INTERNATIONAL CIVIL AVIATION ORGANIZATION

RVSM/RNAV/RNP TF/4 MEETING
REPORT

(LAGOS, 29 – 30 JULY 2004)

Prepared by the APIRG RVSM/RNAV/RNP TASK FORCE

The RVSM/RNAV/RNP Task Force is a Task Force of the AFI Planning and Implementation Regional Group (APIRG).

Its Reports are therefore submitted to APIRG through the ATS/AIS/SAR Sub-Group for review and action.

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APPENDICES

PART I - HISTORY OF THE MEETING

1. Introduction

1.1 The Fourth meeting of the RVSM/RNAV/RNP Task Force (RVSM/RNAV/RNP TF/4) was convened pursuant to AFI/7 RAN Meeting Recommendations 5/7, 5/17 and APIRG/13 Decision 13/58 by the International Civil Aviation Organization at the Sheraton Hotel & Towers Conference Hall, Lagos, Nigeria from 29 to 30 July 2004.

1.2 The meeting was opened by the Managing Director of Nigeria Airspace Management Agency (NAMA), Mr Emperor ONASANYA. He emphasized the preliminary studies which have to be done prior to the implementation of the required procedures aimed at increasing or improving the capacity of a given airspace in order to satisfy the demand of ever growing air traffic. In that regard, he emphasized the importance of the Fourth Meeting of the RVSM/RNAV/RNP Task Force being organized pursuant to APIRG/13 Decision 13/58. He recalled APIRG 14 Conclusion 14/21 relating to the development of an AFI RVSM strategy/action plan within specific target dates and wished the members fruitful deliberations with a view to further enhance the safety of air navigation in the Region.

2. Officers and Secretariat

2.1 The meeting nominated Mr A. N. OKWO Director ATS, NAMA, as its moderator.

2.2 Mr. Apolo KHARUGA, Regional Officer, Air Traffic Management of the ICAO ESAF Office, acted as the Secretary of the meeting. He was assisted by Messrs. Ibrahim Usman AUYO, Regional Officer ATM, WACAF Office, Dakar, and Vic Van Der Westhuizen (ICAO RVSM Program Officer).

3. Attendance

3.1 The meeting was attended by 14 participants from 4 States and 2 International Organizations namely IATA, IFALPA and IFATCA. The list of participants is given at **Appendix A** to this report.

4. Working Language

4.1 The meeting was conducted in the English language only.

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5. Agenda

5.1 The following Agenda was adopted:

Agenda Item 1: Review and follow-up action of conclusions of the third meeting of RVSM/RNAV/RNP Task Force

Agenda Item 2: Review of RVSM Strategy/Action Plan

Agenda Item 3: Review of the outcome of RVSM Seminar

Agenda Item 4: Any Other Business

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6. Conclusions

6.1 The Task Force recorded its actions in the form of Conclusions.

Summary of Conclusions

Number	Title
Conclusion 4/1:	**Safety assessment** That AFI RMA undertakes safety assessment as a matter of urgency, recalling that it was supposed to commence on **1 June 2004**.
Conclusion 4/2:	**Civil/military coordination** That in order to ensure the safe and coordinated implementation of RVSM in the AFI Region, States should ensure that the military aviation authorities are fully involved in the planning and implementation process.
Conclusion 4/3:	**Nomination of a National RVSM programme manager** That States/service providers who have not done so, as a matter of urgency, nominate, a National RVSM Programme Manager who will be responsible for ensuring that the proper mechanisms are put in place for the safe implementation of the RVSM programme and will also act as the focal point or contact person.
Conclusion 4/4	**Reporting of data for monitoring and/or carrying out safety assessment** **That:** a) All States institute procedures for reporting of data, incidents and conditions necessary for performing the collision risk calculations prerequisite for RVSM implementation to the AFI monitoring agency. The data will include, but not necessarily be limited to: i) Height deviations of 300 ft or more. ii) Total number of IFR movements for each month. iii) The average time per movement spent in the level band FL 290 to FL 410. iv) ATC coordination failures. v) Turbulence; and vi) Traffic data.

Number	Title
	b) All States institute procedures for reporting to the AFI monitoring agency data, incidents and conditions necessary for performing the collision risk calculations prerequisite for RVSM implementation; and c) GMU will be used for height monitoring in AFI Region which will be coordinated by the ARMA.
Conclusion 4/5:	**Implementation of RVSM in the AFI Region** **That:** a) All RVSM implementation preparation works (safety, assessment, training) be done taking into consideration the FL band between 290 and 410 inclusive; b) The final decision for implementation be taken at the informal coordination planned for September/October 2004 taking into account status of readiness of States and operators; and c) Implementation of RVSM in the AFI Region be harmonized and coordinated with the implementation time frames of adjacent Regions.
Conclusion 4/6:	**Training of all personnel involved with the implementation of RVSM in the AFI Region** **That:** a) Seminars/Workshops be organized in the Region for training of air traffic services personnel in the RVSM field; and **b)** States having difficulties in implementing RVSM implementation programme, may either individually or in group explore the possibility of seeking outside expertise.
Conclusion 4/7:	**Guidance material for Airworthiness and Operational Approval** That States in the AFI Region be urged to include in their national legislation and regulations the Airworthiness and Operational Approval process for aircraft and operators intending to operate within a designated RVSM airspace based on provisions of ICAO Annex 6 Part 1 Chapt 7 para. 7.2.3 and the guidance material contained in JAA Temporary Guidance Leaflet (TGL) N°6.

Number	Title
Conclusion 4/8:	**Enforcement in national legislation** **That :** **States which have not done so, take the appropriate measures in order:** a) to publish as a matter of urgency, an AIC informing the users of their intention to implement RVSM; and b) to include the necessary provisions in their national legislation (AIPs).
Conclusion 4/9:	**Amendment to ICAO Doc. 7030** That ICAO process as soon as possible an amendment proposal to the AFI SUPPs (Doc 7030) to include relevant provisions for RVSM implementation.
Conclusion 4/10:	**Funding of the RVSM implementation programme** That National Governments, Regulatory bodies, operators, service providers and other stakeholders be granted budgetary allocations for acquisitions and other activities necessary for ensuring that all the requirements are met in a timely manner in order to safely implement RVSM in the AFI Region.
Conclusion 4/11:	**AFI RVSM Action Plan** That the updated RVSM Action Plan at **Appendix B** be circulated to States for action.
Conclusion 4/12:	**Aircraft/Operators readiness survey** That the results of ICAO/IATA surveys be updated and presented at the RVSM TF/5 meeting for consideration.
Conclusion 4/13:	**Monitoring of Height Deviations** **That:** a) ICAO request the States of Botswana, Cape Verde, Egypt, Ghana, Kenya, Nigeria, South Africa, Spain, Tanzania and Tunisia to establish at the ACC where radar is implemented, a unit to conduct monitoring of aircraft height deviations in the AFI RVSM airspace; and b) The data collected at a) above be forwarded to AFI RMA for action.

Number	Title
Conclusion 4/14:	**Organization of AFI airspace in respect of AFI RVSM airspace** That the ATS/SG of APIRG consider as one of its tasks the issue of restructuring of the AFI Region airspace in light of the introduction of RVSM.
Conclusion 4/15:	**Campaign to enhance RVSM Implementation** That sensitisation of Civil Aviation CEO/DGs by Regional Directors of ICAO and IATA on importance of RVSM and the need for its early implementation in the AFI Region be accorded priority during ICAO and IATA missions to States.
Conclusion 4/16	**ICAO and ASECNA Meeting** That ICAO convene as a matter of urgency, a meeting with ASECNA with a view to map the way forward on RVSM Implementation.
Conclusion 4/17:	**AFI Safety Policy** That the AFI Safety Policy at **Appendix C** to this report shall apply in the AFI Region.
Conclusion 4/18:	**National Safety Plan** That the National Safety Plan at **Appendix D** to this report shall apply in the AFI Region.
Conclusion 4/19:	**Strategic Lateral Offset Procedures** That the APIRG ATS Sub-Group address the issue relating to Strategic Lateral Offset Procedures taking into account the work being done by the ICAO Separation and Airspace Safety Panel (SASP).

