



INTERNATIONAL CIVIL AVIATION ORGANIZATION
AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
FIFTEENTH MEETING (APIRG/15)

(Nairobi, Kenya, 26 – 30 September 2005)

Agenda Item 4: Air Navigation and Aviation Security (AVSEC) issues
4.4: RVSM Implementation in the AFI Region

Review of the Report of the Seventh Meeting of APIRG RVSM/RNAV/RNP Task Force

(Presented by the Secretariat)

Summary

This paper presents the report of the Seventh Meeting of the RVSM/RNAV/RNP Task Force.

Action by APIRG is at paragraph 3

References:

RVSM/RNAV/RNP/7 Report

1. Introduction

1.1 The APIRG RVSM/RNAV/RNP Task Force was established pursuant to APIRG/13 Decision 13/58 in order to explore ways and means to develop guidance material and plan for the implementation of RVSM/RNAV/RNP in the AFI Region. The Task Force held seven meetings.

1.2 The Seventh Meeting of the APIRG/RVSM/RNAV/RNP Task Force was convened by ICAO WACAF Office in Dakar, from **8 to 9 August 2005**. Copies of the Report were distributed to members of the Task Force as well as the AFI Provider and user States. They were posted to the ICAO website: <http://www.icao.int/RVSM> programme.

1.3 The meeting was attended by **30** participants from **12** States and **5** International Organizations namely **AFRAA, ARMA, ASECNA, IATA** and **NLR**.

2. Discussions

2.1 The Task Force formulated **29** conclusions and **1 decision**. The Task Force reviewed the previous and amended, retained those current conclusions. All the revised conclusions are conclusions **7/1 to 7/15**. Draft Conclusions **7/16 to 7/23** are new conclusions which have been developed by Task Force and been included in the AFI RVSM Strategy/Action Plan and APIRG is requested to take note of them. Draft Conclusions **7/24, 7/25, 7/26, 7/27 and 7/28** advocates for

approval by APIRG. Conclusion **7/29** requires APIRG to note as the action date of implementation of RVSM will be determined by the completions of activities in the Strategy/Action Plan. The AFI RVSM Strategy/Action Plan and the Amendment proposal for Doc.7030 constitute **Appendix B** and **C** to this paper.

3. Action Required

3.1 APIRG is invited to:

- a) note the report of the Seventh meeting of the RVSM/RNAV/RNP Task Force.
- b) Take action on the draft conclusions of the seventh meeting of the RVSM Task Force, as contained in **Appendix A** to this paper.

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Summary of the Draft Conclusions/Decision of the RVSM/RNAV/RNP/TF/7 Meeting

Number	Title	Action by	Remarks
Conclusion 7/1:	<p>Safety assessment data</p> <p>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.</p>	States	APIRG to note
Conclusion 7/2:	<p>Civil/military coordination</p> <p>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.</p>	States	APIRG to note
Conclusion 7/3:	<p>Nomination of a National RVSM programme manager</p> <p>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.</p>	States	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/4:	<p>Reporting of data for monitoring and/or carrying out safety assessment</p> <p>That:</p> <p>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:</p> <ul style="list-style-type: none"> - Height deviations of 300 ft or more. - Total number of IFR movements for each month. - The average time per movement spent in the level band FL 290 to FL 410. - ATC coordination failures. - Turbulence; and - Traffic data; and <p>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.</p>	States, ICAO	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/5:	<p>Implementation of RVSM in the AFI Region</p> <p>That:</p> <p>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.</p> <p>Implementation of RVSM in the AFI Region be harmonized and coordinated within the AFI Region as well as with the adjacent Regions.</p>	States	APIRG to note
Conclusion 7/6:	<p>Training of all personnel involved with the implementation of RVSM in the AFI Region</p> <p>That:</p> <p>a) Seminars continue to be organized in the Region for training of air traffic services personnel in the RVSM field.</p> <p>b) States having difficulties in implementing RVSM implementation programme, may either individually or in group explore the possibility of seeking outside expertise; and</p> <p>c) On site training courses be conducted to expedite the training process.</p>	States, ICAO	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/7:	<p>Guidance material for Airworthiness and Operational Approval</p> <p>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 Chapt 7 para. 7.2.3 and the guidance material contained in JAA Temporary Guidance Leaflet (TGL) N°6.</p>	States	APIRG to note
Conclusion 7/8:	<p>Enforcement in national legislation</p> <p>That:</p> <p>States which have not done so, take the appropriate measures in order:</p> <ul style="list-style-type: none"> 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. 	States	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/9:	<p>Funding of the RVSM implementation programme</p> <p>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.</p>	States	APIRG to note
Conclusion 7/10:	<p>Aircraft/Operators readiness survey</p> <p>That the results of ICAO/ARMA surveys be updated and presented at the RVSM TF meetings for consideration.</p>	ARMA, ICAO	APIRG to note
Conclusion 7/11:	<p>Monitoring of Height Deviations</p> <p>That:</p> <ul style="list-style-type: none"> 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. 	States, ARMA	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/12:	<p>AFI RVSM Safety Policy</p> <p>That States expedite the publication of an AIC on the AFI RVSM safety policy at Appendix ... to this report.</p>	States	APIRG to note
Conclusion 7/13:	<p>National Safety Plan (NSP)</p> <p>That</p> <ul style="list-style-type: none"> a) States that participated in the NSP workshops expedite the completion of their National Safety Plan, 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. The NSP Validation Panel submit to APIRG/15 meeting a verbal report on the NSP Validation. 	States, ICAO, Task Force	APIRG to note Conclusions 7/13 (c)

