International Civil Aviation Organization

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
SIXTEENTH MEETING (APIRG/16)
(Kigali, Rwanda 19-23 November 2007)

Agenda Item 4: AFI Regional Air Navigation Planning and Implementation Issues

4.3 : Review of the ATS/AIS/SAR /SG/9 meeting and the AFI RVSM Implementation

ARMA RVSM Status Report

(Presented by AFI Regional Monitoring Agency (ARMA*)*

SUMMARY

ARMA Working Paper Presenting an RVSM Status Report to Assist APIRG 16 with RVSM Policy and Strategic Decisions.

1. INTRODUCTION

1.1 The ARMA as required, by ICAO, reports periodically to APIRG on the status of processes managed by ARMA in the planning and implementation of AFI RVSM. This working paper is presented to APIRG 16 to provide the members with information useful to the policy and strategic decision making process. Progress achieved towards implementation of RVSM in the AFI Region will become apparent as well as those areas where more focus is required to rectify shortfalls**.**

1.2 In conducting its duties on behalf of ICAO, as detailed in ICAO documentation, the five primary functions will be briefly reported on as well as those functions associated with planning and implementation as mandated by ICAO ESAF. The processes managed by ARMA are closely coordinated with ARPO and assist him with remaining current on critical issues.

1.3 In order to bring the AFI RVSM project into perspective it should be recalled that RVSM planning and implementation has been managed according to project milestones. Only once these milestones have been met will implementation be considered. In meeting these project milestones it should be emphasized that significant achievements have been recorded with an enormous aviation project covering a vast continent. It should also be recalled that sufficient time has been allowed for to accommodate the enhanced reporting and remedial actions of operational errors which are prevalent in the RVSM band. Due to the ever changing status of the project a Power Point Presentation will be made to present the meeting with the most current information at that point in time

2. DISCUSSION

2.1 The ARMA is guided specifically by the AFI RMA Manual and ICAO Doc 9574 which contain the following five primary functions that are expected to be carried out by the ARMA:

- Establish and maintain a data base of RVSM approvals
- Monitor aircraft height-keeping performance and the occurrence of large height deviations and report results appropriately
- Conduct Safety and Readiness Assessments and report results appropriately
- Monitor operator compliance with State approval requirements
- Initiate necessary remedial actions if RVSM requirements are not met

Together with this:

- State Letter ES AN 4/44 0895 dated 18 December 2003, also tasks the ARMA to assist with the RVSM planning and implementation process.

Establish and Maintain a Data Base of RVSM Approvals

2.2 The AFI RVSM Operational Approvals Data Base contributes towards facilitating the safe and efficient flight of State RVSM Operationally Approved aircraft in RVSM airspace as published. The States in Table 1 have provided ARMA with their State RVSM Operational Approvals however this is an area that needs to be focused on in order to obtain complete records for the monthly dataset distribution to all RMA's as required by ICAO. The monthly dataset contains aircraft meeting the minimum standard required by ICAO for distribution:

Algeria (All)	Ghana (All)	Mauritius (All)	Seychelles (All)
Côte d,ivoire (All)	Guinea (All)	Morocco (Limited)	Uganda (All)

Egypt (All)	Kenya (All)	Reunion (All)	Zimbabwe (All)
Eritrea (All)	Liberia (All)	Rwanda (All)	
Ethiopia (All)	Madagascar (All)	RSA (All)	

Table 1

2.3 A total of 305 AFI RVSM Operational Approvals were recorded in the October 2007 dataset which was distributed. The total is estimated to at least double as the data is correctly lodged with ARMA. States will be expected to maintain the currency of their RVSM Operational Approvals with the ARMA to the benefit of the State's operators. All the above mentioned aircraft recorded in the dataset are being managed for height monitoring compliance.

Monitor Aircraft Height-Keeping Performance and the Occurrence of Large Height Deviations

Height Keeping Monitoring

2.4 A number of AFI Aircraft Operators have utilized the GMU Height Monitoring Service managed by ARMA and have contributed towards the AFI Height Monitoring Program.

