INTERNATIONAL CIVIL AVIATION ORGANIZATION

RVSM/RNAV/RNP TF/7 MEETING
REPORT

(DAKAR, 8 – 9 AUGUST 2005)

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

Note: ARMA, CRA presentation, and IPs/WPs are the CD provided to participants. They can also be downloaded from the ICAO website: **icao.int/regional offices/nairobi/RVSM programme**

PART I - HISTORY OF THE MEETING

1. Introduction

1.1 The Seventh meeting of the RVSM/RNAV/RNP Task Force (RVSM/RNAV/RNP TF/7) 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 in Dakar from **8 to 9 August 2005.**

1.2 The meeting was opened by Mr. Andrew Mensah, ICAO WACAF A/Regional Director. 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 Seventh meeting of the RVSM/RNAV/RNP Task Force being organized pursuant to APIRG/13 Decision 13/58. In order to enhance the implementation, Mr. Mensah remarked, the National Programme Managers whom we believe are the vital organs to the early implementation of RVSM were invited to work together with the Task Force to ensure ways of meeting the target date of implementation. He asked the meeting to discuss in details the contentious issues that need to be addressed and make appropriate recommendations for RVSM implementation in the AFI Region. He recalled APIRG 14 Conclusion 14/21 relating to the development of an AFI RVSM strategy/action plan within specific target dates. He recalled that as a pre-requisite to the implementation of RVSM, the ANC requested a safety Assessment should be conducted. The main elements of the safety assessment is the collision Risk Assessment (CRA) being done by the Netherlands Research Laboratories (NLR) the Functional Hazard Analysis (FHA) being conducted by ALTRAN Technologies of France and the National Safety Plan (NSP) to be developed by States. These three deliverables will be required to develop the AFI RVSM Pre-implementation Safety Case (PISC). He further recalled that it was decided to set up an NSP Validation Panel comprising ICAO HQ, ASECNA, IATA, ATNS, ARMA and RO/ATMs from Dakar and Nairobi. The Panel will be required to validate all NSPs and submit its report to APIRG/15 meeting (Nairobi 26-30 September 2005). He 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. Godwin Makoroma of Tanzania Civil Aviation Authority 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 Mr. Ibrahim Usman AUYO, Regional Officer ATM, WACAF Office.

3. Attendance

3.1 The meeting was attended by **30** participants from **12** States and 5 International Organizations namely AFRAA, ARMA, ASECNA, IATA and NLR. 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 of action of conclusions of Sixth meeting of RVSM/RNAV/RNP Task Force

Agenda Item 2

Review of the activities relating to AFI RVSM Safety Assessment

2.1 Review of the Functional Hazard Analysis Report.

2.2 Report from the ARMA on States readiness to meeting the scheduled RVSM Implementation date of January 19 2006 AIRAC date;

i. Aircraft Airworthiness,
ii. Air Traffic Management

2.3 ARMA Readiness Assessment.

2.4 Status of RVSM States readiness.

2.5 AFI RVSM Implementation – cost recovery.

2.6 AFI RVSM Switchover-optimum period and Time.

2.7 Establishment of Regional Airworthiness certification Agencies.

2.8 Collision Risk Assessment (CRA) – progress report.

Agenda Item 3:

Review and Update the AFI RVSM Strategy/Action Plan

Agenda Item 4:

Review of the final draft Proposal for Amendment to the Regional Supplementary Procedures - Doc.7030/4 African Indian Ocean (AFI) Region (Serial No. ESAF-S 04/1 – AFI RAC/1).

Agenda Item 5

Any other business.

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6. List of Draft Conclusions

Number	Title
Conclusion 7/1:	**Safety assessment data** That States continue to provide the required safety assessment data to ARMA on monthly basis using Forms 1, 2, 3 and the revised Form 4 at **Appendix B**.
Conclusion 7/2:	**Civil/military coordination** That in order to ensure the safe and coordinated implementation of RVSM in the AFI Region, States ensure that the military aviation authorities are fully involved in the planning and the implementation process.
Conclusion 7/3:	**Nomination of a National RVSM programme manager** That States which 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. Additionally NPMs keep this information up to date.
Conclusion 7/4:	Reporting of data for monitoring and/or carrying out safety assessment That: a) All States institute the procedures for reporting of data, incidents and conditions necessary for performing the collision risk calculations prerequisite for RVSM implementation to the AFI Regional monitoring agency (ARMA). 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. b) GMU Monitoring Unit GMU will be used as well as HMU (multilateration) where appropriate for height monitoring in AFI Region which will be coordinated by the ARMA.

Number	Title
Conclusion 7/5:	**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 290 and 410 inclusive, being the AFI RVSM airspace; and. b) Implementation of RVSM in the AFI Region be harmonized and coordinated within the AFI Region as well as with the adjacent Regions.
Conclusion 7/6:	**Training of all personnel involved with the implementation of RVSM in the AFI Region** That: a) Seminars continue to be organized in the Region for training of air traffic services personnel in the RVSM field; b) States having difficulties in implementing RVSM implementation programme, may either individually or in a group explore the possibility of seeking outside expertise; and c) On site training courses be conducted to expedite the training process.
Conclusion 7/7:	**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 the RVSM airspace based on provisions of ICAO Annex 6 Part 1 Chapter 7 para. 7.2.3 and the guidance material contained in JAA Temporary Guidance Leaflet (TGL) N°6.
Conclusion 7/8:	**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.

Number	Title
Conclusion 7/9:	**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 7/10:	**Aircraft/Operators readiness survey** That the results of ICAO/ARMA surveys be updated and presented at the RVSM TF meetings for consideration.
Conclusion 7/11:	**Monitoring of Height Deviations** **That:** a) States which have radar establish at the ACC 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 ARMA for action.
Conclusion 7/12:	**AFI RVSM Safety Policy** That States expedite the publication of an AIC on the AFI RVSM safety policy at **Appendix C** to this report.
Conclusion 7/13:	**National Safety Plans (NSPs)** That a) States that participated in the NSP workshops expedite the completion of their National Safety Plan using the sample at **Appendix D** to this report, and ensure these NSP reach the Secretariat as soon as possible but not later than 31 August 2005; b) ICAO contact States that could not attend the Workshop in order to provide them with the necessary assistance in the preparation of NSPs so as to meet the 31 August 2005 deadline; c) The NSPs be submitted to the NSP Validation Panel (Johannesburg 12-23 September 2005) for their consideration.; and **d)** The NSP Validation Panel submit to APIRG/15 meeting a verbal report on the NSP Validation.

Number	Title
Conclusion 7/14:	**State Readiness Assessment** a) That ICAO urge the States which have not done so, to provide the State RVSM readiness assessment using the form at **Appendix E** to this report; and b) That ICAO urge the States to update "the State Readiness survey" at **Appendix F** to this report.
Conclusion 7/15:	**Exchange of RVSM data between ASECNA and ARMA** That ASECNA sub-regional monitoring unit continue to forward to ARMA the RVSM data collected from their member States.
Conclusion 7/16:	**Collision Risk Assessment (CRA)** **That :** a) RVSM cannot be implemented at the date envisaged (January 2006) as the total Vertical TLS has so far not been met; b) The CRA Consultant make an executive summary of CRA report and include the mitigating factors required to meet the TLS for a verbal presentation at APIRG/15 meeting; c) ARMA continue to provide the CRA data to NLR for inclusion in the AFI Pre-Implementation Safety Case (PISC); and d) The CRA Consultant submit as soon as possible but not later than **31 August 2005** the final CRA report .
Conclusion 7/17:	**Pre-Implementation Safety Case (PISC)** **That:** a) The PISC consultant submit as soon as possible but not later **15 September 2005** the Planning Schedule for PISC for consideration by APIRG/15 meeting; b) The PISC consultant submit as soon as possible but not later than **March 2006** the interim PISC report for consideration by TF/9 meeting; and c) The submission of PISC to the ANC will be determined by the TF/9 meeting.

Number	Title
Conclusion 7/18:	**Continuation of AFI RVSM Programme Office (ARPO)** That the AFI RVSM Programme Office (ARPO) located at the ICAO ESAF Office continue the coordination activities relating to RVSM implementation. website (www.icao.int/ESAF/RVSM)
Conclusion 7/19:	**Adoption of the FHA Final Report** That the results of the AFI RVSM Functional Hazard Assessment of the AFI RVSM Implementation in the AFI Region at Appendix G will be used for the development of NSPs and PISC.
Conclusion 7/20:	**CVSM/RVSM Optimal Switch Over Time** That the TF Secretariat Support Team composed of Nigeria, South Africa, Tanzania, ASECNA and IATA coordinate and research all the associated elements, including weather and human factors, that will have an effect on the switch over, taking into account Conclusion **7/22** below.
Conclusion 7/21:	**AFI RVSM Core Airspace** That: a) for Req_{core}_12 (refer AFI FHA report at Appendix G) "Air/Ground Communication system shall be designed to ensure a total coverage of the RVSM Airspace with a minimum Mean Time Between Failure (MTBF) of **two** months for a given FIR"; and b) for Req_{core}_88 (refer to FHA report at Appendix G) "Aircraft shall be equipped with ACAS II version 7.00".
Conclusion 7/22:	**AFI RVSM Switch-Over Period** **That:** a) for $_{swit}$_24 (refer AFI FHA report at Appendix G) "Use of Eastbound RVSM FL (**FL310, FL350 and FL390**) shall be suspended for a period of **two (2)** hours after the Time Zero (**TO**)"; b) for $_{swit}$_40 (refer AFI FHA report at Appendix G) "Traffic density shall be limited during switch-over period as appropriate; c) a Trigger NOTAM shall be published **two (2**) weeks before Time Zero (TO) notifying the implementation of RVSM and relevant procedures to be applied;

Number	Title
	d) for swit_25 (refer AFI FHA report at Appendix G) "A NOTAM shall be published to suspend **FL310, FL350 and FL390** for RVSM operations after ToS during a period of **two (2)** hours ;" e) for swit_35 (refer AFI FHA report at Appendix G) "Transit of non-RVSM civil aircraft shall be suspended for a period of **two (2)** hours) after Time Zero (**TO**)"; and f) That for swit_36 (refer AFI FHA report at Appendix G) "Operation above FL410 shall be suspended for non-RVSM aircraft for a period of **two (2**) hours after Time Zero (TO)".
Conclusion 7/23:	**FHA safety requirements needing appropriate actions by the RVSM Programme** That the following FHA safety requirements are allocated to the RVSM Programme: a) Req Swit_37 "The switch-over period shall be performed during an appropriate **low traffic** density period";. b) Req Swit_39 "The switch-over period shall be determined out of **Hajj** period"; c) Req Swit_40 "Traffic density shall be limited during switch-over period as appropriate"; d) Req Swit_41 "The FIR airspace shall be optimized to reduce controller workload"; e) Req Swit_52 "The date of switchover shall take into account the effect of adverse **weather** (thunderstorm, sandstorm, etc.) to minimize the effect on switch over operations"; and f) Req Swit_60 "**Civil/Military** coordination committee shall be in place". Note: Req Swit_ - refer to the FHA Report at Appendix G.
Conclusion 7/24:	**Regional Aircraft Certification Agency for RVSM Operation** **That:** a) States having difficulties with the implementation of operational airworthiness certification on the RVSM implementation should seek assistance from other States having this expertise;

Number	Title
	b) Seminars/Workshops be conducted for airworthiness/operations personnel on issues relating to RVSM certification; and c) Studies be conducted by IATA in cooperation with ICAO relating to the establishment of RVSM Certification Agencies for the AFI Region.
Conclusion 7/25:	**AFI RVSM Implementation – Cost recovery** That: a) IATA airlines continue to financially support the RVSM implementation effort in order to improve safety and economy of Air Traffic across Africa; and b) IATA puts in place an RVSM cost recovery scheme based on a charge imposed on all international jet flights in Africa operated by its member airlines.
Conclusion 7/26:	**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 7/27:	**AFI RVSM Strategy/Action Plan** That the updated RVSM Strategy/Action Plan at **Appendix G** be circulated to States for action.
Conclusion 7/28:	**Amendment to ICAO Doc. 7030** That ICAO process, as soon as possible, the amendment proposal to the Regional Supplementary Procedures – Doc.7030/4 – African Indian Ocean Region (AFI) (Serial No. ESAF – S 04/1 – AFI RAC/1) which includes relevant provisions for RVSM implementation. (**Appendix H** refers) taking into account the results of PISC and its review by ANC.

Number	Title
Conclusion 7/29:	**Target Date for AFI RVSM Implementation** That: a) the following target dates be met: b) Review of the revised Collision Risk Assessment. • Review of draft PISC by ARTF/9. • Review of PISC by ANC in May 2006. • Implementation of NSPs by States in June 2006. • Issuance of RVSM implementation NOTAM by all States with an AIRAC cycle notice in June 2006. • Completion of retraining of all operational staff in July 2006; and c) That the target date for implementation of RVSM in the AFI Region will be AIRAC date 28 September 2006.
Decision 7/1:	**Venue of TF/8 Meeting** That the TF/8 Meeting and RVSM Seminar will be held in Lagos, Nigeria from 10-14 October 2005.

PART II: REPORT ON AGENDA ITEMS

Report on Agenda Item 1

Review and follow-up of action of conclusions of sixth 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 sixth meeting of the RVSM/RNAV/RNP Task Force. It reinstated conclusions which were still in force and proposed the action to be taken before the next Task Force meeting planned from 10 to 14 October 2005 in Lagos, Nigeria. These conclusions appear in Part 1 of this report.

Report on Agenda Item 2

Review of the activities relating to AFI RVSM Safety Assessment.

2.1 The meeting was presented with several working papers relating to AFI RVSM Safety Assessment covering the following:

a) Functional Hazard Analysis Report;
b) AFI RMA Readiness Assessment;
c) Status of RVSM state readiness;
d) Progress Report on Collision Risk Assessment;
e) AFI RVSM core airspace;
f) Functional Hazard Analysis Safety requirements;
g) AFI RVSM switch-over period;
h) CVSM – RVSM Optimum switch-over time;
i) AFI RVSM Implementation – Cost recovery; and
j) Establishment of Regional Airworthiness Certification Agencies.

2.2 Functional Hazard Analysis (FHA)

2.2.1 The Task Force seven meeting took note of the fact that the Functional Hazard Analysis had been adopted by TF/6 for application in AFI Region and will be incorporated in the Pre-Implementation Safety Case (PISC).

2.3 ARMA Aircraft Readiness

2.3.1 In considering the aircraft readiness for RVSM, the AFI RMA reported that 54% of AFI aircraft are RVSM approved. The traffic sample revealed that 90% of aircraft operating within the AFI RVSM airspace are RVSM approved (previously 87%) along with 88% of airline operators which is an improvement from the previous of 87% . A fourth readiness survey will be compiled for Task Force 8 meeting in October 2005.

2.4 Collision Risk Analysis (CRA)

2.4.1 The NLR preliminary report on Collision Risk Assessment indicated that the Target Level of Safety has not been met in order to safely implement RVSM at the envisaged date of January 2006. The Task Force considered the more collection of safety data was required. The Task Force requested the CRA consultant to provide the final report on CRA by end of August 2005. The Consultant was also to make a verbal presentation to APIRG/15 meeting.

2.5. RVSM Seminars/Workshops

2.5.1 The Task Force considered the outcome of the two RVSM seminars/workshops held in Dakar (25 – 29 July 2005) and Nairobi (18 – 22 July 2005). Some of the outcomes have been incorporated in the Task Force/7 report.

2.6 National Safety Plans (NSPs)

2.6.1 The Task Force noted that States were actively sending the NSPs developed at the workshop. The deadline for submission of NSPs was fixed as **31 August 2005**.

In view of the discussions the following conclusions were formulated:

Conclusion 7/1 - Safety assessment data

That States continue to provide the required safety assessment data to ARMA on monthly basis using Forms 1, 2, 3 and the revised Form 4 at Appendix B.

Conclusion 7/2 - Civil/military coordination

That in order to ensure the safe and coordinated implementation of RVSM in the AFI Region, States ensure that the military aviation authorities are fully involved in the planning and the implementation process.

Conclusion 7/3 - Nomination of a National RVSM programme manager

That States which 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. Additionally NPMs keep this information up to date.

Conclusion 7/4 - Reporting of data for monitoring and/or carrying out safety assessment

That:

a. All States institute the procedures for reporting of data, incidents and conditions necessary for performing the collision risk calculations prerequisite for RVSM implementation to the AFI Regional monitoring agency (ARMA). 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; and.

b. GMU Monitoring Unit GMU will be used as well as HMU (multilateration) where appropriate for height monitoring in AFI Region which will be coordinated by the ARMA.

Conclusion 7/5 - 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 290 and 410 inclusive, being the AFI RVSM airspace; and

b) Implementation of RVSM in the AFI Region be harmonized and coordinated within the AFI Region as well as with the adjacent Regions.

