

**INTERNATIONAL CIVIL AVIATION ORGANIZATION  
ASIA AND PACIFIC OFFICE**



**REPORT OF THE SPECIAL ATS COORDINATION MEETING OF  
THE ICAO REDUCED VERTICAL SEPARATION MINIMUM  
IMPLEMENTATION TASK FORCE FOR THE BAY OF BENGAL AND  
INDIAN CONTINENTAL AIRSPACE FLIGHT LEVEL ORIENTATION  
SCHEME (FLOS)**

KUALA LUMPUR, MALAYSIA

11 – 13 AUGUST 2003

The views expressed in this Report should be taken as those of the  
Task Force and not the Organization

Published by the ICAO Asia and Pacific Office, Bangkok

RVSM/ SCM/FLOS  
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## 1.1 Introduction

1.1.1 The Special ATS Coordination Meeting of the Reduced Vertical Separation Minimum Implementation Task Force (RVSM/TF/SCM) was held at the Hilton Hotel in Kuala Lumpur, Malaysia from 11 to 13 August 2003.

1.1.2 The Terms of Reference for the Task Force are contained in **Appendix A** to this Report.

## 1.2 Attendance

1.2.1 The meeting was attended by 40 participants from Australia, India, Indonesia, Malaysia, Maldives, Singapore, Sri Lanka, Thailand, IATA and IFALPA. A complete list of participants is at **Appendix B**.

## 1.3 Officers and Secretariat

1.3.1 Mr. Sydney Maniam, Head (Standards), Civil Aviation Authority of Singapore (CAAS), Singapore, continued as Chairman of the Task Force. Mr. John Richardson, Regional Officer ATM, ICAO Asia and Pacific Office, Bangkok served as the Secretary for the meeting. Mr. Ron Rigney, Operations Manager (International Activities), Airservices Australia, continued as Chairman of the ATC Operations Work Group (ATC/WG),

## 1.4 Opening of the Meeting

1.4.1 On behalf of the Director-General of Civil Aviation, Malaysia, Mr Ahmad Nizar Zolfakar, Director, Kuala Lumpur ACC, welcomed the delegates and opened the meeting. He highlighted the success of RVSM implementation in the South China Sea area and reiterated Malaysia's commitment towards RVSM extension in the Bay of Bengal and Beyond on 27 November 2003. He wished delegates a successful meeting that would result in a more effective and pragmatic planning of the contiguous airspace in the area.

1.4.2 Mr. Sydney Maniam thanked Malaysia for its efforts in organizing and hosting the meeting at very short notice. He stressed that it was imperative for the meeting to finalize the operational plan for RVSM operations in the Bay of Bengal and Beyond, in order for the preparations of RVSM to be completed. In particular, the meeting should agree on the assignment of levels and No-PDC procedures which would meet the operational requirements of international traffic flows. He also reminded the States concerned of the need to publish the AIP Supplement on RVSM by 30 September 2003, to provide operators with adequate advance notification on the policies and procedures of RVSM operations. He added that ultimately, the goal was to achieve seamless RVSM operations for traffic operating from Asia to Europe, through the Middle East. To this end, he urged all States concerned to cooperate and work closely so that the use of airspace could be optimized and the management of traffic in the region further enhanced. Mr. Maniam also informed the meeting that a review of operations on the EMARSSH routes would be done concurrently, with a view to address some of the difficulties encountered by operators and ATS providers.

1.4.3 Mr. John Richardson, on behalf of Mr. L.B. Shah, Regional Director, ICAO Asia and Pacific Regional Office welcomed all participants to the meeting. He also expressed appreciation to Malaysia for hosting this meeting at short notice. Mr. Richardson advised that it was crucial to resolve some very important issues to enable the implementation of RVSM in the Bay of Bengal and

beyond westwards to take place on the scheduled date of 27 November 2003. These items included the finalization of the Single Alternate Flight Level Orientation Scheme, publication of AIS material associated with the proposed changes in a timely and accurate manner and to consider the Traffic Orientation Scheme, which was developed at the EMARSSH Post Implementation Meeting in early April 2003 to enable a smooth transition for aircraft planning to transit the Kabul FIR. It was also mentioned that since implementation of the EMARSSH route structure on 28 November 2002, the full usage of all routes had not been realized which caused difficulties with some enroute States. Mr. Richardson further recalled that, in the early days of EMARSSH, the requirements of Mach Number Technique detailed in the ICAO Documents was not being adhered to subsequently causing unnecessary delays. He was pleased to see that this issue had been resolved between the States concerned. In closing, Mr. Richardson brought to the attention of the meeting that the work to be accomplished at this meeting would require harmonization with the Middle East Region, who were also scheduled to introduce RVSM on 27 November 2003.

1.5            **Documentation and Working Language**

1.5.1            The working language of the meeting as well as all documentation was in English.

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**Agenda Item 1: Adoption of Agenda**

1.1 The meeting reviewed the provisional agenda presented by the Chairperson and adopted it as the agenda for the meeting.