Number	Title	Action by	Remarks
Conclusion 7/14:	State Readiness Assessment	ICAO, Task Force	APIRG to note
	<p>That ICAO urge the States which have not done so, to provide the State RVSM readiness assessment; and</p> <p>That ICAO urge the States to update “the State Readiness survey”.</p>		
Conclusion 7/15:	Exchange of RVSM data between ASECNA and ARMA	ASECNA, ARMA	APIRG to note
	<p>That ASECNA sub-regional monitoring unit continue to forward to ARMA the RVSM data collected from their member States.</p>		
Conclusion 7/16:	Collision Risk Assessment (CRA)	ARMA, CRA, NLR,	APIRG to note
	<p>That :</p> <p>RVSM cannot be implemented at the date envisaged (January 2006) as the total Vertical TLS has so far not been met.</p> <p>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.</p>	ICAO	

Number	Title	Action by	Remarks
	<p>ARMA continue to provide the CRA data to NLR for inclusion in the AFI Pre-Implementation Safety Case (PISC).</p> <p>The CRA Consultant submit as soon as possible but not later than 31 August 2005 the final CRA Report .</p>		
Conclusion 7/17:	<p>Pre-Implementation Safety Case (PISC)</p> <p>That:</p> <ul style="list-style-type: none"> 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. c) The submission of PISC to the ANC will be determined by the TF/9 meeting. 	PISC Consultant	APIRG to note
Conclusion 7/18:	<p>Continuation of AFI RVSM Programme Office (ARPO)</p> <p>That the AFI RVSM Programme Office (ARPO) located at the ICAO ESAF Office continue the coordination activities relating to RVSM implementation. ICAO website: (www.icao.int/ESAF/RVSM)</p>	ICAO	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/19:	<p>Adoption of the FHA Final Report</p> <p>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.</p>	ICAO	APIRG to note
Conclusion 7/20:	<p>CVSM – RVSM Optimal Switch Over Time</p> <p>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.</p>	ICAO & Secretariat Support Team.	APIRG to note
Conclusion 7/21:	<p>AFI RVSM Core Airspace</p> <p>a) That 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 MTBF (Mean Time Between Failure) of two months for a given FIR”; and</p> <p>b) That for Req_{core}_88 (refer to FHA report at Appendix G) “Aircraft shall be equipped with ACAS II version 7.00”.</p>	Task Force	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/22:	<p>AFI RVSM Switch-Over Period</p> <p>a) That for <small>swit_24</small> (refer AFI FHA report at Appendix G) “Use of Eastbound RVSM FL (F1310, FL350 and FL390) shall be suspended for a period of Two (2) hours after the Time Zero (TO)”;</p> <p>b) That for <small>swit_40</small> (refer AFI FHA report at Appendix G) “Traffic density shall be limited during switch-over period as appropriate”;</p> <p>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,</p> <p>d) That for <small>swit_25</small> (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 hours”;</p> <p>e) That for <small>swit_35</small> (refer AFI FHA report at Appendix G) “Transit of non-RVSM civil aircraft shall be suspended for a period of Two hours after Time Zero (TO)”; and</p>	States, ICAO, Task Force	APIRG to note

