28 Jan 26	Paid 29,978 28 Jan 26													
Saudi Arabia	Paid 30,000 4 May 23	Paid 30,000 4 June 24	Paid 30,000 31 Jan 25	Paid 30,000 14 Jan 26													
Sudan	Not Paid 10,000																
Syria(*)	Not Paid 10,000																
UAE	Paid 30,000 14 Apr 23	Paid 30,000 23 Feb 24	Paid 30,000 11 Dec 24	Paid 29,960 24 Dec 25													
Yemen	Not Paid 10,000																

MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

Project Proposal

Our Ref: SA/ICAOMIDRMA/V4/2025

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Classification	Restricted
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MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

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MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

Executive Summary

This proposal outlines a strategic upgrade of the **MIDRAS** software to a next-generation platform—**MIDRAS-AIR**—integrating **Automatic Dependent Surveillance–Broadcast (ADS-B)** technology into its collision risk assessment framework. By harnessing real-time, four-dimensional (4D) trajectory data, the enhanced system will enable the **Middle East Regional Monitoring Agency (MIDRMA)** to conduct faster, more accurate, and data-driven **Reduced Vertical Separation Minimum (RVSM)** airspace safety assessments.

Beyond ADS-B integration, MIDRAS-AIR introduces a **dual-mode data processing capability**. In scenarios where aircraft are unequipped with or have disabled ADS-B transponders, the system will seamlessly revert to using **flight plan data**, ensuring comprehensive surveillance coverage and operational continuity across all RVSM operations.

Leveraging the high frequency and precision of ADS-B data, MIDRAS-AIR overcomes the inherent limitations of legacy **Traffic Sample Data (TSD)**, notably in data latency and fidelity. A redesigned **software architecture** and **advanced analytical algorithms** will support continuous 4D trajectory ingestion, real-time collision risk computation, and proactive identification of evolving **airspace hotspots**.

Together, these innovations will establish a **resilient, scalable, and future-ready safety framework** for Middle Eastern airspace—empowering MIDRMA to anticipate risks, optimize operational efficiency, and uphold world-class standards in regional airspace safety management.

MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

1. INTRODUCTION

Given the continued growth in air transportation, one of the key challenges faced by Air Navigation Service Providers (ANSPs) and airlines is how to increase airspace capacity without compromising safety. ICAO's new air traffic management (ATM) paradigms target a doubling of airspace capacity (2x) while enhancing safety by a factor of 10 by 2030.

Achieving these ambitious goals necessitates the development of new operational concepts, safety measures, and safety performance indicators within the air traffic system. For instance, Reduced Vertical Separation Minimum (RVSM) airspace, which spans vertically from 29,000 feet (FL290) to 41,000 feet (FL410), reduces the vertical separation from 2000 feet to 1000 feet, thereby adding six extra flight levels. ICAO has implemented stringent procedures to uphold the safety and integrity of this airspace.

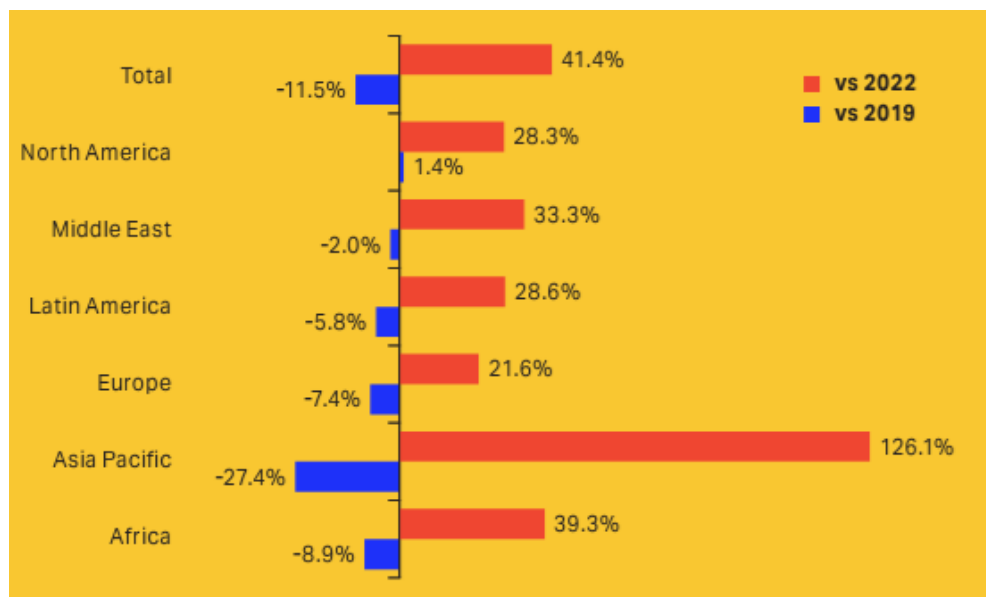


Figure 1: International PRK growth by airline region of registration: Industry-wide international RPKs increased 41.5% YoY, reflecting strong results for all regions with Middle East up by 33% YoY evolution in international traffic.

MIDRMA has developed MIDRAS software for collision risk assessment of Middle East airspace. This software system uses ICAO RGCSP Vertical Collision Risk Model for collision risk computation. The ICAO model is based on knowledge of the traffic flows along a given route structure.

The software computes Collision Risk equation parameters and process flight data for each member state and computes Collision Risk. The MIDRAS software also provides an interactive interface for collision risk visualization, simulation, modelling of scenarios and Hot-Spot analysis.

MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

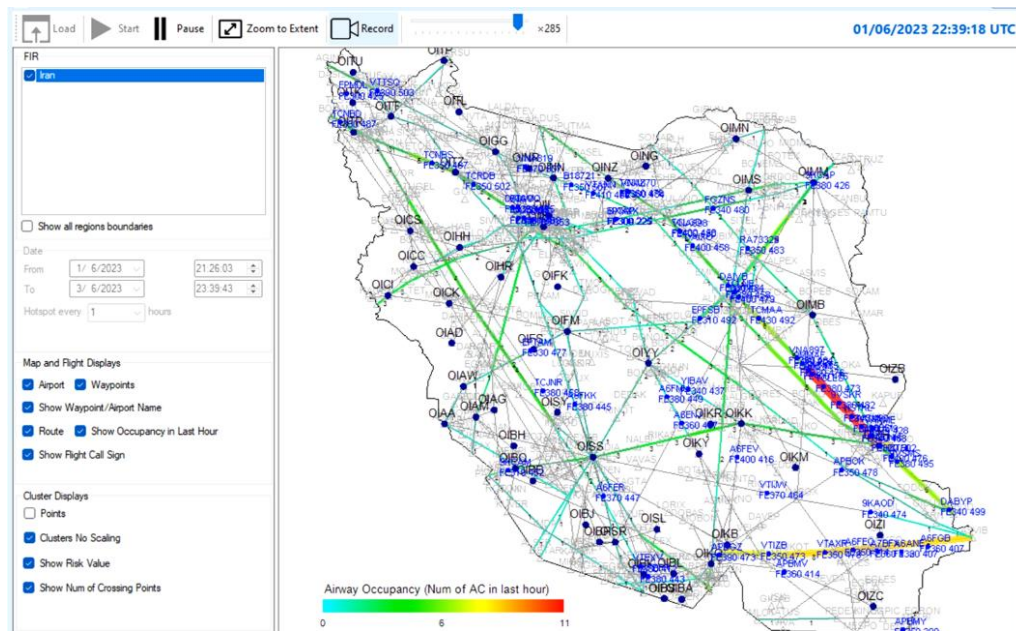


Figure 2: Visual Interface of MIDRAS software

A key challenge in the current air traffic risk assessment process is the reliance on manual data collection, which is often slow, error-prone, and resource-intensive. Manual data entry not only introduces the risk of inaccuracies, such as missing or misaligned data, but also contributes to issues like missing waypoints and incorrect aircraft speed information. These problems, combined with data maintenance issues, can lead to incomplete datasets and data loss, ultimately compromising the accuracy of collision risk assessments. Moreover, the computation of crossing frequency is approximated due to the nature of Traffic Sample Data (TSD) which may lead to errors in computations which need to be manually corrected.

The integration of ADS-B technology into MIDRAS addresses these challenges by providing automated, real-time data that eliminates the need for manual input and data corrections. Unlike manual collection, ADS-B delivers precise aircraft positional data continuously and without delay, ensuring data accuracy and integrity. This real-time nature of ADS-B data minimizes the risk of data loss and significantly improves data maintenance, as the system automatically records and updates traffic information. By leveraging ADS-B, MIDRAS can enhance its collision risk assessments, eliminates manual intervention in data entry and collection, ensuring that the insights are based on timely and accurate data, which is essential for effective management of airspace safety.

Incorporating ADS-B into MIDRAS will elevate the integrity and accuracy of air traffic data, enabling precise collision risk assessments, comprehensive data analytics, and enhancing MIDRAS's operational capabilities in airspace management and safety analytics.

MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

2. BACKGROUND

One of the critical challenges faced in the current air traffic risk assessment process is the collection and accuracy of air traffic data. Traditional data collection methods rely heavily on manual data collection and entry, which is both time-consuming and prone to errors. The manual nature of these processes often results in missing data, misaligned information, missing waypoints, and inaccuracies in recorded aircraft speeds. These issues are particularly prevalent with data provided by various air traffic system providers, where inconsistencies and errors are common.

These inaccuracies significantly impact the reliability of collision risk assessments. Without precise and timely data, the ability to compute crossing frequency and analyze collision risk, if not carefully monitored, may be compromised. The integration of ADS-B technology within MIDRAS addresses these challenges by offering automated, high frequency data feeds that improve the accuracy, timeliness, and completeness of air traffic trajectory data. ADS-B reduces dependency on manual data entry, mitigates errors related to speed, distance, time and provides highly accurate aircraft positional data, ultimately leading to more reliable and precise 4D trajectory-based risk assessments.

The proposed upgrade will leverage ADS-B data to enhance MIDRAS's capabilities in several key areas:

- a) **Enhanced Accuracy and Frequency:** ADS-B offers updates as frequently as every second, compared to Traffic Sample Data (TSD) that is based on Waypoint entry records from Flight Data Processing system. This increase in update frequency and removal of reliance on secondary data feed will allow for more granular data and precise computational accuracy of collision risk models in MIDRAS.
- b) **Collision Risk Hot-Spot Assessment:** ADS-B data integration in MIDRAS will provide highly accurate collision risks hot-spots through detailed positional data, offering a more reliable basis for safety analysis.
- c) **Predictive Analytics:** Enabling MIDRMA to anticipate and mitigate collision risk by predictive modelling of traffic flows and congestion based on ADS-B data, including potential future traffic scenarios and frequent airspace closures.



Figure 3: Middle East airspace flight tracks from ADS-B data (source: Flight radar 24)

3. BENEFITS OF COLLISION RISK ASSESSMENT WITH ADS-B INTEGRATION IN MIDRAS

The integration of ADS-B technology into the MIDRAS software brings numerous advantages to the accuracy and reliability of collision risk assessment, enhancing overall air traffic safety in the MID RVSM airspace. The key benefits include:

a) Enhanced Data Accuracy

- **Real-Time Positional Data:** ADS-B provides highly accurate, GPS-based positional data at frequent intervals. This real-time data significantly reduces errors caused by manual data entry, such as missing waypoints or misaligned flight paths, and ensures that risk assessments are based on the most current and precise information.
- **Automated Data Collection:** Unlike manual data collection, which can be prone to data loss and inaccuracies, ADS-B automatically captures and transmits aircraft positions, altitudes, and speeds directly into the MIDRAS system. This automation reduces human error and enhances data completeness and integrity.

b) Improved Situational Awareness

- **Comprehensive Traffic Monitoring:** ADS-B allows for continuous 4D trajectory data of aircraft across the airspace, providing a complete and real-time data of all flights. This enhanced data helps collision risk modelling with high accuracy.
- **Timely Detection of Conflicts:** The high-frequency updates provided by ADS-B enable MIDRAS to detect Collision Risk Hotspots as they arise, allowing for proactive risk mitigation and reducing the likelihood of collision risk.

c) Efficient Risk Management

- **Rapid Data Processing:** ADS-B data can be processed in real-time, which facilitates quick assessment and analysis of traffic conditions. This efficiency allows air traffic managers to make timely and informed decisions, particularly in complex airspace scenarios such as airspace closure or major traffic diversions in the MID RVSM airspace.
- **Reduction in Manual Data Maintenance:** With ADS-B, there is a significant reduction in the need for manual data maintenance. This not only lowers operational costs but also reduces the time required to update and verify data, allowing manpower resources to be focused on risk assessment and mitigation.

d) Enhanced Predictive Capabilities

- **Reliable Trajectory Prediction:** With accurate, high-frequency data from ADS-B, MIDRAS can generate reliable 4D trajectory predictions, which are crucial for assessing potential Hot-Spots and identifying traffic flows that may lead to higher collision risks.
- **Improved Model Accuracy:** The integration of ADS-B data enhances the accuracy of MIDRAS's collision risk models, as it enables the system to account for real-time variations in aircraft speed and trajectory, providing more robust and precise assessments.

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Middle East Risk Assessment Software with ADS-B Integration

e) Compliance with International Standards

- **Alignment with Global Best Practices:** ADS-B is recognized globally as a key component of modern air traffic management systems. Integrating ADS-B with MIDRAS ensures that the system aligns with international safety standards and best practices, supporting MIDRMA's mission to maintain and enhance airspace safety in the Middle East RVSM airspace.
- **Support for Regulatory Requirements:** ADS-B data supports compliance with aviation regulatory requirements by providing transparent and verifiable data for collision risk assessments, which is essential for reporting and audit purposes.

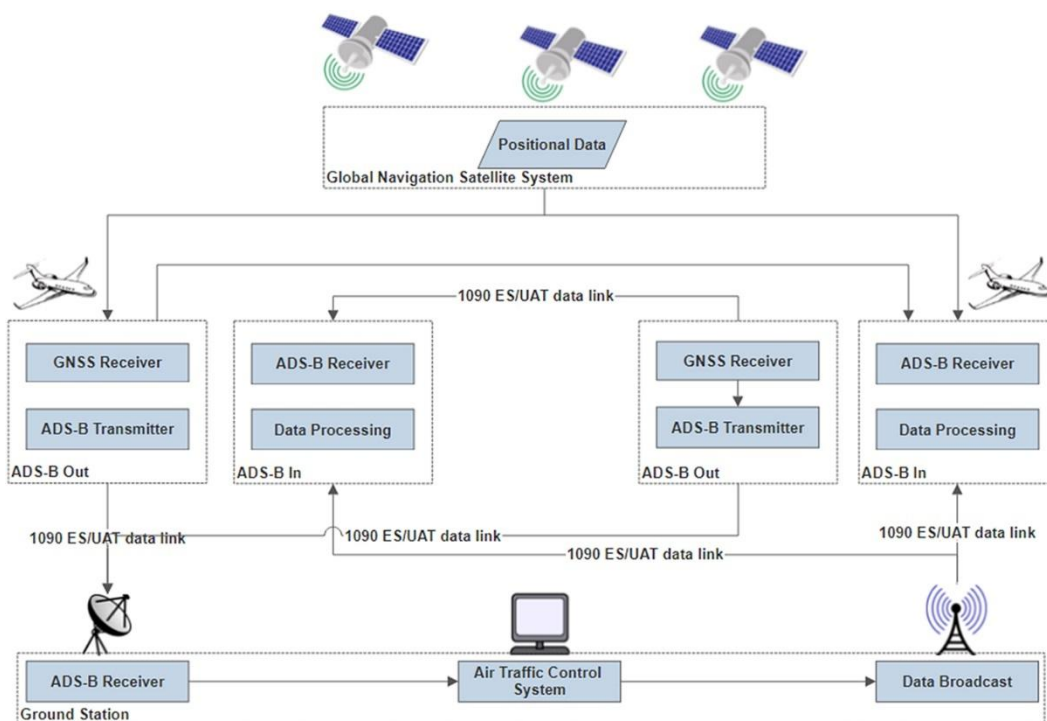


Figure 4: ADS-B data collection process.

The integration of ADS-B technology into MIDRAS significantly enhances the accuracy, timeliness, and reliability of collision risk assessments, providing valuable benefits for air traffic safety and efficiency in the Middle East region. By leveraging real-time data, automated processes, and predictive analytics, MIDRAS with ADS-B capabilities positions MIDRMA at the forefront of air traffic risk management and safety.

4. NEED FOR A NEW ARCHITECTURE AND ADVANCED ALGORITHMS FOR ADS-B INTEGRATION IN MIDRAS

The integration of ADS-B data into MIDRAS requires a fundamental redesign of the software architecture to accommodate the advanced features and capabilities enabled by this technology. Unlike the traditional

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Traffic Sample Data (TSD), which has limited fields and static values, ADS-B data provides a continuous stream of dynamic, four-dimensional (4D) data, including latitude, longitude, altitude, speed, and time. This necessitates new approaches in both data processing and collision risk assessment.

a) New Software Architecture Requirements

- **Scalability and Real-Time Processing:** The existing MIDRAS architecture is designed to handle periodic updates from simpler data formats like Traffic Sample Data (TSD), which are less frequent and contain basic information. In contrast, ADS-B data requires a scalable, high-performance architecture capable of processing real-time data from multiple sources simultaneously. The upgraded architecture must support continuous data ingestion, data processing, and deep analysis, ensuring MIDRAS can handle the increased data volume and complexity.
- **Data Storage and Management:** ADS-B data streams are substantially larger and more detailed than traditional data sources. Therefore, the new architecture needs to incorporate advanced data storage solutions that can manage the high-frequency data while ensuring data integrity and accessibility. This includes optimizing data indexing, retrieval, and archiving to support both current and historical analyses.

b) Development of Advanced 4D Data Processing Algorithms

- **4D Trajectory Prediction and Monitoring:** Traditional algorithms for Traffic Sample Data (TSD) were limited to basic parameters and were not designed to handle the complexities of 4D data (spatial dimensions plus time) that ADS-B provides. New algorithms will be required to process ADS-B data, enabling precise 4D trajectory construction and data analytics. These algorithms will consider variables like speed, heading, and altitude changes, allowing for a more accurate representation of aircraft 4D trajectories and crossing frequencies.
- **Automated Data Correction and Error Handling:** Unlike Traffic Sample Data (TSD), which offers a simpler and more predictable data set, ADS-B data can be prone to various types of errors, such as signal interference or erroneous readings. New algorithms must be developed to automatically detect, correct, or compensate for these errors to ensure the reliability and accuracy of the data used for collision risk assessments.
- **Geospatial Analysis and Real-Time Visualization:** With the added detail of ADS-B, MIDRAS will require advanced geospatial algorithms to analyze aircraft positions in relation to airways, waypoints, and other airspace constraints. This will enable enhanced visualization capabilities such as airway occupancy analytics and fast-time simulation of air traffic, which are critical for identifying potential risk scenarios and Hot-Spot identification.

c) Addressing the Limitations of Traffic Sample Data (TSD)

- **Expanding Data Fields and Parameters:** TSD provides limited fields, primarily focusing on basic flight plan information and waypoint position. In contrast, ADS-B includes a broader range of parameters, such as velocity, heading, rate of climb or descent, and more. The new

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architecture and algorithms will be designed to fully leverage this expanded data set, providing a richer and more detailed basis for analysis.

- **Real-Time Data vs. Static Snapshots:** Unlike the static nature of TSD, ADS-B provides a real-time, dynamic view of air traffic. This capability enables MIDRAS to continuously monitor and update its assessments, as opposed to relying on periodic snapshots that may not accurately reflect current conditions. Real-time processing algorithms will ensure that MIDRAS can identify and respond to emerging collision risks.
- **Enhanced Accuracy and Predictive Capabilities:** The static and limited nature of TSD restricts the ability to make accurate and forward-looking assessments. With ADS-B integration, MIDRAS will benefit from highly accurate, 4D trajectory data that supports sophisticated predictive models. This enhancement will improve the system's ability to anticipate future traffic scenarios and proactively mitigate risks.

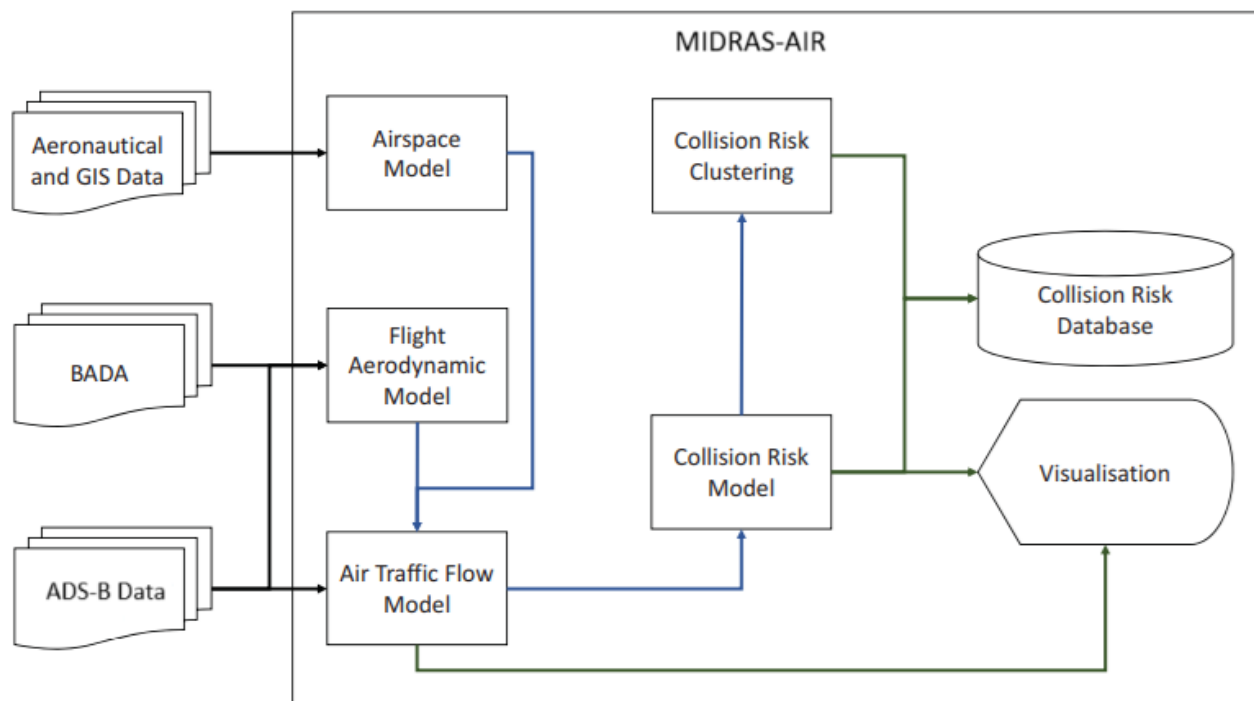


Figure 5: Architecture of the MIDRAS-AIR

5. Dual Data Processing Capability in MIDRAS-AIR

To address the limitations of relying solely on ADS-B data, MIDRAS-AIR will incorporate a dual data processing capability, enabling robust and resilient air traffic management within Reduced Vertical Separation Minimum (RVSM) airspace. This feature is critical for managing scenarios where aircraft

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either lack ADS-B equipment or have their ADS-B transponders switched off, thereby presenting gaps in surveillance coverage if only ADS-B data is used.

a) Flight Plan Data Integration for Non-ADS-B Equipped Aircraft

- While ADS-B integration provides real-time, four-dimensional trajectory data that enhances the precision of collision risk assessment, MIDRAS-AIR will not solely depend on ADS-B. For aircraft without ADS-B transmitters, MIDRAS-AIR will utilize flight plan data, enabling the system to track and assess collision risk based on scheduled trajectories and other pertinent information. This approach ensures that every aircraft operating within RVSM airspace can be included in the airspace collision risk assessment, regardless of its onboard surveillance equipment.

b) Adaptive Processing Based on Surveillance Availability

- MIDRAS-AIR's dual capability enables adaptive processing. When ADS-B data is available, the system prioritizes it for its higher accuracy and frequency of updates. However, in the absence of ADS-B data, MIDRAS-AIR seamlessly transitions to processing collision risk based on flight plan data, supported by legacy surveillance systems when available. This flexibility provides MIDRAS-AIR with an adaptable operational model, ensuring comprehensive coverage without interruption.

c) Enhanced System Resilience and Redundancy

- By supporting both ADS-B data and flight plan data, MIDRAS-AIR introduces a resilient framework that minimizes reliance on a single data source. This redundancy is essential for sustaining operations under diverse conditions, such as equipment outages, signal interference, or intentional deactivation of ADS-B transponders by aircraft. The dual-processing approach bolsters MIDRMA's ability to manage traffic safely in all circumstances, supporting continuous monitoring and risk assessment in RVSM airspace.

d) Ensuring Seamless Compliance with ICAO Standards and Safety Goals

- Incorporating both ADS-B and flight plan data processing aligns MIDRAS-AIR with ICAO standards for surveillance and safety in RVSM airspace. By providing comprehensive surveillance coverage through multiple data sources, MIDRAS-AIR enhances MIDRMA's compliance with international safety standards and its capability to meet evolving airspace safety demands.

Upgrading MIDRAS to integrate ADS-B technology will require a new software architecture capable of real-time data processing and storage, as well as the development of advanced 4D data processing algorithms. These enhancements will allow MIDRAS to leverage the full capabilities of ADS-B data, overcoming the limitations of traditional Traffic Sample data form and delivering a more robust, accurate, and responsive collision risk assessment system.

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6. SCOPE OF WORK AND WORK PACKAGES

The MIDRAS-AIR will involve **four primary work packages** (WPs), each addressing specific technical aspects of ADS-B integration and enhanced functionality. Detailed descriptions of each WP are provided below.

WP1: ADS-B Data Integration and 4D Trajectory based Collision Risk Assessment

- **Objective:** Integrate ADS-B data into MIDRAS to facilitate 4D Trajectory based, high-fidelity collision risk assessments.
- **Tasks:**
 - **Data Processing Algorithms:** Develop robust algorithms to handle ADS-B data streams, including decoding, filtering, and error correction.
 - **Risk Calculation Models:** Implement enhanced collision risk models that exploit the improved accuracy and frequency of ADS-B data. These models will consider trajectory prediction, altitude monitoring, and spatial separation.
- **Outcomes:**
 - Enhanced 4D Trajectory based Collision Risk Assessment.
 - High precision in risk assessments due to frequent position updates.
 - An enriched database for analytical and historical trend analysis.