**Agenda Item 2: Operational Considerations**

**Flight Level Orientation Scheme (FLOS) Arrangements**

2.1 The meeting was presented with four proposals for FLOS arrangements which were submitted by India, Malaysia, Thailand and IATA respectively. These proposals provided the meeting with various options for FLOS arrangements over the Bay of Bengal and Indian continental airspace.

2.2 All options were considered by the meeting and in consideration of the operational requirements of international traffic flows and domestic operations, the meeting agreed on the assignment of levels as shown in the table below:

**PROPOSED FLOS FOR BAY OF BENGAL OCEANIC AIRSPACE**  
**(H24)**

**WESTBOUND**

<b>Bay of Bengal</b>	<b>Flight Level Allocation (FLOS)</b>
N877, P628, L759, M770, P570, M300, N563, N571, P574	FL 280, 320, 340, 360 (FL360 subject to coordination) 380, 400
P646 and L507	All Westbound levels available
P762, L301, N895, L645, A327	FL 300, 360 (FL 360 subject to coordination)

**EASTBOUND**

<b>Bay of Bengal</b>	<b>Flight Level Allocation (FLOS)</b>
N877, P628, L759, M770, P570, M300, N563, N571, P574	All Eastbound Flight Levels available (Except for FL290)
P762, L645, A327	All Eastbound Flight Levels available. FL290 No PDC
L301, N895	All Eastbound Flight Levels available.

**PROPOSED FLOS FOR INTERNATIONAL TRAFFIC OVER CONTINENTAL INDIA  
(0001-1600 UTC)****WESTBOUND**

<b>Indian Continental Airspace</b>	<b>Flight Level Allocation (FLOS)</b>
A791, N877	FL 300, 340, 360, 400 available (See note below)

**EASTBOUND**

<b>Indian Continental Airspace</b>	<b>Flight Level Allocation (FLOS)</b>
A791, N877	FL 310, 350, 390, 410 available

**Notes:**

1. *For Indian AIP Supplement:*

*Airlines are to flight plan in accordance with the Flight Levels Allocation Table above to cross Indian continental airspace on:*

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

2. *FL changes to meet the FL requirements over continental India airspace will be achieved by respective Indian ACCs.*

2.3 The meeting recognized that the purpose of RVSM was to increase the number of cruising levels for RVSM-approved aircraft. The meeting therefore agreed that during the peak westbound period, all westbound RVSM levels should be made available to international traffic flows from Asia to Europe.

2.4 Taking into account the operational requirements of international traffic flows and domestic operations in the Bay of Bengal and Beyond, the meeting agreed on the assignment of levels as shown in the table mentioned para. 2.2.

**No Pre-Departure Coordination (No-PDC)**

2.5 The meeting considered the No-PDC procedures for the assignment of levels to departures from Bangkok, Kuala Lumpur and Singapore to Europe and agreed that the No-PDC flight levels for departures from Kuala Lumpur and Singapore would be FL280, FL320, FL340, FL380 and FL400 for the parallel routes over the Bay of Bengal.

### **Agenda Item 3: Implementation Management Considerations**

#### **Publication of AIP Supplement**

3.1 The meeting agreed that States concerned shall publish the AIP Supplement on RVSM as soon as possible but not later than 30 September 2003. In fact, the AIP Supplement is required to be mailed to all responsible parties two weeks ahead of 30 September to allow for postage time to the Chart makers. This would ensure that operators would be provided with adequate advance notification on the implementation of RVSM in the Bay of Bengal and Beyond to install the data in their flight management systems and carry out the necessary training for aircrew. ICAO requested that a copy of the RVSM AIP be sent via email to the ICAO Regional Office in Bangkok as well as via email to Jepessen, who have undertaken the responsibility to distribute to other chart makers concerned.

#### **Letters of Agreement**

3.2 The meeting agreed that States concerned should finalise their Letters of Agreement with adjacent FIRs, as soon as possible. Details of the assignment of levels and No-PDC arrangements should be included in the respective Letters of Agreement. In addition, specific coordination procedures to facilitate the efficient management of traffic between the FIRs should be put in place.

3.3 The meeting agreed that all States involved in RVSM implementation in the Bay of Bengal and Beyond should complete the Letters of Agreement, prior to RVSM TF/20 in October 2003. Where necessary, the States should arrange for bi-lateral meetings to finalise the Letters of Agreement.

#### **Harmonization of RVSM Operations with the Middle East Region**

3.4 The meeting reviewed plans to harmonize RVSM operations with the Middle East Region. To this end, a second Joint Coordination Meeting with the Middle East RVSM Task Force would be held from 27-28 August 2003 in Abu Dhabi, UAE to finalize ATC coordination procedures and Letters of Agreement.

