International Civil Aviation Organization

MIDANPIRG Air Traffic Management Sub-Group

Eighth Meeting (ATM SG/8)
(Amman, Jordan, 7 – 10 November 2022)

Agenda Item 4: Planning and Implementation issues related to ATM/SAR

PRELIMINARY RESULTS OF THE MID RVSM SMR 2022 (SECOND DRAFT VERSION)

(Presented by the MIDRMA)

SUMMARY

This paper presents the preliminary results of the MID RVSM Safety Monitoring Report 2022 and the challenges that the MIDRMA faced with some member states to submit the required traffic data samples (TDS) in correct format used for the risk analysis and the continued lack of LHD reports problem.

In addition, this paper includes the MMR for all MIDRMA Member States and an assessment made of the non-RVSM approved aircraft that have been observed to operate within the ICAO Middle East RVSM airspace under MIDRMA supervision.

Action by the meeting is at paragraph 3.

REFERENCES

- ICAO Doc 9937
- ICAO Doc 9574
- MIDRMA Board/18 meeting Report (Doha, Qatar, 19 – 20 September 2022)

1. INTRODUCTION

1.1 The MID RVSM Safety Monitoring Report (SMR) is issued by the Middle East Regional Monitoring Agency (MIDRMA) on annual basis for endorsement by the Middle East Air Navigation Planning and Implementation Regional Group (MIDANPIRG). The report should present evidence that according to the data and methods used, all safety objectives set out in the MID RVSM Safety Policy in accordance with ICAO Doc 9574 (2nd Edition) continue to be met in operational services, however for SMR 2022 the MIDRMA faced difficulties in receiving Traffic Data Samples (TDS) from some Member States which are not usable for conducting the risk analysis and not as per the required traffic data format, this problem stopped the MIDRMA from presenting complete draft version of the SMR and instead it was agreed with ICAO MID Office to present this paper which contained the preliminary results of the SMR.

1.2 Based on the calculations performed so far to measure both ICAO TLS (Technical and Overall), the MIDRMA concluded that the MID RVSM airspace did not meet the ICAO TLS for the overall risk for reasons that will be explained in this working paper.

2. DISCUSSION

2.1 Preliminary Results of the MID RVSM SMR 2022 (First Draft Version):

2.1.1 Implementation of RVSM should be based on a safety assessment, demonstrating that all RVSM safety objectives set out in the MID RVSM Safety Policy in accordance with ICAO Doc 9574 (2nd Edition) continue to be met in operational services within the Middle East RVSM airspace.

2.1.2 The results calculated for the MID RVSM SMR 2022 presents evidence that according to the data and methods used that only safety Objectives 1 & 3 have been met while the MID RVSM airspace failed to meet Safety Objective No. 2 due to an isolated event resulted to high operational error period which led the overall risk value to reach above the ICAO TLS.

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 value computed for technical height risk is estimated **1.564×10^{-10}** this meets RVSM Safety Objective 1.

Objective 2 The overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies in the MID RVSM airspace meets the ICAO overall TLS of **5×10^{-9}** fatal accidents per flight hour.

The value computed for the overall risk is estimated **1.724×10^{-7}** this is above the ICAO overall TLS.

Objective 3 Address any safety-related issues raised in the SMR by recommending improved procedures and practices; and propose safety level improvements to ensure that any identified serious or risk-bearing situations do not increase and, where possible, that they decrease. This should set the basis for a continuous assurance that the operation of RVSM will not adversely affect the risk of en-route mid-air collision over the years.

Middle East RVSM Airspace Estimated Annual Flying Hours = **(2,161,356)** Average Aircraft Speed = **441.36 kts**			
Risk Type	**Risk Estimation**	**ICAO TLS**	**Remarks**
Technical Risk	**1.564×10^{-10}**	**2.5×10^{-9}**	**Below ICAO TLS**
Overall Risk	**1.724×10^{-7}**	**5×10^{-9}**	**Above ICAO TLS**

Conclusions:

(i) The estimated risk of collision associated with aircraft height- keeping performance is **1.564 x 10^{-10}** and meets the ICAO TLS of **2.5 x 10^{-9}** fatal accidents per flight hour (RVSM Safety Objective1).

(ii) The estimated overall risk of collision due to all causes which includes the technical risk and all risk due to operational errors and in-flight contingencies is **1.724 x 10^{-7}** this value is above the ICAO overall TLS of **5 x 10^{-9}** fatal accidents per flight hour (RVSM Safety Objective 2).

(iii) Although safety objective No 2 was not met for SMR 2022 due to an isolated event by none-RVSM approved aircraft which resulted long operational error period , based on currently-available information (Except for Tripoli, Kuwait and Beirut FIRs), there is no evidence available to MIDRMA that the continued operations of RVSM adversely affects the overall vertical risk of collision other than the violation of Non-RVSM approved aircraft to the MID RVSM airspace which is under continuous monitoring and review by MIDRMA.

2.1.3 Considerations on the Safety Objectives for MID RVSM SMRs

When considering the three safety objectives for RVSM, the following considerations should be borne in mind:

1. The assessment of risk against the TLS, both for technical and overall risk estimates, relies on height keeping performance data to assess the risk in the vertical plane and studies of traffic density to calculate the risk in the horizontal plane. There are numbers of assumptions that must be verified to satisfy the reliability of the risk assessment, the verification of these assumptions deals primarily with monitoring of aircraft performance issues.
2. The Aircraft performance is assessed by individual airframe and by monitoring group. A monitoring group consists of aircraft that are nominally of the same type with identical performance characteristics that are made technically RVSM compliant using a common compliance method. Monitoring group analysis is necessary to verify that the Minimum Aviation System Performance Standards (MASPS) for that group is valid. Aircraft that are made RVSM compliant on an individual basis are termed non-group.
3. RVSM Safety Objective 2, dealing with overall risk, takes into account the technical risk together with the risk from all other causes. In practice, this relates to the human influence and assessment of this parameter relies on adequate reporting of Large Height Deviation (LHD) Reports, and the correct interpretation of events for input to the CRM.
4. RVSM Safety Objective 3 requires the RMA to monitor long-term trends and to identify potential future safety issues, this compare the level of risk bearing incidents for the current reporting period. It also highlights if there are issues that should be carried forward as recommendations to be adopted for future reports.

