

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



**REPORT OF THE SECOND MEETING OF THE SOUTHEAST ASIA
ROUTE REVIEW TASK FORCE
(SEA-RR/TF/2)**

BANGKOK, THAILAND, 22 – 26 MARCH 2010

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

Approved by the Meeting
and published by the ICAO Asia and Pacific Office, Bangkok

SEA-RR/TF/2
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1.1 Introduction

1.1.1 The Second Meeting of the Southeast Asia Route Review Task Force (SEA-RR/TF/2) was held at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand from 22 to 26 March 2010.

1.2 Officers, Secretariat and Participants

1.2.1 The meeting was chaired by Mr. Peter Rabôt, Head (Air Navigation Services Safety Office), from the Civil Aviation Authority of Singapore (CAAS). Mr. John E. Richardson, ATM Expert, ICAO Asia and Pacific Office, acted as Secretary to the Meeting, assisted by Mr. Kyotaro Harono, ATM Officer, ICAO Asia and Pacific Office.

1.2.2 Forty-six (48) participants from Cambodia, China, Hong Kong China, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Sri Lanka, Thailand, United States, Viet Nam, IATA and IFATCA attended the meeting. A list of participants is in **Appendix A**.

1.3 Opening of the Meeting

1.3.1 The Chairman, Mr. Peter Rabôt, welcomed all participants to the second meeting of the Southeast Asia Route Review Task Force. He mentioned that the gathering at this meeting was once again testimony to the fact that this is an important meeting for States in the Southeast Asia region to further enhance safety together with increasing capacity and efficiency as well as to ensure that the airway structure remains robust and capable of coping with the present and future traffic flows throughout this sub-region.

1.3.2 Mr. Rabôt highlighted that ICAO recognises the importance of the Southeast Asia/Northeast Asia regions through its identification as a major traffic flow (AR9) in the regional air navigation plan. It was also pointed out by the Chairman that IATA had highlighted that 22 of the 40 busiest airports in Asia/Pacific region (excluding West Coast USA) lie within this traffic flow. These facts have not changed. The complications of 21 FIRs interfacing with one another is also very challenging.

1.3.3 The meeting was reminded that the Southeast Asia Route Review Task Force had been tasked by the ATM/AIS/SAR Sub-Group meeting to undertake a review of ATS routes in the Western Pacific/South China Sea airspace south of the Fukuoka FIR boundary. Armed with our terms of reference to enable the task force to carry out this important and timely work, the first meeting was held some three months ago and it was believed that participants have had time to deliberate our next tasks.

1.3.4 It was also noted that, with respect to traffic data requests at the first task force meeting, all States involved have participated which was most appreciated. Almost all requests for data have been forthcoming and much appreciated. In addition, the Chairman paid recognition to the efforts of some States to move forward with their discussions with their neighbours in attempts to provide resolutions to enhancement of routes within their purview. What may seem just a small adjustment to a route or level is actually a significant step in the right direction to improve traffic flows in the region.

1.3.5 On behalf of Mr. Mokhtar A. Awan, Regional Director, ICAO Asia and Pacific Regional Office, Mr. John Richardson, ATM Expert and Secretary for the meeting, welcomed all participants from States and aviation organizations to the second meeting of the Southeast Asia Route Review Task Force. This was especially the case at this time due to some tensions and unease in Bangkok during this period.

1.3.6 Mr. Richardson commended the previous work accomplished at the first meeting of the task force and it was expected that this would continue over this week. It was also an opportunity to use the already agreed procedures of creating Small Working Groups to focus on specific items and thus enhance the productivity of the overall meeting’s results.

1.3.7 It was mentioned that the costs of conducting and participating in a meeting such as this needs to be measured by results and accomplishments over the next 5 day period. In discussing the many issues to be addressed, the meeting was encouraged to look at not only today’s issues, but also tomorrow’s challenges which are just around the corner.

1.3.8 The meeting was advised of an event hosted by ICAO which addressed the challenge posed by an anticipated shortage of skilled aviation professionals. Present at this event were representatives’ from States, industry, training institutions and students who defined and quantified the problem, proposed approaches to solve the problem and outlined the leadership role of ICAO in generating cooperation among concerned stakeholders towards reaching and implementing solutions. A précis of the discussions are attached in **Appendix B** to this report

1.4 **Documentation and Working Language**

1.4.1 The meeting was conducted in English. All meeting documentation was in English.

1.4.2 Thirteen (13) working papers and three (3) information papers were presented to the meeting. A list of the papers is at **Appendix C**.

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Agenda Item 1: Adoption of Agenda

1.1 The meeting adopted the following agenda:

- Agenda Item 1: Adoption of Provisional Agenda
- Agenda item 2: Review Outcomes of Related Meetings
- Agenda item 3: Review of ADS/CPDLC Implementation
- Agenda item 4: Review Current Operations across South-East Asia and Identify Problem Areas
- Agenda item 5: Implementation of the New CNS/ATM Systems in the Region
- Agenda Item 6: ATS Route Development
- Agenda Item 7: Develop a Coordinated Plan for Implementation of Actions Agreed by the Meeting
- Agenda Item 8: Any other business
- Agenda Item 9: Date and Venue for the Next Meeting

Agenda Item 2: Review Outcomes of Related Meetings

Closure of M772

2.1 The meeting noted M772 used for flights from/to Jakarta/Hong Kong as well as destinations in the People's Republic of China had been closed to these aircraft due to the un-serviceability of Manila HF. This caused these aircraft to be rerouted to M754, adding an additional 101NM to the overall distance.

2.2 The Philippines advised the meeting that HF communications have been restored and available for some time and accordingly, M772 has been reopened in the Manila FIR.

Additional Parallel Routes Crossing the Primary Route System

2.3 The concept of having additional crossing routes parallel to the present routes was also discussed. As these routes handled less traffic than the main southeast/northwest route system, it could be feasible to add an additional route alongside the present crossing route spaced at least 50 NM apart. This would allow aircraft to fly outside the radar coverage airspace at the same altitude on both routes, which in turn could free some of the levels now being used to be included in the level allocation for the major route system. The meeting looked at this proposal under Agenda Item 4 of this meeting which is summarized accordingly.

Establishment of a Data Statistics and Analysis Working Group

2.4 The meeting noted that the SEA-RR/TF/1 meeting had agreed to establish a Data Statistics and Analysis Working Group. Each State would provide a contact point and for the purpose

of the data collection process. In addition, States were invited to participate in the working group. Analysis of data would assist in strategies to construct a new or revised route structure.

Statistical Aircraft Data Collection and Analysis

2.5 The selected week for the collection and analysis of data was planned to be the third week of each month commencing in January 2010 at 0001UTC on the third Sunday of each month. Data was collected by the Small Working Group (SWG) set up for this purpose with a report and results detailed under Agenda Item 4 of this report.

2.6 The meeting was advised that there were certain factors which should also be assessed across a broader timeframe of data collection such as:

- a) Seasonal figures;
- b) Identifying busy periods, both on the major routes and crossing routes; and,
- c) The number of FANS equipped aircraft operating in the area.

IATA Outlook on Southeast Asia Route Review

2.7 Details of these matters and other suggestions by IATA are provided under Agenda Item 6 of this report

Viet Nam initiatives

2.8 The meeting noted the ongoing work of Viet Nam in establishing proposed new ATS route structures within their airspace as well as international routes leaving both of their FIRs. Further proposals by Viet Nam are mentioned in this report under Agenda Item 6.

Safety Assessments and Monitoring Requirements

2.9 The meeting was reminded that ICAO PANS/ATM (DOC4444), para. 2.6.1- *Need for Safety Assessments* lists details when a safety assessment will be carried out in respect of proposals for significant airspace reorganizations, for significant changes on the provision of ATS procedures applicable to an airspace or an aerodrome, and for the introduction of new equipment, systems or facilities.

Proposals for improvements to South China Sea airspace operations

2.10 The meeting noted the report from Singapore detailing the background to the methodology used in the implementation of RNP 10 procedures, both lateral and longitudinal, on RNAV routes L642 and M771. Items mentioned were initiated in several discussions of the meeting and are included in the various sections of this report.

2.11 The meeting agreed that the implementation of 50NM lateral separation standard for the remaining four parallel RNAV routes in the South China Sea area would reduce controllers and pilots workload, and also the safety assessment conducted by SEASMA had supported the implementation of RNP10 operations (50/50NM) horizontal separation on all the six parallel RNAV routes. The meeting noted that there would be no route realignment as the 50NM lateral separation standard would be applied on a tactical basis as is the current practice on the L642/M771 route-pair. Singapore, Philippines and Viet Nam agreed in principle to coordinate for the implementation of the 50NM lateral separation standards on the remaining four parallel RNAV routes and will update ICAO Regional Office on the progress of the implementation.

Flow Control Restriction on A1/G86

2.12 The meeting noted that there were many occurrences in the past of flow control restriction imposed by Taipei ACC, due to system maintenance. Traffic affected by the restriction were operating via A1, B348, G86 and M750 entering the Taipei FIR.

2.13 Regarding this subject, the meeting was advised that, notwithstanding the NOTAM issued mentioned periods of disruption of 4 hours, in actual fact on many occasions the disruption was less than 3 hours. There was no timeframe given as to when is item would be overcome.

2.14 With regard to flow measures instigated by Taipei ACC, the meeting was advised that the Taipei ACC is aware of the problem created by their monthly ATC system maintenance to FIRs from Hong Kong to Bangkok. In an endeavour to cause less disruption to ACCs and airlines alike, they have advised that plans are in process to advance their maintenance period to 1400 UTC to minimize the issues.

Initiate Teams/Groups to address specific measures with regard to the Route Review

2.15 The meeting recalled the Terms of Reference of the SEA-RR/Task Force which stated, that the Task Force shall “*Consider setting up appropriate teams/groups which might but not necessarily, include the entire Task Force, to address and implement specific agreed measures within specific airspaces.*”

2.16 It was noted that, as the area under consideration covers a considerable amount of airspace and is managed by many FIRs, management of the changes should be specific to the many sub-areas within the whole framework of the project when appropriate to do so. By establishing appropriate teams/groups within the Task Force, it would enable agreed changes to be made which enhances the coordinated work accomplished by the task force in a cohesive and appropriate time frame.

High Level Objectives of the SEA-RR/TF

2.17 The meeting noted the proposal that the Task Force should take into account two high level objectives:

- a) To develop a route structure capable of meeting the expected/forecast traffic growth over the next decade; and,
- b) To minimise the production of carbon emissions to the greatest extent possible.

2.18 Any plans developed should be assessed against these two high level objectives in the areas of Safety, Operational Efficiency and Environmental Impact. To cater for the forecast traffic growth and, at the same time, adequately address environmental issues, full surveillance coverage over the area under consideration (radar, ADS-B Out; ADS-CPDLC as appropriate) and the harmonisation of the operational application of this surveillance across FIR boundaries was fundamental.

