
**ENR 1.9 – REDUCED VERTICAL SEPARATION MINIMUM (RVSM) –
Policy and Procedures in Chennai, Delhi, Kolkata and Mumbai FIR.**

1. Introduction

- 1.1. The International Civil Aviation Organization (ICAO) Third Asia/Pacific Regional Air Navigation Meeting recommended that Reduced Vertical Separation Minimum (RVSM) should be introduced in the Asia/Pacific region. The Pacific and South China Sea RVSM implementation programs are complete, and application of RVSM will now expand west to the Bay of Bengal States and adjacent FIR. Aircraft operators and air traffic services (ATS) providers may gain significant benefits.
- 1.2. ICAO Doc 9574 - Manual on Implementation of a 300M (1000Ft) Vertical Separation Minimum between FL290 and FL410 (both inclusive) contains explanation of RVSM.
- 1.3. Benefits to be gained from RVSM include:
- i) Adoption of an ICAO endorsed navigation requirement;
 - ii) Improved utilization of airspace for ATC conflict resolution;
 - iii) Fuel savings of \cong 1% for flight closer to optimum cruise altitude; and
 - iv) Reduction in ground delays

2. Content

- i) Definitions
- ii) Identification of RVSM Airspace
- iii) Airworthiness and Operational Approval and Monitoring
- iv) ACAS II and Transponder Equipage
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- vi) Special Procedures for In-flight Contingencies in Oceanic Airspace
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- xv) Delivery Flights for Aircraft that are RVSM approved on delivery
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- xvii) Guidance for Pilot and Controller for Actions in Event of Aircraft System Malfunction or Turbulence Greater than Moderate
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3. Definitions

- 3.1. Exclusive airspace - Airspace in Indian FIRs in which aircraft that are NONRVSM approved are not permitted to flight plan or operate-in unless the provisions of section 14 of this document apply. In regard to the application of RVSM procedures in Indian FIRs aircraft shall be categorized as follows:
- i) RVSM Approved - Aircraft, which have gained a RVSM approval from the State of Registry or State of the Operator.
 - ii) Non-RVSM Approved - Aircraft which do not have a RVSM approval, or was RVSM approved but has become non-approved due to equipment failure.
 - iii) Approved Non-RVSM - Aircraft which have gained an approval to flight plan in exclusive RVSM airspace, as per special coordination procedures.

4. Identification of RVSM airspace in Indian FIR and the Transition plan.

- 4.1. RVSM airspace is prescribed within the Chennai, Delhi, Kolkata and Mumbai FIR within controlled airspace between FL290 and FL410 (both inclusive).
- 4.2. RVSM airspace in the Indian FIR will be designated as follows-

- i) Exclusive RVSM airspace over Bay of Bengal
 - ii) Exclusive RVSM airspace over Arabian Sea in Mumbai FIR as described in Attachment D
 - iii) Non-Exclusive RVSM airspace as described in Attachment D
Note - The Conventional Vertical Separation Minimum airspace in Mumbai FIR is also described in Attachment C
- 4.3. Due to non-implementation of RVSM in the Mauritius, Mogadishu and Seychelles FIR of Africa region, Mumbai FIR will transition aircrafts from Reduced Vertical Separation Minimum (RVSM) Flight Levels to Conventional Vertical Separation Minimum (CVSM) flight levels and from Conventional Vertical Separation Minimum (CVSM) Flight Levels to Reduced Vertical Separation Minimum (RVSM) Flight Levels as required. The Flight Level Allocation Scheme (FLAS) developed by India in coordination with ICAO as given in Para 2.3 below will facilitate transition of traffic to/from these FIR.
- 4.4. The Flight Level Allocation Scheme (FLAS) for the Bay of Bengal Airspace, the Indian Continental airspace and Arabian Sea airspace are detailed below. Flight Level Allocation by ATC shall be in accordance with these tables. In addition, operators shall flight plan in accordance with these tables.

4.4.1. FLAS for Bay of Bengal Oceanic airspace

4.4.1.1 West Bound (H24)

Bay of Bengal	Flight level allocation
N877, P628, L759, P570, M300, N563, N571 and P574	FL280, FL320, FL340, FL360, FL380, FL400 are available (FL360 is available subject to coordination)
P646 and L507	All west-bound flight levels are available
P762, L301, N895, L645, A327	FL300, FL360 are available (FL360 available subject to coordination)

4.4.1.2 East Bound (H24)

Bay of Bengal	Flight level allocation
N877, P628, L759, M770, P570, M300, N563, N571, P574	All east-bound flight levels are available (except FL290)
P762, L645, A327	FL290 is available as No Pre-Departure Coordinated Level. All other flight levels are available subject to coordination
P646, L507, L301 and N895	All east-bound flight levels are available

4.4.2. FLAS for international traffic over continental India.

4.4.2.1 West Bound (0001 to 1600UTC)*

Indian continental airspace	Flight level allocation
A325, A791, N877	FL300, FL340, FL360, FL400 are available (see note below)

FL280, FL320, FL380 available for domestic/international traffic crossing above routes.

* All levels available for international flights in the continental airspace from 1601UTC to 0000UTC of the next day.

Note 1 - Airlines to flight plan in accordance with the FLAS mentioned above to cross Indian continental airspace on-

- a) N877 between VVZ- NNP- PRA- TASOP
b) A791 between CEA VOR to TASOP

Note 2 - Flight Level changes to meet the requirements of FLAS over continental airspace of India will be done within Indian continental airspace.

4.4.2.2 East Bound (0001 to 1600UTC)*

Indian continental airspace	Flight level allocation
A325, A791, N877	FL310, FL350, FL390, FL410 are available (see note below)

FL290, FL330, FL370 available for domestic/international traffic crossing above routes.

* All levels available for international flights in the continental airspace from 1601UTC to 0000UTC of the next day.

Note - Flight Level changes to meet the requirements of FLAS over continental airspace of India will be done within Indian continental airspace.