PART II REPORT ON AGENDA ITEMS

Agenda Item 1: Review and follow-up action of conclusions of the second meeting of RVSM/RNAV/RNP Task Force

1.1 Under this Agenda Item the meeting reviewed and noted the action taken on the conclusions of the third meeting of the RVSM/RNAV/RNP/Task Force. It reinstated those conclusions which were still in force and proposed the action to be taken before the Fifth Task Force Meeting planned for September/October 2004. These conclusions, including those formulated at RVSM/TF/4 appear at Part I of this report.

Agenda Item 2: Review of RVSM Strategy/Action Plan

2.1 The meeting recalled that in noting the APIRG/14 Conclusion 14/21 (implementation of RVSM in the AFI Region) the ANC had expressed its concern that RVSM required a sophisticated implementation process and requested the States to monitor preparations and assist to the extent possible as an acceptable level of safety should be achieved and maintained.

2.2 The meeting noted that the ANC emphasized the provision of ATC and the required CNS facilities and services as a pre-requisite to the RVSM implementation.

2.3 It recalled that the RVSM TF/3 meeting had developed the strategy/action plan and reviewed relevant comments from States, Task Force Members and the interested international organizations. The comments thereby received have been incorporated in the new revised version of the strategy/action plan and it has been circulated to States for their approprite action.

2.4 The meeting agreed that the implementation of RVSM in AFI should be pursued in a pragmatic manner and in detail following the steps in the revised strategy/action plan. The meeting agreed that the strategy/action plan will be reviewed on each of the several TF meetings scheduled for this year before any decision is made to implement the RVSM.

2.5 Furthermore, the meeting agreed that the revised AFI strategy/action plan at **Appendix B,** AFI Safety Policy at **Appendix C** and the National Safety Plan **Appendix D** be circulated to States for action.

2.6 The Meeting recalled the requirements for the implementation of Strategic Lateral Offset procedures in accordance with ICAO Annex 2 Paragraph 3.6.2.1.1 which requires aircraft to operate along defined centre line of established ATS routes and work being pursued by the SASP on the subject. The meeting agreed that the subject be addressed by the APIRG ATS Sub Group.

2.7 The meeting noted the slow progress in responding to the AFI action plan required for RVSM implementation in the Region and considered that there was a need for the issue to be addressed at the highest level of the Civil Aviation Chief Executive Officers and Director Generals. The meeting was also concerned with the lack of ASECNA involvement in the RVSM Task Force activities.

In view of the foregoing, the following conclusions were formulated:

Conclusion 4/11: AFI RVSM Action Plan

That the updated RVSM Action Plan at **Appendix B** be circulated to States for action.

Conclusion 4/15: Campaign to enhance RVSM Implementation

That sensitisation of Civil Aviation CEO/DGs by Regional Directors of ICAO and IATA on importance of RVSM and the need for its early implementation in the AFI Region be accorded priority during ICAO and IATA missions to States.

Conclusion 4/16: ICAO and ASECNA Meeting

That ICAO convene as a matter of urgency, a meeting with ASECNA with a view to map the way forward on RVSM Implementation.

Conclusion 4/17: AFI Safety Policy

That the AFI Safety Policy at **Appendix C** be circulated to States for action.

Conclusion 4/18: National Safety Policy

That the National Safety Plan at **Appendix D** be circulated to States for action.

Conclusion 4/19: Strategic Lateral Offset Procedures

That the APIRG ATS Sub-Group address the issue relating to Strategic Lateral Offset Procedures taking into account the work being done by the ICAO Separation and Airspace Safety Panel (SASP).

Report on Agenda Item 3: Review of the outcome of RVSM Seminar

3.1 The Task Force considered the following topics which were covered by the seminar and incorporated them as appropriate in the AFI RVSM strategy/action plan and also developed relevant conclusions on these issues and included some material in the relevant RVSM documents for application in AFI region.

Subjects/Topics:

1. RVSM requirements:

1.1 RVSM MASPS.
1.2 Guidance Material (OPS/AIR).
1.3 Crew requirements approvals.
1.4 Performance criteria.
1.5 Training.
1.6 Aircraft systems.

2. Air Traffic Management

2.1 Flight rules.
2.2 State aircraft.
2.3 Vertical Separation Minima.
2.4 Flight Planning.
2.5 RVSM Transition airspace.
2.6 In-flight control grounds.
2.7 Phraseologies.
2.8 COM failure procedures.
2.9 ATM options for RVSM.
2.10 Letters of Agreement.
2.11 Air Traffic System support.

3. Height monitoring

3.1 ICAO prerequisites.
3.2 Monitoring requirements.
3.3 HMUs and GMUs.
3.4 Role of RMAs.
3.5 State responsibilities and coordination with RMSs.

4. ATC and Pilot Training.

5. RVSM Safety Assurance.

5.1 Overall safety requirements.
5.2 RVSM safety managements.
5.3 Stakeholders responsibilities.
5.4 ATM and safety objective.
5.5 RVSM safety policy.
5.6 Switch-over planning CVSM to RVSM.
5.7 Switch-over Risk Analysis.
5.8 ICAO RVSM TLS.

Report on Agenda Item 4: Any other Business

Venue and date of the Fifth RVSM/RNAV/TF meeting and Stake Holders Coordination Meeting

4.1 The meeting agreed that the fifth RVSM Task Force meeting will be held in Dakar, WACAF Office from 25 to 26 October 2004 followed thereafter from 27 to 29 October 2004 by the Stakeholders Coordination Meeting (APIRG/14 Conclusion 14/21 refers).

FOURTH MEETING OF THE RVSM/RNAV/RNP TASK FORCE
(Lagos, Nigeria, 29 –30 July 2004)

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ACTION PLAN FOR IMPLEMENTATION OF REDUCED VERTICAL SEPARATION MINIMA IN THE AFRICA-INDIAN OCEAN REGION

30 July 2004

Prepared by the AFI RVSM Program Office [ARPO]
Revision 30/07/04 and updated by ITF/4

	AFI RVSM IMPLEMENTATION ACTION PLAN				
ID	**Description**	**Target Date**	**Status**	**Resources**	**Remarks**
	Program Management				
1	Agree on structure of TF to enable efficient handling of specialist technical tasks	21/11/03	Completed	Secretariat Support Team: ASECNA, SA, IATA, Nigeria, Tunisia	Completed 21 Nov 2003
2	RVSM SIP Report	21/11/03	Completed	RVSM/ITF2	Completed 21 Nov 2003
3	RVSM/RNAV/RNP TF/2 Meeting	21/11/03	Completed	RVSM/ITF2	Completed 21 Nov 2003
4	Identify resources for performing specialist technical tasks	21/11/03	Completed	RVSM/ITF2	Completed 21 Nov 2003
5	Investigate methods of funding any outside assistance required	31/03/04	Completed	ICAO/IATA	To address future funding as/when required
6	Finalize the RVSM Implementation Strategy/ Action Plan	31/12/03	Completed	ICAO	Sent 05 Dec 2003
7	Circulate RVSM Implementation Strategy/Action Plan for comments from States	5/01/04	Completed	ICAO	Sent 05 Dec 2003
8	(a) Doc 7030 amendment Proposal (b) Circulate proposal to States (c) ANC Approval	01/06/04 15/06/04 03/09/04	Completed Completed In Progress	ICAO ICAO ICAO	* Completed 31 May * Circulated to States - T/Date for comments 15 Aug
9	States comments on RVSM implementation Strategy/Action Plan	31/-3/04	Completed	States, ICAO RVSM/ITF3	Completed 31 March 04
10	Regional RVSM informational Website	31/03/04	Completed	IACO/IATA/States	Completed 01 Feb 04
11	RVSM Seminar/RVSM ITF3	19-22/04/04	Completed	ICAO	Completed on Time
12	RVSM Seminar /RVSM/ITF/4	26-30/07/04	Completed	ICAO/RVSM ITF/4	Completed on time
13	Coordination and harmonization of procedures with adjacent Regions	Ongoing	Ongoing	ICAO and AFI RMA	Continuous contact with other Regions
14	States to send AIC re RVSM Implementation intention	31/06/04	In Progress	ICAO/States	Sent new State letter 08/06/04 requesting AIC to be send
15	Confirm target AIRAC implementation date (AIP Supplement to be published)	30/09/04	In progress	ICAO/States	TF5 to review requirement
16	Regional RVSM implementation status reports	Ongoing	Ongoing	ICAO	Monthly Reports

