INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SIXTH MEETING OF THE WESTERN PACIFIC/SOUTH CHINA SEA RVSM SCRUTINY WORKING GROUP (WPAC/SCS RSG/6)

BANGKOK, THAILAND, 7 TO 9 APRIL 2009

The views expressed in this Report should be taken as those of the WPAC/SCS RSG and not of the Organization.

Adopted by the WPAC/SCS RSG
and published by the ICAO Asia and Pacific Office

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PART I – HISTORY OF THE MEETING

1. Introduction

1.1 The Sixth Meeting of the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG/6) was held in Bangkok, Thailand from 7 to 9 April 2009 at the Kotaite Wing of the ICAO Asia and Pacific Office.

2. Attendance

2.1 The meeting was attended by 27 experts from Hong Kong China, Japan, Malaysia, Philippines, Singapore, Thailand & MAAR, United States, Viet Nam, IATA and IFATCA. A list of participants is at **Appendix A** to this report.

3. Officers and Regional Office

3.1. Mr. David Maynard, Manager, Oceanic and Offshore Services for the United States Federal Aviation Administration chaired the meeting.

3.2. Mr. Andrew Tiede, Regional Officer ATM, was the Secretary for the meeting.

4. Opening of the Meeting

Secretariat

4.1. Mr. Andrew Tiede, on behalf of Mr. Mokhtar A. Awan, Regional Director, ICAO Asia and Pacific Regional Office, welcomed all participants to Bangkok. In reflecting on the current difficult circumstances arising from the global economic crisis, he commended the attendance from the major parties involved in the work of the RSG which would allow the work of the group to properly continue. Mr. Tiede reminded the meeting that a 12-month post implementation review meeting of the revised flight level arrangements had been scheduled in late July. However, his initial review of the papers to this meeting suggested that overall safety performance was showing a positive trend and he encouraged participants to consider adopting this meeting as the 12-month review meeting, thereby saving resources by deferring the July meeting to a later time.

Chairman

4.2 The Chairman, Mr. David Maynard, welcomed the members of the WPAC/SCS RSG to the 6th meeting of the RVSM Scrutiny Group. He noted that the operational changes made to the FLOS/FLAS and the routes still appear to be working as expected with regard to improvement of safety of flight within the region. There is however a need to continue to focus on further reductions in the occurrences of Category E LHDs resulting mainly from a lack of a revision to an aircrafts flight level after the initial coordination has been accomplished.

5. Language and Documentation

5.1. All discussions were conducted in English. Documentation was issued in English. A total of eleven (11) Working Papers and two (2) Information Papers were considered by the meeting. A list of the Working and Information Papers is at **Appendix B.**

PART II - REPORT ON THE WPAC/SCS RSG/6 MEETING

Agenda Item 1: Adoption of Agenda

1.1 The meeting adopted the following agenda:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: RMA update for WPAC/SCS area

Agenda Item 3: WPAC/SCS FLOS/FLAS Implementation Feedback

Agenda Item 4: LHD Reduction Arrangements

Agenda Item 5: Large Scale Weather Deviations

Agenda Item 6: ATS Route matters

Agenda Item 7: Update WPAC/SCS RSG Task List

Agenda Item 8: Future Directions and Arrangements

Agenda Item 9: Any other business

Agenda Item 2: RMA update for WPAC/SCS area

MAAR Update

2.1 The Monitoring Agency for the Asia Region (MAAR) provided results of the airspace safety assessment for the RVSM implementation in the Western Pacific/South China Sea (WPAC/SCS) airspace using the new FLAS. The RVSM safety assessment was conducted based on a one-month traffic sample data (TSD) collected in December 2008 and monthly Large Height Deviation (LHD) reports between February 2008 and January 2009 submitted by the concerned States in the WPAC/SCS region.

2.2 The meeting noted that TSD for December 2008 from all affected States had been submitted to MAAR, although the submission from Lao PDR was incomplete, along with the vast majority of monthly LHD reports required. Accordingly, the outcomes of the risk assessment process were based on a nearly complete data set and could be considered as statistically reliable.

2.3 Based on the received LHD reports, the number of LHD occurrences and associated LHD duration (in minutes) by month in the WPAC/SCS RVSM airspace since February 2008 are summarized in **Table 1** below.

Month-Year	No. of LHD Occurrences	LHD Duration (Minutes)	12-month Cumulative	
			No. of LHD Occurrences	LHD Duration (Minutes
February 08	5	11	57	158
March 08	9	28	63	177
April 08	6	11	61	171
May 08	10	23	69	189
June 08	7	13	72	198
July 08	9	15	79	208
August 08	10	11	83	200
September 08	2	4	84	194
October 08	4	5	81	175
November 08	3	4	79	170
December 08	6	10	78	146
January 09	7	12	78	147

Table 1: Summary of LHD Occurrences and Duration in WPAC/SCS RVSM Airspace

2.4 **Table 2** below summarizes the number of LHD occurrences and associated LHD duration (in minutes) by cause of the deviation.

LHD Category Code	LHD Category Description	No. of LHD Occurrences	LHD Duration (Min)
B	Flight crew climbing/descending without ATC clearance	1	2
D	ATC system loop error; (e.g. ATC issues incorrect clearance or flight crew misunderstands clearance message)	3	5
E	coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues (e.g. late or non existent coordination, incorrect time estimate/actual, flight level, ATS route etc not in accordance with agreed parameters)	69	135
I	Turbulence or other weather related causes	3	3
M	Others	2	2
Total		**78**	**147**

Table 2: Summary of LHD Causes in the WPAC/SCS RVSM Airspace

2.5 In light of the above, the LHD occurrences in the WPAC/SCS RVSM airspace are summarized as follows:

- Significant portion of large height deviation occurrences (69 of 78 occurrences) as well as duration (135 of 147 minutes) is attributable to coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues (Category E)

- Since July 2008, there are a total of 41 LHD occurrences, which account for 61 minutes, and

- During the period, the longest duration of LHD is 3 minutes and average duration is 1.5 minutes.

2.6 **Table 3** below summarizes the number of LHD occurrences and associated LHD duration (in minutes) for the top 5 FIR boundaries where incidents commonly occurred since July 2008.

FIR s	Locations	No. of LHD Occurrences	LHD Duration (Min)	Last Occurrence Date
Fukuoka-Manila	GURAG, BISIG	6	16	31-Jan-09
Ho Chi Minh-Manila	ARESI, MIGUG	5	8	18-Jan-09
Manila-Singapore	LAXOR	3	7	18-Sep-08
Manila-Ujung Pandang	BIDOR, SADAN	3	6	22-Dec-08
Kota Kinabalu-Manila	VINIK	7	6	13-Dec-08

Table 3: Summary of LHD Occurrences and duration by FIRs boundary and Locations (Top 5)

2.7 **Table 4** below summarizes the results of the airspace safety assessment, as of April 2009, in terms of the technical, operational, and total risks for the RVSM operation in the WPAC/SCS RVSM airspace.

Source of Risk	Lower Bound Risk Estimation	TLS	Remarks
Technical Risk	0.76×10^{-9}	2.5×10^{-9}	Satisfies Technical TLS
Operational Risk	4.05×10^{-9}	-	-
Total Risk	**4.81×10^{-9}**	**5.0×10^{-9}**	**Satisfies Overall TLS**

Table 4: Risk Estimates for the RVSM Implementation in WPAC/SCS Airspace

2.8 **Figure 1** below presents the trends of collision risk estimates for each month using the appropriate cumulative 12-month of LHD reports since February 2008.

