



WORKING PAPER

**SPECIAL AFRICA-INDIAN OCEAN (AFI)
REGIONAL AIR NAVIGATION (RAN) MEETING**

Durban, South Africa, 24 to 29 November 2008

Agenda Item 6: Development of a set of comprehensive work programmes in the air navigation field, aimed at improving efficiency of the air navigation system (Efficiency Committee)

ARMA RVSM SAFETY REPORT

(Presented by ARMA/ARPO)

SUMMARY

An ARMA working paper presenting an AFI RVSM safety report to inform the meeting of the ARMA safety benefits to AFI and request State commitment in various post implementation processes which contribute to annual safety assessments.

Action by the meeting is in paragraph 3.

1. INTRODUCTION

1.1 The ARMA acting on behalf of ICAO/ARPO has compiled and presents this paper to the SP AFI/08 RAN Meeting in order to provide the meeting with information useful to the policy and strategic decision making process which will contribute to increased safety within the AFI reduced vertical separation minimum (RVSM) flight level band.

1.2 In conducting its duties, as detailed in relevant ICAO documentation, the five primary functions or key performance areas will briefly be discussed. The processes managed by ARMA are closely coordinated with ARPO, located in the ICAO ESAF offices, and assist the office with remaining current on critical issues within AFI concerning RVSM.

1.3 In order to bring the recently implemented AFI RVSM project into perspective it should be recalled that RVSM planning and implementation was managed according to project milestones. Only once these milestones were satisfactorily presented to the AFI RVSM Task Force was implementation contemplated. In meeting these project milestones it should be emphasized that significant safety benefits and achievements were recorded with an enormous aviation project covering a vast continent. Foremost was the completion of an RVSM National Safety Plan for each AFI State. For the first time in AFI aviation history an AFI Regional Monitoring Agency is operating and inter alia gathering data for the processing of safety assessments in the flight level band FL290 – FL410 inclusive. This has led to date to a steady decrease in the collision risk factor measured against the target level of safety. Further to this States will be urged to commit to the RVSM post-implementation processes.

1.4 Thorough pre-implementation planning resulted in a smooth transition from CVSM to RVSM on 25 September 2008 at 0001UTC. At the time of compiling this paper there were no

adverse reports resulting from the implementation phase that required intervention by ARMA/ARPO. There are however areas of concern that will need to be addressed in order to maintain the RVSM system within AFI.

2. DISCUSSION

2.1 The meeting should recall that ARMA is guided specifically by ICAO Doc 9574 and the RMA Manual with the latter currently under review by ICAO. Both contain the following five primary functions that are expected to be carried out by the ARMA:

- a) maintain a database of State RVSM operational approvals (operators/aircraft);
 - b) monitor aircraft height-keeping performance and the occurrence of large height deviations reporting results appropriately;
 - c) conduct safety assessments and report results appropriately;
 - d) monitor operator compliance with State approval requirements;
 - e) initiate necessary remedial actions if RVSM requirements are not met; and
- together with this:
- f) State letter ES AN 4/44 0895 dated 18 December 2003, also tasked ARMA in conjunction with ARPO to guide the RVSM planning and implementation process which is now completed. The five primary functions are briefly discussed hereunder.

2.2 Establish and maintain a database of RVSM approvals

2.2.1 The AFI RVSM operational approvals database contributes towards facilitating the safe and efficient operations of State RVSM Operationally approved aircraft in published RVSM airspace. Only State CAA approved RVSM aircraft are permitted to operate in RVSM airspace. The required information shall be forwarded from Civil Aviation Authorities and not from the aircraft operator. This is an area that needs to be focused on by CAA's in order to obtain and provide ARMA with complete records for the monthly dataset distribution to all RMA's as required by ICAO. Neglect in this area results in aircraft operators being denied the benefits offered by RVSM operations. The monthly dataset contains aircraft meeting the minimum standard required by ICAO for distribution and provides the foundation for the AFI height monitoring programme.

