7.3 AIRWORTHINESS AND OPERATIONAL APPROVAL AND MONITORING

7.3.1 Operators must obtain airworthiness and operational approval from the State of Registry or State of the Operator, as appropriate, to conduct RVSM operations.

7.3.2 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. The Monitoring Agency for Asia Region (MAAR) will process the results of monitoring. For further information on RVSM monitoring, the MAAR web site can be accessed by:

a) Accessing the "Monitoring Program" section of the MAAR website or
b) Using the Internet address for MAAR is **http://www.aerothai.co.th/maar**

7.3.3 Monitoring accomplished for other regions can be used to fulfill the monitoring requirements for the Asia/Pacific region. The MAAR will coordinate with other monitoring agencies to access this information. There are several organizations world-wide who may be able to perform monitoring services in the Asia/Pacific region. Operators should contact the MAAR for confirmation that a monitoring contractor is acceptable for the submission of monitoring data.

7.4 ACAS II AND TRANSPONDER EQUIPAGE

7.4.1 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).

7.4.2 Operators must take action to inform themselves of ACAS II equipage requirements and plan for compliance. ICAO and individual States have established policies requiring ACAS II equipage and schedules for compliance. In addition, the APANPIRG has endorsed early ACAS II equipage in the region.

7.4.3 ICAO Annex 6, Part II, states that, starting 1 January 2000, International General Aviation (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.

7.5 IN-FLIGHT PROCEDURES WITHIN RVSM AIRSPACE

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

a) two primary altimetry systems;
b) one automatic altitude-keeping device;
c) one altitude-alerting device; and
d) one altitude reporting transponder.

7.5.2 The pilot must notify ATC whenever the aircraft :

a) is no longer RVSM compliant due to equipment failure; or
b) experiences loss of redundancy of altimetry systems; or
c) encounters turbulence that affects the capability to maintain flight level.

7.5.3 During cleared transition between levels, the aircraft should not overshoot or undershoot the assigned FL by more than 150 FT (45 M).

7.5.4 Except in an ADS or radar environment, pilots shall report reaching any altitude assigned within RVSM airspace.

7.5.5 Paragraphs **7.6, 7.7, 7.8 and 7.9** below contain procedures for in-flight contingencies that have been updated for RVSM operations. The contingency procedures in paragraphs **7.6** to **7.7** and the off-set procedures in paragraph **7.9** should be applied in Oceanic operations. The weather deviation procedures in paragraph **7.8** may be applied in all airspace in the region.

7.6 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES IN OCEANIC AIRSPACE IN THE KUALA LUMPUR FIR

7.6.1 General Procedures

7.6.1.1 The following general procedures apply to both subsonic and supersonic aircraft and are intended as guidance only. Although all possible contingencies cannot be covered, they provide for cases of inability to maintain

assigned level due to:

a) weather;
b) aircraft performance;
c) pressurization failure; and
d) problems associated with high-level supersonic flight.

7.6.1.2 The procedures are applicable primarily when rapid descent and/or turn-back or diversion to an alternate airport is required. The pilot's judgment shall determine the sequence of actions to be taken, taking into account specific circumstances.

7.6.1.3 If an aircraft is unable to continue flight in accordance with its air traffic control clearance, a revised clearance shall, whenever possible, be obtained prior to initiating any action, using a distress or urgency signal as appropriate.

7.6.1.4 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:

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: flight identification, flight level, aircraft position, (including the ATS route designator or the track code) and intentions on the frequency in use, as well as on frequency 121.5 MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45 MHz);
c) watch for conflicting traffic both visually and by reference to ACAS; and
d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations).

7.7 IN-FLIGHT CONTINGENCY PROCEDURES FOR SUBSONIC AIRCRAFT REQUIRING RAPID DESCENT, TURN-BACK OR DIVERSION IN OCEANIC AIRSPACE IN THE KUALA LUMPUR FIR.

7.7.1 Initial Action

7.7.1.1 If unable to comply with the provisions of paragraph **7.6.1.3** to obtain a revised ATC clearance, the aircraft should leave its assigned route or track by turning 90 degrees right or left whenever this is possible. The direction of the turn should be determined by the position of the aircraft relative to any organized route or track system (for example, whether the aircraft is outside, at the edge of, or within the system). Other factors to consider are terrain clearance and the levels allocated to adjacent routes or tracks.

7.7.2 Subsequent Action

7.7.2.1 An aircraft able to maintain its assigned level should acquire and maintain in either direction a track laterally separated by **15** NM from its assigned route or track and once established on the offset track, climb or descend 500 FT (150 M).

7.7.2.2 An aircraft NOT able to maintain its assigned level should, whenever possible, minimize its rate of descent while turning to acquire and maintain in either direction a track laterally separated by **15** NM from its assigned route or track. For subsequent level flight, a level should be selected which differs by 500 FT (150 M) from those normally used.

7.7.2.3 Before commencing a diversion across the flow of adjacent traffic, the aircraft should, while maintaining the **15** NM offset, expedite climb above or descent below levels where the majority of aircraft operate (e.g., to a level above FL 400 or below FL 290) and then maintain a level which differs by 500 FT (150 M) from those normally used. However, if the pilot is unable or unwilling to carry out a major climb or descent, the aircraft should be flown at a level 500 FT above or below levels normally used until a new ATC clearance is obtained.

