International Civil Aviation Organization

MIDANPIRG Air Traffic Management Sub-Group

Fourth Meeting (ATM SG/4)
(Amman, Jordan, 29 April – 3 May 2018)

Agenda Item 6: ATM Safety Matters

MID RVSM SAFETY MONITORING REPORT 2017 INITIAL RESULTS

(Presented by MIDRMA)

SUMMARY

This Working Paper presents the progress of the development of MID RVSM Safety Monitoring Report 2017 and the results calculated until 31st March 2018. It also details the difficulties to obtain the required Traffic Data Sample (TDS) including problems of corrupted and late receipt of the data from some MIDRMA Member States to carry out the RVSM Safety Analysis.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/16 Report
- MID RVSM SMR 2016 Ver. 0.1
- MIDRMA Board/15 Report

1. INTRODUCTION

1.1 The MID RVSM Safety Monitoring Report 2017 (SMR) covers the current reporting period from 01 September 2017 till 31 August 2018 in the MIDRMA's ongoing process of providing periodic updates of information relevant to the continued safe use of the RVSM in the ICAO Middle East Airspace.

1.2 This paper contained information concerning the status and the results calculated for the first seven months of the current reporting period and the status of the Traffic Data Sample (TDS) required for developing the MID RVSM SMR 2017 and the difficulties facing the MIDRMA to process these data.

1.3 The final version of SMR 2017 will be presented to the MIDANPIRG/17 meeting for endorsement.

2. DISCUSSION

2.1 The MIDANPIRG/16 (Kuwait, 13 – 16 February 2017) agreed under *Conclusion 16/2* that for the development of the MID RVSM SMR 2017, the TDS required for the safety analysis must be collected from 1 September 2017 until 30 September 2017 for all traffic operating within the ICAO Middle East RVSM airspace and must be submitted to the MIDRMA not later than 31 October 2017.

2.2 As usual practice for the preparation of every safety monitoring report to ensure that attention is drawn to the need of collecting the traffic data sample, the MIDRMA circulated a reminder email to all the focal points responsible for submitting the TDS on 27th August 2017 to ensure their readiness for this task before the effective date of Conclusion 16/2.

2.3 Unfortunately, the deadline for submitting the TDS passed and the same problems still exist for this report, the most recent annual one-month traffic movement samples for September 2017 were received from the Flight Information Regions (FIRs) listed in Table 1 but with so many errors including missing flights from some member States although these errors were mentioned in the previous SMRs and these member States were also briefed to overcome these errors but they continued to submit the data with the same errors.

MID States	Sep. 2017	Status	Received Dates
Bahrain FIR	27736	Accepted	17/10/2017
Cairo FIR	28225	Accepted	19/10/2017
Amman FIR	6477	Accepted	29/10/2017
Muscat FIR	40563	Accepted	26/10/2017
Tehran FIR	58331	Accepted	18/11/2017
Khartoum FIR	6717	Accepted	26/10/2017
Emirates FIR	22125	Accepted	24/10/2017
Damascus FIR	1671	Accepted	03/10/2017
Sana'a FIR	4163	Accepted	17/10/2017
Jeddah FIR	42378	Accepted	25/02/2018
Beirut FIR	66	Accepted	30/01/2018
Baghdad FIR	9732	Accepted	18/02/2018
Kuwait FIR	7589	Developed by MIDRMA	01/03/2018
Tripoli FIR	-	No TDS Submitted	Excluded
Total	255,773	13 FIRs	

Table 1: Status of the MID States RVSM Traffic Data Sample (TDS) for Sep. 2017

2.4 The data format for the SMR remains the same since the last three SMRs and was well explained in the reminder email, but some member States submitted their data completely different, which cannot be processed by the MIDRMA MID Risk Analysis Software (MIDRAS).

2.5 For the third consecutive Safety Monitoring Reports, the MIDRMA Board agreed to exclude Tripoli FIR temporary from the RVSM safety analysis for 2017 due to lack of TDS and reporting LHD, taking into consideration the MIDRMA never done any risk analysis for Tripoli FIR RVSM airspace since they have joint the MIDRMA.