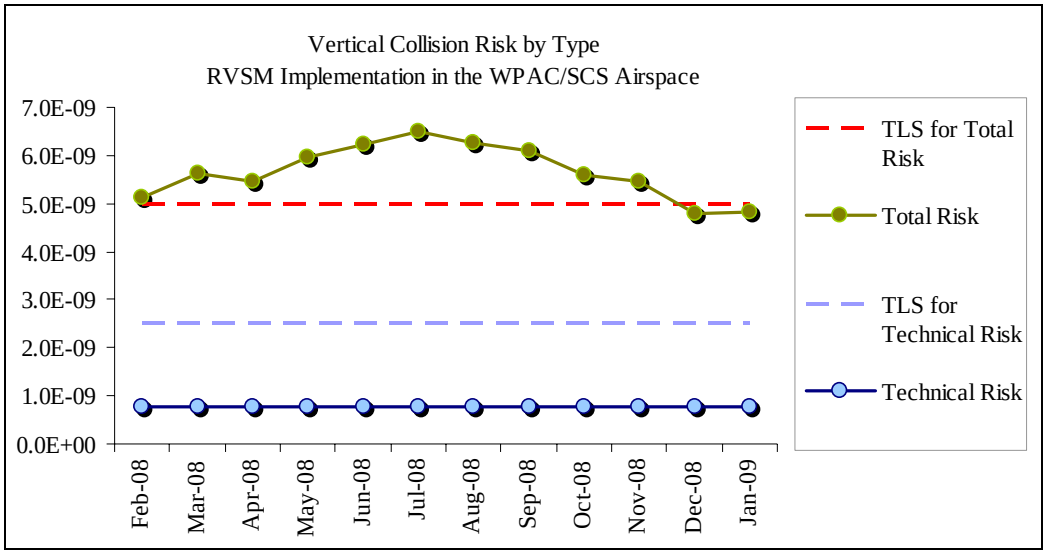

Figure 1: Trends of Risk Estimates for the RVSM Implementation in WPAC/SCS Airspace

2.9 Based on the risk estimate, both technical and total risks satisfy the agreed TLS value of no more than 2.5 x 10^{-9} and 5.0 x 10^{-9} fatal accidents per flight hour due to the loss of a correctly established vertical separation standard of 1,000 ft and to all causes, respectively. The improvement in the overall risk is mainly attributable to the reduction in large height deviation occurrences and duration in recent months.

2.10 Despite the recent improvement, MAAR stressed that it is strongly recommended that States continue to put in place any preventive and/or remedial actions to persistently reduce the number of LHD occurrences as well as duration of LHDS.

2.11 The meeting noted with appreciation the comprehensive reporting from MAAR. It was evident that a positive trend in the risk assessment was firmly established due to the interventions made by States in identifying and treating the numbers and duration of LHDs. This was particularly evident when a comparison was made with the situation that had faced the first meeting of the RSG in February 2007, as shown in **Table 5** and **Figure 2** below.

Source of Risk	Lower Bound Risk Estimation	TLS	Remarks
Technical Risk	0.4 x 10^{-9}	2.5 x 10^{-9}	Satisfies Technical TLS
Operational Risk	13.2 x 10^{-9}	-	-
Total Risk	**13.6 x 10^{-9}**	**5.0 x 10^{-9}**	**Does not satisfy Overall TLS**

Table 5: December 2006 - Risk Estimates for the RVSM Implementation in WPAC/SCS Airspace

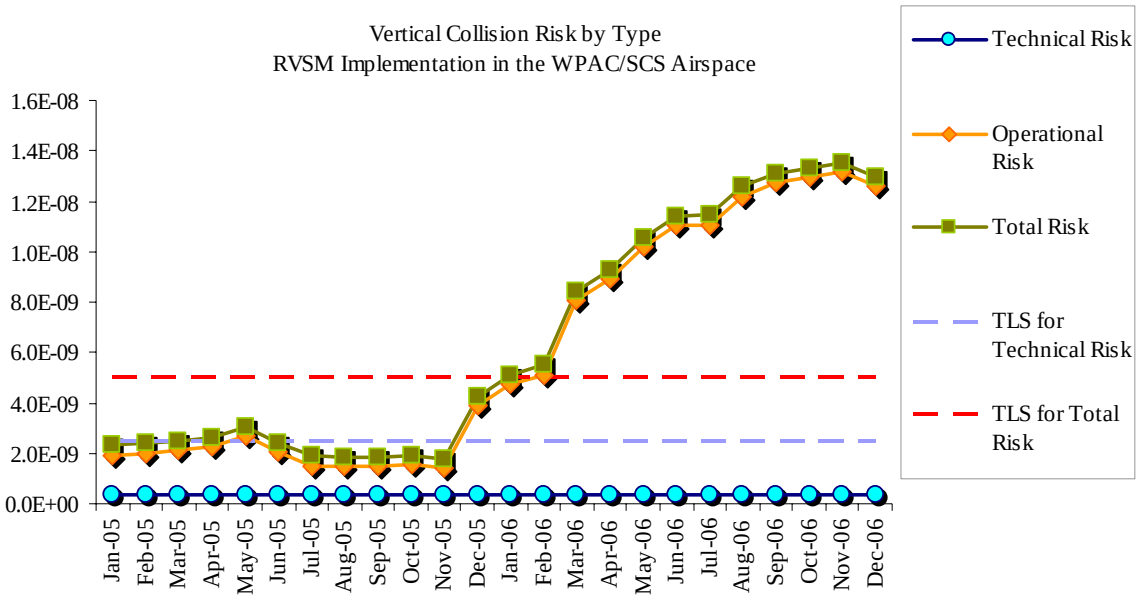

Figure 2: December 2006 -Trends of Risk Estimates for RVSM in WPAC/SCS Airspace

2.12 The improvement in overall safety performance in WPAC/SCS RVSM operations is also demonstrated in **Table 6** below, which provides details of the evolution of Large Height Deviations since the First Meeting of WPAC/SCS RSG in terms of number of occurrences, duration, and associated percentage change.

Reference	Period (12-Month)	No. of LHD Occurrences	LHD Duration (Min)	% Change	
				LHD Occurrences	LHD Duration
1st RSG Meeting	Jan06 - Dec06	84	481		
2nd RSG Meeting	May06 - Apr07	75	345	-10.7%	-28.3%
3rd RSG Meeting	Sep06 - Aug07	56	240	-25.3%	-30.4%
4th RSG Meeting	Jan07 - Dec07	56	169	0.0%	-29.6%
5th RSG Meeting	Sep07 - Aug08	87	210	+55.4%	+24.3%
6th RSG Meeting	Feb08 - Jan09	78	147	-10.3%	-30.0%

Table 6: Evolution of LHD Occurrences – WPAC/SCS RVSM Airspace

2.13 The large height deviation duration for the 12-month period from February 2008 – January 2009 compared to the period from September 2007 – August 2008 has improved by 30%, while the number of occurrences has also decreased by 10%. The positive trend is mainly a result of the reduction in LHD occurrence and duration after August 2008.

JCAB RMA Update

2.14 The Japan Civil Aviation Bureau Regional Monitoring Agency (JCAB RMA) presented the results of the LHD occurrence analysis within the Japanese airspace based on monthly Large Height Deviation (LHD) reports between 1 November 2007 and 28 February 2009. The 16-month of LHD reports were analyzed for the purposes of comparing LHD occurrences before and after implementation of new FLAS on 2 July 2008 and enabled comparison of the 8 month period before implementation of new FLAS with the 8month period after implementation of new FLAS. The analysis showed that ATC Unit-to-ATC Unit coordination errors accounted for a very high percentage of all LHDs, as shown in **Figure 3** below.