Conclusion 7/6 - Training of all personnel involved with the implementation of RVSM in the AFI Region

That:

a) Seminars continue to be organized in the Region for training of air traffic services personnel in the RVSM field;

b) States having difficulties in implementing RVSM implementation programme, may either individually or in group explore the possibility of seeking outside expertise; and

c) On site training courses be conducted to expedite the training process.

Conclusion 7/7 - 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 the RVSM airspace based on provisions of ICAO Annex 6 Part 1 Chapter 7 para. 7.2.3 and the guidance material contained in JAA Temporary Guidance Leaflet (TGL) N°6.

Conclusion 7/8 - 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.

Conclusion 7/9 - 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 7/10 - Aircraft/Operators readiness survey

That the results of ICAO/ARMA surveys be updated and presented at the RVSM TF meetings for consideration.

Conclusion 7/11 - Monitoring of Height Deviations

That:

a) States which have radar establish at the ACC 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 ARMA for action.**

Conclusion 7/12 - AFI RVSM Safety Policy

That States expedite the publication of an AIC on the AFI RVSM safety policy at Appendix C to this report.

Conclusion 7/13 - National Safety Plans (NSPs)

That:

a) States that participated in the NSP workshops expedite the completion of their National Safety Plan using the sample at Appendix D to this report, and ensure these NSP reach the Secretariat as soon as possible but not later than 31 August 2005;
b) ICAO contact States that could not attend the Workshop in order to provide them with the necessary assistance in the preparation of NSPs so as to meet the 31 August 2005 deadline;
c) The NSPs be submitted to the NSP Validation Panel (Johannesburg 12-23 September 2005) for their consideration.; and
d) **The NSP Validation Panel submit to APIRG/15 meeting a verbal report on the NSP Validation.**

Conclusion 7/14 - State Readiness Assessment

a) That ICAO urge the States which have not done so, to provide the State RVSM readiness assessment using the form at Appendix E to this report; and
b) That ICAO urge the States to update "the State Readiness survey" at Appendix F to this report.

Conclusion 7/15 - Exchange of RVSM data between ASECNA and ARMA

That ASECNA sub-regional monitoring unit continue to forward to ARMA the RVSM data collected from their member States.

Conclusion 7/16 - Collision Risk Assessment (CRA)

That :

a) RVSM cannot be implemented at the date envisaged (January 2006) as the total Vertical TLS has so far not been met;
b) The CRA Consultant make an executive summary of CRA report and include the mitigating factors required to meet the TLS for a verbal presentation at APIRG/15 meeting;
c) ARMA continue to provide the CRA data to NLR for inclusion in the AFI Pre-Implementation Safety Case (PISC); and
d) **The CRA Consultant submit as soon as possible but not later than 31 August 2005 the final CRA report .**

Conclusion 7/17 - Pre-Implementation Safety Case (PISC)

That:

a) The PISC consultant submit as soon as possible but not later 15 September 2005 the Planning Schedule for PISC for consideration by APIRG/15 meeting;
b) The PISC consultant submit as soon as possible but not later than March 2006 the interim PISC report for consideration by TF/9 meeting; and;
c) **The submission of PISC to the ANC will be determined by the TF/9 meeting.**

Conclusion 7/18 - Continuation of AFI RVSM Programme Office (ARPO)

That the AFI RVSM Programme Office (ARPO) located at the ICAO ESAF Office continue the coordination activities relating to RVSM implementation. website (www.icao.int/ESAF/RVSM).

Conclusion 7/19 - Adoption of the FHA Final Report

That the results of the AFI RVSM Functional Hazard Assessment of the AFI RVSM Implementation in the AFI Region at Appendix G will be used for the development of NSPs and PISC.

Conclusion 7/20 - CVSM/RVSM Optimal Switch Over Time

That the TF Secretariat Support Team composed of Nigeria, South Africa, Tanzania, ASECNA and IATA coordinate and research all the associated elements, including weather and human factors, that will have an effect on the switch over, taking into account Conclusion 7/22 below.

Conclusion 7/21 - AFI RVSM Core Airspace

That:

a) for Req_{core}_12 (refer AFI FHA report at Appendix G) "Air/Ground Communication system shall be designed to ensure a total coverage of the RVSM Airspace with a minimum Mean Time Between Failure (MTBF) of two months for a given FIR"; and

b) for Req_{core}_88 (refer to FHA report at Appendix G) "Aircraft shall be equipped with ACAS II version 7.00".

Conclusion 7/22 - AFI RVSM Switch-Over Period

That:

a) for $_{swit}$_24 (refer AFI FHA report at Appendix G) "Use of Eastbound RVSM FL (FL310, FL350 and FL390) shall be suspended for a period of two (2) hours after the Time Zero (TO)";

b) for $_{swit}$_40 (refer AFI FHA report at Appendix G) "Traffic density shall be limited during switch-over period as appropriate;

c) a Trigger NOTAM shall be published two (2) weeks before Time Zero (TO) notifying the implementation of RVSM and relevant procedures to be applied;

d) for $_{swit}$_25 (refer AFI FHA report at Appendix G) "A NOTAM shall be published to suspend FL310, FL350 and FL390 for RVSM operations after ToS during a period of two (2) hours ;"

e) for $_{swit}$_35 (refer AFI FHA report at Appendix G) "Transit of non-RVSM civil aircraft shall be suspended for a period of two (2) hours) after Time Zero (TO)"; and

f) **That for $_{swit}$_36 (refer AFI FHA report at Appendix G) "Operation above FL410 shall be suspended for non-RVSM aircraft for a period of two (2) hours after Time Zero (TO)".**

Conclusion 7/23 - FHA safety requirements needing appropriate actions by the RVSM Programme

That the following FHA safety requirements are allocated to the RVSM Programme:

a) Req Swit_37 "The switch-over period shall be performed during an appropriate low traffic density period";
b) Req Swit_39 "The switch-over period shall be determined out of Hajj period";
c) Req Swit_40 "Traffic density shall be limited during switch-over period as appropriate";
d) Req Swit_41 "The FIR airspace shall be optimized to reduce controller workload";
e) Req Swit_52 "The date of switchover shall take into account the effect of adverse weather (thunderstorm, sandstorm, etc.) to minimize the effect on switch over operations"; and
f) Req Swit_60 "Civil/Military coordination committee shall be in place".

Note: Req Swit_ - refer to the FHA Report at Appendix G.

Conclusion 7/29 - Target Date for AFI RVSM Implementation

That:

a) the following target dates be met:
b) Review of the revised Collision Risk Assessment.
- **Review of draft PISC by ARTF/9.**
- **Review of PISC by ANC in May 2006.**
- **Implementation of NSPs by States in June 2006.**
- **Issuance of RVSM implementation NOTAM by all States with an AIRAC cycle notice in June 2006.**
- **Completion of retraining of all operational staff in July 2006; and**

c) That the target date for implementation of RVSM in the AFI Region will be AIRAC date 28 September 2006.

2.7 Regional Aircraft Certification Agency for RVSM Operation

2.7.1 The meeting considered issues relating to the need of establishing a Regional aircraft certification Agency on RVSM operation. The meeting considered such an Agency was necessary. The Task Force recommended that States having difficulties with implementation of operational airworthiness should seek assistance from other States having experience. The meeting also recognized the need for seminars/workshops for airworthiness/operations personnel on issues relating to RVSM certification. The Task Force was of the opinion that studies be conducted relating to the establishment of RVSM certification Agencies in the AFI Region.

2.7.2 In view of the foregoing, the meeting formulated the following conclusion:

Conclusion 7/24 - Regional Aircraft Certification Agency for RVSM Operation

That:

a) States having difficulties with the implementation of operational airworthiness certification on the RVSM implementation should seek assistance from other States having this expertise;

b) Seminars/Workshops be conducted for airworthiness/operations personnel on issues relating to RVSM certification; and

c) **Studies be conducted by IATA in cooperation with ICAO relating to the establishment of RVSM Certification Agencies for the AFI Region**.

2.8 AFI RVSM Implementation Cost Recovery

2.8.1 The meeting considered a work paper relating to AFI RVSM implementation cost recovery, and recognized that there was a need to establish a mechanism where all airlines operating in AFI would be charged.

In view of the foregoing, the following conclusion was formulated:

Conclusion 7/25 - AFI RVSM Implementation – Cost recovery

That:

a) IATA airlines continue to financially support the RVSM implementation effort in order to improve safety and economy of Air Traffic across Africa; and;

b) IATA puts in place an RVSM cost recovery scheme based on a charge imposed on all international jet flights in Africa operated by its member airlines.

Agenda Item 3

Review and update the AFI RVSM Strategy/Action Plan.

3.1 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.

3.2 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. The ANC further requires the Pre-Implementation Safety Case to be presented for approval.

3.3 The meeting re-affirmed its earlier conclusion that there was an urgent need for campaign on the implementation of RVSM at the highest level in the Aviation Administration of each State.

3.4 Furthermore, the meeting agreed that the revised AFI strategy/action plan at **Appendix G** be circulated to States for action.

3.5 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 at each of the TF meetings before any decision is made to implement the RVSM.

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

Conclusion 7/26 - 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 7/27 - AFI RVSM Strategy/Action Plan

That the updated RVSM Strategy/Action Plan at Appendix G be circulated to States for action.

Report on Agenda Item 4

Review of the final draft Proposal for Amendment to the Regional Supplementary Procedures - Doc.7030/4 Africa Indian Ocean (AFI) Region (Serial No. ESAF-S 04/1 – AFI RAC/1)

4.1 The Task Force established a working group composed of ASECNA, Ghana, Kenya, NLR and South Africa and charged it with the responsibility of developing the final draft proposal for amendment to the Regional Supplementary Procedures - Doc.7030/4 Africa Indian Ocean (AFI) Region (Serial No. ESAF-S 04/1 – AFI RAC/1). The deadline for submission of this draft to the Task Force Secretary was **31 September 2005**. The meeting agreed that the final draft be presented to the ATS/SG/8 for their consideration.

In view of the foregoing, the meeting formulated the following conclusion:

Conclusion 7/28 - Amendment to ICAO Doc. 7030

That ICAO process, as soon as possible, the amendment proposal to the Regional Supplementary Procedures – Doc.7030/4 – African Indian Ocean Region (AFI) (Serial No. ESAF – S 04/1 – AFI RAC/1) which includes relevant provisions for RVSM implementation. (Appendix H refers) taking into account the results of PISC and its review by ANC.

Report on Agenda Item 5: Any Other Business

Venue and date of the Eighth RVSM/RNAV/TF meeting

5.1 The Task force decided that the Eighth RVSM Task Force meeting and RVSM Seminar will be held from 10 to 14 October 2005 in Lagos, Nigeria. The meeting also decided that the ninth meeting would be held in March 2006 and the Tenth meeting together with the Stakeholders meeting GO/DELAY meeting would be held in June 2006.

Decision 7/1 - Venue of TF/8 Meeting

That the TF/8 Meeting and RVSM Seminar will be held in Lagos, Nigeria from 10-14 October 2005.

INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICAN OFFICE

Seventh Meeting of RVSM Task Force/7
Septième Réunion de l'Equipe de Travail sur le RVSM TF/7
(Dakar, Sénégal 8 – 9 août 2005)

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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 for the ARMA.

2. It is important for the ARMA to have an accurate record of a point of contact for any queries that might arise. 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 floppy disk/CD, a hard copy must be completed.

    (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) Date example: For October 26, 1998 write 10/26/98.
    (7) Use a separate sheet of paper if insufficient space available.

AFI REGIONAL MONITORING AGENCY (ARMA)

POINT OF CONTACT DETAILS/CHANGE OF POINT OF CONTACT DETAILS FOR MATTERS RELATING TO RVSM APPROVALS

This form should be completed and returned to the address below on the first reply to the ARMA or when there is a change to any of the details requested on the form (PLEASE USE BLOCK CAPITALS).

STATE OF REGISTRY: enter State here

STATE OF REGISTRY (ICAO 2 LETTER IDENTIFIER): enter 2 letter State here
Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the event that there is more than one identifier for the same State, the one that appears first in the list should be used.

ADDRESS:

CONTACT PERSON:

Full Name: enter full name here

Title: Surname: Initials:

Post/Position:

Telephone #: Fax #:

E-mail:

Initial Reply/Change of Details (*Delete as appropriate)*

When complete, please return to the following address:

RMA Address: Mr Kevin Ewels, Manager: ARMA Private Bag X1, Bonaero Park South Africa 1622

Telephone: 27-11- 928-6433

Fax: 27-11- 928-6420

E-Mail: afirma@atns.co.za

AFI REGIONAL MONITORING 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 coordination or transfer of control 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.

NOTE: Complete with available information

AFI REGIONAL MONITORING 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 MONITORING 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 INDICENTS

Date	Time	Description of ACAS Incident

AFI REGIONAL MONITORING AGENCY (ARMA)

AIRCRAFT TRAFFIC FLOW DATA **(Form 4)**
***Revised by RVSM/TF/6 May 2005**

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

Please include information on all flights within the flight level band F290 – F410 (inbound, outbound and over flights)

DATE	ROUTE	CALLSIGN	AIRCRAFT TYPE	OPERATOR	DEPARTURE AERODROME	DESTINATION AERODROME	NAV EQUIPMENT	WAYPOINT/ REPORTING POINT	TIME AT WAYPOINT/ REPORTING POINT	FLIGHT LEVEL
01-01-2005	UR978	AFR827	A319	AFR	FCPP	LFPG		ERKEL	00:24	350
								KAMER	03:02	350
								ATAFA	01:04	350
								BOD	01:21	350
								ELO	02:11	350
								NADJI	02:21	350
01-01-2005	UR978	KQA310	B744	KQA	HKJK	VABB		ERKEL	00:59	370

Note: Please include all waypoints/reporting points, times and FL for the entire route per FIR

AFI REGIONAL MONITORING AGENCY (ARMA)

AIRCRAFT TRAFFIC FLOW DATA **(Form 4)**
***Revised by RVSM/TF/6 May 2005**

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

Please include information on all flights within the flight level band F290 – F410 (inbound, outbound and over flights)

DATE	ROUTE	CALLSIGN	AIRCRAFT TYPE	OPERATOR	DEPARTURE AERODROME	DESTINATION AERODROME	NAV EQUIPMENT	WAYPOINT/ REPORTING POINT	TIME AT WAYPOINT/ REPORTING POINT	FLIGHT LEVEL

Note: Please include all waypoints/reporting points, times and FL for the entire route per FIR

AFI REDUCED VERTICAL SEPARATION MINIMUM (RVSM) RVSM SAFETY POLICY

TABLE OF CONTENTS

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.

<table>
<tr><th>2005 1st Qtr.</th><th>2005 2nd Qtr.</th><th>2005 3nd Qtr.</th><th>2005 4th Qtr.</th><th>2006 1st Qtr.</th><th>2006 2nd Qtr.</th><th>2006 3rd Qtr.</th></tr>
<tr><td colspan="2">Functional Hazard Analysis (FHA) -April 2005</td><td></td><td></td><td>RVSM Implementation 19 January 2006</td><td></td><td></td></tr>
<tr><td></td><td>Safety Policy – May 2005</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">National Safety Plans - May 2005</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Collision Risk Assessment (CRA) -July 2005</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Pre-Implementation Safety Case (PISC) – July 2005</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">Pre-Implementation Safety Case by TF/7 and ATS/SG/8 – August 2005</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">PISC approval by APIRG and ANC September 2005</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">TF/8 and Go/No Go Decision – October 2005</td><td></td><td></td><td></td></tr>
</table>

[*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	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

DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION	DATE	REASON FOR CHANGE	SECTIONS PAGES AFFECTED

TABLE OF CONTENTS

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: ATS Equipment,
- Section 5: ATS Procedures,
- Section 6: Airspace Design,
- 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.

1.3 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] will use TGL6 revision 1 to conduct the approval for civil aircraft and operators for RVSM operations.

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. 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 been 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*].

As of [date], [number] civil aircraft and [number] operators have been approved for RVSM operations . This leaves an anticipated [number] aircraft and [number] operators that will require RVSM approval. [State] anticipates that these approvals will be in place by [date]. In addition, as of [date], State Authorities have approved [number] State aircraft for RVSM operations. This leaves an anticipated [number] aircraft that will require RVSM approval. [State] anticipates that these approvals will be in place by [date].

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

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference] and has made the adaptation provided in Appendix XX.

[State] has reviewed the FHA-proposed mitigation strategy related to the aircraft and operator element of its RVSM System, as follows:

Mitigation	Actions / Activities	Hazard ID

All of these mitigations will be in place by [date].

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

The AFI RVSM training guidance material, approved by the AFI RVSM Task Force for application within the AFI Region, is used for the development of *[Name of State]*'s training material.

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 19 January 2006.

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 AFI RVSM training guidance 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.

As of [date], the following ATS training sessions have been run:

Date	Training module	ACC	Number of staff attending

The following ATS training sessions are planned:

Date	Training module	ACC	Number of staff attending

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*].

