
ENR 1.9 AIR TRAFFIC FLOW MANAGEMENT (ATFM)

1 FLOW MANAGEMENT IS USED TO REGULATE TRAFFIC FOR:

- a) Arrivals into Kuala Lumpur International Airport (KLIA);
- b) Arrivals into Sultan Abdul Aziz Shah (SAAS) Airport; and
- c) Aircraft transiting into Kuala Lumpur FIR and departures from airports within Peninsular Malaysia flight planned over the Bay of Bengal.

2 AIR TRAFFIC CONTROL PROCEDURES FOR ARRIVALS INTO KLIA AND SAAS AIRPORT

2.1 A flow management unit is established at the Kuala Lumpur ATSC at Subang. The unit is responsible for planning the traffic flow to achieve optimum use of the available airspace and runway capacity at the airport(s). Generally, arriving aircraft are sequenced in landing order and any significant delay absorbed before the aircraft enter TMA airspace.

2.2 Flow control sequencing action may include:

- a) Speed control. This may require aircraft to maintain as high a speed as possible or reduce speed, consistent with aircraft performance profiles;
- b) Radar vectoring. This may involve track shortening or lengthening through radar vectoring by ATC;
- c) Holding. Aircraft may expect to be held at an outer holding pattern when necessary.

2.3 Pilots of aircraft subject to holding action by ATC, will be provided with a time to leave the holding pattern.

2.4 When runway or airspace congestion is expected or occurs, traffic may be regulated by the imposition of slot times for departures and/or arrivals. Slot times are only applied to aircraft departing from airports within the Kuala Lumpur FIR for either Subang - Sultan Abdul Aziz Shah Airport or for KL International Airport.

2.4.1 When slot times are to be applied, pilots will be informed by ATC at the departure aerodrome, prior to start up clearance, that traffic delays can be expected at Subang - Sultan Abdul Aziz Shah Airport or KL International Airport and will be offered a slot time for departure.

2.4.2 The slot time will be based on a flow management planned Expected Landing Time (ELT) for Subang - Sultan Abdul Aziz Shah Airport or KL International Airport, as applicable.

2.4.3 When a slot time is provided, it is a joint pilot/ATC responsibility to ensure that the aircraft is able to depart within (a parameter) minutes of the slot time in order to make good the ELT at Subang - Sultan Abdul Aziz Shah Airport or KL International Airport.

2.4.4 Once a slot time has been applied, under normal circumstances there should be no holding; however, there may be a need for limited application of speed control.

2.5 SPEED CONTROL (Arriving Aircraft)

2.5.1 Speed control is used to reduce the need for radar vectoring in the establishment of an approach sequence.

2.5.2 ATC may instruct aircraft to adjust their speed in accordance with the table in ENR 1.6. All speeds are minimum IAS.

2.5.3 Above FL 240 speed control will be based on Ground Speed or Mach No.

2.5.4 A pilot will be advised to resume desired speed when a specific speed control instructions is no longer necessary.

2.5.5 Unless otherwise stated, a speed control instruction applies until the aircraft reaches the point in the descent profile where the speed would normally be reduced below that assigned by ATC.

2.5.6 Unless otherwise specified, a clearance for final approach or a clearance for a visual approach terminates speed control.

2.5.7 Pilots may request an alternative sequencing action when the speed control instruction is unacceptable on operational grounds.

Note: For flights destined for KL International Airport, please refer to WMKK AD 2 - 15.

2.5.8 Phraseologies

2.5.8.1 The following phrases may be used to issue speed restrictions for flow control purposes.

- a) Descend at.....Knots
- b) Cruise and descend at.....Knots
- c) Cruise at.....Mach Number/Ground Speed
- d) Reduce speed to/by.....Knots
- e) Increase speed to/by.....Knots
- f) MaintainKnots [as long as possible]
[until ...miles finals]
[for the next....miles]
- g) Resume normal speed
- h) If acceptable, reduce speed to/byKnots/Mach Number, advise
- i) Cross (significant point) at (time) [at (speed)]

3 ATFM FOR TRANSITING AIRCRAFT AND DEPARTURES FLIGHT PLANNED ON ATS ROUTES OVER BAY OF BENGAL

3.1 Introduction

3.1.1 The States of the ICAO Asia/Pacific Region within the Bay of Bengal, South Asia and Pakistan airspace have implemented an automated Air Traffic Flow Management (ATFM) service under the auspices of the ICAO Bay of Bengal ATS Coordination Group – ATFM Task Force.

3.2 Provision of ATFM Services

3.2.1 ATFM services are provided by Aeronautical Radio of Thailand LTD (AEROTHAI) from the Bangkok Air Traffic Flow Management Unit (ATFMU) at Bangkok ACC. ATFM services will be limited to calculation, promulgation and management of mandatory Allocated Wheels Up Time (AWUT) and Kabul FIR flight level, ATS route and entry fix time for each affected flight.

3.2.2 Air Navigation Services Providers (ANSPs) retain responsibility for the tactical management of flights that are subject to ATFM. In discharging tactical responsibilities, ANSPs will manage non-ATFM compliant flights using delayed pushback and start clearances, non-preferred routes and/or flight levels, enroute holding and/or diversion around Kabul FIR.

3.2.3 The ATFMU utilises the automated, web based Bay of Bengal Cooperative ATFM System (BOBCAT) system in meeting its ATFM responsibilities. These responsibilities will be managed in coordination with aircraft operators and ANSPs in the FIRs concerned.

3.2.4 The ATFMU operates on a 24 hour basis and is responsible for westbound flights entering the Kabul FIR at specified times, flight levels and ATS routes in accordance with paragraph 3.3. The objectives of these ATFM services are to:

- a) Reduce ground and en-route delays;
- b) Maximise capacity and optimize the flow of air traffic within the area;
- c) Provide an informed choice of routing and flight level selection;
- d) Alleviate unplanned in flight re-routing and technical stops; and
- e) Assist regional ANSPs in planning for and managing future workload in the light of forecast increased traffic flows within the area.