Agenda Item 3: Review of ADS/CPDLC Implementation

3.1 Items under this agenda are incorporated in other areas of the report.

Agenda Item 4: Review Current Operations across South-East Asia and Identify Problem AreasUnidirectional Crossing Routes

4.1 The meeting was briefed on the changes which had taken place within the South China Sea area over the past 10–15 years. A new parallel route structure was planned and implemented in the second half of the 1990's, which appeared to satisfy growth for a short time. Then in the early years of the new millennium, RVSM was introduced which once again gave more levels to the growth of traffic in this area. At the same time, the concept of low cost carriers arrived which once again required additional planning on ways to adequately manage the ever increasing traffic workload.

4.2 Despite this continuing growth, the meeting was advised that, there have been times when traffic decreased due to specific unfortunate events. Firstly the SARS epidemic saw a dramatic decrease in air traffic, not only in this particular sub-region but also around the world. Fortunately this issue stabilized and finally went away, but was replaced soon after by the swine flu epidemic which once again caused issues to the airlines concerned. Once again, after a relatively short period of time, things returned to relative normality until the latest and most dramatic event occurred, namely the Global Recession. Fortunately, the economy is now slowly returning to normal and with the resilience of the aviation industry, traffic growth, although a little slower than before, is on the increase.

4.3 During all of this time, the South China Sea (SCS) had been operating on an RNAV 80NM or time-based separation standard of 10 minutes in oceanic areas outside continuous radar coverage. Approximately 2 years ago, with the advent of ADS-C/CPDLC procedures, there is now two unidirectional routes, L642 and M771, which allow 50NM spacing between FANS equipped aircraft.

Proposal to Implement Parallel Tracks Crossing the Major Traffic Flow

4.4 The meeting recalled that there are several ATS routes which cross the main traffic flow serving major airports in the northeast/southwest portions of the SCS. These crossing aircraft also need to be also accommodated with economical efficient levels. The crossing routes are presently bidirectional and are mostly of a shorter distance than the major traffic flows. The 3 charts shown at **Appendix D** gave examples where, by duplicating these crossing routes and using a spacing of 60 NM minimum apart, fewer levels would be required for these aircraft and as a consequence, additional levels may be able to be transferred to the major traffic flows.

4.5 The following crossing routes which could be designed in this fashion are as follows:

- a) M768 Brunei to TSN
- b) L628 Manila to PCA
- c) A461 Manila to Hong Kong
- d) B462/ B348 Manila to Taipei

4.6 These routes are considered as the most used routes crossing the major traffic flow in the South China Sea area.

4.7 Other crossing routes which may also be considered for unidirectional pairs are:

- a) M772 Jakarta to Hong Kong; and,
- b) A583 Australia via Zamboanga to Hong Kong

4.8 Malaysia presented a safety study on the proposed unidirectional route to M768 crossing the South China Sea based on the proposal brought forward by IATA at the SEA-RR/TF/1 meeting. This detailed safety study arrived at the conclusion that the proposed parallel route to M768 should be located to the East of the present M768 rather than IATA suggestion of west of the present route. This alternative proposal was considered to have merit as it would reduce conflicts with other traffic proceeding from/to West Malaysia and Singapore to airports in East Malaysia and Brunei in particular.

4.9 The meeting also noted that other issues which would need to be taken into account when deciding on these new initiatives include:

- a) A safety management assessment on the change;
- b) Realistic benefits to both crossing traffic and the traffic using the major flow traffic; and,
- c) Workload on ACCs concerned in each proposal.

4.10 The Philippines advised the meeting they support the establishment of a unidirectional parallel route to L628 which crosses the major traffic flow from Manila to Bangkok. They also pointed out that L628 also interacts with three other routes, namely M772, M754 and A583.

4.11 To address operational issues (merging and bunching of traffic) and to prevent potential conflicts at the intersecting points, the Philippines recommended an additional route parallel route to the existing RNAV Route L628 so as to enable the establishment of a unidirectional traffic flow. This will allow airspace users more access to optimum flight levels, ATC has more flexibility in selecting alternative flight levels and ultimately, to the environment through reduced carbon emissions.

4.12 It was also recommended to the meeting that the combined flight levels (both East and West) for L628 be allocated for L628 as well as the new proposed unidirectional parallel route.

4.13 The meeting noted the request however further discussion on level allocation for routes crossing the major traffic flow was required. A principle reason for the additional unilateral new crossing routes was to allow the major traffic flows, which have comparatively more traffic, was to allocate an additional flight level (one or two) to cope for the expected growth on these routes. This procedure has not as yet been agreed to by the meeting and will be discussed at future meetings of the task force.

4.14 The meeting noted the proposals and could see benefit in the establishment of parallel routes crossing the main traffic flow. However some States would require further study on this matter, especially in two important areas:

- a) the possible conflict with present routes structures by the implementation of another crossing route; and,
- b) the possible increase in confliction with present routes within a States FIR outside the major traffic flows.

4.15 In developing any proposal to implement parallel unidirectional routes crossing the major traffic flow, it was strongly suggested to the meeting to study each proposal separately to confirm that there are benefits to both the users and ACCs concerned. In addition, any difficulties should be assessed and consideration to overcome these difficulties taken even if it means changing the position of the new parallel route. Finally, the programme for implementation could be achieved either singularly or multilaterally covering all the proposed changes.

Formation of Dedicated Small Working Groups

4.16 The meeting is advised that, on many occasions where a particular Task Force is formed, there are usually many diverse issues to be discussed and agreed to which, in the first instance, does not necessarily require the Task Force as a whole to spend valuable time on the one subject. It was further observed that, at the 1st meeting of the SEA-RR/TF, this concept was raised and there appeared to be no objection in using this mechanism when and if required.

4.17 The meeting noted that the title of the Task Force, Southeast Asia Route Review, opens many areas for discussion. Amongst these subjects would be:

- a) Introduction of RNP 10 horizontal separation where applicable;
- b) Unidirectional RNAV routes on tracks crossing the major traffic flow SW/NE;
- c) Unidirectional routes between Bangkok and Hong Kong including matters which need to be addressed in the strategic plan for this proposal to successfully proceed;
- d) Data collection and analysis on most project items to ensure that qualified data indicates a reason to proceed;
- e) Necessary safety related issues which are required to be addressed before implementation; and,
- f) Realistic target dates to complete all projects within the overall framework of the SEA-RR/Task Force.

4.18 Where a particular subject can be separated from most other items, a small working group consisting of States concerned, along with international organizations where required, could discuss in detail the work required and when completed to the SWG's satisfaction, submit the recommendation back to the plenary task force meeting for final analysis and evaluation.

4.19 The meeting was also informed that there may be times where one group requires input from another group on a specific issue. This can be arranged by working together on the matter until resolved, then going back to respective groups to complete their allotted tasks.

4.20 In discussion on this proposal the general consensus of the meeting was that this working procedure would be an effective way in moving forward on many of the issues which need to be addressed in the overall project.

4.21 Nevertheless, it was also considered that there were several other questions on other route proposals outside the main area of the major traffic flows and the crossing routes which should also be addressed in this manner. In relation to these topics it was felt that the concept of SWGs could

be an effective tool in bringing together States and other parties involved to find suitable answers and solutions to these matters.

4.22 The meeting considered that in the initial phase of the work of the SWG, three such groups should be formulated with specific tasks:

- a) SWG/1 - Data Collection and Analysis. This SWG has already been formed by agreement from SEA-RR/TF/1
- b) SWG/2 – Improvements and modifications to the major traffic flow. This SWG would also be tasked if requested in other international route proposals submitted by States outside the major traffic flow.
- c) SWG/3 - RNAV Routes crossing the major traffic flow

Analysis of one week traffic sample data submitted by States

4.23 The meeting was advised that an analysis of a one week traffic sample data submitted by the States in the region to the Data Statistics and Analysis Working Group had been undertaken. It highlighted the traffic loading of routes, city pairs as well as the filed PBN capability of the aircraft flying on these routes.

4.24 These statistics are described in the charts below:

Figure 1: Data Collection Participation (January 2010 – February 2010)

FIR	January 2010	February 2010
RPHI (Manila FIR)	Yes	
VHHK (Hong Kong FIR)	Yes	Yes
VTBB (Bangkok FIR)	Yes	Yes
VVGL (Ha Noi FIR)	Yes	Yes
VVTS (Ho Chi Minh FIR)	Yes	Yes
WBFC (Kota Kinabalu FIR)	Yes	Yes
WMFC (Kuala Lumpur FIR)	Yes	Yes
WSFC (Singapore FIR)	Yes	Yes
ZJSA (Sanya FIR)	Yes	Yes

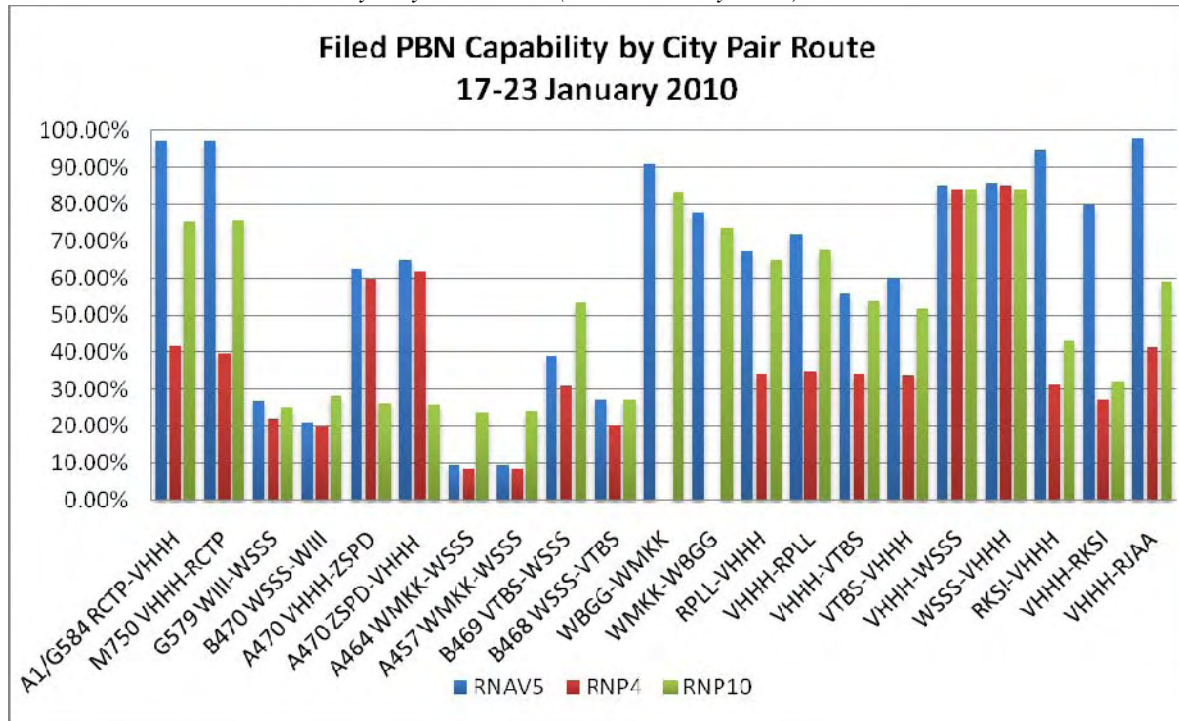
Figure 2: Data Elements Collected: January 2010