WP2: Dual Data Processing Capability for Collision Risk Assessment

- **Objective:** Establish resilient, dual-data processing in MIDRAS-AIR to ensure continuous collision risk assessment, even when ADS-B data is unavailable.
- **Tasks:**
 - **Data Integration:** Enable MIDRAS-AIR to use both ADS-B and flight plan data, ensuring compatibility across data sources.
 - **Model Calibration:** Adapt collision risk models to work effectively with either data source, ensuring accurate assessments.
 - **Validation:** Test the system under mixed data conditions to verify consistent performance.
- **Outcomes:**
 - Maintains full collision risk assessment capabilities regardless of data source.
 - Enables MIDRAS-AIR to dynamically switch data inputs as needed.
 - Models calibrated for both ADS-B and flight plan data for robust risk predictions.

WP3: Advanced Traffic Analysis and Simulation with ADS-B Data

- **Objective:** Enable dynamic traffic simulation capabilities by utilizing ADS-B data for predictive analysis.

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- **Tasks:**
 - **Traffic Flow Modelling:** Develop predictive models to assess current and forecasted air traffic congestion, incorporating ADS-B data for high accuracy.
 - **Scenario-based Simulations:** Implement tools for real-time scenario simulation, allowing users to adjust parameters (such as traffic volume) and evaluate potential outcomes.
 - **3D Visualization Tools:** Create advanced 3D visualization capabilities for air traffic flows, including altitude, speed, and trajectory information, to provide users with intuitive, interactive monitoring.
- **Outcomes:**
 - A predictive framework for managing traffic flows and identifying congestion points.
 - Real-time capability for conducting “what-if” analyses and planning.
 - Improved situational awareness through immersive 3D visualization.

WP4: User Interface and System Performance Enhancements

- **Objective:** Enhance the MIDRAS interface to improve user experience and optimize system performance for handling large volumes of ADS-B data.
- **Tasks:**
 - **User Interface (UI) Redesign:** Develop a responsive, intuitive interface with streamlined navigation and customization options tailored to risk analysts.
 - **Data Handling Optimization:** Implement improvements in data storage and retrieval, including indexing and caching mechanisms to enhance performance.
 - **Enhanced Architecture:** Introduce advanced architecture features, such as robustness, scalability and automatic error handling to ensure data integrity.
- **Outcomes:**
 - A user-friendly, efficient, and secure interface, providing enhanced operational insights.
 - Improved data processing speeds to manage real-time ADS-B data streams effectively.
 - Increased system reliability and reduced downtime through optimized backend processes.

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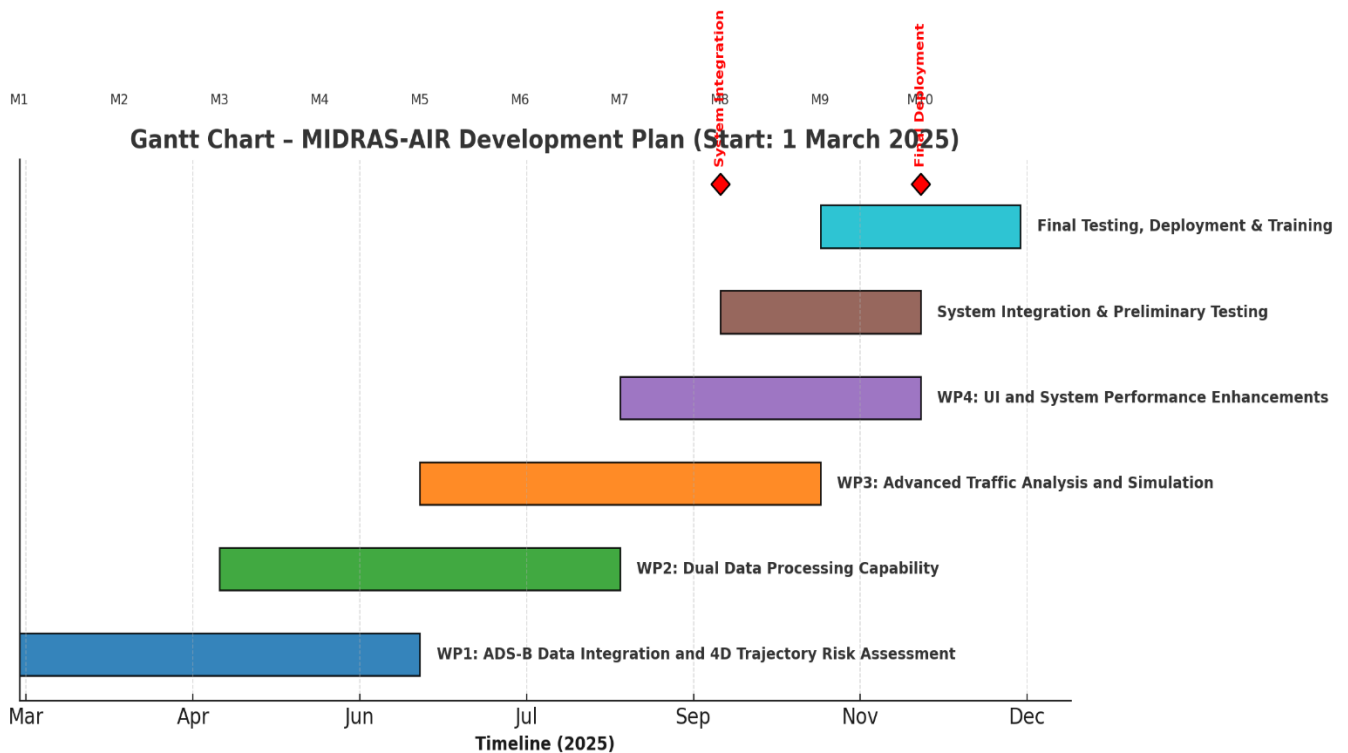
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7. IMPLEMENTATION PLAN AND MILESTONES

The project will be executed over a ten-month period, with concurrent development across work packages. Major milestones include:

- **Month 1-4:** Completion of ADS-B data integration framework and dual data processing capabilities (WP1 and WP2)
- **Month 3-5:** Development of enhanced collision risk models and visualization tools (WP2& WP3)
- **Month 5-7:** Implementation of predictive traffic flow models and UI redesign (WP3 & WP4)
- **Month 8-9:** System integration and preliminary testing with simulated ADS-B data
- **Month 9-10:** Final testing, deployment, documentation, and user training

Table 1: Project Activities – GANTT Chart for 10 Months of Development Phase



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8. PROJECT DELIVERABLE

The MIDRAS-AIR project will result in the following key deliverables, ensuring the successful integration of ADS-B capabilities for enhanced collision risk assessment and air traffic management:

1. ADS-B Integration Module:

- A fully developed and integrated ADS-B module within the MIDRAS-AIR system, enabling real-time data collection and processing of 4D aircraft trajectories.

2. Traffic Analysis and Simulation Tools:

- Advanced traffic analysis tools that leverage ADS-B data for dynamic traffic simulations, supporting proactive collision risk assessment.
- Simulation results and reports demonstrating the effectiveness of the tools in managing air traffic within Middle Eastern airspace.

3. Enhanced User Interface (UI) and Performance Upgrades:

- A redesigned and optimized user interface for MIDRAS-AIR, featuring enhanced visualization of real-time traffic data and collision risk scenarios.
- Performance improvements to support real-time data processing and interactive analysis.

4. System Integration and Testing Documentation:

- Comprehensive system integration reports detailing the implementation of ADS-B into the MIDRAS-AIR framework.
- Testing documentation including test plans, results, and validation reports confirming system functionality and reliability.

5. Technical Documentation and User Manuals:

- Detailed technical documentation covering the architecture, algorithms, and methodologies used in the system upgrade.
- User manuals for operational guidance, detailing system features, user interface navigation, and troubleshooting procedures.

6. Final Project Report:

- A comprehensive project report summarizing the scope, methodology, outcomes, and future recommendations.
- Includes insights on potential areas for further research and development based on the project findings and ADS-B integration results.

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9. BUDGET BREAKDOWN FOR MIDRAS-AIR DEVELOPMENT AND MAINTENANCE

The total estimated budget (**Development and Maintenance**) for the MIDRAS-AIR project is

\$340,000 (Three hundred and forty thousand USD Only)

which include system design, development and integration over a ten-twelve-month period and a subsequent two-year maintenance period. Below is the detailed budget breakdown:

a) Development Phase (10 – 12 months) - Cost: \$240,000

The development phase comprises four key work packages, with detailed costs based on estimated hours and rates. This phase will conclude within nine months, covering the integration of ADS-B, traffic analysis, user interface enhancements, and system testing.

b) Maintenance Phase (24 months) - Cost: \$100,000

After the completion of the development phase, the project will enter a two-year maintenance period, covering ongoing support, updates, and bug fixes for MIDRAS-AIR. This maintenance phase ensures continued reliability and functionality for stakeholders.

Table1: Budget breakdown for Development & Maintenance

Project Phase	Work Package	Cost (USD)
Development Phase	WP1: ADS-B Integration	\$60,000
	WP2: Dual Data Processing Capability	\$43,200
	WP3: Traffic Analysis & Simulation	\$60,000
	WP4: UI & Performance Enhancements	\$36,000
System Integration & Deployment	System Integration and Testing	\$24,000
	Final testing and Deployment	\$16,800
Development & Integration	10-12 Months	\$240,000
Maintenance	Two Years (24 months)	\$100,000
Total Project Cost		\$340,000

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10. PROJECT INCLUSIONS & EXCLUSIONS

- **Key Inclusions:**

- Full development of the software, covering all work packages and system integration.
- A two-year maintenance plan post-development, ensuring continuous support and updates.
- Necessary hardware and software to support the project's objectives.
- Travel Costs: Any travel costs related to the project, including training or software installation, is covered in the proposal.

- **Key Exclusion:**

- Provision of ADS-B Data: For the purposes of this project, one critical exclusion pertains to the provision and cost of ADS-B data. The ADS-B (Automatic Dependent Surveillance-Broadcast) data, which is essential for real-time positional tracking and collision risk assessment within the MIDRAS-AIR system, will be supplied directly by the Middle East Regional Monitoring Agency (MIDRMA).
- ADS-B Decoder and any Third-Party Software Licenses: Licensing fees for any required decoder for raw ADS-B data and third-party software is excluded from the project cost and will be supplied directly by the Middle East Regional Monitoring Agency (MIDRMA).

11. PROJECT TIMELINE

The project is scheduled to span **10-12 months**, with an anticipated start date of **March 1, 2026**, and an expected completion date of **Dec 31, 2026**, with a two-month buffer period to account for uncertainties.

Table 2: Project Timeline

Project Phase	Duration	Start Date	Completion Date
Project Admin / Planning	1 month	Mar 1, 2026	Mar 31, 2025
Design and Development	7 months	Apr 1, 2026	Oct 31, 2026
System Integration	2 months	Sep 1, 2026	Nov 30, 2026
Testing & Deployment	1 month	Dec 1, 2026	Dec 31, 2026

This timeline allows for structured progression through the phases of project initiation, development, system integration, and final testing, ensuring a comprehensive approach to delivering the MIDRAS-AIR project on time.

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12. PAYMENT TERMS

The Consultant will invoice MIDRMA according to the schedule outlined in the agreement or the relevant Statement of Works.

The total project cost is inclusive of GST. Please note that any transaction-related fees, such as bank charges and currency exchange fees, will be borne by MIDRMA.

There will be one full and final invoice of **USD 340,000** (Three Hundred Forty Thousand US Dollars). This invoice will cover the **Development Cost** of USD 240,000 (Two Hundred Forty Thousand US Dollars) and the **Maintenance Cost** of USD 100,000 (One Hundred Thousand US Dollars), to be invoiced and paid at the start of the project in the following account.

Account Details	
Account Name	Sameer Alam
Account Number	537462392001
Bank Name	Oversea-Chinese Banking Corporation Limited Singapore
Bank Address	OCBC CENTRE, FLOOR 9, 65 CHULIA STREET. ZIP Code: 049513
Intermediary Bank	JP Morgan Chase Bank, New York, USA
SWIFT BIC code:	CHASUS33

13. REFERENCES (Consultant in **Bold**)

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Middle East Risk Assessment Software with ADS-B Integration

APPENDIX

CONSULTANCY SERVICES TERMS AND CONDITIONS

These Terms and Conditions shall apply to the provision of the Software Development and Consultancy Services by Sameer ALAM (referred to as CONSULTANT hereafter) as stipulated in Annex (Project Work Details) wherein MIDRMA has requested for ADS-B Integration within MIDRAS software and, unless CONSULTANT has agreed otherwise in writing, they shall also apply to any other services of whatever nature which may be provided by CONSULTANT to the Client in the future.

DEFINITIONS

In this Agreement, unless the context otherwise requires, the following expressions have the following meanings:

"**Agreement**" means the Client Communication in conjunction with these Terms and Conditions.

"**Client**" means any individual, firm or corporate body (which expression shall, where the context so admits, include its successors and assigns) which purchases the Software Development and Consultancy Services from CONSULTANT.

"**Client Communication**" means the email, fax, letter or other written or verbal communication made to the Client confirming the Consultancy Services to be provided.

"**Commencement Date**" means the earlier of the commencement date for this Agreement as set out in the Client Communication and the commencement of the performance of the Consultancy Services.

"**Consultancy Services**" means the consultancy services to be provided by CONSULTANT to the Client as set out in the Client Communication.

"**Fees**" means the fees payable by the Client to CONSULTANT in consideration of the Consultancy Services as set out in the Client Communication or, if not, in accordance with Consultant Standard Charge Out Rates or such other fee as may be agreed.

"**CONSULTANT's Standard Charge Out Rates**" means the charge out rates of CONSULTANT applicable to the Consultancy Services as promulgated by CONSULTANT from time to time; and

"**Representatives**" means any officers or employees of CONSULTANT and any consultants, subcontractors or other agents used by CONSULTANT to fulfill their obligations to the Client under the provisions of this Agreement.

1. THE SOFTWARE DEVELOPMENT AND CONSULTANCY SERVICES

- a. With effect from the Commencement Date, CONSULTANT shall, in consideration of the Fees being paid in accordance with the provisions of this agreement provide the Software Development and Consultancy Services to the Client.
- b. CONSULTANT shall use reasonable care and skill in their performance of the Software Development and Consultancy Services.
- c. CONSULTANT shall use reasonable endeavours to complete its obligations under the Agreement.
- d. The Software Development and Consultancy Services are being provided by CONSULTANT exclusively to the Client. CONSULTANT does not accept responsibility to any third party for the Software Development and Consultancy Services which it provides to the Client unless CONSULTANT has agreed with the Client in writing that CONSULTANT shall accept such liability.

2. FEES

- a. The Client shall pay the Fees in accordance with the provisions of this agreement.
- b. In addition, CONSULTANT shall be entitled to recover from the Client its reasonable incidental expenses in connection with the provision of the Software Development and Consultancy Services.
- c. The Client shall pay CONSULTANT for any additional software development scope and consultancy services provided by CONSULTANT, that are not specified in the agreed Client Communication, in accordance with CONSULTANT's Standard Charge Out Rates or such other fee as may be agreed. Any charge for additional software development and consultancy services will be supplemental to the amounts that may be due for the Software Development and Consultancy Services.
- d. All sums payable pursuant to this Agreement are exclusive of any goods service tax, withholding tax or other tax (except corporation tax or other taxes on profit), for which the Client shall be additionally liable.

3. TERMS OF PAYMENT

- a. All payments required to be made pursuant to this Agreement by the Client shall be made within 30 (thirty) days of the date of the relevant invoice in the currency stated in the invoice in cleared funds to CONSULTANT's bank as set out in the invoice, without any set-off, withholding or deduction except such amount (if any) of tax as the Client is required to deduct or withhold by law.
- b. Promptness of payment shall be of the essence under this Agreement. If the Client fails to make any payment on the due date in respect of the price or any other sum due under these terms and conditions then CONSULTANT shall, without prejudice to any right which CONSULTANT may have pursuant to any statutory provision in force from time to time, have the right to charge the Client interest on a daily basis at an annual rate equal to twelve percent (12%) from time to time on any sum due and not paid on the due date. Such interest shall be accumulatively on a daily basis and shall run from day to day and accrue after as well as before any judgement.

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4. CLIENT RESPONSIBILITIES

The Client undertakes:

- a. to ensure that full information and instructions are given to CONSULTANT and in sufficient time to enable the Software Development and Consultancy Services to be performed effectively and efficiently.
- b. to take such steps as it reasonably can to procure all necessary access for CONSULTANT's Representatives to goods, premises, vessels, installations and transport; and
- c. where it has control of the relevant working environment, to take such steps as it reasonably can to ensure such working environment is safe, without risks to health, and adequate in relation to facilities and arrangements for the Consultant's welfare at work.

5. VARIATION AND AMENDMENTS

- a. If the Client wishes any variations to be made to the Software Development Scope and Consultancy Services, it must notify CONSULTANT in writing as soon as possible. CONSULTANT shall endeavour to make any required changes and any additional costs thereby incurred shall be due to and invoiced to the Client.
- b. If, due to circumstances beyond CONSULTANT's control, it has to make any change in the arrangements relating to the provision of the Software Development and Consultancy Services it shall notify the Client forthwith. CONSULTANT shall endeavour to keep such changes to a minimum and shall seek to offer the Client arrangements as close to the original as is reasonably possible in the circumstances.

6. TERMINATION

- a. All or any part of the Software Development and Consultancy Services may be terminated at such time or times as CONSULTANT and the Client may mutually agree.
- b. CONSULTANT may terminate this Agreement forthwith if:
 - the Client is in breach of any of its obligations hereunder; or
 - the Client suspends, or threatens to suspend, payment of its debts or is unable to pay its debts as they fall due or admits inability to pay its debts; or
 - the Client commences negotiations with all or any class of its creditors with a view to rescheduling any of its debts; or
 - a petition is filed, a notice is given, a resolution is passed, or an order is made, for or in connection with the winding up of the Client; or
 - an application is made to court, or an order is made, for the appointment of an administrator or if a notice of intention to appoint an administrator is given or if an administrator is appointed over the Client; or
 - a floating charge holder of the assets of the Client has become entitled to appoint or has appointed an administrative receiver; or
 - a person becomes entitled to appoint a receiver over the assets of the Client or a receiver is appointed over the assets of the Client; or
 - any event occurs or proceeding is taken with respect to the Client in any jurisdiction to which it is subject that has an effect equivalent or similar to any of the events mentioned above (inclusive); or
 - any circumstances whatsoever beyond the reasonable control of CONSULTANT that necessitate the termination for whatever reason of the provision of Software Development and Consultancy Services.
- c. In the event of termination CONSULTANT shall retain any sums already paid to it by the Client without prejudice to any other rights either party may have whether at law or otherwise.

7. SUB-CONTRACTING

CONSULTANT may sub-contract the performance of any of its obligations under this Agreement without the prior written consent of the Client.

9. LIMITATIONS ON LIABILITY

- a. CONSULTANT's maximum liability under the provisions of this Agreement shall be limited to the fees paid in consideration of the Software Development and Consultancy Services and any claims against CONSULTANT shall be deemed to be waived and absolutely time barred upon the expiry of one year from the completion of the Software Development and Consultancy Services.
- b. CONSULTANT shall not be liable to the Client, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, for any loss of profit, or any indirect or consequential loss arising under or in connection with the Agreement
- c. CONSULTANT shall not be liable to the Client or be deemed to be in breach of these terms and conditions by reason of any delay in performing, or any failure to perform, any of CONSULTANT's obligations if the delay or failure was due to any cause beyond CONSULTANT's reasonable control.
- d. In the event that the Software Development and Consultancy Services involves any work or services to or containing a product or article any of which contain latent defects which were not apparent at the time surveyed and could not reasonably have been expected to have been discovered by such survey (either by reason of lack of access to, limited availability of time or otherwise) then CONSULTANT shall have no liability thereafter.
- e. CONSULTANT shall only be liable to the Client to the extent that CONSULTANT is unable to rectify any matter for which it would otherwise be liable to the Client within a period of 45 days of becoming aware of the said matter.
- f. The Client's relationship is solely with CONSULTANT. No Representative of CONSULTANT has any personal legal liability to the Client whether in contract, tort (including negligence) or otherwise. The fact that any Representative signs in his or her name any document or email in the course of carrying out the Software Development and Consultancy Services does not give rise to any personal legal liability separate to that of CONSULTANT.
- g. The Client agrees that other than in the event of fraud, any claim which the Client brings in respect of a matter on which the Client has instructed CONSULTANT shall be made against CONSULTANT and not against any of the following:

MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

- any Representative of CONSULTANT; or
 - any CONSULTANT Group Company of CONSULTANT or any officer, employee, agent, consultant or subcontractor of any such
 - CONSULTANT Group Company; and
 - any successor of any of the persons listed in the preceding sub paragraphs.
- h. Where CONSULTANT is liable to the Client and a third party is also liable to the Client in connection with the same matter, CONSULTANT shall only be responsible for a fair share of the Client's loss. In particular, if the Client agreed to limit the liability of such other third party or if the Client is unable to recover from that other third party, CONSULTANT's share shall not be increased because of the limitation of liability the Client has agreed with the other third party or the Client's inability to recover from him/it.
- i. The Client shall indemnify CONSULTANT against all damages, costs, claims and expenses suffered by CONSULTANT arising from the provision of the Software Development and Consultancy Services including (but not limited to) loss or damage to any equipment (including that of third parties) caused by the Client, or its agents or employees.
- j. Nothing in this Agreement limits or excludes the liability of CONSULTANT for death or personal injury resulting from negligence; or for any damage or liability incurred by the Client as a result of fraud or fraudulent misrepresentation by the CONSULTANT or any of its Representatives.

10. FORCE MAJEURE AND SUSPENSION OF AGREEMENT

- a. 12.1 Neither CONSULTANT nor the Client shall be responsible for any failure to fulfil any term or condition of this Agreement if and to the extent that fulfilment has been delayed or temporarily prevented by circumstances which are beyond the control and without the fault or negligence of the party affected and which, by the exercise of reasonable diligence, the said party is unable to provide against.
- b. In the event of a suspension of this Agreement for reasons of breach by the Client, force majeure or for the convenience of the Client, CONSULTANT shall be entitled to payment by the Client of the following:
- the full costs of laying off (and re-hiring if necessary) any Representatives employed or hired specifically for the purposes of this Agreement such full costs to include any costs which CONSULTANT has necessarily paid to an employment agent.
 - the costs irrevocably committed relating to the period of suspension by subcontractors, under a subcontract which relates to this Agreement.
 - any other costs which CONSULTANT or its Representatives have irrevocably committed in respect of the period of the suspension.
 - loss of CONSULTANT's anticipated profit under this Agreement for the period of the suspension.
- c. Without prejudice to its rights hereunder CONSULTANT shall have the right but not the obligation to give notice of termination of this Agreement if any period of suspension continues for a period of more than 30 days.

11. WAIVER

- No waiver by CONSULTANT of any breach of this Agreement by the Client shall be considered as a waiver of any subsequent breach of the same or any other provision. A waiver of any term, provision or condition of this Agreement shall be effective only if given in writing and signed by the waiving party and then only in the instance and for the purpose for which the waiver is given.
- No failure or delay on the part of any party in exercising any right, power or privilege under this Agreement shall operate as a waiver of, nor shall any single or partial exercise of any such right, power or privilege preclude any other or further exercise of or the exercise of any other right, power or privilege.

12. SEVERANCE

If any provision of this Agreement is held by any competent authority to be invalid or unenforceable in whole or in part the validity of the other provisions of this Agreement and the remainder of the provision in question shall not be affected thereby.

13. COPYRIGHT

CONSULTANT reserves all copyright and any other rights (if any) which may subsist in the products of, or in connection with, the provision of the Software Development and Consultancy Services or facilities. CONSULTANT reserves the right to take such actions as may be appropriate to restrain or prevent infringement of such copyright.

14. CONFIDENTIALITY

Both CONSULTANT and the Client undertake not to disclose any information provided in confidence by the other party to any third party and the receiving party shall not permit access to such information by any third party unless the disclosing party expressly grants permission save where required to do so by an order of a competent court of law.

15. ASSIGNMENT

This Agreement may not be assigned in whole or in part by the Client without the specific written approval of CONSULTANT.

16. NOTICES AND SERVICE

- a. Any notice or other information required or authorised by this Agreement to be given by either party to the other shall be given by:- sending by pre-paid registered post; or sending by email, facsimile transmission or comparable means of communication.

MIDRAS-AIR

Middle East Risk Assessment Software with ADS-B Integration

- b. Any notice or information given by post in the manner described above which is not returned to the sender as undelivered shall be deemed to have been given on the third day after the envelope containing it was so posted; and proof that the envelope containing any such notice or information was properly addressed, pre-paid, registered and posted, and that it has not been so returned to the sender, shall be sufficient evidence that the notice or information has been duly given.
- c. Any notice or information sent by telex, cable, facsimile transmission or comparable means of communication shall be deemed to have been duly given on the date of transmission, provided that a confirming copy of is sent to the other party 24 hours after transmission.
- d. Service of any document for the purposes of any legal proceedings concerning or arising out of this Agreement shall be effected by either party by causing to be delivered to the other party at its registered or principal office, or to such other address as may be notified to by the other party in writing from time to time.

16. **APPLICABLE LAW AND JURISDICTION**

This Agreement shall be governed and construed in accordance with Singapore law and the parties shall submit to the non-exclusive jurisdiction of the Courts of Singapore. The parties also agree that any non- contractual claims or disputes shall be subject to Singapore law and that the Courts of Singapore shall have non-exclusive jurisdiction to determine any such claim or dispute.

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COST-EFFECTIVENESS STUDY
REPORT

MIDRAS-AIR PROJECT

Prepared by the Middle East Regional
Monitoring Agency (MIDRMA)

03rd January 2026

EXECUTIVE SUMMARY

This Cost-Effectiveness Study assesses the financial, operational, and safety value of implementing the MIDRAS-AIR project for the Middle East Regional Monitoring Agency (MIDRMA). The proposed upgrade enhances the existing Middle East Risk Assessment Software (MIDRAS) through the integration of ADS-B-based surveillance data, while retaining the capability to process conventional flight plan and legacy traffic data to ensure comprehensive RVSM traffic representation.

The primary objective of MIDRAS-AIR is not to automate operational control or directly reduce collision risk, but to strengthen the accuracy, timeliness, and completeness of RVSM collision risk assessments, thereby improving safety assurance and regulatory confidence. The project responds to long-standing limitations associated with manual traffic data submission, including high administrative burden, data quality issues, and limited responsiveness of safety assessments.

From a cost-effectiveness perspective, the study finds that MIDRAS-AIR represents a financially responsible and operationally sustainable investment when assessed over a medium- to long-term horizon. While the project requires an initial development and integration investment, this cost is offset by recurring operational savings arising from reduced manual data handling, validation, and re-processing activities at both MIDRMA and Member State levels.

In addition to direct cost savings, MIDRAS-AIR delivers non-monetary but strategically critical benefits, including:

- Improved accuracy and confidence in collision risk estimates through high-resolution 4D trajectory data*
- More frequent and responsive safety assessments*
- Enhanced identification of emerging risk trends and hotspots*
- Greater resilience through a multi-source surveillance architecture*

A conservative quantitative analysis indicates that, under reasonable assumptions, MIDRAS-AIR achieves cost recovery within a single RVSM monitoring cycle, with sustained net benefits accruing thereafter. Sensitivity analysis further demonstrates that the project remains cost-effective even under partial ADS-B coverage scenarios.