4.4.3. The FLAS in Arabian Sea Oceanic airspace (H24)

S No	ATS Route	Westbound	Eastbound	Remarks
1	L301, P574, N571	All RVSM flight levels FL300, FL320, FL340, FL360, FL380, FL400 are available	All RVSM flight levels FL290, FL310, FL330, FL350, FL370, FL390, FL410 available	
2	N563	FL320, FL340, FL360, FL380 & FL400 are available	FL290, FL310, FL350, FL370, FL390 & FL410 are available	FL300 & FL330 are blocked for crossing routes
3	M300	FL320, FL340, FL360, FL380 & FL400 are available	FL290, FL310, FL350, FL370, FL390 & FL410 are available	FL300 & FL330 are blocked for crossing routes
4	P570	FL320, FL340, FL360, FL380 & FL400 are available	FL290, FL310, FL350, FL370, FL390 & FL410 are available	FL300 & FL330 are blocked for crossing routes
5	R456	FL280-Other levels may be authorized subject to availability in view of the conflicting traffic	FL350, FL370 & FL390 are available. Other levels may be authorized subject to availability in view of the conflicting traffic	FL300 & FL330 are blocked for crossing routes

6	UL425	FL320, FL340, FL360, FL380 & FL400 are available. Other levels may be authorized subject to availability in view of the conflicting traffic	FL290, FL310 & FL410 are available. Other levels may be authorized subject to availability in view of the conflicting traffic	FL300 & FL330 are blocked for crossing routes
7	A451	FL300	FL330	Other levels may be available subject to availability
8	G450, B459, A474	FL300	FL330	Other levels may be available subject to availability. These routes are going into FIR, which are NON-RVSM
9	A452, G424	FL280 & below	FL270 & below	NON RVSM routes
10	G465, A214	All levels (CVSM)	All levels (CVSM)	NON RVSM routes
11	R329	FL280 available as no PDC level. Other levels available with prior coordination	FL290, FL310, FL350, FL370 & FL410 are available (FL330 not available)	

4.4.4. Flight Level Allocation scheme on ATS route A201 and A599

4.4.4.1 Due to transitional airspace issues in airspace to the east of the Indian FIR, flights exiting Indian airspace via routes A599 and A201 will be allocated flight levels in accordance with the table below. Where required, change of flight level will occur west of SUMAG for aircraft exiting via B465/A599 and west of TEBID for aircraft exiting via A201.

ATS Route	Reporting Point	RVSM Flight Level available East of the waypoint
A599	CHILA (222330.0N 0924455.5E)	FL290, FL330, FL370 & FL410
A201	ANSOS (232702.7N 0932748.0E)	FL290, FL330, FL370 & FL410

4.4.4.2 Flight level allocation scheme on ATS route W31 North of way point ASARI in Delhi FIR.

ATS Route	Reporting Point	RVSM Flight Level available East of the waypoint
W31	ASARI	West bound – (Delhi - J&K Sector) FL280, FL320, FL340, FL360, FL380, FL400 & FL430
		East bound – (Delhi - J&K Sector) FL270, FL290, FL330, FL 370, FL380, FL410 & FL450

4.4.4.3 Flight level allocation scheme on ATS route W45 to Guwahati and North-East sector

ATS Route	Reporting Point	RVSM Flight Level available East of the waypoint
W45	Kishanganj NDB (KG)	West bound FL300, FL320, FL340, FL360, FL380 & FL400
		East bound FL290, FL330, FL370, FL380 & FL410

4.4.5. Action by aircraft operators-

4.4.4.1 All flights departing from Indian airports and requesting FL270 and above are required to indicate their RVSM approval status by inserting W as the second letter in item 10-Equipment of FPL or in item 'Q' equipment of RPL for RVSM equipped aircraft.

5. Airworthiness and operational approval and monitoring

5.1. Approval Process - Operators must obtain airworthiness and operational approval from the State of Registry or State of the Operator, as appropriate, to conduct RVSM operations. DGCA India has issued Civil Aviation Requirement (CAR) Section 2 - Airworthiness Series 'O', Part XI dated 29th October 1999 on the approval process to be followed by the Operators for Indian registered aircraft.

5.2. Aircraft Monitoring - Operators are required to participate in the RVSM aircraft monitoring program. This is an essential element of the RVSM implementation program in that it confirms that the aircraft altitude-keeping performance standard is being met.

5.3. The DGCA India Civil Aviation Requirement (CAR) referred to in Para 5.1 above prescribes the monitoring requirements to be followed by Operators of Indian registered aircraft.

6. ACAS II and transponder equipage

6.1. The ICAO Asia/Pacific RVSM Implementation Task Force recommends that those aircraft equipped with ACAS and operated in RVSM airspace be equipped with ACAS II. (TCAS II systems with Version 7.0 incorporated meet ICAO ACAS II standards)

6.2. Operators must take action in accordance with the DGCA India Civil Aviation Requirement (CAR) section-2, Airworthiness, Series 'R', Part IV dated 8th Feb 1994 (Revision-1 dated 7th Sept 1999) regarding ACAS II equipage requirements and plan for compliance. The Asia-Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) has endorsed early ACAS II equipage in the region.

6.3. International General Aviation (IGA) transponder equipage

6.3.3. ICAO Annex 6, Part II, states that, starting 1st January 2000, IGA airplanes should have been equipped with a pressure altitude reporting transponder certified by the appropriate State authority as meeting the provisions of Annex 10. The Operators are required to follow the policy stated in the DGCA India Civil Aviation Requirement (CAR) referred to in 6.2 above, regarding ACAS II equipage requirements and plan for compliance.

7. Procedures within RVSM Airspace

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- 7.1. Before entering RVSM airspace, the pilot should review the status of required equipment. The following equipment should be operating normally-
- i) Two primary altimetry systems
 - ii) One automatic altitude-keeping device
 - iii) One altitude-alerting device, and
 - iv) One operating transponder with operational Mode 'C'
- 7.2. The pilot must notify ATC whenever the aircraft-
- i) is no longer RVSM compliant due to equipment failure; or
 - ii) experiences loss of redundancy of altimetry systems; or
 - iii) encounters turbulence that affects the capability to maintain flight level
- 7.3. Transition between Flight Levels
- 7.3.3. During cleared transition between levels, the aircraft should not overshoot or undershoot the assigned FL by more than 150Ft (45M).
- 7.4. Pilot level call: Except in an ADS or radar environment, pilots shall report reaching any altitude assigned within RVSM airspace.
- 7.5. Contingency Procedures: Paragraphs 8, 9, 10, and 11 below contain procedures for in-flight contingencies that have been updated for RVSM operations. The contingency procedures in paragraphs 8, 9 and the offset procedures in paragraph 11 should be applied in Oceanic operations. The weather deviation procedures in paragraph 10 may be applied in all airspace in the region.
- 7.6. Aircraft on EMARSSH routes
- 7.6.1. On EMARSSH routes aircraft in flight requiring descent below FL90 for not being RVSM approved due to Technical or Operational reasons, may be allocated Flight Levels below the published lower limit of concerned EMARSSH route, but not below MFA. Concerned ACC/OCC/FIC shall ensure coordination with next ATS unit giving sufficient details for such authorization of lower levels. Allocation of levels lower than the vertical limits of EMARSSH routes will be done in contingency only.
- 7.6.2. In case of more than one aircraft on adjacent EMARSSH routes request levels lower than the vertical limits of such EMARSSH routes. Same levels on adjacent routes may be allocated as long as the concerned flights are RNP10 capable. If RNP capability of either aircraft degrades, then different flight levels will be allocated to aircraft so cleared to maintain levels below published vertical limits of adjacent EMARSSH routes.
- 8. Special procedures for in-flight contingencies in oceanic airspace of Chennai, Kolkata and Mumbai FIR.**
- 8.1. Introduction
- 8.1.1. Although all possible contingencies cannot be covered, the procedures in 8.2 and 9 provide for the more frequent cases such as:
- i) Inability to maintain assigned flight level due to meteorological conditions, aircraft performance; pressurization failure
 - ii) En-route diversion across the prevailing traffic flow, and
 - iii) Loss of, or significant reduction in, the required navigation capability when operating in a airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations
- 8.1.2. With regard to 8.1.1 i) and ii), the procedures are applicable primarily when rapid descent and/or turn-back or diversion is required. The pilot's judgment shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.
- 8.2. General procedures
- 8.2.1. If an aircraft is unable to continue flight in accordance with its air traffic control clearance and/or an aircraft is unable to maintain the navigation performance accuracy specified for the airspace, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

