INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE

REPORT OF THE SPECIAL ATS COORDINATION MEETING ON TRANSITION PROCEDURES

Bangkok, Thailand

3-5 September 2003

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

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1.1 Introduction

1.1.1 The Special ATS Coordination Meeting of the Reduced Vertical Separation Minimum Implementation Task Force for Transition Procedures (SCM/RVSM/TF/Transition) was held at the Aeronautical Radio of Thailand (AEROTHAI) Headquarters, Bangkok, Thailand from 3-5 September 2003.

1.2 Attendance

1.2.1 The meeting was attended by 30 participants from Hong Kong China, India, Indonesia, Lao PDR, Malaysia, Singapore, Thailand, Viet Nam IATA, IFALPA and IFATCA. A complete list of participants is at **Appendix A**.

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. David Moores, Regional Officer ATM, ICAO Asia and Pacific Office, Bangkok served as the Secretary for the meeting.

1.4 Opening of the Meeting

1.4.1 Mr. Somnuk Rongthong, Vice President, Air Traffic Service Engineering Bureau of AEROTHAI welcomed the delegates and opened the meeting. He highlighted the benefits of introducing RVSM in the Asia Region and urged all States to continue to cooperate to achieve the implementation of RVSM in the Bay of Bengal and Beyond on 27 November 2003. He complemented those concerned for the successful implementation of RVSM in the West Pacific and South China Sea (WPAC/SCS) area, which had brought significant benefits to users and ATS providers. He noted that this meeting would be dealing with transition procedures, and emphasized the safety issues that needed to be addressed. He wished the participants a successful meeting.

1.4.2 Mr. David Moores, on behalf of Mr. L.B. Shah, Regional Director, ICAO Asia and Pacific Office expressed appreciation to AEROTHAI for hosting this meeting. Mr. Moores drew attention to the importance of this meeting resolving the transition requirements between the WPAC/SCS and Bay of Bengal areas where two different flight level orientation schemes (FLOS) would be operating. He advised the meeting that at the Second Joint Coordination Meeting of the Middle East and Asia Regions Task Forces (JCM/2/MID/ASIA/RVSM/TFs) held at Abu Dhabi, United Arab Emirates from 27-29 August 2003, agreement was reached on the inter-regional arrangements for implementation of RVSM on 27 November 2003. Also, the Ninth Meeting of the Middle East Task Force (MID/RVSM/TF/9) held on 24-27 August 2003 at Abu Dhabi made the decision to go ahead with implementation in the Middle East Region as planned. The Asia Region RVSM Task Force was expected to complete its arrangements to make a “Go/No Go” decision at the ASIA/RVSM/TF/20 meeting to be held at Delhi, India from 20-24 October 2003. This special meeting was expected to complete the transition arrangements leading to the signing of Letters of Agreements by the Sates concerned. With this completed, he was confident that a “Go” decision could be made at RVSM/TF/20.

1.4.3 Mr. Sydney Maniam thanked AEROTHAI for its efforts in organizing and hosting the meeting at very short notice. He outlined the issues that had to be addressed in order for the operational plan for the implementation of RVSM in the Bay of Bengal and Beyond to be finalized. In particular, the meeting should identify the transition areas between the South China Sea and Bay of

Bengal areas and develop coordination procedures for the transfer of control of aircraft using the modified single alternate flight level orientation scheme and single alternate flight level orientation schemes respectively. He also reminded the States concerned of the need to complete the corresponding draft Letters of Agreement to facilitate the implementation of 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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Adoption of Agenda

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

Agenda Item 1: Operational plan

1.1 The Chairperson updated the meeting on the outcome of the Special ATS Coordination Meeting held at Kuala Lumpur, Malaysia from 9-11 August 2003 to consider the flight level assignment for the Bay of Bengal area and continental India which had been presented to the RVSM/TF/19 meeting held at Bangkok, Thailand on 30 June - 4 July 2003. The Kuala Lumpur meeting agreed on the flight level assignment arrangement, which was reviewed by the JCM/2/MID/ASIA/RVSM/TFs meeting and minor revisions were made to clarify understanding.

1.2 The Chairperson informed the meeting that at the Kuala Lumpur Special meeting and the JCM/2/MID/ASIA/RVSM/TFs, the operational plan for RVSM implementation in the Bay of Bengal and beyond had been completed. For this meeting, the major issues were to complete the transition procedures, prepare LOAs, and to update the action plan.

Agenda Item 2: Transition areas between the South China Sea area and the Bay of Bengal and Beyond

Hong Kong, China

2.1 Hong Kong, China presented information on their findings on carrying out flight level transition for westbound traffic on ATS/RNAV routes A1/P901/A202 in the airspace within which Hong Kong, China provides air traffic services. A study was carried out on the feasibility of conducting transition to the single alternate FLOS in Hong Kong airspace without unduly increasing the loading on the ATS system, which may otherwise impact on flight safety.

2.1.1 The Hong Kong airspace was primarily a Terminal Control Area in which traffic density and complexity were high. Any significant re-alignment of established routes or changes to the vertical profile may disturb the balance of the entire route structure. In regard to the feasibility of conducting transition to the single alternate FLOS in Hong Kong airspace, a safety case study was performed. The objective of the study was to assess the safety impact on the Hong Kong ATC system due to the increase in workload in conducting the FLOS transition. Extensive radar simulation was employed to collect as much data as possible to assist in decision making.