Overall, the Cost-Effectiveness Study concludes that MIDRAS-AIR offers strong value for money, delivering measurable operational efficiencies and essential safety assurance benefits, while aligning MIDRMA's RVSM monitoring capability with ICAO's evolving air traffic management framework and global best practices.

INTRODUCTION:

This Cost-Effectiveness Study evaluates the financial, operational, and safety benefits associated with the implementation of the MIDRAS-AIR (Middle East Risk Assessment Software with ADS-B Integration and Response) project for the Middle East Regional Monitoring Agency (MIDRMA). The project aims to enhance RVSM collision risk assessment capabilities through the integration of Automatic Dependent Surveillance–Broadcast (ADS-B) technology, while maintaining comprehensive traffic representation across the ICAO Middle East Region.

The MIDRAS-AIR project is designed to improve the accuracy, timeliness, and operational relevance of collision risk assessments by leveraging high-frequency, four-dimensional (4D) trajectory data derived from ADS-B surveillance where available. At the same time, the system is architected to incorporate conventional flight plan and legacy traffic data to ensure that aircraft not continuously represented through ADS-B — including State, military, VIP, private, or non-equipped aircraft — remain fully accounted for in safety assessments.

This study examines how the proposed integrated, multi-source data approach supports operational efficiency, reduces reliance on manual traffic data submissions, and enhances safety outcomes, while remaining cost-effective for MIDRMA and its Member States. The analysis is aligned with ICAO’s evolving air traffic management (ATM) framework and reflects a balanced, resilient, and future-ready investment in regional RVSM safety monitoring.

CURRENT CHALLENGES

1. Manual Data Submission and Its Limitations:

- a) *At present, collision risk assessments within the Middle East RVSM airspace rely heavily on manually submitted traffic data provided by MIDRMA Member States. This process is resource-intensive, time-consuming, and subject to delays, placing a significant administrative burden on national authorities. The effort required to collect, validate, and submit traffic data contributes to operational inefficiencies across the region.*
- b) *Manual data submission methods are also prone to data quality issues, including missing records, wrong flight levels, incorrect aircraft information, misaligned waypoints, and incomplete datasets. These deficiencies can compromise the accuracy and reliability of collision risk assessments and often require additional effort and resources for data correction and validation.*

2. Operational and Analytical Constraints:

- a. *The reliance on manually collected traffic data limits MIDRMA’s ability to conduct timely and responsive collision risk assessments. Risk evaluations are often based on static or retrospective datasets, reducing the effectiveness of proactive safety monitoring and constraining the ability to identify emerging risk trends in a dynamic operational environment.*
- b. *In addition, while modern surveillance technologies such as ADS-B offer significant potential benefits, the surveillance landscape within the Middle East Region remains diverse. Not all aircraft operating in RVSM airspace are continuously represented through ADS-B transmissions, including certain State, military, VIP, private, or non-equipped aircraft. Exclusive dependence on a single surveillance data source could therefore result in incomplete traffic representation and limit the effectiveness of safety assessments.*

3. Need for an Integrated and Resilient Data Approach

- a) *These challenges highlight the need for a collision risk assessment framework that both reduces reliance on manual data submission and ensures comprehensive traffic coverage across all categories of airspace users. A resilient, integrated approach—capable of leveraging ADS-B data where available while retaining the inclusion of conventional flight plan and legacy traffic data—is essential to support accurate, complete, and cost-effective RVSM safety monitoring in the Middle East Region.*

BENEFITS OF MIDRAS-AIR:

The MIDRAS-AIR project addresses the identified operational and analytical challenges by introducing an enhanced collision risk assessment framework that combines modern surveillance technologies with resilient data processing. The key benefits of the proposed solution are outlined below.

1- Enhanced Data Quality and Accuracy

- a. MIDRAS-AIR enables the use of high-frequency, four-dimensional (4D) trajectory data derived from ADS-B surveillance, providing significantly improved positional accuracy compared to manually submitted traffic data. This reduces uncertainties associated with missing waypoints, incorrect flight level entries, and misaligned flight paths, thereby improving the reliability of collision risk calculations.*
- b. Where ADS-B data is not available, MIDRAS-AIR retains the capability to process conventional flight plan and legacy traffic data, ensuring that all relevant RVSM traffic remains represented in safety assessments. This integrated approach preserves data completeness while enhancing overall analytical accuracy.*

2- Improved Operational Efficiency and Cost Reduction

- a. By automating the collection and processing of traffic data, MIDRAS-AIR substantially reduces the reliance on manual data submissions by Member States. This results in lower administrative workload, reduced data validation effort, and decreased operational overhead for both MIDRMA and its Member States.*
- b. The reduction in manual processes also minimizes the need for post-submission data correction and reconciliation, contributing directly to long-term cost savings and more efficient use of human resources.*

3- More Timely and Proactive Risk Management

- a. The availability of high-resolution traffic data enables MIDRAS-AIR to support more frequent and responsive risk collision assessments. This allows MIDRMA to move beyond retrospective analysis toward a more proactive safety monitoring approach, improving the identification of emerging risk trends and potential collision risk hotspots within RVSM airspace.*
- b. The system's ability to integrate multiple data sources ensures continuity of risk assessment even under conditions where ADS-B data may be unavailable or incomplete, supporting uninterrupted safety oversight.*

4- Enhanced Predictive and Analytical Capabilities

- a. *MIDRAS-AIR supports advanced analytical functions, including improved trend analysis, hotspot identification, and the potential for predictive safety assessments. These capabilities enable better understanding of evolving traffic patterns, airspace complexity, and congestion, supporting informed decision-making and more effective safety interventions.*

5- Long-Term Strategic and Regulatory Benefits

- a. *The MIDRAS-AIR project aligns MIDRMA’s safety monitoring capabilities with ICAO’s evolving air traffic management framework and global best practices. By combining ADS-B-based automation with a resilient, multi-source data architecture, the system provides a future-ready solution that can adapt to increasing traffic volumes, technological evolution, and regulatory requirements.*
- b. *This balanced approach ensures that MIDRMA achieves enhanced safety outcomes while maintaining cost-effectiveness, robustness, and long-term sustainability of its RVSM collision risk assessment activities.*

FINANCIAL ANALYSIS:

While the implementation of the MIDRAS-AIR project requires an initial investment, the overall financial analysis demonstrates that this expenditure is offset by substantial long-term savings and operational efficiencies. The introduction of automated data processing, combined with reduced reliance on manual traffic data submission, provides a strong and sustainable cost-benefit case for MIDRMA and its Member States.

1- Direct Cost Savings

- a. *The automation of traffic data collection and processing significantly reduces the need for manual data submission, validation, and correction activities. By leveraging ADS-B data where available, MIDRAS-AIR minimizes labor-intensive processes associated with traditional traffic data handling, resulting in lower operational and administrative costs for both MIDRMA and Member States.*
- b. *At the same time, the system’s ability to incorporate conventional flight plan and legacy traffic data ensures that non-ADS-B traffic remains fully represented without requiring parallel or duplicated processes. This integrated approach avoids additional cost burdens while preserving comprehensive traffic coverage.*

- c. *Reduced data inaccuracies and fewer post-processing corrections further contribute to direct cost savings by decreasing the resources required for data reconciliation and quality assurance.*

2. Indirect Financial Benefits

- a. *The proactive and more frequent risk assessment capability enabled by MIDRAS-AIR supports early identification of emerging risks, allowing preventive actions to be taken before costly corrective measures become necessary.*

3- Long-Term Financial Sustainability

- a. *Over time, the combined effects of automation, improved data quality, operational efficiency, and resilient system design are expected to deliver sustained financial benefits. The MIDRAS-AIR project therefore represents a cost-effective and financially responsible investment that supports MIDRMA's long-term mandate to maintain safe and efficient RVSM operations in the ICAO Middle East Region.*

- b. *More Explanations:*

Current RVSM monitoring requires:

- I. Manual traffic data collection*
- II. Data validation*
- III. Error correction*
- IV. Re-processing*

These activities are recurrent every year and consume staff time at both MIDRMA and Member States.

With MIDRAS-AIR:

- I. ADS-B automation reduces or eliminates much of this recurring workload.*
- II. Over time, fewer human hours = lower operational costs.*

CONCLUSION:

- a. *The MIDRAS-AIR project represents a cost-effective and strategically sound investment in the enhancement of RVSM collision risk assessment capabilities within the ICAO Middle East Region. By modernizing the existing MIDRAS platform through the integration of ADS-B technology, the project enables more accurate, timely, and operationally relevant safety assessments, while addressing long-standing challenges associated with manual traffic data submission.*
- b. *The Cost-Effectiveness Study demonstrates that the automation of traffic data processing is expected to deliver significant long-term operational efficiencies and cost savings for MIDRMA and its Member States. Reduced administrative workload, improved data quality, and minimized need for post-submission data correction collectively support a more efficient and sustainable safety monitoring framework. Importantly, the MIDRAS-AIR solution is designed to remain fully effective across a diverse surveillance environment. While ADS-B data provides substantial benefits through high-frequency, four-dimensional trajectory information, the system retains the capability to incorporate conventional flight plan and legacy traffic data to ensure that aircraft not continuously represented through ADS-B surveillance remain included in collision risk assessments. This integrated, multi-source approach preserves the completeness, robustness, and regulatory integrity of RVSM safety monitoring activities.*
- c. *In addition to immediate operational benefits, the MIDRAS-AIR project provides long-term strategic value by aligning MIDRMA's safety oversight capabilities with ICAO's evolving air traffic management framework and global best practices. The system's scalable and resilient architecture ensures that it can adapt to increasing traffic volumes, technological advancements, and future regulatory requirements without disproportionate additional investment.*
- d. *Overall, the Cost-Effectiveness Study confirms that the MIDRAS-AIR project delivers strong value for money, combining enhanced safety outcomes with operational efficiency and financial sustainability. The proposed investment supports MIDRMA's mandate to maintain an acceptable level of safety in RVSM airspace and reinforces the Agency's leadership role in regional airspace safety monitoring.*

RECOMMENDATION:

- a. *Based on the findings of this Cost-Effectiveness Study, it is recommended that the MIDRMA Board endorse the implementation of the MIDRAS-AIR project in principle, subject to the review of the detailed project proposal and associated cost elements by MIDRMA Member States.*
- b. *The proposed investment is justified by the demonstrated operational efficiencies, long-term cost savings, enhanced safety outcomes, and alignment with ICAO's strategic direction for air traffic management. The integrated, multi-source data approach ensures that the project remains robust and effective across the full spectrum of RVSM operations within the Middle East Region.*
- c. *Accordingly, the MIDRMA Board is encouraged to support the project and authorize MIDRMA to proceed with the necessary preparatory and coordination activities, in line with the governance framework and decisions of the Board.*

ANNEX A

Cost-Effectiveness Summary – MIDRAS-AIR

1- Purpose

This annex summarizes the cost-effectiveness of the MIDRAS-AIR project to support MIDRMA Board decision-making. The analysis focuses on financial transparency, operational efficiency, and safety assurance value, consistent with ICAO RVSM monitoring objectives.

2- Project Duration and Cost Structure

- a. Year 1: One-time development, integration, and testing*
- b. End of Year 1: System deployment*
- c. Years 2–3: Fixed maintenance and support period*
- d. Beyond Year 3: No recurring operating or licensing costs*

Costs:

- a. One-time development & integration: USD 240,000*
- b. Fixed 2-year maintenance & support contract: USD 100,000*
- c. Total project cost: USD 340,000*

3- Baseline (Current RVSM Monitoring)

- a. RVSM collision risk assessments rely on manual traffic data submission, validation, correction, and re-processing.*
- b. Estimated recurring effort: ~2,800 staff-hours per year (MIDRMA + Member States).*
- c. Conservative cost proxy: ~USD 140,000 per year, recurring annually.*

4- Operational Efficiency Gains (Post-Deployment)

- a. MIDRAS-AIR automates traffic data ingestion using ADS-B where available, while retaining legacy data sources.*
- b. Conservative assumption: 60% reduction in manual data handling effort.*
- c. Estimated savings: ~USD 84,000 per year, starting after deployment (Year 2 onward).*

5- Cost Recovery and Lifecycle View

-
- a. *Simple payback: ~4 years after deployment (≈ 5 years from project start).*
 - b. *10-year post-deployment view:*
 - c. *Total savings: ~USD 840,000*
 - d. *Total project cost: USD 340,000*
 - e. *Net benefit: ~USD 500,000*

6- Sensitivity (ADS-B Coverage)

-
- a. *Cost-effectiveness remains positive under high, medium, and low ADS-B coverage scenarios due to the integrated multi-source data approach.*
 - b. *Even under conservative assumptions, MIDRAS-AIR achieves cost neutrality or net benefit over its lifecycle.*

7- Non-Monetary Benefits (**Decision-Critical**)

-
- a. *Improved accuracy and confidence in RVSM collision risk assessments*
 - b. *More frequent and responsive safety monitoring*
 - c. *Reduced regulatory and audit exposure due to data quality issues*
 - d. *Alignment with ICAO surveillance modernization and RVSM oversight principles*

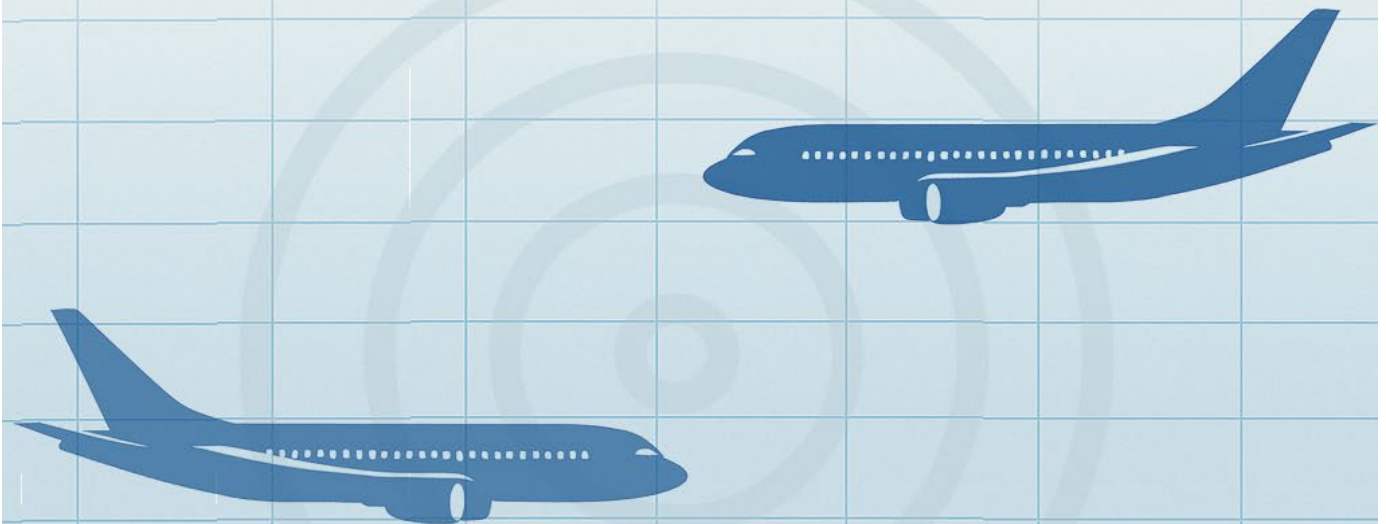
Conclusion

With a single one-time development cost of USD 240,000 and a fixed two-year maintenance contract of USD 100,000, MIDRAS-AIR represents a cost-effective, low-risk, and financially transparent investment. The project delivers sustained operational efficiencies and essential safety assurance value, supporting MIDRMA's mandate to maintain acceptable levels of safety in RVSM airspace.



MID RVSM Safety Monitoring Report 2025

Middle East Regional Monitoring Agency



03 January 2025
ICAO Middle East Region

The Middle East Regional Monitoring Agency (MIDRMA) continues its mandate to ensure that operations within the ICAO Middle East Reduced Vertical Separation Minimum (MID RVSM) airspace maintain the highest safety standards established by ICAO. This report, the MID RVSM Safety Monitoring Report 2025 (SMR 2025), presents the outcomes of the annual safety assessment conducted by the MIDRMA and demonstrates that RVSM operations in the Region remained safe and compliant throughout the reporting period.

The safety analysis draws upon two main data sources: the Traffic Data Sample (TDS) collected between 01 May and 31 May 2025, and all Large Height Deviation (LHD) reports received for the period 1 January – 31 December 2025. Using these inputs with other data related to aircraft ASE parameters, the MIDRAS AI software enhanced with advanced analytical capabilities was employed to calculate the vertical collision risk in accordance with the ICAO collision risk model (CRM).

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

The results confirm that the technical risk associated with aircraft height-keeping performance is 8.932×10^{-11} fatal accidents per flight hour, remaining well below the ICAO Target Level of Safety (TLS) of 2.5×10^{-9} .

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 5×10^{-9} fatal accidents per flight hour.*

The overall risk, which includes both technical and operational factors, was assessed at 9.278×10^{-10} , also significantly below the ICAO TLS of 5×10^{-9} .

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.*

Despite these positive results, incomplete LHD reporting remains a persistent concern. The limited number of reports received from several high-density FIRs continues to reduce confidence in the operational component of the CRM. The MIDRMA reiterates the importance of accurate and timely LHD reporting from all Member States to preserve the integrity of the regional safety assessment.

During 2025, the MIDRMA also recorded steady progress toward the implementation of the ADS-B Height Monitoring System (AHMS), developed in collaboration with MAAR, and the FAA/NAARMO. Building on previous achievements, several States—including Bahrain, Oman and Kuwait, shared

archived ADS-B data to support system validation. The full operational phase of AHMS is expected to begin once the necessary archived ADSB data is officially submitted and the related decisions is endorsed by the Middle East Civil Aviation Authorities, anticipated by January 2026.

In summary, the SMR 2025 demonstrates that the Middle East RVSM airspace continues to meet all ICAO safety objectives. Nevertheless, ongoing attention to LHD data quality, timely TDS submissions and quality, and sustained cooperation among MID States remain critical to ensure that RVSM operations in the Region continue to achieve an acceptable and sustainable level of safety.

The findings reaffirm that the Middle East RVSM airspace continues to operate safely, maintaining a comfortable safety margin comparable to previous years.

KEY OBJECTIVES

Objective	Description	Status
1	Technical risk of collision due to height-keeping performance meets ICAO TLS (2.5×10^{-9} fatal accidents per flight hour)	Achieved
2	Overall risk (technical + operational) meets ICAO TLS (5×10^{-9} fatal accidents per flight hour)	Achieved
3	Address safety issues, recommend improvements, and ensure risk does not increase	Ongoing

SAFETY ANALYSIS HIGHLIGHTS

Technical Risk: 8.932×10^{-11} fatal accidents per flight hour (well below ICAO TLS)

Overall Risk: 9.278×10^{-10} fatal accidents per flight hour (well below ICAO TLS)

Average Aircraft Speed: 464.44 kts

Risk Type	Risk Estimation	ICAO TLS	Remarks
Technical Risk	8.932×10^{-11}	2.5×10^{-9}	Below ICAO TLS
Overall Risk	9.278×10^{-10}	5×10^{-9}	Below ICAO TLS

MAJOR FINDINGS

- a. RVSM operations in the MID Region remain safe and stable.
- b. Technical and overall risks are significantly below ICAO targets.
- c. Incomplete Large Height Deviation (LHD) reporting from several high-density FIRs reduces confidence in operational risk assessment.
- d. Progress continues on the ADS-B Height Monitoring System (AHMS), with full implementation expected by January 2026.
- e. Persistent coordination challenges at Muscat–Mumbai FIR boundary and Sana’a FIR interfaces require dedicated technical meetings.

RECOMMENDATIONS

- a. Improve LHD Reporting: All Member States must submit timely and accurate LHD reports to enhance safety assessment confidence.
- b. Support AHMS Implementation: Continued cooperation and data sharing are essential for the successful rollout of AHMS.
- c. Enhance Regional Coordination: Face-to-face technical meetings are recommended to resolve outstanding safety protocol issues.

AIRSPACE DESCRIPTION

- a. All MID States have implemented RVSM in accordance with ICAO Annex 11, the PANS-ATM (Doc 4444), and ICAO Doc 7030 Regional Supplementary Procedures. RVSM operations in the Region are supported by a mix of conventional and modern surveillance systems including radar, Mode-S, ADS-B, multilateration, and various automated coordination tools used by the Area Control Centers (ACCs).
- b. The MID RVSM airspace constitutes one of the world’s busiest and most complex cross-regional interfaces, with major traffic flows connecting Europe, Asia, Africa, and North America. Daily operations involve a high volume of long-haul traffic, military activity, and dense overflight movements, particularly within the FIRs of Bahrain, Muscat, Jeddah, Kuwait, Tehran, Baghdad, Amman, Cairo, and Emirates.
- c. To ensure continued safe and efficient RVSM operations, Member States are required to comply with the data submission obligations established by the MIDRMA, including the provision of annual Traffic Data Samples (TDS), Large Height Deviation (LHD) reports, and height-monitoring results. These inputs form the foundation of the annual safety assessment and allow the MIDRMA to monitor adherence to ICAO safety objectives.

TRAFFIC DATA SAMPLE (TDS) REVIEW

Submission Status and Quality Review

The annual Traffic Data Sample (TDS) remains one of the key inputs required for the MIDRMA to conduct a reliable regional RVSM safety assessment. In accordance with MIDANPIRG Conclusions and established MIDRMA procedures, all MID States are required to submit a complete TDS covering

the agreed monitoring period for each year. For the SMR 2025, the designated period for TDS collection was 01 May – 31 May 2025.

TDS Submission Status

- a. The majority of MID States demonstrated good cooperation by submitting their TDS within or close to the expected timeframe. However, a number of FIRs either submitted their data late, incomplete or did not provide a TDS at all. Missing or incomplete TDS inputs reduce the regional accuracy of aircraft exposure estimates and place a heavier dependency on interpolated or historical data trends.
- b. As in previous years, the most significant gaps continue to originate from high-volume traffic FIRs. These FIRs handle large flows of international traffic, and therefore their absence or incomplete TDS has a measurable impact on CRM model fidelity. The MIDRMA reiterates that complete TDS submission by all States is essential to maintain confidence in the annual risk estimations.

TDS Format and Technical Quality

Most States submitted data in formats compatible with the MIDRMA's automated processing tools. The technical quality of these files varied, with some containing:

- a. Missing altitude information
- b. Duplicate or overlapping TDS.
- c. Incorrect flight levels and time sequencing
- d. Flights excluded from the designated RVSM altitude band
- e. Although such issues were resolved through manual cleaning and automated filtering using MIDRAS AI, they nevertheless increase processing time and may introduce uncertainty into the CRM exposure calculations.

Incomplete TDS submissions directly affect:

- a. Accuracy of flight-hours estimation
- b. Exposure calculations within the CRM
- c. Confidence levels of the overall safety assessment
- d. To ensure the sustainability of the RVSM safety monitoring program, the MIDRMA stresses the importance of timely, complete, and high-quality TDS submissions from all MID States.

Impact on Safety Assessment

Despite several gaps, the MIDRMA was able to process a sufficiently large and representative dataset to conduct the 2025 RVSM safety analysis. However, the reliability of the model would be considerably improved with full compliance from all FIRs, especially those with high traffic density or major cross-regional flow segments.

CONCLUSIONS

1. The analysis performed by the Middle East Regional Monitoring Agency (MIDRMA) confirms that the overall safety of RVSM operations within the ICAO MID Region remained well within internationally accepted limits during 2025. Both the technical and overall risk values are significantly below the ICAO Target Levels of Safety (TLS), reaffirming that the Region continues to operate a safe and stable RVSM environment.
2. The technical risk, representing the probability of vertical collision arising solely from aircraft height-keeping performance, was calculated at 8.932×10^{-11} fatal accidents per flight hour, comfortably below the ICAO TLS of 2.5×10^{-9} . This confirms that aircraft altimetry systems and maintenance standards across the Region continue to deliver excellent performance and remain consistent with global benchmarks.
3. The overall risk, encompassing both technical errors and operational deviations, including coordination, communication, and contingency events, was assessed at 9.278×10^{-10} fatal accidents per flight hour, remaining well below the ICAO overall TLS of 5×10^{-9} . These results reflect continued compliance with RVSM Safety Objective 2.
4. However, the confidence level associated with the operational risk element remains constrained by the insufficient number of Large Height Deviation (LHD) reports received from several Member States. The absence of consistent reporting, particularly for Categories **A, B, C, D, J, and K**, limits the accuracy of the Collision Risk Model (CRM) and may mask localized risk trends. The MIDRMA once again emphasizes that systematic and timely submission of LHD reports is a fundamental component of the regional safety assurance process.
5. The ADS-B Height Monitoring System (AHMS) initiative advanced considerably during 2025. Technical coordination with FAA/NARMO and MAAR succeeded toward the formal transfer of the ADS-B ASE processing software. Multiple States (Bahrain, Oman and Kuwait) provided archived ADS-B data supporting successful trial analyses. Once the decision related to regular submission of the archived ADSB data by the member states is endorsed and completed—expected by January 2026—the AHMS will enable large RVSM height monitoring for all MID States.
6. Persistent coordination challenges along the Muscat–Mumbai FIR boundary and within the Sana’a FIR interfaces continue to generate a share of the reported LHDs. The MIDRMA strongly recommends holding a dedicated, face-to-face technical meeting between the concerned ACCs, ICAO MID, and the MIDRMA to finalize long-term solutions and close the outstanding RVSM Safety Protocols.
7. Overall, the results of SMR 2025 reaffirm that the Middle East RVSM airspace continues to meet ICAO’s safety requirements. Continued collaboration among all Member States, full participation in data submission programmes, and active support for AHMS implementation will ensure the sustained safety and efficiency of RVSM operations throughout the Region.

TECHNICAL HEIGHT-KEEPING PERFORMANCE RISK ASSESSMENT

RVSM SAFETY OBJECTIVE NO. 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 2.5×10^{-9} fatal accidents per flight hour.

The value computed for technical height risk is estimated 8.932×10^{-11}

This safety objective addresses the technical risk of collision in the MID RVSM airspace that arises solely from aircraft height-keeping performance. This objective focuses on ensuring that aircraft altimetry systems, when operating under RVSM approval, maintain the required level of accuracy and stability to support the reduced vertical separation of 1000 ft.

The objective is evaluated by verifying that the probability of loss of vertical separation due to technical height-keeping errors remains within the ICAO Target Level of Safety (TLS) of 2.5×10^{-9} fatal accidents per flight hour, as defined by ICAO.