- 8.2.2. The radio-telephony distress signal (MAYDAY) or urgency signal (PAN-PAN) preferably spoken three times shall be used as appropriate. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and the overall air traffic situation.
- 8.2.3. If prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time and, until a revised clearance is received, the pilot shall-
- 8.2.3.1 Leave the assigned route or track by initially turning 90⁰ to the right or to the left. When possible the direction of the turn should be determined by the position of the aircraft relative to any organized route or track system. Other facts which may affect the direction of the turn are-
- i) The direction to an alternate airport, terrain clearance,
 - ii) Any lateral offset to be flown, and
 - iii) The flight levels allocated on adjacent routes or tracks
- 8.2.3.2 Following the turn, the pilot should-
- i) If unable to maintain the assigned flight level initially minimize the rate of descent to the extent that is operationally feasible.
 - ii) Take account of other aircraft to be laterally offset from its track.
 - iii) Acquire and maintain in either direction a track laterally separated by 28KM (15NM) from the assigned route, and
 - iv) Once established on the offset track, climb or descend to select a flight level which differs from those normally used by 150M (500Ft).
- 8.2.3.3 Establish communications with an alert nearby aircraft by broadcasting, at suitable intervals, aircraft identification, flight level, position (including the ATS route designator or the track code, as appropriate) and intentions on the frequencies in use and on 121.5MHz (or a backup, or the inter-pilot air to air frequency 123.45MHz)
- 8.2.3.4 Maintain a watch for conflicting traffic visually and by reference to ACAS (if equipped)
- 8.2.3.5 Turn on all aircraft exterior lights (commensurate with appropriate operating limitations)
- 8.2.3.6 Keep the SSR transponder on at all times
- 8.2.3.7 Take action as necessary to ensure the safety of the aircraft.
- 8.2.4. When leaving the assigned track to acquire and maintain the track laterally separated by 28KM (15NM), the flight crew should, where practicable avoid bank angles that would result in overshooting the track to be acquired, particularly in airspace where a 55.5KM (30NM) lateral separation minimum is applied.
- 8.2.5. Extended range operations by aeroplane with two turbine power units (ETOPS).
- 8.2.6. If the 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.

9. Weather deviation procedure

9.1. General

Note - The following procedures are intended for deviations around adverse meteorological condition.

- 9.1.1. When the pilot initiates communications with ATC, a rapid response may be obtained by stating 'WEATHER DEVIATION REQUIRED' to indicate that priority is desired on the frequency and for ATC response when necessary, the pilot should initiate the communications using the urgency call 'PAN-PAN' (preferably spoken three times)
- 9.1.2. The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and aircraft has returned to its cleared route.

9.2. Actions to be taken when controller-pilot communications are established

- 9.2.1. The pilot should notify ATC and request clearance to deviate from track, advising, when possible, the extent of the deviation expected.
- 9.2.2. ATC will take one of the following actions:
- 9.2.2.1 When appropriate separation can be applied issue clearance to deviate from track; or
- 9.2.2.2 if there is conflicting traffic and ATC is unable to establish appropriate separation ATC shall:
- i) advise the pilot of inability to issue clearance for requested deviation
 - ii) advise the pilot of conflicting traffic, and
 - iii) request the pilot's intentions
- 9.2.3. The pilot should take the following actions:
- 9.2.2.1 Comply with air traffic control clearance issued; or
- 9.2.2.2 Advise ATC of intentions and execute the procedures detailed in para 9.3 below.

9.3. Actions to be taken if a revised air traffic control clearance cannot be obtained

Note - The provision of this section apply to situations where a pilot needs to exercise the authority of pilot-in-command under the provisions of Annex 2, para 2.3.1.

9.3.1. If the aircraft is required to deviate from track to avoid adverse meteorological conditions and prior clearance cannot be obtained and ATC clearance shall be obtained at the earliest possible time until an ATC clearance is received the pilot shall take the following actions-

- i) if possible, deviate away from an organized track or route system;
- ii) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: aircraft identification, flight level, position (including the ATS route designator or the track code) and intentions, on the frequency in use and on 121.5MHz (or, as a backup, on the inter-pilot air-to-air frequency 123.45MHz).
- iii) watch for conflicting traffic both visually and by reference to ACAS (if equipped);
Note - If, as a result of action taken under the provisions of 9.3.1 (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.
- iv) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
- v) for deviations of less than 19KM (10NM) remain at a the level assigned by ATC;
- vi) for deviations of greater than 19KM (10NM), when the aircraft is approximately 19KM (10 NM) from track, initiate a level change in accordance with table given below-

Route center-line track	Deviation > 19KM (10NM)	Level Change
East 000 ⁰ – 179 ⁰ M	Left	Descend 90M (300Ft)
	Right	Climb 90M (300Ft)
West 180 ⁰ – 359 ⁰ M	Left	Climb 90M (300Ft)
	Right	Descend 90M (300Ft)

vii) when returning to track, be at its assigned flight level, when the aircraft is within approximately 19KM (10NM) of the centerline, and

viii) if contact was not established prior to deviating, continue attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

9.4. ATS route segments in Oceanic airspace

9.4.1. The segments of ATS routes in Bay of Bengal and Arabian sea, where Strategic Lateral Offset Procedures are applicable are identified below-

9.2.2.1 Chennai FIR

No	ATS Route	From	To
1	L645	SAMAK 075842N 0942500E	SULTO 073836.6N 0880151.2E
2	N563	MEMAK 060000N 0930500E	AKMIL 115135.4N 0800654.6E
3	P 574	NOPAK 063614N 0942500E	MMV VOR 125936.1N 0801014.5E
4	N571	IGOGU 073101N 0942500E	GURAS 140004.8N 0804954.2E
5	N877	LAGOG 083538.5N 0915949.5E	ORARA 155904.4N 0845452.3E
6	P628	IGREX 094328N 0942500E	VATLA 144404.9N 0891850.4E