ID	Description	Target Date	Status	Resources	Remarks
17	RVSM/ITF/5	25-26/10/04	In progress	ICAO/RVSM ITF/5	Scheduled prior to Go/No Go Coordination meeting
18	Go/No-Go decision	27-29/10/04	In Progress	Meeting of all Stakeholders	Coordination meeting scheduled after TF5
19	Publish Trigger NOTAM	25/11/04	In Progress	States	TF5 to confirm date
	Aircraft Operations and Airworthiness				
20	Regional OPS/Airworthiness RVSM Guidance Doc	21/11/03	Completed	ICAO	Sent 05 Dec 2003
21	Develop regional Pilot Training RVSM Guidance Material	30/04/04	Completed	IATA	IATA proposed extract from TGL6 instead
22	Aircraft Operational approval process guidelines	31/05/04	Completed	States, ICAO	Sent 16/03/04
23	State RVSM OPS Approval Survey	30/07/04	In progress	ICAO/States	(i) Survey State letter 22/03/04 (ii) Sent State letter to ID upgrade cost 8/06/04. (ii) Sent State AC Databases
24	Monitor operator approval process	30/07/04	In progress	ARMA/ICAO	
	Air Traffic Management				
25	National RVSM plan	31/03/04	Completed	States, ICAO	Sent to States – 05/05/04
26	Regional ATC OPS Manual	31/03/04	Completed	ICAO	Sent to States – 05/05/04
27	Determine the limits of RVSM airspace	30/06/04	In Progress	States/ICAO	TF5 to verify limits
28	Regional ATC Training Program & Guidance Material	31/03/04	Completed	South Africa/ ASECNA / Nigeria	State letter sent re course dates 28/05/04. First three courses August '04.
29	Simulations to assess ATC workload and possible need for airspace/air route Sector changes	30/06/04	In Progress	States	In National RVSM Plan
30	Identify issues to be addressed in Letters of Agreement	31/05/04	Completed	ICAO	Sent Draft to TF 09/06/04. TF 4 to approve LoA
31	Military aviation preparation	30/06/04	In progress	States, ICAO	In National RVSM Plan
32	National RVSM Regulatory Material	30/08/04	In progress	States, ICAO	To ID requirements
33	States assess the impact of RVSM implementation on controller automation systems and plan for upgrades/ modifications	30/0604	In progress	States	In National Plan
34	Collect weather and turbulence data for analysis	31 /07/04	In progress	ARMA ICAO/States	Contact made UK WX office
35	States to conduct local ATC RVSM training	31/07/04	In progress	States	Syllabi sent to States 28/05/04

ID	Description	Target Date	Status	Resources	Remarks
	RVSM Safety Assurance				
36	Conduct preliminary data collection and readiness assessment	30/06/04	In progress	ARMA/ICAO	Ongoing
37	RVSM Safety assessment	30/09/04	In progress	ARMA/ICAO	Contract to be signed
38	Validate safety assessment	31/12/04	In progress	RVSM ITF/4	Subject No 37 above
39	Develop AFI RVSM Safety Policy	30/06/04	Completed	RVSM/ITF4	Circulate Draft to TF - 07/06/04
40	Develop National RVSM Safety Policy (additional)	30/06/04	Completed	ICAO	Circulated Draft to TF – 07/06/04
	Monitoring Agency				
41	Evaluate options for setting up AFI RMA	21/11/03	Completed	RVSM/ITF2	Completed on time
42	Identify an AFI RMA	21/11/03	Completed	RVSM/ITF/2	Completed on time
43	Establish an AFI RMA.	31/03/04	Completed	South Africa/ICAO	Completed on time
44	Validate implementation readiness assessment	28/09/04	In progress	ICAO/ARMA	TF5

NOTES

- State Letter sent to remind States of all outstanding Issues/Target Dates on 08 June'04.
- Individual State Aircraft Databases compiled and sent with State Letter on 25 June– States to verify/update databases
- Three ATC Training Courses scheduled for August – Training Program to be completed end of October '04.

AFI REDUCED VERTICAL SEPARATION MINIMUM (RVSM) RVSM SAFETY POLICY

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AFI REDUCED VERTICAL SEPARATION MINIMUM (RVSM) SAFETY POLICY

1. INTRODUCTION

This document, the RVSM Safety Policy Document, sets out the Safety Policy, the Safety Objectives and describes the RVSM Safety Sub-Program tasks and actions necessary to ensure the safe implementation of RVSM in the AFI region.

The RVSM Safety Policy Document is intended to provide a framework to facilitate the safety regulation process of the AFI RVSM Program. As such, it is considered to be a formal deliverable of the RVSM Program.

The RVSM Safety Policy Document describes the deliverables of the RVSM Safety Sub-Program together with their role in the overall AFI RVSM Program and in the national safety assurance programs.

2. RVSM OPERATIONAL CONCEPT

The principal concept behind RVSM is the reduction of the vertical separation minimum between adjacent aircraft from 2000 feet to 1000 feet between the Flight Levels FL290 and FL410 inclusive. This will provide six additional cruising levels to air traffic, increase the capacity of the Air Traffic Management system and facilitate the task of Air Traffic Services in maintaining a safe, orderly and expeditious flow of traffic. It can be expected that the capacity and system benefits of RVSM will, by facilitating the Air Traffic Control function, also have the potential for possible safety benefits.

This vertical separation minimum shall be applied between RVSM approved aircraft within the airspace of the designated RVSM airspace. Therefore, all operators proposing to operate across the lateral limits of the RVSM airspace shall be required to indicate on Filed Flight Plans their RVSM status. Except within the AFI RVSM Transitional Airspace Non-RVSM approved aircraft, other than state aircraft, shall not be permitted to operate within RVSM airspace.

For the transition between RVSM and non-RVSM airspace specific procedures shall be established to facilitate the safe transition between RVSM and Non-RVSM airspace. The transition tasks shall be accomplished so as to make RVSM operations transparent to adjacent non-RVSM regions.

The RVSM Program requires that specific training for aircrew and ATC staff shall be performed prior to the start of RVSM operations. The Program also requires ATC equipment and procedures to be modified according to specific Program requirements prior to the start of RVSM operations.

3. AFI RVSM PROGRAM SAFETY POLICY

The Safety Policy for RVSM implementation has been established to meet the requirements of ICAO Standards and Recommended Practices and guidance material on managing collision risk consequent on the implementation of RVSM.

The following statements define the Safety Policy of the RVSM Program:

(i) The AFI RVSM Program uses an explicit, pro-active approach to safety management in the development, implementation and continued operation of RVSM.

(ii) The responsibility of management for the safety performance of the RVSM Program is recognised. The RVSM Program Manager is responsible for the overall management of the Program. The RVSM Safety Program Manager is responsible to the RVSM Program Manager for ensuring the compliance of the Program with AFI Safety Policy and appropriate international standards and requirements. The RVSM Safety Program Manager is also responsible for liaison with the Regulation Authorities.

(iii) The implementation of RVSM shall be conducted in accordance with ICAO requirements and requires ninety percent RVSM approved aircraft within the Region;

(iv) The safety of air navigation has been given the highest priority in the development of the RVSM operational concept and the Implementation Program;

(v) The RVSM Program shall minimise the program's contribution to the serious or risk bearing incidents or aircraft accidents as far as is reasonably practicable.

4. RVSM IMPLEMENTATION SAFETY OBJECTIVES

(i) The RVSM Program shall conduct a full Functional Hazard Analysis looking at the whole system including air and ground segments and the proposed operational concept. This analysis shall adopt a total aviation system perspective and a risk based approach to the classification of hazards. The analysis shall include, but not be restricted to, those risks already identified by ICAO for RVSM implementation;

(ii) The RVSM Program shall, as its principal safety objective, minimise the program's contribution to the risk of an aircraft accident. The RVSM Program recognises the AFI Safety Objectives and Strategy, in particular the general objective to improve safety levels by ensuring that the number of ATM induced accidents and serious or risk bearing incidents do not increase and, where possible, decrease. Therefore, the implementation of RVSM shall not adversely affect the risk of en-route mid-air collision;

(iii) The RVSM Program shall establish an explicit Safety Sub-Program to ensure that Program's contribution to the risk of an aircraft accident is minimised in accordance with the principal safety objective;

(iv) In accordance with ICAO Guidance Material the management of vertical collision risk within RVSM airspace shall meet the Target Level of Safety of 5 x 10^{-9} fatal accidents per flight hour;

(v) In accordance with ICAO Guidance Material, the risk of mid-air collision in the vertical dimension within RVSM airspace, due to technical height keeping performance, shall meet a Target Level of Safety of 2.5 x 10^{-9} fatal accidents per flight hour.