2.1.4 Scope:

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

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

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

***Note:** **Kuwait, Beirut and Tripoli FIRs excluded from the RVSM safety analysis due to lack of data.**

2.1.5 The Data Sampling periods covered by SMR 2022 are as displayed in the below table

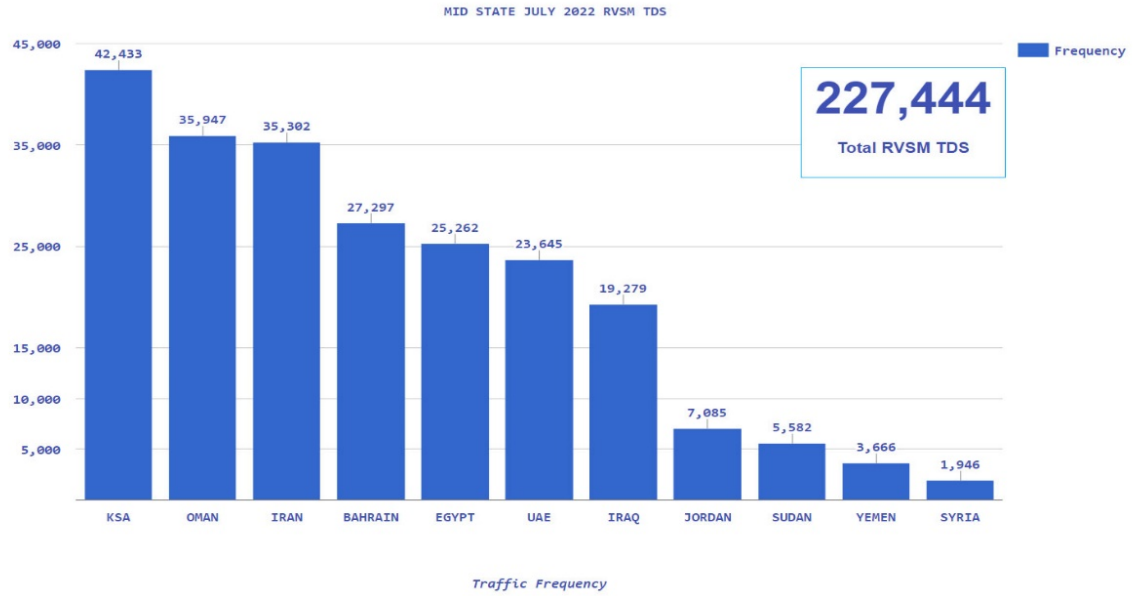
Report Elements	**Time Period**
Traffic Data Sample	01/06/2022 - 30/06/2022
Operational & Technical Errors	01/01/2022 - 31/10/2022

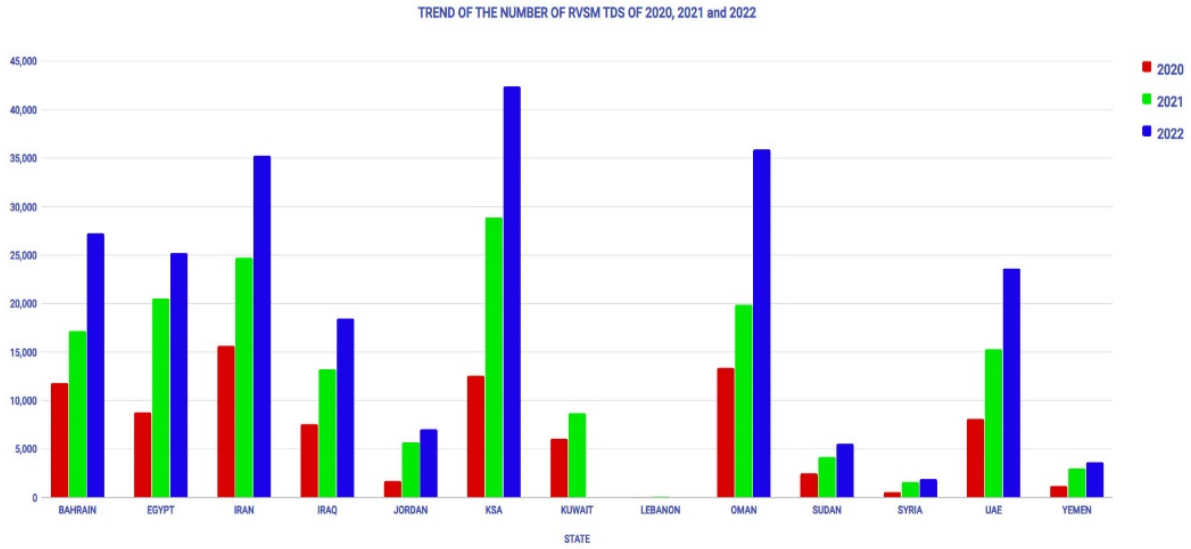
2.1.6 The descriptions of the traffic data collected from each MIDRMA Member State are depicted in table below:

