

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

1.5.1 Minimum (RVSM) of 300 m (1,000 ft)

1.5.1.1 Area of Applicability

1.5.1.2 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 2.1.1 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.

2.3.4 Use of repetitive flight plans

2.3.4.1 Provision shall be made so that repetitive flight plans be accepted for any flight conducted onJanuary 2005 in the AFI RVSM airspace.

2.3.5 Flight planning for RVSM approved aircraft

2.3.5.1 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.

2.3.5.2 Operators of formation flights of State aircraft shall not insert the letter W in Item 10 of the ICAO flight plan form, regardless of the RVSM approval status of the aircraft concerned. Operators of formation flights of State aircraft intending to operate within the AFI RVSM airspace as General Air Traffic (GAT) shall include STS/NONRVSM in Item 18 of the ICAO flight plan form.

2.3.5.3 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.

2.3.5.4 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.

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

2.3.6 Flight planning for non-RVSM approved aircraft

2.3.6.1 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.

2.3.6.2 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 for that portion of the route commencing immediately after the entry point.

2.3.6.3 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.

2.3.6.4 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 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.

2.3.6.5 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.

4.0 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES

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' 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.

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;
- 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 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 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 are the direction to an alternative airport, terrain clearance and the flight levels allocated to adjacent routes.

~~4.3.2 Subsequent action (RVSM airspace)~~

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

~~mid point from the adjacent parallel route or track and:~~

- a) ~~if above FL 410, climb or descend 300 m (1 000 ft); or~~
- b) ~~if below FL 410, climb or descend 150 m (500 ft); or~~
- c) ~~if at FL 410, climb 300 m (1 000 ft) or descend 150 m (500 ft).~~

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

- a) ~~initially minimize its rate of descent to the extent that it is operationally feasible;~~
- b) ~~turn while descending to acquire 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~~
- e) ~~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~~
- e) ~~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~~
- e) ~~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 PHRASELOGY

“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; and
 - 1) comply with the ATC clearance issued; or
 - 2) execute the procedures detailed in 4.5.4 below; and
- b) 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);
- 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:

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)

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.

- 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 2.2. 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 2.2, 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;
 - all formation flights of State aircraft and any other aircraft operating within the AFI RVSM airspace; and
 - non-RVSM approved aircraft and any other aircraft operating within the AFI RVSM transition airspace and within specifically designated airspace.

16.2. 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):~~
 - 1) ~~the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude; and~~
 - 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);~~

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~~

d) ~~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~~

~~multiplies 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.

10.0 AIR TRAFFIC SERVICES MESSAGES

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

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.

10.2 Computer-assisted coordination process

10.2 Procedures

10.2.1 *Operational procedure*

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

- a) These messages shall be automatically generated, exchanged and processed to obviate human intervention to the extent practicable.
- b) A single message shall be sent in respect of each flight due to be transferred and any subsequent

revision shall be the subject of verbal coordination.

- c) The message shall provide the most recent information available on all transfer conditions at the time of transmission.
- d) Acceptance by the receiving unit of the transfer conditions implied in the message shall be assumed, unless the receiving unit initiates verbal coordination to amend the transfer conditions.

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

- e) There shall be bilateral agreement as to the boundary point and transmission times for each route. The normal transmission time shall be 15 minutes before the flight concerned is expected to cross the boundary.
- f) In the event of data not being correlated by the receiving computer with an appropriate entry in its flight plan database, the computer shall originate a warning to the appropriate air traffic control sector to take necessary action for the acquisition of missing flight plan details. This shall normally involve a telephone inquiry.
- g) In the event of incomprehensible or illogical data being detected within the message, the computer shall initiate an appropriate warning to the air traffic control sector involved, if this can be determined, for further action.

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

- h) If the receiving unit has not received a flight plan, the sending air traffic

control unit shall verbally inform the receiving unit of whether or not the aircraft is RVSM approved.

- i) When an automated message does not contain the information filed in Item 18 of the ICAO flight plan form relevant to RVSM operations, the sending air traffic control unit shall inform the receiving unit of that information by supplementing the ACT message verbally, using the term “NEGATIVE RVSM” or “NEGATIVE RVSM STATE AIRCRAFT”, as applicable.
- j) When a verbal coordination process is being used, the sending air traffic control unit shall include the information filed in Item 18 of the ICAO flight plan form relevant to RVSM operations at the end of the verbal estimate message, using the term “NEGATIVE RVSM” or “NEGATIVE RVSM STATE AIRCRAFT”, as applicable.
- k) When a single aircraft is experiencing an in-flight contingency which impacts on RVSM operations, the associated coordination message(s) shall be supplemented verbally by a description of the cause of the contingency.