(vi) Guidance shall be given to the States to explain the necessary activities to provide evidence about the safe implementation of RVSM on the national level and subsequently assure the preparedness of the States.

These Safety Objectives will be complemented by Safety Requirements which may arise as results from the detailed Functional Hazard Analysis which yet has to be carried out.

5. RVSM IMPLEMENTATION SAFETY OBJECTIVES

As part of the RVSM Program, an RVSM Safety Sub-Program has been developed to provide evidence on the compliance of the Implementation Program with the RVSM Safety Policy and the RVSM Safety Objectives.

The work program of the RVSM Safety Program comprises the following elements:

(i) Detailed Hazard Analysis, Preliminary System Safety Assessment and System Safety Assessment of the proposed RVSM operational concept;

(ii) Assessment of operational error reports, both prior to and after implementation, to identify any additional risks and hazards associated with the proposed operational concept and to provide data for the assessment of the target levels of safety;

(iii) Establishment of formal requirements for participating states to demonstrate that all necessary national activities and actions have been undertaken prior to implementation.

(iv) Assessment of the risk of mid-air collision, using methods specified in ICAO guidance material;

(v) A major assessment of aircraft height keeping performance to monitor compliance with height keeping requirements.

Each of these elements will produce deliverables, in the form of reports, which will be formally presented to the ARTF as the Program proceeds.

6. RVSM SAFETY DELIVERABLES

In this section, the major deliverables of the RVSM Safety Sub-Program are described. Although the deliverables are in the form of formal documents, interim reports will be provided for review prior to completion of the final version of a deliverable document.

6.1 RVSM Functional Hazard Analysis

A detailed Functional Hazard Analysis (FHA) shall be carried out to provide assurance that all hazards and risks associated with RVSM have been identified and classified. The FHA shall cover (i) the situation that RVSM is operational one year after its introduction, (ii) the particular situation in States which have to ensure the transition between RVSM and non-RVSM airspace and (iii) the change-over on the day of RVSM introduction. The results of the FHA shall be documented in a detailed report and a hazard/risk matrix. It will be used as input to the Collision Risk Assessment and the National Safety Cases where appropriate. A summary of the results will constitute one chapter of the AFI RVSM Pre-Implementation Safety Case and the detailed report will appear as an Annex.

6.2 Collision Risk Assessment

A Collision Risk Assessment (CRA) shall be carried out in order to provide the evidence that the collision risk in RVSM airspace meets the Target Level of Safety required by ICAO. A summary of the results will form one chapter of the AFI RVSM Pre-Implementation Safety Case and the detailed report will appear as an Annex.

6.3 National Safety Plans

Guidance shall be given to the States to explain the necessary activities to provide evidence about the safe implementation of RVSM on the national level. Using the guidance material National Safety Plans should be produced by the States, submitted to the National Regulator as appropriate and shall be summarised by the RVSM Safety Sub-Program in to order to form one section of the AFI RVSM Pre-Implementation Safety Case.

6.4 AFI RVSM Pre-Implementation Safety Case

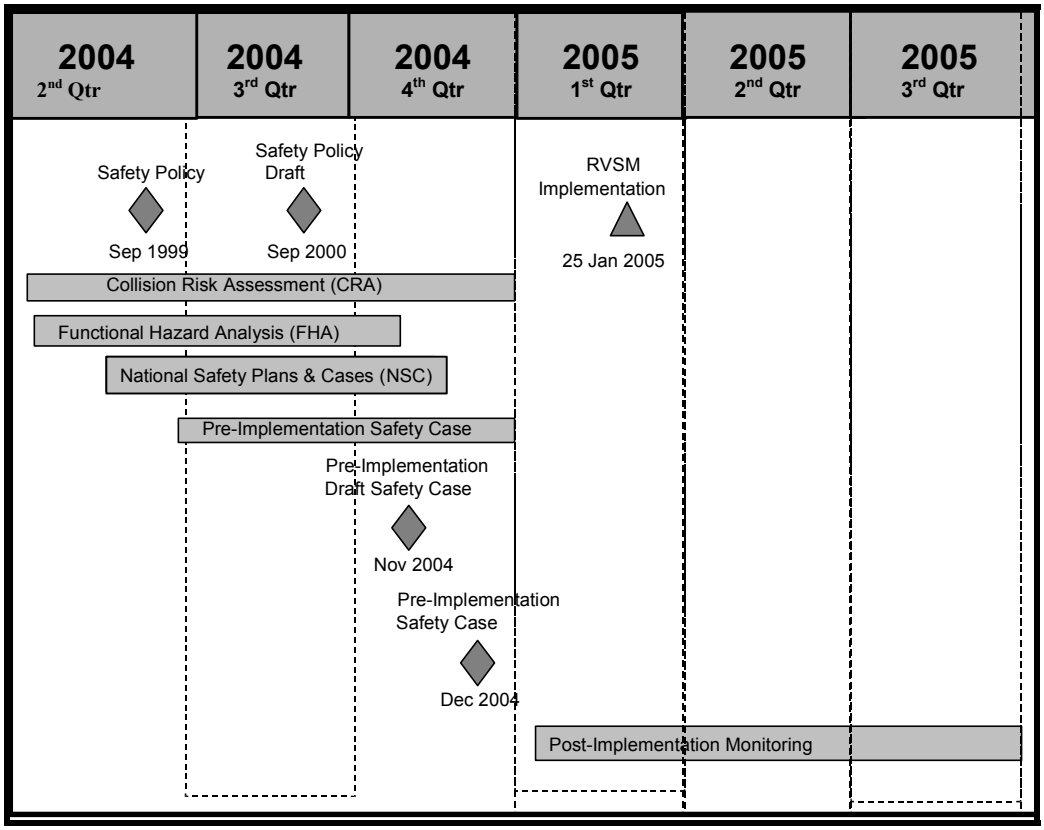
The AFI RVSM Pre-Implementation Safety Case shall provide the assurance that the objectives stated in the AFI RVSM Safety Policy Document are met. Evidence will be provided that (i) all identified hazards and risks are managed and mitigated, (ii) the collision risk meets the ICAO Target Level of Safety and (iii) States show they will safely implement RVSM through the development of national safety documentation.

6.5 AFI RVSM Post-Implementation Safety Case

The required contents of the Post-Implementation Safety Case will be developed as a result of the pre-implementation safety activities. However, the main objective will be to confirm assumptions and estimations being made in order to determine if in an operational RVSM environment the safety objectives can be met. It is expected that the document demonstrates *inter alia* that safety is continuously ensured, the aircraft approval process is effective, the target levels of safety are being met, operational errors do not increase and ATC procedures introduced for RVSM remain effective.

7. AFI RVSM SAFETY PROGRAM SCHEDULE

The following graphic depicts the timescales for the principal elements of the RVSM Safety Sub-Program and the major deliverables foreseen.



[*Insert Name of State*] Safety Plan For the Implementation of RVSM

DOCUMENT APPROVAL

The following table identifies all Authorities that have successively approved the present issue of this document.

AUTHORITY	NAME AND SIGNATURE	DATE
National RVSM Safety Manager		
National RVSM Program Manager		
Head of Operations in National ATS Provider		
Approval Authority		

NOTES

- This draft plan is written to provide a template for use by individual States
- Where possible the text is written to be suitable for direct inclusion in State's Safety Plans.
- Where additional text is required to be inserted by the State, this is indicated in the text in Italics within brackets, for example [*insert Name of responsible authority here*].
- Some of the text is illustrative. In such circumstances a State may need to develop text appropriate to its circumstances, which reflects its local environment and activities etc. The illustrative text does, however, broadly represent best practice and may be used by States for their planning. States should note that there may be more than one way to achieve best practice and the text in this draft plan only reflects one of these possibilities.
- This draft plan does not try to take into account all the specifics of safety planning in use in the States. Each State needs to identify those aspects of their safety planning that are not included in this draft plan. States should include, as appropriate, such aspects within their State Safety Plan

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1 INTRODUCTION

1.1 Safety Plan Objective

The objective of this Safety Plan for [*Name of State*] is to set out those National activities that are required to support the RVSM Safety Case. The plan also addresses safety requirements identified by the State's Regulator [*Insert Name of regulatory authority*]. Each of the National activities required for the implementation of RVSM by [*Name of State*] is described in some detail. The descriptions address:

- The role of the activity in support of the safe implementation and operation of RVSM in [*Name of State*],
- The standards to be applied to the conduct of the activity,
- The additional supporting activities that will provide confidence that the identified National activities will lead to the successful implementation of RVSM within [*Name of State*]. These supporting activities include:
  - Those that help achieve quality,
  - Those that help manage identified risks.