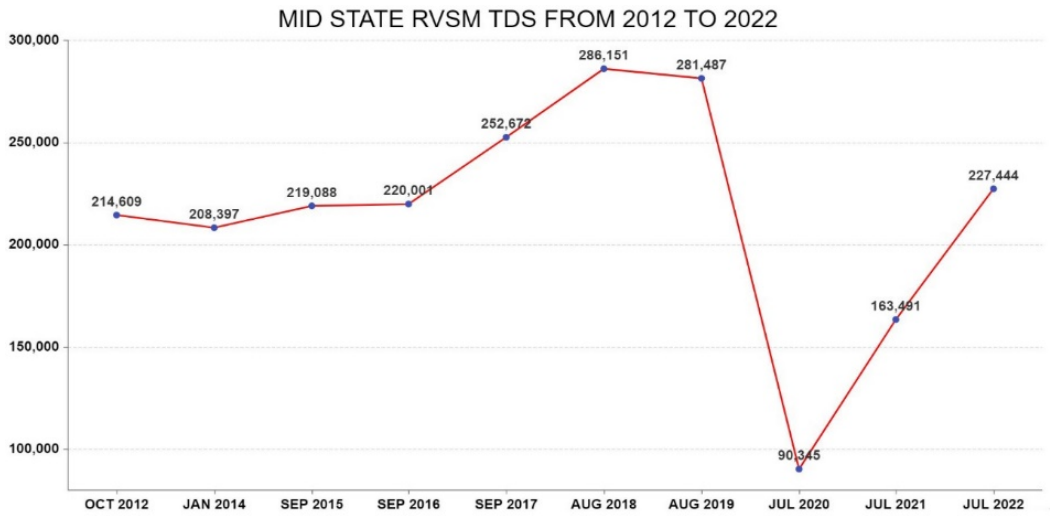
MID States	**No. of Flights**	**Received Dates**	**Status**
Bahrain FIR	27297	01/08/2022	Accepted (Lots of mistakes)
Cairo FIR	25262	30/07/2022	Accepted
Amman FIR	7085	06/07/2022	Accepted
Muscat FIR	35947	27/07/2022	Accepted
Tehran FIR	35302	05/08/2022	Accepted
Khartoum FIR	5582	31/07/2022	Accepted (Corrected TDS)
Emirates FIR	23645	26/07/2022	Accepted
Damascus FIR	1946	22/07/2022	Accepted
Sana'a FIR	3666	28/07/2022	Accepted
Baghdad FIR	19279	05/07/2022	Accepted (Corrected TDS)
Kuwait FIR	-	13/08/2022	Rejected
Jeddah FIR	42433	28/07/2022	Accepted (Lots of mistakes)
Beirut FIR	-		No Data Submitted
Tripoli FIR	-		No Data Submitted
Total	**227,444**		

Table 1: Details of the MID States RVSM Traffic Data Sample (TDS) for July 2021.

2.1.7 The description of the traffic data processed for each MIDRMA member state by the MID Risk Analysis Software (MIDRAS) is depicted in the graph below, a total of **227,444** flights were processed for the 11 FIRs, these flights were evaluated and processed very carefully to ensure accurate results according to the data submitted.


MID STATE JULY 2022 RVSM TDS
Frequency
227,444
Total RVSM TDS
45,000
35,000
25,000
15,000
10,000
5,000
42,433
35,947
35,302
27,297
25,262
23,645
19,279
7,085
5,582
3,666
1,946
KSA
OMAN
IRAN
BAHRAIN
EGYPT
UAE
IRAQ
JORDAN
SUDAN
YEMEN
SYRIA
Traffic Frequency


TREND OF THE NUMBER OF RVSM TDS OF 2020, 2021 and 2022
2020
2021
2022
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
BAHRAIN
EGYPT
IRAN
IRAQ
JORDAN
KSA
KUWAIT
LEBANON
OMAN
SUDAN
SYRIA
UAE
YEMEN
STATE



#	Waypoints	FIRs	Frequency
1	TASMI	BAGHDAD/KUWAIT	8466
2	DAVUS	BAHRAIN/KUWAIT	6977
3	SIDAD	BAGHDAD/KUWAIT	6500
4	NINVA	BAGHDAD/ANKARA	6159
5	RATVO	BAGHDAD/ANKARA	5980
6	TUMAK	BAHRAIN/EMIRATES	5340
7	ULADA	BAHRAIN/JEDDAH	5005
8	RASKI	MUSCAT/MUMBAI	4761
9	ALPOB	BAHRAIN/EMIRATES	4631
10	ULINA	CAIRO/AMMAN	4465
11	GABKO	TEHRAN/EMIRATES	4156
12	SODEX	EMIRATES/MUSCAT	4147
13	BONAM	TEHRAN/ANKARA	3992
14	MENSA	EMIRATES/MUSCAT	3949
15	KITOT	CAIRO/JEDDAH	3801
16	PASOV	EMIRATES/MUSCAT	3619
17	DEESA	AMMAN/JEDDAH	3567
18	NALPO	BAHRAIN/EMIRATES	3514
19	LONOS	BAHRAIN/KUWAIT	3452
20	DAROR	BAHRAIN/JEDDAH	3341

Top 20 Busiest Points in the MID RVSM Airspace

2.1.8 It is truly unfortunate that, after many years of issuing the RVSM SMR for the region, the MIDRMA still faces many difficulties and challenges in receiving the TDS from some member states in the required format, the requirement to collect the TDS is repeated every year in the same format and with no changes, but the TDS received with many errors and, in some cases, completely corrupted and cannot be used for the safety analysis.

2.1.8.1 MIDRMA was forced to reject the TDS from Kuwait, which was corrupted with many errors

and missing flights and could not be processed in the MIDRAS, while the TDS from Iraq and Sudan were temporarily rejected in order to correct all errors. The meeting may wish to note that no TDS was received from Lebanon despite several reminders being sent to the focal point to comply with the MIDANPIRG Conclusion 19/2 and the ICAO State Letter issued to submit the requested TDS.

2.1.8.2 Compiling the TDS and verifying its validity and suitability for use is a laborious task that necessitates a great deal of effort, time, and precision in order to produce reliable outcomes. As a result, the MIDRMA requires all Member States to double-check their data before sending it to avoid rejection and delaying work on the SMR

2.2 Large Height Deviation Reports (LHDs) 2022

2.2.1 The level of collision risk resulting from errors in ATC instructions ,emergency and operational procedures in the MID RVSM airspace needs to be assessed in addition to that resulting from technical height-keeping deviations, the primary source of reporting Large Height Deviation is the ATC units providing air traffic control services in the airspace where RVSM is applied, all MIDRMA Member States are required to submit Large Height Deviation Reports which occurred in their FIRs on a monthly basis (preferably as soon as they occur) even if none was reported during the month of reporting.

2.2.2 The vertical risk estimation due to atypical errors has been demonstrated to be the major contributor in the overall vertical-risk estimation for the ICAO MID RVSM airspace, The MIDRMA noticed good improvement from some member states used not to submit LHD reports equivalent to their high volume of traffic while some other members remain the same and can't see much improvement despite the continuous monthly reminders sent to all member states.