#### **Outstanding EMARSSH route issues to be resolved**

3.5 In the deliberations, the meeting recalled the issue of ATS route congestion that had been discussed at the ATS/AIS/SAR/SG/13 Meeting (23 – 27 June 2003) and the outstanding items that had to be resolved:

- a) bottlenecks over Delhi India causing significant delays for Delhi westbound departures;
- b) restrictions on flight levels on ATS route L333 over India due to military considerations – require additional FL 280;
- c) requirement for new ATS route joining ASOPO to Rahim Yar Khan (RK) within Indian airspace which at present is unable to be used due to military considerations;
- d) effective use of Mach Number Technique (MNT) procedures as application by some Bay of Bengal States was inconsistent and not in accordance with the ICAO Planning Manual, causing unnecessary delays to long-haul international aircraft; and,

- e) a Traffic Orientation Scheme for flights transiting the Kabul FIR

#### **Bottlenecks over Delhi India**

- 3.6 This issue should be resolved under the proposed Traffic Orientation Scheme.

#### **Restrictions on flight levels on ATS route L333**

- 3.7 India informed the meeting that lowering of the Minimum Enroute Altitude (MEA) on L333 from FL310 to FL280 is currently being coordinated with Indian Military Authorities. IATA requested India to consider that in the event that the MEA could not be lowered to FL280, that FL300 be considered as a suitable alternative within the RVSM Table of Cruising Levels. India noted the alternative proposal.

#### **Requirement for new ATS route joining ASOPO to Rahim Yar Khan (RK)**

- 3.8 It was recalled by the meeting that a request had been conveyed to India in respect of the proposed extension of EMARSSH route P628 from ASOPO direct to Rahim Yar Khan (RK). This would provide an additional ATS route for aircraft proceeding to join V390 through Afghanistan, thus reducing the track mile to V390 by approximately 90 NM. It was noted that this route passes through military airspace and like L333 mentioned above, and an MEA of FL300 would also be acceptable. It was also noted by the meeting that Pakistan had agreed to this route within their airspace. India advised that they would give both these proposals urgent consideration.

#### **Effective use of Mach Number Technique (MNT) procedures**

- 3.9 The meeting was reminded that there had been several difficulties in the use of Mach Number Technique (MNT) since implementation of the EMARSSH route structure which were not there previously. States had been urged to follow the procedures as laid down in ICAO documents thus avoiding unnecessary delays.

- 3.10 Following discussions on this matter, the meeting was assured that these issue had been resolved and that a smooth operation of MNT procedures across the Bay of Bengal could be expected in future.

#### **Traffic Orientation Scheme for Flights transiting the Kabul FIR**

- 3.11 IATA presented a Traffic Orientation Scheme (TOS) proposal, which is described at **Appendix C**, for use by flights transiting the Kabul FIR. This proposal had previously been presented to the EMARSSH Post Implementation Review meeting held in April 2003 however due to other matters affecting aviation at the time, there was insufficient representation to thoroughly look at the issue. The purpose of the TOS was to gain the maximum capacity of the routes and levels presently available over Afghanistan and to ensure that last minute diversions imposed on long-haul international aircraft were avoided due to Afghan route overload.

- 3.12 With regard to the westbound flight levels in the Kabul FIR, the meeting recalled that, on all but one transit route, which is rarely used, FL 280 was not available with only FL310, FL350 and FL390 being available. The meeting also noted that a longitudinal separation of 10 minutes MNT on all available routes through the Kabul FIR is required between aircraft flying at the same level and that no level changes were permitted.



3.13 The meeting was advised that the ICAO, the United States FAA and IATA have, over a considerable period of time, endeavored to negotiate with the Coalition Military Forces responsible for this over-flying airspace in Afghanistan to relax the present restrictions regarding available transit levels and additional ATS routes. It now appears that there is a possibility within a few months of holding a joint meeting between the parties concerned to attempt to progress the matter.

3.14 Another factor to be considered was that, under the RVSM Table of Cruising Levels, aircraft wishing to proceed via Afghanistan could be operating at FL300, FL320, FL340, FL360 or FL380. As Afghanistan are still operating in accordance with the Conventional Table of Cruising Levels (CVSM), and with the restrictions on Flight Levels through Kabul FIR, a transition from RVSM to CVSM would be required using only FL310, FL350 and FL390, noting that FL390 would be most unlikely to be used by heavy long-haul aircraft, due to weight limitations.

3.15 Therefore prior to the Kabul FIR, aircraft would require vertical transitions from multiple RVSM levels to only two CVSM levels (i.e. FL310/FL350) within Pakistan airspace. Taking into consideration the restricted number of Flight Levels available, plus the requirement for 10 minutes MNT separation through the Kabul FIR, this procedure would need to be carefully managed from the departure aerodrome, so as to avoid an overload on these routes and possible diversions.