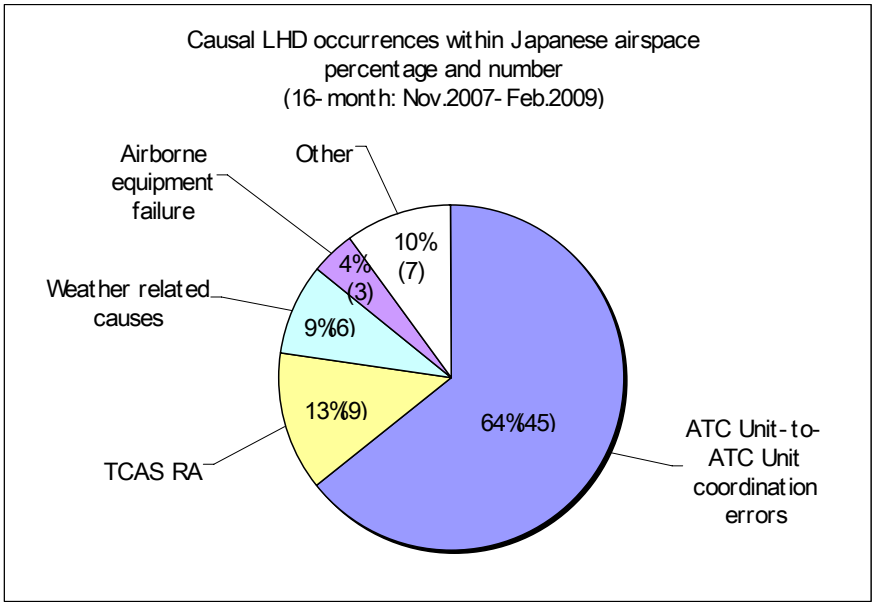

Figure 3: Causal LHD occurrences within Japanese airspace over last 16-months (percentage and number between November 2007 and February 2009)

2.15 JCAB RMA highlighted that:

- ATC Unit-to-ATC Unit coordination errors between Japan and Republic of Korea accounted for 38% of all ATC Unit-to-ATC Unit coordination errors within Japanese airspace over last 16 months.
- ATC Unit-to-ATC Unit coordination errors between Japan and Philippines accounted for 31% of all ATC Unit-to-ATC Unit coordination errors within Japanese airspace over last 16 months.
- In WPAC/SCS airspace, ATC Unit-to-ATC Unit coordination errors between Japan and Philippines were of particular note.

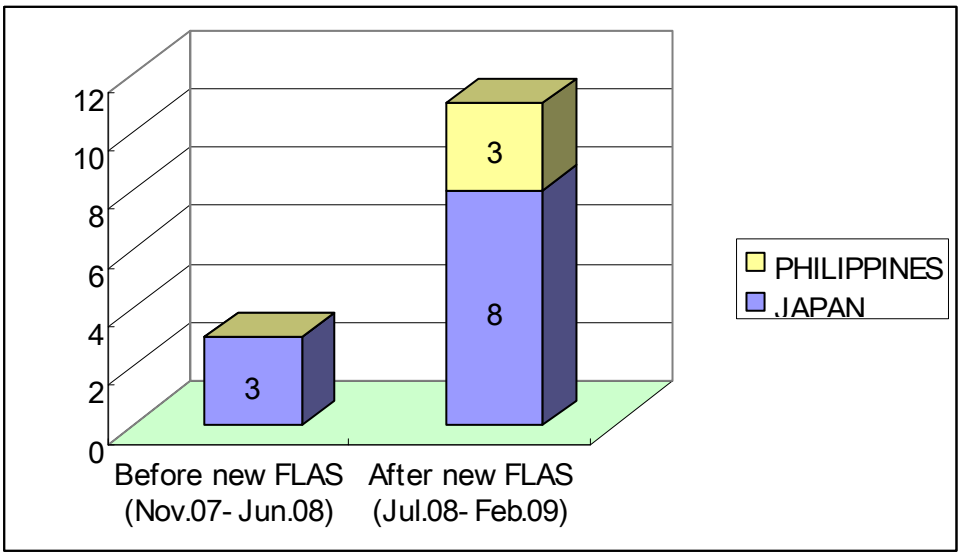

Figure 4: Comparison of occurrences of ATC Unit-to-ATC Unit coordination errors between Japan and Philippines before and after implementation of new FLAS on 2 July 2008

2.16 **Figure 4** above summarizes the comparison of occurrences of ATC Unit-to-ATC Unit coordination errors between Japan and Philippines before and after implementation of new FLAS on 2 July 2008. The meeting noted that just after implementation of new FLAS on 2 July 2008, ATC Unit-to-ATC Unit coordination errors between Japan and Philippines increased, but subsequently these errors gradually reduced as the new arrangements settled in. Japan continues work with directed efforts to reduce LHD occurrences, as detailed in Agenda Item 4 below.

Agenda Item 3: WPAC/SCS FLOS/FLAS Implementation Feedback

Viet Nam

3.1 Viet Nam informed the meeting that the Civil Aviation Administration of Viet Nam (CAAV) had developed a comprehensive plan for revised flight level arrangements within the Ha Noi and the Ho Chi Minh FIRs based on the results of the WPAC/SCS RSG meetings. It included development of implementation plan, finalization of the flight crew and ATC RVSM operational procedures; update of the ATC Supplementary LOAs, improvement of communication facilities especially of ATS direct speech circuits, publishing of supplements to ATC procedures and flight operational manuals, training of air traffic controllers, technical staff, air crews and flight dispatchers of airlines, and the publication of AIP Supplements.

3.2 Since implementation of the revised flight level arrangements in July 2008, it became easier to remember flight level numbers, thereby avoiding possible flight level confusions. There had also been a greater number of flight levels used in the Ha Noi and Ho Chi Minh FIRs, so that capacity has been increased.

3.3 The most traffic has been cleared to fly at optimum flight levels. This met traffic demand which is being increasingly from day to day especially on ATS routes W1, A1/P901, and the 4 parallel RNAV routes within Ho Chi Minh FIR. The traffic delays have been reduced. Additionally, a number of transition areas were reduced, so that the level changes are kept to minimum.

3.4 However, there are existing issues as follows:

a) The flow control restrictions on traffic bound for Taipei from route A1 and traffic bound for Shenzhen, Guangzhou from M771 have imposed workload on the controllers. In Viet Nam's view, closer ATC coordination amongst ACCs concerned should be applied.

b) Flight level changes at BITOD are taking place due to the track directions changing for traffic on route L637 – M753/M755 and vice versa. One of measures proposed by Viet Nam is consideration of additional ATS/RNAV routes – as described in Agenda Item 6 below.

c) Some Large Height Deviations have occurred in the area of transfer of control between Ho Chi Minh ACC and Manila ACC. The details were reported to MAAR as specified by Regional agreement. In some cases the causes could be the non compliance with the provisions of the ATC LOA and maintaining assigned flight level during transfer process. Viet Nam considered that the quality of transfer of control between Ho Chi Minh ACC and Manila ACC could be enhanced and flight crews should pay careful attention to assigned flight level, particularly in airspace served by HF communications. Viet Nam encouraged close contacts between the two ACC chiefs should be continuously maintained.

The Philippines

3.5 The Philippines provided information about operations on L628 (eastbound, FL 330, 370, 410) and M754 (southbound FL 330, 370, 410), noting that the majority of flights on L628 are long haul flights from the Middle East with some regional flights from South East Asia whilst traffic on M754 are a combination of flights from China and Hong Kong China.

3.6 The Philippines were experiencing two issues:

1) Merging traffic at GUKUM***:*** Along L628, direct ATC-Pilot (VHF) communications and radar surveillance commences barely at the edge of the effective range of VHF and radar coverage (approximately 20NM west of waypoint GUKUM). Therefore ATC applies procedural separation, but has limited time to resolve potential crossing conflictions with southbound traffic on M754.

2) Bunching of traffic: The routes (L628 & M754) cross two parallel and other adjoining routes minimizing the availability of standard flight levels. This limits the number of alternative flight levels available to ATC.