The purpose in showing this level of information is to provide early assurance that *[Name of State]* takes its safety responsibilities seriously and has developed a plan to achieve the safe implementation of RVSM.

This safety plan has also been produced to help those within *[Name of State]* who have responsibility for the provision and regulation of the State's Air Traffic Service [*insert Name of ATS Provider*]. It helps them understand the safety aspects of the State's RVSM activities and shows how the National Program Manager is managing these aspects.

1.2 Approach

This National safety plan is divided into sections that consider the National activities for RVSM as follows:

- Section 2: Aircraft and Operator Approvals for RVSM
- Section 3: ATS Training,
- Section 4: Changes to ATS Equipment,
- Section 5: Changes to ATS Procedures,
- Section 6: Airspace Design Changes,
- Section 7: RVSM Switchover,
- Section 8: Operational Monitoring of RVSM.

Within each section the plan:

(a) Describes those activities that are necessary to provide an appropriate ATS following the implementation of RVSM in the AFI region;

(b) Identifies the appropriate responsible Authorities, together with a description as to how these Authorities discharge their responsibility;

(c) Describes the detailed activities and checks that underpin the achievement of quality of the activities described in item (a) above;

(d) Shows how the hazard and risk information that will be produced by AFI's RVSM Program will be addressed as appropriate by the State.

3 Organisation

The Organisation for the RVSM safety plan and associated activities is as follows**.**

(a) [*Insert Name*] has been appointed as the Safety Manager for RVSM and is responsible for the production of this plan;

(b) The National Program Manager [*insert Name*] has responsibility for the National RVSM program. He approves the safety plan and is responsible for obtaining the further approvals that are described below. In approving the plan the National Program Manager is confirming that in his view the plan is acceptable, and accurately describes the activities that are required to show that the stated safety requirements will be achieved;

(c) The Head of ATS Operations [*insert Name*] has overall responsibility for the ATS operations. In approving the plan the Head of Operations is confirming that from a safety perspective all necessary actions have been or will be undertaken by the ATS provider to ensure that RVSM can be safely implemented and operated within *[Name of State]*;

(d) The CAA/ATS provider company [*insert Name*] is the designated Authority and is responsible for the provision of an appropriate Air Traffic Service within the State. In approving the plan the DG is confirming that he is satisfied that responsibility for the safe implementation of RVSM has been properly delegated; that the staff delegated have been duly authorised to act on his behalf; and that they are competent to act on his behalf.

In addition to the above, specific approvals for individual activities are also required (see sections 2.4, 3.4 through to 8.4).

The above organisation applies during the pre-implementation phase of RVSM. There are activities (in particular safety monitoring activities) that take place post-implementation. The responsibility for post-implementation safety activities rests with responsible staff in the State and the ATS provider [*insert Names, otherwise state that the post-implementation safety organisation and responsibilities are not yet determined*].

2 AIRCRAFT AND OPERATOR APPROVALS

2.1 Introduction

This section deals with Aircraft/operator approval requirements for aircraft to operate within the AFI RVSM region and describes the approval program within the State.

2.2 Safety Requirement

The safety requirement is to show that all Operators based in *[Name of State]* are aware of the RVSM implementation and have obtained RVSM approval for themselves and their aircraft as appropriate. Both the aircraft and the Operator require approval if they are to operate in RVSM airspace. It is the responsibility of the State's CAA to describe their regulatory activities that will lead to documentary proof of the State's CAA diligence with respect to these approvals.

2.3 Standards Applied

[Name of State] is a member of APIRG and will use TGL6 revision 1 to conduct the approval for civil aircraft and operators for RVSM operations (Include as *Appendix* A).

2.4 Planned Aircraft/Operator Activities

An approval program has been developed to support the implementation of RVSM. The details of the program are found in [*Name of State*] National RVSM Plan (*Include as Appendix B*). The program subdivides into two main activities:

(a) Awareness Activities
Operators and State aircraft authorities have already been informed about RVSM approval and monitoring requirements through:

- AICs [*supply details of AICs issued and planned for issue*].
- RVSM Seminars/workshops [*Supply details of seminars/workshops already run and planned to be run*]
- A working group has been set up with the Operators and State aircraft Authorities to discuss RVSM implementation. [*supply details of working group*]

(b) Approval Activities
These are described in 2.5 below.

2.5 Approval Activities

There are two areas for which *[Name of State]* has an established approval/regulatory process:

(a) Operator Approval

Those Operators that are based in *[Name of State]*, and wish to operate within the AFI RVSM Airspace, will apply to the State CAA to obtain operational approval (in line with TGL 6). The responsible officer for giving such approvals is [*insert title and name of current jobholder*]. His approval is based on [*insert approval criteria – this should be based on establishing compliance with the relevant aspects of TGL 6*].

(b) Aircraft Certification and Approval

Operators (or owners) of aircraft registered within *[Name of State]* will apply to the State CAA for certification and approval (in line with TGL 6). The responsible officer for giving such approvals is [*insert title and name of current jobholder*]. His approval is based on [*insert approval criteria – this should be based on establishing compliance with the relevant aspects of TGL 6*].

In addition military Authorities have elected to submit identified military transport aircraft for RVSM certification and approval. The responsibility for this rests with *[Name of State]* Ministry of Defence. It has elected to implement the principles embodied in TGL 6 Issue 1. The responsible officer for giving such approvals is [*insert title and name of current jobholder*]. His approval is based on [*insert approval criteria*].

2.6 Quality Assurance of Activities

It is important to ensure that the approval activities are effective and lead to RVSM approved aircraft that are capable of meeting the more stringent height keeping requirements within the AFI RVSM airspace and air crew that are familiar with RVSM rules and procedures. There are several elements that provide confidence in this capability.

2.6.1 Aircraft Technical Height Keeping Performance Monitoring

The ARMA has established a Height Monitoring Infrastructure that will provide ongoing monitoring of a substantial proportion of the aircraft fleet operating within the AFI RVSM region.

Aircraft that are not within the specified standards will be reported to the appropriate State Authorities that approved the aircraft for RVSM operations. The Operator of the non-compliant aircraft will also be contacted. [*Insert Name of State Authority*] will follow up all such reports with the Operators concerned. This review will take place within the normal framework of aircraft certification and operator licensing.

2.6.2 Operational Error Monitoring

The AFI Regional Monitoring Agency (ARMA) has an established and ongoing program of operational error data collection and assessment. Information is obtained from ACCs and States on operational altitude deviations of 300 ft or greater. ARMA will use the data as part of the RVSM Safety Case. At present mechanisms have not been developed to inform the appropriate States of clusters of events associated with a specific operator or region of airspace. These will be established prior to the implementation of RVSM.

In addition to the above, [*insert Name of State Authority*] monitors and reviews aircraft airworthiness and Operator Licenses both on a regular basis and in response to identified concerns or trends.

2.7 Aircraft and Operator Risk Management

Hazards associated with regulatory or approval processes are not normally covered within FHAs. It is however appropriate to review those hazards in the AFI FHA that are associated with aircraft, aircrew and Operator hazards. The results of the FHA are currently not available to the States. When made available, *[Name of State]* will review the hazards and risks that will have been identified by the FHA. The purpose of the review is to identify those aspects where the local circumstances are different from those assumed within the AFI FHA (*Include as Appendix C*). Any additional activities, required as a result of this review, will be listed as actions in future updates to this safety plan.

3 ATS TRAINING

3.1 Introduction

This section focuses on [*Name of State*] ATS training activities that are needed to ensure that operational staff is familiar with RVSM procedures. Additionally further details are provided to show how this training program supports and underpins the safe implementation of RVSM.

3.2 Safety Requirement

The safety requirement associated with the ATS training is to show that all relevant staff have been appropriately trained in RVSM procedures and are competent to operate within an RVSM environment.

3.3 Standards Applied

There are no standards. The AFI training material supplied by AFI has been used as reference guidance for the development of *[Name of State]*'s training material. (*Include as Appendix D*).