3.3 ATFM affected ATS routes, flight levels and applicable hours

3.3.1 All westbound flights intending to enter the Kabul FIR between 2000UTC and 2359UTC daily on ATS routes A466, L750, N644 from FL280 to FL390 inclusive and G792/V390 and B466 between SERKA and PAROD from FL310 to FL390 inclusive shall comply with the ATFM procedures. This includes a mandatory requirement for all flights to obtain a specific ATFM slot allocation from the ATFMU (including AWUT) for entry into the Kabul FIR during the period mentioned above.

Note: There are no ATFM requirements or flight planning restrictions for flights via N571/N877 entering Kabul FIR at SERKA then UL333 to SOKAM. However, to avoid conflicts with flights that are subjected to ATFM procedures, flights shall not flight plan via N571/N877 to enter Kabul FIR at SERKA then B466 to PAROD.

3.3.2 Flights who plan to enter Kabul FIR without an AWUT and entry slot (comprising flight level, ATS route and entry fix time) will be accommodated only after flights with slots have been processed. Such flights should expect

delayed pushback and start clearances, non-preferred routes and/or flight levels, enroute holding and/or diversion around Kabul FIR.

- 3.3.3 In order to ensure availability of slots for westbound departures from designated airports in northern India and Pakistan, departures from these airports are given priority for FL280 in the slot allocation. This does not preclude these flights from requesting higher flight levels with initial slot request.

3.4 Flights Exempted from BOBCAT ATFM

- 3.4.1 The following flights are exempted from the ATFM procedures:

- a) Humanitarian or medical flights
- b) State aircraft with Head of State onboard

- 3.4.2 Flights exempted from ATFM procedures shall indicate the exemption in their flight plan (Field 18 – STS/BOB ATFM EXMP).

- 3.4.3 KLIA AIS shall forward the flight plan information to the ATFMU at AFTN address VTBBZDZX.

3.5 Mandatory AWUT and Kabul FIR Slot allocation

- 3.5.1 Affected flights shall obtain the mandatory AWUT, Kabul FIR entry time, flight level and ATS route from the BOBCAT system. The AWUT and Kabul slot allocation will enable ANSPs to tactically control westbound flights transiting the Kabul FIR at specified times by assigning minimum spacing requirements at established gateway fix points in the vicinity of the eastern boundary of the Kabul FIR.

- 3.5.2 The application, calculation and distribution of AWUT and Kabul FIR entry fix slot allocations will be managed via internet access to the BOBCAT system in accordance with the ATFM operating procedures in paragraph 3.6

3.6 BOBCAT-Operating Procedures

- 3.6.1 All affected flights are required to submit slot requests to the BOBCAT system by logging onto <https://www.bobcat.aero> between 0001 and 1200UTC on day of flight and completing the electronic templates provided.

- 3.6.2 Affected operators who do not have dedicated BOBCAT username/password access should complete the application form provided and fax it to the ATFMU as soon as possible.

3.6.3 Slot Allocation Process

- 3.6.3.1 The slot allocation process is divided into 3 phases, namely the slot request submission, initial slot allocation and finally slot distribution to aircraft operators and ANSPs.

Slot Request Submission

- 3.6.3.2 Slot requests including preferred ATS route, flight level and Maximum Acceptable Delay (MAD) should be lodged between 0001 UTC and 1200 UTC on the day of flight. Slot requests may subsequently be amended prior to 1200 UTC, which is the cut-off time. Aircraft operators are encouraged to submit additional slot request options in case their first choice is not available. This may include variations to ATS route, flight level and MAD.

- 3.6.3.3 Slot requests shall be for flight parameters that are able to be met by the flight. For example, flights requesting a slot at FL390 must be able to transit Kabul FIR at FL390. Flights subsequently unable to meet slot parameters (flight level, ATS route or entry fix time) should expect non-preferred routes and/or flight levels, enroute holding and/or diversion around Kabul FIR.

- 3.6.3.4 As BOBCAT will allocate FL280 on a priority basis to facilitate departures from northern India and Pakistan underneath over-flying traffic, flights departing these airports are encouraged to include FL280 as at least one slot request preference.

- 3.6.3.5 Flights that were not allocated a slot in the initial slot allocation, are not satisfied with the allocated slot or did not submit a slot request should select slots from the listing of remaining unallocated slots available immediately after slot distribution has been completed.

Slot Allocation and Distribution

- 3.6.3.6 Slot allocation will commence at the cut-off time at 1200UTC. BOBCAT will process and generate the slot allocation based on the information submitted in the slot requests. Notification of slot allocation will be made not later than 1230UTC via the ATFMU website. Alternative arrangements for notification of slot distribution (e.g. e-mail, fax, telephone) should be coordinated with the ATFMU.

3.6.3.7 After the slot allocation has been published at <https://www.bobcat.aero>, aircraft operators can:

- a) Use the slot allocation result for ATS flight planning purposes,
- b) Cancel the allocated slot and/or,
- c) Change slot allocation to another available slot in the published list of unallocated slots.

3.6.3.8 Kuala Lumpur ACC and KLIA TWR can also view the slot allocation results at <https://www.bobcat.aero>.

3.6.4 Submission of ATS Flight Plan

3.6.4.1 Once aircraft operators are in receipt of the slot allocation, they shall submit the ATS flight plan using the time, ATS route and flight level parameters of the BOBCAT allocated slot.

3.6.4.2 In addition to normal AFTN addressees, operators should also address flight plan (FPL) and related ATS messages (e.g. DLA, CNL, CHG) to the ATFMU via AFTN address VTBBZDZX for all flights that have submitted a slot request.