This safety objective is concerned exclusively with technical performance factors, including altimetry system design, installation integrity, maintenance practices, and long-term system stability. Operational factors, human errors, and air traffic control-related events are explicitly excluded from this objective and are addressed separately under Safety Objective No. 2.

SCOPE:

The geographic scope of the MID RVSM Safety Monitoring Report for 2025 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: **Damascus FIR** excluded from the RVSM safety analysis due to lack of data

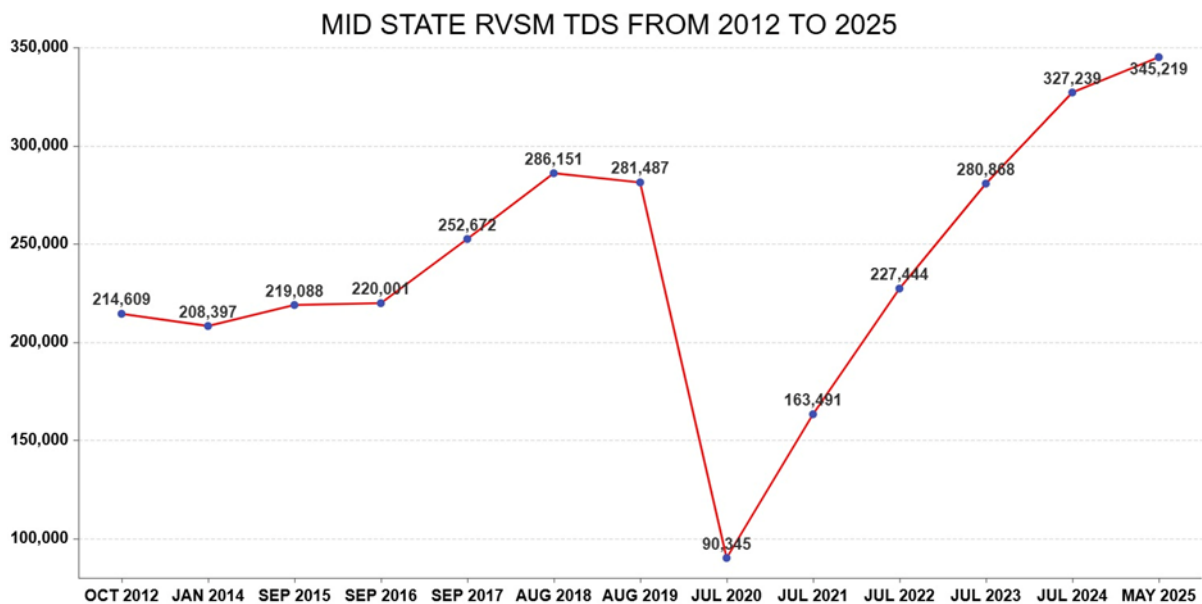
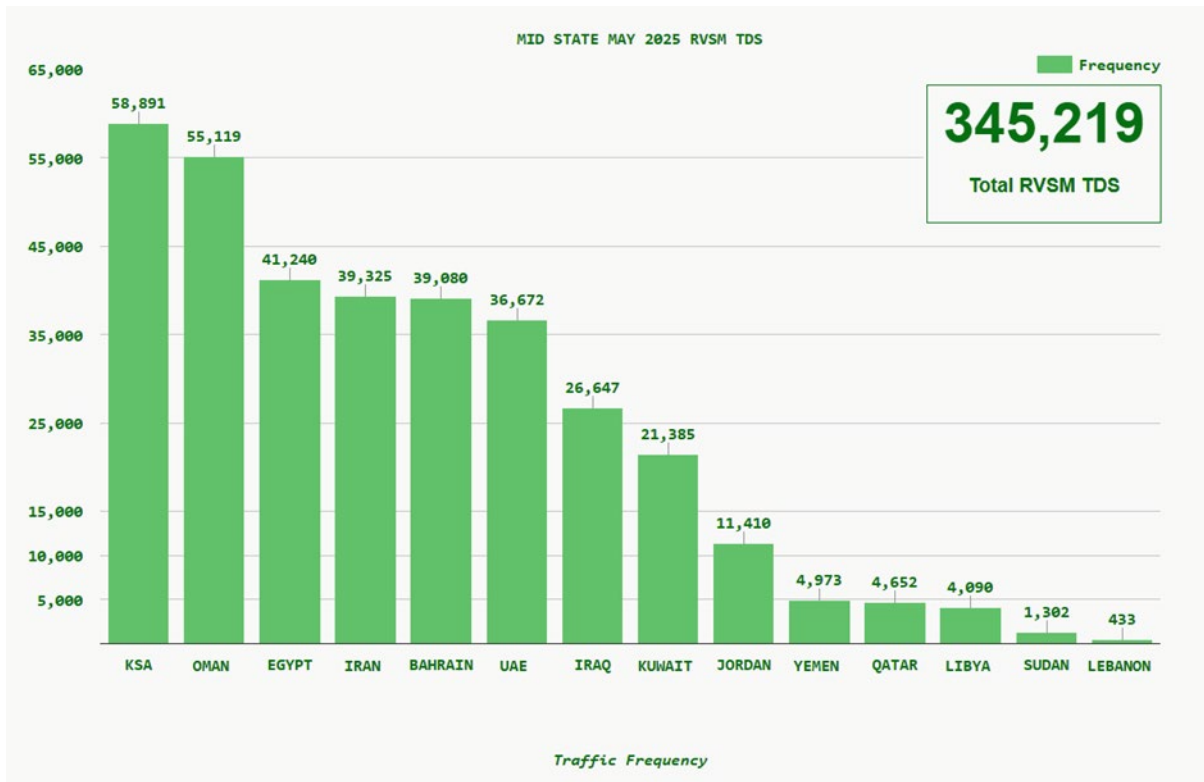
The Data Sampling periods covered by SMR 2025 are as displayed in the table below:

Report Elements	Time Period
Traffic Data Sample	01/05/2025 - 31/05/2025
Operational & Technical Errors	01/01/2025 - 31/12/2025

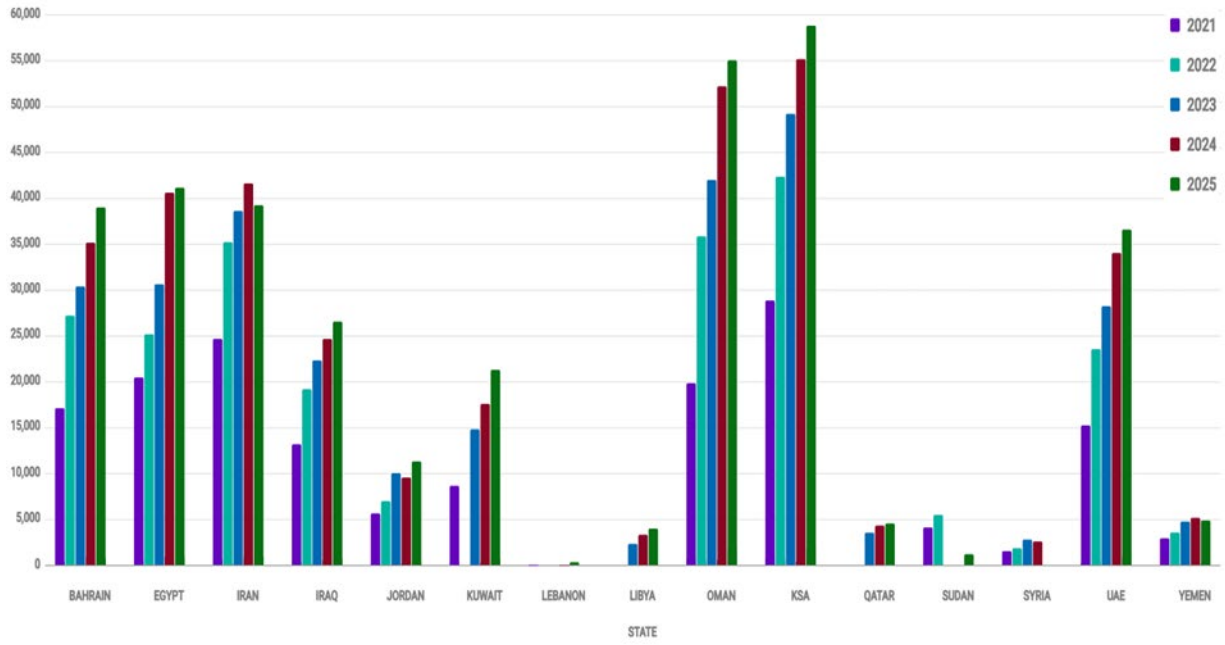
Despite the encouraging results, the MIDRMA reiterates that the incomplete and improperly formatted TDS submissions from several States, combined with the near absence of LHD reports, continue to undermine the confidence level of the final risk estimation. This issue remains a serious obstacle to maintaining a reliable safety monitoring process.

MID States	Received Date	No. of Flights
BAHRAIN	7/3/2025	39080
EGYPT	6/30/2025	41240
IRAN	7/28/2025	39325
IRAQ	6/12/2025	26647
JORDAN	7/1/2025	11410
KUWAIT	6/13/2025	21385
LEBANON	9/3/2025	433
LIBYA	6/30/2025	4090
OMAN	6/19/2025	55119
KSA	6/29/2025	58891
QATAR	6/23/2025	4652
SUDAN	7/20/2025	1302
SYRIA	No data submitted *Excluded from SMR 2025	
UAE	6/11/2025	36672
YEMEN	6/30/2025	4973
Total	345219	

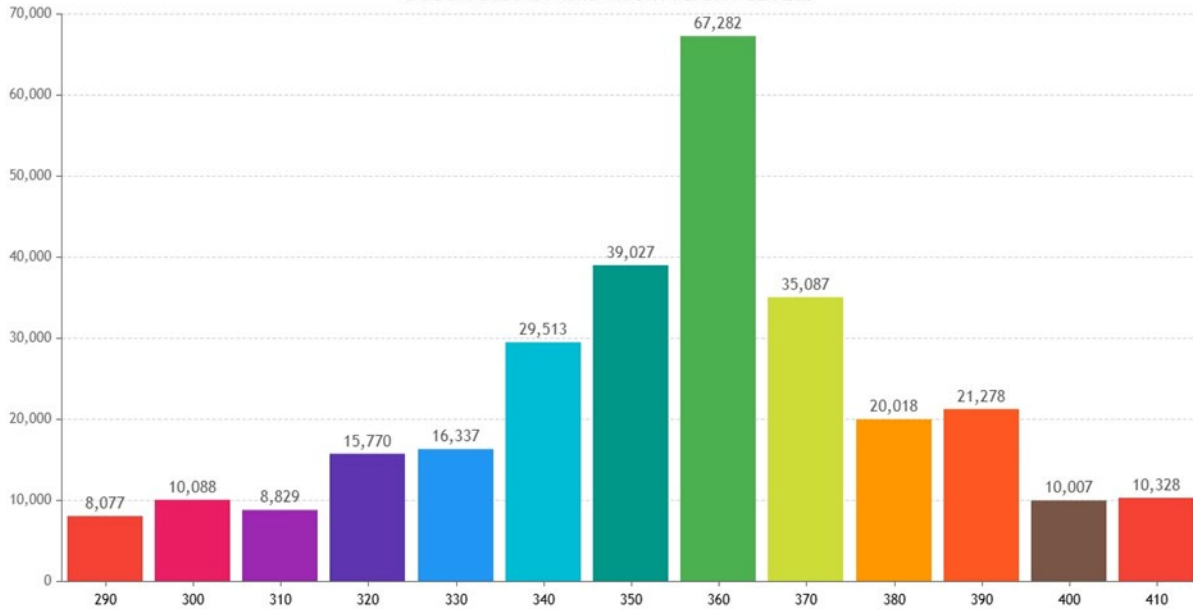
The graphs below illustrate the distribution of submitted Traffic Data Samples (TDS) across all MID States, the overall number of flights analyzed, and the long-term trend of TDS submissions from 2012 to 2025. These visuals reflect a steady increase in total data volume.



TREND OF THE NUMBER OF RVSM TDS OF 2021, 2022, 2023, 2024 and 2025



OCCUPANCY OF MID RVSM FLIGHT LEVELS



#	Route	Frequency	FIR
1	DAVUS-TASMI	9799	Kuwait
2	RATVO-SIDAD	8383	Baghdad
3	TUMAK-DAVUS	6756	Bahrain
4	TASMI-NINVA	6576	Baghdad
5	ALPOB-ULADA	5947	Bahrain
6	RABAP-OBNET	5444	Bahrain
7	ULINA-DEESA	4577	Amman
8	SIDAD-RABAP	4576	Kuwait
9	DAROR-NALPO	4546	Bahrain
10	SIDAD-LONOS	3893	Kuwait
11	RASKI-MENSA	3507	Muscat
12	TASMI-KABAN	3466	Baghdad
13	LONOS-GIRMO	2762	Bahrain
14	TONVO-RASKI	2693	Muscat
15	HECA-ULINA	2506	Cairo
16	RASKI-PASOV	2351	Muscat
17	KUPRO-TONVO	2268	Emirates
18	PARAR-MENSA	2180	Muscat
19	TONVO-PARAR	2164	Muscat
20	OEJN-OERK	1985	Jeddah

Top 20 Busiest Routes

TECHNICAL RISK ESTIMATION FOR 2025

The technical height-keeping performance risk for the MID RVSM airspace during the 2025 monitoring period was estimated using the Collision Risk Model (CRM), in accordance with ICAO-approved RVSM safety monitoring methodology.

The CRM integrates aircraft height-keeping performance characteristics with regional traffic data to estimate the technical vertical collision risk (N_{az}). This risk represents the likelihood of a fatal mid-air collision attributable solely to technical height-keeping errors between aircraft operating at adjacent RVSM flight levels.

For the 2025 monitoring period, the calculated technical vertical risk for the MID Region is:

$$N_{az} = 8.932 \times 10^{-11} \text{ fatal accidents per flight hour}$$

This value remains significantly below the ICAO TLS, providing strong evidence that aircraft operating within the MID RVSM airspace continue to exhibit satisfactory technical height-keeping performance.

The result also demonstrates the continued effectiveness of RVSM approval, monitoring, and corrective processes implemented across the region.

TRAFFIC DATA AND AIRCRAFT PARAMETERS USED

The technical risk assessment for 2025 is based on a comprehensive set of Traffic Data Samples (TDS) and aircraft geometric parameters representative of operations throughout the MID RVSM airspace.

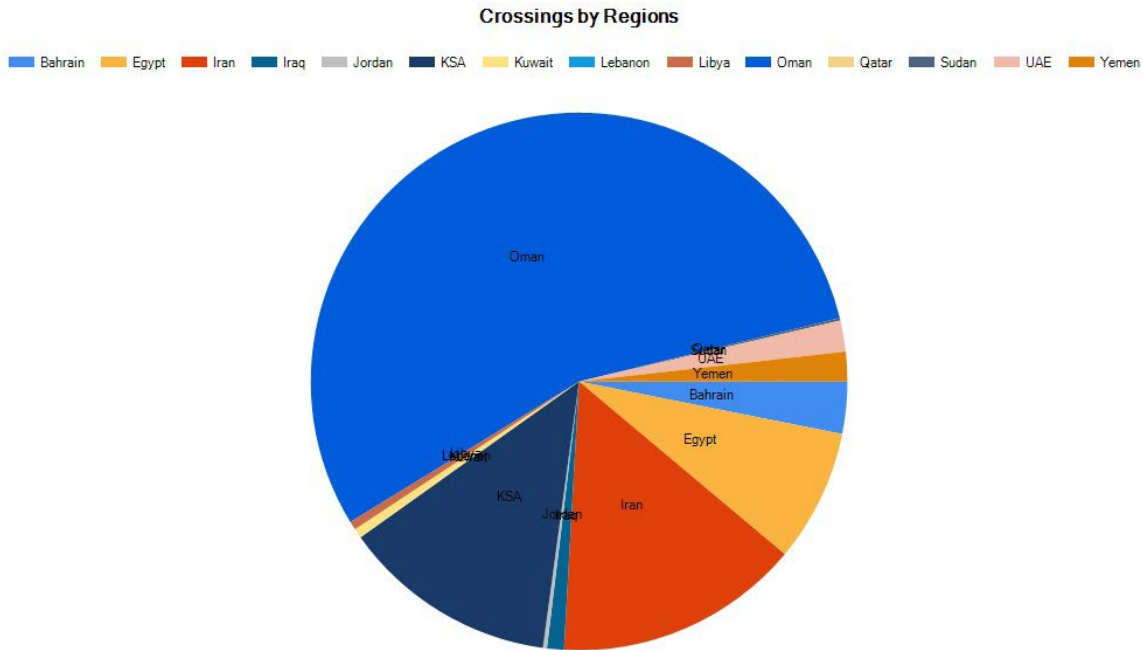
These data include aircraft movement statistics, flight times, distances flown, and average operating speeds, combined with representative aircraft dimensions used to model collision geometry within the CRM. The derived parameters reflect the diversity of aircraft types and traffic patterns present in the region.

For the 2025 assessment, the key parameters used were:

- **Average aircraft diameter (λ_{xy}):** 0.027573 NM (167.53 ft)
- **Average aircraft wingspan (λ_y):** 0.025412 NM (154.41 ft)
- **Average aircraft height (λ_z):** 0.0079215 NM (48.13 ft)
- **Number of flights analysed:** 345,219
- **Total flying time:** 213,085 hours
- **Total flying distance:** 98,230,253 NM
- **Average ground speed:** 464.11 kt
- **Average passing frequency:** 1.246×10^{-1}

These parameters were used consistently across all regional computations and are considered statistically representative of MID RVSM operations during the 2025 monitoring cycle.

Note: MIDRMA's analysis indicates that Muscat FIR continues to operate within an increasingly complex and highly congested traffic environment in the ICAO Middle East RVSM airspace and, for the fourth consecutive year, remains the most complex and congested FIR in the Middle East Region. During the reporting period, a noticeable increase in technical risk indicators has been observed within the Oman FIR RVSM airspace, largely attributable to the sustained growth in traffic density and operational complexity. Notwithstanding these challenges, the overall safety performance of the airspace remains robust, reflecting the continued commitment and professionalism of Oman's Air Traffic Services in maintaining RVSM operations at a high standard. The observed trends highlight the importance of continued vigilance, proactive risk mitigation measures, and close coordination among all stakeholders, to ensure that safety levels are preserved as traffic demand continues to evolve.



ASSUMPTIONS AND VALIDITY OF THE ASSESSMENT

To ensure that the estimated technical risk values are reliable and meaningful, a number of key assumptions underpinning the CRM computations were examined and confirmed to be valid for the 2025 assessment.

These assumptions include the validity of the estimated **frequency of horizontal overlap**, the representativeness of the traffic samples used, and the continued compliance of aircraft with ICAO height-keeping performance specifications. In particular:

- a. The calculated probability of vertical overlap due to technical height-keeping errors, $P_z(1000) = 1.86 \times 10^{-9}$, is well below the ICAO maximum allowable value of 1.7×10^{-8} .
- b. Aircraft operating at 1000 ft RVSM separation comply with the Global Height-Keeping Performance Specification.
- c. Individual aircraft meet the required performance limits for the components of Total Vertical Error (TVE).
- d. The MID RVSM height-monitoring programme remains active, systematic, and effective.
- e. The input data used by the CRM has been validated and screened for consistency and accuracy.
- f. Established procedures exist to identify, investigate, and correct any deficiencies in aircraft technical height-keeping performance.

- g. The assessment methodology remains aligned with ICAO-approved practices and is periodically reviewed to ensure continued applicability.

Collectively, these conditions confirm that the technical risk results for 2025 are robust and credible.

PROBABILITY OF LATERAL OVERLAP – PY(0)

The **probability of lateral overlap, Py(0)** represents the likelihood that two aircraft operating nominally at adjacent RVSM flight levels are laterally overlapped while flying along the same or closely spaced routes. This parameter is a critical input to the CRM, as it directly influences the estimation of vertical collision risk.

For the 2025 monitoring period, Py(0) values were computed for each MIDRMA Member State using the ICAO-approved methodology implemented through the MID Risk Analysis Software. The calculations take into account traffic density, route structure, and aircraft passing frequencies within each FIR.

- a. The results indicate that:
- b. Py(0) values across the MID RVSM airspace remain within expected and acceptable ranges
- c. No abnormal lateral overlap characteristics were identified in any FIR
- d. The average regional passing frequency was calculated as 1.24565×10^{-1} , supporting the validity of the lateral overlap assumptions used in the CRM

Accordingly, the lateral overlap component of the 2025 technical risk assessment is considered appropriate and representative of actual operations within the MID RVSM airspace.

COMPLIANCE WITH PZ(1000) REQUIREMENT

The **Pz(1000)** parameter represents the probability that two aircraft operating at adjacent RVSM flight levels lose vertical separation due to technical height-keeping errors.

For the MID RVSM airspace in 2025:

- a. **Pz(1000) = 1.86×10^{-9}**
- b. This value fully complies with the ICAO Global System Performance Specification limit of **1.7×10^{-8}**

This result confirms that aircraft height-keeping performance continues to meet ICAO requirements throughout the MID Region.

CONCLUSION – SAFETY OBJECTIVE NO. 1

The 2025 technical risk assessment demonstrates that Safety Objective No. 1 (Technical Height-Keeping Performance) continues to be satisfied within the MID RVSM airspace.

The analysis confirms that:

- a. The calculated technical risk remains significantly below the ICAO TLS

- b. Aircraft height-keeping performance remains stable and compliant
- c. No evidence of systemic technical degradation was identified

Accordingly, the MID RVSM airspace continues to operate at an acceptable and compliant level of technical safety with respect to aircraft height-keeping performance.

Note 1: MIDRMA continues to distribute 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.

Note 2: All member states must review and adhere to their MMRs, which are accessible on the MIDRMA website (www.midrma.com).

RECOMMENDATIONS FOR RVSM SAFETY OBJECTIVE NO. 1:

1. Sustain Height-Monitoring Activities

MIDRMA should continue to conduct systematic RVSM height-monitoring activities in accordance with ICAO requirements to ensure the ongoing verification of aircraft height-keeping performance. Particular attention should be given to newly approved aircraft types and fleets with limited monitoring history to confirm continued compliance with the Global Height-Keeping Performance Specification.

2. Enhance the Use of ADS-B–Based Height Monitoring (AHMS)

Member States are encouraged to actively support the transition toward ADS-B–based height monitoring by facilitating the regular provision of archived ADS-B data to MIDRMA. Once fully implemented, AHMS will significantly expand monitoring coverage, improve detection capability, and strengthen confidence in regional technical risk assessments.

3. Maintain Compliance with Minimum Monitoring Requirements (MMRs)

All Member States should ensure that aircraft operators comply with the Minimum Monitoring Requirements (MMRs) issued by MIDRMA. States are encouraged to regularly review their national RVSM oversight processes to ensure that aircraft subject to monitoring obligations are tracked, monitored, and followed up in a timely manner.

4. Early Identification and Corrective Action for Height-Keeping Deviations

MIDRMA, in coordination with States and operators, should continue to promptly identify aircraft exhibiting unsatisfactory height-keeping performance and ensure that appropriate corrective actions are taken without delay. This includes verification of altimetry system maintenance, configuration, and calibration before the aircraft continues unrestricted RVSM operations.

5. Promote Preventive Maintenance and Continued Airworthiness

States should emphasize preventive maintenance practices and strict adherence to altimetry system maintenance standards as part of their continuing airworthiness oversight.

This proactive approach will help sustain the high level of technical performance observed across the MID RVSM airspace.

6. Strengthening Technical Awareness and Training

MIDRMA, in cooperation with ICAO and relevant partners, should continue to support technical workshops and awareness activities for State inspectors, maintenance organizations, and operators, focusing on height-keeping performance, Total Vertical Error (TVE) components, and the interpretation of monitoring results.

7. Maintain Alignment with ICAO Global Practices

MIDRMA should continue to align its technical risk assessment methodology with ICAO guidance material and global best practices, ensuring consistency with other Regional Monitoring Agencies and supporting the credibility of the MID RVSM safety monitoring programme.

OVERALL SAFETY (OPERATIONAL AND TECHNICAL RISK)

Safety objective no. 2 aims to ensure that the overall risk of collision due to all causes including technical risk, operational errors, and in-flight contingencies within the icao middle east (mid) rvsm airspace remains at or below the icao established overall target level of safety (tls) of 5×10^{-9} fatal accidents per flight hour.

Based on the safety assessment conducted for the 2025 reporting cycle, the **estimated overall collision risk** for the mid rvsm airspace was calculated to be 9.278×10^{-10} fatal accidents per flight hour. This computed value continues well below the icao overall tls, thereby indicating that rvsm safety objective no. 2 has been formally satisfied for the reporting period.

While the calculated result demonstrates compliance with icao safety targets, it must be interpreted with caution due to the limitations associated with the availability and quality of operational safety data, particularly large height deviation (lhd) reports, which remain a critical input to the overall risk assessment.

LARGE HEIGHT DEVIATION (LHD) REPORTS – 2025

- a. The MIDRMA continues to express serious concern regarding the persistently inadequate submission of Large Height Deviation (LHD) reports across the ICAO MID Region. Despite sustained efforts by the Agency, including formal correspondence, repeated monthly reminders, and continuous coordination with designated focal points in all Member States, the level of LHD reporting during 2025 remained critically insufficient.
- b. Throughout the twelve-month reporting period of 2025, only three (3) LHD reports were received. Of these, two reports were submitted by Emirates ATC, whose proactive engagement and consistent cooperation with regional safety monitoring requirements are highly acknowledged and appreciated. The remaining single report was received from Jeddah ATC.
- c. It is important to highlight that this reporting deficiency specifically affects **LHD categories** of direct operational relevance to RVSM safety, namely **Categories A, B, C, D, J, and K**, which represent events associated with flight crew actions, ATC errors, and TCAS-related occurrences. These categories are essential for accurately assessing operational risk and validating compliance with Safety Objective No. 2.
- d. The continued absence of meaningful LHD data severely undermines the robustness of the operational risk assessment and significantly reduces the confidence level associated with the calculated overall collision risk. From a regional safety oversight perspective, this situation remains unacceptable and necessitates urgent corrective action by all MIDRMA Member States to ensure compliance with ICAO reporting obligations.