3.4 Planned ATS Training Activities

An ATS training program has been developed to support the implementation of RVSM. The details of the program are found in [*insert reference to appropriate documents*]. The detailed program subdivides into four main activities and shows that it is the intent to train all controllers licensed in RVSM airspace sectors prior to RVSM Implementation on 25 Jan 2005.

3.4.1 Training Roles and Responsibilities

Staff has been identified to lead, prepare and deliver RVSM training to ACC Staff. [Include *Names, staff positions and RVSM training roles*].

3.4.2 Training Material

The training material supplied by ARPO will be used as the basis for the State training material. This will be supplemented by locally developed material. All the designated instructors will become familiar with the material.

3.4.3 Training Program

A program of courses will be established at each ACC [*Names of the ACCs and summary of each training program to be included*]. The program will be developed in close co-operation with managers at each ACC. All controllers who will have operational responsibility in the AFI RVSM region (ie above FL 290) will receive this training. Other controllers and staff within the Air Traffic Provider will as a minimum be familiarise with RVSM operations and how it affects them in their duties. As far as is practical all controllers at an ACC will receive the full RVSM training. This is subject to operational and staffing constraints.

3.4.4 ACC Training Program

Courses will be run at each ACC as required. Follow-up and refresher training will be provided as needed.

3.5 RVSM Training Program Approval

There are two aspects of these training activities for which *[Name of State]* has established an approval process. These two aspects are:

3.5.1 Training Material Approval

All ATS training material is subject to strict control and changes must be approved prior to first use. The RVSM training material is subject to this process. The responsible officer for the approval of the training material is [*insert title and name of current jobholder*]. His approval is based on [*insert approval criteria*].

3.5.2 Controller Competence in RVSM Operations

The change to RVSM does not require changes to the controller's ATC license (or certificate of competence). However the ATS provider does accept the responsibility to ensure that controllers are capable of RVSM operations. To discharge this responsibility the manager of that ACC approves the RVSM training program for each ACC. Approval of the program represents a commitment from each ACC to ensure that all appropriate staff receives RVSM training and that this training makes full use of the approved training material.

3.6 RVSM Training Quality Assurance

It is important to ensure that the ATS training in RVSM operations is effective and understood by controllers. There are several elements that provide confidence in this effectiveness.

3.6.1 Use of the AFI Material as Guidance

The AFI material has been developed by Air Traffic Navigation Services (ATNS) in South Africa and has been subject to extensive review within the RVSM Program. This material forms the core of the training material developed for the State RVSM training program.

3.6.2 ATC Instructors

The responsibility for the development and delivery of the training rests with [*insert Name(s) and roles*]. They are experienced training instructors and are licensed as On-the-Job Training (OJT) Instructors. [*Further evidence of their experience may be usefully provided here*]. They are familiar with RVSM procedures. [*Insert Name(s)*] has attended the AFI Training Course on the RVSM Training material [*insert dates*]. They in turn will ensure that all the other designated instructors become familiar with, and understand, the material.

3.6.3 Training Material Review

Operational and management staff at each ACC will review the material prior to first use. The review comments will be documented and the material will be amended as appropriate.

3.6.4 Timely Training Program

The ATS provider recognizes its responsibility for the competence of controllers in operating within the AFI RVSM region. It will therefore ensure that:

- The training program allows controllers sufficient time from their operational duties to attend one of the courses,
- That accurate course attendance records are kept (including time spent on training simulators), and
- Controllers are encouraged to seek clarification, and further training if necessary, on those aspects they did not fully understand.

3.6.5 Interactive Training Program

Specific interaction will be encouraged through a course feedback questionnaire. The questionnaire will seek attendee views on the quality and ease of understanding of the course. This will be fed back to the instructors and course developers and used to further refine the course. Secondly the material will be presented in an interactive manner and interaction with attendees will be encouraged. Areas of difficulty in assimilating/understanding the material will be sought from attendees and will be addressed on an individual or group basis through further explanation and training if necessary.

3.6.6 Refresher Training

RVSM training may, through operational and staffing constraints, be provided to a controller more than 6 months in advance of RVSM. In such circumstances in the weeks prior to implementation, refresher training will be provided, so that what was learnt on the course is refreshed in the mind. [Provide d*etails of the provisions at each ACC for such refresher and follow-up training*].

3.7 ATS Training Risk Management

A key part of the management of safety is that the safety risks associated with poor or inadequate training are identified and, as appropriate, shown to be acceptably low. Within the AFI RVSM program there is commitment to perform a Functional Hazard Assessment (FHA) (which identifies hazards and assesses the risk associated with such hazards). The results of the FHA are currently not available to the States. When made available, *[Name of State]* will review the hazards and risks that will have been identified by the FHA. The purpose of the review is to identify those aspects where the local circumstances are different from those assumed within the AFI FHA. Any additional activities, required as a result of this review, will be listed as actions in future updates to this safety plan.

4 ATS EQUIPMENT

4.1 Introduction

This section addresses those changes to ATS equipment required for RVSM Operations and describes the program of activities that has been established to make the required changes to ATS equipment. Additionally further details are provided to show that these changes will be completed successfully and will underpin the safe implementation of RVSM.

4.2 Safety Requirement

The safety requirement is to show that the changes to the ATS equipment have been made successfully and approved for operational use.

4.3 Standards Applied

ICAO Technical Document 7030/4 (*Include as Appendix E*) provides the standards for procedures. ARPO has developed an AFI ATC manual that is consistent with ICAO Document 7030/4 and provides further information. (*Include as Appendix F)*. This latter document provides the basis for the changes to ATS equipment that are required for the AFI RVSM Region.

4.4 Planned ATS Equipment Changes

[*Name of State*] has developed a program for changes to ATS equipment to support the implementation of RVSM. The details of the program are found in [*insert reference to the National RVSM Plan*]. This detailed program shows that it is the intent to complete the ATS equipment changes well before the implementation of RVSM on 25 Jan 2005. [*Dates to be inserted and tight timescales requires each the State to summarize the contingency plans that have been developed to mitigate the risk of slippage in the dates*].

In [*Name of State*] changes are required to the Flight Date Processing (FDP), Radar Data Processing (RDP), Display, flightstrip and On-Line Data Interchange (OLDI) systems. Software Modifications are required to all these systems to ensure that they are compatible with the ATC Manual for RVSM.

The State ATS Provider [*insert Name of ATS Provider*] is in contract with an external supplier who will make the necessary changes to the above systems. The contractor will make the changes to the systems, and test them. Following on from the successful conclusion of these tests, the ATS provider will accept the changed software and apply to the [*State CAA*] for approval to operate with the changed software.

4.5 Approval of Activities

There are two aspects of these ATS equipment changes for which *[Name of State]* has established an approval process.

4.5.1 Modified ATS Equipment

With the exception of minor updates to software, all changes require approval from the [*State CAA*] prior to their installation at ACCs. The responsible officer is [*insert title and name*]. He will approve the changes to ATS equipment prior to installation. His approval is based on [*insert approval criteria*].

4.5.2 Modified ATS Equipment for Operational Use at ACCs.

The changes to ATS equipment need to be installed satisfactorily at each ACC. The acceptance of the installed changes is required at each ACC by the [*State CAA*]. The responsible officer is [*insert title and name*] He will approve the equipment at each ACC prior to operational use. His approval is based on [*insert approval criteria or responsible officer's terms of reference, where available and appropriate*].

4.6 Quality assurance of ATS Equipment Changes

It is important to ensure that the changes are successful, in that they fully implement the agreed requirements; and are fully compatible with the systems and practises at each ACC. There are several elements that provide confidence in the successful change to the ATS equipment:

4.6.1 Functional Requirements

Functional Requirements for the change have been established [*reference to be supplied by State*] and the delivered changes will be judged against these requirements. These functional requirements were an integral part of the specification agreed with the contractor.

4.6.2 Software Development

Contractors have development processes for software modifications needed for RVSM operations. These are internal contractor procedures and have been established for some time [*supply ref to these procedures*].

4.6.3 Developed Software

Developed software will go through a series of tests and user trials prior to acceptance. Each of the identified functional requirements will be formally tested against agreed acceptance criteria [*ref on acceptance criteria to be supplied here*].

4.6.4 The Human Machine Interface

Controllers, as part of the RVSM training, will evaluate the Human-Machine Interface (HMI). Feedback will be sought from those attending courses on the usability and clarity of the HMI.