3.7 Aircraft Operator/Pilot in Command and ANSP Responsibilities

Aircraft Operator/Pilot in Command

3.7.1 In accordance with ICAO PANS ATM provisions, it is the responsibility of the Pilot in Command (PIC) and the aircraft operator to ensure that the aircraft is ready to taxi in time to meet any required departure time. PIC shall be kept informed by their operators of the AWUT, Kabul FIR entry fix times and flight parameters (route/level) nominated by BOBCAT.

3.7.2 The PIC, in collaboration with ATC, shall arrange take-off as close as possible to the AWUT in order to meet the Kabul FIR slot time.

ANSPs

3.7.3 In accordance with ICAO PANS ATM provisions, flights with an ATFM slot allocation should be given priority for take off to facilitate compliance with AWUT.

3.7.4 AWUT shall be included as part of the initial ATC clearance. In collaboration with PIC, Kuala Lumpur ACC and KLIA TWR shall ensure that every opportunity and assistance is granted to a flight to meet AWUT and allocated entry fix times at Kabul FIR.

3.8 Coordination between Aircraft Operator/Pilot in Command, ANSPs and Bangkok ATFMU

3.8.1 The PIC shall include the AWUT in the initial ATC clearance request.

3.8.2 PIC shall adjust cruise flight to comply with slot parameters at the Kabul FIR entry fix, requesting appropriate ATC clearances including speed variations in accordance with published AIP requirements.

3.8.3 Prior to departure, in circumstances where it becomes obvious that the Kabul slot time will not be met, a new slot allocation should be obtained as soon as possible and via the most expeditious means (e.g. via coordination between flight dispatcher, PIC, Kuala Lumpur ACC, KLIA TWR and Bangkok ATFMU). Early advice that the Kabul slot time will be missed also enables the slots so vacated to be efficiently reassigned to other flights.

3.8.4 Prior to departure, in the event that the aircraft is unable to meet the Kabul slot time, when requested by the PIC after the aircraft has left the gate, Kuala Lumpur ACC or KLIA TWR shall assist the PIC to coordinate with the ATFMU for a revised slot allocation.

3.8.5 The ATFMU (VTBBZDZX) shall be included in the list of AFTN addressees for NOTAMs regarding any planned activities that may affect slot availability (e.g. reservation of airspace/ closure of airspace, non-availability of routes, etc).

3.8.6 The ATFMU (VTBBZDZX) shall be included in the list of AFTN addressees for ATS messages (e.g. FPL, DEP, DLA, CHG, CNL) relating to flights subject to ATFM procedures.

3.8.7 A missed slot results in dramatically increased coordination workload for ATC and PIC and should be avoided. To minimize coordination workload in obtaining a revised slot allocation, the following procedures are recommended:

- a) If the flight is still at the gate, coordination should take place via operators/flight dispatchers to ATFMU;
- b) If the flight has left the gate, coordination to ATFMU may also take place via the ATS unit presently communicating with the flight.

3.9 Basic computer requirement

3.9.1 Aircraft operators, Kuala Lumpur ACC and KLIA TWR are required to have computer equipment capable of connecting to the BOBCAT website <https://www.bobcat.aero> via the internet and satisfying the following minimum technical requirements:

- a) A personal computer of any operating system with the following characteristics;
 - i) Processor: minimum CPU clock speed of 150 MHz;
 - ii) Operating System: Any that operates one of the following web browsers (i.e. Windows 2000/XP, Linux, Unix, or Mac OS);
 - iii) Web Browser: Internet Explorer 5.5 or newer, Mozilla 1.0 or newer, Mozilla Firefox 1.0 or newer, Netscape 7 or newer;
 - iv) RAM: 64 MB or larger (depending on operating system);
 - v) Hard Disk Space: minimum of 500 MB or larger (depending on operating system);
 - vi) Monitor Display Resolution: Minimum of 800 x 600 pixels; and
 - vii) Internet Connection: 56 Kbps Modem or faster.

3.10 ATFM Users Handbook

3.10.1 Supporting documentation, including detailed information in respect of the ATFM operations described above and other pertinent information has been included in the *Bay of Bengal and South Asia ATFM Handbook* (the "ATFM Users Handbook"), available at <https://www.bobcat.aero>

3.10.2 ANSPs and aircraft operators shall ensure that they are conversant with and able to apply the relevant procedures described in the ATFM Users Handbook.

3.11 Contingency Procedures

3.11.1 In the event that an aircraft operator or Kuala Lumpur ACC is unable to access the ATFMU website, the ATFMU shall be contacted via the alternative means (telephone, fax, AFTN) described in paragraph 3.13.

3.11.2 Contingency procedures for submission of slot request, including activation of Contingency Slot Request Templates (CSRT), are included in the ATFM Users Handbook.

3.11.3 In the event of system failure of BOBCAT, ATFMU shall notify all parties concerned and advise that ATFM slot allocation procedures are suspended. In this event, all parties concerned will revert to the existing ATM procedures as applicable outside the daily period of ATFM metering.

3.12 ATFM System Fault Reporting

3.12.1 An ATFM system fault is defined as a significant occurrence affecting an ATS unit, an aircraft operator or ATFMU resulting from the application of ATFM procedures.

3.12.2 Aircraft operators, Kuala Lumpur ACC and KLIA Tower experiencing an ATFM system fault should complete an ATFM System Fault Report Form from the ATFM Users Handbook and forward it to the ATFMU at the address indicated on the form. The ATFMU will analyze all reports, make recommendations/suggestions as appropriate and provide feed back to the parties concerned to enable remedial action.