DISTRIBUTION OF REPORTED LHDS BY MID FIRS

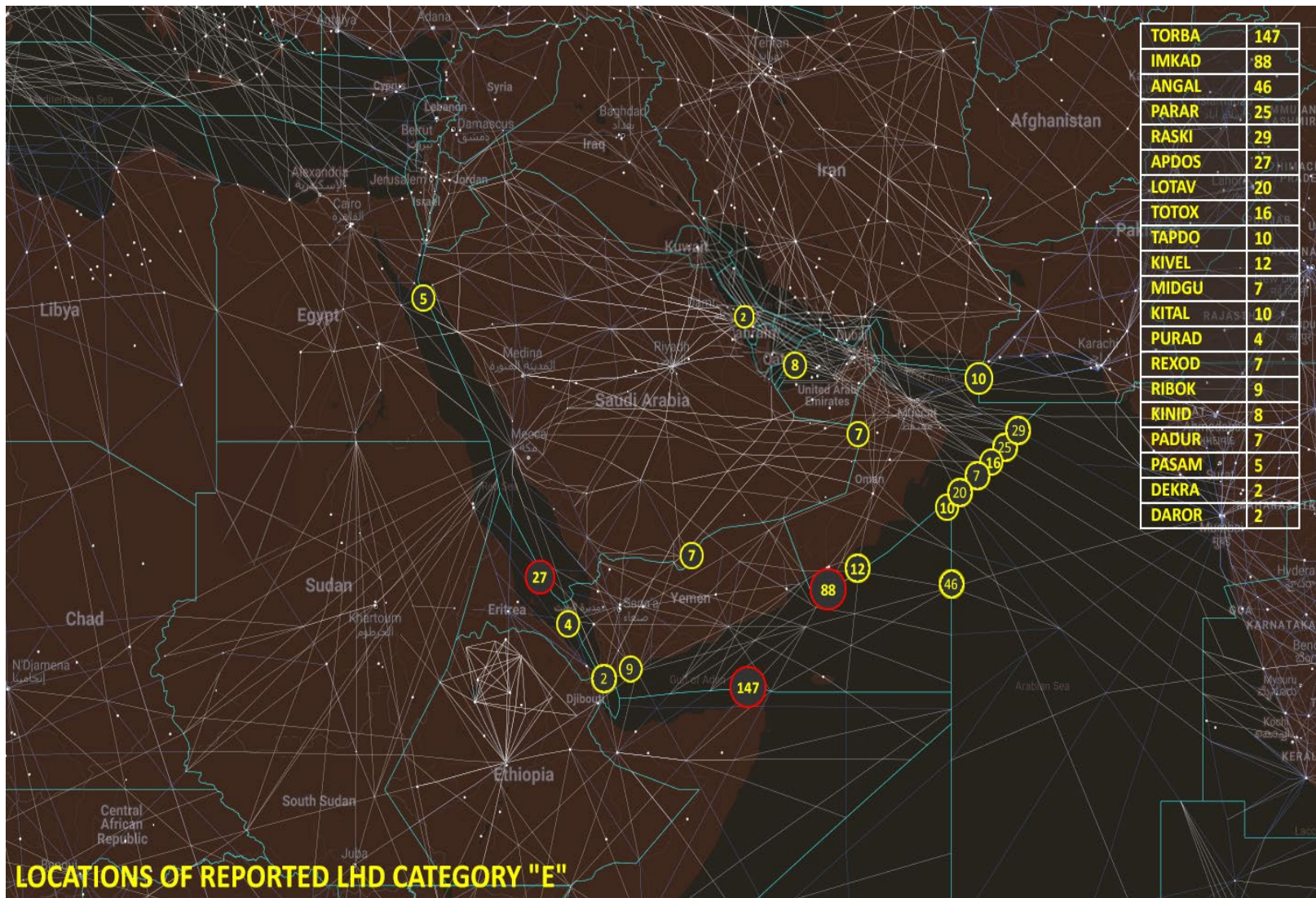
- a. The table below presents the number of reported LHDS and related LHDS across MID FIRs during the 2025 reporting cycle. The figures clearly demonstrate substantial disparities in reporting practices among FIRs, further reinforcing concerns regarding the completeness and representativeness of the available data.

MID FIRs	No. of Reported LHDS	No. of Related LHDS
Bahrain	8	5
Baghdad	2	-
Amman	-	2
Tehran	-	3
Cairo	9	3
Damascus	-	2
Khartoum	-	-
Kuwait	-	1
Muscat	83	95
Jeddah/ Riyadh	11	59
Qatar	14	-
Tripoli	-	-
Emirates	2	5
Sana'a	337	8

MID FIRs	Related to other Adjacent FIRs	No. of Related LHDS
Sana'a	Addis Ababa	148
Sana'a	Asmara	6
Sana'a	Djibouti	0
Sana'a	Mumbai	46
Muscat	Karachi	10
Muscat	Mumbai	60

LHD Reports Related to other Regions

- b. Several FIRs reported no LHDS at all, while others submitted large volumes of coordination-related reports **category E** , This imbalance further complicates the regional operational risk assessment and limits the ability to derive statistically reliable conclusions. The map below illustrates the locations of reported LHD Cat. E



OPERATIONAL RISK ASSOCIATED WITH LHD CATEGORIES

- a. The validated LHD reports for the 2025 Safety Monitoring Report cycle were classified according to standard ICAO LHD categories and used as inputs for the calculation of the overall vertical collision risk under Safety Objective No. 2.
- b. While a large number of coordination-related LHD Category E reports were exchanged between specific FIR interfaces, only three (3) validated LHD occurrences affecting RVSM safety objectives were eligible for inclusion in the overall collision risk model. Notably, no LHDs were reported under Categories B, C, D, J, or K, which are typically associated with the most severe operational safety implications in RVSM airspace.

Note: The LHD reports in this table were validated for the whole SMR 2025 reporting cycle:

LHD Cat. Code	Large Height Deviation (LHD) Categories	No. of LHDs	LHD Duration (Sec.)
A	The flight crew fails to climb or descend the aircraft as cleared.	1	7
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	-	-
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	1	28
I	Turbulence or other weather-related cause	-	-
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	1	60
	Total	3	95

SUMMARY OF OPERATIONAL RISK ASSOCIATED WITH LARGE HEIGHT DEVIATION REPORTS FOR SMR 2025 REPORTING CYCLE

Note 1: For the second time, 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.

The absence of LHDs in critical categories raises serious concerns regarding under-reporting rather than an absence of operational deviations.

The limited dataset substantially constrains the ability to accurately assess operational risk trends and validate the calculated overall collision risk.

For the second time, an RVSM Safety Monitoring Report has been issued with such a low number of LHD reports, highlighting a systemic reporting deficiency rather than an isolated occurrence.

RVSM SAFETY PROTOCOL – EASTERN BOUNDARIES OF MUSCAT FIR

- a. The most recent review of RVSM safety at the eastern boundaries of Muscat FIR confirms that concerns related to Large Height Deviations between Muscat and Mumbai ATC units persist throughout 2025.
- b. Although several corrective and preventive measures have been implemented since the introduction of the RVSM safety protocol, the number of exchanged LHD reports remains unacceptably high. While a slight reduction was observed during the first half of 2025 compared with 2024, the figures continue to exceed acceptable safety thresholds.
- c. This sustained trend indicates that the issue is systemic rather than sporadic, suggesting that existing mitigation measures have not yet achieved their intended safety outcomes. Without the implementation of more robust and sustained corrective actions, the situation will continue to pose a significant safety risk to RVSM operations at this critical FIR interface.

- d. Enhanced coordination procedures, improved data-sharing mechanisms, and strengthened monitoring and investigation processes are urgently required to ensure that corrective actions result in measurable and lasting safety improvements.
- e. Further details related to Muscat–Mumbai LHD exchanges are provided in **Appendix A** of this report.

RVSM SAFETY PROTOCOL – SANA’A FIR

- a. A comparative analysis of the first nine months of 2024 and 2025 indicates a continued and concerning increase in LHD reports involving Sana’a FIR and its adjacent FIRs. During the corresponding period in 2024, 218 LHDs were reported, compared with 265 LHDs in 2025, representing an increase of approximately 73%.
- b. The most significant increases were observed in coordination with Addis Ababa FIR and Muscat FIR, while a reduction was noted with Jeddah FIR. This uneven distribution suggests that while localized improvements have been achieved in some interfaces, systemic coordination challenges persist in others.

Sanaa Related To ---▶	Addis Ababa	Asmara	Jeddah	Mumbai	Muscat	TOTAL
Jan-25	18	2	2	8	17	47
Feb-25	7	0	2	2	10	21
Mar-25	7	0	3	0	8	18
Apr-25	4	1	1	4	7	17
May-25	2	0	2	4	7	15
Jun-25	11	0	2	10	10	33
Jul-25	20	1	4	3	3	31
Aug-25	34	1	2	4	13	54
Sep-25	20	0	4	3	2	29
Oct 2025	10	0	13	6	9	38
Nov 2025	15	1	6	2	7	31
Dec 2025	23	1	6	9	5	44
Total Report	171	7	47	55	98	378

LHD Reports filed by Sana’a ATC related to adjacent FIRs

- c. The continuing rise in LHD occurrences, particularly between Sana’a and Muscat FIRs, reflects unresolved deficiencies in handover coordination, flight level verification, and real-time communication procedures. Unless decisive corrective actions are implemented,

these deviations may compromise the long-term safety of RVSM operations within the affected airspace.

RVSM APPROVALS AND COMPLIANCE MONITORING

- a. In accordance with **ICAO Documents 9574 and 9937**, the MIDRMA continues to perform systematic monitoring of RVSM operational compliance to ensure that aircraft operating within the MID RVSM airspace hold valid State RVSM approvals.
- b. Due to limitations in obtaining comprehensive traffic data from all Member States, compliance monitoring is primarily conducted using monthly RVSM traffic data provided by Bahrain, Baghdad, and Emirates FIRs. The MIDRMA expresses its sincere appreciation to the Civil Aviation Authorities of Bahrain, Iraq, and the United Arab Emirates for their consistent and high-quality data submissions, which remain essential for effective regional safety oversight.
- c. A limited number of non-RVSM-approved aircraft were identified during the 2025 monitoring cycle. These cases were generally attributed to administrative delays or temporary lapses in approval validity, rather than intentional non-compliance. Member States are therefore urged to ensure that RVSM approval databases are maintained accurately and updated promptly.
- d. Detailed results related to non-RVSM-approved aircraft are presented in **Appendix B** of this report.

CONCLUSIONS – RVSM SAFETY OBJECTIVE NO. 2

1. The estimated overall collision risk within the ICAO Middle East RVSM airspace for the 2025 Safety Monitoring Report reporting cycle remains below the ICAO Overall Target Level of Safety (TLS) of 5×10^{-9} fatal accidents per flight hour, thereby indicating formal compliance with RVSM Safety Objective No. 2.
2. The calculated overall risk value reflects the combined contribution of technical risk, operational errors, and in-flight contingencies; however, the reliability of this assessment is significantly affected by limitations in the availability and quality of operational safety data, particularly Large Height Deviation (LHD) reports.
3. The extremely low number of LHD reports received during the 2025 reporting period, especially those associated with operationally critical LHD categories (A, B, C, D, J, and K), raises serious concerns regarding the completeness and representativeness of the operational risk component used in the overall collision risk calculation.

4. The continued absence of standardized and timely LHD reporting from the majority of MIDRMA Member States substantially reduces the confidence level of the operational risk assessment and limits the ability to accurately identify regional safety trends and emerging operational hazards.
5. Persistent LHD hotspots identified at specific FIR interfaces, notably at the eastern boundaries of Muscat FIR and within the Sana'a FIR coordination environment, indicate that systemic operational and coordination deficiencies remain unresolved despite the implementation of existing safety protocols.
6. The observed increase in LHD occurrences under established RVSM safety protocols demonstrates that current corrective and preventive measures have not yet achieved the desired and sustained level of safety improvement, necessitated further review and strengthening of coordination, communication, and monitoring arrangements.
7. While the MIDRMA continues to conduct monitoring of RVSM approval compliance in accordance with ICAO Documents 9574 and 9937, the effectiveness of this activity remains constrained by incomplete traffic data submissions from several Member States.
8. The MIDRMA considers the ongoing deficiencies in Traffic Data Sample (TDS) submissions and LHD reporting to constitute a serious regional safety oversight concern, which requires urgent and coordinated corrective action by all Member States, supported by the ICAO MID Office.

RVSM SAFETY OBJECTIVE NO. 3 – SAFETY IMPROVEMENT, RECOMMENDATIONS, AND CONTINUOUS ASSURANCE

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.

- a. RVSM Safety Objective No. 3 aims to ensure that safety-related issues identified through the RVSM safety monitoring process are effectively addressed through corrective actions, strengthened procedures, and continuous engagement with Member States. This objective is qualitative in nature and is not assessed through numerical indicators; instead, its achievement is demonstrated through the existence and effective operation of a structured and sustainable safety improvement process.
- b. Throughout the reporting period, the Middle East Regional Monitoring Agency (MIDRMA) has systematically reviewed the outcomes of RVSM safety monitoring activities and translated identified safety concerns into clear observations, conclusions, and recommendations. These outcomes have been formally communicated to the concerned States through the

Safety Monitoring Report, bilateral coordination, and relevant regional safety forums, ensuring that safety issues are clearly highlighted and appropriately addressed at both operational and regulatory levels.

- c. The MIDRMA has maintained continuous coordination with Member States to support the implementation of safety improvements related to RVSM operations. Particular attention has been given to issues associated with inter-FIR coordination, the management and reporting of Large Height Deviations (LHDs), the quality and consistency of Traffic Data Sample (TDS) submissions, and the continued oversight of RVSM approvals. This proactive and structured approach ensures that identified safety issues are not left unresolved and that preventive measures are implemented in a timely manner to avoid the escalation of risk.
- d. In addition, the consistent application of ICAO-approved monitoring methodologies has ensured that safety improvement remains an integral component of the RVSM oversight framework in the Middle East Region. The established cycle of monitoring, analysis, reporting, and follow-up provides assurance that safety observations lead to tangible improvements in operational practices and oversight arrangements, thereby preventing the accumulation of latent risks over time.
- e. As part of its continuous efforts to further enhance regional safety oversight, the MIDRMA has also focused on strengthening its risk analysis capabilities through the development of the Middle East Risk Assessment Software with ADS-B Integration and Response (MIDRAS-AIR), as detailed in a dedicated working paper. This initiative represents a strategic enhancement of the MIDRMA's analytical framework by leveraging advanced data integration and automation to support more robust and proactive safety assessments. In parallel, the MIDRMA is implementing an upgrade to the online Large Height Deviation (LHD) reporting system, aimed at improving usability, consistency, and reporting efficiency. All RVSM focal points will be fully briefed well in advance of the upgrade to ensure a smooth transition and the continued effectiveness of regional LHD reporting.
- f. Based on the above, the MIDRMA considers that **RVSM Safety Objective No. 3 has been successfully achieved**. A robust and effective mechanism is in place to ensure that safety issues identified through RVSM monitoring are systematically reviewed, communicated, and addressed. This continuous safety improvement process provides confidence that RVSM operations in the Middle East Region are actively managed and that emerging safety concerns are mitigated in a timely manner.
- g. The achievement of RVSM Safety Objective No. 3 complements the outcomes of Safety Objectives No. 1 and No. 2 by ensuring that technical and operational risks identified through monitoring activities are followed by appropriate corrective and preventive actions. Together, these objectives provide comprehensive assurance that the RVSM system in the Middle East Region continues to operate safely and in accordance with ICAO provisions.

RECOMMENDATIONS

1. In order to sustain and further strengthen the achievements under RVSM Safety Objective No. 3, the MIDRMA recommends that Member States continue to actively support the regional safety improvement process by maintaining close coordination with the MIDRMA on all RVSM-related safety matters. Particular emphasis should be placed on timely and effective follow-up of safety observations and recommendations arising from the RVSM Safety Monitoring Report.
2. Member States are encouraged to ensure that operational procedures at FIR boundaries remain clearly defined, regularly reviewed, and effectively implemented, with special attention given to coordination practices that have the potential to generate Large Height Deviations (LHDs). Continued awareness and reinforcement of proper LHD reporting practices are essential to support accurate safety oversight and the identification of emerging safety trends.
3. States should also continue to support initiatives aimed at enhancing regional risk analysis capabilities, including the development and future implementation of advanced analytical tools such as MIDRAS-AIR. Active participation in system briefings, training activities, and consultations related to new tools and system upgrades, including the online LHD reporting platform, will be essential to ensure their effective and consistent use across the region.

CONCLUSIONS

1. RVSM Safety Objective No. 3 addresses the critical need for a continuous and structured approach to safety improvement within the Middle East RVSM airspace. While this objective is not assessed through quantitative measures, its achievement is demonstrated through the establishment and sustained operation of effective mechanisms for identifying, communicating, and addressing safety-related issues.
2. Based on the actions undertaken during the reporting period, the MIDRMA concludes that RVSM Safety Objective No. 3 has been successfully achieved. Safety issues identified through RVSM monitoring activities are systematically reviewed and translated into practical recommendations, supported by continuous engagement with Member States and the ongoing enhancement of analytical and reporting tools.
3. The continued application of this safety improvement framework, together with sustained collaboration between the MIDRMA and Member States, provides strong assurance that RVSM operations in the Middle East Region will remain safe, resilient, and aligned with ICAO provisions over the long term.

Appendix A

LHD REPORTS SUBMITTED BY MUSCAT ACC RELATED TO MUMBAI ACC

#	ID	Date of Occ	Reported By	Related to	Location	Nature of the occurrence:	Category
1	12299	Jan 1, 2025	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
2	12347	Jan 3, 2025	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
3	12348	Mar 3, 2025	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
4	12349	Mar 3, 2025	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
5	12350	Mar 5, 2025	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
6	12351	Mar 6, 2025	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
7	12352	Mar 9, 2025	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
8	12353	Mar 9, 2025	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
9	12354	Mar 12, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
10	12355	Mar 15, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
11	12356	Mar 22, 2025	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
12	12357	Mar 24, 2025	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
13	12358	Mar 25, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
14	12385	April 5, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
15	12386	April 6, 2025	Muscat	Mumbai	RASKI	Revised Estimate Not Coordinated	E
16	12477	June 6, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
17	12478	June 5, 2025	Muscat	Mumbai	RASKI	Revised Estimate Not Coordinated	E
18	12479	June 5, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
19	12480	June 6, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
20	12481	June 13, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
21	12482	June 13, 2025	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
22	12483	June 14, 2025	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
23	12484	June 14, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
24	12485	June 15, 2025	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
25	12486	June 17, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
26	12487	June 18, 2025	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
27	12488	June 18, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
28	12489	June 20, 2025	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
29	12490	June 22, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E

30	12491	June 24, 2025	Muscat	Mumbai	PARAR	ACFT Entered FIR Without Coordination	E
31	12492	June 24, 2025	Muscat	Mumbai	ASPUX	ACFT Entered FIR Without Coordination	E
32	12493	June 24, 2025	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
33	12494	June 25, 2025	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
34	12495	June 26, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
35	12496	June 28, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
36	12497	June 29, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
37	12498	June 30, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
38	12499	Jun 26, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
39	12652	Oct 01, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
40	12653	Oct 01, 2025	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
41	12654	Oct 02, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
42	12655	Oct 02, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
43	12656	Oct 02, 2025	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
44	12657	Oct 02, 2025	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
45	12658	Oct 02, 2025	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
46	12659	Oct 03, 2025	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
47	12660	Oct 04, 2025	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
48	12661	Oct 04, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
49	12662	Oct 04, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
50	12663	Oct 05, 2025	Muscat	Mumbai	ASPUX	Revised FL Not Coordinated	E
51	12664	Oct 07, 2025	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
52	12665	Oct 07, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
53	12666	Oct 07, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
54	12673	Oct 08, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
55	12674	Oct 08, 2025	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
56	12675	Oct 08, 2025	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
57	12676	Oct 09, 2025	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
58	12677	Oct 10, 2025	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
59	12678	Oct 10, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
60	12679	Oct 10, 2025	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E

LHD REPORTS SUBMITTED BY MUMBAI RELATED TO MUSCAT

#	ID	Date of Occ	Reported By	Related to	Location	Nature of the occurrence:	Category
1	LHD003030	30-1-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
2	LHD003031	3-1-2025	Mumbai	Muscat	PARAR	No transfer information	E
3	LHD003032	4-1-2025	Mumbai	Muscat	RASKI	No or late FL revision	E
4	LHD003033	7-1-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
5	LHD003034	7-1-2025	Mumbai	Muscat	TOTOX	No or late FL revision	E
6	LHD003035	13-1-2025	Mumbai	Muscat	TOTX	No or late FL revision	E
7	LHD003037	18-1-2025	Mumbai	Muscat	RASKI	No or late FL revision	E
8	LHD003038	19-1-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
9	LHD003039	21-1-2025	Mumbai	Muscat	TOTOX	No or late FL revision	E
10	LHD003040	28-1-2025	Mumbai	Muscat	RASKI	No or late FL revision	E
11	LHD003067	9-2-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
12	LHD003068	9-2-2025	Mumbai	Muscat	KITAL	No or late FL revision	E
13	LHD003069	12-2-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
14	LHD003109	3-3-2025	Mumbai	Muscat	PARAR	No transfer information	E
15	LHD003110	3-3-2025	Mumbai	Muscat	PARAR	No transfer information	E
16	LHD003111	8-3-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
17	LHD003112	9-3-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
18	LHD003113	24-3-2025	Mumbai	Muscat	KITAL	No or late FL revision	E
19	LHD003114	24-3-2025	Mumbai	Muscat	REXOD	No or late FL revision	E
20	LHD003153	3-4-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
21	LHD003154	5-4-2025	Mumbai	Muscat	RASKI	No or late FL revision	E
22	LHD003155	5-4-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
23	LHD003156	11-4-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
24	LHD003157	17-4-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
25	LHD003158	21-4-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
26	LHD003159	23-4-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
27	LHD003176	5-5-2025	Mumbai	Muscat	TOTOX	No or late FL revision	E
28	LHD003178	8-5-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
29	LHD003179	14-5-2025	Mumbai	Muscat	REXOD	No or late FL revision	E

30	LHD003180	22-5-2025	Mumbai	Muscat	TOTOX	No or late FL revision	E
31	LHD003181	22-5-2025	Mumbai	Muscat	TOTOX	No or late FL revision	E
32	LHD003182	27-5-2025	Mumbai	Muscat	REXOD	No or late FL revision	E
33	LHD003183	27-5-2025	Mumbai	Muscat	TOTOX	No transfer information	E
34	LHD003217	29-6-2025	Mumbai	Muscat	KITAL	No transfer information	E
35	LHD003218	27-6-2025	Mumbai	Muscat	KITAL	No or late FL revision	E
36	LHD003253	4-7-2025	Mumbai	Muscat	KITAL	No estimate time revi.	E
37	LHD003254	9-7-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
38	LHD003255	23-7-2025	Mumbai	Muscat	PARAR	No transfer information	E
39	LHD003256	3-7-2025	Mumbai	Muscat	LOTAV	No or late estimate rev.	E
40	LHD003305	3-8-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
41	LHD003306	22-8-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
42	LHD003307	29-8-2025	Mumbai	Muscat	LOTAV	No or late estimate rev.	E
43	LHD003308	30-9-2025	Mumbai	Muscat	PARAR	No or late FL revision	E
44	LHD003309	24-8-2025	Mumbai	Muscat	RASKI	No or late FL revision	E
44	LHD003381	29-11-2025	Mumbai	Muscat	LOTAV	No or late FL revision	E
45	LHD003380	18-11-2025	Mumbai	Muscat	TOTOX	No transfer information	E
46	LHD003379	14-11-2025	Mumbai	Muscat	TOTOX	No or late FL revision	E
47	LHD003348	30-10-2025	Mumbai	Muscat	ANGAL	No or late FL revision	E
48	LHD003347	29-10-2025	Mumbai	Muscat	ANGAL	No or late FL revision	E
49	LHD003331	20-10-2025	Mumbai	Muscat	ANGAL	No or late FL revision	E
50	LHD003330	7-10-2025	Mumbai	Muscat	ANGAL	No or late FL revision	E
51	LHD003309	24-08-20205	Mumbai	Muscat	RASKI	No or late FL revision	E

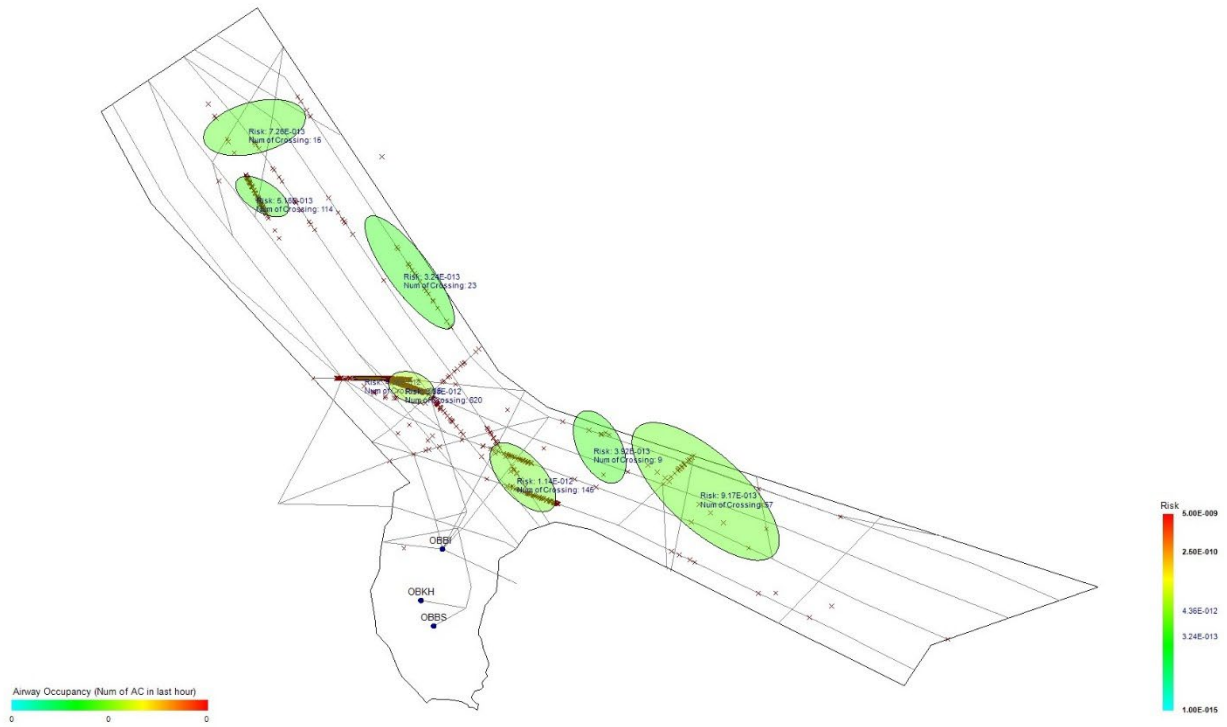
NON-RVSM APPROVED AIRCRAFT

#	Registration of Violating ACFT	ICAO Type	First Observed on	RMA Observed	STATE/RMA Responsible
1	PKLSW	B739	08-03-23	MIDRMA	AAMA
2	PKLVF	B739	20-01-23	MIDRMA	AAMA
3	PKSTD	A320	19-01-23	MIDRMA	AAMA
4	PKLSV	B739	21-12-22	MIDRMA	AAMA
5	PKBGZ	B738	13-12-22	MIDRMA	AAMA
6	PKBKM	A320	30-11-22	MIDRMA	AAMA
7	PKLSU	B739	27-11-22	MIDRMA	AAMA
8	PKSTH	A320	27-11-22	MIDRMA	AAMA
9	PKSJH	A320	06-11-22	MIDRMA	AAMA
10	60208A	C17	30-03-20	MIDRMA	AAMA
11	40001A	C17	25-01-20	MIDRMA	AAMA
12	9SPRR	IL76	09-06-24	MIDRMA	AFIRMA
13	XTEBO	IL76	07-06-24	MIDRMA	AFIRMA
14	5NBYJ	E290	06-06-24	MIDRMA	AFIRMA
15	TTDAB	H25B	31-05-24	MIDRMA	AFIRMA
16	5NADM	B744	28-05-24	MIDRMA	AFIRMA
17	5YFQC	B734	20-05-24	MIDRMA	AFIRMA
18	5HTCP	B39M	19-05-24	MIDRMA	AFIRMA
19	5NBBN	B772	18-05-24	MIDRMA	AFIRMA
20	5HONE	GLF5	15-05-24	MIDRMA	AFIRMA
21	5HTCQ	B39M	15-05-24	MIDRMA	AFIRMA
22	5NHMM	B744	15-05-24	MIDRMA	AFIRMA
23	5YFQA	B734	15-05-24	MIDRMA	AFIRMA
24	5NBOD	GLF4	28-01-22	MIDRMA	AFIRMA
25	5YFAN	CRJ2	15-07-20	MIDRMA	AFIRMA
26	5YWBH	C56X	14-07-20	MIDRMA	AFIRMA
27	ETATF	B350	08-07-20	MIDRMA	AFIRMA
28	ZSCQP	CRJ9	07-07-20	MIDRMA	AFIRMA
29	CCBGV	B789	08-06-22	MIDRMA	CARSAM
30	FAB2857	KC39	22-05-22	MIDRMA	CARSAM