The training material will be approved for use by the above named responsible officer by [date]. Evidence for this approval will be found in [provide reference to the document that gives this approval].

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 RVSM training guidance material

The AFI material has been developed by the AFI RVSM Task Force 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 delivery of the training programme 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.

Or

Operational and management staff at each ACC have reviewed the training material. Their review comments and response to those comments are documented in [provide reference].

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.

Or

A course feedback form has been given to all those that have attended the course offered to date. Thus far the comments made have been mainly positive and have not resulted in any changes to the course material.

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

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference] and has made the adaptation provided in Appendix XX.

[State] has reviewed the FHA-proposed mitigation strategy related to the ATS Training element of its RVSM System, as follows:

Mitigation	Actions / Activities	Hazard ID

All of these mitigations will be in place by [date].

4 ATS EQUIPMENT

4.1 Introduction

This section addresses those 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 equipment will be completed successfully and will underpin the safe implementation of RVSM.

4.2 Safety Requirement

The safety requirement is to show that 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. 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 19 January 2006. [*Dates to be inserted and tight timescales requires each 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 Data Processing (FDP), Radar Data Processing (RDP), Display, flightstrip, Short Term Conflict Alert (STCA), Medium Term Conflict Detection (MTCD) 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 – ATS engineering function*]. He will approve the changes to ATS equipment prior to installation. His approval is based on [*insert approval criteria*].

The ATS equipment will be approved by the above named responsible officer by [date]. Evidence of this approval will be found in [provide reference to the document that gives that approval.

4.5.2 Modified ATS Equipment for Operational Use at ACCs.

The 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 – ATS operational function*]. 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*].

The ATS equipment will be approved by the above named responsible officer by [date]. Evidence of this approval will be found in [provide reference to the document that gives that approval.

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.

Or

HMI has been evaluated by controllers as part of the RVSM training. Feedback has been sought on all the courses run to date. Thus far no significant HMI issue has arisen.

4.7 Risk Management of ATS Equipment Changes

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference] and has made the adaptation provided in appendix XX.

[State] has reviewed the FHA-proposed mitigation strategy related to the ATS Equipment element of its RVSM System, as follows:

Mitigation	Actions / Activities	Hazard ID

All of these mitigations will be in place by [date].

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 is subdivided 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/procedures (LoA/Ps) 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 Acceptance of ACC Amended Agreements (LoA/Ps)

Changes to LoA/Ps 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 a policy to require additional, more senior signatures where the Adjacent or subjacent ACC is in another State. In [*Name of State*] the [*insert title and name of the officer responsible for LoA/Ps signature*] 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.

Or

The changes to the Unit Operations Manual have been reviewed by [list names and staff positions]. Their review comments have been discussed and changes to the manual have been agreed as appropriate. These have been documented in [either reference to a report, letter or memo giving comments and response to those comments, or reference to the review meeting minutes that provide the agreed response to the comments made].

5.6.3 LoA/P Control Process

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

Or

The proposed LoA/P with [name of ACC] has been reviewed by [list names and staff positions]. Their review comments have been discussed and changes to the LoA/P have been agreed where appropriate. These have been documented in [provide reference].

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*].

[or refer to desktop exercises run to explore throughout the likely effects of RVSM operations]

5.7 ATS Procedure Risk Management

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference] and has made the adaptation provided in appendix X.

[State] has reviewed the FHA-proposed mitigation strategy related to the ATS Procedures element of its RVSM System, as follows:

Mitigation	Actions / Activities	Hazard ID

All of these mitigations will be in place by [date].

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) A new flight level allocation scheme;
(c) Re-sectorisation of the upper airspace to allow the capacity in the upper airspace to increase to take advantage of the new RVSM levels;
(d) 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/P 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 Acceptance of 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.

Or

The changes to the Airspace Design have been reviewed by [list names and staff positions]. Their review comments have been discussed and changes to the manual have been agreed as appropriate. These have been documented in [either reference a report, letter or memo giving comments and response to those comments, or reference the review meeting minutes that provide the agreed response to the comments made].

6.7 Airspace Design Change Risk Management

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference] and has made the adaptation provided in Appendix XX.

[State] has reviewed the FHA-proposed mitigation strategy related to the Airspace Design element of its RVSM System, as follows:

Mitigation	Actions / Activities	Hazard ID

All of these mitigations will be in place by [date].

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 19 January 2006 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

The AFI RVSM Task Force will issue the AFI RVSM switch-over plan incorporating the results of the AFI RVSM Functional Hazard Assessment (FHA) [provide reference]. It includes appropriate consideration of the mitigation required by the FHA report.

[State] NPM has agreed to develop a national version of this plan, that will be provided in Appendix XX. This should be completed by [date].

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

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference] and has made the adaptation provided in Appendix XX.

[State] has reviewed the FHA-proposed mitigation strategy related to the Switch-over period, as follows:

Mitigation	Actions / Activities	Hazard ID

All of these mitigations will be in place by [date].

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

ICAO Annex 11 provides the standards.

8.4 Monitoring Activities

The post-implementation monitoring arrangements will continue as per current traffic data capturing procedures and will also consider the normal monitoring of safety performance by the State.

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 their ACCs. The State already supplies this information as part of its contribution to the Collision Risk Assessment (CRA) and the AFI Pre-Implementation Safety Case. The data supplied will be used, together with data from the other RVSM states, to assess the likely risk of collision in AFI RVSM region and to contribute to the AFI RVSM Post-Implementation Safety Case.

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 establishment of such monitoring arrangements is not yet determined and will be part of the national SMS activities.

8.6 Quality Assurance

It is important to ensure that the monitoring arrangements are appropriate and will be conducted efficiently and in a professionl manner.

There are several elements that provide evidence in this. They are:

[insert the elements]

8.7 Risk Management

Monitoring arrangements will help manage operational risks identified in the [State] national hazard log. These arrangements do not introduce additional risks.

APPENDIX : [State] RVSM hazard log

[State] has reviewed the AFI RVSM hazard log of the AFI RVSM Functional Hazard Assessment [provide reference].

With regards to its national RVSM core airspace, [State] has made the following adaptation:

Hazard ID	Hazard Description	Mitigations

With regards the Switch-Over period, [State] has made the following adaptation:

Hazard ID	Hazard Description	Mitigations

RVSM IMPLEMENTATION READINESS ASSESSMENT SURVEY: AFI REGION

State	

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
	RVSM Implementation Program					
1. RVSM Implementation Program – Target Date 19 January 2006	Is the National RVSM Implementation plan/Program harmonized with the AFI RVSM Regional Implementation Plan?					Conclusion: ARTF 4/5
	Has your administration developed an RVSM aircraft and operators approval program?					Conclusion: ARTF 4/7
	Has your Administration submitted a National RVSM Implementation plan/Program to ICAO Regional Program Office?					Conclusion: ARTF 4/11 National RVSM Plan
	Has the National RVSM Implementation plan/Program taken into account the users requirements?					Doc. 9574 Chapter 3 National RVSM Plan
	Has the administration determined the RVSM status of the national fleet?					Doc. 9574 Chap 3 Conclusion: ARTF 4/11 & ARTF 4/12
	Has your administration disseminated the National RVSM Implementation Program to all stakeholders?					Conclusion: ARTF 4/11 National RVSM Plan
	Has the administration designated the National Program Manager for the RVSM implementation program?					Conclusion: 4/3 National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
	RVSM Implementation Program					
	Has your administration designated an ATS Manger responsible for the ATM RVSM Sub-program?					National RVSM Plan
	Has your administration designated a Manager responsible for aircraft OPS/Airworthiness sub-program?					National RVSM Plan
	Has the administration designated a Manager responsible RVSM Safety Sub-Program?					Conclusion: 4/18 National RVSM Plan
	Will RVSM be implemented in the airspace on the date agreed upon by AFI?					Conclusion : ARTF 4/5
	Has your administration published the procedures to accommodate aircraft in RVSM airspace?					Conclusion: ARTF 4/11 National RVSM Plan
	Has your administration made provision to accommodate non-RVSM State aircraft in RVSM airspace?					Conclusion: ARTF 4/9 ICAO Doc 7030/4 National RVSM Plan
	Have national rules/regulations been developed/published for RVSM implementation?					Conclusion: ARTF 4/8

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
	RVSM Implementation Program					
	Has your administration assess the impact of RVSM implementation on controller automation systems and plan for upgrades/ modifications?					Conclusion: ARTF 4/11 National RVSM Plan
	Have documents related with RVSM approval of aircraft and operators of the JAA Temporary Guidance Leaflet (TGL) 6 y/o FAA Document 91 RVSM been adopted?					Conclusion: ARTF 4/7
	Has the RVSM Advisory Circular been adopted for RVSM approval of aircraft and operators?					Conclusion: ARTF 4/7
	Has your Administration established National RVSM approved Aircraft Database?					Doc. 9574 Conclusion: ARTF 4/4
	Are RVSM approvals granted to aircraft and/or operators registered in your State?					Conclusion: ARTF 4/12
	Is a letter of Authorization issued when RVSM approval to individual aircraft granted?					
	Has AFI Regional monitoring Agency (ARMA) form been completed to communicate the status of RVSM approval or withdrawal to ARMA?					Conclusion: ARTF 4/4

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
	RVSM Implementation Program					
	Has the Guidance material on the implementation of a 300 M (1000 FT) vertical separation minimum between FL290 and FL410 inclusive for application in the airspace of the AFI Region been adopted?					Conclusion: ARTF 4/4
	Has National RVSM implementation legislation been published?					Doc. 9574 Conclusion: ARTF 4/8
	Has the AIC been published in advance informing stakeholders of the date for RVSM implementation?					Conclusion: ARTF 4/11
	Is the administration disseminating RVSM legislation and documentation through adequate means?					Conclusion: ARTF 4/11
	Has the Guidance material on the implementation of a 300 M (1000 FT) vertical separation minimum between FL290 and FL410 inclusive for application in the airspace of the AFI Region been adopted?					Conclusion: ARTF 4/4
	Has your administration analysed the impact that would have in RVSM implementation if the required documentation were not taken into account?					Conclusion: ARTF 4/18

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Operations & Airworthiness						
2. RVSM Operations &Airworthiness	Has your administration implemented the National RVSM Operator/ Aircraft approval Program?					Doc. 9574 Chapter 4.2 Conclusion: ARTF 2/8 & ARTF 4/11
	Does the program cover aircraft airworthiness certification (approval of modifications and major repairs) and operational separately?					Doc. 9574 Chapter 4 National RVSM Plan
	Will the program be completed before the RVSM implementation date 19 January 2006?					National RVSM Plan Conclusion: APIRG 14/21
	Has your Administration adopted TGL6 Revision 1 for approval of operators/aircraft for RVSM Operations?					Doc. 9574 Chapter 4 Conclusion: ARTF 4/7
	Has your administration published the National RVSM Operator/ Aircraft approval Legislation?					Doc. 9574 Chapter 4 Conclusion: ARTF4 2/8 & ARTF 4/8
	Has your administration published the required maintenance program to ensure RVSM airworthiness?					Doc. 9574 Chapter 5 National RVSM Plan
	Has your administration developed a Database for RVSM approved aircraft?					Doc. 9574 Chapter 5 Conclusion: ARTF4 4/11 National RVSM Plan
	Has your administration completed a RVSM approved aircraft readiness assessment?					Conclusion: ARTF4 4/12

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
	Operations & Airworthiness					
3. RVSM Operations & Airworthiness Training	Has an RVSM training program been prepared for OPS/Airworthiness personnel?					Doc. 9574 Chapter 4/5 Conclusion: ARTF 4/6 & ARTF 4/11
	Does the program cover aircraft airworthiness certification (approval of modifications and major repairs) and operational (procedures approval and operator training program) separately?					Doc. 9574 Chapter 4 Conclusion: ARTF 4/7
	Will the program be completed before the RVSM implementation date 19 January 2006? If such were the case, the finalization of the training program?					Conclusion: APIRG 14/21
	Does the program have the RVSM training material in OPS/ Airworthiness areas?					
	Which documentation did the administration use to prepare RVSM training material?					
	Has the training material been approved by the corresponding authority?					

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
	Operations & Airworthiness					
	How many phases are envisaged for the training?					
	Has OJT been foreseen and completed before RVSM implementation date?					
	Does the administration make sure that personnel training is appropriate and carried out in a professional manner?					
	Do OPS/Airworthiness instructors have sufficient experience?					
	Are the OPS/Airworthiness instructors used for training qualified to provide on the job training (OJT)?					
	Can the administration assure that the necessary time for an appropriate training was used or will be used?					
	Does training include the establishment of adequate refresher courses, if necessary?					
	Has the administration analysed the impact that would have in RVSM implementation if the requirements for personnel training were not taken into account?					

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Air Traffic Management						
4. Modification in the Airspace Structure	Has your Administration implemented your RVSM National Plan?					Conclusion: ARTF 4/3 National RVSM Plan
	Will your Administration implement RVSM in the Airspace as identified by AFI?					
	Has your administration identified new entry/exit points to RVSM airspace?					Doc. 9574 National RVSM Plan
	Has your administration identified modifications to the existing route network?					Doc. 9574 National RVSM Plan
	Has your administration designated transition airspaces between RVSM and non-RVSM airspaces?					Doc. 9574 National RVSM Plan
	Has your administration identified Modifications in airspace sectorization for RVSM purposes?					Doc. 9574 Chapter 5 Conclusion: 2/13
	If such were the case, was the airspace structure subject to simulations?					Doc. 9574 National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Air Traffic Management						
5. ATC Procedures	Has your administration identified changes in civil/military coordination?					Doc. 9574 Chapter 5 Conclusion: ARTF 4/2
	Does you administration consider air traffic flow management for your State?					
	Has the administration adopted the Cruise Levels Table of Appendix to ICAO Annex for the assignment of cruise levels in RVSM airspace?					Annex 2 Conclusion : ARTF 2/13
	Has the administration adopted adequate national contingency procedures?					Doc. 9574 Chapter 5 ICAO Doc 7030/4 Conclusion: ARTF 4/9 National RVSM Plan
	Have the procedures been duly supervised in order not to affect the safety in air operations?					Doc. 9574 Chapter 3
	Has ICAO guidance material been used in the preparation of procedures?					Conclusion: ARTF 2/13 National RVSM Plan
	The procedures and associated phraseology been included in the operational manual of the ATS unit?					Doc. 9574 Chapter 5 Conclusion: ARTF 2/13 National RVSM Plan
	Has ATC procedures been reviewed with operational personnel from ATC units?					Doc. 9574 Chapter 5 Conclusion: ARTF 3/6 National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Air Traffic Management						
	Have the procedures affecting adjacent ATS been duly coordinated, approved and included in the letters of operational agreement?					Doc. 9574 Chapter 5 Conclusion: ARTF 4/11 National RVSM Plan
	Have ATC procedures and associated phraseology been subject to simulations?					Doc. 9574 Chapter 5 Conclusion : ARTF 3/6 National RVSM Plan
	Are RVSM ATC procedures being disseminated by the adequate means?					Conclusion: ARTF 4/11
	Has the administration analysed the impact it would have in RVSM implementation if the changes required have not been taken into account?					Doc. 9574 Chapters 3/5. National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Air Traffic Management						
6. ATC Equipment	Does your administration has a modification plan of ATC equipment as a result of RVSM?					Doc. 9574 Chap. 5 Conclusion: ARTF2/13 National RVSM Plan
	Has your administration ensured that modifications in ATC equipment are appropriate?					Doc. 9574 Chap. 3 Conclusion: ARTF 4/11
	Do changes circumscribe to FDPS?					Doc. 9574 Chap. 3 National RVSM Plan
	Do changes circumscribe to RDPS?					Doc. 9574 Chap. 3 National RVSM Plan
	Do changes circumscribe to visualizing?					Doc. 9574 Chap. 3 National RVSM Plan
	Do changes circumscribe to STCA?					Doc. 9574 Chap. 3 National RVSM Plan
	Do changes circumscribe to MTCA?					Doc. 9574 Chap. 3 National RVSM Plan
	Do changes circumscribe to the systems software?					Doc. 9574 Chap. 3 National RVSM Plan
	Do changes circumscribe to ATC simulators?					Doc. 9574 Chap. 3 National RVSM Plan
	Does your administration have a contingency plan in case of delays in case of suffering delays in ATC equipment updating?					Doc. 9574 Chap. 5

