



# **INTERNATIONAL CIVIL AVIATION ORGANIZATION**

## **Third Meeting of South China Sea Major Traffic Flow Review Group (SCS-MTFRG/3)**

### **FINAL REPORT**

**25-27 February 2016  
Bangkok, Thailand**

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

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## **FINAL REPORT**

### **1. Introduction**

1.1 The Third Meeting of South China Sea Major Traffic Flow Review Group (SCS-MTFRG/2) was held at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand, from 25 to 27 February 2016.

1.2 The SCS-MTFRG/3 was attended by 28 participants from 08 States and administrations, and 02 International Organizations. The relevant presentations and documents are available at <http://www.icao.int/APAC/Meetings>. The list of participants is contained in Attachment 1.

### **2. Officers & Sub-Regional Office**

2.1 Mr. Pehrinba Renganathan, Regional Officer ATM (AOM-ASM) and Mr. Liu Song, Regional Officer ATM (AOM-FUA) from the ICAO APAC Regional Sub-Office, Beijing moderated the meeting and acted as secretaries.

### **3. Opening of the Meeting**

3.1 Mr. Pehrinba Renganathan commenced proceeding by welcoming everyone. He recalled the progress made and efforts taken by the group members in past two meetings, and highlighted that encouraging progress was being made, albeit a little hesitantly and urged the participants to put in greater effort to bring some of the suggestions to fruition sooner rather than later.

3.2 Mr. Len Wicks from the Regional Office was invited to say a few words. Mr Wicks drew the attention of the participants of the challenges faced by everybody and encouraged group members take an innovative approach to push forward the optimization of the airspace structure in South China Sea area.

3.3 The participants thereafter did self-introduction.

3.4 The working language of the meeting and all documentation was English. A total of 05 Working Papers (WP) and 03 Information Papers (IP) were considered by the meeting. The list of papers deliberated is included as Attachment 2 to this report.

### **4. Meeting Report**

#### **4.1 Agenda Item 1: Adoption of Agenda**

**4.1.1** The provisional agenda as listed in WP01 was adopted unanimously by the meeting without any changes upon the proposal by IATA and seconded by Singapore. The Agenda for the meeting can be found in Attachment 3 to this report.

**4.1.2** The Secretariat reviewed the report of the previous meeting and highlighted that though there were good discussions on the various issues, there had not been any significant

tangible progress. The secretariat emphasised that greater effort and commitment was required to further the objectives of the group.

#### **4.2 Agenda Item 2: Review of the current and planned CNS/ATM capabilities and identifying associated reduced horizontal separation.**

##### **WP03: VHF, SSR, and ADS-B Coverage in WPAC/SCS**

**4.2.1** Thailand, with the assistance of MAAR, was tasked to compile data on communications and surveillance capabilities within the SCS Area.

**4.2.2** The data presented was well received by the participants. The key observation was that most of the areas under the purview of this group were in fact well served by either SSR or ADS-B surveillance coverage. Of great significance was the fact that only a reasonably small portion of the SCS airspace was without any Surveillance/VHF coverage. The respective charts can be found in Appendices 1 and 2

**4.2.3** ICAO asked Hong Kong about the gap in surveillance in the South-Western corner of their FIR. Hong Kong explained that they had to withdraw the surveillance services in that portion of their airspace due to the presence of many ghost targets which could not be resolved satisfactorily. They expect this problem to be overcome after the implementation of their new ATM System.

**4.2.4** China informed the meeting that surveillance capability within Sanya FIR had overlapping cover over that portion of the Hong Kong FIR and would consider surveillance data sharing.

**4.2.5** Hong Kong suggested that the ADS-B Implementation Task Force be requested to assist in surveillance data sharing as this was already under their purview. ICAO hoped that this sharing of data be facilitated without any political connotations.

**4.2.6** The USA informed the meeting about the use of the many oil rigs in the Gulf of Mexico as platforms for ADS-B equipment and in remote Alaska, they even used ships at sea as surveillance platforms. ICAO hoped that this approach may help plug the hole in the small portions of the SCS that were not covered by the surveillance.

**4.2.7** Hong Kong asked if the implementation of the new systems in the Philippines can improve surveillance within the FIR. IATA hoped that a state by state update will provide the actual coverage information and hoped that the ADS-C/CPDLC implementation programme would help cover some of the gaps in surveillance coverage.

