International Civil Aviation Organization

MIDANPIRG STEERING GROUP

Third Meeting (MSG/3)
(Cairo, Egypt, 17 – 19 June 2013)

Agenda Item 5: Air Navigation Deficiencies and Safety Matters

MID RVSM SMR 2013 INITIAL RESULTS

(Presented by MIDRMA)

SUMMARY

This paper details the initial results of the MID RVSM Safety Monitoring Report (SMR) 2013 and tries to demonstrate according to the data used that the key safety objectives of the SMR in accordance with ICAO Doc 9574 were met in operational service.

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/13 Report
- MIDRMA Board/12 Report
- SMR 2012

1. INTRODUCTION

1.1 The Middle East Regional Monitoring Agency (MIDRMA) presents the MID RVSM Safety Monitoring Report 2013 to the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG) Steering Group (MSG) and MIDANPIRG.

1.2 The report presents evidence that the key safety objectives, as set out in the MID RVSM safety policy in accordance with ICAO Doc 9574 (2nd Edition), continue to be met in the Middle East RVSM airspace.

1.3 The initial results for the SMR 2013 are based on corrected data by the MIDRMA; the original data received from some member States was corrupted and not useful for the analysis.

2. DISCUSSION

2.1 The meeting may wish to note that since the establishment of the MIDRMA, Eurocontrol continued to offer generous assistance to train the MIDRMA team for conducting safety analysis according to the collision risk model developed for the European region, this model was found to be very complex and more abstract, which focuses on the statistical distribution of deviation from planned path. It is thus over conservative and sometimes over estimates risk, moreover, the statistical derivation does not make it easy to see what the key parameters are and thus what the areas of improvements. Because of these issues the MIDRMA decided to adopt the ICAO risk model as it reflects closer picture to reality.

2.2 The Safety Monitoring Report consists of estimating the risk of collision associated with RVSM and comparing this risk to the agreed RVSM safety goal, the Target Level Safety (TLS). A key issue for the assessment of RVSM safety is the satisfaction of the three Safety Objectives defined for the MIDRMA.

2.3 The safety assessment work is accomplished through collection of data related to the operations in the RVSM airspace and, with the help of the MID RVSM Scrutiny Group which convened back to back with the MIDRMA Board/12 meeting on 16th December 2012, which analyzed the operational errors reported by all MIDRMA member States for the SMR production period, the final conclusions of the data processed have been severely limited by the continued NIL reporting of Large Height Deviations (LHDs) and Coordination Failure Reports (CFRs) from some members.

2.4 The MIDRMA continuously stressed the importance of all MIDRMA member States to submit the required data to adequately assess and calculate all relevant safety parameters and factors, however the MIDRMA still suffers problems with some member States due to the late submission of the traffic data and due to the corrupted data which caused excessive delay for calculating the SMR safety parameters.

2.5 Reference to MIDANPIRG CONCLUSION 13/71 concerning the development of MID RVSM SMR 2013, the FPL/traffic data for the period 1-31 October 2012 shall be used for the development of the MID RVSM Safety Monitoring Report 2013, the descriptions of the total traffic data collected from each MIDRMA member States is depicted in table below, a total of 214,609 flights were gathered for all aircraft operated in the MID RVSM airspace, all these flights were evaluated and processed very carefully to ensure accurate results according to the data submitted.

MID States Actual Traffic Movements					Jan 2011 vs Oct 2012
SN	MID States	June 2009	Jan 2011	Oct 2012	Increase or Decrease (%)
1	Bahrain FIR	24285	**30099**	**39345**	23.50
2	Muscat FIR	22520	**28224**	**30357**	7.03
3	Jeddah/Riyadh FIR	22422	**25499**	**30944**	17.60
4	Cairo FIR	19228	**14270**	**26332**	45.81
5	Emirates FIR	15868	**21076**	**24676**	14.59
6	Tehran FIR	10479	**10638**	**17523**	39.29
7	Damascus FIR	9774	**11719**	**8027**	**-45.99**
8	Amman FIR	8554	**10689**	**6857**	**-55.88**
9	Kuwait FIR	3570	**10364**	**13596**	23.77
10	Sana'a FIR	3490	**4305**	**5170**	16.73
11	Beirut FIR	2949	**3845**	**1286**	**-66.5**
12	Baghdad FIR	-	-	**10496**	
	Total	**143,139**	**170,728**	**214,609**	**20.45**

