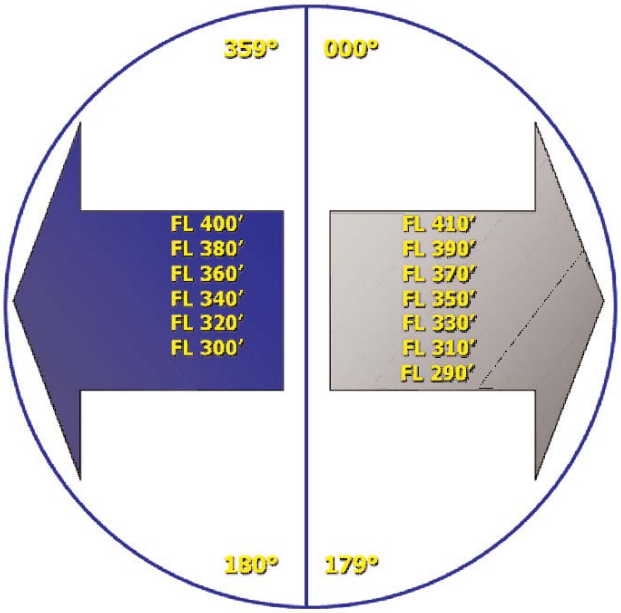
I·F·A·L·P·A
The Global Voice of Pilots

Air Traffic Services
Briefing Leaflet

09ATSBL01 September 2008

African RVSM Implementation

In recent years reduced vertical separation minima (RVSM) has been introduced to a number of regions around the world. This process will continue with the implementation of RVSM to FIRs and surrounding Oceanic airspace of the entire African continent on 25 September 2008 at 0001Hour UTC.
The Airspace between FL290 and FL410 inclusive is defined as RVSM airspace. AFI RVSM airspace is exclusive RVSM airspace and therefore aircraft that are not State RVSM Operationally Approved will not be permitted to operate into AFI RVSM airspace.
The AFI RVSM Implementation program is undoubtedly the largest Communications, Navigation, and Surveillance / Air Traffic Management (CNS/ATM) implementation project undertaken by the AFI Region. The initiative will not only realise the implementation of RVSM as planned, but it will also, by improving the ATM infrastructure contribute to improving overall safety in the AFI region. Simultaneously with the process, AFI States and Aviation partners are being drawn closer together in the field of ATM cooperation.



RVSM Compliance Operations

1.**Qualifications**
All aircraft entering RVSM Airspace must be State RVSM operationally approved. In order to obtain State RVSM Operational approval based on the European Joint Aviation Authority, Temporarily Guidance Leaflet No. 6 rev.1 (JAA TGL6,rev.1) there are two steps to the approval process:

- RVSM Airworthiness Approval indicating that an aircraft has been successfully modified and/or inspected in compliance with the applicable criteria.

- RVSM Operational Approval indicates firstly that the aircraft holds the relevant State RVSM Airworthiness Approval and secondly that the ongoing operating procedures and continued airworthiness procedures (e.g. maintenance and repair) are fully acceptable to the appropriate Civil Aviation Authority.

Thereafter the aircraft is expected to take part in the AFI RVSM Height Monitoring program on a regular basis. Height Monitoring results from other Regions contributes to the AFI Height Monitoring program. Such exchange of data is supported by ICAO.

2.**Equipage**
2.1 The AFI Region has adopted ACAS II requirements in conformity with the relevant provisions contained in ICAO Annexes 6 and 10. These requirements apply to AFI RVSM airspace. Additionally, the ICAO AFI RVSM Implementation Task Force recommends that those aircraft equipped with ACAS and operated in RVSM airspace shall be equipped with ACAS II. (TCAS II systems with Version 7.0 incorporated meet ICAO ACAS II standards in Annex 6).

2.2 Before entering RVSM airspace, the pilot should review the status of required equipment. The following equipment should be operating normally:

a) two independent primary altimetry systems;
b) one automatic altitude-control system (autopilot); and
c) one altitude-alerting device.