2.2.2 A total of 395 AFI RVSM operational approvals were recorded in the October 2008 dataset which was distributed to other RMA's. The total AFI RVSM fleet is expected to increase as the data is correctly lodged with ARMA. States (CAA's) will be expected to maintain the currency of their RVSM operational approvals with the ARMA to the benefit of the State's aircraft operators. All aircraft recorded in the dataset are being managed for height monitoring compliance in accordance with the AFI height monitoring requirements which are available on the ARMA webpage. Incorrect submissions or omissions will have a negative effect on the height monitoring requirements and program. In addition this database is utilized to substantiate that aircraft operating in the RVSM band are actually approved by their respective State CAA's for RVSM operations.

2.3 Monitor aircraft height-keeping performance and the occurrence of large height deviations

Height keeping monitoring

2.3.1 AFI aircraft operators are utilizing the GMU height monitoring service managed by ARMA and have contributed towards the AFI height monitoring programme in order to achieve their height monitoring targets.

2.3.2 ARMA, with the contract services of ARINC, have processed a large number of GMU height monitoring missions and the data obtained has been generally good which is reflected in the results of the technical vertical collision risk. This service is available to all aircraft operators in all AFI States.

2.3.3 The ARMA also utilizes European HMU results to contribute towards achieving AFI height monitoring targets. This is in line with ICAO and was so utilized in CRA 1 and CRA 2 with excellent results.

2.3.4 AFI CAA's are requested to provide all possible assistance to the GMU height monitoring specialists that will be periodically appointed to AFI operators to carry out the in flight data recording. Further to this CAA's are urged to manage their RVSM fleets in such a way that RVSM height monitoring requirements are met.

Large height deviations

2.3.5 Large height deviations (300FT or more) must be recorded and directly reported to ARMA via the established process. ARMA acknowledges the indispensable IATA contribution in this regard and the fact that this input is utilized in safety assessments due to the poor returns from AFI FIR's. Large height deviations, 300FT or more, are usually derived as follows:

- a) from an error in the altimetry or altitude-keeping systems of aircraft;
- b) from turbulence and other weather-related phenomena;
- c) from an emergency descent by an aircraft without the crew following established contingency procedures;
- d) from responses to airborne collision avoidance systems (ACAS) advisories;
- e) from an error in following a correctly issued ATC, clearance, resulting in flight at an incorrect flight level;
- f) from an error in issuing an ATC clearance, resulting in flight at an incorrect flight level; and
- g) fFrom errors in coordination of the transfer of control responsibility for an aircraft between adjacent ATC units, resulting in flight at an incorrect flight level.

2.3.6 Large height deviations are critical to RVSM safety and are accordingly taken into account when safety assessments are conducted. Each case is thoroughly investigated and remedial actions are proposed to assist in curbing large height deviations. In support of the above ARMA will be proposing an RVSM scrutiny group early in 2009 to assist with the management of operational errors. This is consequent with other regions and as expected by ICAO after the All RMA meeting held in Montreal May 2008.

2.4 Conduct Safety Assessments

2.4.1 Safety assessments are conducted annually to monitor the safety of the RVSM system as well as to satisfy the requirements of the post operational safety case. ARMA can only accomplish this with the participation of ALL AFI FIR's delivering ALL their monthly traffic data to ARMA in the prescribed format until otherwise notified.

2.4.2 This is an area that requires discipline in order to make the monthly returns a way of life on a continuous basis. The results of the safety assessments provide AFI with an indication of the collision risk in the flight level band FL290 – FL410 measured against the Target Level of Safety and also indicates areas or “hot spots” that need special attention. The data collected can also be utilized for various other safety related tasks whether by AFI or the State/FIR concerned. State CAA's are urged to commit to the recording of quality data to ensure the success of future assessments. The maintenance of RVSM is dependent on data and the resulting assessments.