MID States RVSM Traffic Data used for the SMRs

2.6 Safety Monitoring Report 2013 Initial Results:

2.6.1 RVSM Safety 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 x 10^{-9} fatal accidents per flight hour. The 2013 value computed for technical height risk is **$3.07x10^{-13}$**. This meets RVSM Safety Objective 1.

Technical Risk Values				
Year 2006	Year 2008	Year 2010	Year 2012	**Year 2013**
$2.17x10^{-14}$	$1.93x10^{-13}$	$3.96x10^{-15}$	5.08 x 10^{-14}	**$3.07x10^{-13}$**

2.6.1.1 According to the technical risk values as shown in the above table from the previous SMRs, the TLS value increased from the last SMR but still safe comparing to the ICAO TLS 2.5 x 10^{-9}.

2.6.1.2 **Pz (1000) compliance:**

The Pz (1000) is the probability that 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 ASE and typical AAD data is estimated to be of **5.26 x 10^{-9}**. This value meets the Global System Performance Specification that the probability of two aircraft will lose procedural vertical separation of 1000ft should be no greater than **$1.7x10^{-8}$**.

2.6.1.3 **Middle East RVSM Airspace Horizontal Overlap Frequency (HOF):**

a) The airspace to the northern part of Bahrain FIR continued to be the busiest and most complex airspace in the Middle East Region, however the northern and eastern part of Muscat FIR is also very complex and so is the airspace around HIL in Jeddah/Riyadh FIR. Accordingly, the determination of the Horizontal Overlap Frequency was measured in four different FIRS, Bahrain, Kuwait, Muscat and the Central part of Jeddah/Riyadh FIRs.

b) The MIDRMA merged all radar data through the RADAC system and the calculated horizontal overlap frequency from the four radars was estimated to be **4.33 x 10^{-8}** per flight hour.

Horizontal Overlap Frequency (HOF)				
Year 2006	Year 2008	Year 2010	Year 2012	**Year 2013**
$6.99x10^{-3}$	$5.1x10^{-11}$	$2.88x10^{-6}$	$6.49x10^{-5}$	**4.34 x 10^{-8}**

c) It should be noted however that the radar data available may not be totally representative of the traffic patterns for the whole MID region, particularly as western states in this area are subject to a level of unrest that has had a significant impact on the level of traffic.

d) Overall though as the airspace monitored in the MID region is considered to be both busy and complex, and has been so in the past in the western states, the results are considered to be valid.

2.6.2 RVSM Safety Objective 2:

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

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 is **5.82×10^{-11}** which meets the ICAO overall TLS of **5×10^{-9}** fatal accidents per flight hour, the table below reflects a comparison with the overall risk values calculated for the previous SMRs.

Overall Risk Values				
Year 2006	Year 2008	Year 2010	Year 2012	Year 2013
Not calculated due to the absence of suitable information on atypical errors	4.19×10^{-13}	6.92×10^{-12}	1.04×10^{-11}	**$5.82\ 10^{-11}$**

2.6.3 RVSM Safety Objective 3:

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

2.6.3.1 **Conclusions for RVSM Safety Objective 3**:

a) Current risk-bearing situations have been identified and actions will be taken to ensure resolving all violations and information was collected during the MID RVSM Scrutiny Group meeting on 16th December 2012 in order to identify operational issues and potential mitigations.

b) The MIDRMA will include in its work program training activity and briefings on RVSM safety assessment requirements to raise the awareness of ATC, RVSM approval Authorities and Air Operators personnel.

Therefore, it is concluded that this Safety Objective is currently met.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note and discuss the contents of this working paper.

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