3.16 The focus of the TOS was to share the available routes through Afghanistan during the peak Westbound departure period by allocating particular ATS routes within the Kabul FIR to each of the major departure points on the Malaysian Peninsular (Bangkok, Kuala Lumpur and Singapore or over-flying these airports from the East) as well as departures from Delhi and Mumbai in India. The orientation scheme was devised so that these aircraft would be managed to intercept their particular ATS routes through Afghanistan. This is an interim solution proposed by IATA until all routes and levels are available within the Kabul FIR. The TOS is described as follows:

a) *RNAV route N644*

N644 is the northernmost track through Afghanistan to the Caspian and Black Seas and thus would support Bangkok departures (or flights that over-fly Bangkok). Traffic proceeding to N644 must route over Delhi-A466-DI and must be spaced (vertically or horizontally) and managed to be separated by 10 minutes MNT at the same CVSM level prior to entering the Kabul FIR.

b) *RNAV route L750*

L750 is the middle track through Afghanistan to the Caspian and Black Seas. This track caters primarily to departures from Singapore and Kuala Lumpur on L759 over the Bay of Bengal.

Departures from Singapore or Kuala Lumpur cannot exceed a flow rate of one flight every 10 minutes at the same altitude. This will ensure that no more than 10 – 12 flights per hour will transit L750 through the Kabul FIR using the full capacity of FL310/350. It will be a shared responsibility for Singapore/Kuala Lumpur to ensure that departures from respective ports do not exceed the recommended flow rates on L750 through Afghanistan.

c) *RNAV route V390*

V390 was implemented in March 2003. This track will be an attractive route for departures out of Mumbai and should also cater for Delhi departures who presently have difficulty obtaining a suitable clearance through Afghanistan

on the other available routes due to overflying aircraft who already have been allocated the available levels of FL310/350. It is also likely that this route could be a favoured seasonal route for departures out of Singapore and Kuala Lumpur. Nevertheless, Mumbai and Delhi departures should be given priority access to this route and a procedure should be developed to allow SIN/KUL departures to fill the additional slots.

d) *RNAV route A466*

*Aircraft from Singapore/Kuala Lumpur*

The meeting was informed that M770 should be used for flights from Singapore/Kuala Lumpur wishing to use A466 through the Kabul FIR and Russian airspace. This routing would not interfere with the Bangkok – Europe traffic intending to operate on N644 through Afghanistan’s airspace as these routes diverge at Dera Ismail Khan (DI) and become separated within Lahore FIR.

*Aircraft from Bangkok*

Bangkok departures planning to use A466 through Afghanistan would need to be flow managed with aircraft out of Singapore/Kuala Lumpur also planning via A466.

*Aircraft from Delhi*

A similar strategy as the one above for Bangkok would be required for Delhi departures. Depending on the amount of aircraft planning this route and taking into consideration that Delhi aircraft flight plan details for A466 may not be available prior to the departure of aircraft from the Malaysian Peninsular ports, this may create difficulties in coordination with Bangkok, Kuala Lumpur and Singapore ACCs to accommodate these aircraft. Until more routes and levels are available through Afghanistan proceeding through Russian Federation airspace, it could be more advisable for these particular Delhi departures to either plan via V390 or alternatively through Russian airspace via P500 or M881.

Aircraft from Delhi planning on A466 would require the same flow management considerations to harmonize with other aircraft mentioned above.

e) *RNAV route P646/L507*

ATS routes P646 and L507 have been allocated all westbound RVSM flight levels. These two routes converge at BBN and then track to N644. To facilitate a regulated flow of traffic into Afghanistan’s airspace, on this route, it would be a requirement for Bangkok to not exceed one departure flight every 10 minutes for each available N644 slot (FL310 and FL350) into Afghanistan. This would mean that Bangkok can launch 10-12 flights per hour during peak flow periods on N644, utilising two CVSM flight levels into Afghanistan’s airspace and would be Bangkok’s responsibility to ensure the ten minute spacing.

f) *RNAV route L759*

L759 is currently the most used ATS route for flights departing Kuala Lumpur/Singapore for European ports. In an effort to restrict the amount of traffic on this route and cause more shared usage of other parallel routes, there was a suggestion that a speed restriction of M.84 be applied to the route at FL 280 or FL320 during peak traffic flow periods. It was suggested that this proposal be put to the IATA RCG meeting for further consideration by the airlines.

3.17 It should be noted that the TOS as detailed in this report would now require some small modifications in line with the discussions at this meeting. This Traffic Orientation Scheme is only required for the night-time westbound peak period and should be relaxed outside this period.

**TOS Traffic Management Plan**

3.18 Taking the above into account, the meeting agreed to take follow-up action on the TOS and devise a management plan to optimize the use of available routes and Flight Levels through the Kabul FIR. This would require Malaysia, Singapore and Thailand to meet as a matter of urgency, to discuss and put in place a plan for aircraft departing from their airports and transiting the Kabul FIR, taking into account the level restrictions and other requirements through that airspace.

3.19 It was further agreed that this plan should be developed in time for presentation to members of the IATA Regional Coordinating Group (RCG) which is scheduled to be held in Singapore on 26-27 August 2003.