2.1.2 The safety study produced the following findings:

A1/P901

a) various options of level availability were evaluated by the use of radar simulator. Results showed that when only a small number of levels, e.g. FL300, FL340, FL380 and FL400, were available for P901/A1, the traffic complexity and workload involved in level transition activities within Hong Kong airspace were extremely high, especially when weather deviation on P901/A1 and L642 resulted in lateral separation problems. The increase in operational risk thus induced was considered unacceptable unless all six levels, i.e. FL300, FL320, FL340, FL360, FL380 and FL400 could be made available as for allocation as No-PDC levels to westbound traffic on P901/A1 for Hong Kong, China to carry out level transition;

b) with FL300, FL320, FL340, FL360, FL380 and FL400 made available to conduct level transition within Hong Kong airspace, sufficient lead time was required for timely promulgation of procedures and changes of documents for ATC personnel/airspace users, and staff conversion training. In this regard, subject to other external factors, the transition arrangements could be put in place on or after late November 2003; and

A202

c) it is feasible to adopt the single alternate FLOS on the portion of ATS Route A202 within Hong Kong airspace. However, as a certain segment of A202 west of SIKOU was in non-RVSM airspace, it was anticipated that there would be difficulties in implementing the single alternate FLOS along the entire ATS route A202.

Technical collision risk for aircraft on bi-directional ATS routes operating RVSM

2.1.3 Hong Kong, China considered that a uni-directional ATS Route system would contribute to the reduction of technical collision risk value when the flight levels within the single alternate FLOS were utilized by traffic.

2.1.4 The meeting noted the Hong Kong, China study and results. The meeting was advised by the Monitoring Agency in the Asia Region (MAAR) that the safety assessment they performed for A1/P901 would not support the introduction of the single alternate FLOS under bi-directional traffic operations due to the high density of traffic on these routes. In this regard, the overall target level of safety (TLS) of 5×10^{-9} fatal accidents per flight hour could not be met. In the case of A202, the TLS was met but the technical risk was close to the maximum permitted of 2.5×10^{-9} fatal accidents per flight hour. More information on the MAAR safety assessment is provided below.

Malaysia

2.1.5 Malaysia presented information on transition arrangements necessary to establish transition areas and procedures to provide seamless operations in the Kuala Lumpur FIR, which was located between the WPAC/SCS and Bay of Bengal areas where different FLOSs (modified single alternate and single alternate respectively) were being applied.

2.1.6 The adoption of two FLOSs had affected the need for transition areas to facilitate flights overflying the Malaysian Peninsula from the WPAC/SCS area utilizing the modified single alternate FLOS to the Bay of Bengal Area and beyond where single alternate FLOS would be implemented and vice versa.

Transition in Kuala Lumpur FIR

2.1.7 The meeting identified the transition areas for aircraft overflying the Kuala Lumpur FIR between the South China Sea and Bay of Bengal areas as shown in Table A below:

Route	Transition Area	Direction
M765/VKB/B219/VPG/G468/BOB Area	VKB/ B219/ VPG	WESTBOUND
BOB Area/G468/VPG/B219/VKB/M765	VPG /B219/ VKB	EASTBOUND
SCS AREA/PK/G582/VBA/BOB AREA	PK /G582/ VBA	WESTBOUND
BOB AREA/VBA/G582/PK/SCS AREA	VBA/G582/PK	EASTBOUND

Table A

2.1.8 The meeting agreed that Kuala Lumpur ACC will be responsible for the transition from the modified single alternate flight level orientation scheme to the single alternate flight level orientation scheme and vice versa. The level changes would be effected when aircraft were within the transition area as shown in Table B and Table C.

WESTBOUND

Route	SCS Flight Level Assignment	BOB Flight Level Assignment
SCSArea/M765/VKB/B219/VPG/ G468/BOB Area	310*/350*/390	300*/320/340/360*/380/400
L642 or N892 joining PK/G582/VBA/BOB Area	300/320/340/360/380/400	No change
M758 or M761 joining PK/G582/VBA/BOB Area	310/350/390	300*/320/340/360*/380/400

Table B

*Note 1: — * Fl 310, and 350 on M765 available subject to coordination.*

*Note 2: — * FL 300 on N877, P628, L759, M770, P570, M300, N563, N571, P574 not available.*

*Note 3: — * FL 360 on P628, L759, M770, P570, M300, N563, N571, P574, P762, L301, N895, L645, A327 available subject to coordination.*

EASTBOUND

Route	BOB Flight Level Assignment	SCS Flight Level Assignment
BOB Area/G468/VPG/B219/VKB/ M765/SCS Area	310/330/350/370/390	290/330/370/410
BOB Area/VBA/G582/PK joining M758 or M761	310/330/350/370/390	290/330/370/410
BOB Area/VBA/G582/PK joining M771, L625 and N884	310/330/350/370/390	300/320/340/360/380/400

Table C

2.1.9 The meeting also agreed that Bangkok ACC would not assign FL310 and FL390 for eastbound traffic entering the Kuala Lumpur FIR on M751.

Thailand

2.1.11 Thailand presented information on a proposed flight level allocation scheme to be used in transition procedures following implementation of RVSM in the Bay of Bengal Area to mitigate potential conflict between the modified single alternate FLOS operating in the South China Sea and West Pacific area and the single alternate FLOS to be implemented in the Bay of Bengal area. The arrangements proposed should lead to the improvements of the ATS operations in the WPAC/SCS area.

2.1.12 It was noted that RVSM had been implemented successfully in the WPAC/SCS airspace since February 2002. In conjunction with the RVSM implementation in WPAC/SCS, Thailand had also implemented Phase I of RVSM in the southeast sector of the Bangkok FIR. The second phase of the RVSM implementation was planned on 27 November 2003 in conjunction with implementation in the Bay of Bengal and beyond.