**4.2.8** Singapore reported that they have integrated the ADS-B data from the ADS-B ground stations on the Indonesian Islands of Natuna and Matak into their ATM system. The ADS-B data were still not being used for ATC operations as flight checks to determine the vertical and horizontal coverage had just been completed and the results were being analyzed at the moment.

**4.2.9** IATA congratulated MAAR on the excellent job of compiling the surveillance data and was hopeful that with the ongoing implementation of the ADS-C/CPDLC within the Manila FIR would enable routes to be upgraded to RNP4 – 30/30.



**4.2.10** ICAO congratulated MAAR on their efforts and opined that since most of the airspace involved was now within surveillance coverage, it may be more useful to identify those areas that were not covered by surveillance.

#### **IP02 Operation of New Air Traffic Control Center In Ha Noi FIR**

**4.2.11** Viet Nam informed the meeting that VATM had commissioned a new ATCC for the Ha Noi FIR on 11th January 2015, and was equipped with the modern ATM automation systems incorporating functions such as safety monitoring, AMAN/DMAN, flight data processing, air ground data processing, radar and ADS-B surveillance etc.

**4.2.12** With the operation of Ha Noi ATCC, the separation between Ha Noi ACC and Vientiane ACC has been reduced to 20 NM on ATS routes A1, A1/R575, A202, B329, R328, R335, R474 and ATS routes A206, B465, B214 eastbound. The separation between Ha Noi ACC and Sanya ACC on the ATS routes A202/A206/A1 is 30NM. ICAO recalled that the airspace was category S so the advent of a separation standard close to PANS-ATM (5NM) in conformance with the Seamless ATM Plan was expected. The total movements controlled by Ha Noi ACC in a typical day increased from 791 to 1160.

**4.2.13** ICAO congratulated Viet Nam on the improvement of the ATM capability in Ha Noi FIR, and was pleased to note that there were no reports of any disruptions to services during the transition. IATA congratulated Viet Nam on the progress and modernisation of facilities.

**4.2.14** China informed the meeting that they were conducting lateral offset on R474 and asked if Vietnam had any plans to implement this in the Hanoi FIR. Viet Nam informed the meeting that it was possible to implement the offset procedure after overcoming some coordination issues. ICAO offered to assist Viet Nam in CMAC in any way possible. Viet Nam informed that CMAC was in fact ongoing.

**4.2.15** The secretariat, in furthering the work of the group revisited the various PBN NavSpecs that were discussed in *SCS MTF/2 - IP01*. In view of the 2018 timeline specified in the APAC Seamless ATM Plan for RNP2, the meeting reached a consensus that the approach taken would be to start the planning based on RNAV2 specifications with a view to transitioning to RNP2 at the appropriate time. The 'PBN in a Page can be found as Attachment 4

#### **4.3 Agenda Item 3: Review of the existing MTF Route structure in SCS Airspace and identifying priorities**

##### **WP 04 WPAC/SCS 2015 Traffic Sample Data Visualization**

**4.3.1** Thailand, through MAAR compiled the TSD from all states involved and presented the data in pictorial form for better visualisation of the main traffic flows within the SCS Area. MAAR explained that due to the different sources of data provided by the states, the visualisation provided would not be very accurate, but was sufficiently robust to indicate the general flow densities. The thickness of the lines indicated density, and colour coding helped visualise the East - West Bound flows. The visualisation can be found as Appendix 3 to this report

**4.3.2** Hong Kong inquired if the flows can be categorised by flight levels for N892/L625. MAAR informed that this was possible, and they only need the route segment (fix pairs) to be specified.

**4.3.3** ICAO opined that it may be more relevant to work based on airspaces rather than specific flows, for instance the difficulties experienced on A1/A202. Solutions to current problems may need to be approached in a phased manner, initially starting with RNAV2 as an interim measure while awaiting the planned timeline for the implementation of RNP2 and utilising the excellent surveillance and communications capabilities before looking towards implementing new routes.

**4.3.4** USA commended on the excellent data compilation as it was a good source of information for decision making. When coupled with the surveillance and communications data, it could assist in selecting the types of separation to be used, decide on current and future demands and how to meet these demands. Solutions could include the reduction of separation standards and/or additional routes. The meeting noted that the goal was for everyone to work towards eventual implementation of Free Route Areas (FRAs).

**4.3.5** Thailand suggested that the FLAS/FLOS information should be analysed systematically with up to date data and to be incorporated into the TSD visualisation to see if there was potential to reduce conflicts.