3.7 This situation had led to instances of increased workload for ATC and in some cases use of non-standard flight levels had been coordinated with Ho Chi Minh ACC to solve conflicts. Based on a one-week traffic movement data (5-11 March 2009), Philippines had identified the following:

- Total No. of flights through GUKUM = 321
- Total No. of flights using F330, F370, & F410 = 147
- Total No. of flights affected (total one week) = 26 (17.69%)
- Total No. of flights transitioned to non standard levels = 12 (8.16%)

3.8 The Philippines informed the meeting that the assistance from Ho Chi Minh ACC had been very flexible and beneficial in addressing these issues. Consequently, the matter was not of significant concern at the current traffic levels and arrangements. The Philippines would keep the matter under review.

Thailand

3.9 Thailand informed the meeting that as a result of the work of the RSG a number of operational benefits had resulted for Thailand, as reported to the last RSG meeting. In conjunction with the implementation of the revised flight level arrangements, Thailand had also taken the opportunity to review internal procedures to improve ATC tactical control and implement improvements to airspace efficiency, including:

- 40NM radar spacing for A1, A202 and R474 has been widely introduced
  - New CDC procedure based on initial FL assignment has been introduced as a step-by-step approach to reduce ground delay
  - A departure clearance data-link program is being progressed to improve ATM and enable future enhancement in Bangkok FIR.

- LHD reporting procedures has been implemented with Vientiane and Phnom Penh ACCs
  - LHD reporting procedures with Kuala Lumpur ACC would be reviewed at the next ACC meeting sometime in May or June. However, the 2 ACCs have long been well aware of this activity and the next step is simply to reflect this in LOAs.

3.10 Thailand is still experiencing issues due to ATFM restrictions from Taipei FIR, and noted that in most cases this appeared to be due to ATM system PMI during the peak night time period which affected ATC coordination and airline operators. This situation had led to the following:

- Traffic from VTBS being interrupted on some occasions. This has been the situation for more than 3 years but during the past year difficulties were experienced on many more occasions.

- Some interim procedures have been put in place to alleviate the problem and effects from this restriction. However Thailand considers that further coordination among the FIRs concern is required to smooth coordination and reduce workload, as well as reducing the delays for flights from VTBS.

Agenda Item 4: LHD Reduction Activities

4.1 As described in Agenda Item 2 above, the meeting recognized that the large numbers of LHDs attributable to errors in ATC Unit-to-ATC Unit coordination were still driving the risk estimate and needed to be corrected. The situation in this respect had significantly improved over the life span of the RSG, but improvements in reducing LHD events were still actively sought.

4.2 The Secretariat highlighted that a LHD should always be considered as one type of a breakdown of ATS coordination incident and therefore should be addressed under normal ATS Safety Management System (SMS) processes in accordance with Annex 11 provisions. Investigations of LHD should be conducted in the same way as investigations into other ATS incidents, with causal factors indentified and remediation’s put in place.

4.3 The meeting recognized that the information that had been provided by MAAR in WP02 was very comprehensive and would be valuable in investigating these examples of LHD. Accordingly, the meeting agreed to use WP02 as the basis for such investigations and States agreed to provide periodic updates to relevant regional ATM meetings that detail the outcome of the SMS processes that have been undertaken to further reduce the number of LHDs.

Japan

4.4 Japan informed the meeting that Civil Aviation Bureau Japan (JCAB) had taken remedial actions by reviewing ATC coordination procedures and would introduce new ATC systems and AIDC messaging capabilities. A new ATC system named the Integrated En-route Control System (IECS) using electronic flight progress strips would be introduced at Naha ACC in March 2010, which has jurisdiction over the south-western part of the Fukuoka FIR bordering the WPAC/SCS airspace. Some human errors such as ATC unit-to-ATC unit coordination errors were expected to decrease as a result of the implementation of this new ATC system.

4.5 Occurrences of ATC unit-to-ATC unit coordination errors between Japan and the Republic of Korea accounted for the highest percentage of all occurrences of ATC unit-to-ATC unit coordination errors within the Japanese airspace. Japan and the Republic of Korea would start operation of AIDC in early summer of 2009. Japan had reported LHD reports to JCAB RMA, and the effect of AIDC in reducing the occurrences of ATC unit-to-ATC unit coordination errors would be carefully studied by JCAB RMA and the results presented to relevant meetings.

4.6 Japan was continuing work towards implementation during 2012 of an interface system which has ability to connect with any AIDC system and plans to implement AIDC interfacing with the WPAC/SCS FIRs. Presently, Japan was conducting an AIDC implementation programme with Taipei ACC aiming to commence operations in 2012. Japan has commenced internal discussions about implementation of AIDC with China (Shanghai ACC), the Philippines (Manila ACC) and the Russian Federation, to begin the operations in and after 2013. Japan was also planning to implement AIDC with the WPAC/SCS FIRs, but the timeline for implementation was yet to be determined.

Agenda Item 5: Large Scale Weather Deviations

5.1 The meeting recalled that WPAC/SCS RSG/5 had agreed that a solution to the Large Scale Weather Deviation (LSWD) matters was ideally necessary before the commencement of the next typhoon season in April/May 2009, and requested that the next RSG meeting address the LSWD issue as a priority. States were encouraged to conduct coordination of proposed LSWD arrangements before this meeting in order to ensure that RSG/6 was well positioned to reach agreement on a suitable procedure.

5.2 Viet Nam informed the meeting that from July 2008 to November 2008, weather conditions in the Ho Chi Minh FIR were unfavorable because of typhoon and severe turbulence. A large number of flights had to deviate far away from track or divert to domestic routes and the large scale weather deviation procedures had been activated on some occasions. Viet Nam proposed that implementation of an agreed contingency procedure should be considered when there are at least five weather deviation requests of 10 NM or more within a 30 minute period.

5.3 Following discussion, the meeting adopted the LSWD procedures shown in **Appendix C** as regional procedures. Affected ACCs (Fukuoka ATMC, Ho Chi Minh, Hong Kong, Kota Kinabalu, Manila, Naha, Sanya, Singapore and Taipei ACCs) were encouraged to urgently incorporate the LSWD procedures into operational LOAs in time for the 2009 typhoon season which was imminent. Hong Kong China reported that LSWD contingency flight level arrangements, as outlined in Appendix C, had been incorporated into the operational LOAs with Sanya ACC since July 2008.

5.4 The meeting recognized that, with regard to the Sanya and Taipei FIRs, China was not present at the meeting. Accordingly, the Secretariat would write to China highlighting the outcomes from the meeting and that the RSG had adopted regional LSWD procedures, and seek support from China in including the procedures in the LOAs for Sanya and Taipei ACCs.

5.5 Recognizing that the activation of LSWD procedures had the effect of suddenly reducing the available airspace capacity, the meeting discussed ways in which airspace users could be alerted to the changed circumstances. One of the problems to be overcome was the large number of requests made on ATC VHF by pilots requesting the nature and duration of the delays. A draft text for use with the regional LSWD procedures that authorized the use of NOTAMs to advise of capacity restrictions was prepared, as follows:

> *In order to enable airspace users to manage the sudden reduction in capacity resulting from the activation of LSWD procedures, activating ACCs should ensure promulgation of a NOTAM immediately the decision is taken to activate LSWD. Such NOTAM should advise that capacity restrictions exist due to adverse weather and, to the extent possible, specify the airways affected and limited flight levels expected to be available. Where possible, an estimate of the duration of the capacity restriction should be included and NOTAMC issued in due course.*

5.6 However, the meeting recognized that transmission of NOTAMs went to addressees globally and that it was likely that many addressees would not be interested in capacity reductions in the WPAC/SCS area. As such, a reduced address list for the NOTAM which comprised only the affected ACCs was discussed, but the limitations in appropriately informing users were identified. Ultimately, the meeting agreed that further study was necessary and requested that this matter be tabled at the SEACG/16 meeting in May 2009 for further discussion.