2.1.13 The meeting was advised that Thailand had delayed implementation of RVSM Phase II because of the transition issues in the Bangkok FIR concerning the FLOS. Also, the traffic orientation within the Bangkok FIR affected both international and domestic operations. Phase II would be implemented domestically within the Bangkok FIR using the single alternate FLOS at the same time as the Bay of Bengal and beyond area. With the introduction of Phase II in the domestic airspace, RVSM would be implemented for the entire Bangkok FIR, exclusively.

2.1.14 As the geographical location of Thailand overlaps between the WPAC/SCS and Bay of Bengal areas, the differences in the FLOS between these two areas would make the Bangkok FIR a transition area, which presented safety problems and complicated operational procedures.

2.1.15 Thailand fully supported the implementation of a common RVSM FLOS in both the WPAC/SCS and Bay of Bengal areas, thus eliminating the transition airspace between the two areas. The meeting recognized that the WPAC/SCS route structure was a highly successful operation and operators and ATS providers were experiencing significant benefits from the present mode of operation. However, the meeting agreed that it was desirable to have a uniform RVSM FLOS, and in the interest of harmonization a uniform single alternate FLOS for the WPAC/SCS should be adopted. The meeting considered this matter further under Agenda Item 4.

2.1.16 Thailand proposed that as an interim arrangement to support the transition between the single alternate and modified single alternate FLOS, the following conditions should apply:

- within a radar environment;
- in low traffic density area; and
- flight level assignment to be applied to ensure operational safety and to reduce human error.

2.1.17 Thailand identified five (5) major areas that required transition schemes to be taken into consideration:

1) Traffic on the Northern part of Vientiane FIR connecting with Bangkok FIR on ATS routes R474 and B346;

2) Transition on A202 for Westbound traffic;

3) Single alternate FLOS on A1/P901;

4) Transition on B202, G474, R468 and N891 in the Bangkok FIR; and

5) Proposal for the use of the single alternate FLOS on M751.

2.1.18 The meeting considered the Thailand proposal and following discussion with the States concerned, the transition areas and procedures were agreed as shown below.

Transition in Bangkok FIR and Vientiane FIR

2.1.19 The meeting identified the transition areas for aircraft transiting the Bangkok and Vientiane FIRs between the South China Sea and Bay of Bengal areas and the corresponding transition procedures as shown in Table D below:

Route	Flight Level Assignment	Remarks
A581 B346 B218 Northbound	FL310, 350, 390	Level assignment to be effected by Bangkok ACC *(For flight to VLLB or Kunming FIR and beyond)*
A581 R215 B346 B218 Southbound	FL300, 320, 340, 360, 380, 400	Level assignment to be effected by Vientiane ACC **(***No-PDC may be required*)
R474 Eastbound	FL290, 330, 370, 410	Level assignment to be effected by Bangkok ACC (*For flight to Vientiane and Hanoi FIRs and beyond*)
R474 Westbound	FL300, 320, 340, 360, 380, 400	Level assignment to be effected by Vientiane ACC *(No-PDC may be required***)**

Route	Flight Level Assignment	Remarks
A202 Eastbound	FL290, 330, 370, 410	Level assignment to be effected by Bangkok ACC
A202 Westbound	FL300, 320, 340, 360, 380, 400	Level change to be effected by Vientiane ACC *(Transition between VILAO and SAV)*
A1 B202 G474 R468(E) A340 R334 N891 R588 Eastbound	FL290, 330, 370, 410	Level assignment to be effected by Bangkok ACC
A1 B202 Westbound	FL300, 320, 340, 360, 380, 400	Level change to be effected by Bangkok ACC *(Transition to start between PAPRA and BUTRA, and BOMPA and PAK respectively*)
G474 R468(E) A340 R334 N891 R588 Westbound	FL300, 320, 340, 360, 380, 400	Level change to be effected by Bangkok (*Transition to start at Bangkok FIR boundary*)
M751 Northbound	FL300, 320, 340, 360, 380, 400	Level change to be effected by Kuala Lumpur ACC
M751 Southbound	FL290, 330, 350, 370, 410	Level assignment to be effected by Bangkok ACC
B465 Eastbound Westbound	FL290, 330, 370, 410 FL300, 320, 340, 360, 380, 400	Level assignment to be effected by VTN Level change to be effected by Vientiane between LPB-LAPON

Table D

Note: — The transition procedures on ATS routes A1 between PAPRA and BUTRA and on B202 between BOMPA and PAK would be carried out by Vientiane ACC when the responsibility for providing ATC was handed back to LAO PDR, which was expected in mid-2004.

IATA

2.1.20 IATA presented a proposal for transition between China Standard Levels and ICAO RVSM. To provide effective ATC management good air/ground communications were essential. It was noted that in some airspaces adjoining and over the Bay of Bengal the air/ground communications were exceedingly poor, and this was a longstanding deficiency. With the introduction of RVSM on 27 November 2003, there was an urgent need for this deficiency to be addressed, in particular with regard to aircraft transitioning from one flight level system to another.

2.1.21 The meeting recognized that on ATS routes A201 and A599 for eastbound traffic transiting the Yangon FIR and entering the Kunming FIR at position LINSO, the transition from RVSM flight levels to the China metric levels could involve traffic crossing levels. To avoid this potential conflict, the meeting agreed that India should not allocate FL 310, 350 and 390 to eastbound

traffic prior to entering the Yangon FIR. Further, the meeting agreed to review the flight level management arrangement described above at the 90-day post implementation review meeting.

2.1.22 IATA presented the meeting with a table of a system for flight level transition to be used for transition between ICAO standard flight levels and the current China metric level standard. The meeting agreed that this was a good model to be used by States when carrying out such transitions (**Appendix B** refers).