7	L759	MIPAK 115000N 0942500E	NISUN 135605.2N 0921949.2E
8	P762	LULDA 122345N 0942500E	DUGOS 085306.3N 0844752.6E
9	UL425	TVM VOR 082829.3N 0765529.0E	ANODA 095805.8N 0722358.1E
10	P570	TVM VOR 082829.3N 0765529.0E	POMAN 115605.3N 0715958.2E
11	M300	CLC VOR 110806.5N 0755717.5E	IGAMA 134104.8N 0715958.2E

9.2.2.2 Kolkata FIR

No	ATS Route	From	To
1	N877	ORARA 155904.4N 0845452.3E	VVZ VOR 174003.9N 0831510.0E
2	L301	RINDA 153500N 0920000E	VVZ VOR 174003.9N 0831510.0E
3	P628	VATLA 144404.9N 0891850.4E	LARIK 185003.6N 0845222.2E
4	L759	LIBDI 141505.1N 0915949.3E	LEMAX 195433.3N 0860921.6E
5	M770	MEPEL 160200N 0920000E	KAKID 203833.1N 0865951.2E
6	M770A	BUBKO 191103.7N 0883950.5E	LEGOS 213802.9N 0880520.6E
7	N895	SAGOD 175548.2N 0915949.1E	BBS VOR 201437.2N 0854846.7E
8	P646	IBITA 191703.8N 0915949.0E	DOPID 205503.2N 0891216.1E
9	L507	TEBOV 202503.5N 0915949.0E	CEA VOR 223842.6N 0882710.4E

9.2.2.3 Mumbai FIR

No	ATS Route	From	To
1	UL 425	ANODA 095805.8N 0722358.1E	ASPUX 174403.6N 0600003.8E
2	P 570	POMAN 115605.3N 0715958.2E	KITAL 200300N 0601800E
3	M 300	IGAMA 134104.8N 0715958.2E	LOTAV 203700N 0605700E
4	N 563	KAKIB 150004.4N 0734707.4E	REXOD 211230N 0613830E
5	P 574	OKILA 163533.9N 0730627.7E	TOTOX 215030N 0622230E
6	N 571	crossing 072 deg E	PARAR 222630N 0630700E

7	L 301A	EXOLU 201249.8N 0713410.4E	NOBAT 210902.5N 0680000.1E
8	L 301	ACTIV 201502.8N 0731457.6E	RASKI 230330N 0635200E
9	M 638	NOBAT 210902.5N 0680000.1E	SAPNA 233001.7N 0675000.2E
10	A 451	BISET 182321.4N 0691806.5E	ANGAL 161404.1N 0600003.8E
11	G 450	DARMI 174741.6N 0703438.8E	DOGOD 131249.9N 0630002.4E
12	UM 551	DONSA 143518.5N 0651133.4E	ANGAL 161404.1N 0600003.8E
13	B 459	GUNDI 172136.7N 0712936.4E	UBDOR 100005.8N 0655554.0E
14	A 474	ERVIS 170527.8N 0720314.2E	POPET 071342.5N 0681336.0E
15	R 456	BIBGO 073006.5N 0705647.8E	KITAL 200300.0N 0601800.0E
16	P 323	DONSA 143518.5N 0651133.4E	GIDAS 142008.6N 0600003.8E

Note - The ATS route segments listed above for the application of special procedures, for in flight contingencies in some cases, encompass a portion of continental airspace of India. This has been done for ease of application of the procedures and to avoid insertion of additional waypoints on the ATS Routes.

9.5. Procedures for Strategic lateral offsets in oceanic and remote continental airspace

9.5.1. The following basic requirements apply to the use of the Strategic Lateral Offset Procedures (SLOP)-

- i) Strategic Lateral Offset Procedures shall be applied only by aircraft with automatic offset tracking capability.
- ii) The decision to apply a strategic lateral offset is the responsibility of the flight crew.
- iii) The offset shall be established at a distance of one or two nautical miles to the right of the centerline of the ATS route relative to the direction of flight.
- iv) The offsets shall not exceed 2NM right of centerline of the ATS route.
- v) 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 (centerline, 1NM or 2NM right offset) shall be used.
- vi) 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.
- vii) Aircraft transiting areas of radar coverage in airspace where offset tracking is permitted may initiate or continue an offset.
- viii) Aircraft without automatic offset tracking capability must fly the centerline of the ATS Route being flown.

9.5.2. For ATS route segment in Oceanic airspace refer para 7.4 above.

10. Special Procedures to mitigate Wake Turbulence Encounters and Distracting Aircraft System Alerts in the Oceanic Airspace of the Chennai, Kolkata and Mumbai FIR.

10.1. The following special procedures are applicable to mitigate wake turbulence or distracting aircraft system alerts [e.g., ACAS, Ground Proximity Warning System (GPWS)] in airspace where RVSM is applied.

Note: In the contingency circumstances below, ATC will not issue clearances for lateral offsets and will not normally respond to actions taken by the pilots.

10.2. An aircraft that encounters wake vortex turbulence or experiences distracting aircraft system alerts shall notify ATC and request a flight level, track or speed change to avoid the condition. However, in

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- situations where such a change is not possible or practicable, the pilot may initiate the following temporary lateral offset procedure with the intention of returning to center line as soon as practicable:
- 10.2.1. the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air to air frequency; 123.45MHz, and
 - 10.2.2. one (or both) aircraft may initiate lateral offset(s) not to exceed 2NM from the assigned track, provided that:
 - i) as soon as practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so (ATC will not normally respond); and
 - ii) the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s) (ATC will not normally respond).

11. Transition areas

- 11.1. Refer Para 4.3

12. Flight Planning requirements

- 12.1. Unless special arrangement is made as detailed below, RVSM approval is required for operators and aircraft to operate within designated RVSM airspace. The operator must determine that the appropriate State authority has granted them RVSM operational approval and they will meet the RVSM requirements for the filed route of flight and any planned alternate routes. 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.
- 12.2. All operators filing Repetitive Flight Plans (RPL) shall include the letter 'W' in Item Q of the RPL to indicate RVSM approval status and include all equipment and capability in conformity with Item 10 of the ICAO Flight Plan.

Note:- The detailed guidance for flight planning is contained in the DGCA Civil Aviation Requirement (CAR) Section 2 - Airworthiness Series 'O', Part XI dated 29th October 1999.
- 12.3. Procedures for 'State aircraft' - Aircraft used in military, customs, coast guard, border security force and ARC shall be deemed to be 'state aircraft'. Flight plans of 'state aircraft' shall include letter 'M' in item 8(b) of the flight plan to indicate military aircraft and 'STS/APPROVED NONRVSM' in item 18 of the flight plan to indicate the NON-RVSM approval status of the flight.