Agenda Item 6: ATS Route matters

Viet Nam proposals

6.1 Viet Nam submitted a number of proposals for ATS route amendments and new ATS routes to the meeting, with the objective of reducing flight distance and time and facilitating flight and ATC operations. The route proposals from Viet Nam are shown in **Appendix D** and are described as follows:

SCS/1 ATS route between NASAN – LADIS – AKSAG

SCS/2 Extension of ATS route B329 from PAKSE to VILAO – NAMHA (Ha Noi FIR)

SCS/3 ATS route between Cat Bi – SIKOU

SCS/4 ATS route between Cat Bi – Haikou and Cat Bi – Sanya

SCS/5 ATS route between ASSAD – IKELA

SCS/6 Extension of ATS route G221 from BUNTA to DVOR/DME Phu Cat

SCS/7 ATS/RNAV route between DVOR/DME Phu Cat – IKELA (long term solution)

SCS/8 ATS route from Can Tho – VOR/DME Phnom Penh

SCS/9 ATS route from DVOR/DME Cam Ranh – MESOX

SCS/10 RNAV route between Tan Son Nhat – ENREP

6.2 Viet Nam was in the process of coordinating the proposals with affected parties, including the ICAO Regional Office and Civil Aviation Authorities in Cambodia, China, Laos, Singapore and Thailand. IATA thanked Viet Nam for these initiatives and all participants would study the proposals with the objective of providing feedback to the SEACG/16 meeting during May 2009. Viet Nam would also update SEACG/16 on the progress of their coordination with the respective Civil Aviation Authorities affected.

IATA proposals

6.3 IATA also presented a number of ATS route proposals for consideration, as follows:

IATA/SCS/11

6.4 Flights operating between Southeast Asian airports and San Francisco/Los Angeles routing via G467 were required to route from ENDAX (at the Oakland/Manila FIR boundary) to TOKON via Jomaling. Westbound flights were also regularly routed by ATC between ENDAX and Kota Kinabalu via Tacloban even though there is no published routing.

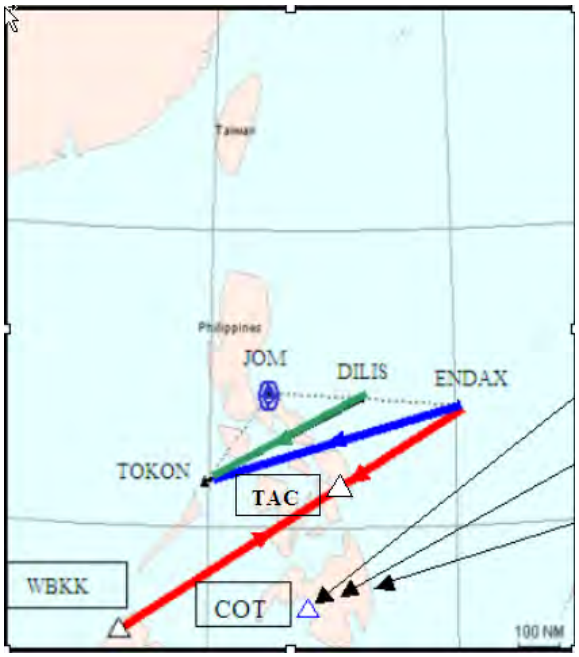

Chart 1 - IATA/SCS/11 Proposal

6.5 The segment of the route between ENDAX and TOKON requires a big detour, which can be eliminated by implementing a direct route or DILIS - TOKON routes (see Chart 1). IATA requested that Philippines consider implementing the direct route between ENDAX and Kota Kinabalu via Tacloban, which is currently available on request to ATC. This would allow airlines to flight plan the route. Also, the Philippines was requested to investigate the possibility of implementing three fixed routes east of Cotabato to facilitate eastbound flights from the west coast of the USA to Southeast Asia.

IATA/SCS/12, 13 & 14

6.6 IATA noted that three trunk routes serve international over-flights through the Sanya FIR as follows:

- **A1** - over-flying Hong Kong
- **L642** - Hong Kong to Ho Chi Minh/Kuala Lumpur/Singapore
- **M771**- Singapore/Kuala Lumpur/Ho Chi Minh to Hong Kong/China

6.7 IATA informed the meeting that the original design of the South China Sea RNAV routes required 60 NM lateral spacing between the routes unless the routes were under radar surveillance. Hong Kong, Sanya and Ho Chi Minh ACCs now had radar coverage for the entire route within their respective FIRs.

6.8 As such, the 60 NM lateral track spacing is no longer a requirement in this airspace. A1, L642 and M771, can be realigned taking into account the existing communications, navigation and surveillance capabilities.

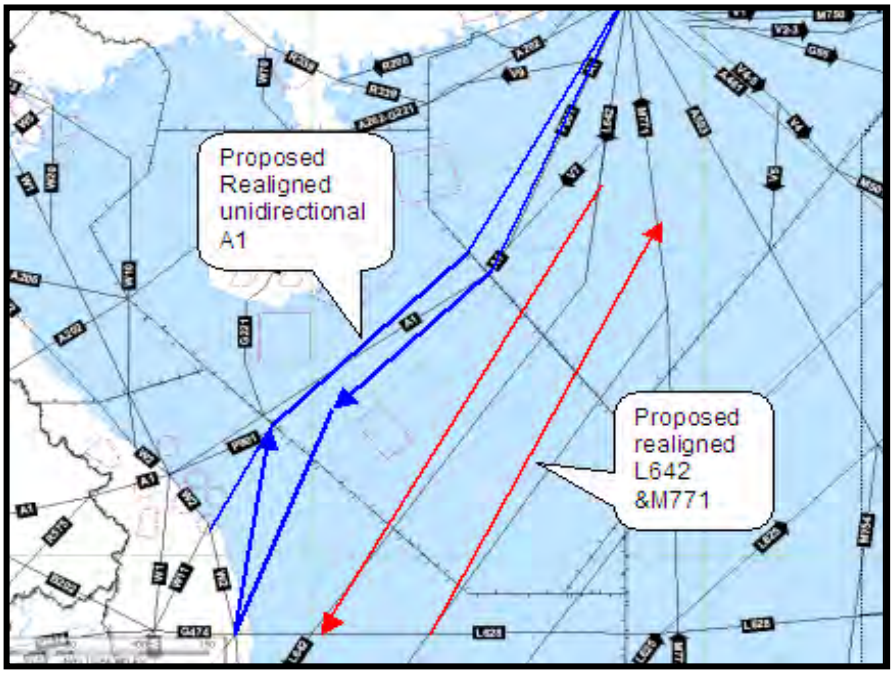

Chart 2 - IATA/SCS/12, 13 & 14 Proposals

6.9 Concurrently, realigning A1 and implementing closely spaced parallel tracks would increase the route capacity, enable access to optimal flight levels, and enhance ATM efficiency. The recurrent savings in fuel and reduction in CO_2 emissions would be considerable given the fact that these routes carry a very high load of aircraft movements. IATA requested that China, Hong Kong China and Vietnam review the request so as to provide a more fuel-efficient and environmentally friendly route structure.

IATA/SCS/15

6.10 In implementing the change of FLAS in the South China Sea and the adjoining areas, the WPAC/SCS RSG had recognised that implementing additional crossing routes would enhance the flight level availability for flights operating across the uni-directional parallel route structure. IATA informed the meeting that one such crossing route is M768, which is currently allocated (No PDC) eastbound flight levels of FLs 270, 330, 410 and westbound flight levels of FLs 300 and 380.