2.1.23 IATA drew attention to the ATC communication problems being experienced in the Yangon FIR, which were being reported by airlines on a regular basis. As Myanmar had not been attending RVSM meetings, there was some apprehension that they may not make the necessary improvements to the ATC communications and meet RVSM requirements in time for implementation on 27 November 2003. In the event that the Yangon FIR did not operate RVSM, this would have serious consequences for international operations over the Bay of Bengal.

2.1.24 India informed the meeting that they had given consideration to the need for contingency arrangements in the event RVSM was not implemented in the Yangon FIR, and transition procedures would be put in place.

2.1.25 ICAO informed the meeting that the Asia/Pacific Office conducted a mission to Myanmar on 27-28 July 2003 to determine their readiness status and to assess what further assistance may be required to complete their RVSM arrangements. APANPIRG/14 was apprized of the Myanmar situation and requested States to provide appropriate assistance. The Civil Aviation Authority of Singapore offered to provide controller training and this was presently being coordinated with Myanmar through the ICAO Asia/Pacific Office. Discussions were underway to address the communications problem and the Task Force would be kept up to date on progress. It should be noted that the Director General of the Civil Aviation Department of Myanmar had informed ICAO that they would be implementing RVSM in accordance with the ICAO RVSM Implementation Plan.

Safety assessment for ATS routes A1/P901 and A202

2.2 MAAR presented the meeting with the results of applying the internationally accepted safety assessment process used for calculating the safety levels of non-radar procedural oceanic airspace for implementation of bi-directional single alternate FLOS on the ATS routes A1/P901 and A202. The meeting was reminded of the values of the parameters used in the Collision Risk Model (CRM). A summary of the Large Height Deviation (LHD) reports associated with the RVSM implementation on these routes used in the CRM was provided.

Results of the Risk Estimates for the Implementation of Bi-directional Single Alternate FLOS on ATS Routes A1/P901 and A202

A1/P901

Source of Risk	Risk Estimate using Single Alternate FLOS	Target Level of Safety	Status
Technical Risk	4.81×10^{-9}	2.5×10^{-9}	**Exceeds TLS**
Operational Risk	4.16×10^{-9}	-	-
Total Risk	8.97×10^{-9}	5.0×10^{-9}	**Exceeds TLS**

A202

Source of Risk	Risk Estimate using Single Alternate FLOS	Target Level of Safety	Status
Technical Risk	2.30×10^{-9}	2.5×10^{-9}	**Below TLS**
Operational Risk	1.01×10^{-8}	-	-
Total Risk	1.24×10^{-8}	5.0×10^{-9}	**Below TLS**

Results of the Risk Estimates for the Implementation of Uni-directional Single Alternate FLOS on ATS Routes A1/P901 and A202

A1/P901

Source of Risk	Risk Estimate using Single Alternate FLOS	Target Level of Safety	Status
Technical Risk	0	2.5×10^{-9}	**Below TLS**
Operational Risk	2.43×10^{-10}	-	-
Total Risk	2.43×10^{-10}	5.0×10^{-9}	**Below TLS**

A202

Source of Risk	Risk Estimate using Single Alternate FLOS	Target Level of Safety	Status
Technical Risk	0	2.5×10^{-9}	**Below TLS**
Operational Risk	6.04×10^{-10}	-	-
Total Risk	6.04×10^{-10}	5.0×10^{-9}	**Below TLS**

2.2.1 Based on the above estimates, the total risk attributable to all causes for the use of bi-directional single alternate FLOS on the ATS routes A1/P901 exceeds the agreed TLS of 5×10^{-9} fatal accidents per flight hour. The total risk for the ATS route A202 does not exceed the TLS, but the technical risk is relatively high.

2.2.2 In light of the results of the safety assessment, MAAR recommended that uni-directional single alternate FLOS be implemented on ATS routes A1/P901 and A202 in the future.

2.2.3 The meeting expressed appreciation to MAAR for the comprehensive presentation of the safety assessment. In light of the results of the safety assessment, the meeting agreed that RVSM single alternate FLOS would not be implemented on A1/P901 in non-radar procedural ATC airspace between positions BUNTA and DAGON on A1, and ITBAM and IKELA on P901. The meeting agreed that the modified single alternate FLOS should continue to be used on A1/P901 on that portion of the routes.

2.2.4 In regard to A202, the meeting agreed that implementation of RVSM on A202 on the non-radar portion of the route, would be dependent on the coordination of the States concerned. The meeting noted that the technical risk of 2.3×10^{-9} fatal accidents per flight hour as determined by the

safety assessment was close to the maximum permitted technical risk of 2.5 x 10^{-9} fatal accidents per flight hour, and this should be taken into account by States when determining whether to implement RVSM on A202 in non-radar airspace.

2.2.5 It was recognized that to implement RVSM using the single alternate FLOS, it would be necessary to change the route configurations for the oceanic portion of A1/P901. The preferred option was to establish uni-directional routes. However, the meeting further recognized that there was insufficient time prior to implementation of RVSM on 27 November 2003 to make such changes. Therefore, the meeting agreed that the States concerned should review the matter and consider a revised route plan as appropriate.

Agenda Item 3: Coordination procedures for the transfer of control of aircraft operating between the South China Sea area and the Bay of Bengal and Beyond

3.1 The meeting considered the coordination procedures required by States for implementing and operating RVSM. It was agreed that States would coordinate with adjacent States to finalize arrangements and update operating procedures and other relevant documentation. It was emphasized that all outstanding issues should be completed before the RVSM/TF/20 meeting on 20-24 October 2003, when the "Go/No Go" decision would be made.

3.1.1 The meeting agreed that where appropriate, transition procedures should be incorporated in the respective LOAs. In addition, AIP Supplements published by States should contain detailed operational and transition procedures. It was reiterated that AIP Supplements should be published no later than AIRAC date 2 October 2003.