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Air Traffic Management						
7. RVSM ATCO Training	Has an RVSM training program been prepared for ATCOs?					Doc. 9574 Chap. 5 Conclusion: ARTF 3/6
	Is the program addressed for all ATC personnel?					Doc. 9574 Chap. 5 Conclusion: ARTF4/11
	Shall the program be completed before the RVSM implementation dated 19 January 2006? If such were the case, indicate finalization date of training program.					Conclusion: APIRG 14/21 Doc. 9574 Chap. 5 National RVSM Plan
	Does the program contemplate aspects related with the responsibilities of ATCOs?					Doc. 9574 Chap. 5 National RVSM Plan
	Does the program have RVSM training material?					Doc. 9574 Chap. 5 Conclusion: ARTF2/13 National RVSM Plan
	Which documentation did the administration use to elaborate RVSM?					Doc. 9574 Chap. 5 National RVSM Plan
	Has the training material been prepared under strict control and approved by the Operational Unit or the corresponding training centre?					Doc. 9574 Chap. 5 Conclusion: ARTF 3/6 National RVSM Plan
	Has OJT been programmed? When will this program end?					Doc. 9574 Chap. 5 National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
Air Traffic Management						
	Does the administration ensure that the personnel training is appropriate and is carried out professionally?					Doc. 9574 Chap. 5 National RVSM Plan
	Do instructors have training and sufficient knowledge of RVSM Operations and do/did they have experience enough?					Doc. 9574 Chap. 5 National RVSM Plan
	Are instructors used in training or were they qualified to provide OJT training?					Doc. 9574 Chap. 5 National RVSM Plan
	May the administration ensure that the necessary time is or was used for an appropriate training?					Doc. 9574 Chap. 5 National RVSM Plan
	Does your administration foresee to establish adequate refreshing courses?					Doc. 9574 Chap. 5 National RVSM Plan
	Has your administration analysed the impact it would have in RVSM implementation if no personnel training requirements were taken into account?					Doc. 9574 Chap. 5 National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Safety Assurance						
8. RVSM Safety Assurance from FL 290 to FL 410 inclusive	Has your Administration implemented your RVSM National Safety Plan?					Doc. 9574 Chap. 3 Conclusion: ARTF 4/18 & ARTF 4/19
	Is the National RVSM Safety plan harmonized with the AFI RVSM Safety Policy?					Conclusion: ARTF 4/11
	Has your Administration submitted a National RVSM Safety plan to ICAO Regional Program Office?					Conclusion: ARTF 4/11
	Has your Administration informed National Operators of RVSM Implementation requirements?					National RVSM Plan
	Has your Administration adopted TGL6 Revision 1 for approval of operators/aircraft for RVSM Operations?					Doc. 9574 Chapter 3 Conclusion: ARTF 4/7
	Has your administration implemented the National RVSM Operator/ Aircraft approval Program?					Doc. 9574 Chap. Conclusion: ARTF 4/12
	Has your administration disseminated the National RVSM Implementation Program to all stakeholders?					Conclusion: ARTF4/11
	Has your administration implemented the National RVSM ATS Training Program?					ICAO Doc 7030/4 Conclusion: ARTF 2/7 & ARTF 4/6 National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Safety Assurance						
	Has your administration published guidelines for RVSM Pilot Training?					Conclusion: ARTF 4/11 National RVSM Plan
	Has your administration developed a program for changes to ATC equipment to support the implementation of RVSM?					Conclusion: ARTF 4/11 National RVSM Plan
	Has the changes to ATS Equipment satisfactorily been installed?					Conclusion: ARTF4/17 National RVSM Plan
	Has the changes to ATS Procedures been approved?					Conclusion: ARTF 4/5 & 4/17
	Has your administration published the procedures to accommodate aircraft in RVSM airspace?					Conclusion: ARTF 4/8 & 4/9 National RVSM Plan
	Has the ATC Manual been approved?					Conclusion: ARTF 2/7 & ARTF4/11 National RVSM Plan
	Is the ATC Manual consistent with ICAO Doc 7030/4?					Conclusion: ARTF 4/9
	Has your administration coordinated the procedures required for RVSM at the ACC with adjacent ACCs?					

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Safety Assurance						
	Has your administration amended the required Letters of Agreement (LoA) with adjacent ACCs for RVSM Operations?					Conclusion: ARTF 4/11
	Has the ATSU Operations Manual been amended to include changes as a result of RVSM?					
	Has your administration approved the changes to airspace design to support the implementation of RVSM?					
	Has your administration developed special procedures to enable safe switchover to RVSM?					
	Has your administration developed a program for ATC to report operational data errors?					Conclusion: ARTF 4/4

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Monitoring						
9. RVSM Operations Monitoring	Has the administration established adequate measures so that there is a monitoring before, during and after RVSM implementation in order to verify that the safety level is met?					Annex 11 Para. 2.26 Conclusion: ARTF 2/1 Conclusion: ARTF 4/4 National RVSM Plan
	Does the administration demand the operators/users the presentation of a monitoring program of aircraft for its approval?					
	Has the administration implemented a data collection program of large height deviations (LHD)?					Conclusion: ARTF 4/4
	Is this information submitted to ARMA monthly basis?					Conclusion: ARTF 4/4
	Is there a database with such information?					Conclusion: ARTF 4/4 National RVSM Plan
	Has the administration implemented a monthly data collection program for errors in the ATC communications circuit?					Doc. 9574 Chapter 5 National RVSM Plan
	Does the administration have a database with such information?					Conclusion: ARTF 4/4
	Is the information submitted to ARMA on the total of IFR movements on a monthly basis?					Conclusion: ARTF 4/4

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Monitoring						
	Is there a database with such information?					Conclusion: ARTF 4/4
	Is information related to turbulence reports submitted to ARMA?					Conclusion: ARTF 4/4
	Is there a database with such information?					Conclusion: ARTF 4/4
	Has the administration established a continuous monitoring of the system?					Annex 11 para. 2.26 Doc. 9574 Chapter 6
	Has the administration assessed the impact that the lack of a continuous monitoring program and RVSM operations monitoring would have in air safety?					National RVSM Plan

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Switch-Over						
10. RVSM Switchover	Has your administration adopted or will it adopt the measures to ensure a safe and effective transition to RVSM?					Doc. 9574 Chapter 5 National RVSM Plan Conclusion: ARTF4/11
	Have special procedures been established for the switchover period?					Doc. 9574 Chapter 5 National RVSM Plan
	Are contingency plan adequate for the switchover period?					Doc. 9574 Chapter 5 National RVSM Plan
	Has the administration foreseen the information process to ARMA during the next tour for RVSM implementation?					Doc. 9574 Chapter 5 National RVSM Plan
	Has the administration foreseen the information process to ARMA during the following 12 and 24 hours after RVSM implementation?					Doc. 9574 Chapter 5 National RVSM Plan)
	Has the administration assessed the impact that the lack of an RVSM transition plan and associated contingency measures could have in safety?					National RVSM Plan.

SUBJECT	ITEMS ASSESSED	TD	DC	NA	REMARKS	Ref. ICAO Regional/National Doc
RVSM Resources						
11. Assignment of Resources for the Implementation of RVSM program	Have adequate measures been adopted in order to have the necessary resources for a successful RVSM implementation?					Conclusion: ARTF 4/11 National RVSM Plan
	For changes in ATC equipment?					Conclusion: ARTF 4/17 & 4/18
	For personnel training and associated material?					Conclusion: ARTF 4/17 & 4/18
	For training of OPS/Airworthiness inspectors?					Conclusion: ARTF 4/17 & 4/18
	To face administrative costs?					National RVSM Plan
	Has the administration evaluated the impact that the lack of assignment of sufficient resources in the RVSM national implementation program would have in air safety?					National RVSM Plan

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STATES	NPM	AIC	LOA	State Plan	AFI Safety Policy	ATC Manual	AC RVSM Readiness	ATC Training	Pilot Training	State AC Approval	Legis lation	Safety Forms	Military Ready	Semi nar
Algeria	Y	Y					Y	Y				Y		Y
Angola	Y	Y					Y	Y				Y		Y
Benin		Y										Y		
Botswana	Y			Y	Y		Y	Y				Y	Y	Y
Burkina Faso		Y										Y		
Burundi	Y											Y		
Cameroon	Y	Y					Y	Y				Y		Y
Cape Verde												Y		
Central African Republic		Y										Y		
Chad		Y										Y		
Congo		Y										Y		
Comores		Y						Y				Y		
Cote d'Ivoire		Y												
DRC	Y											Y		
Djibouti	Y	Y										Y		Y
Egypt	Y											Y		Y
Ethiopia	Y	Y		Y		Y	Y	Y	Y	Y		Y	Y	Y
Eritrea	Y	Y			Y			Y	Y		Y	Y	Y	
Equatorial Guinea		Y										Y		
Gabon	Y											Y		Y
Gambia	Y	Y										Y		
Ghana	Y	Y		Y	Y	Y	Y	Y	Y			Y	Y	Y
Guinea	Y	Y		Y	Y	Y		Y				Y		Y
Guinea Bissau												Y		
Kenya	Y	Y		Y	Y		Y	Y	Y	Y		Y	Y	Y
Lesotho	Y											Y		

STATUS OF AFI RVSM STATES RVSSM READINESS SURVEY

STATES	NPM	AIC	LOA	State Plan	AFI Safety Policy	ATC Manual	AC RVSM Readiness	ATC Training	Pilot Training	State AC Approval	Legislation	Safety Forms	Doc 7030	Military Ready	Seminar
Liberia	Y	Y		Y	Y	Y		Y				Y			Y
Libya															
Madagascar	Y	Y		Y			Y	Y				Y			Y
Mali	Y	Y										Y			
Malawi	Y							Y				Y			
Mauritius	Y	Y		Y	Y		Y		Y	Y	Y	Y			Y
Morocco	Y	Y										Y			
Mozambique	Y	Y		Y		Y	Y	Y				Y			Y
Namibia	Y							Y				Y			
Niger	Y	Y										Y			
Nigeria	Y	Y		Y				Y				Y			Y
Réunion	Y											Y			Y
Rwanda	Y	Y	Y	Y	Y			Y				Y			
Sao Tome and Principe	Y														Y
Senegal	Y	Y										Y			Y
Seychelles	Y						Y	Sept 05	Y	Y				N/A	Y
Sierra Leone	Y	Y		Y	Y	Y		Y				Y			Y
Somalia (CACAS)	Y	Y						Y							Y
South Africa	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y			Y
Sudan	Y	Y						Y							Y
Swaziland	Y	Y						Y				Y		Y	
Tanzania	Y	Y		Y	Y	Y	Y	Y	Y	Y		Y		Y	Y
Tunisia	Y	Y													
Togo	Y	Y										Y			
Uganda	Y	Y		Y	Y	Y	Y	Y	Y	Y		Y		Y	Y
Zambia	Y	Y		Y	Y	Y	Y	Y	N/A			Y			Y
Zimbabwe	Y	Y		Y	Y		Y	Y				Y		Y	Y

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

9 AUGUST 2005

Prepared by the Secretary of the RVSM/TF

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	**Doc 7030 amendment Proposal Circulate proposal to States (c) ANC Approval**	**01/06/04 15/06/04 May 06**	**Completed Completed In Progress**	**ICAO ICAO ICAO**	*** Completed 31 May * Approval draft by (TF/6) *Approval final draft by TF/9 March 2006**
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 1 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**

AFI RVSM IMPLEMENTATION ACTION PLAN					
ID	Description	Target Date	Status	Resources	Remarks
14	States to send AIC re RVSM Implementation intention	Oct 05	In Progress	ICAO/States	Continuous
15	Confirm target AIRAC implementation date (AIP Supplement to be published)	Oct 05	In progress	ICAO/States	TF8 to review requirement
16	Regional RVSM implementation status reports	Ongoing	Ongoing	ICAO	Monthly
17	State Readiness Assessment, CRA, PISC, Doc.7030	March 2006	In Progress	ICAO	TF/9
18	RVSM/ARTF/5	15-16/11/04	Completed	ICAO/RVSM ITF/5	
19	RVSM/ARTF/6	25-27/05/05	Completed	ARTF/6	
20	RVSM/ARTF/8	08-09/08/05 10-12/08/5	Completed Completed	ARTF/7 ATS SG/8	
21.	RVSM/ARTF/8 and RVSM Seminar	10 – 14 October 2005	In Progress		
22.	RVSM/ARTF/9 meeting	March 06	In Progress	ARTF	
23.	RVSM TF/10 meeting and GO/NO GO meeting	June 06	In Progress	States	TF/10 to confirm date
24	Publish Trigger NOTAM	June 06	In Progress	States	TF/10 and GO/NO GO meeting to confirm date
25	Develop switch over plan	TBA ARPO		ICAO	TF8
	Aircraft Operations and Airworthiness				
26	Regional OPS/Airworthiness RVSM Guidance Doc	21/11/03	Completed	ICAO	Sent 05 Dec 2003 to states for action.

AFI RVSM IMPLEMENTATION ACTION PLAN					
ID	Description	Target Date	Status	Resources	Remarks
27	Develop regional Pilot Training RVSM Guidance Material	30/04/04	Completed	IATA	Sent to States for action May 2004.
28	Aircraft Operational approval process guidelines	31/05/04	Completed	States, ICAO	Sent to States for action June 2004.
29	Aircraft RVSM Approval Survey	On Going	In progress	ICAO/States	Continuous
30	Ensure aircraft/operator approval process	On Going	In progress	ICAO/ARMA/IATA	Airworthiness training to be provided for State authorities
	Air Traffic Management				
31	National RVSM plan	31/03/04	Ongoing	States, ICAO	States to complete by June 2006.
32	National Safety Plan Validation Panel	12-23-09-05	In progress	ARMA/IATA/ICAO	
33	APIRG/15 Consideration of TF Reports	25-30-9-05	In Progress	ICAO	
34	Regional ATC OPS Manual	31/03/04	Completed	ICAO	Sent to States – 05/05/04
35	Determine the limits of RVSM airspace	30/06/04	Completed	States/ICAO	TF4 verified limits.
36	Regional ATC Training Program & Guidance Material	June 06	On Going	States	Instructor training completed. Refresher Retraining necessary for all ops staff
37	Simulations to assess ATC workload and possible need for airspace/air route Sector changes	March 06	In Progress	States	In National RVSM Plan
38	Letters of Agreement	March 2006	Completed	States	Specimen LOA sent to States.
39	Military aviation preparation	March 06	In progress	States	In National RVSM Plan
40	National RVSM Regulatory Material	March 06	In progress	States, ICAO	To Identify requirements
41	States assess the impact of RVSM	Sept 05	In progress	States	In National Plan

AFI RVSM IMPLEMENTATION ACTION PLAN					
ID	**Description**	**Target Date**	**Status**	**Resources**	**Remarks**
	implementation on controller automation systems and plan for upgrades/ modifications				
42	**Collect weather and turbulence data for analysis**	**31 /05/05**	**Completed**	**ARMA ICAO/States**	**TF/7**
43	**a) States to conduct local ATC RVSM training** **b) Re-training for all operational Staff**	**May 06** **July 2006**	**In progress**	**States**	**TF/10 and GO/NO GO meeting June 2006**
	RVSM Safety Assurance				
44	**Conduct preliminary data collection and readiness assessment**	**On Going**	**In progress**	**ARMA/ICAO**	**Ongoing**
45	**Develop AFI RVSM Safety Policy**	**30/06/04**	**Completed**	**RVSM/ARTF4**	**Sent to States for publication July 2004.**
46	**a) Develop National RVSM Safety Plan**	**30/06/04**	**Completed**	**ICAO**	**Sent to States for Action July 2004.**
	b) Conduct NSP workshops facilitated by ATC experts	**July 05**	**Completed**	**ICAO /IATA/ATNS/ASEC NA**	**Nairobi & Dakar July 2005**
	c) Submit NSP's for validation	**31/08/05**	**In Progress**	**States**	**TF7**
	d) Submit final NSP's after validation comments have being taken into account	**31/08/05**		**States**	**TF7**
	e) Once NSP's are implemented, DCA's to confirm State readiness to Implement RVSM in writing	**June 06**		**States**	**TF7**
	f) Update State readiness document	**June 06**		**ICAO**	
47	**RVSM Functional Hazard Assessment (FHA)**	**4-8/04/05**	**Completed**	**ARMA/ICAO**	**3 FHA meetings conducted** **Final FHA 4-8/04/05.**

AFI RVSM IMPLEMENTATION ACTION PLAN					
ID	**Description**	**Target Date**	**Status**	**Resources**	**Remarks**
					Report Completed May 2005 and adopted.
48	**Validate Functional Hazard Assessment**	**31/05/05**	**Completed**	**RVSM ARTF/6**	**TF/6/25-27/05/05**
49	**Update activities on NSPVP, PISC, CRA, Doc.7030**	**10-12/10/05**		**TF/8**	**October 2005**
50	**RVSM Collision Risk Assessment**	**March 06**	**In progress**	**ARMA/ICAO/IATA**	**Revised assessment**
51	**Validate Collision Risk Assessment**	**March 06**	**In progress**	**RVSM ARTF/9**	
52	**Develop AFI Pre-Implementation Safety Case**	**March 06**	**In Progress**	**ARMA/ICAO/IATA**	**TF9 review PISC progress**
53	**AFI Pre-Implementation Safety Case: APIRG/ANC**	**May 06**	**In Progress**	**ARPO/ANC/IATA**	
54	**RVSM Implementation**	**28/09/06**		**States**	**Tentative target date.**
	Monitoring Agency				
55	**Evaluate options for setting up AFI RMA**	**21/11/03**	**Completed**	**RVSM/ITF2**	**Completed on time**
56	**Identify an AFI RMA**	**21/11/03**	**Completed**	**RVSM/ITF/2**	**Completed on time**
57	**Establish an AFI RMA.**	**31/03/04**	**Completed**	**South Africa/ICAO**	**Completed on time**
	Post Implementation Safety Case (POSC)				
58	**Validate implementation readiness template**	**15/11/04**	**Completed**	**ICAO/ARMA**	
59	**Data collection to continue for submission to ARMA**	**Monthly**	**In Progress**	**States**	
60	**Evaluate system safety after implementation plus 3, 6, 12 and 24 months**			**ARMA**	
61	**Monitor system safety in adjacent Regions**			**ARMA**	

ATTACHMENT

PROPOSAL FOR AMENDMENT TO THE REGIONAL SUPPLEMENTARY PROCEDURES – DOC.7030/4 AFRICAN INDIAN OCEAN (AFI) REGION

(Serial No. ESAF-S 04/1 – AFI RAC/1)

a) Proposed by:

AFI Planning and Implementation Regional Group (APIRG)

b) Proposed amendment: *(cf. Regional Supplementary Procedures,* Doc.7030/4 – AFI, Part 1, Rules of the Air, Air Traffic Services and Search and Rescue, incorporating Amendment No.206). Editorial note**:** Amendments are arranged to show deleted text using strikeout (~~text to be deleted~~), and added text with grey shading (text to be inserted).