**4.3.6** Viet Nam highlighted their concerns about the difficulties they were encountering due to the FLAS/FLOS that limited the number of available levels for their traffic on the North/South axis which handled up to 673 flights per day whereas A1/A202 each handled only about 220 flights per day.

**4.3.7** MAAR explained that they had difficulty deciphering the Viet Nam domestic traffic data. The TSD MAAR received contains fewer flights on Viet Nam's domestic north-south route. Viet Nam and MAAR agreed to investigate the cause of this discrepancy. MAAR also added that the lack of appropriate coordinates may affect the traffic count as well. Viet Nam provided the missing coordinates during the meeting.

**4.3.8** It was pointed out that the gaps in the chart within the Sanya FIR was due to MAAR not having the necessary data in view of the Sanya FIR being under the purview of the China RMA.

**4.3.9** Hong Kong expressed concerns that increasing the number of routes available will not necessarily be advantageous as it would lead to more complexity and holding caused by terminal area congestion. ICAO opined that route spacing and ATFM were not directly related as it was a surveillance environment and suggested that appropriate ATFM measures should be instituted to address terminal capacity issues

**4.3.10** USA was of the opinion that more aircraft within an airspace was not necessarily a bad thing. If there was an unacceptable increase in workload, then it may be an issue.

#### **4.4 Agenda Item 4: Discussion on PBN Routes Development and FLAS/FLOS Optimization**

##### **WP 05 APAC ROUTE CATALOGUE**

**4.4.1** In presenting WP05, IATA reminded that they had already made adequate presentations pertaining to the APAC Route Catalogue in meetings 1 and 2 previously. IATA thereafter highlighted some key changes to user requirements.

**4.4.2** China explained that at the moment they were focusing on A1 and that the progress for A202 was taking more time than anticipated due to the need for further discussions and coordination with other airspace users.

**4.4.3** ICAO reminded that the driving force should be enhancement of capacity instead of restricting demand. IATA also highlighted the many proposals contained in the Asia/Pacific ATS Route catalogue had been there for many years because there had been no concerted effort by all players involved in implementing the proposals. IATA also pointed out A1 as a pertinent example. The SEA RRTF/5 had agreed to a solution and even set an implementation timeline for A1. However, today the stakeholders were still discussing the basics of a solution to the A1 issue.

##### **WP 06 CNS Replacement Plan in Hong Kong, China and Proposed Re-designation of ATS Routes within Hong Kong FIR**

**4.4.4** Hong Kong informed the meeting that most of the existing CNS equipment were nearing the end of their lifespans. After taking into consideration the advances in aviation technology, and with due consultation with the stakeholders in the industry and in view of the widespread application of GPS it would be prudent to decommission some ground NavAids. This would necessitate the re-designation of certain conventional routes to PBN NavSpecs. Hong Kong reminded that as some of the routes were part of the wider APAC Route Network and therefore their re-designation within the Hong Kong FIR would be notified to all concerned accordingly.

##### **IP 03 BANP ATS Route Amendment Template and Steps**

**4.4.5** The Secretariat presented IP03 to introduce the template and associated procedures for BANP ATS Route amendment, aiming to provide States with guidance when planning and implementing the new routes for international traffic. For new ATS route forming part of the regional network of ATS routes or changes to regional network of ATS routes, Proposal for Amendment (PfA) to the BANP need to be approved by ICAO Council.

**4.4.6** The IP reemphasised that when planning and pushing forward the implementation of PBN routes in South China Sea area, States are required to pay attention and comply with ICAO's requirements on BANP ATS route amendment.

**4.4.7** The Secretariat also informed the meeting that though an e-ANP is going to replace the legacy BANP this year, the procedure for the PfA will remain unchanged. The template and the guidance on the PfA is available on ICAO's website:

<http://www.icao.int/APAC/Pages/edocs.aspx>

**South China Sea Flight Level Allocation Scheme / Flight Level Orientation Scheme (FLAS/FLOS)**

Since one of the objectives of the SCS MTFRG was to review the FLAS and FLOS in use in the SCS Area, the secretariat presented the various levels in use, and some of the conditions that were attached thereof, like the NO PDC Levels, where transitioning was required and etc. The secretariat reminded the meeting that the FLAS/FLOS was devised at the turn of the century and that whilst it may have been very necessary then, the situation has seen much change. Among them was the extensive surveillance and communications infrastructure in place as well as changes to traffic flows in the intervening years. The meeting was reminded that in furthering the work of the group, the need to review and revise the FLAS/FLOS as appropriate needs to be given due consideration. ICAO also highlighted that there had been significant safety concerns raised by IFATCA and States (as well as RASMAG) about the non-standard SCS FLOS (by means of a FLAS), and that this airspace needed to return to the standard FLOS in Annex 2 Appendix 3a. ICAO also opined that capacity building should be achieved through alternative means such as extra ATS routes. The presentation is attached as Attachment 5.