Agenda Item 4: Letters of agreement for the implementation of RVSM in the Bay of Bengal and Beyond

4.1 The meeting reviewed the requirements for LOAs and States concerned agreed to exchange LOAs as soon as practicable and to be completed if possible by RVSM/TF/20, and no later than 27 November 2003.

4.1.1 The following States reported that they had completed coordination to finalize LOAs, which included arrangements for transition procedures: Indonesia, Lao PDR, Malaysia, Singapore, Thailand, and Viet Nam.

Agenda Item 5: Other Business

RVSM switch over time and arrangements

5.1 The Chairperson informed the meeting that at the JCM/2/MID/ASIA/RVSM/TFs meeting at Abu Dhabi, it was agreed that the switch over time from CVSM to RVSM would be 0200 UTC. The meeting recalled that the EMARSSH routes were implemented at 0200 UTC and concurred with the JCM/2/MID/ASIA/RVSM/TFs that this time should be adopted for the Asia Region. The meeting agreed that States in the Asia Region should coordinate with neighbouring States to finalize switch over arrangements.

5.1.1. The meeting was informed of a model Switch Over Plan adopted by States in the Middle East Region for RVSM switch over from CVSM to RVSM at 0200 UTC on 27 November 2003 as agreed by the MID/RVSM/TF/9. The Switch Over Plan contains procedures, phraseology,

system changes, etc for the period shortly before and during implementation of RVSM, and extending into the post-implementation phase. The Switch Over Plan is provided in **Appendix C**.

5.1.2 The meeting considered the suitability of the plan for use by States in the Asia Region. India advised the meeting that the Switch Over Plan called for the blocking of CVSM westbound flight levels, FL310, 350 and 390 from 0100 to 0200 UTC, one hour before the switch over time of 0200 UTC. This meant that there would be no westbound flight levels available for one hour prior to RVSM implementation and this would not be practicable. It would be preferable if RVSM eastbound flight levels, FL310, 350 and 390 were blocked from 0200 to 0400 UTC. In this case, eastbound FL290, 330, and 410 would be available. Also, by extending the flight level block time by one hour, this provided an additional safety buffer.

5.1.3 In light of the above, the meeting agreed that this was a better arrangement for use by States in the Asia Region. In this regard, the ICAO Asia/Pacific Office was requested to liaise with the Middle East Office on this matter.

Safety of Transition Areas for the WPAC/SCS area

5.2 MAAR presented an update of the LHD reports for the period between June 2001 and July 2003 received by the APARMO and MAAR. It was found that one of the LHD reports showed that an aircraft had been operating at the wrong flight level, FL360 in the opposite direction to its assigned flight level, FL350 for a 10 minute period. Because the incident occurred in transition airspace, this raised cause for concern over transition airspace operations. Further, the transition taking place was from the single alternate FLOS to the modified single alternate FLOS, i.e. no transition was made from even to odd flight level in the transition area.

5.2.1 In light of the above, MAAR recommended that a comprehensive study of the use of different FLOS in the WPAC/SCS should be conducted with a view to harmonization. Use of a single FLOS would remove the requirement to conduct transition between RVSM FLOSs.

5.2.2 The meeting recognized the problems with RVSM operations using the single alternate FLOS and the modified single alternate FLOS in adjacent airspace in the WPAC/SCS and Bay of Bengal areas. In this regard, the meeting was reminded that at the RVSM/TF/18 meeting, it was agreed to carry out a detailed study of this matter, and to continue to operate the dual FLOS arrangement after implementation of RVSM in the Bay of Bengal area due to the limited time available to study the issue in detail.

5.2.3 The meeting recognized the safety issues related to transition operations, and the incident described above underlined the potential risks involved. Therefore, it was imperative that States and ATS Providers responsible for transition procedures, ensure that an appropriate level of safety management was in place prior to conducting transition operations. Further, controller training should include a thorough understanding of transition procedures and operations in the transition area.

5.3 **Action Plan**

5.3.1 The meeting agreed on the action plan as shown in **Appendix D**.

Future RVSM Task Force Meeting

5.4 India informed the meeting that the holding of the RVSM/TF/20 meeting on 20-24 October at Delhi, India would be confirmed at the BBACG/13 meeting on 8-12 September at Bangkok.

Closing of the Meeting

6.1 Mr. Sydney Maniam expressed sincere appreciation to AEROTHAI for the excellent support and arrangements for this Special ATS Coordination Meeting. He commended all concerned AEROTHAI 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.

