

MID RVSM TF/3  
Report on Agenda Item 2

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**REPORT ON AGENDA ITEM 2: SAFETY AND AIRSPACE MONITORING ASPECTS (SAM/WG)**

2.1 Under this agenda item, the safety and monitoring aspects were addressed by the SAM/WG. The group accordingly reviewed its terms of reference and noted that these were closely modeled on those for the Asia/Pacific Region. It was noted that the Task Force laid down the Terms of Reference. The working group's terms of reference is indicated at **Appendix 2A** to the report on this agenda item.

2.1.1 Additionally the normal working arrangements, whereby the TF Chairman, WG Rapporteurs and the ICAO Secretariat to the widest possible extent undertake co-ordination with other working group and with the Task Force as a whole, were noted. For issues requiring wider discussion, joint sessions of two WGs or plenary sessions of the TF will be held. However, such sessions are kept to a minimum in order to give maximum time to the WGs.

2.2 The duties and responsibilities of the MECMA were reviewed. The working group noted the delineation in responsibilities between itself and the MECMA. The latter is responsible for the day-to-day and time-consuming tasks, such as establishing and maintaining databases and the conduct of readiness assessments and safety assessments. Like for the SAM/WG, the duties and responsibilities of the MECMA were closely modeled on those for the Asia/Pacific Region (APARMO). The MECMA's group's duties and responsibilities are as stated in **Appendix 2B** to the report on this agenda item.

2.2.1 MECMA's address is:  
**Middle East Central Monitoring Agency (MECMA)**  
**P.O. Box 666**  
**Abu Dhabi**  
**United Arab Emirates**  
**Telephone: +971 2 405 4339**  
**Fax: +971 2 449 1599**  
**Email: [traffic@mecma.com](mailto:traffic@mecma.com)**  
**(for forwarding of traffic samples)**  
**Website: [www.mecma.com](http://www.mecma.com)**

2.2.2 MECMA's website has been established with information about the Agency and certain forms for reporting of traffic and monitoring.

2.3 MID RVSM TF/2 meeting discussed the options for carrying out safety analysis and found that the following two options merited further considerations:

- Subcontract the task to a suitably qualified company. This option had been chosen for the South Atlantic area and would be considered.
- Accept assistance from a qualified regional organization. This option had been chosen for the Asia/Pacific area and would be considered.

2.3.1 It was confirmed that no other State or organization was prepared to contribute towards the considerable cost of subcontracting the work associated with preparing readiness assessments and safety assessments and that MECMA was not prepared to fund this activity on its own, bearing in mind the high cost and that subcontracting would not result in transfer of know-how to the benefit of the Agency.

2.3.2 Since RVSM TF/2 meeting, further discussions have been held between the UAE GCAA and the United States' FAA regarding continued assistance. While it has not yet been possible to obtain a formal commitment from the FAA, the positive and helpful approach from the FAA has remained unchanged. This had extended to production of the "**Know Your Airspace**" working paper for the meeting which was a substantial contribution (*Attachment C to the Report*).

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2.3.3 A Memorandum of Cooperation was established between the United States' FAA and the UAE GCAA in 1999 and the possibility of formalizing the necessary support under the umbrella of this MOC is currently being investigated.

2.3.4 As an alternative, the possibility of completing the safety case related tasks in cooperation with Eurocontrol remains. During the meeting, this option was explored on an informal basis and the Eurocontrol delegate indicated that liaison visits normally offered good opportunities for transfer of knowledge and experiences gained during the implementation process. It was agreed that a MECMA visit to Eurocontrol would be beneficial in this respect.

2.3.5 Based on the positive position of both the FAA and Eurocontrol, both of whom had made considerable contributions to the Task Force, the meeting adopted the following conclusion:

**CONCLUSION 3/1 - SAFETY ANALYSIS**

That,

The safety analysis required for RVSM implementation in the Middle East Region be carried out by MECMA under the auspices of the UAE General Civil Aviation Authority initially based on information from, or in cooperation with one or more suitably qualified regional organizations.