6.11 Conceptually, IATA suggested that with the establishment of an additional crossing route parallel to M768 a uni-directional flow could be provided (**Chart 3** below refers). The same flight levels can then be used in both directions where they cross the parallel route structure. The routes can be merged again when clear of the parallel routes. For example, in the easterly direction the routes can be merged at MAMOK to join B583, which has access to eastbound FLs 290. 330, 370, 410, and westbound FLs 300, 340, and 380. Towards the north, merging could take place at Phnom Penh or beyond.

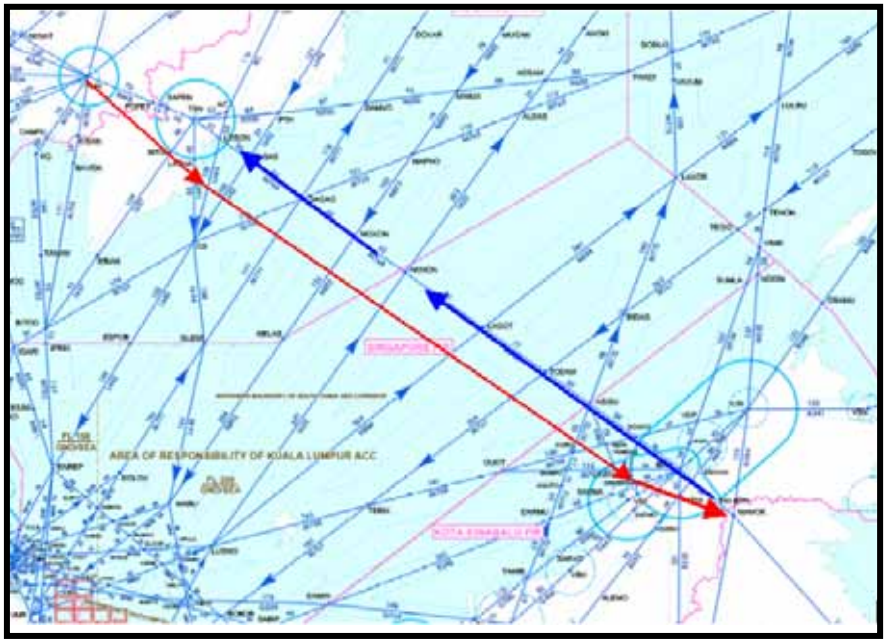

Chart 3 - IATA/SCS/15 Proposal

IATA/SCS/16

6.12 IATA informed the meeting that Manila ACC had recently issued a NOTAM informing airlines that M772 would no longer be available for flights between Jakarta and Hong Kong for a lengthy period because Manila HF radio was unserviceable. This has resulted in flights having to route via M754 which is 101 nautical miles longer and causes an additional fuel burn of between 1500 to 1600 kilograms per flight. Accordingly, IATA proposed that an additional route segment be established to the west of M772 which routed via the Sanya FIR, rather than via Manila FIR, as shown in **Chart 4**. Moving the route to the west would take advantage of the existing radar and data link surveillance and VHF communications capability that was available to the west of M772

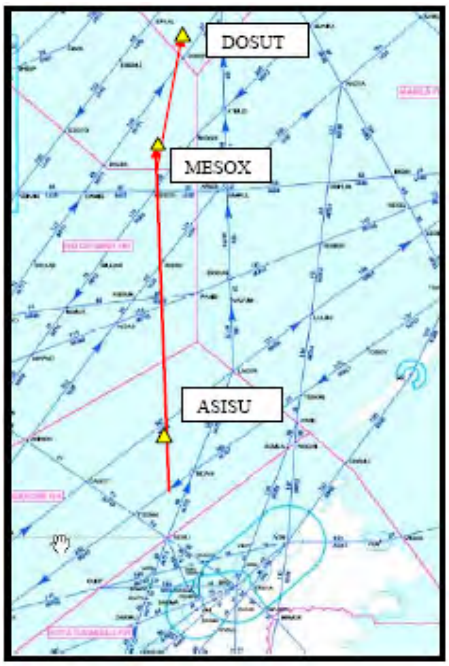

Chart 4 - IATA/SCS/16 Proposal

6.13 The meeting thanked IATA for these proposals, which would be further studied by all participants in time for the SEACG/16 meeting in May 2009. In respect to the IATA/SCS/16 proposal, the Philippines reported that spare parts had been sourced for the HF equipment and the HF capability for Manila FIR would be restored within the next week.

6.14 Hong Kong China, Malaysia and Singapore advised, in relation to IATA/SCS/16, that they could foresee complexities in operating the existing M772 and the proposed IATA/SCS/16 at the same time and it was likely that a choice would need to be made to have only one or the other of these routes. In this context, the meeting noted that the lateral separation between M772 and the proposed IATA/SCS/16 was unlikely to be sufficient for the routes to operate independently and the No PDC levels would be the same for both routes.

6.15 Advantage would be taken during SEACG/16 to further discuss and advance the proposals. In the meantime, the Regional Office would include the Viet Nam and IATA proposals into the ATS Route Catalogue to enable widespread review.

Agenda Item 7: Update WPAC/SCS RSG Task List

7.1 In reviewing the WPAC/SCS RSG task list, the meeting updated the status of items considered complete and suitable for closure as well as those remaining open, noting the progress that had been made. The meeting agreed that the updated task list included as **Appendix E** reflected the remaining items on the work programme of the RSG and noted that these tasks could adequately be attributed to the South East Asia ATS Coordination Group (SEACG) and Regional Airspace Safety Monitoring Advisory Group (RASMAG) for further action.

7.2 In light of the decision taken by the meeting to recommend dissolution of the RSG, the Secretariat would present the RSG Task List to SEACG/16 and RASMAG for consideration

Agenda Item 8: Future Directions and Arrangements

8.1 The meeting commended the excellent outcomes that had been achieved by the participants to the WPAC/SCS RSG. In respect to the major concerns that had originally led APANPIRG to establish the WPAC/SCS RSG, the implementation of revised flight level arrangements about 10 months ago had resulted in greater harmonisation with the flight level arrangements in airspaces surrounding the WPAC/SCS area. Strategies implemented by States for the management of LHDs were having a significant beneficial effect which had resulted in very positive trends in safety performance that were expected to ensure the regional TLS continued to be met in the foreseeable future.

8.2 The meeting recalled the regional practice under which complex implementations were subject to a post implementation review meeting held at approximately 12 months after the implementation, to provide a suitable forum to raise and correct any long standing issues that had resulted from the implementation.

8.3 In light of the positive outcomes in terms of improved safety performance, stability of the flight level implementation and adoption of LSWD procedures the meeting agreed that although this meeting had been held at 10 months after implementation, it should be treated as the 12 month post implementation review. Accordingly, no further meeting of the RSG was necessary in terms of post implementation review.

Review of Terms of Reference

8.4 The meeting recalled that APANPIRG/17 (August 2006) had recognized that there were three very significant safety matters outstanding in relation to WPAC/SCS operations that needed to be urgently addressed:

1) the target level of safety (TLS) for WPAC/SCS RVSM operations being exceeded and showed an adverse trend;

2) concerns in relation to the use of a modified alternate FLOS in the WPAC/SCS and the consequential RVSM interface arrangements with the single alternate FLOS used in areas surrounding the WPAC/SCS; and

3) no updated horizontal safety assessment had been undertaken for the SCS parallel route structure in the four and a half years since implementation.

8.5 In relation to point 3) above, APANPIRG/17 agreed that the horizontal safety assessment must be completed by 30 June 2007 and adopted Conclusion 17/6 in this respect. Subsequently Thailand, on behalf of the SCS States concerned, completed the horizontal safety assessment as required by Conclusion 17/6.

8.6 In relation to points 1) and 2) above APANPIRG/17 considered that the RVSM related safety issues should be urgently scrutinized by a dedicated working group that would specifically address matters relating to WPAC/SCS RVSM operations and established the WPAC/SCS RSG (Decision 17/5) to do this work, drafting Terms of Reference (TOR) accordingly.