Amend the SUPPs in the AFI Region as follows:

AFI REGIONAL SUPPLEMENTARY PROCEDURES

PART 1 – RULES OF THE AIR, AIR TRAFFIC SERVICES AND SEARCH AND RESCUE

These procedures are supplementary to the provisions contained in Annex 2, Annex 6 (Part II), Annex 11, PANS-ATM (Doc 4444) and PANS-OPS (Doc 8168).

1.0 FLIGHT RULES

1.1 Visual flight rules (VFR)
(A2 – 4.7 and 4.8)

1.1.1 At selected aerodromes, only VFR flights to be operated within a control zone established at an aerodrome serving international flights and in specified portions of the associated terminal control area shall:

a) have two-way radio communications;

b) obtain clearance from the appropriate ATC unit; and

c) report positions, as required.

Note.- The phrase "specified portions of the associated terminal control area" is intended to signify at least those portions of the TMA used by international IFR flights in association with approach, holding, departure and noise abatement procedures.

1.2 Instrument flight rules (IFR)
(A2 – 2.2 and Chapter 5)

Note.- Annex 2, 2.2 permits a choice for a flight to comply with either the instrument flight rules or the visual fight rules when operated in visual meteorological conditions subject to certain limitations in Chapter 4 of the Annex. The following indicates certain further restrictions to that choice.

1.2.1 Special application of instrument flight rules

1.2.1.1 Flights shall be conducted in accordance with the instrument flight rules (even when not operating in instrument meteorological conditions) when operated above flight level 150.

1.3 Changes of flight levels
(A2 – 5.2.2)

1.3.1 All changes of flight levels required by transition from the system of designated cruising levels for flights along controlled routes to the semicircular system of cruising levels, or vice versa, shall be made at points within controlled airspace.

1.3.2 The specific points to be used for the changes of flight levels mentioned in 1.3.1 shall be subject of coordination between the ATS units concerned, bearing in mind the need to avoid border points or other points where transfer of communications/transfer of responsibility would be adversely affected.

1.4 Air traffic advisory service
(P-ATM, 9.1.4)

Note.- The PANS-ATM leaves it to the discretion of the pilot whether or not to obtain air traffic advisory service when available. The following procedures make it compulsory to obtain such service under certain circumstances.

1.4.1 All IFR flights shall comply with the procedures for air traffic advisory service when operating in advisory airspace.

1.5 Reduced Vertical Separation Minimum (RVSM) of 300 m (1,000 ft)

1.5.1 Area of Applicability

1.5.2 RVSM shall be applicable in that volume of airspace between FL290 and FL410 inclusive in the following flight information regions/upper flight information regions (FIRs/UIRs):

Accra, Addis Ababa, Algiers, Antananarivo, Asmara, Beira, Brazzaville, Cairo, Canarias, Cape Town, Casablanca, Dakar, Dar es Salaam, Entebbe, Gaborone, Harare, Johannesburg, Kano, Khartoum, Kinshasa, Lilongwe, Luanda, Lusaka, Mauritus,
Mogadishu, Nairobi, N'Djamena, Niamey, Roberts, Sal Oceanic, Seychelles, Tripoli, Tunis, Windhoek

Note. – The volume of airspace specified in 1.5.2 will be referred to as " AFI RVSM airspace.

2.0 FLIGHT PLANS

2.1 Contents of flight plans
(A2 – 2.3; P-ATM, 4.4.1 and Appendix 2)

2.1.1 Route

2.1.1.1 Whenever possible, flights should be authorized to fly direct between any two intermediate or terminal points of the AFI ATS route network. In this case, flight progress reports should be made in relation to the significant points defining the basic route.

2.1.2 Mach number

2.1.2.1 For turbo-jet aircraft intending to operate at or above FL 250 with FIR Canarias. The Mach number planned to be used shall be specified in Item 15 of the flight plan.

2.2 Presentation of flight plan
(A2 – 3.3.1.4)

2.2.1 The appropriate ATS authority exercising the Annex 2 provision, 3.3.1.4, to prescribe a lead-time other than 60 minutes before departure for the submission of a fight plan concerning a flight to be provided with air traffic control service, air traffic advisory service or flight information service shall, as far as practicable, prescribe a period of 30 minutes for that purpose.

2.3 RVSM Approval status and aircraft registration

2.3.1 Item 10 of the flight plan (Equipment) shall be annotated with the letter W if the aircraft and operator have received RVSM State approval. Furthermore, the aircraft registration shall be indicated in Item 18 of the flight plan.

2.3.2 Submission of a flight plan

2.3.2.1 Information relative to an intended flight or portion of a flight, to be provided to air traffic services units, shall be in the form of a flight plan.

2.3.2.2 In addition to military operations, operators of customs or police aircraft shall insert the letter M in Item 8 of the ICAO flight plan form.

2.3.3 Use of repetitive flight plans

2.3.3.1 Provision shall be made so that repetitive flight plans be accepted for any flight conducted on 19 January 2006 in the AFI RVSM airspace.

2.3.3.2 Flight planning for RVSM approved aircraft

2.3.3.3 Operators of RVSM approved aircraft shall indicate the approval status by inserting the letter W in Item 10 of the ICAO flight plan form, regardless of the requested flight level.

2.3.3.4 Operators of RVSM approved aircraft shall also include the letter W in Item Q of the RPL, regardless of the requested flight level. If a change of aircraft operated in accordance with a repetitive flight plan results in a modification of the RVSM approval status as stated in Item Q, a modification message (CHG) shall be submitted by the operator.

2.3.3.5 Operators of RVSM approved aircraft and non-RVSM approved State aircraft intending to operate within the AFI RVSM airspace, as specified in 2.1, shall include the following in Item 15 of the ICAO flight plan form:

a) the entry point at the lateral limits of the AFI RVSM airspace and the requested flight level for that portion of the route commencing immediately after the RVSM entry point; and

b) the exit point at the lateral limits of the AFI RVSM airspace and the requested flight level for that portion of the route commencing immediately after the RVSM exit point.

2.3.3.6 Operators of non-RVSM approved State aircraft with a requested flight level of FL 290 or above shall insert STS/NON RVSM in Item 18 of the ICAO flight plan form.

2.3.3.7 Flight planning for non-RVSM approved aircraft

2.3.3.8 Except for operations within the AFI RVSM transition airspace, operators of non-RVSM approved aircraft shall flight plan to operate outside the AFI RVSM airspace.

2.3.3.9 Operators of non-RVSM approved aircraft intending to operate from a departure aerodrome outside the lateral limits of the AFI RVSM airspace to a destination aerodrome within the lateral limits of the AFI RVSM airspace shall include the following in Item 15 of the ICAO flight plan form:

a) the entry point at the lateral limit of the AFI RVSM airspace; and

b) a requested flight level below FL 290 or above FL410 for that portion of the route commencing immediately after the entry point.

2.3.3.10 Operators of non-RVSM approved aircraft intending to operate from a departure aerodrome to a destination aerodrome which are both within the lateral limits of the AFI RVSM airspace shall include in Item 15 of the ICAO flight plan form a requested flight level below FL 290 or above FL410.

2.3.3.11 Operators of non-RVSM approved aircraft intending to operate from a departure aerodrome within the lateral limits of the AFI RVSM airspace to a destination aerodrome outside the lateral limits of the AFI RVSM airspace shall include the following in Item 15 of the ICAO flight plan form:

a) a requested flight level below FL 290 or above FL410 for that portion of the route within the lateral limits of the AFI RVSM airspace; and

b) the exit point at the lateral limit of the AFI RVSM airspace, and the requested flight level for that portion of the route commencing immediately after the exit point.

2.3.3.12 Operators of non-RVSM approved aircraft intending to operate from a departure aerodrome to a destination aerodrome which are both outside the lateral limits of the AFI RVSM airspace, with a portion of the route within the lateral limits of the AFI RVSM airspace, shall include the following in Item 15 of the ICAO flight plan form:

a) the entry point at the lateral limit of the AFI RVSM airspace, and a requested flight level below FL 290 or above FL 410 for that portion of the route commencing immediately after the entry point; and

b) the exit point at the lateral limit of the AFI RVSM airspace, and the requested flight level for that portion of the route commencing immediately after the exit point.

3.0 AIR-GROUND COMMUNICATIONS AND IN-FLIGHT REPORTING

Note.- Annex 2, 3.6.3, 3.6.5.1 and 5.3.3 and PANS-ATM, 4.11, require controlled flights and certain IFR flights outside controlled airspace to maintain a continuous listening watch on the appropriate radio frequency and to report positions in specified circumstances. The following expands such requirements and specifies additional details regarding the transmission and contents of in-flight reports.

3.1 Application
(A2 – 3.6.3, 3.6.5, 5.3.3; P-ATM, 4.11)

3.1.1 All aircraft on VFR flights, and aircraft on IFR flights outside controlled airspace, shall maintain a watch on a radio station furnishing communications for the unit providing flight information service in the flight information region and file with that station information as to their position unless otherwise authorized by the State overflown.

3.2 Time or place of position reports
(A2 – 3.6.3, 3.6.5, 5.3.3; P-ATM, 4.11)

3.2.1 Position reports additional to those required by the general position-reporting procedures shall be made when entering or leaving controlled or advisory airspace.

3.3 Transmission of position reports
(P-ATM, 4.11)

3.3.1 The last position report before passing from one flight information region to an adjacent flight information region shall also be made to the ATS unit serving the airspace about to be entered.

3.4 Air-Ground Communication Failure Procedures

3.4.1 As soon as it is known that two-way communication has failed, ATC shall maintain a vertical separation of 600m (2000ft) between an aircraft with radio communication failure and another aircraft when both aircraft are operating within the AFI RVSM airspace, unless the horizontal separation between the aircraft is considered adequate. The foregoing is based on the assumption that the aircraft will operate in accordance with 3.4.2 or 3.4.3.

Visual Meteorological Conditions (VMC)

3.4.2 Except as provided for in 3.4.3, a controlled flight experiencing communication failure in VMC shall:
a) set transponder to Code 7600;
b) continue to fly in VMC;
c) land at the nearest suitable aerodrome;
d) report its arrival time by the most expeditious means to the appropriate ATS unit.

Instrument Meteorological Conditions (IMC)

3.4.3 A controlled IFR flight experiencing communication failure in IMC, or where it does not appear feasible to continue in accordance with 3.4.2, shall:

a) set transponder to Code 7600; and

b) maintain for a period of 7 minutes the last assigned speed and level or the minimum flight altitude, if the minimum flight altitude is higher than the last assigned level.

FIRs.

The period of 7 minutes commences:
i) if the aircraft is operating on a route without compulsory reporting points or has been instructed to omit position reports:

1) at the time the last assigned level or minimum flight altitude is reached, or

2) at the time the aircraft sets transponder to Code 7600, whichever is later; or if the aircraft is operating on a route with compulsory reporting points and has not been instructed to omit position reports:

i) at the time the last assigned level or minimum flight altitude is reached, or

ii) at the previously reported pilot estimate for the compulsory reporting point, or

iii) at the time the aircraft fails to report its position over a compulsory reporting point, whichever is later;

Note 1:-The period of 7 minutes is to allow the necessary air traffic control and co-ordination measures.

Note 2:- instrument meteorological conditions (IMC), aircraft will maintain the last assigned speed and level or minimum flight altitude for a period of 20 minutes instead of 7 minutes.

c) thereafter adjust level and speed in accordance with the filed flight plan;

Note: As regards changes to levels and speed, the Filed Flight Plan, which is the flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes will be used.

d) if being radar vectored or proceeding offset according to RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;

Note: As regards the route to be flown or the time to begin descent to the arrival aerodrome, the Current Flight Plan, which is the flight plan,

including changes, if any, brought about by subsequent clearances, will be used.

e) proceed according to the current flight plan route to the appropriate designated navigation aid serving the destination aerodrome and, when required to ensure compliance with (f) below, hold over this aid until commencement of descent;

f) commence descent from the navigation aid specified in (e) above at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;

g) complete a normal instrument approach procedure as specified for the designated navigation aid; and

h) land, if possible, within thirty minutes after the estimated time of arrival specified in (f) above or the last acknowledged expected approach time, whichever is later.

4.0 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES EUR/SAM CORRIDOR

4.1 Introduction

4.1.1 The following procedures are intended for guidance only and will be applicable within the EUR/SAM corridor. Although all possible contingencies cannot be covered, they provide for cases of:

a) inability to maintain assigned flight level due to weather, aircraft performance, pressurization failure and problems associated with high-level supersonic flight;

b) loss of, or significant reduction in, the required navigation capability when operating in parts of the airspace where the navigation performance accuracy is prerequisite to the safe conduct of flight operations; and

c) en-route diversion across the prevailing EUR/SAM traffic flow.

4.1.2 With regard to 4.1.1 a) and c) above, the procedures are applicable primarily when rapid descent, turnback, or both are required. The pilots's judgement shall determine the sequence of actions to be taken, having regard to the specific circumstances. Air traffic control (ATC) shall render all possible assistance.

4.2 General procedures

4.2.1 The following general procedures apply to both subsonic and supersonic aircraft. Although all possible contingencies cannot be covered, they provide for cases of inability to maintain assigned level due to weather, aircraft performance, pressurization failure and problems associated with high-level supersonic flight. They are applicable primarily when rapid descent and/or turnback or diversion to an alternate airport are required. The pilot's judgment shall determine the sequence of actions taken, taking into account specific circumstances.

4.2.1.1 If an aircraft is unable to continue flight in accordance with its ATC clearance, and/or an aircraft unable to maintain the navigation performance accuracy specified for the airspace, a revised clearance shall whenever possible, be obtained prior to initiating any action, using the distress or urgency signals as appropriate. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and the overall traffic situation.

4.2.1.2 If prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time and, until revised clearance is received, the pilot shall:

a) if possible, deviate away from an organized track or route system before commencing emergency descent;

b) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals, aircraft identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions, on the frequency in use, ~~and~~ as well as on frequency 121.5 MHz (or, as a back-up[, on the inter-pilot air-to-air frequency 123.45 MHz);

c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);

d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

e) switch on the SSR transponder at all times; and

f) initiate such action as necessary to ensure the safety of the aircraft.

4.3 Subsonic aircraft

4.3.1 Initial action

4.3.1.1 If unable to comply with the provisions of 4.2.1.1 to obtain a revised ATC clearance, the aircraft should leave its assigned route or track by turning 90 degrees to the right or left whenever this is possible. The direction of the turn should, where possible, be determined by the position of the aircraft relative to any organized route or track system,
eg. whether the aircraft is outside, at the edge of, or within the system. Other factors ~~that may affect the direction of the turn~~ to consider are the direction to ~~an~~ the alternative airport, terrain clearance and the flight levels allocated to adjacent routes or tracks.

4.3.2 Subsequent action (RVSM airspace)

4.3.2.1 In RVSM airspace, an aircraft able to maintain its assigned flight level should turn to acquire and maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system space at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track and:

a) if above FL 410, climb or descend 300 m (1 000 ft); or

b) if below FL 410, climb or descend 150 m (500 ft); or

c) if at FL 410, climb 300 m (1 000 ft) or descend 150 m (500 ft).