January 2010	Registration Number	PBN Type	ETD/ATD	ETA/ATA	Entry/Exit Information	Route/FL Changes
RPHI (Manila FIR)	N/A	N/A	N/A	N/A	Yes	N/A
VHHK (Hong Kong FIR)	Yes	Yes	Yes	Yes	Yes	N/A
VTBB (Bangkok FIR)	Yes	N/A	Yes	Yes	Yes	Yes
VVGL (Ha Noi FIR)	Most	N/A	All ETD Some ATD	All ETA Some ATA	Yes	N/A
VVTS (Ho Chi Minh FIR)	N/A	N/A	N/A	N/A	Yes	N/A
WBFC (Kota Kinabalu FIR)	Most	Yes	Most	Most	Yes	Yes
WMFC (Kuala Lumpur FIR)	Most	Yes	N/A	N/A	Yes	N/A
WSFC (Singapore FIR)	Yes	Yes	No ETD All ATD	No ETA All ATA	Yes	Yes
ZJSA (Sanya FIR)	Most	Yes	N/A	N/A	Yes	Yes

Figure 3: Data Elements Collected: February 2010

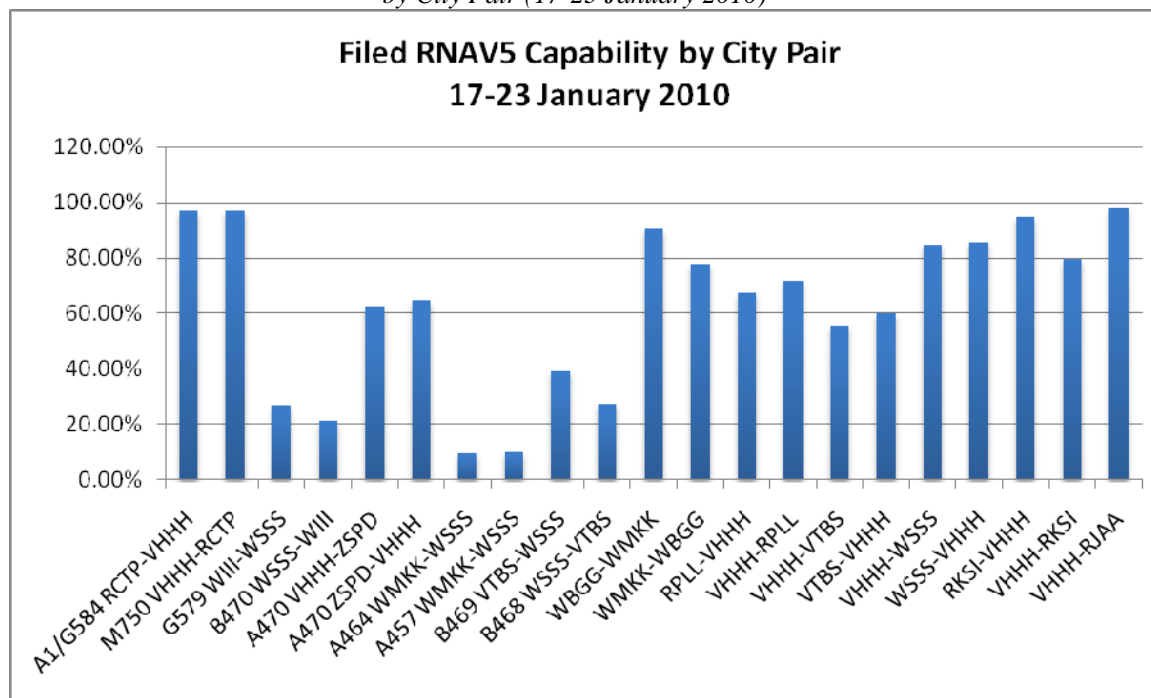
February 2010	Registration Number	PBN Type	ETD/ATD	ETA/ATA	Entry/Exit Information	Route/FL Changes
RPHI (Manila FIR)						
VHHK (Hong Kong FIR)	Yes	Yes	Yes	Yes	Yes	N/A
VTBB (Bangkok FIR)	Yes	N/A	Yes	Yes	Yes	Yes
VVGL (Ha Noi FIR)	Most	Yes	ETD for Int'l Some ATD	No ETA Some ATA	Yes	N/A
VVTS (Ho Chi Minh FIR)	N/A	Yes	N/A	N/A	Yes	N/A
WBFC (Kota Kinabalu FIR)	Yes	Yes	Yes	Yes	Yes	Yes
WMFC (Kuala Lumpur FIR)	Yes	Yes	Yes	Yes	Yes	Yes
WSFC (Singapore FIR)	Yes	Yes	No ETD All ATD	No ETA All ATA	Yes	Yes
ZJSA (Sanya FIR)	Most	Yes	N/A	N/A	Yes	Yes

Figure 4: Percentage of Aircraft that Filed PBN Capability in the Flight Plan Categorized by City Pair Route (17-23 January 2010)



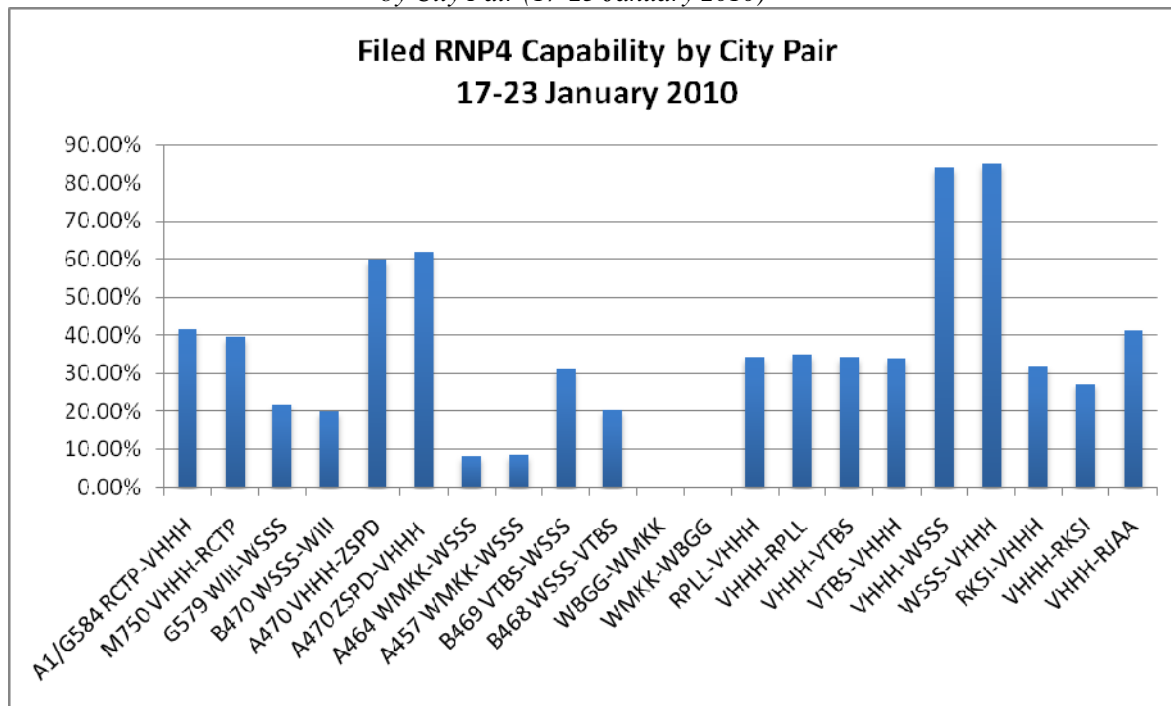
- Notes:
1. Filed PBN capability may be lower than actual capability due to the lack of filing requirements
 2. WSSS-VTBS route is B469 in the Singapore FIR, which becomes M751 in Kuala Lumpur FIR and Bangkok FIR
 3. City Pair VHHH-RJAA does not have PBN capability data for RJAA-VHHH direction

Figure 5: Percentage of Aircraft that Filed RNAV5 Capability in the Flight Plan Categorized by City Pair (17-23 January 2010)



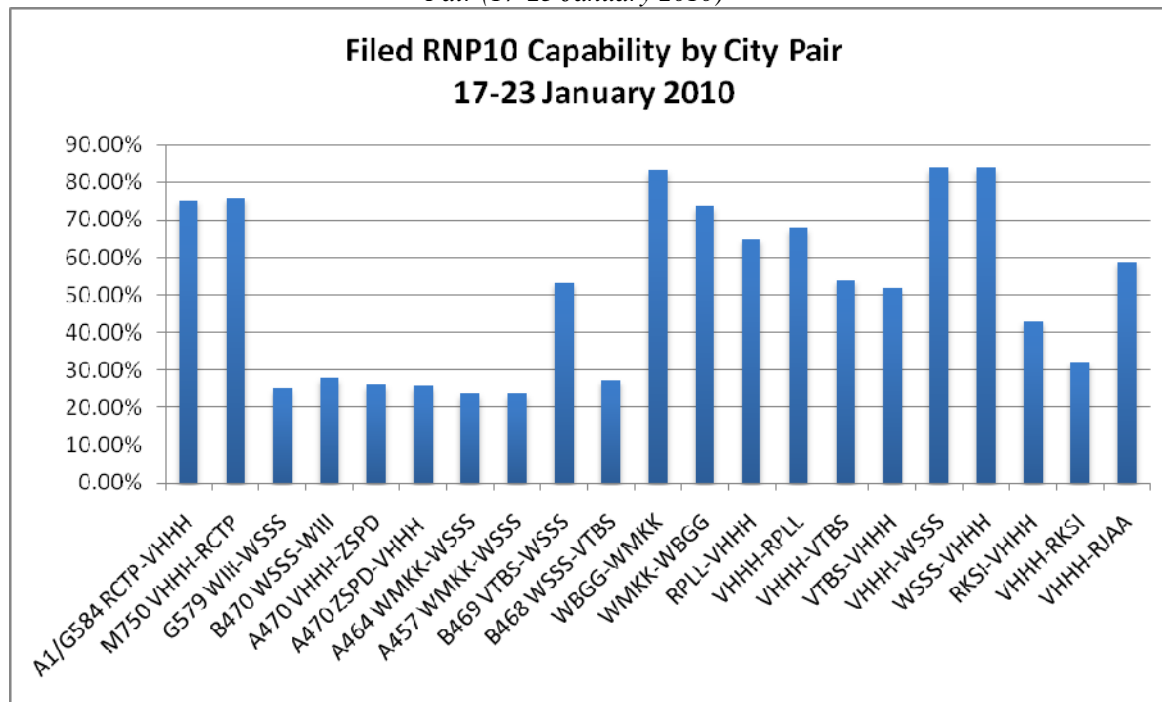
- Notes:
1. Filed RNAV5 capability may be lower than actual capability due to the lack of filing requirements
 2. WSSS-VTBS route is B469 in the Singapore FIR, which becomes M751 in Kuala Lumpur FIR and Bangkok FIR
 3. City Pair VHHH-RJAA does not have RNAV5 capability data for RJAA-VHHH direction