3.13 Address of Air Traffic Flow Management Unit (ATFMU)

3.13.1 The ATFMU may be contacted as follows;

Unit Name : Bangkok ATFMU
Telephone : +66-2-287-8024, +66-2-287-8025
Fax : +66-2-287-8027
Tel/Fax : +66-2-287-8026
E-mail : atfm@bobcat.aero
ATFN : VTBBZDZX
Website : <https://www.bobcat.aero>

4 NO PRE-DEPARTURE COORDINATION (NO PDC) PROCEDURE

4.1 INTRODUCTION

4.1.1 No Pre-Departure Coordination (No PDC) procedures apply to flights departing from airports within the Bali, Bangkok, Hanoi, Ho Chi Minh, Hong Kong, Jakarta, Kota Kinabalu (including Brunei), Kuala Lumpur, Manila, Phnom Pehn, Singapore, Taipeh and Vientiane FIRs, as well as Sanyo AOR on RNAV and ATS routes.

4.2 NO PDC FLIGHT LEVEL ALLOCATION IN KUALA LUMPUR FIR

4.2.1 Flights participating in the No PDC arrangement will be allocated specific flight levels depending on the flight planned route as indicated in the table below :

Route	Allocated No PDC Flight Levels	Remarks
A464	FL290	For south bound traffic up to ATVIX
A576	FL290	For south bound traffic up to AKTOD
B470	FL290	For south bound traffic up to ANITO
G334	FL250, FL270	For east bound traffic
	FL260, FL280	For west bound traffic
L625	FL310, FL320, FL350, FL360, FL390, FL410	Uni-directional eastbound
L642	FL310, FL320, FL350, FL360, FL390, FL410	Uni-directional westbound
L759	FL280	Aircraft requesting FL280 and FL300 will be cleared to FL280. Succeeding aircraft on the same route will be cleared to FL280 with 10 min longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route. The first aircraft from either Singapore or Kuala Lumpur to be over Kuala Lumpur/Bangkok FIR boundry can expect its requested level.
M751	All flight levels	For flights to / from airports within Bangkok FIR
M758	FL270, FL290, FL330	For east bound traffic
	FL280, FL300, FL340	For west bound traffic
M761	FL270, FL290, FL330	For east bound traffic
	FL280, FL300, FL340	For west bound traffic
M765	FL290, FL370	For east bound traffic
	FL280, FL340	For west bound traffic
M770	FL280	Aircraft requesting FL280 and FL300 will be cleared to FL280. Succeeding aircraft on the same route will be cleared to FL280 with 10 min longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route. The first aircraft from either Singapore or Kuala Lumpur/Bangkok FIR boundry can expect its requested level.
M771	FL310, FL320, FL350, FL360, FL390, FL410	Uni-directional eastbound

N571, N571/N877	FL280	Aircraft requesting FL280 and FL300 will be cleared to FL280. Succeeding aircraft on the same route will be cleared to FL280 with 10 min longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route. The first aircraft from either Singapore or Kuala Lumpur to be over GUNIP can expect its requested level.
N884	FL310, FL320, FL350, FL360, FL390, FL410	Uni-directional eastbound
N891	FL330	For south bound traffic
	FL260, FL300, FL380	For north bound traffic
N892	FL310, FL320, FL350, FL360, FL390, FL410	Uni-directional westbound
P628	FL280	Aircraft requesting FL280 and FL300 will be cleared to FL280. Succeeding aircraft on the same route will be cleared to FL280 with 10 min longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route. The first aircraft from either Singapore or Kuala Lumpur to be over GIVAL can expect its requested level.

- 4.2.2 The flight levels indicated in the table above are intended to facilitate initial departure only. Flight level allocation once airborne is still subject to normal ATC requirements.

4.3 NO PDC FLIGHT LEVEL ALLOCATION IN KOTA KINABALU FIR

4.3.1 Flights participating in the No PDC arrangement will be allocated specific flight levels depending on the flight planned route as indicated in the table below :

Route	Allocated No PDC Flight Levels	Remarks
A341	FL310, FL370	For east bound traffic
	FL320, FL360, FL400	For west bound traffic
B348 (BRU-VJN- OSANU)	FL310, FL350, FL390	For north east bound traffic
	FL320, FL360, FL400	For south west bound traffic
B583	FL290, FL330, FL370, FL410	For east bound traffic
	FL300, FL340, FL380	For west bound traffic
B584 / R223	FL310, FL350, FL390	For north east bound traffic
	FL320, FL360, FL400	For south west bound traffic
B592	FL310, FL350, FL390	For north east bound traffic
	FL320, FL360, FL380, FL400	For south west bound traffic
G334	FL250, FL270	For east bound traffic
	FL260, FL280	For west bound traffic
G580 (VKG-ATETI) B348 (BRU-KAMIN) M761 (VKG-AGOBA)	FL270, FL290, FL330	For east bound traffic
	FL280, FL300, FL340	For west bound traffic
M754 / M522	FL300, FL340, FL380	For north east bound traffic
	FL290, FL330, FL370, FL410	For south west bound traffic
M758 / M759	FL270, FL290, FL330	For east bound traffic
	FL280, FL300, FL340	For west bound traffic
M768	FL270, FL330, FL410	For east bound traffic
	FL300, FL380	For west bound traffic
M772	FL300, FL380	For north bound traffic

4.3.2 The flight levels indicated in the table above are intended to facilitate initial departure only. Flight level allocation once airborne is still subject to normal ATC requirements.

5 UNI-DIRECTIONAL ROUTING SYSTEM ALONG THE WESTERN PORTION OF PENINSULAR MALAYSIA

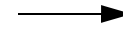
5.1 NORTHBOUND

a) Flights Departing And Landing At Airports Within Kuala Lumpur FIR.