2.4.3 The outcome of the recently released CRA 3 for the year 2007 has produced another encouraging result. This is summarized as follows:

- a) the technical vertical collision risk was once again met;
- b) the total vertical TLS was found to be exceeded by a factor of 1.3 – 2.2 depending on the assumption made with regards to missing data. This is an improvement to CRA 2 which was a factor of 3 above the TLS and even a bigger improvement to the initial CRA 1;
- c) vertical incidents decreased from 27 incidents (CRA 2) to 13 incidents (CRA 3) impacting positively on RVSM;
- d) the inconsistencies regarding the reporting of incidence will have to receive increased attention; and
- e) the maintenance of AFI RVSM will require continued long term dedicated hard work.

2.4.4 Unrelated to RVSM, however detected by the RVSM safety assessment, is the large amount of horizontal incidents that are taking place in AFI which is an area of concern and will have to be addressed by States as a matter of extreme urgency. Horizontal incidents are recorded when two aircraft are at the same correct Flight Level converging on a common point resulting in a reduction in separation. CRA 2 recorded 35 horizontal separation reductions and CRA 3 has recorded 34 indicating that States may have not put any measures into place to manage these incidents as reported to the AFI RVSM Task Force and APIRG 16. ARMA and ARPO have and will be urging States yet again to put measures into place to reduce these occurrences as a matter of extreme urgency.

2.5 Monitor Operator Compliance with State Approval Requirements

2.5.1 This function is continuously in progress and will improve as the States CAA's lodge their State RVSM approved aircraft with the ARMA. The AFI RVSM airspace should now after implementation only have RVSM State approved operators operating in the RVSM band. It is essential that this area is focused on and that State CAA's provide ARMA with the required RVSM approval records.

2.6 Initiate Remedial Actions if RVSM Requirements are not Met

2.6.1 Remedial actions are continuously initiated to address reported large height deviations with operators. RVSM Non compliance within the RVSM band is addressed to the relevant CAA for investigation and remedial action. This item is a continuous task and it is requested that CAA's cooperate with ARMA to obtain solutions that will contribute towards greater safety in the RVSM band.

2.7 RVSM planning and implementation

2.7.1 Even although RVSM planning and implementation has been successfully completed it must be emphasized that the maintenance of the RVSM system will still require much dedicated work which will include the post operational safety case, continued assessments and long-term height monitoring.

2.7.2 As required by the AFI RVSM safety policy a post operational safety case, will be compiled to ensure that all the PISC aspects have been met and that the RVSM system is operating according to specifications. All role players are urged to cooperate and participate when requested to provide information. In this aspect the submission of data to the ARMA is essential.

2.8 Monthly FIR Traffic and Associated Returns to ARMA

2.8.1 AFI RVSM Task Force 9, Conclusion 9/4, tasked the ARMA to compile a list of defaulting FIR's that should receive reminders and assistance in this regard. This list was presented at APIRG 16 however the defaulting States remain alarmingly high. CRA 3 assessment for 2007 had to be processed without data from 18 FIR's where a 100% return is required from 30 FIR's. This situation will need to drastically improve to make further quality system monitoring a reality. The following quality data is required monthly:

- a) large height deviations;
- b) aircraft movements to derive total flying hours;
- c) other operational considerations; and
- d) traffic flow data to inter alia calculate passing frequencies.

2.9 AFI RVSM National Program Managers (NPM)

2.9.1 NPM's play a pivotal role in the maintenance of RVSM and will be indispensable until the RVSM system is mature. States are urged to ensure that NPM's are in place, contactable and mandated to carry out their duties.

3. ACTION BY THE MEETING

3.1 The meeting is requested to:

- a) support the long term submission of State RVSM operationally approved aircraft to ARMA;
- b) support the AFI Height Monitoring Program in the long term;
- c) support the long term collection of Safety assessment data;

- d) support the continued availability of State RVSM NPM's;
- e) support the ARMA scrutiny group to be established in 2009; and
- f) support measures to reduce the large amount of horizontal incidents in AFI.

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