Note: The aircraft owned by the state governments will not qualify for State Aircraft status. They will be categorized as General Aviation Aircraft.

13. Procedures for Operation of NON-RVSM Approved Aircraft in Non-Exclusive RVSM Airspace.

- 13.1. Flight priority - It should be noted that RVSM approved aircraft will be given priority for level allocation over NON-RVSM approved aircraft.
- 13.2. Vertical Separation applied - The vertical separation minimum between NON-RVSM aircraft operating in the RVSM stratum and all other aircraft is 2000Ft.
- 13.3. Phraseology. NON-RVSM compliant aircraft operating in RVSM airspace should use the phraseology contained in Attachment 'B'.

14. Procedures for operation of NON-RVSM approved aircraft climbing or descending through exclusive RVSM airspace.

- 14.1. NON-RVSM approved aircraft may be cleared to climb to and operate above FL410 or descend to and operate below FL290 provided that they:
 - 14.1.1. Do not climb or descend at less than the normal rate for the aircraft and
 - 14.1.2. Do not level off at an intermediate level while passing through the RVSM stratum.

15. Special coordination procedures for cruise operation of NON RVSM approved aircraft in exclusive RVSM airspace.

- 15.1. NON-RVSM approved aircraft may not flight plan between FL290 and FL410 (both inclusive) within exclusive RVSM airspace, except for the following situations-
 - i) The aircraft is being initially delivered to the State of Registry or Operator; or
 - ii) The aircraft was RVSM approved but has experienced an equipment failure and is being flown to a maintenance facility for repair in order to meet RVSM requirements and/or obtain approval; or
 - iii) The aircraft is transporting a spare engine mounted under the wing; or
 - iv) The aircraft is being utilized for mercy or humanitarian purposes; or

- v) Is a State aircraft (refer Para 11.3 for explanation)
Note: The procedures are intended exclusively for the purposes indicated and not as a means to circumvent the normal RVSM approval process.

15.2. The assignment of cruising levels to NON-RVSM approved aircraft listed in paragraph 14.1 (a) to (e) shall be subject to an ATC clearance. Aircraft operators shall include STS/Category of operations (i.e. FERRY/HUMANITARIAN/MILITARY/CUSTOMS/POLICE)/APPROVED NON-RVSM in Field 18 of the ICAO Flight Plan.

15.3. The operator who intends to operate a flight from, into or through Indian FIRs shall obtain approval for conducting such flights from the WSO of the concerned FIR where he first encounters Indian RVSM airspace.

15.4. Request for approval of such operations shall be made not less than 4 Hrs and not more than 72 Hrs prior to intended time of departure.

15.5. The operator shall be responsible for gaining approval from each FIR the flight will transit.

15.6. Where necessary, the Air Traffic Control Center may be contacted as follows-

Contact Officer	Telephone Number	FAX Number	AFTN
Watch Supervisory Officer, Chennai	91-44-2256 1365	91-44-2256 1365	VOMMZRX *
Watch Supervisory Officer, Delhi	91-11-2565 4283	91-11-2565 3284	VIDPZRX *
Watch Supervisory Officer, Kolkata	91-33-2511 9520	91-33-2513 0134	VECCZRX *
Watch Supervisory Officer, Mumbai	91-22-2682 8088	91-22-2682 8088	VABBZRX *

* The AFTN message to Watch Supervisory Officer must indicate 'ATTN: WSO'. Where required the WSO of the nearest Area Control Center may also be contacted.

16. Delivery flights for aircraft that are on delivery

16.1. An aircraft that is RVSM approved on delivery may operate in exclusive RVSM airspace provided that the crew is trained on RVSM policies and procedures applicable in the airspace and the responsible State issues the operator a letter of authorization approving the operation. State notification to the Monitoring Agency for Asia Region (MAAR) of AEROTHAI/Asia Pacific Approval Registry and Monitoring Organization (APARMO) should be in the form of a letter, e-mail or fax documenting the one-time flight. The planned date of the flight, flight identification, and registration number and aircraft type/series should be included. The details of such flights shall also be forwarded to the WSO/WSOs of the Indian FIRs through which the operation of such flight is planned at least three days in advance. The details of the contact person are available in Para 15.6 above.

17. Procedures for suspension of RVSM

17.1. The Watch Supervisory Officer of the concerned FIR may consider suspending RVSM procedures within affected areas of the FIR under his supervision when there are pilot reports of greater than moderate turbulence. Within areas where RVSM procedures are suspended, the vertical separation minimum between all aircraft will be 2000Ft.

18. Guidance for pilots and controllers for Actions in the event of aircraft system malfunction or turbulence greater than moderate.

18.1. See Attachment A for guidance in these circumstances.

19. Procedures for Air-Ground communication failure

19.1. An aircraft operated as a controlled flight shall maintain continuous air-ground voice communication watch on the appropriate communication channel of, and establish two-way communication as necessary with, the appropriate air traffic control unit. For aircraft forming part of aerodrome traffic at a controlled aerodrome the conditions given in Para 19.2 shall apply.

Note 1: SELCAL or similar automatic signaling devices satisfy the requirement to maintain an air-ground voice communication watch.

Note 2: The requirement for an aircraft to maintain air ground voice communication watch remains in effect after CPDLC has been established

19.2. Communication failure.

If a communication failure precludes compliance with Para 19.1, the aircraft shall comply with the communication failure procedures of Annex 10, Volume II, and with such of the following procedures as are appropriate. In addition, the aircraft, when forming part of the aerodrome traffic at a controlled aerodrome, shall keep a watch for such instructions as may be issued by visual signals.

19.2.1. Action by pilot-in-command-

- i) if in visual meteorological conditions, the aircraft shall-
- ii) continue to fly in visual meteorological conditions;
- iii) land at the nearest suitable aerodrome; and
- iv) report its arrival by the most expeditious means to the appropriate air traffic control unit.

19.2.2. If in instrument meteorological conditions or when conditions are such that it does not appear feasible to complete the flight in accordance with Para 19.2.1 (see (i)), the aircraft shall:

- i) 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;
- ii) 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 (iii) below, hold over this aid until commencement of descent;
- iii) commence descent from the navigation aid specified in (ii) 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;
- iv) complete a normal instrument approach procedure as specified for the designated navigation aid; and
- v) land, if possible, within thirty minutes after the estimated time of arrival specified in (iii) or the last acknowledged expected approach time, whichever is later.

Note 1: As evidenced by the meteorological conditions prescribed therein, Para 19.2.1 relates to all controlled flights, whereas Para 19.2.2 relates only to IFR flights.