2.6 **RVSM Safety Monitoring Report 2017 Initial Results**

The calculated results below for the first seven months of the SMR 2017 conducted for all MID FIRs except for Tripoli FIR.

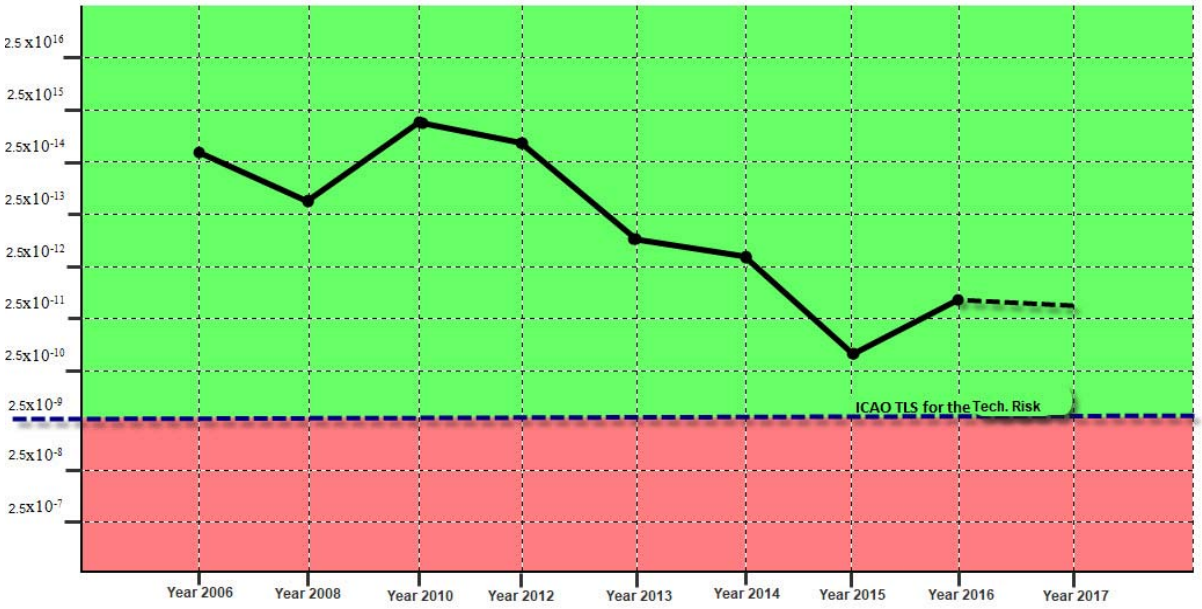
2.6.1 **RVSM Safety Objective 1: Technical Risk**

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

So far, the value computed for technical height risk is **5.647x10^{-11}**, this meets RVSM Safety Objective 1.

2.6.1.1 The MIDRMA scrutiny threshold of 180 ft. ensures that any individual aircraft that is monitored with excessive Altimetry System Error (ASE) will be identified and appropriate action will be taken. The increase in Pz (1000) may indicate a small deterioration in overall ASE performance due to inadequate capture of contributing factors in maintenance procedures, the Pz (1000) which is the probability of two aircraft at adjacent RVSM flight levels will lose vertical separation due to technical height keeping errors. The value of the probability of vertical overlap Pz(1000), based on the actual observed Altimetry System Error (ASE) and typical Assigned Altitude Deviation (AAD) data is estimated to be of **6.15x10^{-08}**.

2.6.1.2 The value of the Pz(1000) is subject to change in the final version of the SMR due to the continuous efforts of enhancing the TDS.