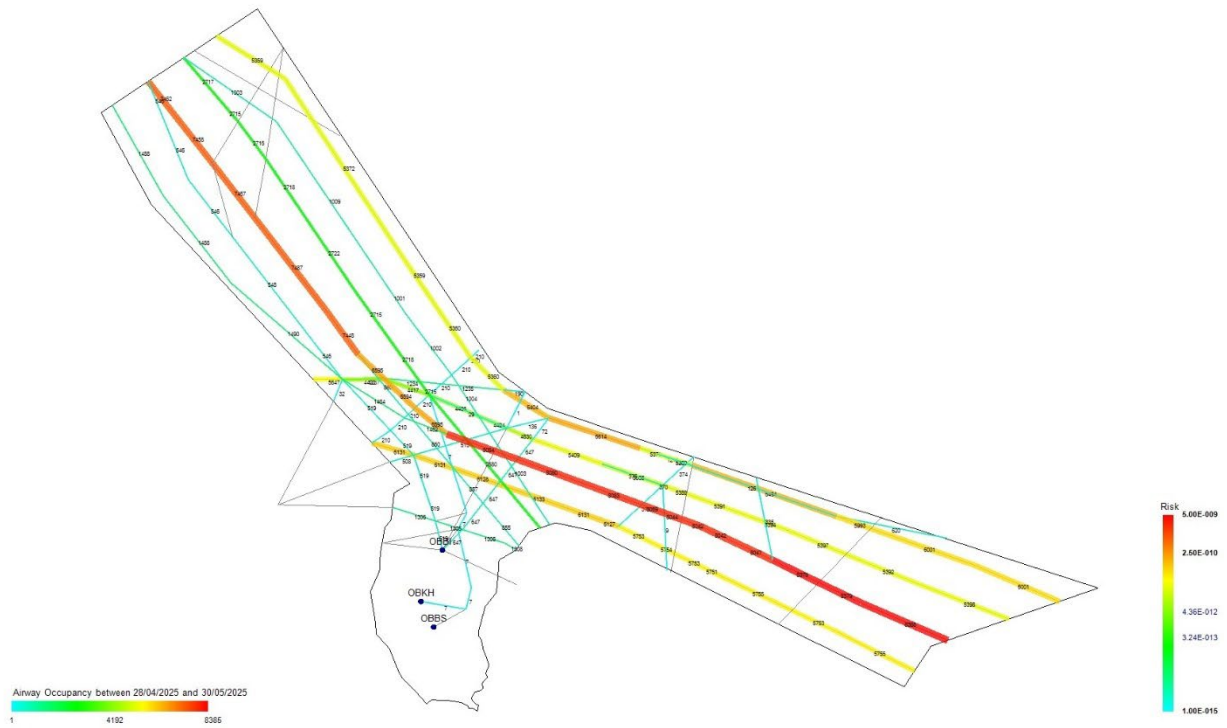
31	21140	IL76	19-06-22	MIDRMA	CHINARMA
32	ICJSN	C25C	15-05-23	MIDRMA	EURRMA
33	URFSE	IL76	11-12-22	MIDRMA	EURRMA
34	URAZR	B77W	03-02-22	MIDRMA	EURRMA
35	URAZN	B753	01-02-22	MIDRMA	EURRMA
36	URAZO	B753	01-02-22	MIDRMA	EURRMA
37	URFSD	IL76	24-12-21	MIDRMA	EURRMA
38	URFSC	IL76	05-12-21	MIDRMA	EURRMA
39	EW550TH	IL76	04-12-21	MIDRMA	EURRMA
40	URSQQ	B738	02-12-21	MIDRMA	EURRMA
41	URFSA	IL76	09-05-21	MIDRMA	EURRMA
42	UR11316	AN12	22-07-20	MIDRMA	EURRMA
43	IN307	IL38	03-12-20	MIDRMA	MAAR
44	KJ3452	IL76	03-08-20	MIDRMA	MAAR
45	CB8001	C17	29-07-20	MIDRMA	MAAR
46	CB8004	C17	24-07-20	MIDRMA	MAAR
47	80002A	C17	23-07-20	MIDRMA	MAAR
48	K3604	E35L	17-07-20	MIDRMA	MAAR
49	KJ3454	IL76	16-03-20	MIDRMA	MAAR
50	STPSA	F900	18-10-23	EURRMA	MIDRMA
51	5ALEX	BE200	09-07-22	EURRMA	MIDRMA
52	STALL	CRJ1	11-06-22	MIDRMA	MIDRMA
53	N993JA	A333	18-03-25	MIDRMA	NAARMO
54	N993JA	A333	18-03-25	MIDRMA	NAARMO
55	N882RR	PC12	10-03-25	MIDRMA	NAARMO
56	N505MS	C55B	03-06-24	MIDRMA	NAARMO
57	N788DP	B737	25-02-24	MIDRMA	NAARMO
58	N890DA	GLF5	25-02-23	MIDRMA	NAARMO
59	N800AJ	CL60	10-02-23	MIDRMA	NAARMO
60	N651CV	C650	21-11-22	MIDRMA	NAARMO
61	N320MK	GLF3	24-09-22	MIDRMA	NAARMO
62	N46HB	F9000	22-08-22	MIDRMA	NAARMO
63	N411VP	EA50	01-05-22	MIDRMA	NAARMO
64	N605AS	PC12	11-04-22	MIDRMA	NAARMO
65	N981DB	H25B	05-04-22	MIDRMA	NAARMO

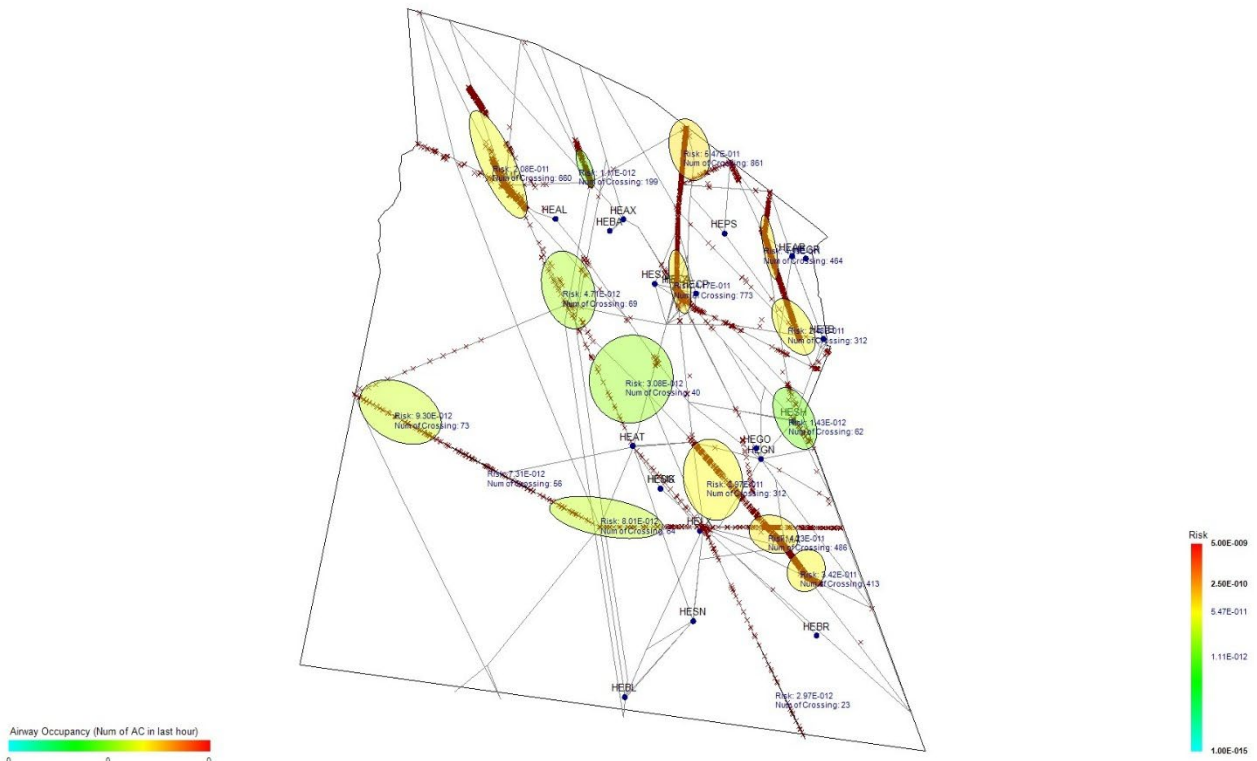
66	N981DB	H25B	05-04-22	MIDRMA	NAARMO
67	N145DB	E35L	22-01-22	MIDRMA	NAARMO
68	N685MF	GLF4	08-12-21	MIDRMA	NAARMO
69	N298RB	GLF4	14-05-21	MIDRMA	NAARMO
70	N1112B	B350	16-07-20	MIDRMA	NAARMO
71	N44UA	CL60	07-06-20	MIDRMA	NAARMO