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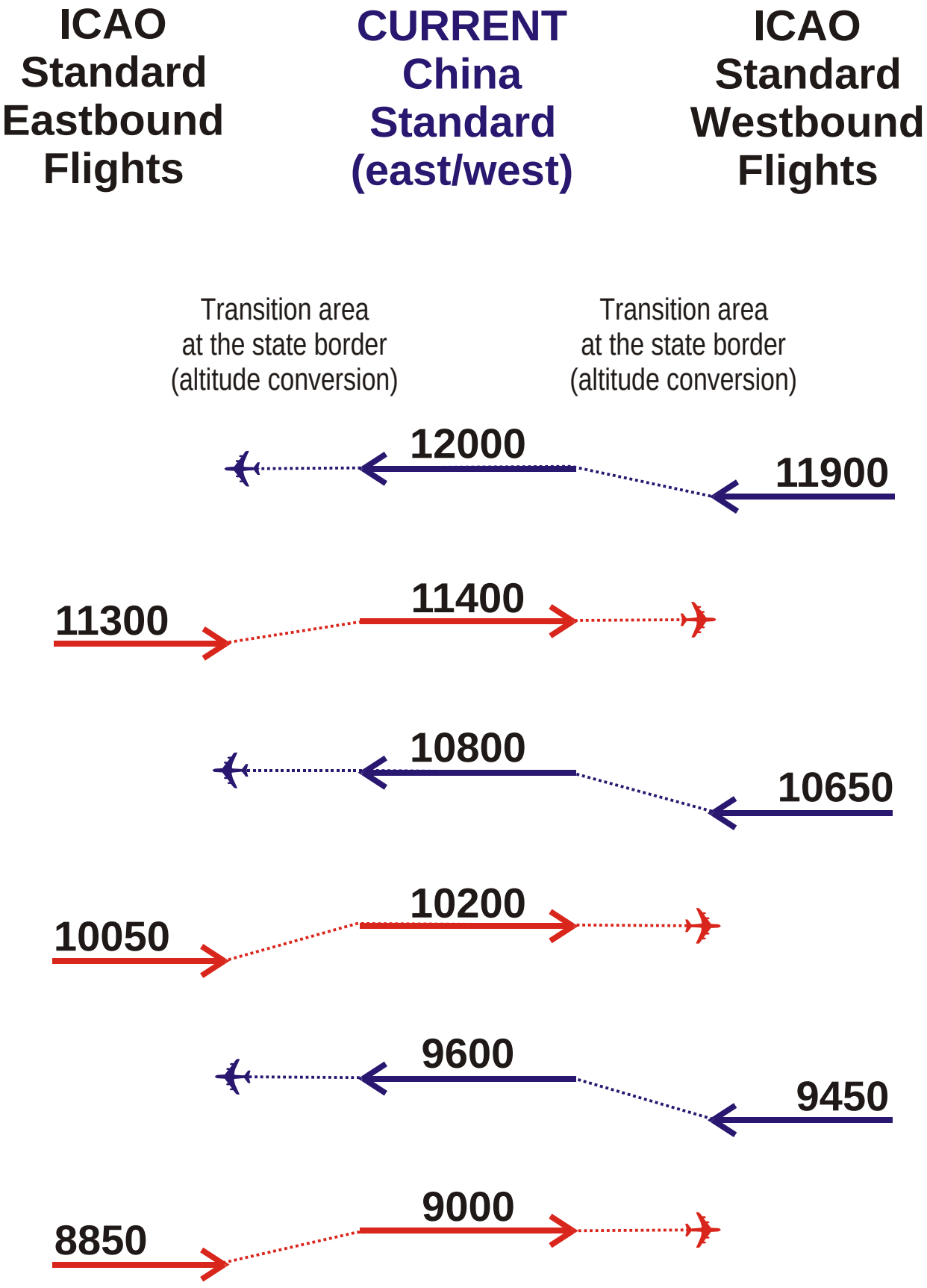
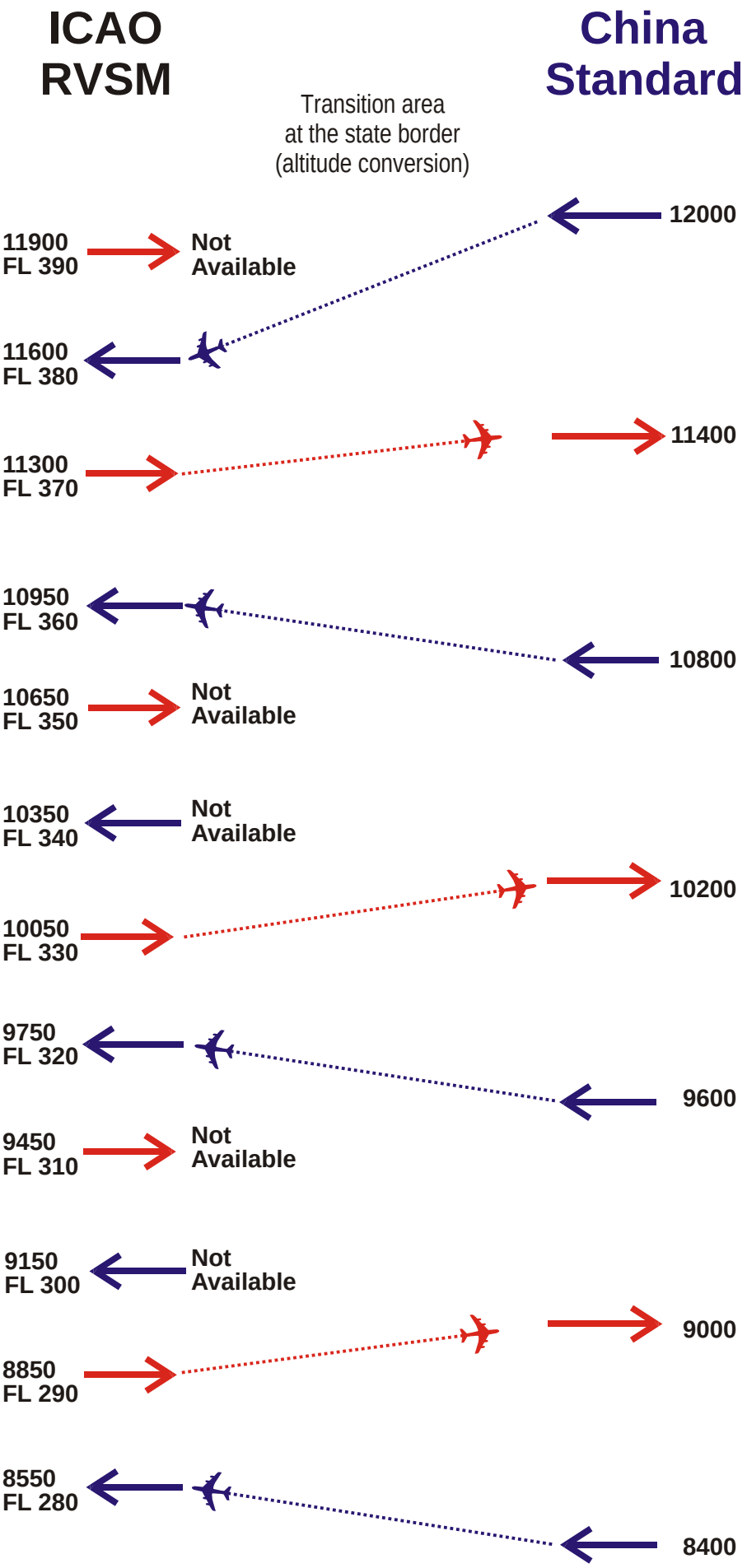