2.4 The meeting considered minimum monitoring requirements and noted that these differ between regions and States:

- The Asia/Pacific Region requires monitoring of two or three airframes per type per operator, depending on previous RVSM experience.
- The Russian FAA requires monitoring of each airframe for which RVSM approval is sought.
- The European Region (Eurocontrol) does not directly link monitoring of airframes to RVSM approval. However, there are requirements regarding monitoring of a certain percentage (10%, 30%, 60% and 100% - depending on confidence level) of a fleet prior to RVSM implementation.

2.4.1 The Middle East monitoring situation is akin to that of the Asia/Pacific area, where only GMU technology is available for monitoring. This, in turn, has distinct similarities with the North Atlantic Region, where RVSM was first introduced. As a consequence, it was considered appropriate to use the Asia/Pacific monitoring requirements, as established by the APARMO, as a starting point for development of minimum requirements for the MID Region.

2.4.2 The APARMO monitoring requirements would then be adapted, where necessary, to cater for differences between the Asia/Pacific and the Middle East regions.

**CONCLUSION 3/2 - REQUIREMENTS FOR MONITORING**

That,

- a) Operators having met the monitoring requirements as indicated at **Appendix 2C** to the Report on agenda item 2, for a given fleet/type of aircraft, will be accepted as having satisfied the RVSM monitoring requirements for the Middle East Region. For Middle East operators, documentation for monitoring shall be provided to MECMA; and
- b) MECMA will update the table in the light of data and experience gained in other Regions.

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2.5 As agreed at MID RVSM TF/2 meeting (report on agenda item 3, paragraph 3.7.3), the meeting considered the organizational options for height monitoring with GMU technology.

2.5.1 The criteria for technical acceptance by MECMA were:

- the measuring methodology and results are accepted by another regional monitoring agency such as APARMO or Eurocontrol; and
- the service is available on equal terms to all users of MID airspace.

**Furthermore, clarity is required on the following issues:**

- The extent of services being provided
- The cost of services provided

2.5.2 Based on these criteria, companies were invited, individually or under the auspices of IATA, to present specific proposals, based on which a decision on a height-keeping monitoring service for the MID Region could be made.

2.5.3 Two companies, ARINC and CSSI, had presented proposals to IATA.

2.5.3.1 Both companies are providing monitoring services that are technically/operationally acceptable to APARMO and/or Eurocontrol. Therefore, results obtained using same technology on behalf of operators seeking MID RVSM approval will be accepted by MECMA.

2.5.3.2 The financial structuring of the proposal were, however, fundamentally different and IATA was not ready to enter into any arrangement based upon the existing offers. The matter will be decided upon at an RCG meeting in September, following which IATA will be making its presentation to MECMA.

2.5.3.3 MECMA indicated that while a decision was planned for TF/3 meeting, it can be deferred by a month without adverse effect on the RVSM programme. However, the matter would have to be settled well before TF/4 meeting, which was likely to be scheduled for 2002. Consequently, MECMA will defer action on this issue until early October in order to give IATA time to formulate a comprehensive proposal for provision of a GMU monitoring services under its auspices.

2.5.3.4 In order to facilitate access to GMU monitoring service providers, MECMA will issue available material and establishment of links from the MECMA website to relevant information on ARINC and CSSI websites, if so desired by the providers. This will be done in October 2001.

2.6 The effect of large height deviations (Assigned Altitude Deviations – AAD) was discussed.

2.6.1 As per Conclusion 2/2, all States were required to institute procedures for reporting of large height deviations with effect from 01 July 2001. These should be reported to MECME each month along with the total number of IFR movements.

2.6.2 By 25 August 2001, reports from two FIRs had been received by MECMA. The two ACCs had handled some 28,000 flights and one AAD had occurred – but at 15,000 ft. The incident had been investigated and the cause determined as incorrect altimeter setting due to pilot error.

2.6.3 The meeting considered input from Europe and Asia/Pacific and agreed to address the safety aspects in two ways:

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- Qualitatively. In Europe a Scrutiny Group has been established to evaluate each incident separately to establish, *inter alia*, the cause, the safety implications and remedial measures.
- Quantitatively. By calculating the error ratio – i.e. the time spent outside  $\pm 200$  ft from the assigned altitude in the level band FL290 - FL410, as compared to the total flight time of all movements in this level band. As it was considered impracticable to establish the exact accumulated flight time within this level band, it was found suitable calculate an average time per movement based on a sufficiently large traffic sample and use this value in a simplified calculation of the monthly flying time against which to assess deviations.