MID RVSM SMR 2025 HOTSPOTS AND AWYS OCCUPANCY

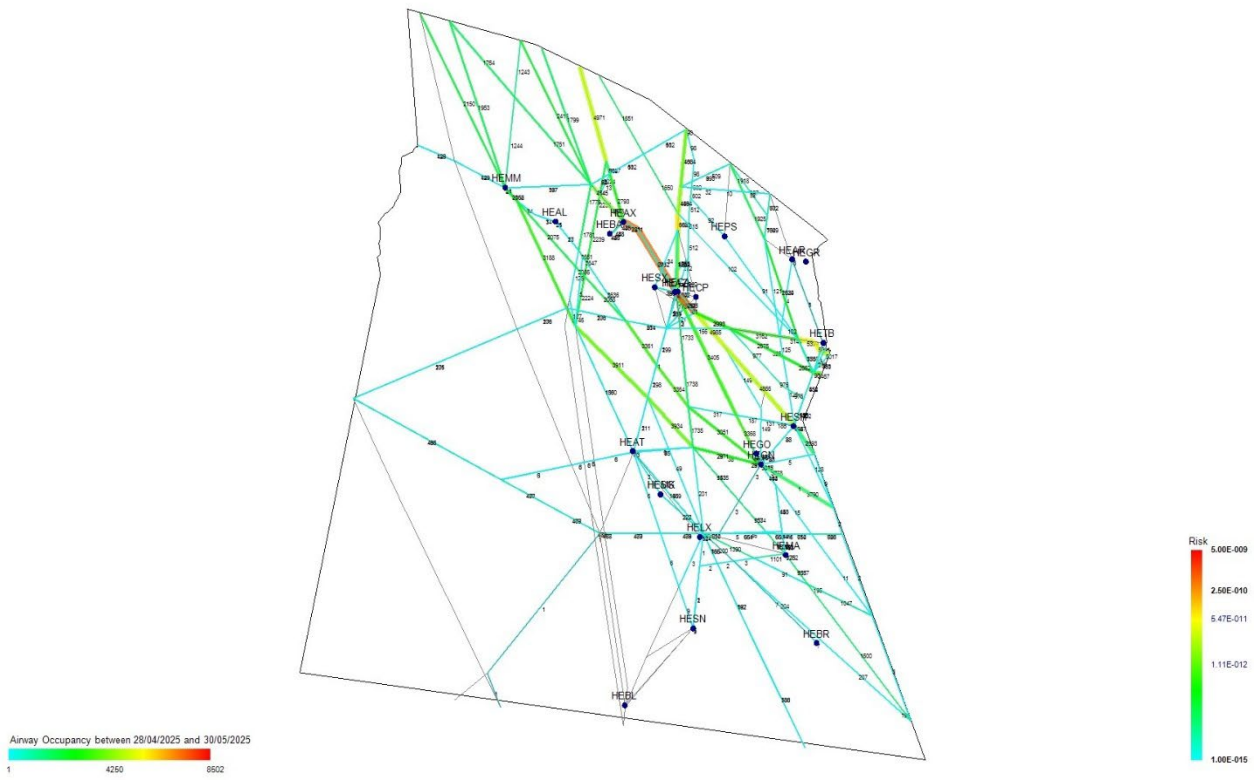


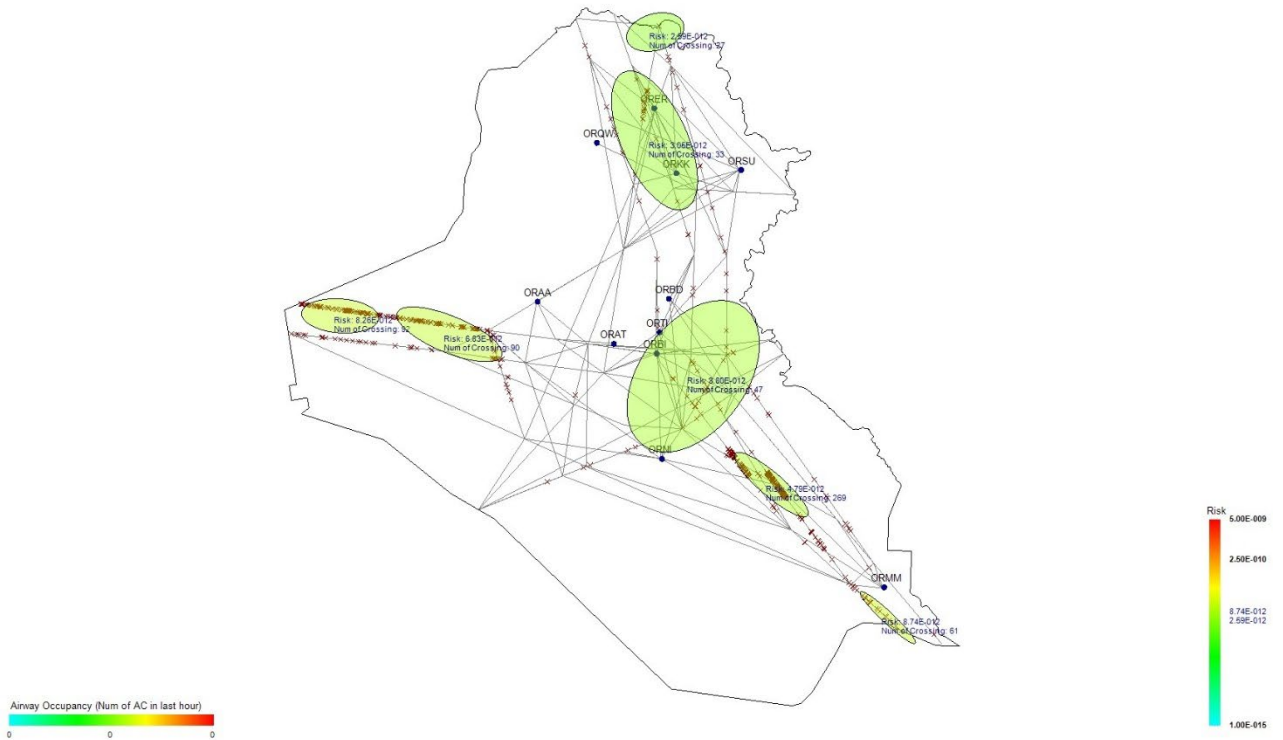
BAHRAIN FIR



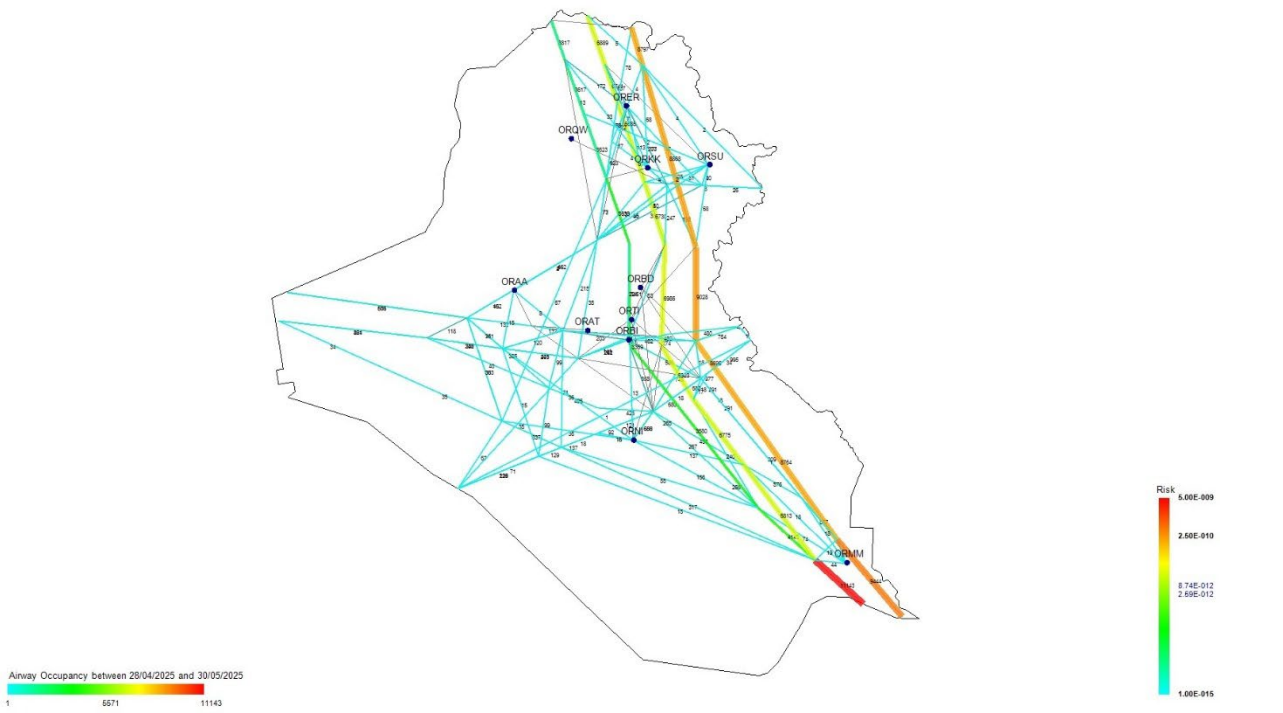


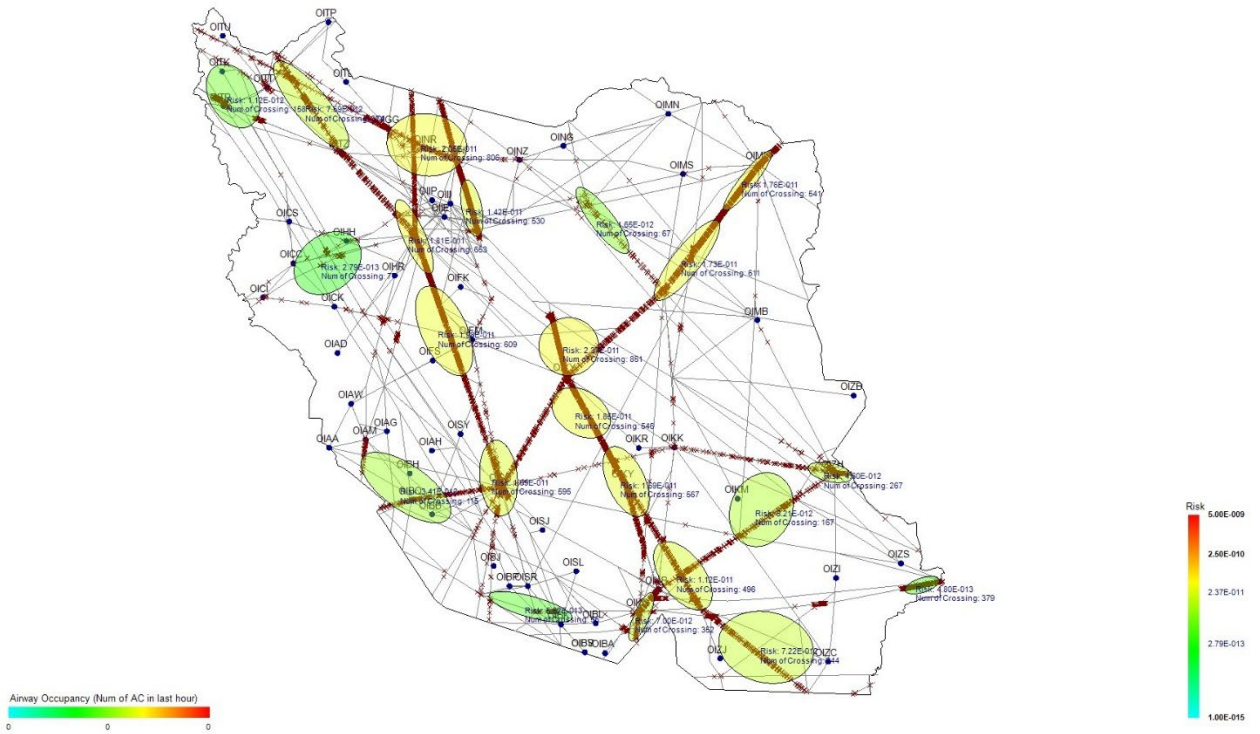
CAIRO FIR



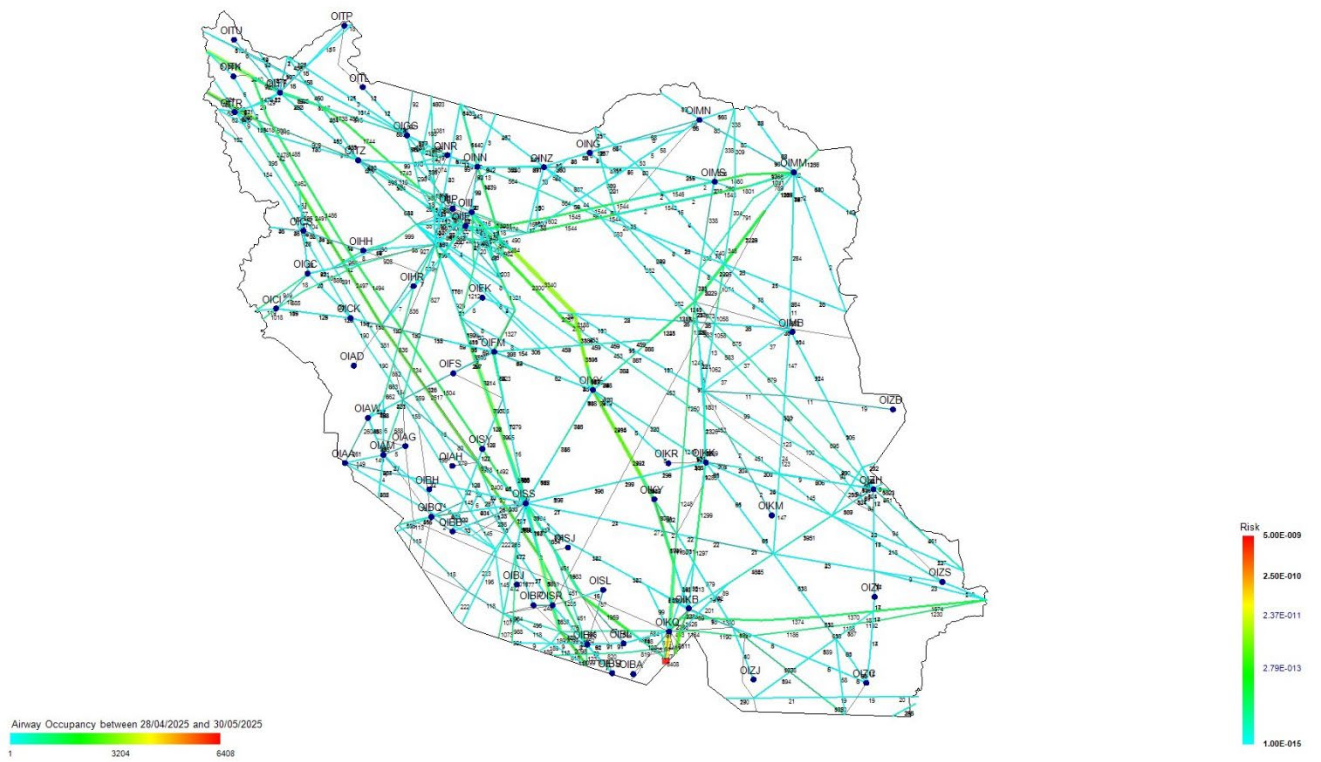


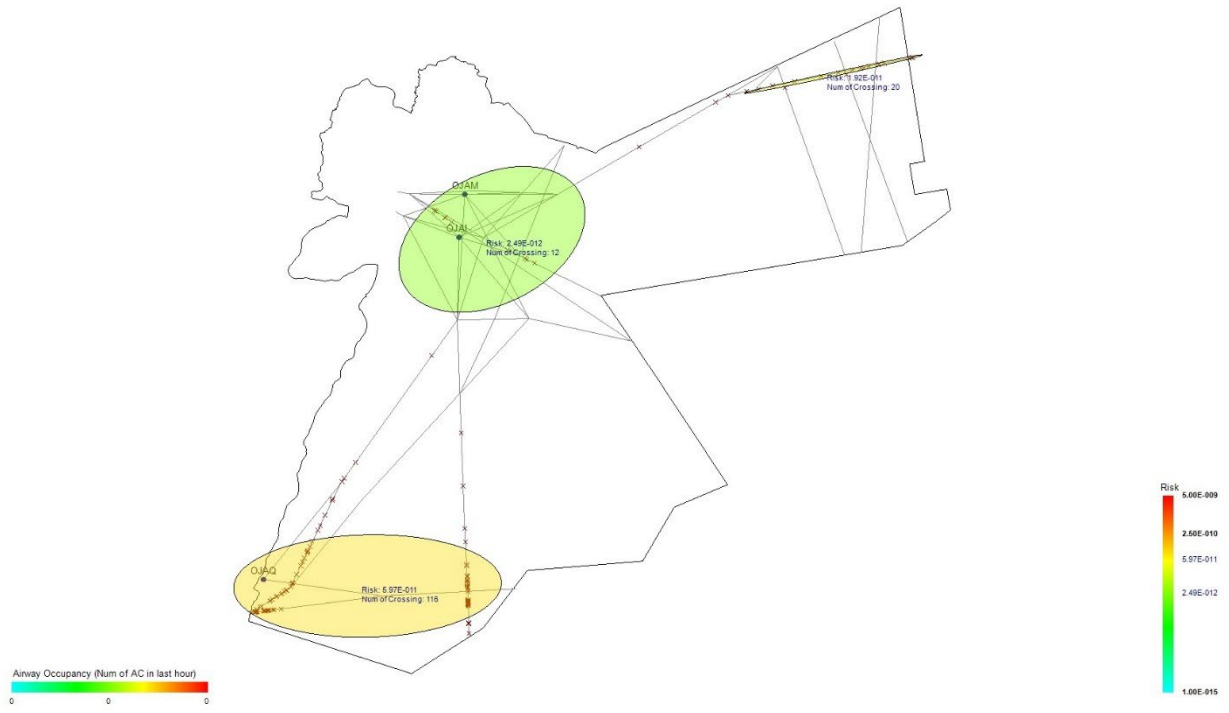
BAGHDAD FIR



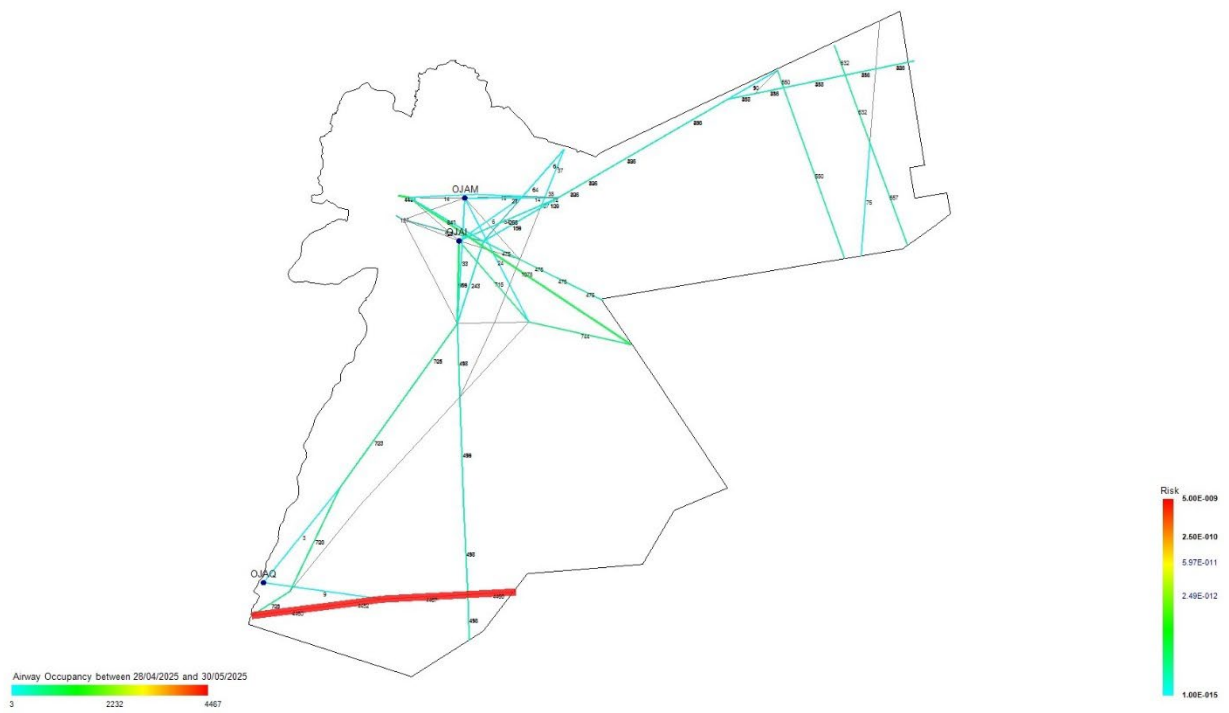


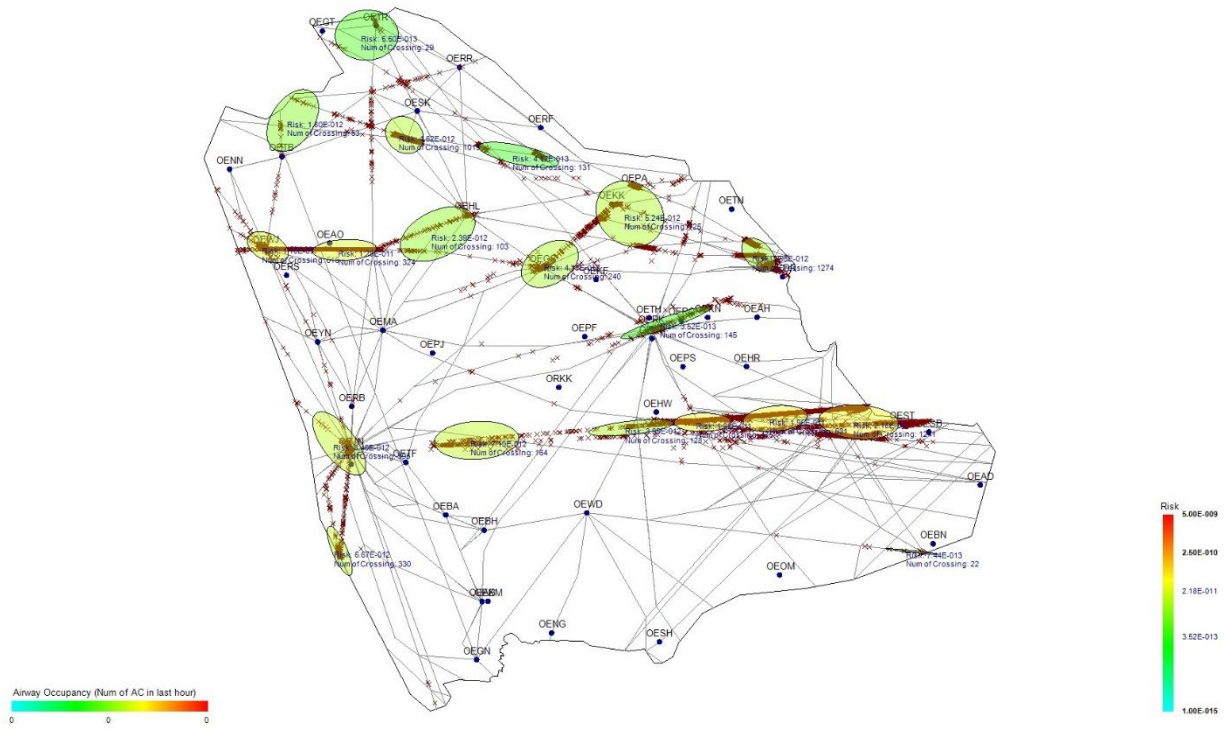
TEHRAN FIR



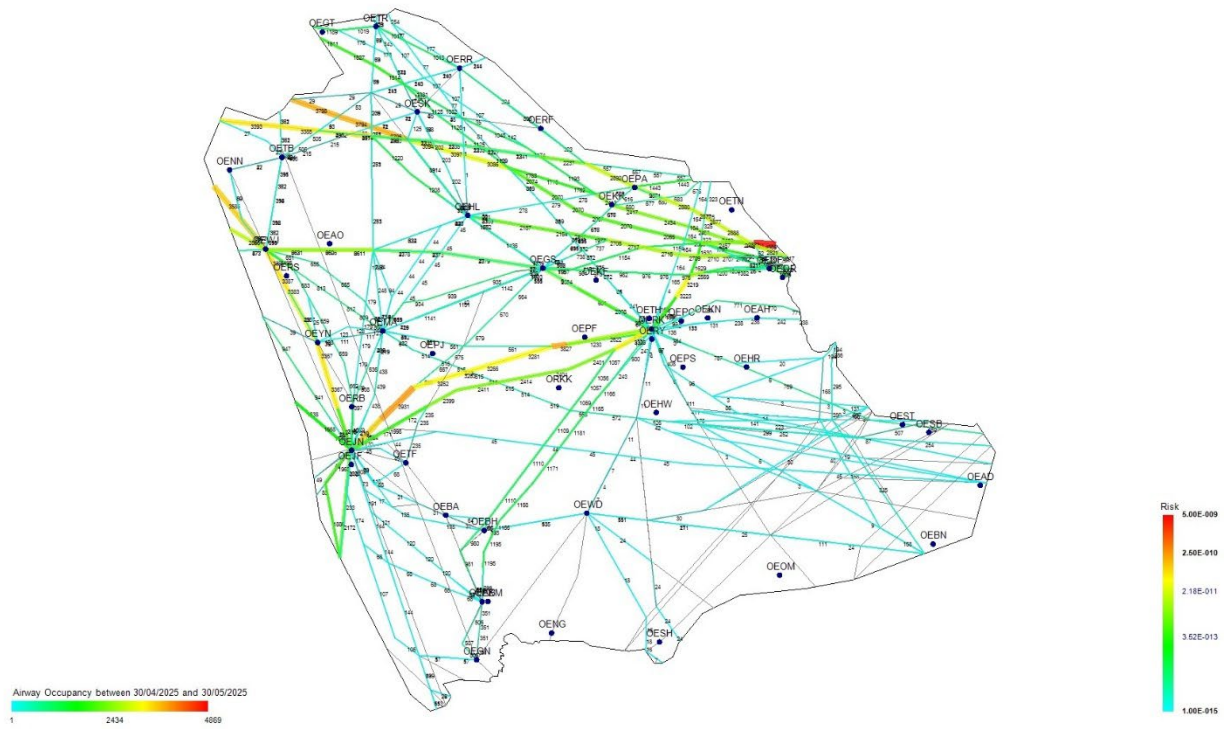


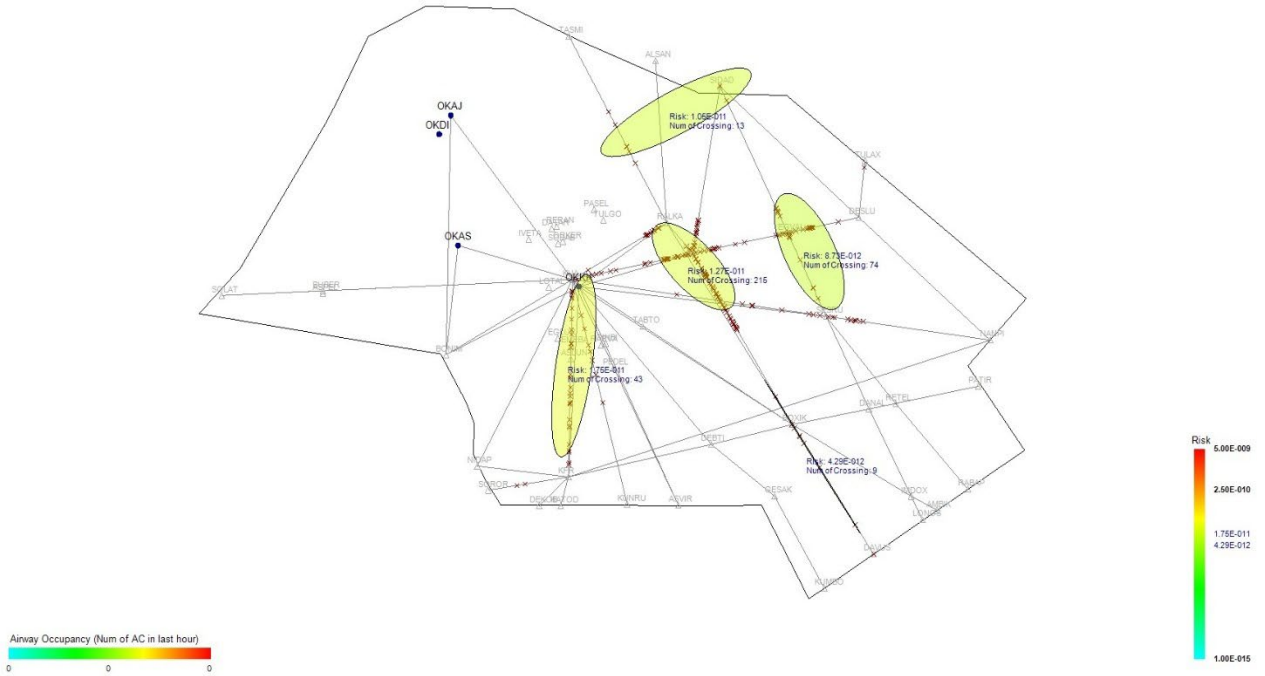
AMMAN FIR



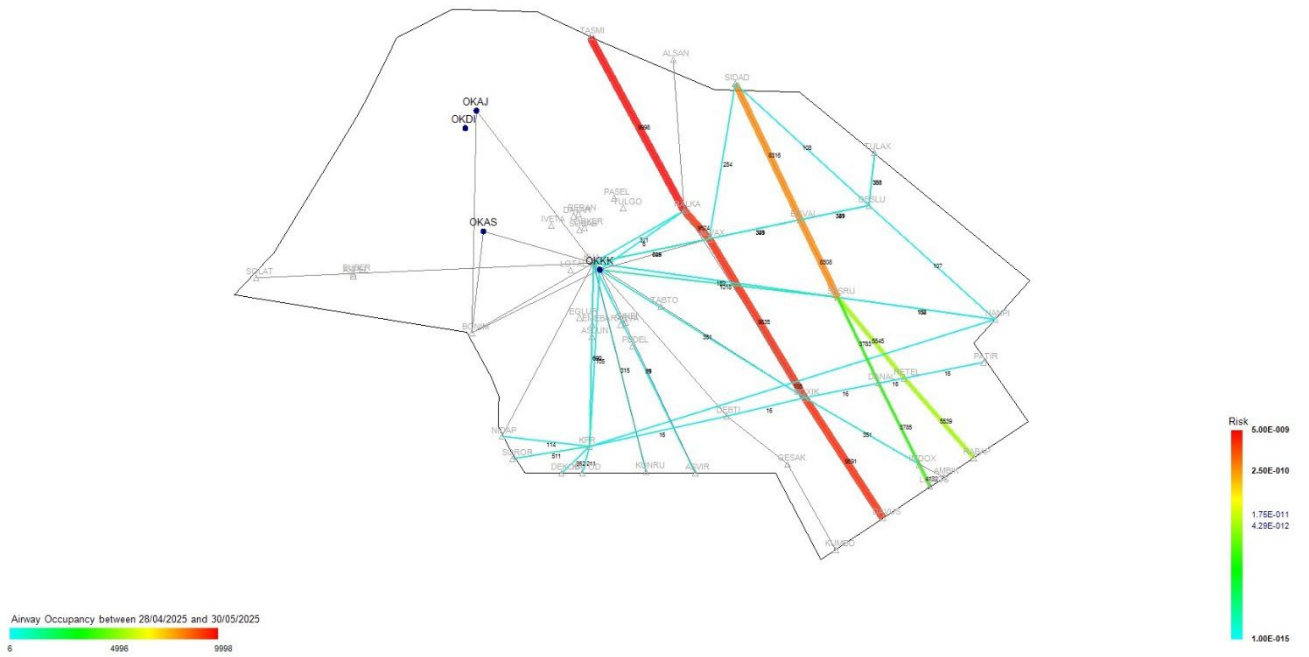


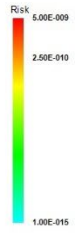
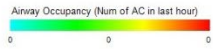
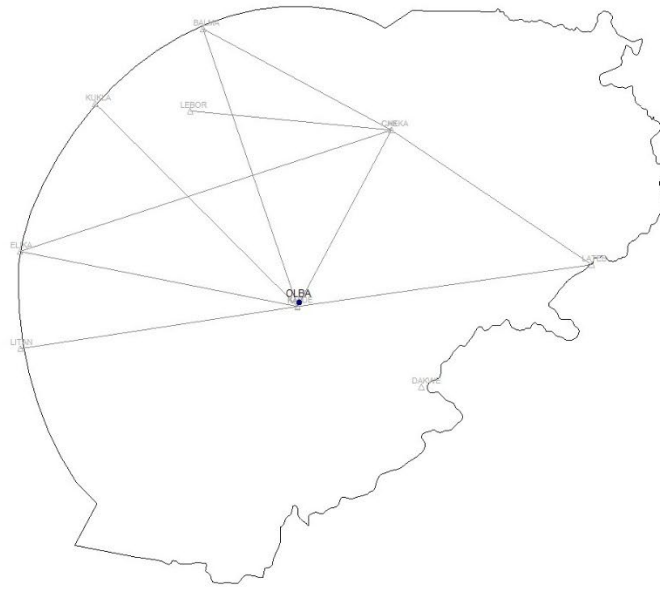
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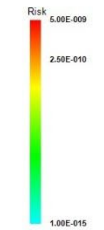
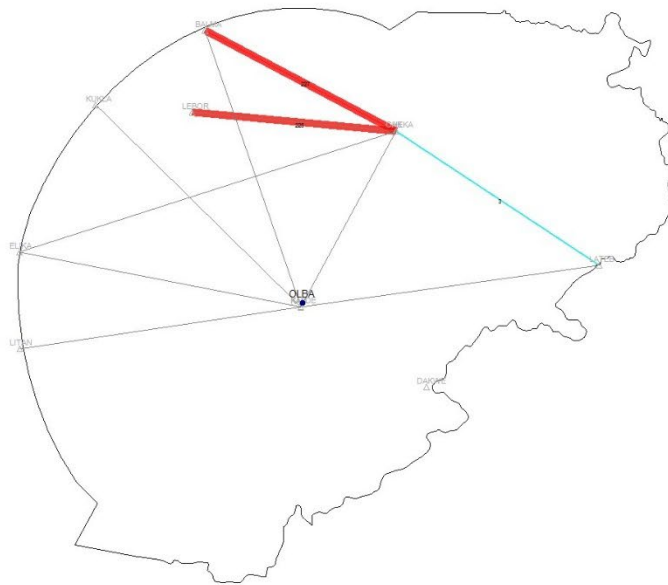