4.3.2.2 An aircraft that is unable to maintain its assigned flight level should:

a) initially minimize its rate of descent to the extent that it is operationally feasible;

b) turn while descending to acquire an d maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is the mid-point from the adjacent parallel route or track; and

c) for the subsequent level flight, select a level which differs from those normally used by 300 m (1 000 ft) if above FL 410, or by 150 m (500 ft) if below FL 410.

4.3.3 Subsequent action (non-RVSM airspace)

4.3.3.1 In non-RVSM airspace, an aircraft able to maintain its assigned flight level should turn to acquire and maintain in either direction or track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track and:

a) if above FL 290, climb or descend 300 m (1 000 ft); or

b) if below FL 290, climb or descend 150 m (500 ft); or

c) if at FL 290, climb 300 m (1 000 ft) or descend 150 m (500 ft).

4.3.3.2 An aircraft unable to maintain its assigned flight level should:

a) initially minimize its rate of descent to the extent that it is operationally feasible;

b) turn while descending to acquire and maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track; and

c) for the subsequent level flight, a level should be selected which differs from those normally used by 300 m (1 000 ft) if above FL 290 or by 150 m (500 ft) if below FL 290.

4.3.2 En-route diversion across the prevailing SAT air traffic flow

4.3.2.1 Before diverting across the flow of adjacent traffic, the aircraft should climb above FL 410 or descend below FL 280 using the procedures specified in 4.3.1 or 4.3.2 or 4.3.3. However, if the pilot is unable or unwilling to carry out a major climb or descent, the aircraft should be flown at a level as defined in 4.3.2.1 or 4.3.3.1 until a revised ATC clearance is obtained.

4.3.3 Extended range operations by aeroplanes with two-turbine power-units (ETOPS)

4.3.3.1 If these contingency procedures are employed by a twin-engine aircraft as a result of an engine shutdown or failure of an ETOPS critical system, the pilot should advise ATC as soon as practicable of the situation reminding ATC of the type of aircraft involved, and request expeditious handling.

4.4 Supersonic aircraft

4.4.1 Turnback procedures

4.4.1.1 If a supersonic aircraft is unable to continue flight to its destination and a reversal of track is necessary, it should:

a) when operating on an outer track of a multi-track system, turn away from the adjacent track;

b) when operating on a random track or on an inner track of a multi-track system, turn either left or right as follows:

1) if the turn is to be made to the right, the aircraft should attain a position 46 km (25 NM) to the left of the assigned track and then turn to the right into its reciprocal heading, at the greatest practical rate of turn;

2) if the turn is to be made to the left, the aircraft should attain a position 46 km (25 NM) to the right of the assigned track and then turn to the left into its reciprocal heading, at the greatest practical rate of turn;

c) while executing the turnback, the aircraft should lose height so that it will be at least 1 850 m (6 000 ft) below the level at which turnback was started, by the time the turnback is completed;

d) when turnback is completed, heading should be adjusted to maintain a lateral displacement of 46 km (25 NM) from the original track in the reverse direction, if possible maintaining the flight level attained on completion of the turn.

Note.- for multi-track systems where the route spacing is greater than 93 km (50 NM), the mid-point distance should be used instead of 46 km (25 NM).

4.5 Weather deviation procedures

4.5.1 General

4.5.1.1 The following procedures are intended to provide guidance. All possible circumstances cannot be covered. The pilot's judgement shall ultimately determine the sequence of actions to be taken. ATC shall render all possible assistance.

4.5.1.2 If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time. Until an ATC clearance is received, the aircraft shall follow the procedures detailed in 4.5.4 below.

4.5.1.3 The pilot shall advise ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to the center line of its cleared route.

4.5.2 Obtaining priority from ATC when weather deviation is required.

4.5.2.1 When the pilot initiates communications with ATC, rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response.

4.5.2.2 The pilot still retains the option of initiating the communications using the urgency call "PAN PAN" (preferably spoken three times) to alert all listening parties to a special handling condition which will receive ATC priority for issuance of a clearance or assistance.

4.5.3 Actions to be taken when controller-pilot communications are established

4.5.3.1 The pilot notifies ATC and requests clearance to deviate from tract, advising when possible, the extent of the deviation expected.

4.5.3.2 ATC takes one of the following actions:

a) If there is no conflicting traffic in the horizontal plane, ATC will issue clearance to deviate from track; or

b) If there is conflicting traffic in the horizontal plane, ATC separates aircraft by establishing appropriate separation; or

c) If there is conflicting traffic in the horizontal plane and ATC is unable to establish appropriate separation, ATC shall:

1) advise the pilot of inability to issue clearance for requested deviation;

2) advise the pilot of confliction traffic; and

3) request the pilot's intentions.

SAMPLE PHRASEOLOGY

"UNABLE (*requested deviation), TRAFFIC IS (call sign, position, altitude, direction*), ADVISE INTENTIONS".

4.5.3.3 The pilot will take the following actions:

a) advise ATC of intentions by the most expedious means; and

b) comply with the ATC clearance issued; or

c) execute the procedures detailed in 4.5.4 below. ATC will issue essential traffic information to all aircraft and;

d) if necessary, establish voice communications with ATC to expedite dialogue on the situation.

4.5.4 Actions to be taken if a revised ATC clearance cannot be obtained

4.5.4.1 The provisions of this section apply to situations where a pilot has the need to exercise the authority of a pilot-in-command under the provisions of Annex 2, 2.3.1.

4.5.4.2 If a revised ATC clearance cannot be obtained and deviation from track is required to avoid weather, the pilot shall take the following actions:

a) if possible, deviate away from the organized track or route system;

b) establish communications with and alert nearby aircraft broadcasting, at suitable intervals: flight level, aircraft identification, aircraft position (including ATS route designator or the track code) and intentions, on the frequency in use and on frequency 121.5 MHz (or, as a back-up, on the inter-pilot air-to-air frequency 123.45 MHz);

c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);

Note.- if, as a result of actions taken under the provisions of 4.5.4.2 b) and c) above, the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary to avoid conflict.

d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

e) for deviations of less than 19 km (10 NM), aircraft should remain at a level assigned by ATC;

f) for deviation of greater than 19 km (10 NM), when the aircraft is approximately 19 km (10 NM) from track, initiate a level change based on the following criteria in Table 1;

Table 1

Route center line track	Deviations >19 km (10 NM)	Level change
EAST $000^0 - 179^0$ magnetic	LEFT RIGHT	DESCEND 90 m (300 ft) CLIMB 90 m (300 ft)
WEST $180^0 - 359^0$ magnetic	LEFT RIGHT	CLIMB 90 m (300 ft) DESCEND 90 m (300 ft)

g) when returning to track, be at its assigned level, when the aircraft is within approximately 19 km (10 NM) of the center line; and

h) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue

to keep ATC advised of intentions and obtain essential traffic information.

4.6 Special Procedures for in-flight contingencies involving a loss of vertical navigation performance required for flight within the AFI RVSM airspace

4.6.1 General

4.6.1.1 An in-flight contingency affecting flight in the AFI RVSM airspace pertains to unforeseen circumstances that directly impact on the ability of one or more aircraft to operate in accordance with the vertical navigation performance requirements of the AFI RVSM airspace, as specified in 1.5.2 Such in-flight contingencies can result from degradation of aircraft equipment associated with height-keeping, and from turbulent atmospheric conditions.

4.6.1.2 The pilot shall inform air traffic control as soon as possible of any circumstances where the vertical navigation performance requirements for the AFI RVSM airspace cannot be maintained. In such cases, the pilot shall obtain a revised air traffic control clearance prior to initiating any deviation from the cleared route and/or flight level, whenever possible. Where a revised air traffic control clearance could not be obtained prior to such a deviation, the pilot shall obtain a revised clearance as soon as possible thereafter.

4.6.1.3 Air traffic control shall render all possible assistance to a pilot experiencing an in-flight contingency. Subsequent air traffic control actions will be based on the intentions of the pilot, the over-all air traffic situation, and the real-time dynamics of the contingency.

4.6.2 Degradation of aircraft equipment — pilot reported

4.6.2.1 When informed by the pilot of an RVSM approved aircraft operating in the AFI RVSM airspace that the aircraft's equipment no longer meets the RVSM MASPS, as specified in 18, air traffic control shall consider the aircraft as non-RVSM approved.

4.6.2.2 Air traffic control shall take action immediately to provide a minimum vertical separation of 600 m (2 000 ft) or an appropriate horizontal separation from all other aircraft concerned operating in the AFI RVSM airspace. An aircraft rendered non-RVSM approved shall normally be cleared out of the AFI RVSM airspace by air traffic control, when it is possible to do so.

4.6.2.3 Pilots shall inform air traffic control, as soon as practicable, of any restoration of the proper functioning of equipment required to meet the RVSM MASPS.

4.6.2.4 The first ACC/UAC to become aware of a change in an aircraft's RVSM status shall coordinate with adjacent ACCs/UACs, as appropriate.

4.6.3 Severe turbulence — not forecast

4.6.3.1 When an aircraft operating in the AFI RVSM airspace encounters severe turbulence due to weather or wake vortex that the pilot believes will impact the aircraft's capability to maintain its cleared flight level, the pilot shall inform ATC. Air traffic control shall establish either an appropriate horizontal separation or an increased minimum vertical separation.

4.6.3.2 Air traffic control shall, to the extent possible, accommodate pilot requests for flight level and/or route changes, and pass traffic information, as required.

4.6.3.3 Air traffic control shall solicit reports from other aircraft to determine whether RVSM should be suspended entirely or within a specific flight level band and/or area.

4.6.3.4 The ACC/UAC suspending RVSM shall coordinate any such suspension(s), and any required adjustments to sector capacities with adjacent ACCs/UACs, as appropriate, to ensure an orderly progression to the transfer of traffic.

4.6.4 Severe turbulence — forecast

4.6.4.1 Where a meteorological forecast is predicting severe turbulence within the AFI RVSM airspace, air traffic control shall determine whether RVSM should be suspended and, if so, the period of time, and specific flight level(s) and/or area.

4.6.4.2 In cases where RVSM will be suspended, the ACC/UAC suspending RVSM shall coordinate with adjacent ACCs/UACs with regard to the flight levels appropriate for the transfer of traffic, unless a contingency flight level allocation scheme has been determined by letter of agreement. The ACC/UAC suspending RVSM shall also coordinate applicable sector capacities with adjacent ACCs/UACs, as appropriate.

5.0 AIR TRAFFIC CONTROL CLEARANCES

5.1 Adherence to ATC-approved Mach number
(A2 – 3.6.2)

5.1.1 Air Traffic Control clearances

5.1.1 Turbojet aircraft operating at or above FL 250 within the Canarias FIR shall adhere to the Mach number approved by ATC and shall request ATC approval before making any change thereto. If it is essential to make an immediate change in the Mach number (eg. due to turbulence), ATC shall be notified as soon as possible that such a change has been made.

5.1.2 If it is not feasible, due to aircraft performance, to maintain the last assigned Mach number during en-route climbs and descents, pilots of aircraft concerned shall advise ATC at the time of the climb/descent request.

5.1.3 ATC clearance into the AFI RVSM airspace

5.1.3.1 Except for operations within the AFI RVSM transition airspace and within specifically designated airspace, only RVSM approved aircraft and non-RVSM approved State aircraft shall be issued an air traffic control clearance into the AFI RVSM airspace.

5.1.3.2 Air traffic control clearance into the AFI RVSM airspace shall not be issued to formation flights of aircraft.

6.0 SEPARATION OF AIRCRAFT

6.1 Lateral separation
(A11 – Attachment B; P-ATM, 5.4.1 and 5.11)

6.1.1 Minimum lateral separation shall be 185 km (100 NM) except as provided for in 6.1.2 and 6.1.3 below.

6.1.2 Where aircraft are transiting into an airspace with a larger lateral minimum than the airspace being exited, lateral separation will continue to exist provided that:

a) the smaller separation minimum exists;

b) flight paths diverge by 15 degrees or more until the larger minimum is established; and

c) it is possible to ensure, by means approved by the appropriate ATS authority, that the aircraft have navigation capability necessary to ensure accurate track guidance.

6.1.3 For flights on designated controlled oceanic routes or areas within the Canarias FIR (southern sector), Dakar Oceanic, Recife and Sal Oceanic FIRs, the

minimum lateral separation that shall be applied between RNAV-equipped aircraft approved to RNP 10 or better shall be 93 km (50 NM).

6.1.3.1 The letter R shall be annotated in Item 10 (Equipment) of the flight plan to indicate that the aircraft meets the RNP type prescribed.

6.1.3.2 Operators shall establish programmes to mitigate the occurrence of large lateral track errors due to equipment malfunction or operational error, which:

a) ensure that operating drills include mandatory navigation cross-checking procedures to identify navigation errors in sufficient time to prevent aircraft inadvertently deviating from an ATC-cleared route; and

b) provide for the continued airworthiness of aircraft navigation systems necessary to navigate to the degree of accuracy required.

Note.- Detailed guidance material on RNP is contained in the Manual on Required Navigation Performance (RNP) (Doc 9613).

6.1.3.3 A target level of safety of 5×10^{-9} fatal accidents per flight hour per dimension shall be established for route systems operating a 93 km (50 NM) lateral separation minimum and the safety level of such airspace shall be determined by an appropriate safety assessment.

Note.- Detailed guidance on conducting safety assessments is contained in the Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689).

6.1.3.4 The following criteria are used in the operational assessment of airspace system safety:

a) the proportion of the total flight time spent by aircraft 46 km (25 NM) or more off the cleared track shall be less than 7.0×10^{-4}; and

b) the proportion of the total flight time spent by aircraft between 74 km and 111 km (40 NM and 60NM) off the cleared track shall be less than 4.1×10^{-5}.

6.1.3.5 Adequate monitoring of flight operations shall be conducted to provide data to assist in the assessment of continuing compliance of aircraft with the lateral navigation performance capabilities of RNP 10 and 6.1.3.3 above. Such data shall include operational errors dues to all causes. A safety assessment shall be carried out periodically, based on the data collected, to confirm that the safety level continues to be met.

Note:- Detailed guidance on monitoring is contained in the Air Traffic Services Planning Manual (Doc 9426) and the Manual of Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689).

6.2 Longitudinal separation
(P-ATM, 5.4.2 and 5.11)

6.2.1 Except as provided for in 6.2.2, the minimum longitudinal separation between turbo-jet aircraft shall be:

a) 20 minutes, except as specified below;

b) 15 minutes at or above FL 250 within the Canarias, Dakar Oceanic, Recife and Sal Oceanic FIRs, provided that the Mach number technique is applied, and, whether in level, climbing or descending flight, the aircraft have reported over the

same entry point to the ATS routes or a common point into the oceanic-controlled airspace and follow the same track or continuously diverging tracks; or

c) 10 minutes or 150 km (80 NM), derived by RNAV, when the Mach number technique is applied on designated controlled oceanic routes in the EUR/SAM corridor within the Dakar Oceanic, Recife and Sal Oceanic FIRs.

6.2.2 For flight in the EUR/SAM corridor (Canarias (southern sector), Dakar Oceanic, Recife and Sal Oceanic FIRs), the minimum longitudinal separation minima between RNAV-equipped aircraft approved to RNP 10 or better on the same track shall be 93 km (50 NM) provided that:

a) the letter R shall be annotated in Item 10 (Equipment) of the flight plan to indicate that the aircraft meets the RNP type prescribed; and

b) a target level of safety of 5 x 10^{-9} fatal accidents per flight hour per dimension shall be established and the safety level of such airspace shall be determined by an appropriate safety assessment.

6.2.2.1 Adequate monitoring of flight operations shall be conducted to provide data to assist in the assessment of continuing compliance of aircraft with the longitudinal navigation performance capabilities of RNP 10. Such data shall include operational errors due to all causes. A safety assessment shall be carried out periodically, based on the data collected, to confirm that the safety level continues to be met.

Note.- Detailed guidance on monitoring is contained in the Air Traffic Services Planning Manual (Doc 9426) and the Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689).

6.3 Vertical separation Minimum

6.3.1. Between FL 290 and FL 410 inclusive within the AFI RVSM airspace, the vertical separation minimum shall be:

a) 300 m (1 000 ft) between RVSM approved aircraft;

b) 600 m (2 000 ft) between:

- non-RVSM approved State aircraft and any other aircraft operating within the AFI RVSM airspace; and

- non-RVSM approved State aircraft and any other aircraft operating within the AFI RVSM transition airspace and within specifically designated airspace.

6.3.2 ATC shall provide a minimum vertical separation of 600 m (2 000 ft) between an aircraft experiencing a communications failure in flight and any other aircraft, where both aircraft are operating within the AFI RVSM airspace.