Note 2: The provision of air traffic control service to other flights operating in the airspace concerned will be based on the premise that an aircraft experiencing communication failure will comply with the rules in Para 19.2.2.

19.2.3. Action by Air Traffic Control Unit

Note 1- See also Doc 4444, PANS-ATM, Chapter 6, Para 6.3.2.4 concerning departure clearances containing no geographical or time limit for an initial level and procedures to be applied in relation to an aircraft experiencing air-ground communication failure under such circumstances.

19.2.3.1 Action by air traffic control units when unable to maintain two-way communication with an aircraft operating in a control area or control zone shall be as outlined in the paragraphs which follow.

19.2.3.2 As soon as it is known that two-way communication has failed, action shall be taken to ascertain whether the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified manoeuvre which can be observed by radar or to transmit, if possible, a specified signal in order to indicate acknowledgement.

19.2.3.3 In the continental airspace of Indian FIRs the applicable vertical separation minimum between an aircraft experiencing a communication failure in flight and any other aircraft shall be 600M (2000 Ft), unless an appropriate horizontal separation minimum exists. If the aircraft fails to indicate that it is able to receive and acknowledge transmissions, the separation shall be maintained between the aircraft having the communication failure and other aircraft, based on the assumption that the aircraft will:

- i) if, in visual meteorological conditions, comply with the provisions in Para 19.2.1 above.
- ii) if, in instrument meteorological conditions or when conditions are such that it does not appear feasible to complete the flight in accordance with (i): comply with the provisions in Para 19.2.2. above.

Note1- Since ATC is often unable to determine the extent of any equipment failure for an aircraft experiencing a communication failure in flight, ATC shall provide a vertical separation as mentioned in Para 19.2.2.3 above. However, no specific procedures are

prescribed for the flights experiencing a communication failure in the oceanic airspace of Indian FIRs where the communication coverage of the concerned FIR may not be adequate. In such cases, subject to traffic conditions, and coordination with the subsequent FIR/ACC the ATC, may provide additional separation to such flights experiencing a communication failure in the oceanic airspace.

Note 2 - Provisions related to minimum levels are contained in Annex 2, para 5.1.2.

Note 3 - As evidenced by the meteorological conditions prescribed therein, para 18.2.2.3 (i) relates to all controlled flights, whereas para 19.2.2.3 (ii) relates only to IFR flights.

19.2.3.4 Action taken to ensure suitable separation shall cease to be based on the assumption stated in Para 19.2.2.3 when:

- i) it is determined that the aircraft is following a procedure differing from that in Para 19.2.2.3; or
- ii) through the use of electronic or other aids, air traffic control units determine that action differing from that required by Para 19.2.2.3 may be taken without impairing safety; or
- iii) positive information is received that the aircraft has landed.

19.2.3.5 As soon as it is known that two-way communication has failed, appropriate information describing the action taken by the air traffic control unit, or instructions justified by any emergency situation, shall be transmitted blind for the attention of the aircraft concerned, on the frequencies available on which the aircraft is believed to be listening, including the voice frequencies of available radio navigation or approach aids. Information shall also be given concerning:

- i) weather conditions favourable to a cloud-breaking procedure in areas where congested traffic may be avoided; and
- ii) weather conditions at suitable aerodromes.

19.2.3.6 Pertinent information shall be given to other aircraft in the vicinity of the presumed position of the aircraft experiencing the failure.

19.2.3.7 As soon as it is known that an aircraft, which is operating in its area of responsibility, is experiencing an apparent radio communication failure, an air traffic services unit shall forward information concerning the radio communication failure to all air traffic services units concerned along the route of flight. The ACC in whose area the destination aerodrome is located shall take steps to obtain information on the alternate aerodrome(s) and other relevant information specified in the filed flight plan, if such information is not available.

19.2.3.8 If circumstances indicate that a controlled flight experiencing a communication failure might proceed to (one of) the alternate aerodrome(s) specified in the filed flight plan, the air traffic control unit(s) serving the alternate aerodrome(s) and any other air traffic control units that might be affected by a possible diversion shall be informed of the circumstances of the failure and requested to attempt to establish communication with the aircraft at a time when the aircraft could possibly be within communication range. This shall apply particularly when, by agreement with the operator or a designated representative, a clearance has been transmitted blind to the aircraft concerned to proceed to an alternate aerodrome, or when weather conditions at the aerodrome of intended landing are such that a diversion to an alternate is considered likely.

19.2.3.9 When an air traffic control unit receives information that an aircraft, after experiencing a communication failure has re-established communication or has landed, that unit shall inform the air traffic services unit in whose area the aircraft was operating at the time the failure occurred, and other air traffic services units concerned along the route of flight, giving necessary information for the continuation of control if the aircraft is continuing in flight.

19.2.3.10 If the aircraft has not reported within thirty minutes after:

- i) the estimated time of arrival furnished by the pilot;
- ii) the estimated time of arrival calculated by the ACC; or
- iii) the last acknowledged expected approach time,

whichever is latest, pertinent information concerning the aircraft shall be forwarded to aircraft operators, or their designated representatives, and pilots-in-command of any aircraft concerned and normal control resumed if they so desire. It is the responsibility of the aircraft operators, or their designated representatives, and pilots-in-command of aircraft to determine whether they will resume normal operations or take other action.

20. Radar procedures

20.1. Aircraft radio transmitter failure

20.1.1. If two-way communication is lost with an aircraft, the radar controller should determine whether or not the aircraft's receiver is functioning by instructing the aircraft on the frequency so far used to

acknowledge by making a specified man oeuvre and by observing the aircraft's track, or by instructing the aircraft to operate IDENT or to make code changes.

Note: Transponder-equipped aircraft experiencing radio-communication failure will operate the transponder on Mode A, Code 7600.

- 20.1.2. If the action prescribed in Para 20.1.1 is unsuccessful, it shall be repeated on any other available frequency on which it is believed that the aircraft might be listening.
- 20.1.3. In both the cases covered by Para 20.1.1 and Para 20.1.2, any maneuvering instructions shall be such that the aircraft would regain its current cleared track after having complied with the instructions received.
- 20.1.4. Where it has been established by the action in Para 20.1.1 that the aircraft's radio receiver is functioning, continued control of transponder equipped aircraft where SSR is available can be effected using code changes or IDENT transmissions to obtain acknowledgement of clearances issued to the aircraft.