**Other Operational Issues**

3.20 The meeting also noted that departures from Singapore/Kuala Lumpur flight planning via I.R. Iran could be allocated P628, N877 or alternatively, the Bay of Bengal routes to the south, to avoid congestion over TIGER which is in non-radar airspace in the Indian FIR.

3.21 In regard to Phuket (PUT) departures to Europe, the meeting considered that these aircraft should not interfere with the scheduled services during the night-time rush hours. Consequently, the meeting concluded that these operations should be the subject of PDC procedures and that such flights should be encouraged to operate outside the regular peak traffic period.

**Agenda Item 4: Future Work – Actions Agreed and Meeting Schedule**

4.1 In addition to the list of tasks that had been developed by the Task Force for the implementation of RVSM in the Bay of Bengal and Beyond, the meeting agreed that the States concerned would complete the assigned Action Items as shown at **Appendix D**.

4.2 The meeting noted the future work of the Task Force to facilitate RVSM implementation in the Bay of Bengal and Beyond as follows:

2<sup>nd</sup> Joint Co-ordination Meeting between Asia/Pacific  
and Middle East RVSM Task Forces:

27-28 August 2003 in Abu Dhabi, UAE

Special ATS Coordination Meeting for Transition  
into the Bay of Bengal and Beyond:

3 -5 September 2003, Bangkok, Thailand

RVSM/TF/20: 5 days 20-24 October 2003, New Delhi, India (Provisional)  
(Bay of Bengal and Beyond focus)

(Target Implementation Bay of Bengal and Beyond AIRAC date 27 November 2003)

RVSM/TF/21: 3 days February 2004 and location TBD  
(90-day follow up review on Bay of Bengal and Beyond focus)

RVSM/TF/22: 2 days November 2004 and location TBD  
(1-year follow up review on Bay of Bengal and Beyond focus)

**Agenda Item 5: Other Business**

5.1 There was no other business to be discussed.

**Agenda Item 6: Closing of the Meeting**

6.1 Mr. Sydney Maniam expressed sincere appreciation to Malaysia for the excellent conduct of the Special ATS Coordination Meeting. He commended all concerned DCA Malaysia staff for their warm hospitality and professional support to the meeting. He also thanked all participants for their efforts and cooperation, which had contributed significantly to the successful completion of the meeting.

6.2 IATA thanked Malaysia for their hospitality and all States for their willingness to progress the issues, in particular India for the considerable compromises they were prepared to make in order to achieve the desired result. It was noted that their strong delegation justified India's commitment to ensure an implementation of RVSM in this area on the scheduled date.

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**TERMS OF REFERENCE OF THE  
RVSM IMPLEMENTATION TASK FORCE**

- 1) To develop strategic, benefits-driven implementation plans (based on cost benefit studies), in concert with airspace users, for RVSM operations within selected areas and airspace of the Asia/Pacific Region, ensuring inter-regional harmonization;
- 2) To consider any amendments to RVSM guidance material that may be proposed by States and international organizations;
- 3) To address any other matters as appropriate and relevant to the implementation of RVSM;
- 4) The Task Force will include participation from States and International Organizations that are considering or involved with the implementation of RVSM; and
- 5) The Task Force will report to the ATS/AIS/SAR Sub-Group.

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Appendix B to the Report

**LIST OF PARTICIPANTS**

STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
<b>AUSTRALIA</b>		
Mr. Ron Rigney	Operations Manager (International Activities) Brisbane Centre Airservices Australia Locked Bag 747 Eagle Farm QLD 4009 Australia	Tel: 61-7-3866 3487 Fax: 61-7-3866 3599 E-mail: ron.rigney@airservicesaustralia.com
Mr. Phil Irvine	CNS/ATM Specialist Airservices Australia Locked Bag 747 Eagle Farm QLD 4009 Australia	Tel: 61-7-3866 3338 Fax: 61-7-3866 3367 E-mail: phil.irvine@airservicesaustralia.com
<b>INDIA</b>		
Mr. Kanu Gohain	Joint Director General of Civil Aviation India DGCA INDIA, Aurobindo Marg New Delhi 110023	Tel: 91-11-24679251 Fax: 91-11-24633140 E-mail:
Shri R.C. Khurana	General Manager (ATM) Airports Authority of India Rajiv Gandhi Bhawan Safdarjung Airport New Delhi-110003 India	Tel: 91-11-24652648 Fax: 91-11-24611078 E-mail: gmaraaai@vsnl.net gmatmchqnad@airportsindia.org.in
Mr. Mukesh C. Dangi	Dy. General Manager (ATM) Airports Authority of India Rajiv Gandhi Bhawan Safdarjung Airport New Delhi-110003 India	Tel: 91-11-24632950 EXT 406 Fax: 91-11-24611078 E-mail: mcdangi@airportsindia.org.in
<b>INDONESIA</b>		
Mr. Nanang S. Taruf	Deputy Director for System, Procedure Air Navigation Directorate of Aviation Safety, DGAC 23 <sup>rd</sup> Gd. Karya Jl. Medan Merdeka Barat No.8 Jakarta 10110, Indonesia	Tel: +62-21 350 6451 Fax: +62-21 350 7569 E-mail: cns-atm@telkom.net
Mr. Zulkifli Moeslim	Chief of ATS Polonia Airport – Medan Polonia Airport Medan 20157 Indonesia	Tel: +62-811-640966 Fax: +62-614561800 E-mail: zulumike@indosat.net.id
Mr. Yusfandri Gona	Head of Flight Test DGAC of Indonesia, Merdeka Barat No.8 22 <sup>nd</sup> Floor – Karya Building Jakarta 10110 – Indonesia	Tel: 62-21-3506665/4 Fax: 62-21-3506663 E-mail: yugo_gona@yahoo.com