~~The minimum vertical separation that shall be applied between FL 290 and FL 410 inclusive is 300 m (1 000 ft).~~

~~6.3.1 Area of applicability~~

~~The reduced vertical separation minimum (RVSM) shall be applied for flights between FL 290 and FL 410 inclusive, within the Canarias (Southern sector), Dakar Oceanic, Recife (oceanic portion) and Sal Oceanic FIRs.~~

~~*Note.- Implementation will be carried out in phases and will be promulgated by appropriate AIP Supplements and included in the respective AIPs.*~~

~~6.3.2 Establishment of RVSM transition areas (A2 Appendix 3; A6, Parts I and II, 7.2.3; A11 3.3.4; P-ATM, 5.3.2)~~

6.3.2.1 In order to allow for the transition of flights to and from EUR/SAM airspace, the ATS authorities responsible for Canarias, Dakar Oceanic, Recife and Sal Oceanic FIRs may establish designated RVSM transition areas. A 300 m (1 000 ft) vertical separation minimum can be applied between RVSM approved aircraft within these transition areas.

6.3.2.2 An RVSM transition area shall have a vertical extent of FL 290 to FL 410 inclusive, be contained within horizontal dimensions determined by the provider States, be overlapping with or contained within EUR/SAM RVSM airspace and should have direct controller pilot communications.

6.3.3 RVSM approval

The minimum separation in 6.3 shall only be applied between aircraft and operators that have been approved by the State of Registry or the State of the Operator, as appropriate, to conduct flights in RVSM airspace and that are capable of meeting the minimum aircraft system performance specification (MASPS) height keeping requirements (or equivalent).

6.3.4 MASPS

The MASPS height keeping requirements are as follows:

a) for all aircraft, the differences between cleared flight level and the pressure altitude actually flown shall be symmetric about a mean of 0 m (o ft), shall have a standard deviation no greater than 13 m (43 ft) and shall be such that the error frequency decreases with increasing magnitude at a rate which is at least exponential;

b) for groups of aircraft that are nominally of identical design and built with respect to all details that could influence the accuracy of height keeping performance in the RVSM flight envelope (FL 290 to FL 410 inclusive):

4) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude; and

5) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft);

e) for non-group aircraft for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aircraft: the ASE shall not exceed 61 m (200 ft) in magnitude in the RVSM flight envelope (FL 290 to FL 410 inclusive); and

f) the following criteria shall be used in the operational assessment of airspace system safety: the total vertical error (TVE), which is the difference between the geometric height of the aircraft and the geometric height of the flight level to which it is assigned, is required to be such that:

1) the probability that TVE equal to or greater than 91 m (300 ft) in magnitude is equal to or less than 2.0×10^{-3};

2) the probability that TVE equal to or greater than 152 m (500 ft) in magnitude is equal to or less than 5.0×10^{-6};

3) the probability that TVE equal to or greater than 200 m (650 ft) in magnitude is equal to or less than 1.4×10^{-6};

4) the probability that TVE between 290 m and 320 m (950 ft and 1 050 ft), inclusive, in magnitude is equal to or less than 1.7×10^{-7}; and

5) The proportion of time that aircraft spend at incorrect flight levels, 300 m (1 000 ft), or multiples thereof, away from assigned flight levels is equal to or less than 7.1×10^{-7}.

Note.- Guidance material regarding the initial achievement and contained maintenance of the height-keeping performance in 6.3.4 is contained in the Guidance Material on the Implementation of a 300 m (1 000 ft) Vertical Separation Minimum (VSM) for Application in the EUR/SAM corridor.

6.3.5 Target level of safety (TLS)

Application of RVSM in the airspace designated in 6.3.1 shall meet a TLS of 5×10^{-9} fatal accidents per aircraft flight hour due to all causes of risk in the vertical dimension.

6.3.6 Approval status and aircraft registration

Item 10 of the flight plan (Equipment) shall be annotated with the letter W if the aircraft and operator have received RVSM State approval. Furthermore, the aircraft registration shall be indicated on Item 18 of the flight plan.

6.3.7 Operation of aircraft not approved for RVSM

6.3.7.1 Except for areas where transition areas have been established, aircraft not meeting the requirements of 6.3.4 shall not be allowed to operate in EUR/SAM RVSM airspace.

6.3.7.2 Exceptionally, aircraft that have not received RVSM State approval may be cleared to operate in airspace where RVSM may be applied in accordance with policy and procedures established by the State provided that 5=600 m (2 000 ft) vertical separation is applied.

Note.- Transitions to and from EUR/SAM RVSM airspace will normally take place in the first FIR in EUR/SAM RVSM airspace.

6.3.8 Monitoring

Adequate monitoring of flight operations in the EUR/SAM RVSM airspace shall be conducted to assist in the assessment of continuing compliance of aircraft with the height-keeping capabilities in 6.3.4. Monitoring shall include assessment of other sources of risk to ensure that the TLS specified in 6.3.5 is not exceeded.

Note.- Details of the policy and procedures for monitoring established by the South Atlantic Monitoring Agency (SATMA) are contained in the Guidance Material on the Implementation of a 300 m (1 000 ft) Vertical Separation Minimum (VSM) for Application in the EUR/SAM Corridor.

6.3.9 Wake turbulence procedures

6.3.9.1 The following special procedures are applicable to mitigate wake turbulence encounters in the airspace where RVSM is applied.

6.3.9.2 An aircraft that encounters wake turbulence should notify ATC and request a revised clearance. However, in situations where a revised clearance is not possible or practicable:

a) the pilot should establish contact with other aircraft, if possible, on the air-to-air frequency 123.45 MHz; and

b) one (or both) aircraft may initiate lateral offset(s) not to exceed 3.7 km (2 NM) from the assigned route(s) or track(s), provided that:

~~1) as soon as it is practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so; and~~

~~2) the offsetting aircraft notify ATC when re-established on assigned routes(s) or track(s).~~

~~*Note.- In the contingency circumstances above, ATC will not issue clearances for lateral offsets and will not normally respond to action taken by pilots.*~~

6.4 Information on application of separation minima
(A11 – 3.4; P-ATM, 5.4.1, 5.4.2 and 5.11)

6.4.1 Where, circumstances permitting, separation minima lower than those specified in 6.1 and 6.2 will be applied in accordance with the PANS-ATM~~, appropriate information should be published in Aeronautical Information Publications so that users of the airspace are fully aware of the portions of airspace where the reduced separation minima will be applied and of the navigation aids on the use of which those minima are based.~~

7.0 ALTIMETER SETTING PROCEDURES APPLICABLE TO AIR TRAFFIC SERVICES AND MINIMUM LEVELS
(P-ATM, 4.10 AND 4.10.3)

7.1 The lowest usable flight level for holding and approach manoeuvres shall be calculated from actual QNH, unless the pressure variation is so small that reference to climatological data is acceptable.

Note 1.- The lowest usable flight will provide a terrain clearance of at least 300 m (1 000 ft) and, for operation in the vicinity of an aerodrome will not be established below 450 m (1 500 ft) above aerodrome elevation.

Note 2.- MET Offices will inform ATS units when, in abnormal conditions, pressure goes below the minimum climatological value, in order that appropriate steps can be taken to cancel temporarily the use of the lowest flight level or levels that would not ensure the minimum terrain clearance.

7.2 Based on current and anticipated atmospheric pressure distribution, area control centers shall coordinate, where required, the lowest flight level to be used.

7.3 In determining the transition level, the table at Appendix A should be used when necessary. This table shows the transition level directly as a function of the transition altitude of the aerodrome and of the current QNH altimeter setting value.

8.0 FLIGHT INFORMATION SERVICE

8.1 Information on runway conditions
(A11 – 4.2.1; P-ATM, 6.6)

8.1.1 Unless otherwise provided, area control centers shall have available for transmission to aircraft on request immediately prior to descent, information on the prevailing runway conditions at the aerodrome of intended landing.

8.2 Transmission of SIGMET information
(P-ATM, 9.1.3.2)

8.2.1 Transmission of SIGMET information to aircraft shall be at the initiative of the appropriate ATS unit, by the preferred method of directed transmission followed by acknowledgement, or by a general call when the number of aircraft would render the preferred method impracticable.

8.2.2 SIGMET information passed to aircraft shall cover a portion of the route up to two hours' flying time ahead of the aircraft.

8.3 Transmission of amended aerodrome forecast
(P-ATM, 9.1.3.5)

8.3.1 Amended aerodrome forecasts shall be passed to aircraft within 60 minutes from the aerodrome of destination, unless the information would have been made available through other means.

8.4 Transmission of trend forecasts
(A11 – 4.2.2)

8.4.1 The latest trend forecasts available to the ATS unit, provided it is no more than one hour old, shall always be transmitted to an aircraft together with the latest report of routine or special observation, when the aircraft requests the latter information.

9.0 AIR TRAFFIC SERVICES COORDINATION

9.1 Coordination between units providing area control service
(P-ATM, 10.3)

9.1.1 If a flight should enter an adjacent area information concerning any review of estimate of three minutes or more shall be forwarded to the adjacent area control center.

10. AIR TRAFFIC SERVICES MESSAGES

10.1 Flight plan and departure messages
~~(P-ATM, 11.3.3 and 11.4.2.2)~~

10.1.1 The procedures applicable for the AFI RVSM airspace are contained in the PANS-ATM Doc.4444 paragraphs 11.3.3 and 11.4.2.

~~10.1.1 Filed flight plan messages for flights intending to operate within the NAT Region at a distance of 60 NM or less from the northern and southern boundaries of Gander Oceanic and Shanwick Oceanic flight information regions shall be addressed to the area control centers in charge of the NAT flight information regions along the route and, in addition, to the area control centers in charge of the nearest adjacent NAT flight information regions.~~

~~10.1.2 For flights departing from points within the adjacent regions and entering the NAT Region without intermediate stops, filed flight plan message shall be transmitted to the appropriate area control centers immediately after the flight plan has been submitted~~.

10.1 Computer-assisted coordination process

10.1.1 Procedures

10.1.1.1 *Operational procedure*

10.1.1.1.1 The following basic rules shall apply for the use of EST and ACT messages:

a) These messages shall be automatically generated, exchanged and processed to obviate human intervention to the extent practicable.

b) A single message shall be sent in respect of each flight due to be transferred and any subsequent revision shall be the subject of verbal coordination.

c) The message shall provide the most recent information available on all transfer conditions at the time of transmission.

d) Acceptance by the receiving unit of the transfer conditions implied in the message shall be assumed, unless the receiving unit initiates verbal coordination to amend the transfer conditions.

Note.— Bilateral arrangement may be required to cover the event of failure of the ATS direct speech circuit.

e) There shall be bilateral agreement as to the boundary point and transmission times for each route. The normal transmission time shall be 15 minutes before the flight concerned is expected to cross the boundary.

f) In the event of data not being correlated by the receiving computer with an appropriate entry in its flight plan database, the computer shall originate a warning to the appropriate air traffic control sector to take necessary action for the acquisition of missing flight plan details. This shall normally involve a telephone inquiry.

g) In the event of incomprehensible or illogical data being detected within the message, the computer shall initiate an appropriate warning to the air traffic control sector involved, if this can be determined, for further action.

Note.— Any system-initiated warning shall require reversion to verbal coordination.

h) If the receiving unit has not received a flight plan, the sending air traffic control unit shall verbally inform the receiving unit of whether or not the aircraft is RVSM approved.

i) When an automated message does not contain the information filed in Item 18 of the ICAO flight plan form relevant to RVSM operations, the sending air traffic control unit shall inform the receiving unit of that information by supplementing the ACT message verbally, using the term "NEGATIVE RVSM" or "NEGATIVE RVSM STATE AIRCRAFT", as applicable.

j) When a verbal coordination process is being used, the sending air traffic control unit shall include the information filed in Item 18 of the ICAO flight plan form relevant to RVSM operations at the end of the verbal estimate message, using the term "NEGATIVE RVSM" or "NEGATIVE RVSM STATE AIRCRAFT", as applicable.

k) When a single aircraft is experiencing an in-flight contingency which impacts on RVSM operations, the associated coordination message(s) shall be supplemented verbally by a description of the cause of the contingency.

11.0 ALERTING AND SEARCH AND RESCUE SERVICES

11.1 Routes and equipment of private aircraft
(P-ATM, 11.3.3 and 11.4.2.2)

11.1.1 General aviation aircraft operating over designated areas, land or sea, where search and rescue operations would be difficult, should:

a) carry appropriate survival equipment:

b) follow the route or specified procedures if not equipped with two-way radio, except that under special circumstances, the appropriate authority may grant specific exemptions from this requirement.

11.2 Alerting services
(P-ATM, 9.2)

11.2.1 The procedures for "Alerting Service" detailed in the PANS-ATM, 9.2, are applicable to all fights except those conducted wholly in the vicinity of an aerodrome when exempted by the appropriate air traffic control unit.

12.0 IDENTIFICATION OF ATS ROUTES (A11, Appendix 1 – 2.4)

12.1 Composition of designators

12.1.1 The letter D to indicate that on a route or portion thereof advisory service only is provided and the letter F to indicate that on a route or portion thereof flight information service only is provided shall be added after the basic designators of the ATS route in question.

13.0 USE OF SECONDARY SURVEILLANCE RADAR (SSR) (P-ATM, Chapter 8)

13.1 Secondary surveillance radar information may be used alone for the provision of horizontal separation between properly equipped aircraft in the circumstances and under the conditions specified below:

a) Within the coverage area of the associated primary radar, in order to overcome known deficiencies of that radar, eg. the fact that primary radar echoes of cetin aircraft are not, or not continuously, presented on the radar display due to the reflecting characteristics of such aircraft, clutter, etc. In this case, SSR responses may be used for the separation of transponder-equipped aircraft and, additionally, for the separation of transponder-equipped aircraft from other known aircraft not using SSR but displayed clearly on the primary radar display, provided that the SSR responses from any aircraft (not necessarily the one being provided separation) coincide with the primary radar echo of the same aircraft.

Note.-Where SSR accuracy cannot be verified by means of monitor equipment or by visual correlation of the SSR response with the primary radar echo from a given aircraft, SSR responses alone may be use only to provide identification.

b) Outside the coverage area of the associated primary radar, or in certain areas (which shall be defined horizontally as well as vertically) and under circumstances specified by the appropriate authority in consultation with the operators, provided:

1) reliable SSR coverage exists within the area;

2) the area is designated as controlled airspace;

3) the control of the air traffic in the area is vested in one ATC unit unless adequate means of coordination exists between all ATC units concerned;

4) actual operating experience has shown that loss of SSR responses is not occurring at a rate affecting the safety of operations and adequate measures for earliest possible detection of such losses have been developed;

5) density and/or complexity of air traffic in the area and provision of navigational guidance allow a safe reversion to other forms of separation in case of SSR failure;

6) the aircraft concerned have previously been identified and identification has been maintained;

7) procedural separation is applied between aircraft with

functioning transponders and other aircraft; and

8) when primary radar fails and until procedural separation is established:

i) the positional accuracy of the SSR responses has been verified (see 13.1 a) and Note): and

ii) the pilots of the aircraft concerned have been advised.

c) In the case of aircraft emergency.

~~**13.2 Carriage and operation of pressure-altitude reporting SSR transponders**~~

~~13.2.1 With effect from 1 January 2000, all aircraft operating as IFR flights in the AFI Region shall be equipped with a pressure-altitude reporting SSR transponder.~~

~~13.2.2 Unless otherwise directed by air traffic control, the last assigned identity (Mode A) code shall be retained. If no identity code has been assigned, Mode A code 2000 shall be selected and retained.~~

~~**14.0 USE OF AIRBORNE COLLISION AVOIDANCE SYSTEMS (ACAS)**~~
~~(A2 – 3.2; A6, Part I – 6.18; A10 – Vol. IV; A11 – 2.4.2; P-OPS, Vol. I, Part VIII; P-ATM, Chapter 4)~~

~~**14.1 Carriage and operation of ACAS II**~~

~~14.1.1 ACAS II shall be carried and operated in the AFI Region by all aircraft that meet the following criteria:~~

~~a) With effect from 1 January 2000 all civil fixed-wing turbine-engined aircraft having a maximum take-off mass exceeding 15 000 kg or maximum approved passenger seating configuration of more than 30.~~

~~b) With effect from 1 January 2005, all civil fixed-wing turbine-engined aircraft having a maximum take-off mass exceeding 5 700 kg or a maximum approved passenger seating configuration of more than 19.~~

~~**14.2 Responsibility for separation of aircraft during manoeuvres in compliance with a resolution advisory (RA)**~~

~~14.2.1 The use of ACAS II does not alter the respective responsibilities of pilots and controllers for the safe operation of aircraft.~~

~~14.2.2 On being notified that an aircraft, under air traffic control, is manoeuvres in accordance with a resolution advisory (RA), a controller should not issue instructions to that aircraft which are contrary to the RA as communicated by the pilot. Once an aircraft departs from the current ATC clearance compliance with an RA, the controllers cease to be responsible for providing separation between that aircraft and other aircrafts affected as a direct consequence of the manoeuvre induced by the RA. However, when circumstances permit, the controller should endeavour to provide traffic information to aircraft affected by the manoeuvre. The controller's responsibility for providing separation for all the affected aircraft resumes when:~~

~~a) the controller acknowledges a report from the pilot that the aircraft has resumed the current clearance; or~~
~~b) the controller acknowledges a report from the pilot hat the aircraft is resuming the current clearance and issues an alternative clearance which is acknowledged by the flight crew.~~

~~**14.3 ACAS**~~

~~14.3.1 ACAS can have a significant effect on air traffic control. Therefore there is a continuing need to monitor the performance of~~

~~ACAS in the developing air traffic management environment.~~

~~14.3.2 Following and RA event, or other significant ACAS event, pilots and controllers should complete an ACAS RA report; aircraft operators and ATS authorities should forward the completed reports through established channels.~~

14. Special procedures applicable to designated airspaces

14.1 RVSM approved aircraft and non-RVSM approved State aircraft entering the AFI RVSM airspace from a non-RVSM environment

14.2 RVSM approved aircraft and non-RVSM approved State aircraft entering the AFI RVSM airspace from a non-RVSM environment shall be established at a flight level in accordance with:

a) the Tables of Cruising Levels, as published in ICAO Annex 2, Appendix 3, a); and/or

b) a flight level allocation scheme, if applicable; and/or

c) as specified in an inter area control centre (ACC) letter of agreement.