3. **Communications failure procedure**

In the event of radio communication failure, the procedures in ICAO Doc. 4444 PANS/ATM apply, Chapter 15; the most relevant for pilots are transcribed below;

15.3.3 If the aircraft fails to indicate that it is able to receive and acknowledge transmissions, separation shall be maintained between the aircraft having the communication failure and other aircraft, based on the assumption that the aircraft will:
a) if in visual meteorological conditions:
1) continue to fly in visual meteorological conditions;
2) land at the nearest suitable aerodrome; and
3) report its arrival by the most expeditious means to the appropriate air traffic control unit; or

b) if in instrument meteorological conditions or when conditions are such that it does not appear likely that the pilot will complete the flight in accordance with a):

1) unless otherwise prescribed on the basis of a regional air navigation agreement, in airspace where procedural separation is being applied, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan; or

2) in airspace where an ATS surveillance system is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following:
i) the time the last assigned level or minimum flight altitude is reached; or
ii) the time the transponder is set to Code 7600 or the ADS-B transmitter is set to indicate the loss of air-ground communications; or
iii) the aircraft's failure to report its position over a compulsory reporting point;
whichever is later and thereafter adjust level and speed in accordance with the filed flight plan;

3) when being vectored or having been directed by ATC to proceed offset using 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;

4) proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with 5), hold over this aid or fix until commencement of descent;

5) commence descent from the navigation aid or fix specified in 4) 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;

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

Telephone Numbers for ATC Centres

ACC	Country	Tel
Abidjan	Cote d'Ivoire	+225 21 27 64 39
Accra	Ghana	+233 21 773 283
Addis Ababa	Ethiopia	+251 11 661 1156/57
		+251 11 650 517/519
Algiers	Algeria	+213 21 66 96 14 Supervisor
		+213 21 53 33 73 Supervisor
		+213 21 67 21 30 Head of ACC
Antananarivo	Madagascar	+261 202 258 125
Asmara	Eritrea	+291 1 181 424
Bamako	Mali	+233 220 93 58
Beria	Mozambique	+258 23 301 626
		+258 23 301 071/2
Brazzaville	Congo	+242 547 8182
Cairo	Egypt	+202 226 7883
		+202 226 67925
Casablanca	Morocco	+212 22 539 012
		+212 37 773 074
Cape Town	South Africa	+27 21 937 1119
Dakar	Senegal	+221 338 200 705
Dar es Salaam	Tanzania	+255 22 21 10 254
Douala	Cameroon	+237 33 42 77 34
Entebbe	Uganda	+256 414 320 907
Gaborone	Botswana	+267 395 9440
Harare	Zimbabwe	+263 457 5187
		+263 457 5183
Johannesburg	South Africa	+27 11 928 6454/5
Johannesburg Oceanic	South Africa	+27 11 928 6453
Kano	Nigeria	+234 80 77 593 011
		+234 80 77 593 012
Khartoum	Sudan	+249 8378 4925
		+249 8378 8192
		+249 183 770 534
Kinshasa	DRC	+243 812 432 606
		+243 810 086 772
Lagos	Nigeria	+234 80 77 59 30 01
		+234 80 77 59 30 02
Libreville	Gabon	+241 05 18 22 04
Lilongwe	Malawi	+265 701 063
Luanda	Angola	+244 222 351 027
		+244 222 651 207
Lubumbashi	DRC	+243 990 871 956
		+243 815 773 046
Lusaka	Zambia	+260 211 271 091
		+260 211 271 469
Mogadishu	Somalia	+254 20 762 2774
		+254 20 762 2785
Mauritius	Mauritius	+230 603 2000
Nairobi	Kenya	+254 20 827 101
		+254 20 827 100 Ext 46015
Ndjamena	Chad	+235 252 0830
		+235 252 4262
Niamey	Niger	+227 20 733 586
Ouagadougou	Burkina Faso	+226 5031 1641
Roberts	Monrovia	+231 6 823 776
Sal	Cape Verde	+238 241 1730 Supervisor
		+238 241 1970
		+238 992 5420 Cell
Seychelles	Seychelles	+248 374 051
		+248 384 173
		+873 762 398 Sat phone
Tripoli	Libya	+218 21361 9083
		+218 21361 9614
Tunis	Tunisia	+216 71 754 000
Windhoek	Namibia	+264 61 208 8111

7) land, if possible, within 30 minutes after the estimated time of arrival specified in 5) or the last acknowledged expected approach time, whichever is later.