2.6.4 The following Conclusion was adopted:

**CONCLUSION 3/3- ASSIGNED ALTITUDE DEVIATIONS**

That,

- a) In order to evaluate the impact of Assigned Altitude Deviations, States should provide information to MECMA, permitting individual assessments of AAD incidents; and
- b) each ACC should calculate the average time per movement spent in the level band FL290/FL410 and report the value to MECMA along with the basis of the calculation.

*Note: sample to be posted to MECMA website.*

2.7 The safety effects of ATC coordination failures were discussed.

2.7.1 As per Conclusion 2/3 of MID RVSM TF/2 meeting, all States were required to institute procedures for reporting of ATC coordination failures with effect from 01 July 2001. These should be reported to MECMA each month along with the total number of IFR movements. MECMA is tasked with further processing of this data in accordance with its terms of reference and development of a methodology for assessing risk associated with such failures.

2.7.2 By 25 August 2001, reports from two FIRs, with a total of 28,000 flights, had been received by MECMA. One ACC had reported 21 coordination failures – of which four had occurred in the level band FL290 - FL410. The other ACC had reported no coordination failures, although it was noted that direct communication with two adjacent ACCs did not exist.

2.7.3 The methodologies for assessment of risk in the Pacific and European areas were discussed and it was agreed that a quantitative evaluation was not possible in as far as reasonable figure for risk, individually or accumulated, stemming from the reported ATC coordination failures could not be calculated based on any known set of criteria.

2.7.4 While the form for reporting of coordination failures generally was found to be suitable, the inability to express risk by a numerical value rendered the filed “Dur” (duration) irrelevant. MECMA updated the form indicated at **Appendix 2D** to the report on agenda item 2 and will post it on its website.

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2.7.5 The following Conclusion was adopted:

**CONCLUSION 3/4      ATC COORDINATION FAILURES**

That,

- a) In order to evaluate the impact of ATC coordination failures, States should provide information to MECMA, permitting individual assessments of such incidents; and
- b) MECMA will carry out evaluations of cause, safety implications and remedial measures.

2.8 The FAA had produced an updated version of a comprehensive profile of operators, aircraft types, and readiness in the Middle East (MID) Region where the reduced vertical separation minimum (RVSM) is provisionally planned to be applied.

2.8.1 Additionally, IATA had carried out a survey of the RVSM programmes of operators. Out of 75 surveyed airlines 42 had responded with data concerning approval status for their fleets.

2.8.2 It was noted that no data was available from G/A operators and that experiences from other regions show that these companies can be difficult to contact. A special category in the Middle East Region is the rulers' flights, which are characterized by air transport type aircraft being operated like airlines. A large proportion of these aircraft operate into the EUR Region on a regular basis and are either already RVSM approved and monitored, or in the process of advanced stages of their preparations.

2.8.3 Results of the traffic sampling carried out 20 January – 20 February 2001 show that the proportion of operations currently being conducted by State approved operators and aircraft in the MID RVSM target airspace is 80.4%. With two years until implementation, this proportion is encouraging.

2.8.4 Certain observations need to be associated with the analysis:

2.8.4.1 The traffic sample contained flights FL220 and above. The analysis was extended down to this level in order encompass traffic cruising well below their requested levels on congested routes to Europe. However, inclusion of the levels between FL220 and FL280 resulted in a substantial number of propeller-driven aircraft being incorporated in the statistical material – the most notable type in this respect being the C130 accounting for 2.5% of the movements.

2.8.4.2 Although Kuwait and Syria have provided traffic data, this was not included in present version of the analysis due to the date of submission.

2.8.4.3 The sampling period encompassed the inbound phase of the Haj (pilgrim) period. Pilgrims are carried on chartered planes, many of which are older types than the typical air transport types operated in the region.

2.8.4.4 It cannot be assumed that the non-RVSM types are evenly distributed across the area covered by the traffic sample and some FIRs should carry out individual analysis – or provide data to MECMA for this purpose to ensure an adequate proportion of the movements will be RVSM-capable prior to implementation.