2.5 ARMA in conjunction with ARINC have processed the GMU Height Monitoring missions and the data obtained with excellent results. This service is available to all aircraft operators in all States in AFI.

2.6 The ARMA does not currently have sufficient AFI data to commence with Height Monitoring trends and analysis in order to assess total altimetry stability. It is envisaged that local results will be combined with European results to monitor the altimetry stability within the AFI region for some time into the future. This is in line with ICAO and was so utilized in CRA 1 and CRA 2 with very good results.

2.7 AFI Civil Aviation Authorities are urged to provide all possible assistance to the GMU Height Monitoring Specialists that will be periodically appointed to operators to carry out the in flight data recording.

Large Height Deviations

2.8 Large Height Deviations (300FT or more) are recorded and directly reported to ARMA via the established process. ARMA acknowledges the IATA contribution in this regard and the fact that this input is utilized in safety assessments due to the lack of returns from AFI FIR's. Large Height Deviations, 300FT or more, are usually derived as follows:

- From an error in the altimetry or altitude-keeping systems of aircraft

- From turbulence and other weather-related phenomena
- From an emergency descent by an aircraft without the crew following established contingency procedures
- From responses to airborne collision avoidance systems (ACAS) advisories
- From an error in following a correctly issued ATC, clearance, resulting in flight at an incorrect flight level
- From an error in issuing an ATC clearance, resulting in flight at an incorrect flight level
- From errors in coordination of the transfer of control responsibility for an aircraft between adjacent ATC units, resulting in flight at an incorrect flight level.

2.9 Large Height Deviations are critical to RVSM safety and are accordingly taken into account when safety assessments are conducted. This subject will be covered again under the CRA section.

Conduct Safety and Readiness Assessments

2.10 Safety Assessments are conducted annually to monitor the safety of the system as well as to satisfy the Pre Implementation Safety Case and eventually the POSC**.** This can only be accomplished with the participation of all FIR's delivering their monthly traffic data to ARMA.

2.11 The results of readiness assessments have proved beyond all reasonable doubt that approved RVSM operator and aircraft pairs are consistently calculated to be at or in excess of 90%.

2.12 The ARMA is therefore satisfied that a sufficiently high proportion of operations will be conducted by State approved RVSM operator and aircraft. The percentage obtained should further improve when RVSM is implemented.

Monitor Operator Compliance with State Approval Requirements

2.13 This function is continuously in progress and will improve as the States lodge their State RVSM approved aircraft and operators with the ARMA. As with the aircraft readiness 90% of operators captured within the proposed RVSM band were State approved with traceability to databases. It is essential that this area is focused on and that State Civil Aviation Authorities provide ARMA with the required RVSM approval records.

Initiate Remedial Actions if RVSM Requirements are not Met

2.14 Remedial actions have been initiated to address reported large height deviations with operators. The ARMA considers this item as a continuous task and will be reported on as required to the AFI RVSM Task Force.

RVSM planning and implementation

2.15 Functional Hazard Assessment (Project Milestone Achieved)

As required by the AFI RVSM Safety Policy a comprehensive Functional Hazard Assessment, FHA, has been completed and approved by the AFI RVSM Task Force 6. The FHA has been used extensively in the compiling of the National Safety Plans, NSP, and the Pre Implementation Safety Case, PISC which is complete with available information. It would appear that the FHA is contributing towards greater safety in AFI considering the incidents being recorded and the results obtained from the most recent safety assessment.