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. I Wayan Sudiarta	RVSM Program Manager DGAC of Indonesia Merdeka Barat No.8 22 <sup>nd</sup> Floor – Karya Building Jakarta 10110 – Indonesia	Tel: 62-21-3506664/5 Fax: 62-21-3506663 E-mail: sudiarta_wayan@yahoo.com mjovebali@yahoo.com
Mr. Ahmad Agil	Operation Development PT. Garuda Indonesia GSO Building 3 <sup>rd</sup> Floor Room 317, Soekarno Hatta Apt. Cengkareng, Indonesia	Tel: 62-21-5501521 Fax: 62-21-5501528 E-mail: ahmad.agil@garuda_Indonesia.com
<b>MALAYSIA</b>		
Mr. Ahmad Nizar Zolfakar	Director, Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7846 5233 Fax: 603 7845 6590 E-mail: klatcc@tm.net.my
Mr. Maniam Appadurai	Deputy Director, Air Traffic Services Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7846 5233 Fax: 603-7847 2997 E-mail: accwmfc@tm.net.my
Mr. Abdul Rahim Sharif	Deputy Director, Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7847 3573 Fax: 603 7847 3572 E-mail: hjrahims@tm.net.my
Mr. Ghazali Said	Deputy Director, Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7847 3573 Fax: 603 7847 3572 E-mail: guzz@tm.net.my
Mr. D. Thangiah	Deputy Director, Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7847 3573 Fax: 603- 7847 3572 E-mail: shanrajoo@hotmail.com
Mr. Tajul Annwar Ismail	Assistant Director, Air Traffic Services Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7846 5233 Fax: 603-7847 2997 E-mail: accwmfc@tm.net.my
Mr. Shanmugaraj Rajoo	Air Traffic Controller Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7847 3573 Fax: 603 -7847 3572 E-mail: shanrajoo@hotmail.com