2.9 Reporting of wake vortex turbulence and weather (medium and severe turbulence) had been provided by one FIR for the month of July 2001. No instances were recorded.

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2.9.1 In the EUR planning process, vortex and weather were considered potential safety issues and extensive data collection and evaluation has taken place. Eurocontrol had concluded there would be no increased risk from wake vortex, but possibly an increased nuisance.

2.9.2 For weather, RVSM will be suspended in affected areas based on actual reports of severe turbulence. Data indicate that this will only happen infrequently.

2.9.3 There are different problems in the PAC and NAT areas with aircraft flying in trail for many hours on routes with resulting problems from wake vortex. In the PAC Region a regional supplementary procedure with 1 NM offset has been approved in RNP 10 airspace with 50 NM separation.

2.9.4 It was agreed that more data would be required to establish the safety impact and to institute this by extending the reporting by flight crews already being carried out in the EUR region. The IATA RCG will address this issue at next meeting in September.

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## **APPENDIX 2A**

### **Safety & Airspace Monitoring Work Group (SAM/WG)**

#### **Terms of Reference**

The SAM/WG is responsible for mathematical and statistical analysis to assist with the maintenance and on-going monitoring of safety through the assessment of collision risk for Middle East Region RVSM and other tasks as agreed with the RVSM Task Force.

The main tasks of the SAM/WG are:

- i) To develop a monitoring program to ensure that the quantity and quality of data are collected to allow an assessment of vertical collision risk;
- ii) To review existing mathematical and statistical techniques to assure their appropriateness for MID Region RVSM;
- iii) To ensure the transferability of aircraft data collected from other airspace regions;
- iv) To support the assessment of the safety of RVSM prior to and during the Verification and Operational Trials by the production of collision risk assessments based on height deviation incidents and height monitoring data to determine whether the TLS is being met;
- v) To devise suitable methodologies for incorporating the effects of projected traffic increases and system changes on occupancy and collision risk in the future environment;
- vi) To identify those elements which are critical in the assessment of collision risk and suggest areas where improvements might be effective in reducing risk;
- vii) To establish a policy for investigating those errors that may jeopardise satisfaction of the Target Level of Safety (TLS);
- viii) To estimate periodically the vertical occupancies (traffic densities, passing frequencies, etc.) in the MID Region; and
- ix) To perform periodically other data collections (e.g. ASE stability) in order to ensure that the parameter values used in the mathematical collision risk models remain current.

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**APPENDIX 2B**

**Duties and Responsibilities of the MECMA**

The Middle East Central Monitoring Agency (MECMA) for RVSM implementation has the following duties and responsibilities:

- a) to establish and maintain a central registry of State RVSM approvals of operators and aircraft using the Middle East Region airspace where RVSM will be applied;
- b) to facilitate the transfer of approval data to and from other RVSM regional monitoring agencies;
- c) to establish and maintain a data base containing the results of height-keeping performance monitoring and all altitude deviations of 300 ft or more within Middle East Region airspace, and to include in the database the results of MECMA requests to operators and States for information explaining the causes of observed large height deviations;
- d) provide timely information on changes of monitoring status of aircraft type classifications to State authorities and operators;
- e) to assume overall responsibility for
  - i) coordination of the Global Positioning System Monitoring System (GMS); and
  - ii) assessing compliance of operators and aircraft with RVSM height-keeping performance requirements in conjunction with RVSM introduction in the Middle East Region;
- f) to provide the means for identifying non-RVSM approved operators using Middle East airspace where RVSM is applied; and notifying the appropriate State approval authority; and
- g) to conduct readiness assessments and safety assessments as an aid for the Middle East RVSM Task Force for decision making in preparation for RVSM implementation on a specified date.

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## **APPENDIX 2C**

### **Middle East RVSM Minimum Monitoring Requirements As of 29 August 2001**

#### **Initial Monitoring**

All Middle East operators that operate or intend to operate in airspace where RVSM is applied are required to participate in the RVSM monitoring program. The table of monitoring requirements shown below establishes requirements initial monitoring associated with Middle East RVSM implementation. In their application to the appropriate State authority for RVSM approval, operators must show a plan for meeting the applicable initial monitoring requirements.