2.2.3 The estimation of total risk (Safety Objective 2) combines the results from Safety Objective 1 with the estimation of risk due to all other factors. This second component, often termed operational risk, is dependent on a large number of factors including, airspace configuration, traffic densities, ATC procedures, individual controller/pilot actions and specific sector operational characteristics. The operational risk is estimated by the evaluation of the magnitude and duration of events extracted from operational incident reports which transformed to Large Height Deviation reports.

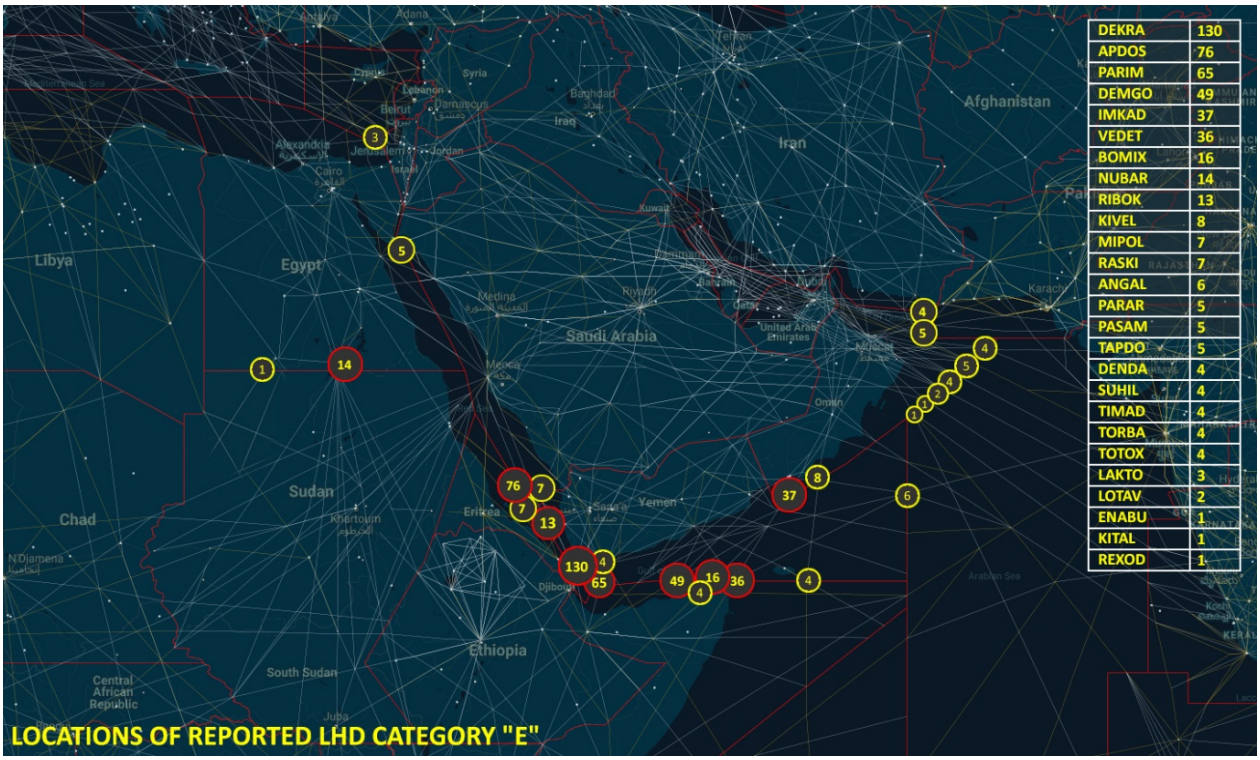
2.2.3.1 Despite the fact that the MIDRMA Member States have submitted a small number of LHD reports to date, and that the SMR cycle is not yet completed (there are two months more left), there is a chance that the results presented for Safety Objective No.2 will worsen if more critical LHD reports are submitted.

2.2.4 The Table below presents a summary of operational risk associated with Large Height Deviation (LHD) reports by LHD categories, these reports used to calculate the overall vertical collision risk for the MID RVSM airspace.

LHD Cat.	Large Height Deviation (LHD) Categories	No. of LHDs	LHD Duration (Sec.)
A	Flight crew fails to climb or descend the aircraft as cleared	3	**35**
B	Flight crew climbing or descending without ATC clearance	2	**60**
C	Incorrect operation or interpretation of airborne equipment	1	**40**
D	ATC system loop error	-	**-**

E	ATC transfer of control coordination errors due to human factors	14	**660**
F	ATC transfer of control coordination errors due to technical issues	-	**-**
G	Aircraft contingency leading to sudden inability to maintain level	-	**-**
H	Airborne equip. failure and unintentional or undetected FL change	1	**30**
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	1	**3420**
M	Other	1	**40**
	Total	21	**4285**

Summary of Operational Risk associated with Large Height Deviation Reports



2.2.5 RVSM Safety Protocol at the Eastern Boundaries of Muscat FIR and the increased Number of LHD reports submitted by Yemen related to some its adjacent FIRs:

2.2.5.1 The MIDRMA continued to monitor the LHD reports at the eastern boundaries of Muscat FIR filed by Mumbai and Muscat ACCs. The MIDRMA would like to draw the meeting's attention to the fact that Muscat/Mumbai RVSM safety protocol is still open since 2017, and it is time to make a decision to close it provided the risk is eliminated or reduced to its bare minimum, which the MIDRMA cannot see it is happening without confirmation of installing OLDI/AIDC in both ACCs.

Note: in this working paper details the LHD reports filed by both ATCUs from 01st January until 31st October 2022.

2.2.5.2 A virtual meeting arranged by the ATM officers in ICAO MID and ESAF Offices last March and was attended by MIDRMA, Yemen and Addis Ababa ATCUs to discuss the continued increasing number of LHD reports filed by Sana'a ACC related to its neighbouring FIRs. MIDRMA presented all the archived LHD reports filed by Yemen and requested to explore all possible solutions and agree in corrective measures to reduce the number of these LHDs as soon as possible because it started to affect the ICAO overall TLS.The attendees agreed to continue arranging for other meetings to discuss this issue with other neighbouring ACCs.