4.7 Risk Management of ATS Equipment Changes

A key part of the management of safety is that the safety risks associated with poor or inadequate ATS equipment are identified and, as appropriate, shown to be acceptably low. Within the AFI RVSM program there is commitment to perform a Functional Hazard Assessment (FHA) (which identifies hazards and assesses the risk associated with such hazards). The results of the FHA are currently not available to the States. When made available, *[Name of State]* will review the hazards and risks that will have been identified by the FHA. The purpose of the review is to identify those aspects where the local circumstances are different from those assumed within the AFI FHA. Any additional activities, required as a result of this review, will be listed as actions in future updates to this safety plan.

5 ATS PROCEDURES

5.1 Introduction

This section identifies changes required to ATS Procedures for implementation of RVSM in the AFI region and to implement new ATS procedures within each ACC. Additionally further details are provided to show how these activities underpin the safe implementation of RVSM.

5.2 Safety Requirement

The safety requirement is to show that the changes to the ATS procedures have been approved for use. Assurance is required to show that the new procedures are appropriate; do not cause excessive controller and aircrew workloads; and have been co-ordinated with other organisations.

5.3 Standards Applied

ICAO Document 7030/4 provides the standards. AFI has developed an ATC manual that is consistent with ICAO Document 7030/4 and provides further amplification of its implementation in the AFI region.

5.4 ATS RVSM Procedures

A program of activities has been established to develop and co-ordinate the changes to the ATS procedures. The details of the program are found in [*Name of State*] National RVSM Plan. The program subdivides into the following main activities:

5.4.1 State Aircraft Authorities Co-ordination

State aircraft in [*Name of State*] have no restriction on operating between flight levels FL290 and FL410 and do not require special procedures or co-ordination. State aircraft will operate within a policy of the flexible use of airspace and in co-operation with the Civil Authorities. The implementation of RVSM potentially imposes additional requirements on both State and Civil Authorities. A co-ordinating committee [*insert Name*] has been formed with these State-aircraft Authorities to ensure that satisfactory procedures are developed and that the high standards of co-operation and co-ordination continue following the Implementation of RVSM.

5.4.2 Adjacent ACC Co-ordination

The changes to procedures required for RVSM at an ACC will need to be co-ordinated with adjacent ACCs. New (or amended) letters of agreement (LoAs) are required. The Head of the ATS Provider is responsible for making the necessary agreements.

5.4.3 ATSU Operations Manual Changes

Each ACC will need to change its ATSU Operations Manual to include the changes as a result of RVSM. This is the responsibility of ACC management. The changes will include these appropriate changes due to the new LoAs, and any new agreements with the State Authorities concerning the use of RVSM airspace by State aircraft.

National Program activities recognise the links between the changes to airspace, which must precede the changes to procedures, and the development of RVSM ATC training which can only be fully completed when the new procedures are available.

5.5 Approval of ATS Procedures Changes

There are two aspects of these changes to procedure activities for which *[Name of State]* has established an approval process.

5.5.1 ATSU Operations Manual Approval

Any change to an ACC Operations Manual is subject to strict control. All changes must be approved prior to use. The responsible officer is [*insert title and name of current jobholder*]. He will approve the changes to the manual for use. His approval is based on [*insert approval criteria*].

5.5.2 ACC Amended Agreements (LoAs)

Changes to LoAs are approved (signed) by ACC managers of both centers. For ACCs within [*Name of State*] approval is based on [*insert approval criteria*].

In addition within [*Name of State*] it is policy for to require additional, more senior signatures where the Adjacent or subjacent ACC is in another State. In [*Name of State*] the Director General/CEO of the CAA signs. His approval is based on [*insert approval criteria or responsible officer's terms of reference, where appropriate*].

5.6 ATS Procedures Changes Quality assurance

It is important to ensure that the changes to ATS procedures are appropriate and have been conducted in a professional manner. There are several elements that provide confidence in this.

5.6.1 ICAO and AFI Material

ICAO Documents 7030/4, 9574 and the AFI ATC Manual for RVSM have been subject to extensive review and development and provide a definitive basis for these changes.

5.6.2 Operational Staff Review

Operational staff at each ATSU will review the ATSU Operations Manuals. The review comments will be documented and where appropriate the manual will be modified.

5.6.3 LoA Control Process

All LoAs within *[Name of State]* are subject to extensive review. Within [*Name of State*] this includes the Airspace policy staff, and ACC operational staff.

5.6.4 Procedure and Airspace Design Change Simulation

[Name of State] has a computer based simulation capability. The changes to airspace design and use of RVSM procedures will be subject to simulation. The simulation validates the use of the new RVSM procedures and changes to airspace policy. [Insert s*imulation dates, constraints and objectives*].

5.7 ATS Procedure Risk Management

A key part of the management of safety is that the safety risks associated with poor or inadequate ATC procedures are identified and as appropriate shown to be acceptably low. Within the AFI RVSM Program there is commitment to perform a Functional Hazard Assessment (FHA) (which identifies hazards and assesses the risk associated with such hazards. The results of the FHA are currently not available to the States. When made available, *[Name of State]* will review the hazards and risks that will have been identified by the FHA. The purpose of the review is to identify those aspects where the local circumstances are different from those assumed within the AFI FHA. Any additional activities, required as a result of this review, will be listed as actions in future updates to this safety plan.

6 AIRSPACE DESIGN

6.1 Introduction

This section addresses airspace design activities needed to ensure safe and effective RVSM operations. Additionally further details are provided to show how these airspace changes underpin the safe implementation of RVSM.

6.2 Safety Requirement

The safety requirement associated with the changes to airspace design is to show that the changes are appropriate and are consistent with the safe operation of RVSM in the AFI region.

6.3 Standards Applied

Whilst it is best practice to simulate such changes to show both the impact on traffic flows and controller workload, there are no applicable standards for evaluating proposed changes.

6.4 Planned Airspace Design Changes

A program for airspace design changes has been developed to support the implementation of RVSM. The details of the program are found in [*Name of State*] National RVSM Plan. There are several changes to the design of airspace that have been proposed to support the effective implementation of RVSM. These include:

(a) Changes to entry, reporting and exit points to minimise possible congestion at these points;
(b) Changes to **DFL**, if it is currently an RVSM level;
(c) A new flight level allocation scheme;

(d) Re-sectorisation of the upper airspace to allow the capacity in the upper airspace to increase to take advantage of the new RVSM levels;
(e) Some modifications to allow more direct routings.

Some of these changes need to be agreed with ACCs in adjoining states and are reflected in the LoA change process described in section 5.3 above.

6.5 Approval of Airspace Design Changes

There are two aspects of these airspace design activities for which *[Name of State]* accepts responsibility and has established an approval process.

6.5.1 Approval of the Changes

All airspace design issues are subject to strict change control and must be approved prior to first use. The responsible officer [*insert title and name of current jobholder*] will approve the changes. His approval is based on [*insert approval criteria*].

6.5.2 Changes Included in the LoAs as Necessary

This approval process is described above in section 5.5.

6.6 Airspace Design Quality Assurance

It is important to ensure that the changes to airspace design are effective. There are several elements that provide confidence in this effectiveness.

6.6.1 Use of Simulations

Simulations have been performed [*insert ref here*]. The studies show that the airspace design changes are effective within simulations of RVSM Operations. The simulation shows that controllers can safely handle RVSM operations.

6.6.2 Review Airspace Changes

The proposed airspace design changes receive extensive review by management staff within each of the ACCs. The review comments will be documented and where appropriate the manual will be modified.

6.7 Airspace Design Change Risk Management

A key part of the management of safety is that the safety risks associated with poor or inadequate changes to airspace design are identified and as appropriate shown to be acceptably low. Within the AFI RVSM program there is commitment to perform a Functional Hazard Assessment (FHA) (which identifies hazards and assesses the risk associated with such hazards). The results of the FHA are currently not available to the States. When made

available, *[Name of State]* will review the hazards and risks that will have been identified by the FHA. The purpose of the review is to identify those aspects where the local circumstances are different from those assumed within the AFI FHA. Any additional activities, required as a result of this review, will be listed as actions in future updates to this safety plan.

7 RVSM SWITCHOVER

7.1 Introduction

Switchover is the operational process of managing the actual conversion of ATS from a 2000-ft separation (CVSM) environment to a 1000-ft (RVSM) environment. It covers the changes in the few hours before switchover on 25 Jan 2005 and the first few hours after the switchover. This switchover is the key operational aspect of the countdown to the implementation of RVSM. This section confirms that the operational impact of switchover to RVSM has been addressed and contingency plans exist. Details are provided to show how this changeover activity supports and underpins the safe implementation of RVSM.