From	To	FPL Route
WMKJ	WMKM	A457 GUPTA W535 VMK
	WMKK	A457 VKL
	WMSA	A457 VKL A464 VBA
	WMKI	B466 SUKAT A457 TEPUS W532 VIH
	WMKP	B466 SUKAT A457 VPG
	WMKL	B466 SUKAT A457 VPG W525 VPL
	WMKA	B466 SUKAT A457 VAS
WMKM	WMKK	A457 VKL
	WMSA	A457 VKL A464 VBA
	WMKI	B466 SUKAT A457 TEPUS W532 VIH
	WMKP	B466 SUKAT A457 VPG
	WMKL	B466 SUKAT A457 VPG W525 VPL
	WMKA	B466 SUKAT A457 VAS
WMKK	WMSA	DCT VBA
	WMKI	A457 TEPUS W532 VIH
	WMKP	A457 VPG
	WMKL	A457 VPG W525 VPL
	WMKA	A457 VPG VAS
WMSA	WMKI	VBA SUKAT A457 TEPUS W532 VIH
	WMKP	VBA SUKAT A457 VPG
	WMKL	VBA SUKAT A457 VPG W525 VPL
	WMKA	VBA SUKAT A457 VPG VAS
WMKI	WMKP	W532 TEPUS A457 VPG
	WMKL	W532 TEPUS A457 VPG W525 VPL
	WMKA	W532 TEPUS A457 VPG VAS
WMKP	WMKL	VPG W525 VPL
	WMKA	VPG A457 VAS

b) Flights To Destinations Outside Kuala Lumpur FIR.

From	Entering Adjacent FIR	Joining Airways or Way-points	FPL Route
Airports south of WMKM	Jakarta FIR	N563, M300	VJR A457 KASRI DCT SALAX
		P574	VJR B466 VBA G582 PUGER P574
	Chennai FIR	N571/N877	VJR B466 GUNIP N571/N877
		B466	VJR B466
		P628	VJR B466 SUKAT A457 VPG B579 VPL P628
			Note: Between 1500 UTC – 2030 UTC, airline operators are to file flight plan via VJR B466 SUKAT A457 VPG Y337 GIVAL P628
	Bangkok FIR	L759, L515/M770	VJR B466 SUKAT A457 VPG B579 PUT
		M770	Note: Between 1500 to 2030 UTC, airline operators are encourage to file flight plans via B466 SUKAT A457 VAS TAMOS HTY
		A457	VJR B466 SUKAT A457 VAS TAMOS HTY
	WMKK	Jakarta FIR	P574
G582			VKL R461 G582 MDN
Chennai FIR		N571	VKL R467 GUNIP N571
		B466	VKL R467 B466
		P628	VKL A457 VPG B579 VPL P628
			Note: Between 1500 UTC – 2030UTC, airline operators are to file flight plan via VKL A457 VPG Y337 GIVAL P628
Bangkok FIR		L759, L515/M770	VKL A457 VPG B579 PUT
			M770
		A457	VKL A457 VAS TAMOS HTY



From	Entering Adjacent FIR	Joining Airways or Way-points	FPL Route
WMSA	Bangkok FIR	L759, L515/M770	VBA B466 SUKAT A457 VPG B579 PUT
		A457	VBA B466 SUKAT A457 TAMOS HTY
WMKP	Bangkok FIR	L759	VPG B579 PUT
		A457	VPG A457 HTY
WMKL	Bangkok FIR	L759	VPL B579 PUT
		A457	VPL DCT VAS A457

5.2 SOUTHBOUND

- a) FLIGHTS DEPARTING AND LANDING AT AIRPORTS WITHIN KUALA LUMPUR FIR AND FLIGHTS PROCEEDING BEYOND KUALA LUMPUR FIR.

From	To	FPL Route
WMKA	WMKP	VAS A457 VPG
	WMKI	VAS R325 VIH
	WMSA	VAS R325 VIH A464 VBA
	WMKK	VAS R325 VIH A464 VKL
	WMKM	VAS R325 VIH A464 DUMOK W535 VMK
	WMKJ	VAS R325 VIH A464 TOPOR W534 VJR
	WSSS	VAS R325 VIH A464 SJ
WMKL	WMKP	VPL W525 VPG
	WMKI	VPL W531 VIH
	WMSA	VPL W531 VIH A464 VBA
	WMKK	VPL W531 VIH A464 VKL
	WMKM	VPL W531 VIH A464 DUMOK W535 VMK
	WMKJ	VPL W531 VIH A464 TOPOR W534 VJR
	WSSS	VPL W531 VIH A464 SJ
WMKP	WMKI	VPG W530 VIH
	WMSA	VPG W530 VIH A464 VBA
	WMKK	VPG W530 VIH A464 VKL
	WMKM	VPG W530 VIH A464 DUMOK VMK
	WMKJ	W530 VIH A464 TOPOR W534 VJR
	WSSS	VPG W530 VIH A464 SJ
WMSA	WMKK	VBA A464 VKL
	WMKM	VBA A464 DUMOK VMK
	WMKJ	VBA A464 TOPOR W534 VJR
	WSSS	VBA A464 SJ
WMKK	WMKM	VKL A464 DUMOK VMK
	WMKJ	VKL A464 TOPOR W534 VJR
	WSSS	VKL A464 SJ
WMKM	WMKJ	VMK OGAKO A464 TOPOR W534 VJR
	WSSS	VMK A464 SJ

b) FLIGHTS ENTERING KUALA LUMPUR FIR FROM ADJACENT FIR.