14.3 Any changes from non-RVSM levels to RVSM flight levels shall be initiated by the first ACC/upper area control centre (UAC) providing air traffic control service to the aircraft within the AFI RVSM airspace, and shall be achieved before the aircraft passes the transfer of control point to the adjacent ACC/UAC, unless otherwise specified in an inter ACC letter of agreement.

14.4 *Aircraft entering a non-RVSM environment from the AFI RVSM airspace*

14.4.1 Aircraft entering a non-RVSM environment from the AFI RVSM airspace shall be established with the applicable vertical separation minimum.

14.4.2 The applicable vertical separation minimum shall be established by the last ACC/UAC providing air traffic control service to the aircraft within the AFI RVSM airspace, and before the aircraft passes the transfer of control point to the adjacent ACC/UAC.

14.4.3 Such aircraft shall be established at a flight level in accordance with:

a) the Tables of Cruising Levels, as published in ICAO Annex 2, Appendix 3, b); and/or

b) a flight level allocation scheme, if applicable; and/or

c) as specified in an inter ACC letter of agreement.

14.5 ***Non-RVSM approved civil operations***

14.5.1 Non-RVSM approved State aircraft operating from a departure aerodrome outside the lateral limits of the AFI RVSM airspace with a destination aerodrome within the lateral limits of the AFI RVSM airspace:

a) shall be cleared to a flight level below FL 290; and

b) any such flight level changes shall be initiated by the first ACC/UAC providing air traffic control service to the aircraft within the AFI RVSM airspace, and shall be achieved before the aircraft passes the transfer of control point to the adjacent ACC/UAC.

14.5.2 Non-RVSM approved aircraft operating from a departure aerodrome to a destination aerodrome which are both within the lateral limits of the AFI RVSM airspace shall be cleared to a flight level below FL 290.

14.5.3 Non-RVSM approved aircraft operating from a departure aerodrome within the lateral limits of the AFI RVSM airspace to a destination aerodrome outside the lateral limits of the AFI RVSM airspace:

a) shall be cleared to a flight level below FL 290; and

b) may be cleared to FL 290 or above by the last ACC/UAC providing air traffic control service to the aircraft within the AFI RVSM airspace, and any such flight level changes shall be achieved before the aircraft passes the transfer of control point to the adjacent ACC/UAC.

14.5.4 Non-RVSM approved aircraft operating from a departure aerodrome to a destination aerodrome which are both outside the lateral limits of the AFI RVSM airspace, with a portion of the route within the lateral limits of the AFI RVSM airspace:

a) shall be cleared to a flight level below FL 290 or above FL 410 by the first ACC/UAC providing air traffic control service to the aircraft within the AFI RVSM airspace, and any such flight level changes shall be achieved before the aircraft passes the transfer of control point to the adjacent ACC/UAC, in accordance with the flight level allocation system (FLAS), if applicable, and/or as specified in an inter ACC letter of agreement; and

b) may subsequently be cleared to a requested flight level within, or through, the AFI RVSM airspace by the last ACC/UAC providing air traffic control service to the aircraft within the AFI RVSM airspace, and any such flight level changes shall be achieved before the aircraft passes the transfer of control point to the adjacent ACC/UAC.

15 Phraseology related to RVSM Operations in the AFI RVSM AIRSPACE

15.1 Controller/pilot RTF phraseology

Phrase Meaning	Phrase Meaning
(*call sign*) CONFIRM RVSM APPROVED	For a controller to ascertain the RVSM approval status of an aircraft.
NEGATIVE RVSM*	For a pilot to report non-RVSM approval status: a) on the initial call on any frequency within the AFI RVSM airspace (controllers shall provide read back with this same phrase); and b) in all requests for flight level changes pertaining to flight levels within the AFI RVSM airspace; and
	c) in all read backs to flight level clearances pertaining to flight levels within the AFI RVSM airspace. Additionally, except for State aircraft, pilots shall include this RTF phrase to read back flight level clearances involving the vertical transit through FL 290 or FL 410.
AFFIRM RVSM*	For a pilot to report RVSM approval status.
NEGATIVE RVSM STATE AIRCRAFT*	For a pilot of a non-RVSM approved State aircraft to report non-RVSM approval status, in response to the RTF phrase (*call sign)* CONFIRM RVSM APPROVED.

UNABLE RVSM DUE TURBULENCE*	Denial of air traffic control clearance into the AFI RVSM airspace.
UNABLE RVSM DUE EQUIPMENT*	For a pilot to report that the aircraft's equipment has degraded below the MASPS required for flight within the AFI RVSM airspace. This phrase is to be used to convey both the initial indication of the non-MASPS compliance, and henceforth, on initial contact on all frequencies within the lateral limits of the AFI RVSM airspace until such time as the problem ceases to exist, or the aircraft has exited RVSM airspace.
READY TO RESUME RVSM*	For a pilot to report the ability to resume operation within the AFI RVSM airspace after an equipment or weather-related contingency.

Phrase Meaning	**Phrase Meaning**
REPORT ABLE TO RESUME RVSM	For a controller to confirm that an aircraft has regained its RVSM approval status, or to confirm that the pilot is ready to resume RVSM operations.

*Note.-*indicates a pilot transmission*

15.2 Phraseology between ATS units

NEGATIVE RVSM *or* NEGATIVE RVSM STATE AIRCRAFT [*as applicable*]	To verbally supplement an automated estimate message exchange that does not automatically transfer Item 18 information. Also used to verbally supplement estimate messages of non-RVSM approved aircraft.
UNABLE RVSM DUE TURBULENCE [*or* EQUIPMENT, *as applicable*]	To communicate the cause of a contingency relating to an aircraft that is unable to conduct RVSM operations due to severe turbulence or other severe weather-related phenomenon [or equipment failure, as applicable]. End of new text.

16. RVSM Approval

16.1 Except for State aircraft, operators intending to conduct flights within the volume of airspace specified in 14.1.2 where RVSM is applied shall require an RVSM approval either from the State in which the operator is based or from the State in which the aircraft is registered. To obtain RVSM approval, operators shall satisfy the said State that:

a) aircraft for which the RVSM approval is sought have the vertical navigation performance capability required for RVSM operations through compliance with criteria of the RVSM minimum aircraft systems performance specifications (MASPS);

b) they have instituted procedures in respect of continued airworthiness (maintenance and repair) practices and programmes; and they have instituted flight crew procedures for operations in AFI RVSM airspace specified in 14.1.2

Note 1.— An RVSM approval is not restricted to a specific region. Instead, it is valid globally on the understanding that any operating procedures specific to a given region, in this case the AFI Region, should be stated in the operations manual or appropriate crew guidance.

Note 2.— Aircraft that have received State approval for RVSM operations will be referred toas "RVSM approved aircraft".

Note 3.— Aircraft that have not received State approval for RVSM operations will be referred to as "non-RVSM approved aircraft".

17. Minimum Aircraft Systems Performance (MASPS)

17.1 The characteristics of total vertical error (TVE) distribution form the basis of the MASPS which were developed to support the introduction of RVSM operations in accordance with agreed global safety standards. The MASPS were designed to ensure that:

a) in respect of groups of aircraft that with respect to all details that could influence the accuracy of height-keeping performance, height-keeping capability shall be such that TVE for the group of aircraft shall have a mean no greater than 25 m (80ft) in magnitude and shall have standard deviation no greater than 92 – 0.004z for 0<_z<0 where z is the magnitude of the mean TVE in feet or 28 – 0.013z for 0 <_ z <_ 25 when z is in metres. In addition, the components of TVE must have the following characteristics:

1) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80ft) in magnitude;

2) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft); and

3) the differences between cleared flight levels and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in frequency of differences with increasing difference magnitude shall be at least exponential.

b) in respect of a non-group aircraft for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belongings to a group of aircraft, height-keeping performance capability shall be such that the components of the TVE of the aircraft have the following characteristics:

1) the ASE of non-group aircraft shall not exceed 60 m (200 ft) in magnitude under all flight conditions; and

2) the differences between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in additional, the decrease in frequency of differences with increasing difference magnitude shall be at least exponential.

17.2 Guidance material of use to those involved in the initial achievement and continued maintenance of the height-keeping performance capability has been issued by ICAO under the title Manual on the Implementation of a 300 m (1,000 ft) Vertical Separation Minimum (VSM) between FL290 and FL410 Inclusive. Detailed technical guidance material on the airworthiness, continued airworthiness, and the operational practices and procedures for AFI airspace is

provided in the Joint Aviation Authorities Administrative and Guidance Material, Section one: General, part 3: Leaflet No. 6

18. RVSM Monitoring

18.1 Adequate monitoring of flight operations in the AFI RVSM airspace shall be conducted to assist in the assessment of continuing compliance of aircraft with the height-keeping capabilities in 17. Monitoring shall include assessment of other sources of risk to ensure that the TLS specified in 19 is not exceeded.

Note.— Details of the policy and procedures for monitoring established by the AFI Monitoring Agency (South Africa) are contained in the Guidance Material on the Implementation of a 300 m (1000 ft) Vertical Separation Minimum (VSM) for Application in the AFI Region are contained in ICAO Doc 9574 and other appropriate documentations on the subject.

19. Target level of safety (TLS)

19.1 Application of RVSM in the airspace designated in 6.3.1.1 shall meet a TLS of 5 x 10^{-9} fatal accidents per aircraft flight hour due to all causes of risk in the vertical dimension.

~~**21. Wake turbulence procedures**~~

~~21.1 The following special procedures are applicable to mitigate wake turbulence encounters in the airspace where RVSM is applied.~~

~~21.2 An aircraft that encounters wake turbulence should notify air traffic control (ATC) and request a revised clearance. However, in situations where a revised clearance is not possible or practicable:~~

~~a) the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air-to-air frequency; and~~

~~b) one (or both) aircraft may initiate lateral offset(s) not to exceed 2 NM from the assigned route(s) or track(s), provided that:~~

~~— as soon as it is practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so; an the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s).~~

~~*Note.— In the contingency circumstances above, ATC will not issue clearances for lateral offsets and will not normally respond to action taken by pilots.*~~

20. Special procedures for strategic lateral offsets in Oceanic Controlled Area (OCA) and remote continental airspace within AFI Region

Note. — The following incorporates lateral offset procedures for both the mitigation of the increasing lateral overlap probability due to increased navigation accuracy, and wake turbulence encounters.

20.1 The use of highly accurate navigation systems (such as the global navigation satellite system (GNSS)) by an increasing proportion of the aircraft population has had the effect of reducing the magnitude of lateral deviations from the route centre line and consequently increasing the probability of a collision should a loss of vertical separation between aircraft on the same route occur.

20.2 The application of lateral offsets to provide lateral spacing between aircraft, in accordance with the procedures specified in 20.3 and 20.4, can be used to mitigate the effect of this reduction in random lateral deviations, thereby improving overall system safety.

Implementation considerations for ATS authorities

20.3 The application of lateral offsets requires authorization from the ATS authority responsible for the airspace concerned. The following considerations shall be taken into account by the ATS authority when planning authorization of the use of strategic lateral offsets in a particular airspace:

a) Strategic lateral offsets shall only be authorized in en-route oceanic or remote continental airspace. Where part of the airspace in question is within radar coverage, transiting aircraft should normally be allowed to initiate or continue offset tracking.

b) Strategic lateral offsets may be authorized for the following types of routes (including where routes or route systems intersect):

1) uni-directional and bi-directional routes; and

2) parallel route systems where the spacing between route centre lines is not less than 55.5km (30 NM).

c) In some instances it may be necessary to impose restrictions on the use of strategic lateral offsets, e.g. where their application may be inappropriate for reasons related to obstacle clearance.

d) These offset procedures should be implemented on a regional basis after coordination between all States involved.

e) The routes or airspace where application of strategic lateral offsets is authorized, and the procedures to be followed by pilots, shall be promulgated in aeronautical information publications (AIPs).

f) Air traffic controllers shall be made aware of the airspace within which strategic lateral offsets are authorized.

Lateral offset procedures to be applied by pilots

20.4 In the application of strategic lateral offsets, pilots should take the following points into consideration:

a) Offsets shall only be applied in airspace where this has been approved by the appropriate ATS authority.

b) Offsets shall be applied only by aircraft with automatic offset tracking capability.

c) The decision to apply a strategic lateral offset is the responsibility of the flight crew.

d) The offset shall be established at a distance of one or two nautical miles to the right of the

centre line relative to the direction of flight.

e) The strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, one of the three available options (centreline, 1 NM or 2 NM right offset) shall be used.

f) In airspace where the use of lateral offsets has been authorized, pilots are not required to inform air traffic control (ATC) that an offset is being applied.

g) Aircraft transiting areas of radar coverage in airspace where offset tracking is permitted may initiate or continue an offset.

20.5 Pilots may, if necessary, contact other aircraft on the air-to-air frequency 123.45 MHz to coordinate offsets.

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c) Proposer's reason for amendment:

Implementation of Reduced Vertical Separation Minimum (RVSM) in the AFI Region. The reduction in vertical separation will improve the provision of air traffic services in the areas concerned and is in line with the implementation strategy adopted in the AFI CNS/ATM implementation plan. This will improve ATC efficiency and airspace capacity.

d) Proposed implementation date of the amendment:

Upon approval by Council.

e) Proposal has been circulated to the following States and International Organizations:

Afghanistan	Cape Verde	Ethiopia	Japan
Algeria	Central African Republic	Finland	Jordan
Angola	Chad	France	Kenya
Argentina	Chile	Gabon	Kuwait
Armenia	China	Gambia	Lebanon
Australia	Colombia	Germany	Lesotho
Austria	Congo	Ghana	Libyan Arab Jamahiriya
Bahrain	Comoros	Greece	Liberia
Bangladesh	Cote d'Ivoire	Guinea	Luxembourg
Belarus	Croatia	Guinea Bissau	Madagascar
Belgium	Cuba	Hungary	Malawi
Benin	Cyprus	Iceland	Malaysia
Bosnia and Herzegovina	Czech Republic	India	Maldives
Botswana	Democratic Republic of Congo	Indonesia	Mali
Brazil	Democratic Peoples' Republic of Korea	Iran, Islamic Republic of	Malta
Bulgaria	Denmark	Iraq	Mauritania
Burkina Faso	Djibouti	Ireland	Mauritius
Burundi	Egypt	Israel	Mexico
Cameroon	Equatorial Guinea	Italy	Morocco
Canada	Eritrea	Jamaica	Mozambique

Namibia	Sweden
Netherlands	Switzerland
New Zealand	Syrian Arab Republic
Niger	Thailand
Nigeria	The former Yogoslav Republic of Macedonia
Norway	Togo
Oman	Tunisia
Pakistan	Turkey
Philippines	Uganda
Poland	United Arab Emirates
Portugal	United Kingdom
Qatar	United Republic of Tanzania
Republic of Korea	United States
Romania	Uruguay
Rwanda	Viet Nam
Russian Federation	Yemen
Sao Tome and Principe	Zambia
Saudi Arabia	Zimbabwe
Senegal	ASECNA
Seychelles	IATA
Sierra Leone	IFALPA
Singapore	
Slovakia	
Slovenia	
Somalia	
South Africa	
Spain	
Sri Lanka	
Sudan	
Swaziland	

f) Secretariat comments

a) This amendment proposal has been developed within the framework or the APIRG/12, 13 and 14 Meetings Conclusions/Decisions 12/66, 13/58 and 14/21 respectively concerning the planning and evolutionary implementation of RVSM in the AFI Region.

b) Implementation of RVSM in the AFI Region would enable aircraft operating in the AFI RVSM airspace to continue under RVSM in EUR/NAT, MID/ASIA, CAR/SAM and ASIA/PAC RVSM airspaces, thereby enhancing the efficiency of seamless flight operations.