20.2. Complete aircraft communication failure

- 20.2.1. When a controlled aircraft experiencing complete communication failure is operating or expected to operate in an area and at flight levels where radar separation is applied, such separation may continue to be used. However, if the aircraft experiencing the communication failure is not identified, radar separation shall be applied between aircraft under radar control and all unidentified aircraft observed along the expected route of the aircraft with the communication failure, until such time as it is known, or can safely be assumed, that the aircraft with radio failure has passed through the airspace concerned, has landed, or has proceeded elsewhere. Aircraft transponder failure in areas where the carriage of a functioning transponder is mandatory. When an aircraft experiencing transponder failure after departure is operating or expected to operate in an area where the carriage of a functioning transponder with specified capabilities is mandatory, the ATC units concerned should endeavor to provide for continuation of the flight to the aerodrome of first intended landing in accordance with the flight plan. However, in certain traffic situations, either in terminal areas or en-route, continuation of the flight may not be possible, particularly when failure is detected shortly after takeoff. The aircraft may then be required to return to the departure aerodrome or to land at the nearest suitable aerodrome acceptable to the operator concerned and to ATC.
- 20.2.2. In case of a transponder failure which is detected before departure from an aerodrome where it is not practicable to effect a repair, the aircraft concerned should be permitted to proceed, as directly as possible, to the nearest suitable aerodrome where repair can be made. When granting clearance to such aircraft, ATC should take into consideration the existing or anticipated traffic situation and may have to modify the time of departure, flight level or route of the intended flight. Subsequent adjustments may become necessary during the course of the flight.

Attachment 'A'

Contingency Scenarios

1. The following paragraphs summarize pilot actions to mitigate the potential for conflict with other aircraft in certain contingency situations. They should be reviewed in conjunction with the expanded contingency scenarios detailed on pages 9 to 14 and 17 to 22, which contain additional technical and operational detail.

2. Loss or degradation of altimetry system

2.2. **Scenario 1:** The pilot is-

2.2.1. Unsure of the vertical position of the aircraft due to the loss or degradation of all primary altimetry systems, or

2.2.2. Unsure of the capability to maintain cleared flight level (CFL) due to turbulence or loss of all automatic altitude control systems.

The Pilot should-	ATC can be expected to-
Maintain CFL while evaluating the situation;	
Watch for conflicting traffic both visually and by reference to ACAS, if equipped;	
If considered necessary, alert nearby aircraft by- 1) making maximum use of exterior lights; 2) broadcasting position, flight level, and intentions on the frequency in use, on 121.5 MHz (as a back-up, the VHF inter-pilot air-to-air frequency, 123.45MHz, may be used)	
Notify ATC of the situation and intended course of action. Possible courses of action include:	Obtain the pilot's intentions and pass essential traffic information.
1) Maintaining the CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	1) If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting ATC clearance to climb above or descend below RVSM airspace if the aircraft cannot maintain CFL and ATC cannot establish adequate separation from other aircraft.	2) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
3) Executing the contingency maneuver shown in paragraphs 6 and 7 of this AIP Supplement to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	3) If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation
	4) Notify adjoining ATC facilities/sectors of the situation

2.3. **Scenario 2** - There is a failure or loss of accuracy of one primary altimetry system (e.g. greater than 200 Ft difference between primary altimeters.

The Pilot should -

Cross check standby altimeter, confirm accuracy of the primary altimetry system and notify ATC of the loss of redundancy. If unable to confirm primary altimetry system accuracy, follow pilot actions listed in the preceding scenario

3. **Expanded equipment failure and turbulence encounter scenarios**

3.1. Operators may consider this material for use in training programs

3.2. **Scenario 1** – All automatic altitude control systems fail (e.g. automatic altitude hold)

The Pilot should-	ATC can be expected to-
Initially, maintain CFL. Evaluate the aircraft's capability to maintain altitude through manual control.	
Subsequently, Watch for conflicting traffic both visually and by reference to ACAS, if equipped.	
If considered necessary, alert nearby aircraft by- 1) making maximum use of exterior lights; 2) broadcasting position, flight level, and intentions on the frequency in use, on 121.5MHz (as a back-up, the VHF inter-pilot air to-air frequency, 123.45MHz, may be used.)	
Notify ATC of the failure and intended course of action. Possible courses of action include: 1) maintaining the CFL and route, provided that the aircraft can maintain level.	1) If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) requesting ATC clearance to climb above or descend below RVSM airspace if the aircraft cannot maintain CFL and ATC cannot establish lateral, longitudinal or conventional vertical separation.	2) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
3) executing the contingency maneuver shown in paragraphs 6 and 7 of this AIP Supplement to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	3) If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation.
	4) Notify adjoining ATC facilities/sectors of the situation.

3.3. **Scenario 2** - Loss of redundancy in primary altimetry system

The Pilot should-	ATC can be expected to-
If the remaining altimetry system is functioning normally, couple that system to the automatic altitude control system, notify ATC of the loss of redundancy and maintain vigilance of altitude keeping.	Acknowledge the situation and continue to monitor progress

3.4. **Scenario 3** - All primary altimetry systems are considered unreliable or fail.

The Pilot should-	ATC can be expected to-
Maintain CFL by reference to the standby altimeter (if the aircraft is so equipped).	
Alert nearby aircraft by- 1) making maximum use of exterior lights; 2) broadcasting position, flight level, and intentions on the frequency in use, on 121.5 MHz (as a back up, the VHF inter-pilot air-to-air frequency, 123.45MHz, may be used).	
Consider declaring an emergency. Notify ATC of the failure and intended course of action. Possible courses of action include:	Obtain pilot's intentions, and pass essential traffic information.
1) Maintaining CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	1) If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting ATC clearance to climb above or descend below RVSM airspace if ATC cannot establish adequate separation from other aircraft	2) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
3) Executing the contingency maneuver shown in paragraphs 6 and 7 of this AIP Supplement to offset from the assigned track and FL, if ATC clearance cannot be obtained.	3) If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation.
	4) Notify adjoining ATC facilities/sectors of the situation.

3.5. **Scenario 4** – The primary altimeters diverge by more than 200Ft (60M)

The Pilot should -
Determine the defective system through the normal airplane integrated comparator warning system or in the absence of such a system, establish trouble-shooting procedures comparing the primary altimeters to the standby altimeter (corrected using the correction card)
If the defective system can be determined, couple the functioning altimeter to the altitude keeping device in use
If the defective system cannot be determined, follow the guidance in Scenario 3 for failure or unreliable altimeter indications of all primary altimeters

3.6. **Scenario 5** – Turbulence (greater than moderate) which the pilot believes will impact the aircraft's capability to maintain flight level.