7.2 Safety Requirement

The safety requirement is to show that the special procedures for the switchover to RVSM have been approved for use. Assurance should be provided to show that procedures and reversionary modes of operation are in place.

7.3 Applied Standards

[Name of State] will use the AFI RVSM countdown plan as the basis for its own countdown plan. (*Include as Appendix G*).

7.4 Planned Switchover

Activities need to be planned to enable the safe and effective switchover to RVSM. The details of these planning actives are found in [*insert ref*]. The plan assumes that the AFI countdown activities will identify the optimum way to handle the switch from CVSM to RVSM. *[Name of State]* planning activity focuses on the establishing information and special procedures for its ACCs and establishing suitable arrangements and staffing levels for the switchover period.

7.5 Approval of Switchover Plans

There is one aspect of this switchover for which *[Name of State]* accepts responsibility and has established an approval process.

7.5.1 Approval of Special Procedures Developed for each ACC

These special ATS procedures (to cover switchover) will require approval prior to use just like any other ATS procedure. The responsible officer is [*insert title and name of current jobholder*]. He will approve the material for use and the approval is based on [*insert approval criteria*].

7.6 Switchover Quality Assurance

It is important to ensure that the planning for switchover is effective. There are several elements that provide confidence in this effectiveness.

7.6.1 AFI Countdown Material

The AFI material on the countdown process is being developed and the switchover aspects are an identified key part of the countdown process. This AFI material has been subject to extensive review.

7.6.2 Review of Switchover Procedures

Operational and management staff at each ACC will review the material. The review comments will be documented and the material will be amended as appropriate.

7.7 Switchover Risk Management

A key part of safety management is that the safety risks associated with the switchover are identified and shown to be acceptably low. Within the AFI RVSM program there is commitment to perform a Functional Hazard Assessment (FHA) (which identifies hazards and assesses the risk associated with such hazards). The results of the FHA are currently not available to the States. When made available, *[Name of State]* will review the hazards and risks that will have been identified by the FHA. The purpose of the review is to identify those aspects where the local circumstances are different from those assumed within the AFI FHA. Any additional activities, required as a result of this review, will be listed as actions in future updates to this safety plan.

8 RVSM OPERATIONAL SAFETY MONITORING AND REVIEW

8.1 Introduction

This section identifies activities required for post-implementation monitoring of the safety performance of RVSM operations by *[Name of State]*.

8.2 Safety Requirement

The safety requirement is to provide appropriate monitoring of the operational safety performance of the ATS in the application of RVSM.

8.3 Applied Standards

There are no appropriate standards.

8.4 Monitoring Activities

The post-implementation monitoring arrangements are not yet determined. This determination is part of the establishment of post-implementation arrangements. In [*Name of State*] this will be considered as one aspect of the development of national countdown arrangements.

There are two key activities:

(a) ATS Performance Safety Monitoring

These arrangements will be a specific aspect of the normal monitoring of safety performance by the State.

(b) Operational Error Reporting

[Name of State] commits to providing operational error data reported by controllers in its ACCs. The State already supplies this information as part of its contribution to the AFI Pre-Implementation Safety Case. The data supplied is used, together with data from the other RVSM states, to assess the likely risk of collision in AFI RVSM region. In addition *[Name of State]* will assess this data provided by its own ACCs and act on the evidence as appropriate.

8.5 Approvals

The approval process for the establishment of such monitoring arrangements is not yet determined.

8.6 Quality Assurance

[Name of State] will develop monitoring arrangements that achieve the safety requirement to monitor operational performance. However, as the arrangements have not yet been determined, it is not possible to identify requirements at present as to the aspects of these arrangements that give confidence in the achievement of quality.

8.7 Risk Management

Monitoring arrangements will help manage operational risks and do not introduce additional risks.

AFI REGIONAL MONITORING AGENCY (ARMA)

ARMA forms for use in obtaining information from a State authorities and/or Service Providers

NOTES TO AID COMPLETION OF ARMA FORMS

1. Please read these notes before attempting to complete forms ARMA F1, F2, F3, F4 and F5.

2. It is important for the ARMAs to have an accurate record of a point of contact for any queries that might arise from on-going height monitoring. States are therefore requested to identify their National Program Manager with their first reply to the ARMA. Thereafter, there is no further requirement unless there has been a change to the information requested on the form.

3. If recipients are unable to pass the information requested to the ARMA through the Internet, by direct electronic transfer, or by data placed on a 3.5" floppy disk, a hard copy must be completed. The numbers below refer to the superscript numbers on the blank ARMA F2.

    (1) Enter the single letter ICAO identifier as contained in ICAO Doc 7910. In the case of their being more than one identifier designated for the State, use the letter identifier that appears first.
    (2) Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA". For military aircraft, enter "MIL". If none, place an X in this field and write the name of the operator/owner in the Remarks row.
    (3) Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A320; for Boeing B747-438 enter B744.
    (4) Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.
    (5) Enter ICAO allocated Aircraft Mode S address code.
    (6) Enter yes or no.
    (7) Example: For October 26, 1998 write 10/26/98.
    (8) Use a separate sheet of paper if insufficient space available.

AFI REGIONAL MONTORING AGENCY (ARMA)

HEIGHT DEVIATIONS (Form 1)

STATE: **ACC:** **MONTH:**

State of Registry	
Flight Identification	
Operator	
State of Operator	
Aircraft Type and Series	
Registration	
Serial Number	
Mode S Address	
Total height deviation	
Total time of deviation	
Cause of Deviation[1]	

Date and Time of Measurement	Assigned Flight Level	Observed Flight Level	Air route	Geographical Location

Provide description of incident including total height profile if available.

[1] Include Number from List Below

1. Error in altimetry or altitude-keeping system of an aircraft
2. Turbulence or weather related phenomena
3. Emergency descent by aircraft without crew following established contingency procedures
4. Response to Airborne Collision Avoidance System (ACAS) advisories
5. Error in following a correctly issued ATC clearance, resulting in flight at an incorrect flight level
6. Error in issuing an ATC clearance, resulting in flight at an incorrect flight level
7. Errors in coordinaton of transfer of contrl responsibility for an aircraft between adjacent ATC units, resulting in flight at an incorrect flight level
8. Other reason, include reason in Description of Incident

AFI REGIONAL MONTORING AGENCY (ARMA)

MONTHLY MOVEMENTS (Form 2)

STATE: **ACC:** **MONTH:**

TOTAL IFR MOVEMENTS FOR THE MONTH:	
TOTAL MONTHLY IFR MOVEMENTS IN THE BAND F290 - F410	
AVERAGE TIME PER MOVEMENT IN LEVEL BAND F290 - F410	
LEVEL FLIGHT	
CLIMBING AND DESCENDING	

AFI REGIONAL MONTORING AGENCY (ARMA)

OTHER OPERATIONAL CONSIDERATIONS (Form 3)

STATE: **ACC:** **MONTH:**

COORDINATION FAILURES

NUMBER OF EVENTS IN MONTH	

COMMUNICATION FAILURE

DATE	TIME	DURATION	CAUSE OF COMMUNICATION FAILURE

TOTAL TIME FOR MONTH	

TURBULENCE

DATE	TIME	DURATION	MAGNITUDE[1]	LOCATION

1 Magnitude as measured from Meteorology Turbulence Scale

ACAS INCIDENTS

Date	Time	Description of ACAS Incident

AFI REGIONAL MONTORING AGENCY (ARMA)

TRAFFIC FLOW DATA (Form 4)

STATE: **ACC:** **MONTH**

Please include all information for the month on aircraft arriving or departing from within the state, which operate within the f
band F280 - F410. Do not include aircraft overflying the FIR.

CALLSIGN	OPERATOR	AIRCRAFT TYPE	DEPARTURE PT	DESTINATION	FLIGHT LEVEL

AFI REGIONAL MONTORING AGENCY (ARMA)

TRAFFIC FLOW DATA (OVERFLYING AIRCRAFT) (Form 5)

STATE: **ACC:** **MONTH:**

Please include information on all aircraft overfling the airspace within the flight level band F280 - F410

DATE	ROUTE	CALLSIGN	AIRCRAFT TYPE	OPERATOR	DEPARTURE AERODROME	DESTINATION AERODROME	NAV EQUIPMENT	WAYPOINT	TIME AT WAYPOINT PASSING