ICAO Standard Eastbound Flights
CURRENT China Standard (east/west)
ICAO Standard Westbound Flights
Transition area at the state border (altitude conversion)
Transition area at the state border (altitude conversion)
12000
11900
11300
11400
10800
10650
10050
10200
9600
9450
8850
9000


ICAO
RVSM
China
Standard
Transition area
at the state border
(altitude conversion)
12000
11900
FL 390
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Available
11600
FL 380
11400
11300
FL 370
10950
FL 360
10800
10650
FL 350
Not
Available
10350
FL 340
Not
Available
10200
10050
FL 330
9750
FL 320
9600
9450
FL 310
Not
Available
9150
FL 300
Not
Available
9000
8850
FL 290
8550
FL 280
8400

APPENDIX C

RVSM SWITCH OVER PLAN FOR THE MID REGION STATES

1 GUIDANCE MATERIAL FOR SECTOR PROTECTION DURING SWITCH OVER TO RVSM PROCEDURES IN THE MID REGION

1.1. INTRODUCTION

1.1.1 As part of its preparation for the Switch Over to RVSM Operations, this RVSM Switch Over Plan provides guidance to ANS Providers as to the extent and duration of any temporary capacity reduction measures needed to ensure a safe and effective start of RVSM. The RVSM Switch Over Plan contains procedures, phraseology, system changes etc to work effectively, shortly before and during implementation of RVSM and extend into the Post-Implementation Phase.

1.2 RATIONALE FOR POSSIBLE FLOW CONTROL RESTRICTIONS, FOR AN APPROPRIATE PERIOD, FOLLOWING THE IMPLEMENTATION OF RVSM

1.2.1 The prime reason for some protection is that air traffic controllers should not be expected to work to their sector capacity during their first exposure to RVSM. Time perhaps will be required to build up controller confidence in processes, procedures and systems. States should make their own assessment of local conditions as to whether sector protection and appropriate flow control measures are required.

1.2.2 Equally, many pilots will also be experiencing and planning for RVSM flight for the first time. It is important that the infrastructure in terms of flight planning and ATS system modifications are found to be working effectively within the new RVSM environment.

1.2.3 The other factors, which need to be carefully monitored as part of the switch over phase, is the impact on military non-RVSM Compliant flights, wake vortex reports and flights that have, as a result of the implementation of RVSM, been pushed below FL290 or above FL410

2. SEQUENCE OF STEPS FOR SWITCH OVER FROM CVSM TO RVSM

ON START DAY:

0100 UTC: Coordination to prepare for the change from CVSM to RVSM between adjacent ACC's supervisors will start.

0100 UTC Flight Plans will be checked for the letter "W" to be entered in Field 10 or in the case of an RPL, EQPT/W in Item Q.

0100 UTC: All ACC sectors shall begin broadcasting an alert message to all aircraft announcing that RVSM will be implemented at 2001 UTC. This alert message shall be repeated every 15 minutes and then 5 minutes, prior to 2001 UTC. A version of this alert message could be included in the ATIS message for 0100 & 0200 UTC as well.

NOTE: T**he alert message shall be: " ALL STATIONS, ALL STATIONS, JEDDAH CONTROL, BE ADVISED, RVSM OPERATIONS WILL COMMENCE AT TIME 0201 UTC, I REPEAT, RVSM OPERATIONS WILL COMMENCE AT TIME 0201 UTC, JEDDAH CONTROL OUT "**

0100 UTC: Actions to establish RVSM Compliant status of each flight shall start. The RVSM Compliant status of each aircraft under control shall need to be established, before Switch Over, to determine potential course of action for level changes and a subsequent comparison against flight plan information and the associated status as displayed on radar. The approved phraseology is:

a) For a controller to ascertain the Compliant status of an aircraft, each aircraft will be asked:

Call sign << **CONFIRM RVSM APPROVED** >>**.**

b) For a pilot to report RVSM Compliant status or Non-RVSM Compliant, as appropriate.

Call sign << AFFIRM RVSM >>.