2.2.6 The MIDRMA pointed out during MIDRMA Board 17 & 18 the lack of response to the received LHD reports using the feature of direct response to the reporting unit to ensure that all responses are archived and referenced when needed. Unfortunately, the extreme majority of the Member States continue to ignore using this feature and don't bother to investigate and reply to the received LHD reports.

2.2.7 The table below reflects the LHD reports received from all MIDRMA member states from 01st January until 31st October 2022.

MID FIRs	No. of Reported LHDs	No. of Related LHDs
Bahrain	5	NIL
Baghdad	1	1
Amman	2	2
Tehran	2	8
Cairo	26	13
Damascus	NIL	1
Khartoum	9	17
Kuwait	NIL	4
Muscat	53	41
Jeddah/ Riyadh	11	102
Tripoli	NIL	NIL
Emirates	5	1
Sana'a	424	3

2.3 Assessment of Non-RVSM Approved Aircraft 2022

2.3.1 The MIDRMA conducts systematic reviews of the operator compliance with State RVSM approvals within the ICAO Middle East Region as part of the tasks and responsibilities of a Regional Monitoring Agency (RMA), as specified in ICAO Doc 9937 and 9574. In order to protect the safety of the RVSM airspace, these checks are performed to detect aircraft that are not approved and using the

RVSM airspace.

2.3.2 Although daily compliance monitoring of the entire ICAO Middle East airspace would be preferable, challenges in collecting traffic information make this impracticable. According to ICAO Doc 9937, the responsible RMA must monitor full airspace compliance for at least 30 days per year, while MIDRMA fulfills this responsibility on a monthly basis.

2.3.3 MIDRMA stipulates that there must be two sources of data to track operator adherence to state RVSM approval:

a- List of operators, types and registration marks of aircraft operating in the RVSM airspace, and
b- The latest worldwide RVSM approvals database.

2.3.4 The first requirement is met once a year in the form of the traffic data sample used for the MID RVSM risk analysis, as well as the monthly RVSM TDS received from Bahrain, IRAQ, and the UAE, though aircraft registrations are missing in much of the data from some Member States. As a result, this information cannot confirm the true state of non-compliant traffic in some FIR regions.

2.3.5 MIDRMA uses Bahrain, Baghdad, and Emirates FIRs RVSM traffic data as the primary source for checking non-RVSM approved aircraft in the MIDRMA area of responsibility because it is difficult to obtain traffic data from all Member States on a monthly basis. The MIDRMA would like to take this opportunity to thank Bahrain CAA, IRAQ CAA, and UAE General Civil Aviation Authority for sending their FIRs RVSM traffic on a monthly basis for inspecting the noncompliant aircraft in the region. The data received from these Member States is consistently complete and in the proper format.

Note: Recently, Jeddah started to send their RVSM traffic data which will definitely improve MIDRMA scrutiny of none-RVSM approved aircraft.

2.3.6 The second requirement in 2.3.3 is the combined approvals database containing the approval records provided by all RMAs (Worldwide Combined RVSM Approvals Database) is used to verify the RVSM approval status of the operations identified in the traffic movement data sample. The combined global RVSM database updated by all RMAs on a regular basis.

2.3.7 To ensure that traffic data only includes valid RVSM approvals, it is compared to the most recent global RVSM approval database. The processes that fit this description but didn't have valid RVSM approvals will be listed for further investigation and confirmation. Cross-checks with the MIDRMA's latest updated RVSM approvals, typos in traffic data, code sharing, and lease agreements between airline operators who will maintain aircraft under a duplicate RVSM approval in two countries at the same time are all part of the verification process. The appropriate Civil Aviation Airworthiness Authority will be contacted to clarify the discrepancy and request a response with their findings and the corrective measures being taken to resolve the issue once the verification process is finished and our findings are validated.

2.3.8 The primary systemic cause of the non-conformity of the missing approvals, according to the findings of MIDRMA's investigation, is the delay in notifying the appropriate RMA before the aircraft begin to operate within the RVSM airspace. These results highlight how crucial it is for states to promptly inform the concerned RMA of the operator approval status.

2.3.9 When the findings of MIDRMA have been checked and verified, official letters or emails will be sent to the following:

a- MIDRMA Airworthiness Inspectors responsible for the non-RVSM approved aircraft found operating in ICAO MID RVSM airspace or outside the region if reported by other RMAs, and will be required to respond with the results of their investigations.

b- All RMAs responsible for violating aircraft must conduct investigations into noncompliant aircraft operations in the MID RVSM airspace and report their findings.

2.3.10 This type of scrutiny, which is carried out using the monthly RVSM traffic data received from Bahrain, Iraq, and the UAE, assisted MIDRMA in tracking down violating aircraft and alerting relevant air traffic control units of those aircraft.

2.3.11 The tables below reflects the MIDRMA Bulletin of the Non-RVSM Approved aircraft observed operating within the ICAO MID RVSM airspace and in the RVSM airspace of other RMAs, the expectation from the this analysis related to States exercising operational authority would act to address the approval issue well in advance and before allowing the approved aircraft to operate within the RVSM airspace to avoid undesirable actions against legitimate operators and also States that find such aircraft operating in their airspace will take appropriate action.

NON-RVSM approved aircraft – Responsibility of MIDRMA Member States

#	Observed Operating RVSM in	ACFT Reg.	ICAO Type	First Observed on	Responsible State
1	Jeddah	STALL	CRJ1	11-06-2022	SUDAN
2	Khartoum, Jeddah	STTAH	B737	06-01-2022	SUDAN
3	EURRMA	5ALEX	BE200	09-07-2022	LIBYA
4	Baghdad, Damascus	YKATA	IL76	01-01-2020	SYRIA