#### **Aircraft Status for Monitoring**

Aircraft engineering work required for the aircraft to receive RVSM airworthiness approval must be completed prior to the aircraft being monitored. Any exception to this rule will be co-ordinated with the State authority.

#### **Follow-on Monitoring**

Monitoring is an on-going program that will continue after the initial RVSM approval process. A follow-on sampling program for additional operator aircraft will be co-ordinated by the Middle East RVSM Task Force.

#### **Monitoring of Airframes that are RVSM Compliant on Delivery**

If an operator adds new RVSM compliant airframes of a type for which it already has RVSM operational approval and has completed monitoring requirements for the type in accordance with the table below, the new airframes are not required to be monitored – except as targeted at a later date in the follow-on monitoring program. If an operator adds new RVSM compliant airframes of an aircraft type for which it has **NOT** previously received RVSM operational approval, then the operator should complete monitoring in accordance with the table below.

#### **Applicability of North Atlantic and Asia/Pacific Monitoring**

Monitoring data obtained in conjunction with RVSM monitoring programmes from other regions can be used to meet Middle East monitoring requirements. The Middle East Central Monitoring Agency (MECMA), which is responsible for administering the Middle East monitoring programme, will get access to monitoring data from other regions and will coordinate with States and operators to inform them on the status of individual operator monitoring requirements.

#### **Update of Monitoring Requirements Table and Website**

As significant data is obtained, monitoring requirements for specific aircraft types may change. When the table is updated, States and operators will be informed. The updated table will be posted on the MECMA website being maintained by the UAE GCAA.

The website address is: [www.mecma.com](http://www.mecma.com)

**For most aircraft types, monitoring is NOT required to be completed prior to operational approval being granted. SEE THE TABLE BELOW.**

Monitoring <b>NOT REQUIRED</b> Prior to the Grant of RVSM Approval			
	Classification	Aircraft Group	Minimum operator Monitoring for Each Aircraft Type
<b>1</b>	Operators <b>with</b> <b>prior</b> RVSM experience	New aircraft types from a manufacturer with a demonstrable track record of the production of MASPS compliant airframes – OR any of the following types: A306, A30B, A312-GE, A312-PW, A313-GE, A313-PW, A318, A319, A320, A321, A330, A340, B712, B733, B734, B735, B736, B737, B738, B741, B742, B743, B744, B74R, B74S, B752, B753, B762, B763, B764, B772, B773, C525-I, C550-B, C560-U, C56X, CARJ, CL60-600, CL60-601, CL60-604, DC10, F100, F2TH, F70, F900, F900-EX, FA20, GLF4, GLF5, H25B-800, H25C, L101, LJ60, MD11, MD80, MD90.	at least TWO airframes unless operator has only one of a type, then ONE airframe - monitoring to be completed as soon as possible but not later than <b>within 6 months</b> after the issue of RVSM operational approval or the start of Middle East RVSM operations whichever occurs later.
<b>2</b>	Operators <b>without</b> <b>prior</b> RVSM experience	Same types as above in section 1	at least THREE airframes unless operator has only 1 or 2 of a type, than all operator airframes of that type, - monitoring to be completed as soon as possible but not later than <b>within 3 months</b> after the issue of RVSM operational approval or the start of Middle East RVSM operations whichever occurs later.
<b>3</b>	All operators of aircraft that are expected to meet reduced monitoring requirements	B74R, C501, C560, DC8, DC9, GALX, E135, F200, FA10, GLF2, GLF3, LJ45,	Individual monitoring of RVSM approved airframes, - monitoring to be completed as soon as possible but no later than <b>within 3 months</b> after the issue of RVSM operational approval or the start of Middle East RVSM operations whichever occurs later.

Monitoring <b>REQUIRED</b> Prior to the Grant of RVSM Approval			
<b>4</b>	Insufficient data on approved aircraft	Other group or non-group aircraft not listed in above 3 sections OR New aircraft types from a manufacturer without a demonstrable track record of the production of MASPS compliant airframes	Individual monitoring of airworthiness approved airframes to be completed prior to the issue of RVSM operational approval

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