Number	Title	Action by	Remarks
	f) That for <i>swit_36</i> (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:	<p>FHA safety requirements needing appropriate actions by the RVSM Programme</p> <p>That the following FHA safety requirements are allocated to the RVSM Programme:</p> <p>Req <i>Swit_37</i> “The switch-over period shall be performed during an appropriate low traffic density period” .</p> <p>Req <i>Swit_39</i> “The switch-over period shall be determined out of Hajj period”,</p> <p>Req <i>Swit_40</i> “Traffic density shall be limited during switch-over period as appropriate”,</p> <p>Req <i>Swit_41</i> “The FIR airspace shall be optimised to reduce controller workload”,</p> <p>Req <i>Swit_52</i> “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</p> <p>Req <i>Swit_60</i> ”Civil/Military coordination committee shall be in place”.</p> <p><i>Note: Req Swit_ - refer to the FHA Report at Appendix G.</i></p>	States, Task Force	APIRG to note

Number	Title	Action by	Remarks
Conclusion 7/24:	<p>Regional Aircraft Certification Agency for RVSM Operation</p> <p>That:</p> <ul style="list-style-type: none"> 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. c) Studies be conducted by IATA in cooperation with ICAO relating to the establishment of RVSM Certification Agencies for the AFI Region. 	States, ICAO, IATA	APIRG to approve this draft conclusion
Conclusion 7/25:	<p>AFI RVSM Implementation – Cost recovery</p> <p>That:</p> <ul style="list-style-type: none"> a) IATA airlines continue to financially support the RVSM implementation effort in order to improve safety and economy of Air Traffic across Africa. 	States, ICAO, IATA	APIRG to approve this draft conclusion

Number	Title	Action by	Remarks
	<p>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.</p>		
Conclusion 7/26:	Campaign to enhance RVSM Implementation	States, ICAO, IATA	APIRG to approve this draft conclusion
	<p>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.</p>		
Conclusion 7/27:	AFI RVSM Strategy/Action Plan	States, ICAO, IATA	APIRG to approve this draft conclusion
	<p>That the updated RVSM Strategy/Action Plan at Appendix A be circulated to States for action.</p>		
Conclusion 7/28:	Amendment to ICAO Doc. 7030	States, ICAO	APIRG to approve this draft conclusion
	<p>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 taking into account the results of PISC and its review by ANC.</p>		

Number	Title	Action by	Remarks
Conclusion 7/29:	Target Date for AFI RVSM Implementation That the target date for implementation of RVSM in the AFI Region will be AIRAC date 28 September 2006 .	States, ICAO	APIRG to approve this draft conclusion
Decision 7/1:	Venue of TF/8 Meeting That the TF/8 Meeting will be held in Lagos, Nigeria from 10 to 14 October 2005.	Task Force	APIRG to note

**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
					Completed on Time
12	RVSM Seminar /RVSM/ITF/4	26-30/07/04	Completed	ICAO/RVSM ITF/4	
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	ARTE/6	
20	RVSM/ARTF/8	08-09/08/05 10-12/08/5	Completed Completed	ARTE/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	June 06	In Progress	States	TF/10 to confirm date
24	Publish Trigger NOTAM	June 06	In Progress	States	TF/10 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 Air Traffic Management	On Going	In progress	ICAO/ARMA/IATA	Airworthiness training to be provided for State authorities
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 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. Report Completed May

AFI RVSM IMPLEMENTATION ACTION PLAN					
ID	Description	Target Date	Status	Resources	Remarks
					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 flight 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, Mauritius, 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 flight 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 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 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 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 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 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 track, 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 expeditious 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	DESCEND 90 m (300 ft)
	RIGHT	CLIMB 90 m (300 ft)
WEST 180 ⁰ – 359 ⁰ magnetic	LEFT	CLIMB 90 m (300 ft)
	RIGHT	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 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 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 5×10^{-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 (0 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 flights 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 certain 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 that 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 an 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.

	<p>a) on the initial call on any frequency within the AFI RVSM airspace (controllers shall provide read back with this same phrase); and</p> <p>b) in all requests for flight level changes pertaining to flight levels within the AFI RVSM airspace; and</p>
	<p>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.</p>
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 (<i>call sign</i>) 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

15 Phraseology related to RVSM Operations in the AFI RVSM AIRSPACE

15.1 Controller/pilot RTF phraseology

Phrase Meaning	Phrase Meaning
(<i>call sign</i>) 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:

	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

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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 to as “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 belonging 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 addition, 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.

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

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 5×10^{-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; and the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s).~~

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.
- 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.

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:

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

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 Yugoslav 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 of 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.

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