NON-RVSM approved aircraft – Responsibility of other RMAs

#	Observed in FIR	ACFT Reg.	ICAO Type	First Observed on	Responsible RMA
1	Sana'a	21140	IL76	19-06-2022	CHINARMA
2	Bahrain, Emirates	40001A	C17	25-01-2020	AAMA
3	Emirates	60208A	C17	30-03-2020	AAMA
4	Emirates	5NBOD	GLF4	28-01-2022	AFIRMA
5	Cairo	5YFAN	CRJ2	15-07-2020	AFIRMA
6	Khartoum	5YWBH	C56X	14-07-2020	AFIRMA
7	Cairo	ETATF	B350	08-07-2020	AFIRMA
8	Sana'a	ZSCQP	CRJ9	07-07-2020	AFIRMA
9	Emirates	FAB2857	KC39	22-05-2022	CARSAM
10	Emirates	CNTMX	E35L	29-12-2021	EURRMA
11	Baghdad, Emirates	EW550TH	IL76	04-12-2021	EURRMA
12	Cairo	UR11316	AN12	22-07-2020	EURRMA
13	Cairo	URAZN	B753	01-02-2022	EURRMA
14	Cairo	URAZO	B753	01-02-2022	EURRMA
15	Cairo	URAZR	B77W	03-02-2022	EURRMA
16	Bahrain, Emirates, Baghdad	URFSA	IL76	09-05-2021	EURRMA

17	Bahrain, Baghdad	URFSC	IL76	28-09-2021	EURRMA
18	Bahrain, Emirates	URFSC	IL76	05-12-2021	EURRMA
19	Bahrain, Emirates	URFSD	IL76	29-09-2021	EURRMA
20	Emirates	URFSD	IL76	24-12-2021	EURRMA
21	Emirates	URSQO	B738	02-12-2021	EURRMA
22	Cairo	80002A	C17	23-07-2020	MAAR
23	Cairo, Muscat	CB8001	C17	29-07-2020	MAAR
24	Cairo, Muscat, Emirates	CB8004	C17	24-07-2020	MAAR
25	Bahrain	IN307	IL38	03-12-2020	MAAR
26	Muscat	K3604	E35L	17-07-2020	MAAR
27	Emirates	KJ3452	IL76	03-08-2020	MAAR
28	Emirates	KJ3454	IL76	16-03-2020	MAAR
29	Bahrain, Emirates	N312JE	CL60	25-08-2022	NAARMO
30	Bahrain, Emirates	N46HB	F9000	22-08-2022	NAARMO
31	Bahrain, Emirates	N88YH	CRJ2	17-08-2022	NAARMO
32	Cairo	N1112B	B350	16-07-2020	NAARMO
33	Emirates	N131GA	GLF5	14-03-2020	NAARMO
34	Emirates	N145DB	E35L	22-01-2022	NAARMO
35	Emirates	N181CK	GLEX	17-12-2020	NAARMO
36	Bahrain, Emirates, Baghdad	N298RB	GLF4	14-05-2021	NAARMO
37	Baghdad, Emirates	N298RB	GLF4	09-01-2022	NAARMO
38	Emirates	N302PJ	H25B	01-07-2021	NAARMO
39	Emirates	N405LL	H25B	29-05-2022	NAARMO
40	Emirates	N410F	FA8X	09-05-2022	NAARMO
41	Emirates	N411VP	EA50	01-05-2022	NAARMO
42	Bahrain, Emirates	N44UA	CL60	07-06-2020	NAARMO
43	Emirates	N5062	SF50	14-01-2020	NAARMO
44	Bahrain, Baghdad	N527EF	GLF4	11-04-2020	NAARMO
45	Bahrain	N558QA	C510	05-05-2022	NAARMO
46	Khartoum	N604DT	CL60	26-02-2022	NAARMO
47	Bahrain, Emirates	N605AS	PC12	11-04-2022	NAARMO
48	Bahrain, Emirates, Baghdad	N685MF	GLF4	08-12-2021	NAARMO
49	Emirates	N685SC	CL60	06-05-2022	NAARMO
50	Cairo	N71KM	C30J	26-02-2022	NAARMO
51	Cairo	N866G	ZZZZ	14-02-2022	NAARMO
52	Bahrain, Baghdad	N920SA	F2TH	18-02-2021	NAARMO
53	Emirates	N981DB	H25B	05-04-2022	NAARMO
54	Emirates	XAFEM	GA6C	03-02-2022	NAARMO

2.4 **Minimum Monitoring Requirements 2022**

2.4.1 All operators that operate or intend to operate in airspace where RVSM is applied are required to participate in the regional RVSM monitoring program. This monitoring program addresses requirements for monitoring the height-keeping performance of aircraft in order to meet regional safety

objectives and addresses the requirements for monitoring established in ICAO Annexes 6 and 11 as well as Doc 9574 and 9937. In their application to the appropriate State authority for RVSM approval, operators must show a plan for meeting the applicable monitoring requirements. Initial monitoring should be completed as soon as possible but not later than 3 months after the issue of the temporary RVSM approval and thereafter as directed by the regional monitoring agency. A table detailing the minimum monitoring requirements is published by the MIDRMA in conjunction with ICAO and other Regional Monitoring agencies and it is available on the MIDRMA website.

2.4.2 Since the height monitoring mandated, the MIDRMA and MIDANPIRG agree that this requirement should be implemented in accordance with the RVSM Minimum Monitoring Requirements (MMRs), the MIDRMA continued to coordinate with all MIDRMA Member States to publish their minimum monitoring requirements through the MIDRMA's automated MMR system, which is published on the MIDRMA website to ensure the availability of these requirements at all times for the concerned MID Civil Aviation Authorities and airline operators.

2.4.3 The majority of current aircraft types are eligible for RVSM airworthiness approval under group approval provisions. These provisions permit the defining of aircraft-type groups consisting of aircraft types which are designed and assembled by one manufacturer and are of nominally identical design and build with respect to all details that could influence the accuracy of height-keeping performance. It is not normally necessary to monitor all airframes within a monitoring group providing an adequate sample is available and the performance of the group is within the satisfied parameters. The minimum monitoring requirements (MMR) document lists the aircraft types which are eligible for RVSM approval under the group provisions and the groups to which they belong. It also indicates the level of monitoring that should be expected for each operator.

2.4.4 The total number of RVSM approved aircraft registered by the MIDRMA member states is **1905** aircraft, the MIDRMA continuously monitor the validity dates of height monitoring requirements for all these aircraft and keep all member states fully aware of the validity status through the Minimum Monitoring Requirement software available in the MIDRMA website.