7.7.2.4 If these contingency procedures are employed by a twin-engine aircraft as a result of an engine shutdown or a 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 requesting expeditious handling.

7.8 WEATHER DEVIATION PROCEDURES

7.8.1 General Procedures

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

7.8.1.2 If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an air

traffic control clearance shall be obtained at the earliest possible time. In the meantime, the aircraft shall follow the procedures detailed in paragraph **7.8.2.2** below.

7.8.1.3 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 centreline of its cleared route.

7.8.1.4 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.

7.8.1.5 The pilot still retains the option of initiating the communications using the urgency call "PAN PAN" to alert all listening parties to a special handling condition, which may receive ATC priority for issuance of a clearance or assistance.

7.8.1.6 When controller-pilot communications are established, the pilot shall notify ATC and request clearance to deviate from track, advising, when possible, the extent of the deviation expected. ATC will take one of the following actions:

a) if there is no conflicting traffic in the horizontal dimension, ATC will issue clearance to deviate from track; or
b) if there is conflicting traffic in the horizontal dimension, ATC will separate aircraft by establishing vertical separation or, if unable to establish vertical separation, ATC shall:

i) advise the pilot unable to issue clearance for requested deviation;

ii) advise pilot of conflicting traffic;

iii) request pilot's intentions.

SAMPLE PHRASEOLOGY:

"Unable (requested deviation), traffic is (call sign, position, altitude, direction), advise intentions."

7.8.1.7 The pilot will take the following actions:

a) Advise ATC of intentions by the most expeditious means available;
b) Comply with air traffic control clearance issued or
c) Execute the procedures detailed in **7.8.2.2** below. (ATC will issue essential traffic information to all affected aircraft);
d) If necessary, establish voice communications with ATC to expedite dialogue on the situation.

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

7.8.2.1 The pilot shall take the actions listed below under the provision that the pilot may deviate from rules of the air (e.g. the requirement to operate on route or track centreline unless otherwise directed by ATC), when it is absolutely necessary in the interests of safety to do so.

7.8.2.2 **If a revised air traffic control 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 an organized track or route system;
b) establish communication with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions (including the magnitude of the deviation expected) on the frequency in use, as well as on frequency 121.5 MHz (or, as a back-up, the VHF 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 10NM**,** aircraft should remain at the level assigned by ATC;
f) **for deviations of greater than 10NM,** when the aircraft is approximately 10 NM from track, initiate a level change based on the following criteria :

Route centreline track	Deviations great than 10 NM	Level change
EAST 000-179 magnetic	LEFT RIGHT	DESCEND 300 FT CLIMB 300 FT
WEST 180-359 magnetic	LEFT RIGHT	CLIMB 300 FT DESCEND 300 FT

Note : Items (b) and (c) above calls for the pilot to broadcast aircraft position and pilot's intentions, identify conflicting traffic and communicate air-to-air with near-by aircraft. If the pilot determines that there is another aircraft at or near the same FL with which his aircraft might conflict, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

g) 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;

h) when returning to track, be at its assigned flight level, when the aircraft is within approximately 10NM of centreline.

7.9 STRATEGIC LATERAL OFFSET PROCEDURES TO MITIGATE THE EFFECTS OF WAKE TURBULENCE OF PRECEDING AIRCRAFT IN NON-RADAR OCEANIC AIRSPACE WITHIN KUALA LUMPUR FIR

7.9.1 These offsets are only applicable in the non-radar oceanic airspace within the Kuala Lumpur FIR along the following route segments:

a) P628 between GIVAL and IGREX

b) **L510 between GIVAL and EMRAN**

c) N571 between VAMPI and IGOGU

d) P574 between ANSAX and NOPEK

e) A327 between RUSET and POVUS

7.9.2 The offset procedures are applied by aircraft with automatic offset tracking capability.

7.9.3 The following requirements apply to the use of the offset:

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

b) The offset shall be established at a distance of one or two nautical miles to the right of the centre line relative to the direction of flight.

c) 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.

d) 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.

e) Aircraft transiting through airspace other than specified in para 3.1, the offset tracking is permitted once ATC clearance is obtained from the ATS unit.

7.10 FLIGHT PLANNING REQUIREMENTS

7.10.1 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.

7.10.2 All operators filing Repetitive Flight Plans (RPLs) 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 standard Flight Plan.

7.11 PROCEDURES FOR OPERATION OF NON-RVSM COMPLIANT AIRCRAFT IN RVSM AIRSPACE

7.11.1 It should be noted that RVSM approved aircraft will be given priority for level allocation over non-RVSM approved aircraft.

7.11.2 The vertical separation minimum between non-RVSM aircraft operating in the RVSM stratum and all other aircraft is 2,000 FT.

7.11.3 Non-RVSM compliant aircraft operating in RVSM airspace should use the phraseology contained in page ENR 1.9 - 18 and ENR 1.9 - 19.

7.11.4 Non-RVSM compliant aircraft may be cleared to climb to and operate above FL290 or descend to and operate below FL410 provided that they:

a) Do not climb or descend at less than the normal rate for the aircraft; and

b) Do not level off at an intermediate level while passing through the RVSM stratum.