Collision Risk Assessment (Project Milestone)

Collision Risk Assessment 1

2,16 APIRG should recall that this was the first attempt by AFI to establish the safety levels in the proposed RVSM band. The overall estimated collision risk result calculated and presented was 65 X 10^{-9} fatal accidents per flight hour or simplistically a factor of 13 above the Target Level of Safety. The most important focus areas identified by this assessment were:

- Drastically reduce operational errors
- All FIR's must provide ARMA monthly with complete quality RVSM data

Collision Risk Assessment 2

2.17 The overall estimated collision risk was calculated and presented at a most encouraging 15 X 10^{-9} fatal accident per flight hour or simplistically a factor of 3 above the Target Level of Safety. The most important focus areas identified by this the second assessment were:

- Drastically reduce operational errors
- All FIR's must provide ARMA with complete quality RVSM data monthly

2.20 This result places AFI in a favorable position to recommend to APIRG 16 to provide a mandate to complete the PISC and submit to the ICAO ANC for implementation approval provided that all identified tasks are completed with the continued downward movement of the estimated risk towards the TLS.

2.21 The assessment identified a non RVSM related trend of an unacceptably high incidence of aircraft flying at the same level with standard separation being reduced. This has been addressed with all States and Fir's through the NPM.

Collision Risk Assessment 3

2.22 CRA 3, calendar year 2007, is currently in the data capturing phase and is being seriously hampered by FIR's defaulting on their monthly returns. It should be noted that this data might be required for a POSC. Currently there is not sufficient data to satisfy the requirements for any type of assessment which is of concern. AFI FIR's must make data capturing a way of life in the ACC in order to return complete quality data every month. This is essential to maintain and sustain RVSM assessments now and into the future. Once again it appears that operational errors will play a large role in the estimated overall collision risk result for CRA 3.

National Safety Plans (Project Milestone)

2.23 As required by the AFI RVSM Safety Policy each State in the AFI Region is required to have a National Safety Plan prior to RVSM implementation. Significant progress has been achieved towards obtaining the final and signed copies from each State. The final result will be presented at the meeting with reference to a map of Africa in a power point presentation. This will ensure that APIRG 16 is provided with the most up to date information and will cater for those States presenting their final and signed Plans on arrival. At the time of compiling this report the following States were outstanding:

- Mozambique
- Sao Tome & Principe
- Central African Republic

Pre Implementation Safety Case (Project Milestone)

2.24 As required by the AFI RVSM Safety Policy a Pre Implementation Safety Case, PISC, has been completed with all available information, by ALTRAN Technologies in conjunction with the ARMA and other AFI role-players. Certain aspects of the PISC are receiving final attention in order to achieve an acceptable level of evidence which ultimately enhances RVSM safety.

Monthly FIR Traffic and Associated Returns to ARMA

2.25 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. The list is presented to APIRG in order to urge FIR's to submit the monthly returns. Due to the sensitivity of the results of this tasking the ARMA is obliged to ensure that all FIR's are given adequate opportunity to present their returns to the ARMA. Taking this into

consideration the final results will be included into the power point presentation. The period of concern is 1January 2007 to 31 October 2007 to cater for CRA 3 which terminates on 31 December 2007. As an initial example CRA 2 recorded a monthly data return 47% making it extremely difficult to complete the associated assessments required for monitoring the system. Traffic data submitted for CRA 3 for the first 10 months in 2007 is recorded at 38% for all participating AFI FIR's. This percentage will need to drastically improve to make further system monitoring a reality.

AFI RVSM NPM's

2.25 The meeting should recall that NPM's play a pivotal role in the RVSM project and will be indispensable during the process prior to switchover, during switchover and then post switchover from CVSM to RVSM. States are urged to ensure that NPM's are in place, contactable and mandated to carry out their duties.

3. ACTIONS BY THE MEETING

3.1 The meeting is requested to:

- Support stringent incident reporting measures together with appropriate remedial actions, with special reference to vertical displacement incidents.

- Support the continued collection of RVSM traffic data by all FIR's with the timely and accurate submission thereof to the ARMA.

- Provide the ARPO with the mandate to submit the PISC to the ICAO ANC for implementation approval during the first quarter of 2008 taking into consideration the completion of the outstanding tasks and the continued downward movement of the estimated risk towards the TLS with the aim of implementing RVSM on the target date 25 September 2008.

END