Note: The online MMR software is linked with the MID RVSM approvals database and constantly updated with the member states approvals list.

2.4.5 The MIDRMA programmed the MMR software to send automatic reminders on a monthly basis for all member states to send their updated RVSM approval list, also the software sends a monthly summary MMR tables with the validity status for all the RVSM approved aircraft in the Middle East region. These reminders helped all MIDRMA focal points for airworthiness issues to react before the height monitoring expiry dates and instruct airline operators to conduct height monitoring when necessary.

2.4.6 The meeting may wish note that MIDANPIRG Conclusion 17/3 concerning the procedures for the follow-up with States and the issuance of warning related to RVSM approved aircraft without valid height-keeping performance monitoring results. Accordingly, the MIDANPIRG agreed to the following conclusion:

MIDANPIRG CONCLUSION 17/3: *PROCEDURE FOR THE FOLLOW-UP WITH STATES AND THE ISSUANCE OF WARNING RELATED TO RVSM APPROVED AIRCRAFT WITHOUT VALID HEIGHT-KEEPING PERFORMANCE MONITORING RESULTS*

a) The MIDRMA will notify the States concerned every 3 months about their aircraft noncompliance 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 noncompliance 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; and
g) Once the issue would be resolved, a notification should be issued by MIDRMA to all MID States and RMAs.

2.4.6.1 MIDRMA can't see the implementation of this procedures by some member states especially those with high percentage of their RVSM approved aircraft that are not compliant for long time of height monitoring according to ICAO Annex 6 part 1 requirements. It is therefore necessary to address this issue to the Member States shown in the MMR table below, which must explain to the meeting why their authorities didn't take any action to comply with this conclusion.

2.4.7 The updated Minimum Monitoring Requirements table reflected below.

Note: The status of the Syrian RVSM approved aircraft will be explained in Part 2 of this WP.

MID STATES RVSM AIRCRAFT MINIMUM MONITORING REQUIREMENTS TABLE

Valid as of 31st October 2022

MID States	RVSM APPROVED A/C	HAVE RESULTS OR COVERED	NOT COVERED	NOT COVERED IN %	A/C MMR
Bahrain	62	62	0	0%	**0**
Egypt	151	125	26	**18%**	**19**
Iran	213	199	14	7%	**12**
Iraq	47	47	0	0%	**0**
Jordan	45	42	3	7%	**3**
KSA	281	229	52	**19%**	**6**
Kuwait	68	68	0	0%	**0**
Lebanon	32	28	4	13%	**3**
Libya	40	30	10	25%	**8**
Oman	74	73	1	1%	**1**
Qatar	276	276	0	0%	**0**

Sudan	15	11	4	27%	**3**
Syria	15	0	15	**100%**	**9**
UAE	580	548	33	6%	**14**
Yemen	6	4	2	**33%**	**2**
TOTAL	**1905**	**1742**	**164**	**9%**	**80**

Table 1: LHD Reports Filed by Muscat Related to Mumbai

#	ID	Date of Occ	Reported By	Related to	Location	Nature of the occurrence:	Category
1	10527	06/02/2022	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
2	10528	18/02/2022	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
3	10529	27/02/2022	Muscat	Mumbai	RASLI	ACFT Entered FIR Without Coordination	E
4	10589	01/03/2022	Muscat	Mumbai	LOTAV	Revised FL Not Coordinated	E
5	10590	07/03/2022	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
6	10591	07/03/2022	Muscat	Mumbai	TOTOX	Revised Estimate Not Coordinated	E
7	10592	27/03/2022	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
8	10837	01/07/2022	Muscat	Mumbai	TOTOX	ACFT Entered FIR Without Coordination	E
9	10838	03/07/2022	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E
10	10839	07/07/2022	Muscat	Mumbai	PARAR	Revised FL Not Coordinated	E
11	10840	17/07/2022	Muscat	Mumbai	REXOD	ACFT Entered FIR Without Coordination	E
12	10841	20/07/2022	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
13	10842	20/07/2022	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
14	10843	27/07/2022	Muscat	Mumbai	PARAR	Revised Estimate Not Coordinated	E
15	10844	28/07/2022	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
16	10845	30/07/2022	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
17	10907	08/08/2022	Muscat	Mumbai	LOTAV	Revised Estimate Not Coordinated	E
18	10908	12/08/2022	Muscat	Mumbai	LOTAV	ACFT Entered FIR Without Coordination	E
19	10909	15/08/2022	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
20	10910	16/08/2022	Muscat	Mumbai	REXOD	Revised FL Not Coordinated	E
21	10911	16/08/2022	Muscat	Mumbai	RASKI	ACFT Entered FIR Without Coordination	E
22	10912	18/08/2022	Muscat	Mumbai	TOTOX	Revised FL Not Coordinated	E
23	10913	20/08/2022	Muscat	Mumbai	RASKI	Revised FL Not Coordinated	E
24	10914	25/08/2022	Muscat	Mumbai	KITAL	ACFT Entered FIR Without Coordination	E

Table 2 : LHD Reports Filed by Mumbai Related to Muscat

#	ID	Date of Occurrence	Reported By	Related to	Location	Nature of the occurrence:	
1	LHD001574	21/07/2022	Mumbai	Muscat	KITAL	No or late FL revision	E
2	LHD001572	30/08/2022	Mumbai	Muscat	TOTOX	No or late FL revision	E
3	LHD001571	30/08/2022	Mumbai	Muscat	REXOD	No or late FL revision	E
4	LHD001570	28/08/2022	Mumbai	Muscat	REXOD	No or late FL revision	E
5	LHD001567	17/08/2022	Mumbai	Muscat	PARAR	No or late FL revision	E
6	LHD001566	14/08/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
7	LHD001526	30/07/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
8	LHD001525	28/07/2022	Mumbai	Muscat	RASKI	No or late FL revision	E