8.7 In overall terms, it was apparent to the meeting that the specific TOR established for the RSG by APANPIRG to address urgent safety matters in the WPAC/SCS airspace had been substantially met and the RSG could therefore be considered for dissolution. However, as a result of the intense focus on WPAC/SCS RVSM operations generally over the past two years, the following additional matters had been identified and were recommended to the South East Asia ATS Coordination Group (SEACG) for further action:

a) ATC methodologies based on the application of 'No Pre Departure Coordination' (No-PDC) flight level allocation arrangements, although useful in resolving conflicting situations between crossing routes, were regularly unable to provide access to optimum flight levels,

b) existing surveillance capabilities in some areas are not fully utilized, and

c) the existing route structures in some areas do not support full efficiency of air traffic management, with crossing and merging tracks occurring in areas without surveillance and requiring application of larger procedural separations standards.

8.8 The meeting agreed that the residual work items on the task list of the RSG –pertaining mainly to ATS route proposals - could be adequately handled by the SEACG under their existing mandate. Further assistance was available from RASMAG and the ATM/AIS/SAR Sub Group if necessary.

8.9 Accordingly, the meeting agreed to the following draft conclusion for consideration by the ATM/AIS/SAR Sub Group in June 2009:

Draft Conclusion RSG/1- Dissolution of Western Pacific/South China Sea RVSM Scrutiny Working Group

That, having substantially completed the Terms of Reference established by APANPIRG,

a) the Western Pacific/South China Sea RVSM Scrutiny Working Group (WPAC/SCS RSG) be commended for the swift and effective outcomes in satisfactorily addressing RVSM safety performance in the WPAC/SCS area, and

b) the WPAC/SCS RSG be dissolved and any residual work items be allocated to the South East Asia ATS Coordination Group (SEACG) and/or the Regional Airspace Safety Monitoring Advisory Group (RASMAG) and ATM/AIS/SAR Sub Group as necessary.

8.10 In agreeing to propose the dissolution of the RSG, the meeting recognised that the role undertaken by the United States FAA in providing leadership and ongoing support to the RVSM Scrutiny Group had been instrumental in the positive outcomes demonstrated by the RSG. The availability of Mr. David Maynard as Chairman was very valuable in the work processes of the group and had measurably assisted the excellent progress achieved by the Scrutiny Group.

Agenda Item 9: Any other business

Realign FIR Boundary – Oakland, Manila, Ujung Pandang FIRs

9.1 The meeting recalled that Indonesia, Philippines and the United States had previously reached agreement for the realignment of the complex joint FIR boundary with Oakland in the vicinity of position approximately N0400 E13220. An amendment proposal to the Air Navigation Plan was being prepared in coordination with the Regional Office to implement the changes in a coordinated manner on a suitable AIRAC date. In order to minimise the complexity of the ATC coordination required in this vicinity, the 3 States also agreed to simultaneously realign ATS route A450 and a suitable amendment proposal would be coordinated with the Regional Office for this realignment

Clarification of LHD Template

9.2 Singapore drew the attention of the meeting to some instances in the LHD data where a LHD had been reported by one State but no complementary report had been submitted by the other State affected. Although the RASMAG had attempted to address this by including a 'tick box' on the LHD reporting template with the question "*Were the Supervisors of the affected ACCs advised of this LHD occurrence"*, concern was raised by the meeting that this could be interpreted as a situation whereby a LHD was raised by a controller internally to his/her ACC supervisor, rather than between neighbouring ACC Supervisors as had been intended by RASMAG.

9.3 The meeting requested that the Secretariat bring this matter to the attention of RASMAG for review, with the objective of making clear the requirement for coordination between ACCs, as opposed to coordination within ACCs, for LHD occurrences.

Closing of the Meeting

Secretariat

9.4 In closing the meeting, Mr. Tiede summarised the outcomes that had been achieved and highlighted that the many positive interactions between States and international organisations, notably IFATCA and IATA, had led to the very beneficial outcomes in the work of the Scrutiny Group. He recognised all participants for their contributions in achieving the enhanced safety outcomes that had resulted from the RSG. Mr. Tiede thanked the Chairman for his positive influences in steering the RSG through sometimes stormy waters to comprehensively meet the challenges that had been set by APANPIRG. Implementation of the new routes and revised flight level arrangements in the WPAC/SCS area were significant operational changes which will result in safety, efficiency and environmental benefits for many years to come. Mr. Tiede urged all parties to continue to work closely together through the SEACG, RASMAG and ATM/AIS/SAR Sub Group forums to ensure that further safety and efficiency gains were made wherever possible.

Chairman

9.5 The Chairman, Mr. Maynard, expressed his strong thanks to the members of the WPAC/SCS/RSG for their participation in this and the previous meetings of the Scrutiny Group. The work that had gone on between meetings was evident and Mr. Maynard expressed the strong view that the Group should be very proud of its accomplishments, especially given the overall minimal amount of time that the group has been assembled.

9.6 Mr. Maynard reminded the members that while the group has been successful in meeting its charter as laid out by APANPIRG, it is still incumbent upon the States and organizations to continue to work collaboratively to further reduce the number of LHDs occurring within the region. Addressing the root causes of ATC Unit-to-ATC Unit coordination errors would show immediate results, thus ensuring that there will not be a future need for APANPIRG to reconvene the WPAC/SCS/RSG.

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LIST OF WORKING PAPERS (WPS) AND INFORMATION PAPERS (IPS)

WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP/1	1	Provisional Agenda – WPAC/SCS RSG/6	Secretariat
WP/2	2	Summary of the Airspace Safety Review for the RVSM Operation in the Western Pacific/South China Sea (WPAC/SCS) Region	MAAR
WP/3	8	Review WPAC/SCS RSG Terms of Reference	Secretariat
WP/4	2	Summary of the Airspace Safety Review for the New FLAS in the Western Pacific (WPAC) RVSM Airspace *(Revised)*	JCAB RMA
WP/5	6	More efficient routings in the South China Sea Airspace in Kota Kinabalu and Manila FIR	IATA
WP/6	3,4,6	RVSM Operations within Ho Chi Minh FIR	Viet Nam
WP/7	7	WPAC/SCS RSG Task List	Secretariat
WP/8	6	More efficient routings in the South China Sea Airspace	IATA
WP/9	6	Alternative safe and efficient routing between Jakarta and Hong Kong and points beyond	IATA
WP/10	6	More efficient crossing routes in the South China Airspace	IATA
WP/11	3	The Operational Impact of the Revised Flight Level Allocation Scheme (FLAS) within the Manila Flight Information Region	Philippines

INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	4	Summary of LHD Reduction Activities in Japan	Japan

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Flight Level Allocation Scheme (FLAS) for Large Scale Weather Deviations (LSWD) in Western Pacific/South China Sea area

as applicable by

Fukuoka ATMC, Ho Chi Minh, Hong Kong, Kota Kinabalu, Manila, Naha, Sanya, Singapore and Taipei ACCs

Flight Level Allocation (LSWD)	ATS Route and Direction of Flight										
	N892	**L625**	**N884** *(South of LBG)*	**N884** *(North of CAB)*	**M767**	**A582/B462**		**A590**		**L642**	**M771**
	SW	NE	NE	NE	SW	E	W	E	W	SW	NE
410				410							
400	400				400				400	400	
390		390	390			390		390			390
380							380				
370				370							
360	360				360				360	360	
350		350	350			350		350			350
340							340				
330				330							
320	320				320				320	320	
310		310	310			310		310			310
300							300				
290				290							

Activation conditions:

1) The LSWD procedures will be activated to mitigate effects of widespread adverse weather. Coordination will be conducted in accordance with Operational Letters of Agreement (LOA) between the affected ACCs with the objective of implementing LSWD procedures simultaneously by all ACCs.