To	From Adjacent FIR	From Airways or Way-points	FPL Route
WMKL	Bangkok FIR	L759 and L515	B579 VPL
	CHENNAI FIR	L510/P628	L510 GIVAL P628 VPL
WMKP	Bangkok FIR	L759 and L515	B579 VPL W525 VPG
		A464	VAS W650 VPG
	CHENNAI FIR	B466/G468	B466 GUNIP VPG
		L510/P628	L510 GIVAL P628 VPL W525 VPG
		N571/G468	N571 GUNIP VPG
WMKI	Bangkok FIR	R325	DUBAX R325 VIH
		A464	KARMI A464 VIH
WMSA	Bangkok FIR	R325	DUBAX R325 VIH A464 VBA
		A464	KARMI A464 VBA
	CHENNAI FIR	B466	B466 VBA
		L510/P628	L510 GIVAL P628 VPL W531 VIH A464 VBA
		N571/B466	N571 GUNIP B466 VBA
WMKK	Bangkok FIR	L759 and L515	DUBAX R325 VIH A464 VKL
		R325	DUBAX R325 VIH A464 VKL
		A464	KARMI A464 VKL
	CHENNAI FIR	B466/R467	B466 GUNIP R467 VKL
		L510/P628	L510 GIVAL P628 VPL W531 VIH A464 VKL
		N571/R467	N571 GUNIP R467 VKL
WMKJ	Bangkok FIR	L759 and L515	R325 DUBAX R325 VIH A464 TOPOR W534 VJR
		A464	A464 KARMI A464 TOPOR W534 VJR
	CHENNAI FIR	L510/P628	L510 GIVALP628 VPL W531 VIH A464 TOPOR W534 VJR
		B466	B466 VBA A464 TOPOR W534 VJR
		N571	N571 GUNIP R467 VKL TOPOR W534 VJR
	JAKARTA FIR	P574/R461	P574 PUGER R461 VKL A464 TOPOR W534 VJR
		R461/G582	R461 PUGER VBA A464 TOPOR W534 VJR
WSSS and beyond WSSS	Bangkok FIR	L759 and L515	DUBAX R325 VIH A464 VKL A464 SJ
		A464	A464 KARMI A464 SJ
	CHENNAI FIR	L510/P628	L510 GIVAL P628 VPL W531 VIH A464 SJ
		N571	N571 GUNIP R467 VKL A464 SJ
	JAKARTA FIR	P574/R461	P574 PUGER R461 VKL A464 SJ
		R461/G582	R461 PUGER VBA A464 SJ
		N563, M300	SALAX A576 REKOP SJ

6 UNI-DIRECTIONAL RNAV ROUTES IN KUALA LUMPUR FIR

6.1 UNI-DIRECTIONAL RNAV ROUTES Y332, Y333, Y334, Y335 AND Y336

6.1.1 These uni-directional routes are to regulate traffic over **VPK DVOR/DME** and to segregate departure and arrival routing from/to KLIA by establishing another anchor point (PADLI) to the South of **VPK DVOR/DME**. Segregation of departure and arrival routes shall be achieved by designating **VPK DVOR/DME** and PADLI as a "gate-in" and "gate-out" depending on the runway-in-use at KLIA.

6.1.2 Arrangement for "gate-in" and "gate-out" shall be as follows:

RWY IN-USE (KLIA)	ARRIVAL GATE - IN	DEPARTURE GATE - OUT
Runway 32	PADLI	VPK DVOR/DME
Runway 14	VPK DVOR/DME	PADLI

6.1.3 Arrivals and departures to and from Subang Airport (WMSA) shall continue to track via G582 VPK.

6.1.4 The uni-directional routing system shall be observed by all arrivals and departures to and from KLIA except arrivals on M763 which shall track via TAXUL Y331 PIBOS thereafter PIBOS transition.

6.2 FLIGHT PLANNING

6.2.1 Default flight planning by the operators for departures and arrivals from/to KLIA shall be for Runway 32 as follows:

6.2.1.1 Departure KLIA – Default FPL

DEPARTURE KLIA – Default FPL		
DEP RUNWAY	DEP ROUTE	SID
RWY 32	W533 G582 VPK followed by appropriate ATS route/s	KIMAT DEP

6.2.1.2 Arrival KLIA – Default FPL

ARRIVAL KLIA – Default FPL		
ARR RUNWAY	ARR Route	STAR
RWY 32	From appropriate ATS route/s VPK G584	NIPAR/ISTAN

6.2.2 However, depending on the runway-in-use at KLIA, ATC will re-route these flights to comply with the "gate-in"/"gate-out" arrangement described in para 6.1.2 above as follows:

6.2.2.1 Departure KLIA

DEPARTURE KLIA			
DEP RUNWAY	DEP ROUTE	SID	GATE OUT
RWY 32	W533 G582 VPK	KIMAT DEP	VPK
RWY 14	G584 ISTAN Y336 PADLI (see note)	ISTAN DEP	PADLI

Note; *Since the default FPL is via VPK, Clearance Delivery shall now include detailed routings to re-join the default FPL routing at the WMKK/WSSS FIR boundary.*

An example of such a clearance

" (callsign) cleared to (destination) ISTAN Bravo Departure Y336 PADLI Y335 IDSEL flight planned route (altitude) (transponder code)

6.2.2.2 Arrival KLIA

ARRIVAL KLIA			
ARR RUNWAY	GATE IN	ARR ROUTE	STAR ARR/TRANSITION
RWY 32	PADLI	PADLI Y336 ISTAN	NIPAR/ISTAN
RWY 14	VPK	VPK G582 PIBOS	KIDOT/PIBOS

7 RVSM PROCEDURES IN THE KUALA LUMPUR AND KOTA KINABALU FIR

7.1 IDENTIFICATION OF RVSM AIRSPACE IN KUALA LUMPUR FIR

7.1.1 RVSM airspace is prescribed within the Kuala Lumpur FIR within controlled airspace between FL290 and FL 410 (inclusive). RVSM levels will be assigned to RVSM approved aircraft operating on ATS/RNAV routes stated below:

- a) P574, N571 and P628 would be assigned the westbound levels FL300, FL340, FL360 (FL360 is subject to coordination), FL380 and FL400. All eastbound levels would be available except FL290.
- b) A327 and L645 would be assigned the westbound levels FL320 and FL360 (FL360 is subject to coordination). All eastbound levels would be available subject to coordination with FL290 as No-PDC.
- c) M751 would be assigned the westbound levels FL300, FL320, FL340, FL360, FL380 and FL400. All eastbound levels would be available except FL310 and FL390.
- d) In all other ATS/RNAV routes other than mentioned above, assignment of cruising levels are in accordance with the ICAO Table of Cruising Levels as published in ICAO Annex 2, Appendix 3, Table (a).