The Pilot should-	ATC can be expected to-
Watch for conflicting traffic both visually and by reference to ACAS, if equipped.	
If considered necessary, alert nearby aircraft by: 1) making maximum use of exterior lights; 2) broadcasting position, flight level, and intentions on the frequency in use, on 121.5 MHz (as a back up, the VHF inter-pilot air-to-air frequency, 123.45MHz, may be used).	
Notify ATC of intended course of action as soon as possible. Possible courses of action include:	
1) Maintaining CFL and route provided ATC can provide lateral, longitudinal or conventional vertical separation.	1) Assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting flight level change, if necessary.	2) If unable to provide adequate separation, advise the pilot of essential traffic information and request pilot's intentions.
3) Executing the contingency maneuver shown in paragraphs 6 and 7 of this AIP Supplement to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	3) Notify other aircraft in the vicinity and monitor the situation
	4) Notify adjoining ATC facilities/ sectors of the situation.

Attachment 'B'

Phraseology related to RVSM Operations

1. Controller-Pilot phraseology

Message	Phraseology
For a controller to ascertain the RVSM approval status of an aircraft:	(call sign) CONFIRM RVSM APPROVED
For a pilot to report NON-RVSM approval status: i. on the initial call on any frequency within the RVSM airspace (controllers shall provide a read-back with this same phrase), and ii. in all requests for flight level changes pertaining to flight levels within the RVSM airspace; and iii. in all read-backs to flight level clearances pertaining to flight levels within the RVSM airspace. Additionally, except for State aircraft, pilots shall include this phrase to read back flight level clearances involving the vertical transit through FL 290 or FL410. <i>See examples that follow.</i>	NEGATIVE RVSM*
For a pilot to report RVSM approval status.	AFFIRM RVSM*
For a pilot of a NON-RVSM approved State aircraft to report NON-RVSM approval status, in response to the phrase (call sign) CONFIRM RVSM APPROVED.	NEGATIVE RVSM STATE AIRCRAFT*
Denial of clearance into the RVSM airspace:	(call sign) UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN [or DESCEND TO, or CLIMB TO] FLIGHT LEVEL (number)
For a pilot to report when severe turbulence affects the aircraft's capability to maintain the height-keeping requirements for RVSM.	UNABLE RVSM DUE TURBULENCE*
For a pilot to report that the aircraft's equipment has degraded enroute below that required for flight within the RVSM airspace. (See Attachment A) <i>(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 RVSM airspace until such time as the problem ceases to exist, or the aircraft has exited the RVSM airspace.)</i>	UNABLE RVSM DUE EQUIPMENT*

For a pilot to report the ability to resume operations within the RVSM airspace after an equipment or weather-related contingency.	READY 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.	REPORT ABLE TO RESUME RVSM

Example 1- A NON-RVSM approved aircraft, maintaining FL260, subsequently requests a climb to FL320.

Pilot: (call sign) REQUEST FL320, NEGATIVE RVSM

Controller: (call sign) CLIMB TO FL320

Pilot: (call sign) CLIMB TO FL320, NEGATIVE RVSM

Example 2 - A NON-RVSM approved aircraft, maintaining FL260, subsequently requests a climb to FL430.

Pilot: (call sign) REQUEST FL430, NEGATIVE RVSM

Controller: (call sign) CLIMB TO FL430

Pilot: (call sign) CLIMB TO FL430, NEGATIVE RVSM

Example 3 - A NON-RVSM approved aircraft, maintaining FL360, subsequently requests a climb to FL380.

Pilot: (call sign) REQUEST FL380, NEGATIVE RVSM

Controller: (call sign) CLIMB TO FL380

Pilot: (call sign) CLIMB TO FL380, NEGATIVE RVSM

Example 4 - A NON-RVSM approved civil aircraft maintaining FL280, subsequently requests a climb to FL320.

Pilot: (call sign) REQUEST FL320, NEGATIVE RVSM

Controller: (call-sign) UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN FL280

2. Coordination between ATS units

Para	Message	Phraseology
1	To verbally supplement an automated estimate message exchange that does not automatically transfer Item 18 from flight-plan information.	NEGATIVE RVSM OR NEGATIVE RVSM STATE AIRCRAFT [as applicable]

2	To verbally supplement estimate messages of NON-RVSM approved aircraft.	NEGATIVE RVSM OR NEGATIVE RVSM STATE AIRCRAFT [as applicable]
3	To communicate the cause of a contingency relating to an aircraft that is unable to conduct RVSM operations due to severe turbulence or other severe weather-related phenomenon [or equipment failure, as applicable]	UNABLE RVSM DUE TURBULENCE (or EQUIPMENT [as applicable]

Attachment 'C'

RVSM & CVSM airspace

1. Mumbai FIR

1.1. The airspace described below is **exclusive** Reduced Vertical Separation Minimum (RVSM) airspace in Mumbai FIR

1.1.1. Airspace bounded by coordinates - SAPNA (233001.7N 06750003.2E) to 2330N 06430E to 1948N 06000E to ANGAL (161404.1N 0600003.8E) to 1200N 06000E to 132804.8N 0624502.5E to 131504.9N 063002.4E to UBDOR (100005.8N 0655554.0E) to POPET (071342.5N 0681336.0E) to 0730N 07000E to 0730N 07200E then along the MUMBAI/CHENNAI FIR boundary to 150004.4N 0731357.7E to 195902.9N 0712258.5E to 210902.5N 0680000.1E to SAPNA (233001.7N 0675000.2E)

1.2. The airspace described below is Conventional Vertical Separation Minimum (CVSM) airspace in Mumbai FIR

1.1.2. Airspace bounded by coordinates - 1200N 06000E to 132804.8N 0624502.5E to 131504.9N 063002.4E to UBDOR (100005.8N 0655554.0E) to POPET (071342.5N 0681336.0E) to 0730N 07000E to 0300N 07000E to 0000 06800E to 0600S 0800E to 0600S 06000E then along the MUMBAI/SEYCHELLES FIR, then along MUMBAI/MOGADISHU FIR to 1200N 06000E on ATS route segments in Mumbai FIR over Arabian Sea, in CVSM airspace, air traffic advisory service is being provided.

Attachment 'D'

India's Non-Exclusive RVSM airspace

1. The airspace described below is India's Non-Exclusive RVSM airspace
- 1.1. The airspace bounded by coordinates - 0700N 07700E to 0907N 07524E to 195902.9N 0712258.5E to 210902.5N 0680000.1E to 233001.7N 0675000.2E to 233000N 0681000E then along the common border of India and Pakistan till it meets Afghanistan and India border in Jammu and Kashmir State, then eastwards along the international boundary to a point on common border on India and Nepal to the point of common border of India and China and Nepal, then along the border of India, China and Myanmar, then along the border of India and Myanmar to 214700N 0923200E then along common border of India and Bangladesh to 223538.7N 0885626.2E to 215003.0N 0902349.5E to 205503.2N 0891216.1E to 203503.2N 0875950.7E to 152204.5N 0820853.6E to 141404.8N 0812054.0E to 100005.9N 0802254.5E to 100000N 0800000E to 090000N 0793000E to 0700N 07700E.