Figure 6: Percentage of Aircraft that Filed RNP4 Capability in the Flight Plan Categorized by City Pair (17-23 January 2010)



- Notes:
1. Filed RNP4 capability may be lower than actual capability due to the lack of filing requirements
 2. WSSS-VTBS route is B469 in the Singapore FIR, which becomes M751 in Kuala Lumpur FIR and Bangkok FIR
 3. City Pair VHHH-RJAA does not have RNP4 capability data for RJAA-VHHH direction

Figure 7: Percentage of Aircraft that Filed RNAV5 Capability in the Flight Plan Categorized by City Pair (17-23 January 2010)



- Notes:
1. Filed RNP10 capability may be lower than actual capability due to the lack of filing requirements
 2. WSSS-VTBS route is B469 in the Singapore FIR, which becomes M751 in Kuala Lumpur FIR and Bangkok FIR
 3. City Pair VHHH-RJAA does not have RNP10 capability data

Figure 8: Two-way City Pairs with more than 150 movements/week
(17-23 January 2010)

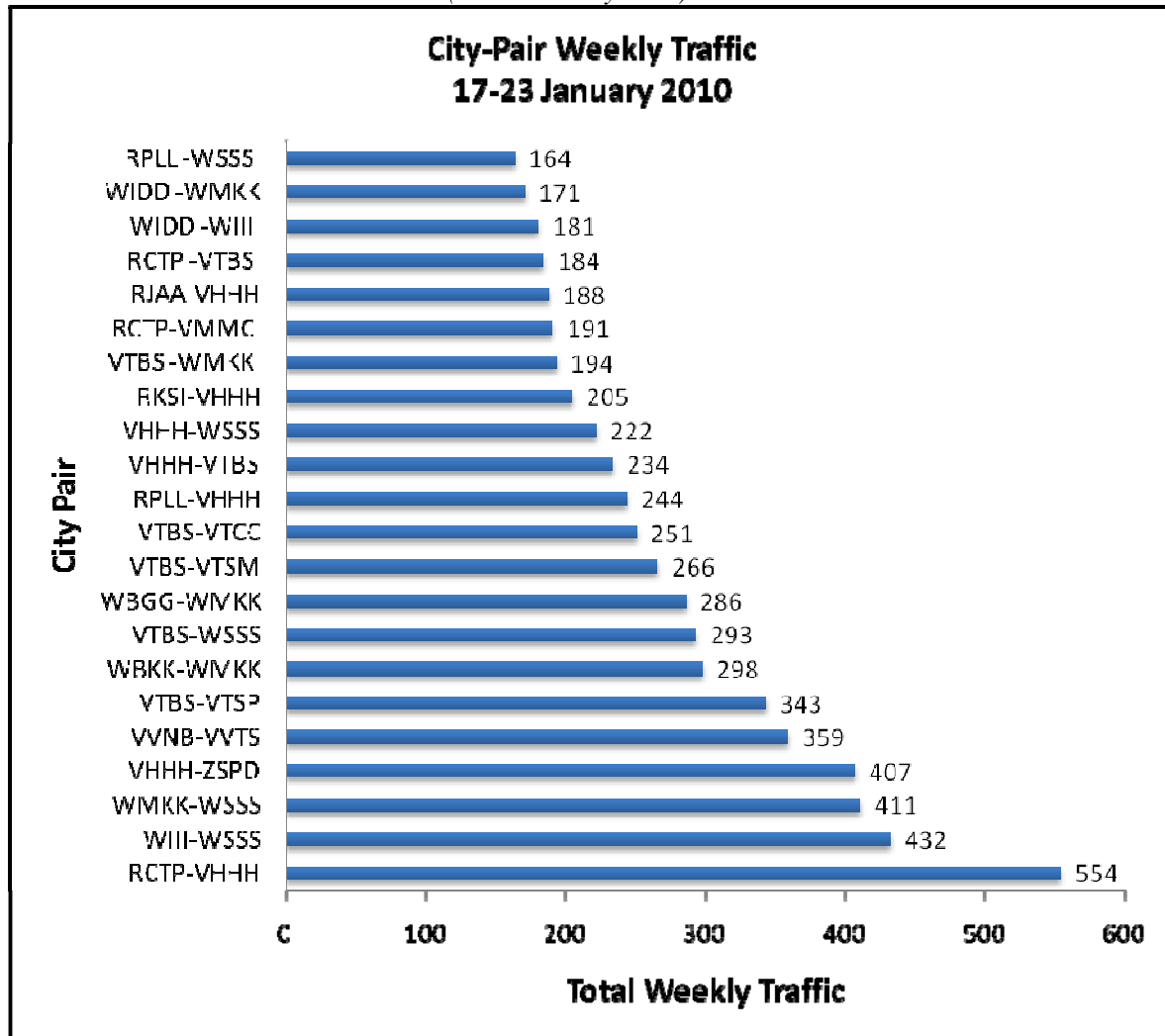


Figure 9: CANSO Quality of Service Benchmarking Regional Top One-Way City Pairs (500 – 1,000 mile distance) based on Official Airline Guide (OAG) information in calendar year 2009

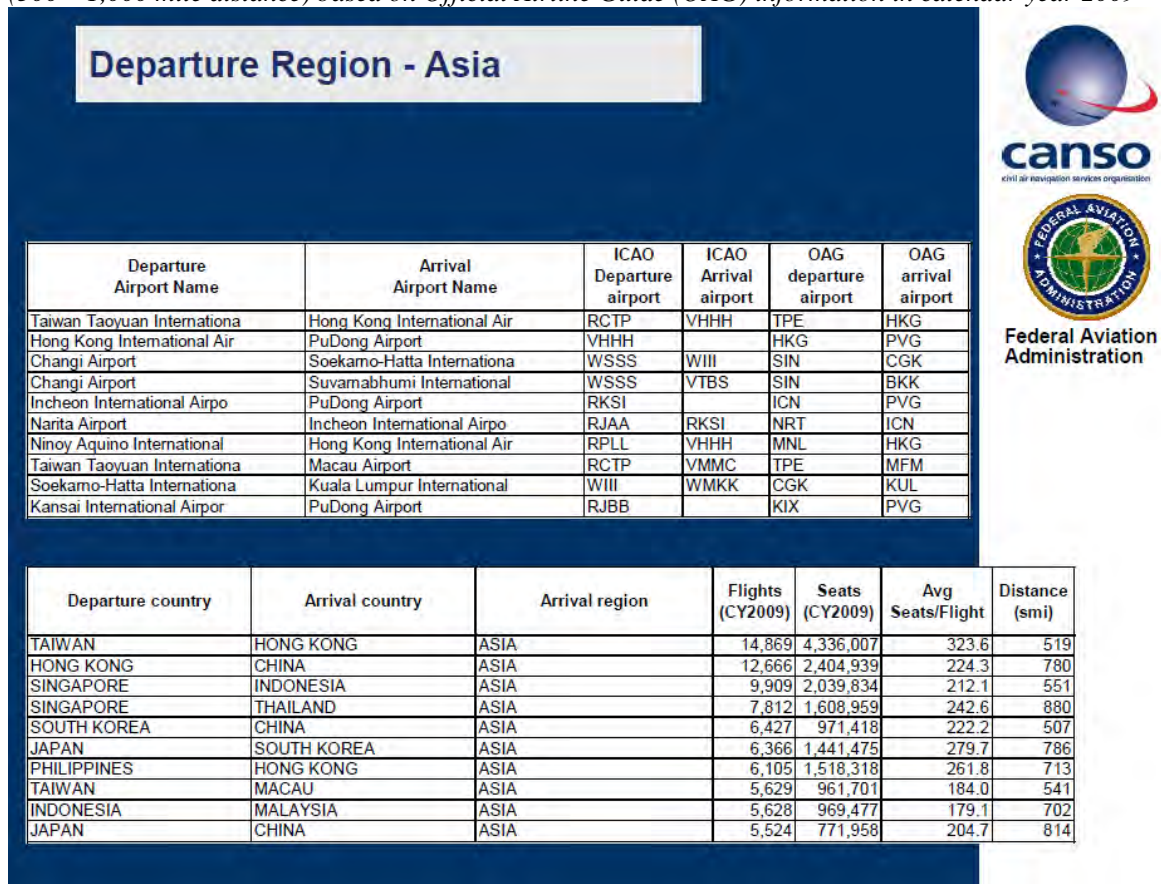
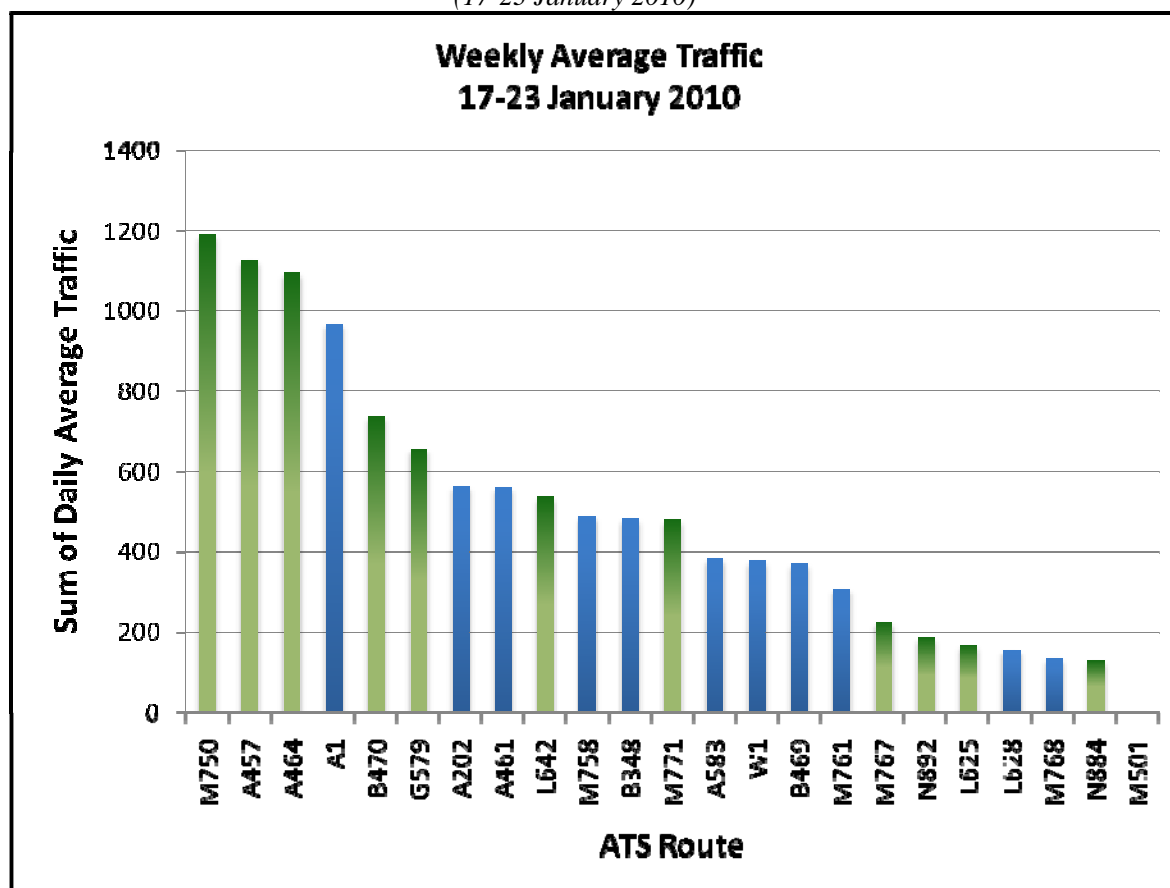