7.2 IDENTIFICATION OF RVSM AIRSPACE IN KOTA KINABALU FIR

7.2.1 RVSM airspace is prescribed within controlled airspace in the Kota Kinabalu FIR between FL290 and FL410 (inclusive).

7.2.2 RVSM Cruising Levels

- a) RVSM approved acft eastbound on ATS routes G460 (VKG - VSI - VBU - BRU) and G580 (VKG - VMI - BRU) shall be assigned FL290, FL310, FL330, FL350, FL370, FL390 and FL410.
 - b) RVSM approved acft westbound on ATS routes G460 (BRU - VBU - VSI - VKG) and G580 (BRU - vmi - VKG) shall be assigned FL300, FL320, FL340, FL360, FL380 and FL400.
 - c) RVSM approved acft eastbound on ATS route B583 shall be assigned FL290, FL330, FL370 and FL410.
 - d) RVSM approved acft westbound on ATS route B583 shall be assigned FL300, FL340 and FL380.
 - e) RVSM approved acft eastbound on ATS routes R223, B592, B584 and B348 (BRU - VJN - OSANU) shall be assigned FL310, FL350 and FL390.
 - f) RVSM approved acft westbound on ATS route B592 shall be assigned FL320, FL360, FL380 and FL400.
 - g) RVSM approved acft westbound on ATS routes B584, A341, R223 and B348 (OSANU - VJN - BRU) shall be assigned FL320, FL360 and FL400.
 - h) RVSM approved acft eastbound on ATS route A341 shall be assigned FL310 and FL370.
 - i) RVSM approved acft eastbound on ATS routes M754 and M522 shall be assigned FL300, FL340 and FL380.
 - j) RVSM approved acft westbound on ATS routes M754 and M522 shall be assigned FL290, FL330, FL370 and FL410.
 - k) RVSM approved acft eastbound on ATS route M768 shall be assigned FL290, FL330, FL370 and FL410.
 - l) RVSM approved acft westbound on ATS route M768 shall be assigned FL300, FL340 and FL380.
 - m) RVSM approved acft eastbound on ATS routes M758, M759, M761, B348 (KAMIN - BRU) and G580 (ATETI - VKG) shall be assigned FL290, FL330, FL370 and FL410.
 - n) RVSM approved acft westbound on ATS routes M758, M759, M761, B348 (BRU - KAMIN) and G580 (VKG - ATETI) shall be assigned FL300, FL340 and FL380.
 - o) RVSM approved acft eastbound on ATS route M772 shall be assigned FL300 and FL380.
- Other levels are available subject to prior coordination between the parties concerned.

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) P627 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.

7.11.5 Non-RVSM compliant aircraft may not flight plan between FL290 and FL410 inclusive within RVSM airspace except for the following situations :

- a) The aircraft is being initially delivered to the State of Registry or Operator; or
- b) 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
- c) The aircraft is transporting a spare engine mounted under the wing; or
- d) The aircraft is being utilized for mercy or humanitarian purposes; or
- e) State aircraft (those aircraft used in military, custom and police services shall be deemed state aircraft)

Note : The procedures are intended exclusively for the purposes indicated and not as a means to circumvent the normal RVSM approval process.

7.11.5.1 The assignment of cruising levels to non-RVSM compliant acft listed in para 5.13.5 a) to e) shall be subject to an ATC clearance. Aircraft operators shall include the "STS / Category of Operations (i.e. FERRY / HUMANITARIAN / MILITARY/CUSTOM/POLICE) / NON-RVSM COMPLIANT" in Field 18 of the ICAO Flight Plan.

7.11.5.2 Where necessary, the Air Traffic Control Centre may be contacted as follows:

Kuala Lumpur Area Control Centre

Telephone : 603 - 78473573

AFTN : WMFCZQZX

FAX : 603 - 78473572

Kota Kinabalu Area Control Centre

Telephone : 6088 - 224404

AFTN : WBFCZQZX

FAX : 6088 - 219170

7.12 DELIVERY FLIGHTS FOR AIRCRAFT THAT ARE RVSM COMPLIANT ON DELIVERY

7.12.1 An aircraft that is RVSM compliant on delivery may operate in 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 MAAR 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, registration number and aircraft type/series should be included. Fax number: 603-88891541 AFTN: WMKKYAYX

7.13 PROCEDURES FOR SUSPENSION OF RVSM

7.13.1 Air traffic services will consider suspending RVSM procedures within affected areas of the Kuala Lumpur FIR and Kota Kinabalu FIR 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 2,000 FT.

7.14 GUIDANCE FOR PILOTS AND CONTROLLERS FOR ACTIONS IN THE EVENT OF AIRCRAFT SYSTEM MALFUNCTION OR TURBULENCE GREATER THAN MODERATE

7.14.1 See page ENR 1.9 - 15 to ENR 1.9 - 17 for guidance in these circumstances.

7.15 PROCEDURES FOR AIR-GROUND COMMUNICATION FAILURE

7.15.1 The air-ground communication failure procedures specified in AIP ENR 1.6 - 3 in conjunction with ICAO PANS-ATM Doc 4444 should be applied.

CONTINGENCY SCENARIOS

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 below which contain additional technical and operational detail.