9	LHD001524	27/07/2022	Mumbai	Muscat	PARAR	No or late estimate time revision	E
10	LHD001523	20/07/2022	Mumbai	Muscat	LOTAV	No transfer information	E
11	LHD001522	20/07/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
12	LHD001521	17/07/2022	Mumbai	Muscat	REXOD	No transfer information	E
13	LHD001520	07/07/2022	Mumbai	Muscat	PARAR	No transfer information	E
14	LHD001519	03/07/2022	Mumbai	Muscat	KITAL	No transfer information	E
15	LHD001518	01/07/2022	Mumbai	Muscat	TOTOX	No transfer information	E
16	LHD001472	15/06/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
17	LHD001451	30/05/2022	Mumbai	Muscat	REXOD	No transfer information	E
18	LHD001450	27/05/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
19	LHD001447	08/05/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
20	LHD001446	03/05/2022	Mumbai	Muscat	RASKI	No transfer information	E
21	LHD001401	29/04/2022	Mumbai	Muscat	LOTAV	No or late FL revision	E
22	LHD001373	01/03/2022	Mumbai	Muscat	LOTAV	No or late FL revision	E
23	LHD001372	07/03/2022	Mumbai	Muscat	TOTOX	No or late FL revision	E
24	LHD001369	07/03/2022	Mumbai	Muscat	TOTOX	No or late estimate time revision	E
25	LHD001368	27/03/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
26	LHD001367	06/02/2022	Mumbai	Muscat	PARAR	No or late FL revision	E
27	LHD001365	18/02/2022	Mumbai	Muscat	KITAL	No transfer information	E
28	LHD001363	27/02/2022	Mumbai	Muscat	RASKI	No transfer information	E
29	LHD001361	19/03/2022	Mumbai	Muscat	LOTAV	No transfer information	E
30	LHD001360	13/03/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
31	LHD001359	12/03/2022	Mumbai	Muscat	PARAR	No or late FL revision	E
32	LHD001358	09/03/2022	Mumbai	Muscat	PARAR	No transfer information	E
33	LHD001357	05/03/2022	Mumbai	Muscat	KITAL	No transfer information	E
34	LHD001356	05/03/2022	Mumbai	Muscat	KITAL	No transfer information	E
35	LHD001355	03/03/2022	Mumbai	Muscat	LOTAV	No or late FL revision	E
36	LHD001301	23/02/2022	Mumbai	Muscat	PARAR	No or late FL revision	E
37	LHD001300	27/02/2022	Mumbai	Muscat	KITAL	No or late FL revision	E
38	LHD001278	31/01/2022	Mumbai	Muscat	TOTOX	No or late FL revision	E
39	LHD001277	09/01/2022	Mumbai	Muscat	RASKI	No or late FL revision	E
40	LHD001276	09/01/2022	Mumbai	Muscat	REXOD	No or late estimate time revision	E
41	LHD001275	09/01/2022	Mumbai	Muscat	TOTOX	No or late estimate time revision	E

Appendix B

2.5 RVSM Height Monitoring Activities Update

2.5.1.1 Syria RVSM Approved Aircraft : With the increased number and activities of the RVSM approved aircraft registered by the Syrian Civil Aviation Authority in the ICAO Middle East Region, the MIDRMA submitted an official request since last year for an OFAC License to the FAA and the US Department of Treasury to conduct RVSM height monitoring by using the Enhanced GMU equipment, this license is under process and follow-up by MIDRMA and the FAA but without knowing if the OFAC license will be granted or not.

2.5.1.2 As we all know, height monitoring is a very critical safety issue and its very much related to the analysis conducted in the annual SMR because lack of height monitoring means lack of 1000 ft vertical separation assurance. The Syrian Civil Aviation Authority (SCAA) shows positive and responsible actions towards this matter and ready to conduct the required monitoring for all their registered approved aircraft as soon as possible, but without an OFAC license that restricts MIDRMA to perform height monitoring in accordance with the agreed purchase agreement for the EGMUs, MIDRMA is unable to accomplish this task.

2.5.1.3 The MIDRMA coordinated with the SCAA Flight Safety Department to legalize the lack of height monitoring issue and to follow the procedure for granting temporary RVSM approvals for all the registered aircraft and to put an official request to MIDRMA for conducting height monitoring as per ICAO Annex 6 Part 1 requirements during the 60 days waiver period which was expired by end September 2022 and renewed again by the same authority to be valid until end of December 2022. The MIDRMA coordinated with ICAO MID office to escalate this issue with the FAA but it seems their response is not very promising and no update received until now concerning our application for the OFAC license although it was already addressed to the FAA representative who attended the last MIDRMA Board/18.

2.5.2 Libya RVSM Approved Aircraft: The MIDRMA managed to conduct height monitoring for 14 aircraft registered by the Libyan CAA and was able to reduce the noncompliant percentage from 82% to 25%, there are 9 other aircraft that must be checked as soon as possible and work hard to prevent these aircraft from entering the airspace in case they fail to comply with RVSM height monitoring requirements as per ICAO Annex 6 Part 1.

2.5.3 Iran RVSM Approved Aircraft: MIDRMA coordinated with Iran CAO Flight Safety Department and agreed to conduct height monitoring of the remaining 12 RVSM approved aircraft by end of November 2022 which will reflect Iran CAO to be fully compliant for RVSM height monitoring when these aircraft are inspected.

2.5.4 Egypt RVSM Approved Aircraft: Despite the monthly reminders sent to MIDRMA focal point for airworthiness issues, the MIDRMA didn’t receive any response from the responsible airworthiness inspectors to meet ICAO Annex 6 Part 1 requirements for conducting RVSM height monitoring for 19 aircraft which are expired for long time.

2.5.5 Sudan RVSM Approved Aircraft: The responsible Airworthiness Inspector coordinated with MIDRMA to conduct RVSM height monitoring by MID of November 2022 for all the remaining aircraft required to be monitored which will reflect Sudan CAA to be fully compliant for RVSM height monitoring.

Appendix C

2.6 MIDRMA Proposal to Include the Following States in the MID Air Navigation Deficiency Database (MANDD):

1- Kuwait: Due to corrupted RVSM TDS submitted for SMR 2022.
2- Egypt: No action has been taken for a long time to correct the problem of prolonged lack of RVSM height monitoring.
3- Lebanon: No RVSM TDS submitted for SMR 2022.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and discuss the results of Safety Objective No 2.

b) discuss and approve MIDRMA's proposal in 2.6

- END -