Figure 10: Average Weekly Traffic on Current ATS Route Structure
 (17-23 January 2010)



Note: Green bars represent uni-directional routes while blue bars represent bi-directional routes

4.25 The meeting thanked the Data Statistics and Analysis Working Group for their efforts in giving an overall picture of the present situation. This type of data will be extremely useful when the task force becomes more involved in the decision making of the final product of realignment of the present route structure and the introduction of additional routes to increase efficiencies in the area under consideration.

4.26 In studying the data presented, it was observed that there were some gaps in the data collection process which could have an adverse effect on data quality. Accordingly the meeting was strongly encouraged to supply all the requested data each month at the regular time, in order for the Data Statistics and Analysis Working Group to give the meeting an accurate presentation of the present disposition of traffic to base important decisions in the future, not only on the major traffic flows and crossing routes but also in other areas under consideration by the meeting.

4.27 IATA advised the meeting that the data collection and analysis was extremely important in support of the Task Force. However they noted that the data was only indicative of current traffic figures, IATA felt it was necessary to extrapolate the figures to indicate what future traffic requirements would be. They proposed using 2012 and 2016 as target dates in alignment with the PBN Regional plan. IATA proposed a range of predicted growth (e.g. 3,6,12%) would better support plans for the establishment of new routes or separations and could aid early identification of potential issues.

Agenda Item 5: Implementation of the New CNS/ATM Systems in the Region

5.1 *There was no discussion under this agenda item.*

Agenda Item 6: ATS Route DevelopmentRNAV Route Adjustments in the SEA Area*Unidirectional routes replacing A202 and A1*

6.1 The meeting recalled that, at the SEA-RR/TF/1 meeting, in order to increase efficiency in route design which would also reduce track miles and carbon emissions, consideration should be given to some variations of the present route structure as well as looking at the feasibility of using specific unidirectional routes where traffic density demanded. Two examples where this strategy could be used was in respect to ATS route A202 and A1.

6.2 Both of these routes were between Bangkok and Hong Kong. The diagram shown in **Appendix E** was generic in nature however it gives examples of 2 pairs of routes under full radar coverage, where significant benefit could be obtained to both the users and the providers of the ATS service in the area concerned.

6.3 As an example of close spaced parallel RNAV routes, the meeting noted that in the Gulf area of the Middle East region, States concerned have developed a route structure under full radar/VHF coverage which optimises the airspace by the development and implementation of RNAV 5 procedures. Lateral spacing of RNAV routes varies between 10 to 20 NM, depending on the circumstance. This innovative route orientation has been in effect for several years in several FIRs and ACCs reports indicate that the procedures provide safe, efficient and operational benefits to aircraft and ACCs alike.

6.4 It was suggested to the meeting that this type of model deserves serious consideration in the SCS area, especially where, by slight amendment to the present route structure, some routes presently outside full radar/VHF coverage could be included under RNAV 5 procedures and gain the benefits mentioned in para 6.3 above.

6.5 The meeting recognized that there were other considerations to consider such as military issues which could affect the nature of this proposal. Nevertheless, consideration of this methodology, with appropriate civil/military coordination, has brought positive results in the past within the area under consideration.

Realignment of L642 and M771

6.6 The meeting was also asked to consider whether it would be possible to move segments of the present two the RNAV RNP 10-50 NM separation routes L642 and M771 between Ho Chi Minh FIR and Hong Kong FIR to the west of their present position so that both routes could be considered as RNAV 5 routes under full radar and VHF coverage.

ATS route implementation and proposals for new routes

6.7 Viet Nam advised the meeting that they have developed a comprehensive Plan for establishing as well as revising both domestic and international ATS routes within their FIRs. Within this process they have closely coordinated with Vietnam Airlines, Vietnam Air Navigation Services

Corporation, Regional Airport Corporations and respective Military Agencies in finalizing this Plan with various optimum ATS route options.

6.8 These routes would reduce flight distance and time as well as facilitate flight and ATC operations. CAAV advised the meeting that they highly appreciate the close coordination and assistance made by ICAO Regional Office, Lao DCA, SSCA, CAAS, CAAC and other Civil Aviation Authorities concerned in this process.

6.9 The meeting also noted that Viet Nam has significantly improved and gained efficiencies as a result of many changes to their domestic route structure.

6.10 In the regard to international ATS routes, the coordination meeting between CAAV and Lao DCA resulted in the following initiatives:

- a) A new ATS route B214 NASAN – LADON – AKSAG (serving traffic between Ha Noi and Europe) and extension of ATS route B329 from PAKSE to VILAO – NAMHA (serving traffic between Ha Noi and Phnom Penh). Both initiatives were implemented in January 2010.

6.11 In addition, the following improvements were also noted:

- a) A new RNAV route Q15 Cam Ranh – MESOX within Ho Chi Minh FIR serving traffic between Ho Chi Minh City and Northeast Asia as well as future international traffic to/from Cam Ranh airport;
- b) Extension of ATS route G221 from BUNTA to Phu Cat within Ho Chi Minh FIR serving traffic between Ho Chi Minh City/Kuala Lumpur and Hong Kong (China)/Northeast Asia as well as future traffic between Ho Chi Minh City and Hainan island) which was introduced in March 2010;and,
- c) The ATS/RNAV routes W2, A206, B468, M771 have been revised including supplementing Compulsory/Non-Compulsory reporting Points, re-alignment via new reporting point and revision of coordinates/replacing reporting point.

ATS routes to be implemented

6.12 In coordination with SSCA Cambodia, 2 new ATS routes/segments were agreed to, with a proposed implementation date in July 2010:

- a) A new ATS route R213 Can Tho – VOR/DME Phnom Penh (serving future traffic between Can Tho City and Phnom Penh/Bangkok/Vientiane); and,
- b) Extension of ATS route R334 Bangkok – Koh Kong to Shihanoukville and Phu Quoc (serving future traffic between these destinations).

6.13 Following a coordination meeting between CAAV and CAAS, which was convened in February 2010, agreement was reached for a new unidirectional RNAV route M756 ENREP - Tan Son Nhat, serving traffic between Singapore and Ho Chi Minh City as well as future traffic to Can Tho City. The target date of implementation will be defined after the operational route assessment is completed.

6.14 The meeting was advised that a coordination meeting was held in 2009 between CAAV and CAAC to investigate the possibility of an ATS route between Cat Bi – NANKANG serving traffic between Ha Noi/Haiphong and Hong Kong/Northeast Asia. This coordination meeting agreed to the proposal in principle and both CAAV and CAAC will further discuss technical matters.

6.15 Following a request from SSCA Cambodia, a proposed new route/segment serving traffic between Phnom Penh and Northeast Asia within Ho Chi Minh FIR is under consideration and further study by CAAV. The final solution would be made in conjunction with a study on route/corridor to/from Chu Lai airport which has planned to be upgraded to an international airport in the near future.

6.16 The meeting was also advised that, In order to reduce flight distance for aircraft operating between Ha Noi and Siem Riep, CAAV proposed a new ATS routes via VILAO – UBON to Siem Riep, which passes through Vientiane, Bangkok to Phnom Penh FIRs, Bangkok and Vientiane FIRs. This route considerably reduces the flight distance and time however, due to military issues within the Bangkok FIR on the described proposed route, no agreement could be reached at this meeting. Thailand advised the meeting that they would discuss this proposal with their military counterparts and coordinate the results to all parties concerned.

6.17 A chart depicting this proposed route is in **Appendix F** to this report.

IATA review on South China Sea routes

6.18 IATA presented a review of the South China Sea routes and proposed the short-term availability of RNP4 separations to provide increased efficiency.

6.19 IATA summarised the scope of the RNP-SEA noting that the application of 50nm longitudinal separation only applies to L642/M771. This is due to the lack of datalink capability within the Manila FIR. APANPIRG adopted conclusion 19/12 calling for accelerated implementation of datalink within Manila FIR.

6.20 The Philippines confirmed at the meeting that their datalink system with an upgraded ATM system was scheduled to be installed mid 2010 with an expected datalink trial commencing Q4 2010. The initial trial will be in the Eastern portion of their airspace to test the capabilities in a low density area of their FIR. It is expected that the trial will expand to the western portion of the Manila FIR in 2011. The meeting noted that this indicated full operational datalink services could be expected in 2012.

6.21 IATA then reviewed discussion from SEA-RR/TF/1 noting the proposals for increased efficiencies in the short-term. The primary SCS routes L642/M771 already enjoy almost complete surveillance and VHF coverage with only one gap between Singapore and Vietnam.