Trends of Technical Risk Estimates for the ICAO MID RVSM Airspace

2.6.2 **RVSM Safety Objective 2: Overall Risk**

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

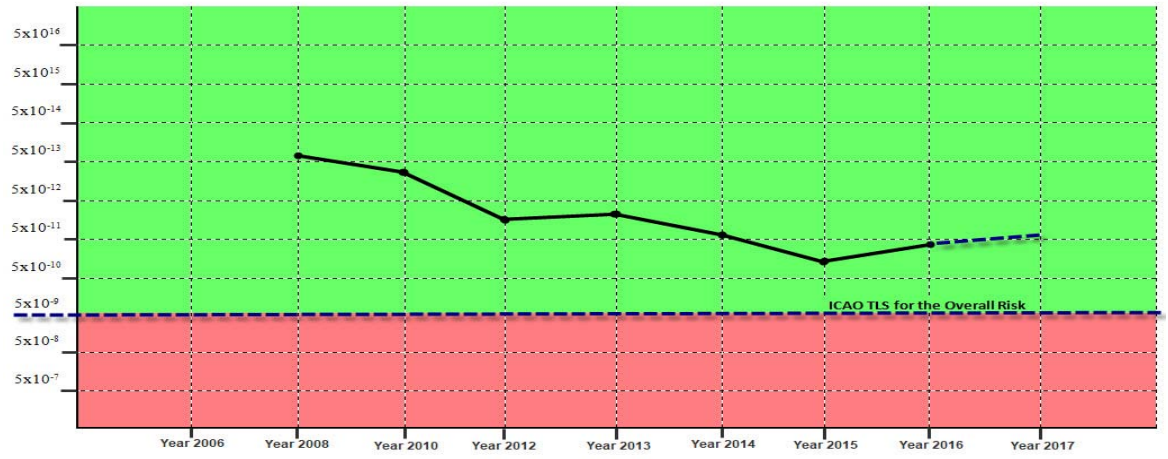
2.6.2.1 The computed overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace for the first seven months of the SMR reporting period is estimated **5.17x10^{-11}**

2.6.2.2 This estimate respects the Target Level of Safety. However the low number and poor detail of Large Height Deviation reports received by the RMA from some busy MID FIRs does not support high confidence in the accuracy of this result.

2.6.2.3 The estimation of the overall risk is extremely sensitive to individual parameters of time and magnitude of deviation against total flight time. A small increase in the parameters would result in a relatively large increase in the risk estimate. The low number of contributory reports would suggest that this estimate is significantly lower than the reality.

2.6.2.4 With regard to the calculated risks, both the technical and overall risk of mid-air collision estimates remain below the Target Level of Safety and forecast increases of air traffic are not expected to have impact in the next two to three years if no abnormal situations effect the traffic flow.

2.6.2.5 The graph below shows the trends of the overall Risk Estimates for all the Safety Monitoring Reports published since 2006, the results clearly indicate the ICAO TLS is varying between $5\times\mathbf{10}^{-12}$ and $5\times\mathbf{10}^{-10}$ with more likely to increase if the operational errors are not controlled.



Trends of Overall Risk Estimates for the ICAO MID RVSM Airspace

2.6.2.6 The MIDRMA noticed an increase in the LHD reports at the eastern FIR boundary of Muscat FIR, the reports filed from Muscat, Mumbai and Karachi ATCUs at their transfer of control points reached to a dangerous level and started to effect the ICAO TLS of RVSM implementation in the MID and APAC Regions. Therefore, the MIDRMA Board/15 meeting (Muscat – Oman 29 – 31 January 2018) opened a Safety Protocol for the purpose of resolving this issue as soon as possible.

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

2.6.2.7 The MIDRMA Board/15 meeting agreed that a Special Coordination Meeting between Iran, India, Oman and Pakistan with the presence of MAAR, MIDRMA and ICAO APAC and MID Regional Offices, to be conducted during the ATM SG/4 (02 May 2018) to agree on clear action plan to mitigate the risk associated with the high level of coordination failures at the interfaces between the above mentioned States.