Scenario 1 : The pilot is :

- a) unsure of the vertical position of the aircraft due to the loss or degradation of all primary altimetry systems, or
- b) 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 <ul style="list-style-type: none"> a) making maximum use of exterior lights; b) broadcasting position, FL, and intentions 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.
a) maintaining the CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	a) 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.
b) 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.	b) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
c) executing the contingency manoeuvre shown in paragraphs 5.6 and 5.7 to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	c) 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.
	d) Notify adjoining ATC facilities/sectors of the situation.

Scenario 2 : There is a failure or loss of accuracy of one primary altimetry system (e.g., greater than 200 feet difference between primary altimeters)

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

EXPANDED EQUIPMENT FAILURE AND TURBULENCE ENCOUNTER SCENARIOS

Operators may consider this material for use in training programs.

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 a) making maximum use of exterior lights; b) broadcasting position, FL, and intentions 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:	
a) maintaining the CFL and route, provided that the aircraft can maintain level.	a) 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.
b) 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.	b) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
c) executing the contingency manoeuvre shown in paragraphs 5.6 and 5.7 to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	c) 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.
	d) Notify adjoining ATC facilities/ sectors of the situation.

Scenario 2 : Loss of redundancy in primary altimetry systems

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

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 a) making maximum use of exterior lights; b) broadcasting position, FL, and intentions 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.
a) maintaining CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	a) 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.
b) requesting ATC clearance to climb above or descend below RVSM airspace if ATC cannot establish adequate separation from other aircraft.	b) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
c) executing the contingency manoeuvre shown in paragraphs 5.6 and 5.7 to offset from the assigned track and FL, if ATC clearance cannot be obtained.	c) 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.
	d) Notify adjoining ATC facilities/sectors of the situation.

Scenario 4 : The primary altimeters diverge by more than 200 FT (60 M)

The Pilot should
Attempt to determine the defective system through established trouble-shooting procedures and/or comparing the primary altimeter display to the standby altimeter (as corrected by the correction cards, if required).
If the defective system can be determined, couple the functioning altimeter system to the altitude-keeping device.
If the defective system cannot be determined, follow the guidance in Scenario 3 for failure or unreliable altimeter indications of all primary altimeters.

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: a) making maximum use of exterior lights; b) broadcasting position, FL, and intentions 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:	
a) maintaining CFL and route provided ATC can provide lateral, longitudinal or conventional vertical separation.	a) 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.
b) requesting flight level change, if necessary.	b) If unable to provide adequate separation, advise the pilot of essential traffic information and request pilot's intentions.
c) executing the contingency manoeuvre shown in paragraphs 5.6 and 5.7 to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	c) Notify other aircraft in the vicinity and monitor the situation.
	d) Notify adjoining ATC facilities/ sectors of the situation.

PHRASEOLOGY RELATED TO RVSM OPERATIONS**Controller-Pilot Phraseology :**

Phraseology	Message
(call sign) 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 RVSM airspace (controllers shall provide a read-back with this same phrase), and b) In all requests for flight level changes pertaining to flight levels within the RVSM airspace; and c) In all read-backs of flight level clearances pertaining to flight levels within the 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 (call sign) CONFIRM RVSM APPROVED .
(call sign) UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN [or DESCEND TO, or CLIMB TO] FLIGHT LEVEL (number)	Denial of clearance into the RVSM airspace.
UNABLE RVSM DUE TURBULENCE*	For a pilot to report when severe turbulence affects the aircraft's capability to maintain the height-keeping requirements for RVSM.
UNABLE RVSM DUE EQUIPMENT*	For a pilot to report that the aircraft's equipment has degraded below that required for flight within the 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 RVSM airspace until such time as the problem ceases to exist, or the aircraft has exited the RVSM airspace.)
READY TO RESUME RVSM*	For a pilot to report the ability to resume operations within the RVSM airspace after an equipment or weather-related contingency.
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.

* indicates a pilot transmission

Example 1: A non-RVSM approved aircraft, maintaining FL 260, subsequently requests a climb to FL 320.

Pilot: (call sign) REQUEST FL 320, NEGATIVE RVSM
 Controller: (call sign) CLIMB TO FL 320
 Pilot: (call sign) CLIMB TO FL 320, NEGATIVE RVSM

Example 2: A non-RVSM approved aircraft, maintaining FL 260, subsequently requests a climb to FL 430.

Pilot: (call sign) REQUEST FL 430, NEGATIVE RVSM
 Controller: (call sign) CLIMB TO FL 430
 Pilot: (call sign) CLIMB TO FL 430, NEGATIVE RVSM

Example 3: A non-RVSM approved aircraft, maintaining FL 360, subsequently requests a climb to FL 380.

Pilot: (call sign) REQUEST FL 380, NEGATIVE RVSM
 Controller: (call sign) CLIMB TO FL 380
 Pilot: (call sign) CLIMB TO FL 380, NEGATIVE RVSM

Example 4: A non-RVSM approved civil aircraft maintaining FL 280, subsequently requests a climb to FL 320.

Pilot: (call sign) REQUEST FL 320, NEGATIVE RVSM
 Controller: (call sign) UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN FL 280

Coordination between ATS units:

Message	Phraseology
To verbally supplement an automated estimate message exchange which does not automatically transfer Item 18 flight plan information.	NEGATIVE RVSM or NEGATIVE RVSM STATE AIRCRAFT [as applicable]
To verbally supplement estimate messages of non-RVSM approved aircraft.	NEGATIVE RVSM or NEGATIVE RVSM STATE AIRCRAFT [as applicable]
To communicate the cause of a contingency relating to an aircraft that is unable to conduct RVSM operations due to severe turbulence or other severe weather-related phenomenon [or equipment failure, as applicable].	UNABLE RVSM DUE TURBULENCE [or EQUIPMENT , as applicable]