6.22 The South China Sea ADS-B project represents a solution to this gap with ADS-B receivers and VHF transceivers co-located. At SEA-ADS-B WG/5 in January 2010, proposed timelines were presented that should enable operational separations to be applied based on ADS-B late 2011/early 2012. As such the principles of RNAV5 may provide more advantages to stakeholders than RNP4, based on the complete surveillance and VHF coverage expected. However there were several requirements that still need to be fulfilled which may delay RNAV5 until approximately 2014.

6.23 In the meantime, based on the traffic data available, there is potential benefit in pursuing the application of RNP4 separations between suitably equipped aircraft. With the potential for RNAV5, there is no need to redesignate the route, but availability could provide ATC with increased efficiencies and capacity.

6.24 Singapore supported the proposal that RNP4 separation should be available on L642/M771 in the short term.

Establishment of Uni-directional RNAV Routes between South East Asia and China

6.25 IATA recalled the discussions at TF/1 where a summary of the major traffic flows identified the 22 busiest airports.

6.26 IATA believed significant benefits would be enabled by establishing uni-directional RNAV routes between Bangkok-Beijing and Bangkok-Shanghai. This would not only serve traffic between these airports but also for Malaysia, Singapore and potentially beyond.

6.27 IATA noted that the extensions was outside the prime area of focus for the SEA-RR/TF but asked for endorsement of the concept and referral to the appropriate forum for consideration.

6.28 China advised the meeting that all proposals put forward at this task force affecting China will be carefully considered by CAAC and ATMB.

Establishment of RNAV5 Corridor between Singapore and Indonesia

6.29 IATA referred to the BOB-RHS/TF/2 meeting held in February 2010, where Indonesia and Singapore jointly presented their plans for the redesignation of two routes as RNP 10 and for the application of 50nm longitudinal separations on these routes commencing in Q4 2010. This same information was further presented to this meeting.

6.30 IATA endorsed the implementation of these routes as RNP10 but noted the application of RNP10 50nm longitudinal and RNP4 30/30 separation contain specific aircraft requirements in surveillance and communication. These requirements can be extremely costly to airlines and can limit the effectiveness of efficiencies associated with the RNAV routes.

6.31 The implementation of RNAV5 however, does not place the same requirements on the aircraft as it is based on direct surveillance and VHF communications. With the exception when surveillance requires ADS-B, most commercial aircraft operating within this region could comply with RNAV5 with little difficulty.

6.32 The establishment of RNAV5 routes can deliver substantial benefits with route spacing generally between 10-30nm depending on the safety assessment. Separations are based on ATM capabilities.

6.33 IATA noted that the “triangle of routes” between Singapore-Bali-Jakarta-Singapore enjoy complete coverage utilising radar and VHF. This will be further enhanced in the future with ADS-B. It was also noted that Indonesia had experienced traffic growth of approximately 20% over the past few years with many routes being heavily loaded.

6.34 While endorsing the current plans for the implementation of RNP10 and associated separations, IATA suggested that in establishing RNP4, the needs of all stakeholders could be better supported with the establishment of RNAV5 uni-directional routes within this “triangle”. Singapore recognised the benefits of RNAV5 however guidance material from ICAO on the safety assessment methodology and requirements for RNAV5 Operations would be appreciated. ICAO agreed to look into this matter through RASMAG.

6.35 IATA noted that some experience in the region already existed with Japan establishing their “Sky Highway” in Oct 2009 and the “triangle” could easily be extended into adjacent routes based on the capabilities and traffic needs.

6.36 Taking this initiative into account, it was suggested to Singapore and Indonesia to:

- a) Continue with their current RNP10 plans as announced;
- b) agree in principle with the establishment of RNAV5 corridor with uni-directional routes between Singapore-Bali-Jakarta-Singapore with the objective of implementing in 2011; and,
- c) Consider the requirements to establish firm plans and timelines.

6.37 Indonesia noted that the plans would have to be in alignment with the ICAO Regional PBN plan but otherwise endorsed the principle.

6.38 Singapore and Indonesia agreed to review the requirements with a view to establishing firm plans and timelines

Re-alignment of ATS Routes to meet RNP 10 Requirements

6.39 Indonesia advised the meeting that they intended to upgrade 8 conventional ATS Routes to RNAV(RNP) 10 routes. The ATS routes included in this change are as follows:

ATS Routes Transformation		FIR
Conventional/Existing	RNAV	
B344	L774	WIIF
B584	M522	WAAF
A464	M774	WIIF, WAAF
G462	M766	WIIF, WAAF
B583	M768	WAAF
A214	N628	WIIF
B335	N633	WIIF
A327	P627	WIIF
B592	P648	WIIF
R456	P756	WIIF

6.40 The meeting was advised that Indonesia and Singapore have agreed to implement the program on a step by step basis. In this regard, one of the steps is to focus on two of the major routes that operate to/from South-East Asia and Australasia. These two routes are A464 and A576. The current minimum longitudinal separation on these 2 routes is 10 minutes based on the Mach number technique.

6.41 Based on the feedback gathered from operators, the vast majority of the flights flying on these 2 routes already have RNAV10 capabilities. The schedule on reduction of longitudinal separation is as follows:

- a) April 2010 - Implementation of RNAV10 route M774 and lowering the upper limit of ATS route A464.
- b) 3rd Quarter 2010 - Targeted implementation of RNAV10 route M635 and lowering the upper limit of ATS route A576 and implementation of 50 NM lateral separation in Singapore FIR
- c) 2nd Quarter 2011 - Targeted implementation of 50NM longitudinal separation of 50NM on both M635 and M774.

6.42 The meeting was advised that prior to the implementation of the EMARSSH Route Structure which involved Indonesia on routes to/from Australia, Indonesia implemented RNP10 routes within Indonesia airspace. One such route was L511 which served flights to/from Australia to South East Asia. However the meeting noted that L511 has some route segments which are less than 50 NM laterally separated with ATS route A576 (between BLI to SUMBU).

6.43 The meeting was advised that, in order to have both routes laterally separated for RNAV RNP 10 operations, Indonesia intends to redesignate of A576 to an RNP 10 route M635 as well as continue the usage of L511, In addition it is proposed to realign M635 (presently A576) to the North between BLI – SUMBU to BLI – RAMPY – AKULA . This action will give a small mileage increase in this change however the overall benefit with the implementation of both RNAV will more than compensate this small mileage increase. The meeting thanked Indonesia and Singapore for the work they have achieved in coordination between each other.

Agenda Item 7: Develop a Coordinated Plan for Implementation of Actions Agreed by the Meeting

7.1 The meeting updated the Task List which is at **Appendix G** to this Report.

Agenda Item 8: Any Other Business

8.1 Sri Lanka presented information to the meeting on their proposal to establish an ATS Route Network for the New Hambantota International Airport in Sri Lanka. A chart describing the proposed traffic flow into and out of this new facility is at **Appendix H** to this report.

Agenda Item 9: Date and Venue for the Next Meeting

9.1 It is proposed that the next meeting will be over 4 days from 17 to 20 August 2010.

Closing of the Meeting

9.2 In formally closing the SEA-RR/TF/2 meeting, the Chairman, Mr. Peter Rabôt advised that this meeting had been tasked to review, recommend and implement changes where necessary to the SEA Route Structure with the sole purpose of improving efficiency and reducing the impact of aviation on the environment.

9.3 The Chairman noted that, a group that is dedicated and committed to wanting change such as this task force would overcome the various obstacles which are often in the path, to achieve the overall purpose of the project. He sincerely thanked all participants for their cooperation and willingness to move forward on this project. The Chairman expressed the view that this is all testimony to the true cause, which is to assist all our customers, the airlines, as well as help our controllers with the increasing volume of traffic this region is experiencing.

9.4 He looked forward to the next task force meeting and was confident that continued improvements in the development of the routes in SEA will be achieved under the leadership and guidance of ICAO and with the cooperation between States and other aviation administrations involved.

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ICAO ADDRESSES SHORTAGE OF SKILLED AVIATION PROFESSIONALS

March 9, 2010 — oacicomm

ICAO recently hosted a five-day event addressing the challenge posed by an anticipated shortage of skilled aviation professionals. Representatives from States, industry, training institutions and students defined and quantified the problem, proposed approaches to solve the problem and outlined the leadership role of ICAO in generating cooperation among concerned stakeholders towards reaching and implementing solutions.

Statistics

- In the next 20 years, airlines will have to add 25,000 new aircraft to the current 17,000-strong commercial fleet
- By 2026, we will need 480,000 new technicians to maintain these aircraft and over 350,000 pilots to fly them
- Between 2005 and 2015, 73% of the American air traffic controller population is eligible for retirement

The underlying problem

Simply stated, the demand for aviation professionals will exceed supply. Factors include:

- wholesale retirements in the current generation of aviation professionals
- aviation professions not attractive enough to potential candidates
- competition with other industry sectors for skilled employees
- training capacity insufficient to meet demand
- learning methodologies not responsive to new evolving learning style
- accessibility to affordable training
- lack of harmonization of competencies in some aviation disciplines, and
- little awareness by the "next generation" of types of aviation professions available.

Solutions

Solutions must be globally-harmonized in nature and include human resource planning tools, accredited training and educational programmes adapted to the next generation, and wide-ranging cooperation among concerned stakeholders.

ICAO's role in solving the problem

and moving forward

In 2009, ICAO established the Next Generation of Aviation Professionals Taskforce, consisting of 29 representatives from industry, education and training providers, regulatory bodies and international organizations. Near-term objectives are to: inventory human resources planning data; identify and support initiatives to reach out to the next generation; and, find ways to harmonize training regulations. The Task Force will also support initiatives relating to the next generation of aviation professionals.

ICAO and the International Air transport Association (IATA) are collaborating on this issue, generating synergy between ICAO's Next Generation of Aviation Professionals Taskforce and IATA's Training and Qualification Initiative (ITQI). IATA is supportive of global harmonized standards and will be implementing evidence-based training and as well as competency-based training for engineering and maintenance.

Looking ahead, the following are planned:

- In 2010, ICAO will develop a new training policy that will allow the Organization to endorse aviation training institutions by 2011.
- By the end of 2011, the Next Generation of Aviation Professionals Taskforce will complete the development of competencies for most of the Annex 1 (Personnel Licensing) functions including: airline transport pilots (ATPLs), air traffic controllers, and maintenance.

Along with all aviation training stakeholders, ICAO is committed to creating an environment that will allow the next generation to lead in the development of aviation's future. This includes maintaining active lines of communication with the students as the Next Generation of Aviation professionals.