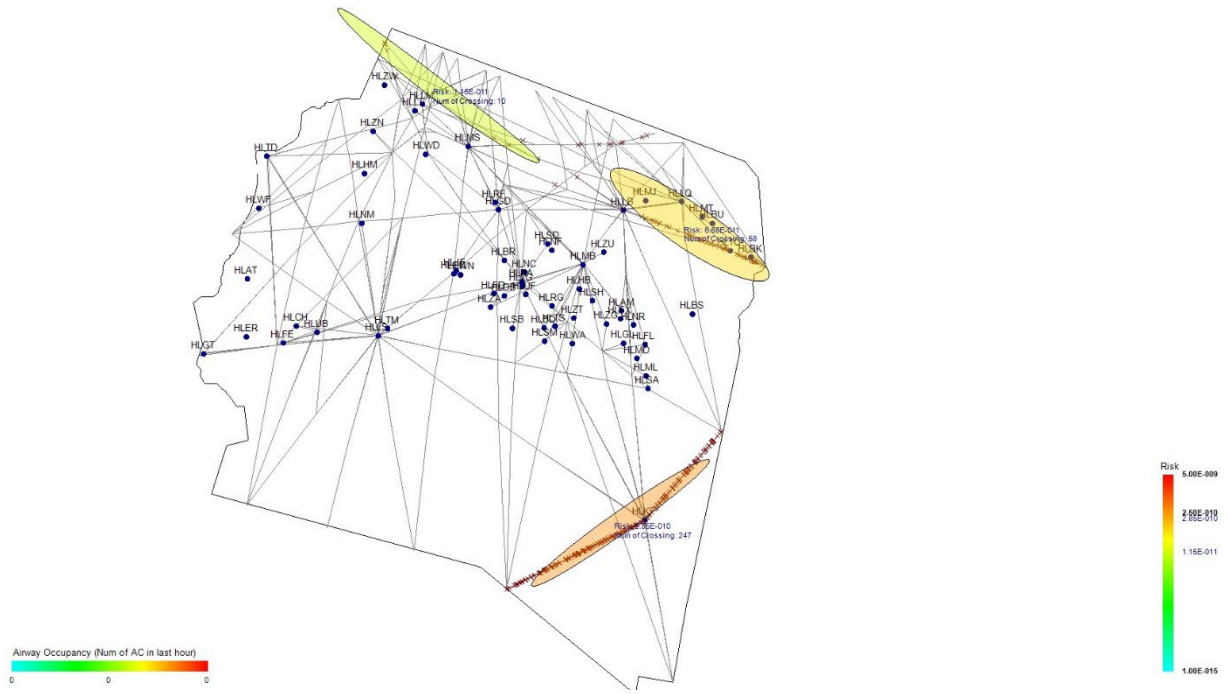
KUWAIT FIR



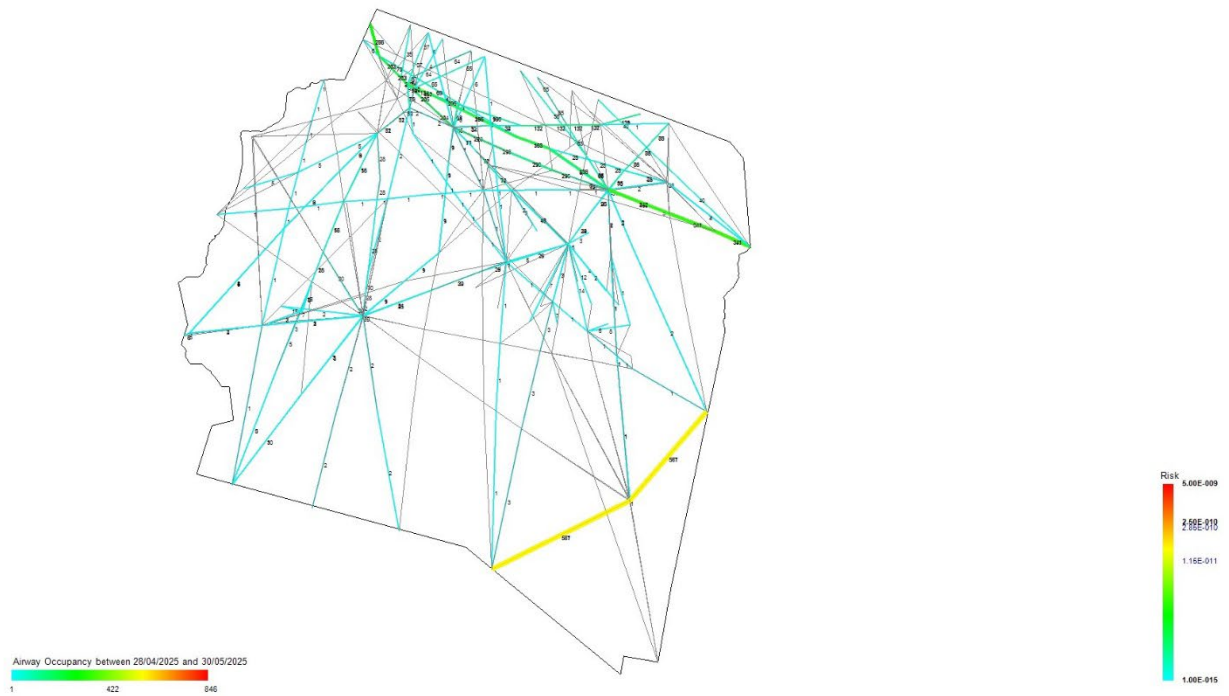


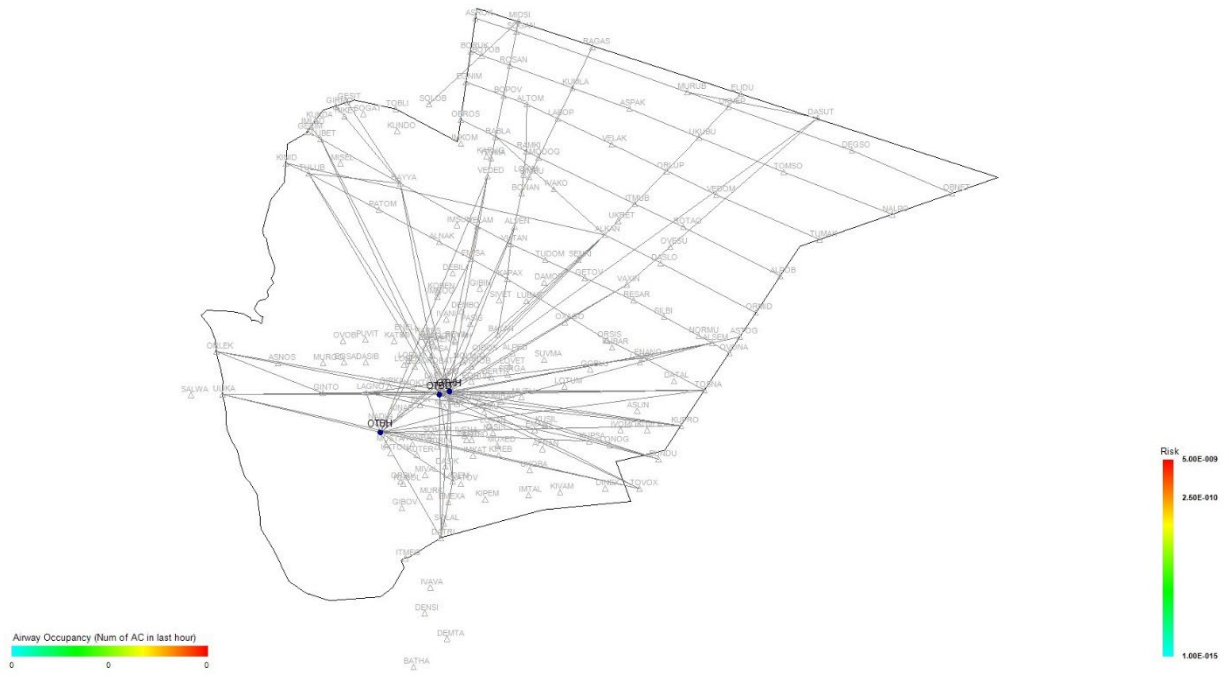
BEIRUT FIR



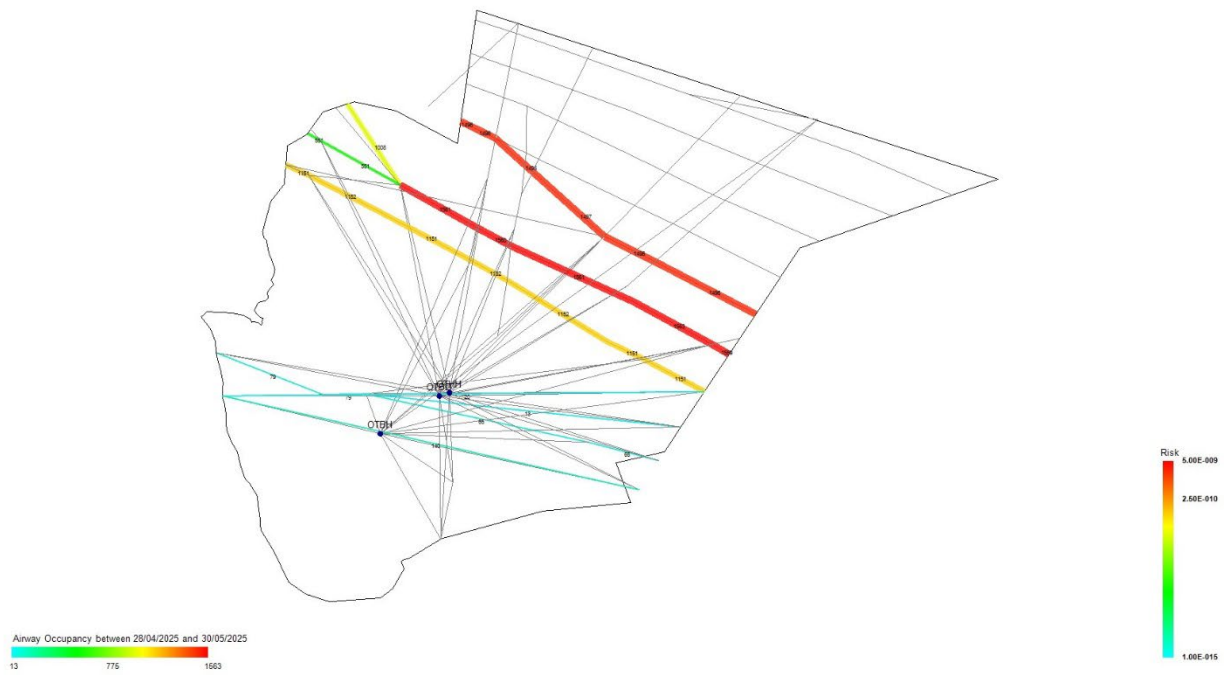


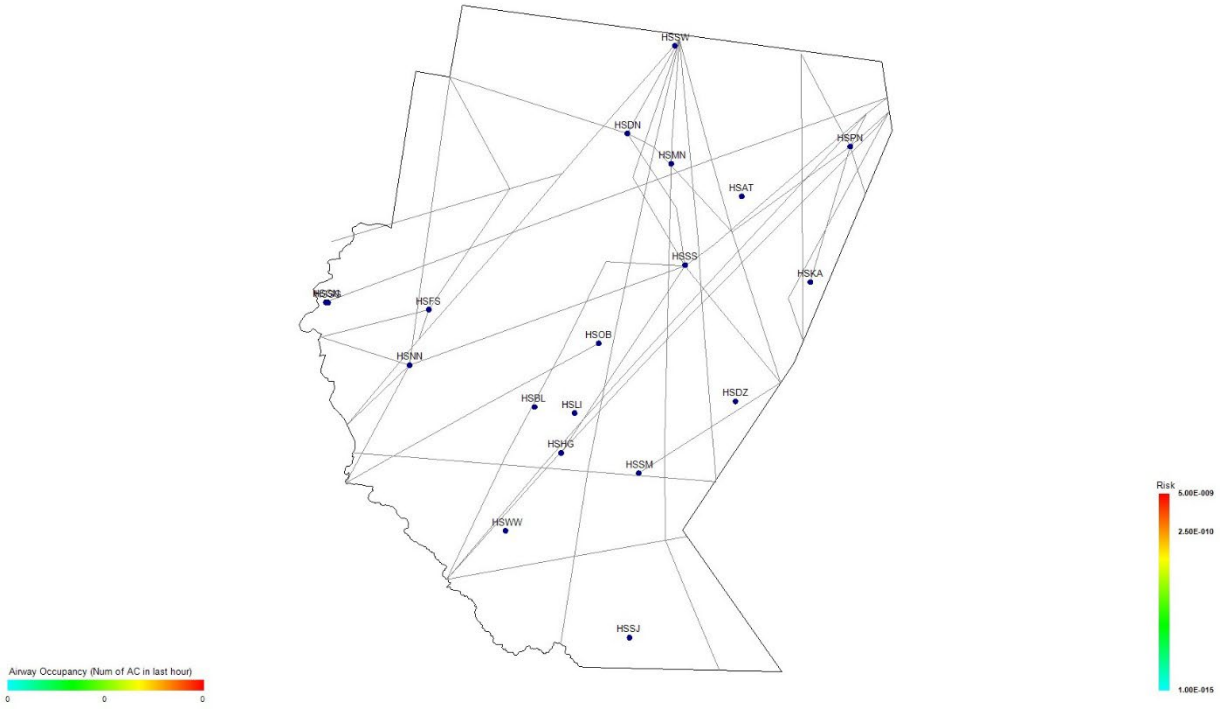
TRIPOLI FIR



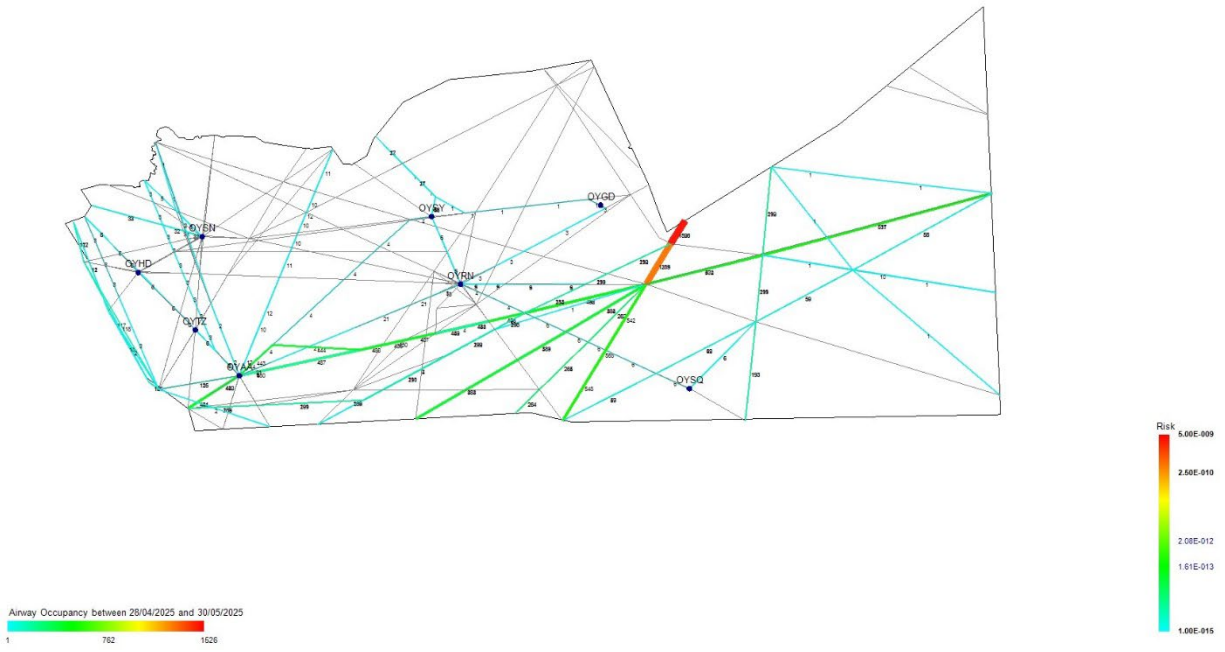


DOHA FIR

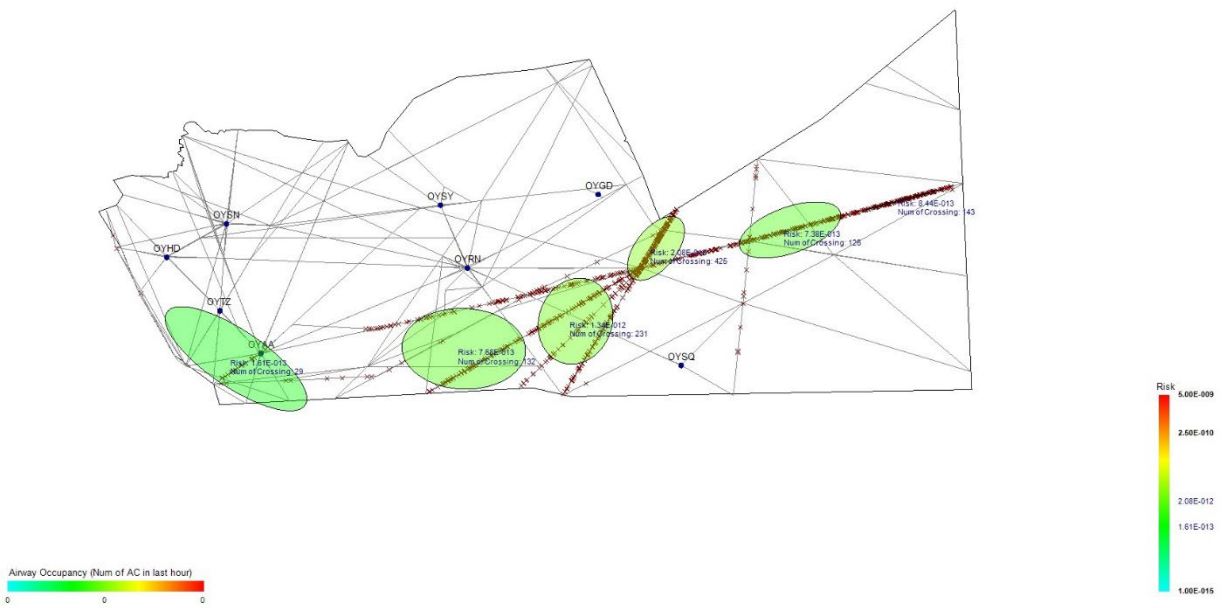




KHARTOUM FIR



SANA'A FIR



MID RVSM MINIMUM MONITORING REQUIREMENTS (MMRS)

Seq	MID States	RVSM APPROVED A/C	HAVE RESULTS OR COVERED	NOT COVERED	NOT COVERED IN %	A/C MMR
1	Bahrain	76	73	3	4%	2
2	Egypt	172	161	11	6%	10
3	Iran	240	228	12	5%	6
4	Iraq	56	49	7	13%	4
5	Jordan	51	49	2	4%	2
6	KSA	377	377	0	0%	0
7	Kuwait	71	68	3	4%	1
8	Lebanon	29	29	0	0%	0
9	Libya	48	39	9	19%	9
10	Oman	62	61	1	2%	1
11	Qatar	329	328	1	0%	1
12	Sudan	16	2	14	88%	10
13	Syria	18	13	5	28%	4
14	UAE	645	622	23	4%	13
15	Yemen	8	0	8	100%	4
Total		2198	2099	98	4%	67

LIST OF MIDRMA BOARD MEMBERS/ALTERNATES AND FOCAL PONTS

Chairman: Mr. Ahmed Yousif Al Malki (Bahrain)

STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
BAHRAIN	<p>Mr. Ahmed Mohammed Bueheery Chief Air Traffic Management Civil Aviation Affairs P.O. Box 586 BAHRAIN</p> <p>Fax: +973 17 329977 Tel: +973 17 321117 Mobile: +973 39522696 E-mail: a.ali@mtt.gov.bh</p>	<p>Mr. Isa Al-Khamiri Safety Manager Civil Aviation Affairs P.O. Box 586 – BAHRAIN</p> <p>Fax: +973 17 329977 Tel: +973 17 321118 Mobile: +973 3644768 E-mail: ialkhamiri@mtt.gov.bh</p>	<p>Same as MEMBER</p>	<p>Eng. Abdulrazzaq Abdulwahid Aircraft Registration Specialist Civil Aviation Affairs P.O. Box 586 BAHRAIN Tel: +973 17 32 9031 E-mail: a.mohammed@mtt.gov.bh</p>
EGYPT	<p>Mr. Tayseer Mohamed Abdelkareem General Manager of ATS Egyptian Civil Aviation Authority (ECAA) General Manager of ATS Cairo - Egypt</p> <p>Fax: +202 2268 7849 Tel: +202 2267 8883 Mobile: +20100 522 8675 E-mail: tayseerkasem73@gmail.com tayseer.mohamed@civilaviation.gov.eg</p>	<p>Mr. Ehab Raslan Mohamed General Manager R&D National Air Navigation Services Company (NANSC) Cairo Airport Road Cairo - EGYPT</p> <p>Office: +20222680929 / ext: 6690 Mobile: +201011 2699 0000 Email: ehab.raslan@nansceg.net</p>	<p>Mr. Ahmed Farouk Sayed Ali ATC National Air Navigation Services Company (NANSC) Cairo Airport Road Cairo - EGYPT</p> <p>Mobile: +20100 654 7752 Email: ahmedfarouk.atc@gmail.com</p> <p>----- ALTERNATE</p> <p>Mr. Mohamed Zakaria Elsayed ATC National Air Navigation Services Company (NANSC) Cairo Airport Road Cairo - EGYPT</p> <p>Mobile: +20100 3080555 Email: mohamedzakaria88@gmail.com</p>	<p>Eng. Ahmed Abdelaziz Mohamed Egyptian Civil Aviation Authority Cairo Airport Road Cairo - EGYPT</p> <p>Mobile: +20100 272750 Email: ahmed.salama@civilaviation.gov.eg</p> <p>----- ALTERNATE</p> <p>Eng. Ahmed Mohamed Ead Airworthiness Senior Inspector Egyptian Civil Aviation Authority Cairo Airport Road Cairo - EGYPT</p> <p>Mobile: +20100 3765057 Email: ahmed.ead@civilaviation.gov.eg</p>

STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
<p>IRAN</p>	<p>Mr. Mohammad Shahbazi Vice President in Flight Standards Tehran Mehrabad International Airport P.O. Box 13445-1798 Tehran – IRAN</p> <p>Fax: (+9821) 66078730 Tel: (+9821) 66078700 Ext 133 Mobile: (+98)912436921 E-mail: m-shahbazi@caa.gov.ir</p>	<p>Mr. Alireza Nikouee Head of Airworthiness Audit Group I.R. Iran Civil Aviation Authority Tehran Mehrabad International Airport P.O. Box 13445-1798 Tehran-IRAN</p> <p>Fax: (+9821) 4464 9274 Tel: (+9821) 66078700 9 (Ext. 369) Mobile: (+98)9125708066 Email: a-nikouee@caa.gov.ir</p>	<p>Mr. Alireza Adnan ATC Experts Iran CAA</p> <p>Fax: +9821 660 78719 Mob: +989227024263 E-mail : Ar-adnan@caa.gov.ir alirezaadnan@yahoo.com</p> <p>-----</p> <p>Mr. Ahad Daei Kouzehkanany Safety and Security Oversight and ANS, AIG Expert Civil Aviation Authority Islamic Republic of Iran</p> <p>Fax+9821 66025045 Tel: +9821 66036552 Mobile: +989371939205 Email: a-daei@caa.gov.ir</p>	<p>Mr. Alireza Hosseinian Amiri Airworthiness Inspector Airworthiness Department (CAO) Tehran Mehrabad International Airport P.O. Box 13445-1798 Tehran – IRAN</p> <p>Fax: (+9821) 66078730 Tel: (+9821) 66078700 Mobile: (+98) 9111140700 E-mail: a-hosseinian@caa.gov.ir</p> <p>-----</p> <p>ALTERNATE</p> <p>Mr. Hussein Zare Toosi Pilot, Flight Operations Department (CAO) Tehran Mehrabad International Airport P.O. Box 13445-1798 Tehran – IRAN</p> <p>Fax : (+9821) 4464 9274 Tel : (+9821) 61022128 Mobile : (+98) 912 423 7891 E-mail : h-zare@caa.gov.ir</p>
<p>IRAQ</p>	<p>Mrs. Fatimah Hasan Mohammed ATS Inspector / ANS Manager Iraq Civil Aviation Authority Baghdad, Iraq</p> <p>Mobile: (964) 7737334481 Email: fatimah_hm_87@yahoo.com fatima@icaa.gov.iq</p>	<p>-</p>	<p>Same as MEMBER</p>	<p>-</p>

STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
JORDAN	<p>Mr. Marwan Hani Ibrahim Al-Masri ANS Director/Amman City Airport</p> <p>Civil Aviation Regulatory Commission Queen Alia Airport</p> <p>Tel: +962-6 445 1672 Mobile: +962 795 990 890 Fax: +962-6 445 1667 Email: marwan.al-masri@carc.gov.jo</p>	<p>Same as MEMBER</p>	<p>Mr. Ali Alquddah Air Traffic Control Officer</p> <p>Mobile:+962 799 838892 Email: Ali.Alqudah@CARC.GOV.JO</p>	<p>Eng. Adel Khawladeh Airworthiness Inspector Civil Aviation Regulatory Commission P.O. Box 7547/11110 Amman - JORDAN</p> <p>Fax: (962-6) 487 4710 Tel: (962-6) 489 2282 Ext 3741 Mobile: +962- 772348340 E-mail: adel.alkhawaldeh@carc.gov.jo</p>
KUWAIT	-	-	<p>Mr. Mustafa A. Al-tarrah Head of Air Navigation Services Inspectors Aviation Safety Department Directorate General of Civil Aviation P.O. Box 17 – Safat 13001 – Safat – Kuwait</p> <p>Tel.: +965 244336699 Ext. 12370 Mob: +965 999 77440 E-mail: ma.altarrah@dgca.gov.kw</p>	<p>Engr. Hassan Alshatti Airworthiness Inspector Directorate General of Civil Aviation P.O. Box 17 – Safat 13001 – Safat – Kuwait</p> <p>Tel.: +965 24336699 Ext. 12360 Tel.: +9765 99723243 E-mail: h.alshatti@dgca.gov.kw</p>
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STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
LIBYA	-	-	Mr. Omar Abudabar Civil Aviation Authority (CAA) E-Mail: omar.aboudabar@caa.gov.ly ans@caa.gov.ly	Mr. Younis Amaara Civil Aviation Authority (CAA) E-Mail: yonos.amarh@caa.gov.ly ops@flightsafety.caa.gov.ly
OMAN	Eng. Saleh Abdullah Al-Harathi Director General of Air Navigation Civil Aviation Authority P.O. Box 1. P.C 111 SEEB Tel: +968 24354860/866 Mobile: +968 95205073 Email: saleh@caa.gov.om	Mr. Hilal Ali Al-Maqbali Director of ATC Civil Aviation Authority P.O. Box 1. P.C 111 SEEB Tel: +968 24354867 Mobile: +968 95338685 E-mail: h.almaqbali@caa.gov.om	Mr. Nasser Salim Al'Tuweya ATC Supervisor Civil Aviation Authority P.O. Box 1. P.C 111 SEEB Fax: +968 24354506 Tel: +968 24519305 Mobile: +968 95180233 E-mail: nass2008@caa.gov.om	Mr. Mohammed Saif Al-Bimani Civil Aviation Authority Fax: +968 24354506 Tel: +968 24354075 Mobile: +968 99417381 E-mail: m.albimani@caa.gov.om

STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
<p>QATAR</p>	<p>Mr. Nayif Al Jaber Director Air Safety Department NCCM Qatar Qatar Civil Aviation Authority</p> <p>Tel: +974 44571667 Mob: +974 33123378 Email: Nayif.Aljaber@caa.gov.qa</p>	<p>Mr. Ramy Saad ANS Inspector Qatar Civil Aviation Authority</p> <p>Tel: +97444571560 Mob: +97430060955 Email: ramy.saad@caa.gov.qa</p>	<p>Mr. Eissa Abdulrahman Al-Meabid Assistant Director of Air Navigation Department Head of Air Traffic Control Civil Aviation Authority P.O/Box 73-Doha, Qatar</p> <p>Tel: +974 44705999 Mob: +974 33337087 E-mail: eissa.almeabid@caa.gov.qa</p>	<p>AIRWORTHINESS FOCAL POINT: Mr. Majed Al Atawi Director Air Safety Department Qatar Civil Aviation Authority</p> <p>Tel: +97444557252 Mob: +97455558487 Email: majed.alatawi@caa.gov.qa</p> <p>-----</p> <p>FLIGHT OPERATIONS FOCAL POINT: Captain Christos Kalogirou Acting Head of Flight Operations Air Safety Department Civil Aviation Authority P.O. Box 73 - Doha, QATAR</p> <p>Tel: +974-4 4557425 Mobile: +974-33941716 E-mail: christos.kalogirou@caa.gov.qa</p>
<p>SAUDI ARABIA</p>	<p>Mr. Ibrahim B. Aljabri GACA / Air Navigation Safety General Manager</p> <p>Tel: +966 Mobile: +966 E-mail: ialjabri@gaca.gov.sa</p>	<p>Mr. Khalid H. Alharbi GACA / Airspace Director</p> <p>Tel: +966 56 544 5441 Mob: +966 56 542 6837 E-mail: khhhalharbi@gaca.gov.sa</p>	<p>Mr. Abdulhalim H. Bukhari GACA / Continuous Airworthiness Director Aviation Safety and Environmental Sustainability King Khalid International Airport Riyadh - Saudi Arabia</p> <p>Tel:+966 (12) 6847583 Mobile: +966 555508024 E-mail: ahbukhari@gaca.gov.sa</p>	<p>Mr. Ahmed AbuGhalab SANS / ATFM Chief</p> <p>Mob: +966 54 777 8700 E-mail: asabughallab@sans.com.sa</p> <p>-----</p> <p><i>Alternate:</i> Mr. Terad Alghamdi SANS / ATFM Supervisor Tel: +966 12 684 8823 Mob: +966566555707 E-mail: TALALGHAMDI@sans.com.sa</p>

STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
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UAE	<p>Mr. Ahmed Al Jallaf Assistant Director General Air Navigation Services General Civil Aviation Authority Sheikh Zayed Air Navigation Centre P.O. Box 666 Abu Dhabi, UNITED ARAB EMIRATES</p> <p>Fax: +971-2 599 6883 Tel: +971-2 599 6888 Mobile: +971-50 614 9065 E-mail: aljallaf@szc.gcaa.ae</p>	<p>Mr. Muayyed Al Teneiji Director Air Traffic Management General Civil Aviation Authority Sheikh Zayed Air Navigation Centre P.O. Box 666 Abu Dhabi United Arab Emirates Fax: (971-2) 599 6830 Tel: (971-2) 599 6836 Mobile: (971-56) 685 4505 Email: mtenaiji@szc.gcaa.ae</p>	<p>Mr. Faisal Al Khaja Senior Specialist Unit Operations General Civil Aviation Authority Sheikh Zayed Air Navigation Centre P.O. Box 666 Abu Dhabi, UNITED ARAB EMIRATES</p> <p>Fax: +971-2 599 6836 Tel: +971-2 599 6841 Mobile: +971-50 642 4812 E-mail: fkhaja@szc.gcaa.ae</p>	<p>Capt. Anaziaz Zikir Sr. Inspector, Priv. & Spec Ops General Civil Aviation Authority Abu Dhabi, UNITED ARAB EMIRATES</p> <p>Tel: +971 4 2111 586 Mob: +971-50 6152931 Email: azzy@gcaa.ae</p>

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STATE	MIDRMA BOARD MEMBER	ALTERNATE	ATC FOCAL POINT	AIRWORTHINESS/FLIGHT OPERATIONS FOCAL POINT
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MIDRMA	<p style="text-align: center;">Middle East Regional Monitoring Agency P.O. Box 50468 – KINGDOM OF BAHRAIN</p> <p style="text-align: center;">Fax: +973 17 32 9956 Tel: +973 17 32 9054 Email: midrma@midrma.com</p>			

ATTACHMENT A

List of Participants

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Egypt / Egyptian Civil Aviation Authority	Mr. AbdelGhafar Elsayed AbdelGhafar AbdelHalim	General Manager, Ground Handling Aircraft Inspection
Egypt / Egyptian Civil Aviation Authority	Mr. Maher Gamal Sayed	Air Traffic Services Inspector
Egypt / Egyptian Civil Aviation Authority	Mr. Mohamed Ali Mohamed Ali	General Director of ATS Safety Standards
Egypt / Egyptian Civil Aviation Authority	Mr. Mohamed Essam El-nayeb	ANS Inspector
Egypt / Egyptian Civil Aviation Authority	Ms. Rana Mohammad Abd El-Raheem	ATS Inspector
Egypt / NANSO	Mr. Ahmed Farouk Sayed Ali	Air Traffic Controller
Egypt / NANSO	Capt. Mohamed Farghaly Mohamed	General Manager of Research & Development Directorate
Egypt / NANSO	Mr. Sagy Sayed	ATC
Jordan / ANS / CARC	Mr. Ali AlQudah	ATCO
Jordan / ANS / CARC	Mr. Marwan AlMasri	Director Of ANS
Libya / Civil Aviation Authority	Mr. Mustafa Mohamed A Ali	Cheif of area control center
Libya / Civil Aviation Authority / ANS	Mr. Abdulmonaam Ahmad Ammar Ahmad Abaza	ANS Director
Qatar / Civil Aviation Authority	Mr. Erwin Obergruber	ANS Advisor, MBA, MRAeS
Saudi Arabia / Saudi Air Navigation Services	Mr. Abdulrahman Hamed Alamoudi	Air Traffic Flow Management Supervisor
Saudi Arabia / Saudi Air Navigation Services	Mr. Terad Alghamedi	Air Traffic Flow and Capacity Management Chief
Sudan / Civil Aviation Authority	Mr. Yasir Rabih Hassan Mudathir	Director of Air Navigation Service (ANS)
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MIDRMA	Mr. Fathi Althawadi	MIDRMA IT Manager
ICAO MID	Mr. Ahmad Amireh	MID RO ATM/SAR
ICAO MID	Mr. Ahmad Kavehfiroz	ICAO MID, ATM Officer
ICAO MID	Ms. Dina Elkarimy	Technical Assistant, ATM/SAR & ASF

- END -