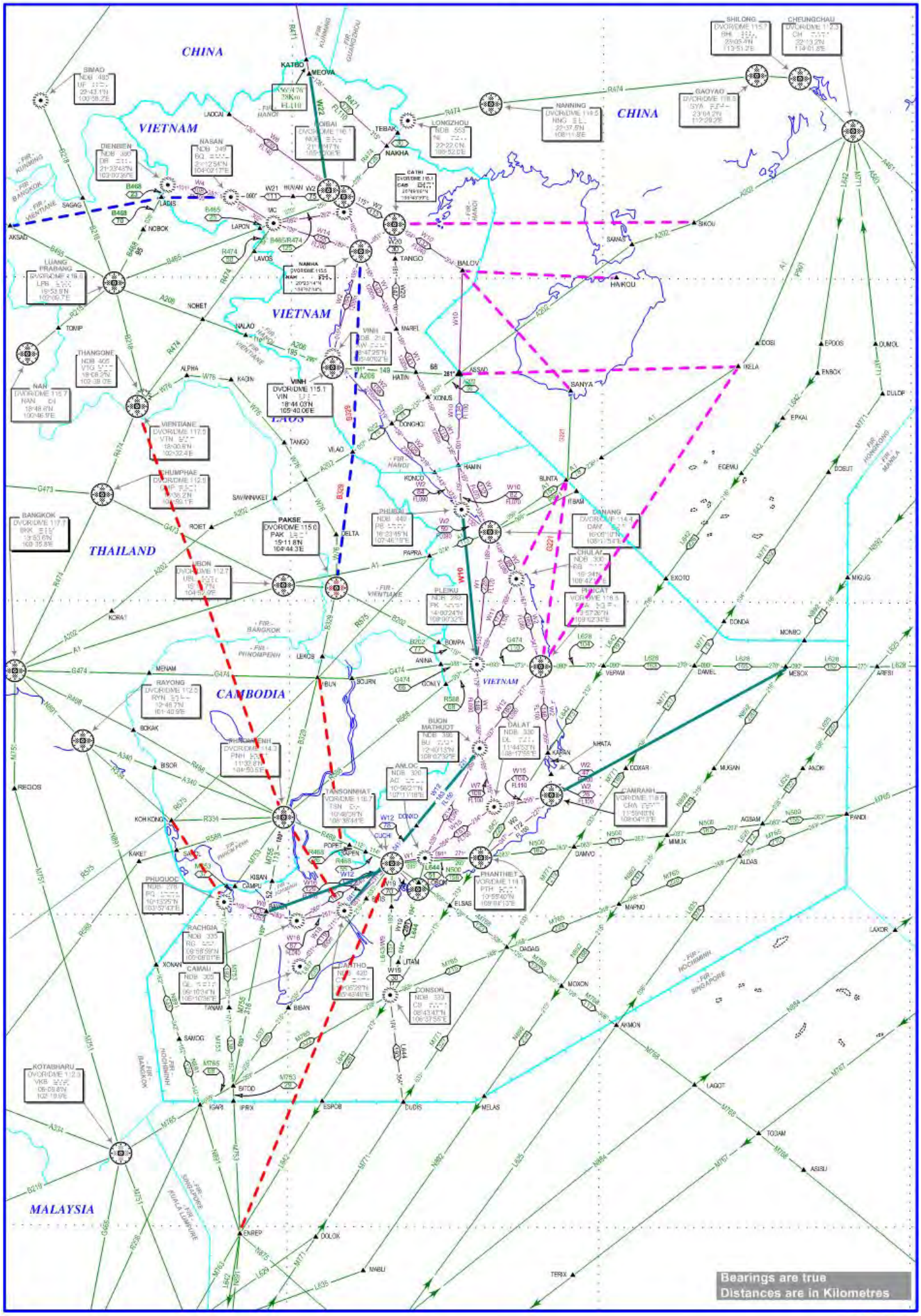
2) Activation of LSWD procedures is intended to mitigate situations of potential loss of lateral separation between ATS routes served by the same No-PDC flight levels. For example, this could include situations where 5 or more deviations of more than 10 NM are experienced/anticipated in a 30 minute period and those deviations can not be completed within one FIR.

3) In circumstances where deviations are wholly contained within one FIR, or suitable coordination can be completed between two adjacent FIRs, activation of LSWD procedures may not be necessary.

Appendix D

CHART OF PROPOSED ATS ROUTES

(This chart has only ATS route illustration purpose)



WPAC/SCS RSG — TASK LIST

(last updated RSG/6, 9 April 2009)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
1/5	Consider introduction of additional parallel "crossing" ATS routes to enable bi-directional routes to be treated as uni-directional routes to increase capacity and availability of optimum flight levels	SEACG/16 (May 2009)	States, IATA, SEACG	Ongoing	*Note: Raised at RSG/1, Jan 2007* Present proposals from RSG/6 to SEACG/~~15~~ 16 in May 200~~8~~9. SEACG/16 to assume all further responsibility for route proposals
~~**1/6**~~	~~Review ATC coordination procedures and practices between ACCs to ensure procedures and/or practices do not contribute to LHD.~~	~~RSG/6~~	~~States,~~	~~Ongoing~~ ~~Closed~~	~~*Note: Raised at RSG/1, Jan 2007*~~ ~~WPAC/SCS RSG/3 (Nov 2007), RSG/4 (Feb 2008), RSG/5 (Oct 2008) & RSG/6 (Apr 2009) reviewed actions taken so far, substantial progress made, States to continue routine work in this area~~
~~**5/1**~~	~~Regional Office transmit letter to Malaysia highlighting difficulties in the delayed signing of operational LOAs by Malaysia.~~	~~November 2008~~	~~Regional Office~~	~~Open~~ ~~Completed~~	~~Regional Office letter Ref.: T 3/10.1.19 – AP-ATM0343 transmitted on 08 December 2008~~
~~**5/2**~~	~~States conduct prior coordination in relation to development of regional or bilateral procedures applicable to Large Scale Weather Deviations (LSWD) as preparation for RSG/6 meeting~~	~~WPAC/SCS RSG/6 meeting March 2009~~	~~States~~	~~Open~~ ~~Completed~~	~~RSG/6 reached agreement on LSWD procedures~~

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
5/3	States conduct Safety Management System investigations into LHDs with the objective of identifying and correcting causal factors. WP02 from MAAR to RSG/6 meeting to be used as reference material. Outcomes of SMS investigations to be reported to ~~RSG/6.~~ SEACG/16 and RASMAG/11	SEACG/16 (May 2009) RASMAG/11 June 2009	States, SEACG, RASMAG	Open	
6/1	China did not attend RSG/6. Secretariat to transmit letter to China notifying adoption of regional LSWD procedures and urging China to incorporate the LSWD procedures in operational Letters of Agreement	May 2009	Regional Office	Open	
6/2	Secretariat to include the ATS route proposals from RSG/6 meeting into ATS Route Catalogue	May 2009	Regional Office	Open	
6/3	Secretariat to bring to attention of RASMAG the concerns raised by RSG/6 in relation to LHD template question "*Were the Supervisors of the affected ACCs advised of this LHD occurrence".*	June 2009	Regional Office	Open	
6/4	Secretariat to present RSG Task list to SEACG and RASMAG for action on any residual matters following dissolution of RSG	SEACG/16 (May 2009) RASMAG/11 June 2009	Regional Office	Open	
6/5	Prepare and circulate amendment proposal to realign FIR boundary between Manila, Ujung Pandang and Oakland FIR	SEACG/16 (May 2009)	United States, Indonesia, Philippines, Regional Office	Open	