Call sign << NEGATIVE RVSM>> or
<<NEGATIVE RVSM STATE AIRCRAFT>>

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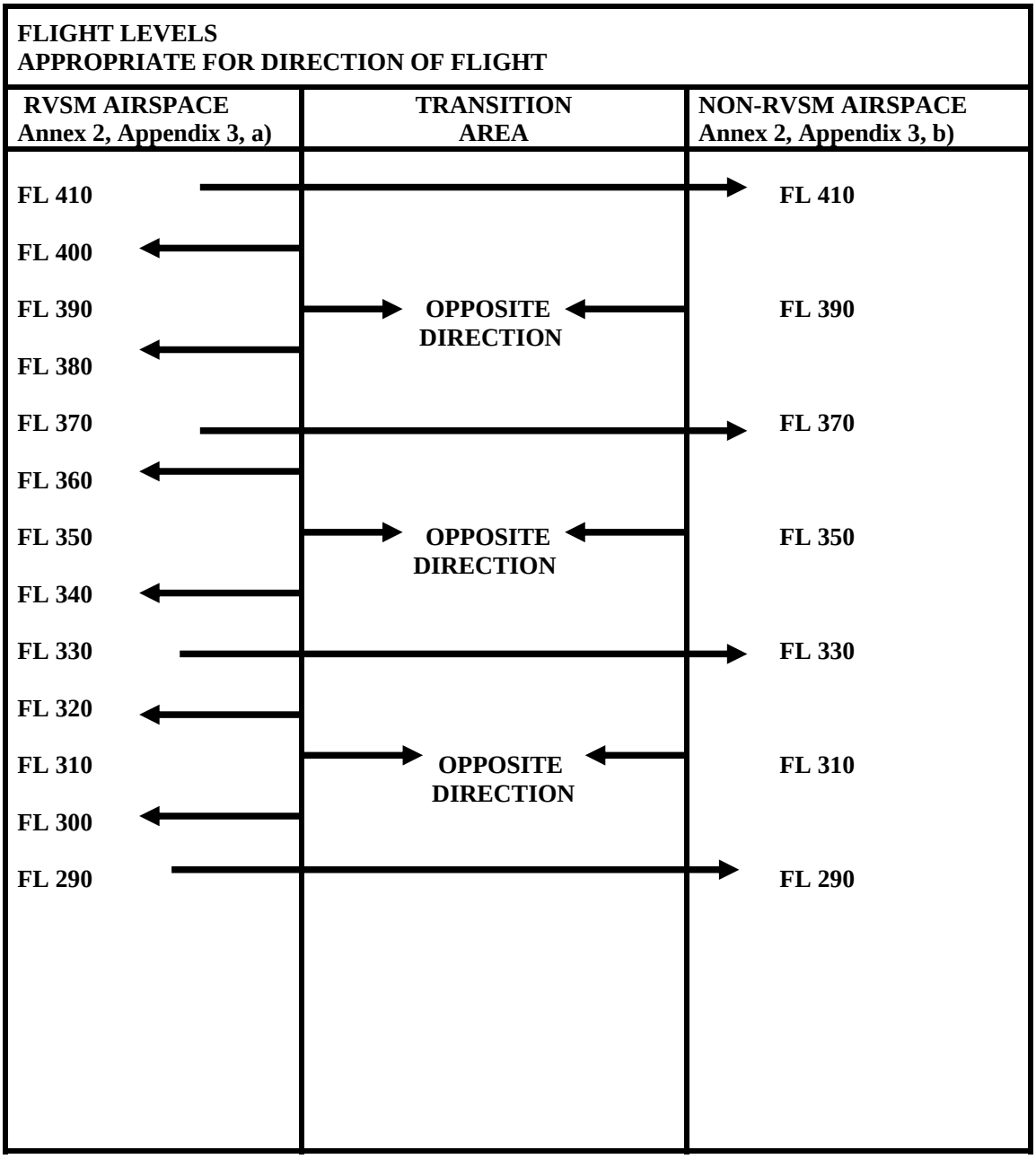
0100 UTC: Following prior coordination between the adjacent ACC controllers:

a) RVSM Compliant aircraft shall be re-cleared to appropriate RVSM Flight Levels n accordance with ICAO Annex 2, Appendix 3, a) (see Attachment). **To avoid the risk of human errors or coordination errors, Fl 310, FL 350 and FL 390 shall not be assigned to any flight from 0100 UTC until 0300 UTC**; and

b) Non RVSM Compliant flights shall be restricted to FL280 or below or FL430 and above.

0201 UTC: Confirm RVSM Flight Levels are now in use and correct RVSM Compliant and Non RVSM Compliant status information is appropriately printed on flight progress strips and properly displayed in radar data blocks.

0300 UTC: ACC Supervisors review facility log book and collect significant event data that occurred during the RVSM Switch Over period (0100 UTC to 0300 UTC). This Switch Over data shall be submitted to MECMA for subsequent analysis.


FLIGHT LEVELS
APPROPRIATE FOR DIRECTION OF FLIGHT
RVSM AIRSPACE
Annex 2, Appendix 3, a)
TRANSITION
AREA
NON-RVSM AIRSPACE
Annex 2, Appendix 3, b)
FL 410
FL 410
FL 400
FL 390
OPPOSITE
DIRECTION
FL 390
FL 380
FL 370
FL 370
FL 360
FL 350
OPPOSITE
DIRECTION
FL 350
FL 340
FL 330
FL 330
FL 320
FL 310
OPPOSITE
DIRECTION
FL 310
FL 300
FL 290
FL 290

CHECKLIST OF ACTION ITEMS

ACTIVITY	TARGET DATE OF COMPLETION	REMARKS
Publish the SIP Supplement for RVSM	30 September 2003	States involved in Bay of Bengal and Beyond AIRAC Date: 2 October 2003
Submit reports on Large Height Deviations to MAAR	15 September 2003	States involved in Bay of Bengal and Beyond
Complete Safety Assessment for RVSM implementation in Bay of Bengal and Beyond	RVSM/TF/20	MAAR RVSM/TF/20: 20-24 October 2003
Finalize arrangements for switch over to RVSM operations	RVSM/TF/20	States involved in Bay of Bengal and Beyond. RVSM/TF/20: 20-24 October 2003
Finalize Letters of Agreement	27 November 2003	States involved in Bay of Bengal and Beyond Review draft at RVSM/TF/20: 20-24 October 2003
Examine reorganization of A1/P901 for uni-directional traffic flow	As soon as practicable	Hong Kong, China to liaise with States concerned and report to ICAO

— END —