All presentations made at the Symposium are available on the ICAO website : www.icao.int

LIST OF WORKING PAPERS (WPs) AND INFORMATION PAPERS (IPs)

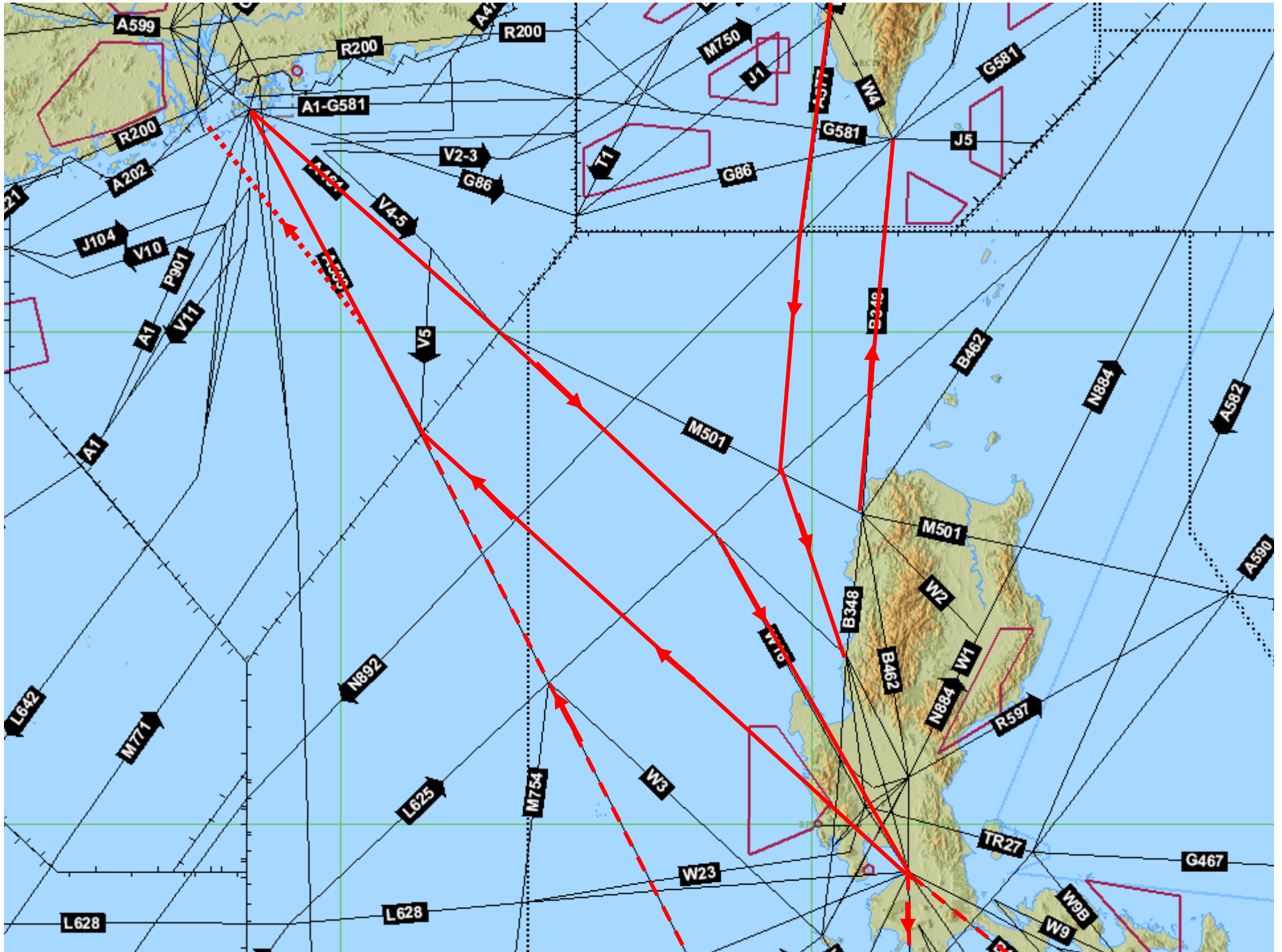
WORKING PAPERS

NUMBER	AGENDA	WORKING PAPERS	PRESENTED BY
WP/1	1	Provisional Agenda	Secretariat
WP/2	2	Review of SEA-RR/TF/1 Meeting	Secretariat
WP/3	6	RNAV Route Adjustments in SEA Area	Secretariat
WP/4	4	Unidirectional Crossing Routes	Secretariat
WP/5	4	Formation of Dedicated Small Working Groups	Secretariat
WP/6	6	ATS Route Implementation and Proposals for New Routes	Viet Nam
WP/7	7	Update SEA-RR/TF Task List	Secretariat
WP/8	6	South China Sea Route	IATA
WP/9	6	Establishment of Uni-directional RNAV Routes between South East Asia and China	IATA
WP/10	6	Proposed Establishment of a Uni-directional Route Structure within the Manila FIR	Philippines
WP/11	6	Establishment of RNAV5 Corridor between Singapore and Indonesia	IATA
WP/12	4	Analysis of One Week Traffic Sample Data submitted by States	Singapore Thailand
WP/13	6	Re-alignment of ATS Route to meet RNP10 Requirement	Indonesia

INFORMATION PAPERS

NUMBER	AGENDA	INFORMATION PAPERS	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	6	Reduced Horizontal Separation on RNAV Routes between Indonesia and Singapore	Indonesia Singapore
IP/3	8	Establishing an ATS Route Network for the New Hambantota International Airport in Sri Lanka	Sri Lanka

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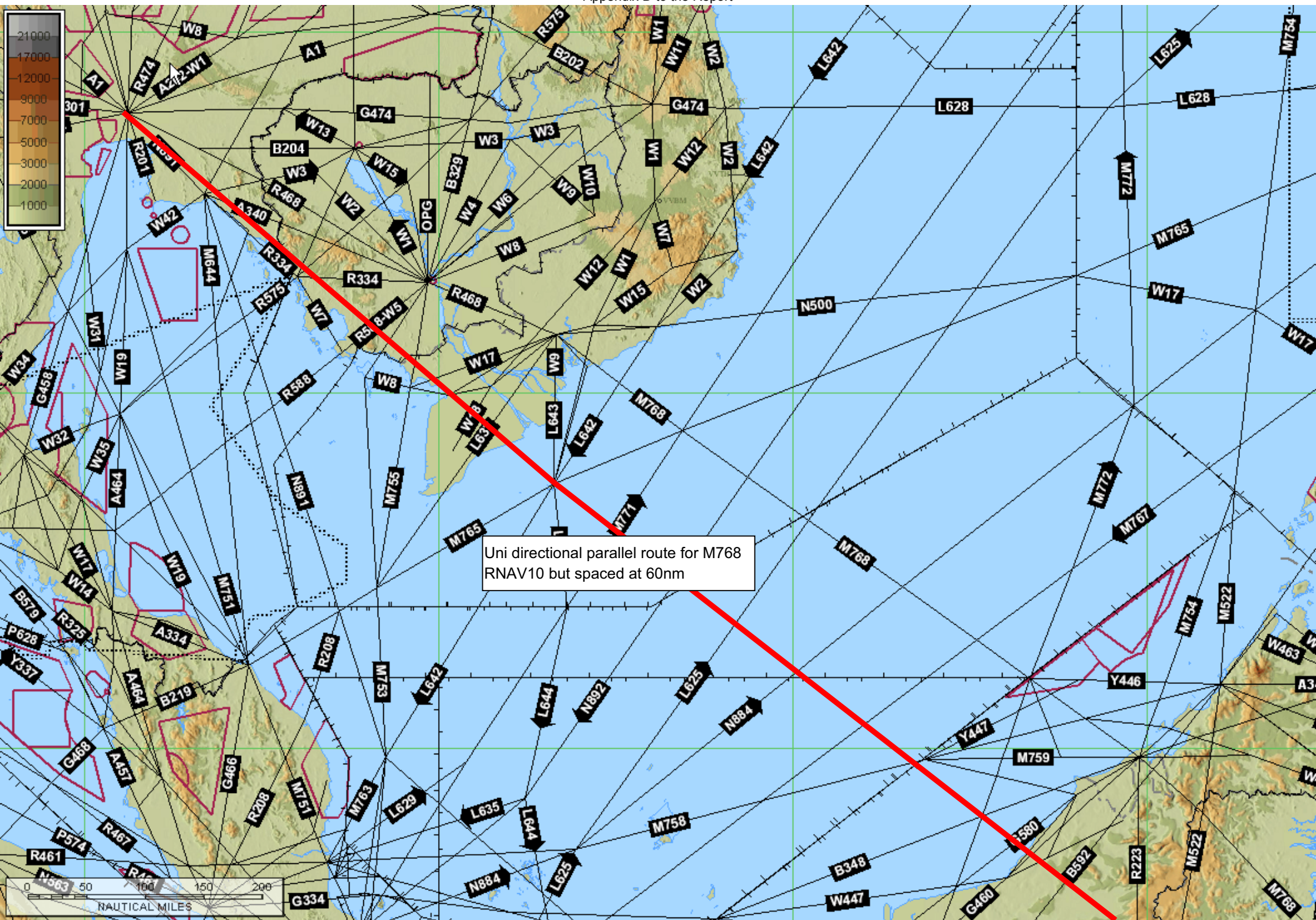
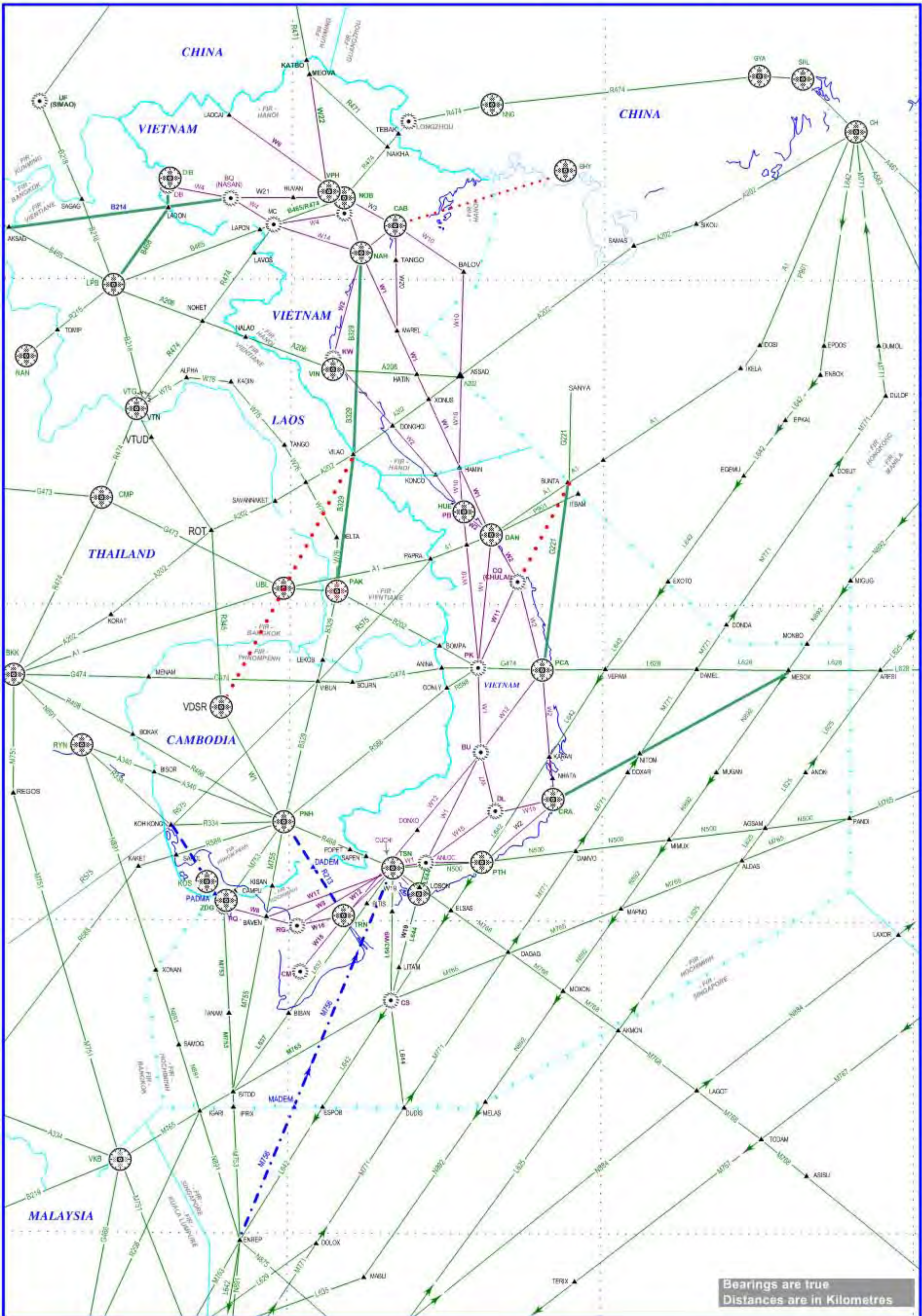