4. **Wake turbulence procedures**

4.1 Pilots encountering or anticipating wake turbulence in AFI RVSM airspace have the option of requesting;

a) FL change, or

b) a vector (if possible) or

c) applying SLOP (no ATC clearance required in remote continental airspace).

5. **Deviation actions taken by Pilot**

5.1 Pilots of aircraft operating in IFR, when deviating for any reason by 300ft or more from a cleared flight level by ATC in RVSM airspace, shall report to the relevant ATS unit concerned via radio or data link, as soon as practicable, on the level deviation.

5.2 After completion of the flight, the pilot shall also report to the operator the details of any deviation.

ASECNA managed centres

Centre	Phone	SATCOM Code 870
Abidjan ACC	+(225) 21 27 64 39	763041714
Bamako ACC	+ (223) 220 93 58	763041718
Bangui TWR	+(236) 261 98 70	763041722
Brazzaville ACC/FIC	+(242) 547 81 82	763041726
Cotonou TWR	+(229) 21 30 76 35	
	+(229) 95 36 07 16	763041730
Dakar ACC/FIC	+(221) 33 820 07 05	763041734
Douala ACC	+(237) 3342 77 34	763041738
Antananarivo - Ivato	+261 2022 58125	763041742
Libreville ACC	+(241) 05 18 23 04	763041746
Lomé TWR	+(228) 226 50 62	763041750
Malabo TWR	+(240) 09 22 01	763041754
N'Djamena ACC/FIC	+(235) 252 42 62	
	+(235) 252 08 30	763041758
Niamey ACC/FIC	+(227) 20 73 35 86	763041762
Nouakchott ACC	+(222) 525 35 18	763041766
Ouagadougou ACC	+(226) 50 31 16 41	763041770

6. **Transition between FL's**

6.1. During cleared transition between levels, the aircraft should not overshoot or undershoot the assigned FL by more than 150 ft.

7. **Strategic lateral offset procedures (SLOP)**

7.1. The flight crew may apply strategic lateral offsets on remote continental airspace (Non-radar airspace) when the aircraft is equipped with automatic offset tracking capability.

7.2. The decision to apply a strategic lateral offset shall be the responsibility of the flight crew.

7.3. The strategic lateral offset shall be established at a distance of 1 NM or 2 NM to the right of the centre line of the route relative to the direction of flight.

7.4. Pilots are not required to inform ATC that a strategic lateral offset is being applied.

7.5. Within radar airspace, the strategic lateral offset procedure requires approval by ATC.

7.6. Pilots applying SLOP as described in above, may request approval from ATC to continue with the offset upon entering radar airspace.

8. **Flight Plan Requirements**

8.1 The letter "W" shall be inserted in item 10 (Equipment) of the ICAO standard flight plan to indicate that both the aircraft and operator are RVSM approved.

9. **Suspension of RVSM**

9.1 Air traffic services will consider suspending RVSM procedures within affected areas of AFI FIRs when there are pilot reports of greater than moderate turbulence.

9.2 Within areas where RVSM procedures are suspended, the vertical separation minimum between all aircraft will be 2,000ft within the same RVSM FLAS.

10. **Procedures for Implementation Day**

• All aircraft that operate or are planning to operate in the RVSM Flight Level band within the African Continent at, and beyond, 25 September 2008 0001UTC shall comply with the RVSM requirements.

• All aircraft entering African Continent airspace between FL290 and FL410 inclusive at, and beyond, 25 September 2008 0001UTC will be assigned a Flight Level in accordance with the RVSM FLAS.

• All aircraft departing from African Continent airports that need to file a FL between FL290 and FL410 inclusive at, and beyond, 25 September 2008 0001UTC will be assigned a Flight Level in accordance with the RVSM FLAS.