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Appendix B to the Report

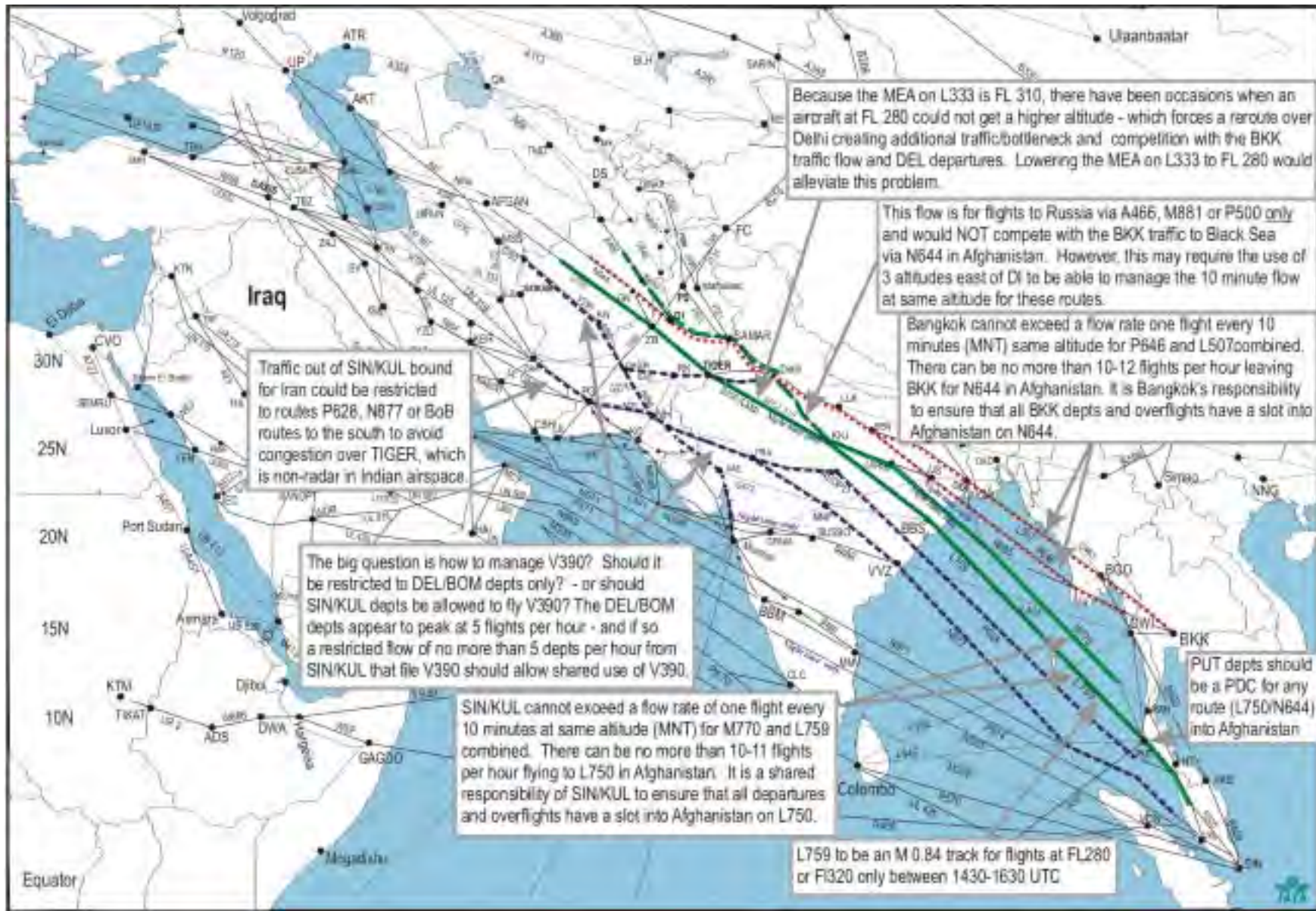
STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Richard Tan Hock Chye	Air Traffic Controller Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7847 3573 Fax: 603 -7847 3572 E-mail: bmrch@hotmail.com
Mr. Tay Swee Boon	Air Traffic Controller Air Traffic Control Centre (KL ACC) Department of Civil Aviation Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7847 3573 Fax: 603 -7847 3572 E-mail: taysboon@tm.net.my
Mr. Vausu Dev Varma	Instructor Civil Aviation College Sultan Abdul Aziz Shah Int. Airport 47200 Subang, Selangor Darul Ehsan Malaysia	Tel: 603-7846 4333 E-mail: vausuv@yahoo.com
Mr. Azham Ahmad	Assistant Director Aeronautical Information Services KL International Airport 64000 Sepang Selangor, Malaysia	Tel: 603-87874118 Fax: 603-89265989 E-mail: atcklia@tm.net.my
Mr. Peter Tan Jin Hooi	Captain, Acting Fleet Manager B777 Malaysia Airlines Flight Operations Division Ground Floor, East Wing Flight Management Building KL International Airport 64000 Sepang Selangor, Malaysia	Tel: 603-85255306 Fax: 603-85255313 E-mail: tanjh@mas.com.my
Mr. Norshid Ali	Captain, B744, Technical and Dev Pilot Malaysia Airlines Flight Operations Division Ground Floor, East Wing Flight Management Building KL International Airport 64000 Sepang Selangor, Malaysia	Tel: 603-85255310 Fax: E-mail: norshid@mas.com.my
Mr. Mohd Nazri Sulaiman	Executive Flt Ops Malaysia Airlines Flight Operations Division Ground Floor, East Wing Flight Management Building KL International Airport 64000 Sepang Selangor, Malaysia	Tel: 016-297 8836 Fax: 603-8787 1244 E-mail: nazs@mas.com.my
Mr. Kamarudin Kamilin	Chief Pilot Training & Standards Malaysia Airlines 4 <sup>th</sup> Floor, Admin Building Southern Support Zone KL International Airport 64000 Sepang Selangor, Malaysia	Tel: 603-8525 2975 Fax: 603-8525 3104 E-mail: kdin@mas.com.my