CHART OF PROPOSED NEW AND REVISED ATS ROUTES



SEA-RR/TF/2
Appendix G to the Report

TASK LIST

SN	Activity	Start	Completed	Present Status	Group Responsible
	Identify Operational Need				
	Agree on operational needs for a route review in South China Sea area				
	Safety Assessment				
	Review available summary data (non-compliant aircraft, aberrant aircraft etc)				
	Examine history of navigational errors and assess possible impact on safety				
	Confirm collision risk model assumptions/parameters are consistent with airspace where the routes are being reviewed. 50 NM longitudinal separation is to be applied				
	Collect weather and turbulence data for analysis				
	Report monthly navigational errors (including operational errors) to Enroute Monitoring Agency				
	Collect traffic sample data for safety assessment for the routes under review. 50 NM longitudinal separation implementation				
	Conduct a Safety Assessment				
	Feasibility Analysis				
	Examine the operational factors and workload associated with the routes under review. 50 NM longitudinal separation implementation				
	Determination of Requirements (airborne & ground systems)				
	States assess the impact of the routes to be implemented 50 NM longitudinal separation implementation on controller automation systems and plan for upgrades/modifications				
	Aircraft & Operator Approval Requirements				
	Promulgate the operational approval process of RNP 10 PBN requirements				
	Notify States when significant changes occur to the 50 NM longitudinal separation documentation				
	Perform Rulemaking (if required)				
	Recommend State airspace regulatory documentation				
	Perform Necessary Industry & International Co-ordination				
	Establish target implementation date				
	Report to SEACG ATM/AIS/SAR/SG				
	Process Doc 7030 amendment				
	Publish advance AIC				

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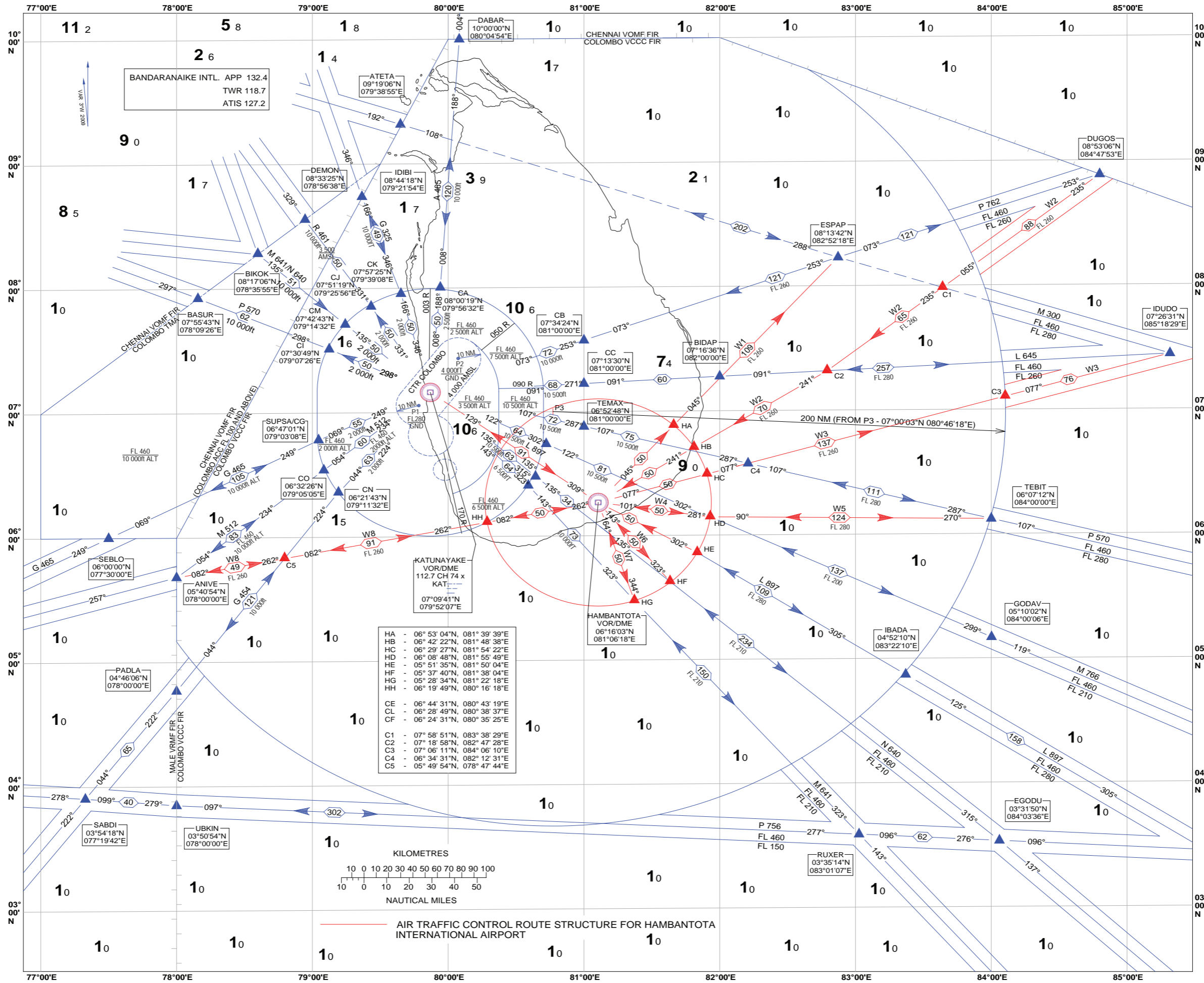
TASK LIST

SN	Activity	Start	Completed	Present Status	Group Responsible
	Publish AIP Amendment containing the 50 NM longitudinal separation policy/procedures				
	Review inter-facility coordination procedures				
	Finalize changes to Letters of Agreement				
	Approval of Aircraft & Operators				
	Establish approved operations readiness targets				
	Assess operator readiness				
	Develop Pilot & ATC Procedures				
	Review weather and contingency procedures. for applicability under the 50 NM longitudinal separation				
	Conduct simulation modelling to assess impact of the 50 NM longitudinal separation operations				
	Report on simulation activity				
	Develop procedures for handling non-compliant aircraft in ATS documentation				
	Develop mutually acceptable ATC procedures for non-approved State acft to transit the reviewed routes 50 NM longitudinal separation airspace				
	Implement procedures for suspension of the reviewed routes. 50 NM longitudinal separation				
	Liaise with State defense authorities regarding military operations				
	Pilot & ATC Training				
	Provide Pilot/ATC training documentation based on past experience				
	Conduct local the 50 NM longitudinal separation training for air traffic controllers				
	Perform System Verificiation				
	Navigational performance monitoring needed to undertake initial safety analysis				
	Provide representative traffic movement data to Safety Monitoring Agency				
	Undertake initial safety analysis				
	Prepare/maintain regional status report detailing the routes 50 NM longitudinal separation implementation plans				
	Final Implementation Decision				
	Review aircraft navigational performance and operational errors				
	Complete ATS State documentation				
	Publish Trigger NOTAM				

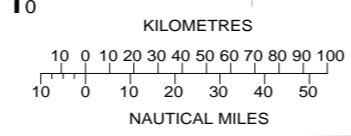
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TASK LIST

SN	Activity	Start	Completed	Present Status	Group Responsible	
	Complete readiness assessment					
	Complete safety analysis					
	Declare Initial Operational Capability					
	Monitor System Performance					
	Perform Follow-On Monitoring					
	Adopt New route and associated separation					
	Declare Full Operational Capability					
	Meetings					
	Task Force/XX (Bangkok)					



HA	- 06° 53' 04"N, 081° 39' 39"E
HB	- 06° 42' 22"N, 081° 48' 38"E
HC	- 06° 29' 27"N, 081° 54' 22"E
HD	- 06° 08' 48"N, 081° 55' 49"E
HE	- 05° 51' 35"N, 081° 50' 04"E
HF	- 05° 37' 40"N, 081° 38' 04"E
HG	- 05° 28' 34"N, 081° 22' 18"E
HH	- 06° 19' 49"N, 080° 16' 18"E
CE	- 06° 44' 31"N, 080° 43' 19"E
CL	- 06° 28' 49"N, 080° 38' 37"E
CF	- 06° 24' 31"N, 080° 35' 25"E
C1	- 07° 58' 51"N, 083° 38' 29"E
C2	- 07° 18' 58"N, 082° 47' 28"E
C3	- 07° 06' 11"N, 084° 06' 10"E
C4	- 06° 34' 31"N, 082° 12' 31"E
C5	- 05° 49' 54"N, 078° 47' 44"E



— AIR TRAFFIC CONTROL ROUTE STRUCTURE FOR HAMBANTOTA INTERNATIONAL AIRPORT