2.7 RVSM Height Monitoring for MID RVSM Approved Aircraft

2.7.1 The MIDRMA raised their concern during MIDRMA Board/15 meeting related to the status of the Libyan aircraft granted RVSM approvals (based on the data received from the African RMA after the responsibility of the Libyan aircraft officially transferred to MIDRMA) without information or feedback from the State on the status of their height-keeping performance results. Accordingly, the MIDRMA worked closely with the ICAO MID Office to ensure this issue addressed to the Libyan Civil Aviation Authority to avoid any disturbance hindering air traffic in the Middle East Region.

2.7.2 The ICAO MID Office succeeded to establish contact with the Libyan Civil Aviation Authority to arrange for the inspection of all RVSM approved aircraft required to be monitored according to a specific schedule, the monitoring started in March 2018 and the MIDRMA finished monitoring seven aircraft belong to Libyan Airlines and Afriqiyah Airways in Jordan – Amman, the MIDRMA would like take this opportunity to thanks Jordan for their excellent and professional way to handle the monitoring flights of the Libyan aircraft within Amman FIR which helped the MIDRMA to complete their task without any difficulties. The remaining Libyan aircraft will be monitored within the next two months.

2.7.3 The MIDRMA managed to conduct GMU monitoring for 181 aircraft registered in the Middle East region in the last 20 months reflecting a decrease in the percentage of the monitored aircraft registered in the MID Region to 89% with known height monitoring results and 6% less than the performance target for height monitoring set by MIDRMA Board. However, this percentage is expected to increase to more than 98% especially after the US Department of Treasury - Office of Foreign Assets Control (OFAC) granted the MIDRMA a license for using the EGMU and the Altimetry System Error software to analyze the monitoring data for I.R. of IRAN Civil Aviation Organization RVSM approved aircraft which is keeping the ICAO Middle East Region free from any height monitoring restrictions.

2.7.4 The meeting may wish to note, that the MIDRMA Board/15 meeting agreed that a procedure should be developed and presented to the ATM SG/4 meeting related to the follow-up with the States and the issuance of warning related to RVSM approved aircraft without valid height-keeping performance monitoring results according to ICAO Annex 6 Part 1 requirements. The meeting also agreed to the following Draft Conclusion:

DRAFT CONCLUSION 15/2: RVSM MINIMUM MONITORING REQUIREMENTS AND CONDITIONS

That, the MIDRMA Member States be urged to

a. Take necessary measures to ensure their aircraft operators fully comply with ICAO Annex 6 provisions related to long-term height monitoring requirements, based on the MMR Tables;

b. Comply with the MID RVSM MMR Conditions published in the MIDRMA website; and

c. Withdraw the RVSM Approvals of aircraft not complying with the State MMR before 1 September 2018.

2.7.5 Based on the above, the MIDRMA propose the following procedure to ensure the compliance of RVSM approved aircraft registered in the ICAO Middle East Region for height monitoring:

a) The MIDRMA will notify the States concerned every 3 months about their aircraft non-compliance with ICAO RVSM Height Monitoring requirements;

b) States should take remedial actions to rectify the situation and ensure that their relevant aircraft are complying with ICAO RVSM Height Monitoring requirements in a timely manner, and notify the MIDRMA about their corrective action plans

c) States should develop corrective action plans in coordination with the airlines concerned and MIDRMA, which includes a time frame to allow the concerned airline operator rectify this violation as early as possible, this period should not exceed **90 days** to perform the height monitoring.

d) If **no** height monitoring would be conducted during the **90 days**, the concerned States must withdraw the RVSM approval of the aircraft concerned and inform the MIDRMA

e) The MIDRMA should issue a warning to all MID States and RMAs related to non-compliance aircraft registered in the MID Region

f) The MIDRMA in coordination with the ICAO MID Office will continue working closely with the States concerned to resolve the issue.

g) Once the issue would be resolved, a notification should be issued by MIDRMA to all MID States and RMAs

3. ACTION BY THE MEETING

3.1 The meeting is invited to discuss:

a) the difficulties facing the MIDRMA concerning the submission of TDS;

b) the initial SMR 2017 Technical and Overall risk results;

c) the absence of LHD reports and TDS from Tripoli FIR; and

d) agree on the proposed procedure in para 2.7.5.

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