11.0 ALERTING AND SEARCH AND RESCUE SERVICES

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

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

- a) carry appropriate survival equipment:

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

11.2 Alerting services (P-ATM, 9.2)

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

12.0 IDENTICAL 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 used 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) 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.

15. Special procedures applicable to designated airspaces

15.1 Provisions for the transition of aircraft to/from the AFI RVSM airspace

15.1.1 Area of applicability

15.1.1.1 Transition tasks associated with the application of a 300 m (1 000 ft) vertical separation minimum within the AFI RVSM airspace, shall be carried out in all or parts of the following FIRs/UIRs:

Accra, Addis Ababa, Algiers, Antananarivo, Asmara, Brazzaville, Cairo, Canarias, CapeTown, Casablanca, Dakar, Durban, Kano, Luanda, Mogadishu, Port Elizabeth, Roberts, Tripoli, Windhoek, Tunis,

Note.— The volume of airspace referred to in 15.3.1.1 will be referred to as the “AFI RVSM transition airspace”.

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

15.1.2.1 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.

15.3.2.2 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 VSM airspace, and shall be achieved before the aircraft passes the transfer of control point to the adjacent CC/UAC, unless otherwise specified in an inter ACC letter of agreement.

15.3.2.3 Aircraft entering a non-RVSM environment from the AFI RVSM airspace

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

15.3.3.2 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.

15.3.3.3 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.

15.3.3.4 Non-RVSM approved civil operations

15.3.3.5 Non-RVSM approved 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.

15.3.4.2 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.

15.3.4.3 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.

15.3.4.4 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.

16. Air Traffic Services messages

16. Phraseology related to RVSM Operations in the AFI RVSM AIRSPACE

16.1 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: a) on the initial call on any frequency within the AFI RVSM airspace (controllers shall provide read back with this same phrase); and b) in all requests for flight level changes pertaining to flight levels within the AFI RVSM airspace; and
	c) in all read backs to flight level clearances pertaining to flight levels

	within the AFI RVSM airspace. Additionally, except for State aircraft, pilots shall include this RTF phrase to read back flight level clearances involving the vertical transit through FL 290 or FL 410.
AFFIRM RVSM*	For a pilot to report RVSM approval status.
NEGATIVE RVSM STATE AIRCRAFT*	For a pilot of a non-RVSM approved State aircraft to report non-RVSM approval status, in response to the RTF phrase (<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 TURBULENCE*	
UNABLE RVSM DUE EQUIPMENT*	For a pilot to report that the aircraft's equipment has degraded below the MASPS required for flight within the AFI RVSM airspace. This phrase is to be used to convey both the initial indication of the non-MASPS compliance, and henceforth, on initial contact on all frequencies within the lateral limits of the AFI RVSM airspace until such time as the problem ceases to exist, or the aircraft has exited RVSM airspace.
READY TO RESUME RVSM*	For a pilot to report the ability to resume operation within the AFI RVSM airspace after an equipment or weather-related contingency.

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

*Note.-*indicates a pilot transmission*

16.2 Phraseology between ATS units

NEGATIVE RVSM <i>or</i> NEGATIVE RVSM STATE AIRCRAFT [<i>as applicable</i>]	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 [<i>or</i> EQUIPMENT, <i>as applicable</i>]	To communicate the cause of a contingency relating to an aircraft that is unable to conduct RVSM operations due to severe turbulence or other severe weather-related phenomenon [<i>or</i> equipment failure, <i>as applicable</i>]. End of new text.

17. RVSM Approval

17.1 Except for State aircraft, operators intending to conduct flights within the volume of airspace specified in 2.1 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 2.1

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”.

18. Minimum Aircraft Systems Performance (MASPS)

18.1 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.

18.2 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

19. RVSM Monitoring

19.1 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 18. Monitoring shall include assessment of other sources of risk to ensure that the TLS specified in 20 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.

20. Target level of safety (TLS)

20.1 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; an the~~

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

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