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Mr. Shamsudin Mahadi,	RMAF MEG Markas Operasi Udara RANOP-KAHANUD Aras 10.13 Wisma Pertahanan Jalan Padang Tembak 50634 Kuala Lumpur Malaysia	Tel: 603-2071 6516 Fax: 603-2698 6403 E-mail: cliau7@yahoo.com kodhr@hotmail.com
Mr. Mohd Amir b. Alias	RMAF Capt. No.2 Squadron Subang Air Force Base 40000 Shah Alam Selangor Malaysia	Tel: 019-284 4741 Fax: E-mail: carubou88@yahoo.com
<b>MALDIVES</b>		
Mr. Mohamed Solih	Chief Air Traffic Services Maldives Airports Company Ltd Male International Airport Hulhule Maldives	Tel: 960-313308 Fax: 960-313258 E-mail: msolih@airports.com.mv atcc@airports.com.mv
<b>SINGAPORE</b>		
Mr. Maniam Sydney	Head (Standards) Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: 65-6541 2456 Fax: 65-6545 6516 E-mail: sydney_maniam@caas.gov.sg
Mr. Rosly bin Md Saad	Deputy Chief Singapore Air Traffic Control Centre Civil Aviation Authority of Singapore 60, Biggin Hill Singapore 509950	Tel: 65-6541 2430 Fax: 65-6545 6252 E-mail: rosly_saad@caas.gov.sg
Mr. Kuah Kong Beng	Senior Air Traffic Control Manager (Airspace) Civil Aviation Authority of Singapore Singapore Changi Airport P.O. Box 1 Singapore 918141	Tel: 65-6541 2457 Fax: 65-6545 6516 E-mail: kuah_kong_beng@caas.gov.sg
<b>SRI LANKA</b>		
Mr. Kottagoda Hettiarachchige Ratnasiri	Senior Air Traffic Controller (ACC) Airport and Aviation Services Limited Colombo Airport Ratmalana Sri Lanka	Tel: 94-1-2252299 Fax: 94-1-2252299 E-mail:
<b>THAILAND</b>		
Mr. Aphinun Vannangkura	Director of Bangkok Control Centre Aeronautical Radio of Thailand Ltd. 102 Ngamduplee, Tungmahamek Bangkok 10120, Thailand	Tel: 66-2-285 9057 Fax: 66-2-285 9489
Mr. Tinnagorn Choowong	Air Traffic Control Manager Bangkok Area Control Centre Aeronautical Radio of Thailand Ltd. 102 Ngamduplee, Rama4 Rd. Satorn Bangkok, Thailand 10120	Tel: +66-2-285 9975 Mobile: +66-9-8166486 Fax: +66-2-285 9406 E-mail: tinnagorn.ch@aerorhai.co.th

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STATE/NAME	DESIGNATION/ADDRESS	CONTACT DETAILS
Capt. Werasak Wiroonpetch	Department Manager, International Aviation Affairs and Development Thai Airways International (Public) Company Limited 89 Vibhavadi Rangsit Rd Bangkok 10900	Tel: +66-2-545 2665 Fax: +66-2-545 3849 E-mail: werasak.w@thaiairways.com
<b>IATA</b>		
Mr. Soon Boon Hai	Assistant Director, Safety Operations & Infrastructure – Asia/Pacific International Air Transport Association 71 Robinson Road #05-00, SIA Building Singapore 068896	Tel: 65-6239 7267 Fax: 65-6536 6267 E-mail: soonbh@iata.org
Mr. Owen B. Dell	Manager International Operations Cathay Pacific Airways Limited International Affairs Department 9/F Central Tower, Cathay Pacific City 8 Scenic Road Hong Kong International Airport Lantau, Hong Kong, China	Tel: 852 2747 8829 Fax: 852 2141 8829 SITA: HKGVLCX E-mail: owen_dell@cathaypacific.com
Capt. Aric Oh	Manager Flight Ops Singapore Airlines Limited 161 Tai Keng Gardens Singapore 535433	Tel: +65-6540 3694 Fax: +65-6285 8687 E-mail: aric_oh@singaporeair.com.sg ciraho@pacific.net.sg
<b>IFALPA</b>		
Capt. Ng Kok Seong	IFALPA Representative 47 Limau Grove Singapore 467841	Tel: +65-64449425 Fax: +65-64449425 E-mail : kokseong@singnet.com.sg
<b>ICAO</b>		
Mr. John E. Richardson	Regional Officer, ATM ICAO Asia & Pacific Office P.O.Box 11 Samyaek Ladprao Bangkok – 10901 Thailand	Tel: 66-2-5378189 ext 159 Fax: 66-2-5378199 AFTN: VTBBICOX E-mail: jrichardson@bangkok.icao.int Jricho282@yahoo.com



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**RVSM ATC SUB-GROUP ACTION ITEMS**

	<b>ACTION ITEM</b>	<b>TIME FRAME</b>	<b>RESPONSIBLE PARTY</b>	<b>REMARKS</b>
1.	Issue AIP Supplement on Single Alternate FLOS	Mid Sep 03	Individual States	56 Day AIRAC Cycle requirement
2.	Review No-PDC procedures	Early Oct 03	Malaysia, Singapore, Thailand	Report to TF/20 (Delhi – Oct 03) on final No-PDC arrangements
3.	Develop Management Plan for TOS	End Aug 03	Malaysia, Singapore, Thailand, IATA	To be considered by IATA RCG Meeting
4.	Lower MEA from FL310 to include FL280 and FL300	27 Nov 03	India	If FL280 not available – FL300 acceptable
5.	Implement proposed EMARSSH route ASOPO to Rahim Yar Khan (RK)	27 Nov 03	India	To complete EMARSSH route system in the Asia/Pacific region
6.	Review and revise ATS Letters of Agreement	27 Nov 03	All States	Update level assignment