• All crew should be reminded that FL310, FL350 and FL390 will be suspended from time of switchover for two hours. (Refer to applicable AFI State AIP Supplements),

• Aircraft operating or planning to operate in AFI RVSM airspace at the time of switchover must include in their flight plan an RVSM requested altitude, consistent with the direction of flight, at 0001 UTC. This requirement for a requested altitude is especially important in the event of lost communications.

• Aircraft operating within the African Continent airspace at 25 September 2008 0001UTC can expect the following;

• Commencing at 2315 UTC on the 24th September controllers will broadcast the following message on the appropriate Area Control Frequencies, "Attention all aircraft, attention all aircraft, RVSM operations will begin at 0001 UTC". This message will be repeated at 2330 UTC, 2345 UTC and again at 2355 UTC.

• All operations above FL410 with regard to non RVSM approved aircraft are suspended with effect from 2201UTC on the 24th September 2008 to 0201UTC on the 25th September 2008.

• Effective 2201UTC on the 24th September 2008, with the exception of non RVSM approved state aircraft (Military, Police and Customs); all other non RVSM approved aircraft are permanently excluded from operations in the airspace between FL290 and FL410 inclusive.

Controller actions to be expected by flight crew 2201UTC 24 Sept – 0201 UTC 25 Sept

Date/Time UTC	***Controller Actions***
24 Sept 2201 - 25 Sept 0201	*Suspend operations above FL410 by non RVSM aircraft*
25 Sept 0001	*Start allocating RVSM flight levels (with the exception of FL310, 350 & 390*
25 Sept 0001- 25 Sept 0200	*Suspend use of eastbound RVSM FL310,350 & 390, allocate only RVSM FL290, 330, 370 & 410 to eastbound flights.*
25 Sept 0201 onwards	*Allocation without exception RVSM flight levels in accordance with FLAS (2,000ft separations may be used in emergencies using RVSM flight levels*

11.**Post Implementation 0201UTC onward**
All aircraft operating in RVSM airspace will be cleared in accordance with the RVSM FLAS.

12. **RVSM Phraseology**
13. Contingency scenarios

A) For a controller to ascertain the RVSM approval of an aircraft: ***(Call Sign) confirm RVSM approved***

B) For a pilot to report Non-RVSM approved status
1. On initial call on any frequency within RVSM airspace
and
2. In all requests for flight level changes pertaining to flight levels within RVSM airspace
(Call Sign) negative RVSM

C) For a pilot to report RVSM approved status: ***(Call Sign) affirm RVSM***

D) For a pilot of a non RVSM approved state aircraft to report non-RVSM approved status in response to the phrase (Call sign) confirm RVSM approved: ***(Call Sign) Negative RVSM state aircraft***

E) Denial of clearance into the RVSM airspace: ***(Call Sign) Unable issue clearance into RVSM airspace. Maintain (descend to or climb to) FLXXX***

F) For a pilot to report when severe turbulence affects the aircraft's ability to maintain the height keeping requirements of RVSM: ***(Call Sign) Unable RVSM due to turbulence***

G) For a pilot to report that the aircraft's equipment has degraded en route below that required to for flight within the RVSM airspace:

(Call Sign) Unable RVSM due to equipment

Note: This phrase is to be used to convey both the initial indication of non –MASPs compliance and henceforth, on initial contact on all frequencies within the lateral limits of the RVSM airspace until such time as the problem has ceased to exist or the aircraft has left the RVSM airspace

H) For a pilot to report the ability to resume operations within the RVSM airspace after a weather or equipment related problem:

(Call Sign) ready to resume RVSM

I) For a Controller to confirm that an aircraft has regained its RVSM approved status or to confirm that the pilot is ready to resume RVSM operations:

(Call Sign) report when able to resume RVSM operations

Contingency Actions: Weather encounters and aircraft system failures - initial pilot actions

Initial Pilot Actions when unable to maintain flight level (FL) or unsure of aircraft altitude-keeping capability:

- ***Notify ATC and request assistance as detailed below.***
- ***Maintain cleared flight level, to the extent possible, while evaluating the situation***
- ***Watch for conflicting traffic using all available means***
- ***Alert nearby aircraft by illuminating exterior lights (commensurate with aircraft limitations)***
- ***If unable to contact ATC, broadcast position, flight level and intention on 126.9 MHz***

Severe turbulence and/or mountain wave activity (MWA) induced altitude deviations of approximately 200 feet

Pilot actions:

- **When experiencing severe turbulence and/or MWA induced altitude deviations of approximately 200 feet or greater, pilot will contact ATC and state "Unable RVSM Due (state reason)" (e.g., turbulence, mountain wave)**
- **If not issued by the controller, request vector clear of traffic at adjacent FL's**
- **If desired, request FL change**
- **Report location and magnitude of turbulence or MWA to ATC**

Controller actions:

- Assess the traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal or increased vertical separation and, if so, apply the appropriate minimum.
- Advise pilot of conflicting traffic
- Issue FL change, traffic permitting
- Issue PIREP to other aircraft

Mountain wave activity encounters – General

Note: MWA encounters do not necessarily result in altitude deviations on the order of 200 feet. The guidance below is intended to address less significant MWA encounters.

Pilot actions:

- **Contact ATC and report experiencing MWA,**
- **Report location and magnitude of MWA to ATC,**
- **If so desired, pilot may request a FL change.**

Controller actions:

- Advise pilot of conflicting traffic at adjacent FL,
- If pilot requests, vector aircraft to avoid merging target with traffic at adjacent RVSM flight levels, traffic permitting,
- Issue FL change or re-route, traffic permitting,
- Issue PIREP to other aircraft.

Wake turbulence encounters

Pilot actions:

- **Contact ATC and request vector, FL change or, if capable, a lateral offset.**

Controller actions:

- Issue vector, FL change or lateral offset clearance, traffic permitting.

Unable RVSM due to equipment failure of automatic altitude control system, altitude alerter or all primary altimeters

Pilot actions:

• Contact ATC and state "Unable RVSM Due Equipment",

• Request clearance out of RVSM airspace unless operational situation dictates otherwise.

Controller actions:

• Provide 2,000ft vertical separation or appropriate horizontal separation,

• Clear aircraft out of RVSM airspace unless operational situation dictates otherwise.

One primary altimeter remains operational

Pilot actions:

• Cross check stand-by altimeter,

• Notify ATC of operation with single primary altimeter,

• If unable to confirm primary altimeter accuracy follow actions for failure of all primary altimeters.

Controller actions:

• Acknowledge operation with single,

• Relay to other controllers or facilities who will subsequently handle the aircraft and any special handling requirement or being provided.

Transponder failure

Pilot actions:

• Contact ATC and request authority to continue to operate at cleared flight level,

• Comply with revised ATC clearance, if issued.

Controller actions:

• Consider request to continue to operate at cleared flight level,

• Issue revised clearance, if necessary.

Aircraft requiring rapid descent

Pilot actions:

• Notify ATC of aircraft location and request FL change as required,

• Upon declaring an emergency a pilot may exercise his right and change his assigned flight level. He shall notify ATC immediately and submit a report upon arrival at the destination,

• If unable to contact ATC and rapid descent required:

• Deviation procedure for level change: turn 30° right or left and track out 15 nm then, turn to track parallel the original route, then climb or descend to the new level, and then return to the original FL (when appropriate).

Note: be aware: when returning to the original route, it is possible you may have have conflicting traffic.

• Establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position and intention on the frequency in use, as well as on frequency 121.5, 126.9 MHz in IFBP airspace (or, as a backup, the VHF inter-pilot air-to-air frequency 123.45 MHz),

• Establish visual contact with conflicting traffic.

• Turn on all aircraft exterior lights.

For more information about the implementation of RVSM in Africa see the ICAO Regional office in Nairobi website:
www.icao.int/esaf/RVSM

IFALPA 60 — Sixty years working for the highest level of air safety Worldwide