**Workshop Session to start SCS MTF Route Development Planning**

**4.4.8** The secretariat presented a brief overview on the development of an airspace concept and what it constitutes.

**4.4.9** The USA briefly discussed the FAA Metroplex process. The process is used to evaluate airspace and procedures in high density metropolitan areas. There are several similarities between challenges in these areas and the traffic in the SCS. The Metroplex process begins with an evaluation of the airspace to include known areas of congestion as well as the areas of forecast capacity limiters. The process brings together all affected ATC facilities, the users, and the affected airports along with other stakeholders to identify the challenge and explore potential solutions. Generally it is not a blank slate approach but one designed to implement the most effective measures to address the greatest challenges. Solutions generally require minimal infrastructure changes. From start to finish the process is designed to take less than 24 months with initial benefits implemented in about 18 months. The process is designed to be scalable and repeatable and to deliver measurable benefits to the users and ANSPs.

**4.4.10** Thereafter the meeting was invited to set some objectives for the SCS-MTFRG. The presentation is attached as Attachment 6. After much deliberation, the following Objectives were agreed:

1. Improve Safety
2. Increase Capacity
3. Harmonise ATM Procedures in SCS
4. Leverage on the excellent Surveillance and Communications capabilities

### **South China Sea Operational Concept**

**4.4.11** The APAC Regional Office gave an update on the APAC Seamless ATM Plan, which has been endorsed by APANPIRG and presented to the APAC DGCA Conference.

**4.4.12** Expected Implementation: 09 November 2017

**4.4.13** Communication: VHF, either direct or using a shared facility (therefore States are encouraged to provide shared transceivers where they are required)\*

**4.4.14** Navigation: using the Seamless ATM Plan's expectations:

- RNAV 2/ RNP 2 – near parallel or parallel routes spaced 20NM apart for the major traffic routes to increase capacity where required (note: this is a procedural separation, and is not the determinant of the ATC separation, which is based on ATS surveillance);
- implementation of extra RNAV 2/ RNP 2 routes where required which are not necessarily based on existing routes; and
- the new routing structure to be based on the most direct routes possible, using key entry/exit waypoints to/from the South China Sea, or SID/STAR waypoints.

**4.4.15** Surveillance: using the Seamless ATM Plan's expectations:

- coverage by ADS-B and SSR\*;
- ADS-B data to be shared wherever this data is required.

**4.4.16** ATM: using the Seamless ATM Plan's expectations:

- operationalization of 5-10NM ATC separation;
- 10-20 NM separation at Transfer of Control Points (TOC);
- removal of the Flight Level Allocation Scheme (FLAS);
- ATFM measures such as Miles-in-Trail or Minutes-in-Trail to be applied where required for tactical capacity/demand balancing; and
- an update of ATC LOAs and contingency plans as required.

***\*ICAO encourages states to share surveillance and communications capabilities wherever possible, and in instances where necessary, establish new capabilities to plug the gaps in surveillance and VHF communications within the South China Sea. It is suggested that 09 November 2017 be set as preliminary target for full surveillance and communications within the South China Sea area.***

**4.4.17** As an outcome of the workshop style airspace design session, some preliminary routes were proposed, and 3 areas of priority were identified for this group to focus on, namely A1/A202 as priority 1, L642/M771 as priority 2 and A461/A583/N892/L625 as priority 3. The outcome can be found as Appendix 4

**4.4.18** After the preliminary discussions, it was decided that **A1**, as priority number 1, will be tackled by the states involved.

**4.4.19** The states involved, namely China, Hong Kong China, Thailand and Viet Nam held discussions on how best to address the implementation of a solution to the A1 issues. It was

broadly agreed that a parallel route structure should be implemented. An initial proposal with 4 options has been looked at. Each State will conduct further technical analysis and the work will be progressed through email communications where possible. Progress on this activity will be report at SCS MTFRG 4. The 4 proposals are attached to this report as Attachment 5

#### **4.5      Agenda Item 5: Review and update of the task list of SCS MTFRG**

##### **IP 01 Update on the ADS-C/ CPDLC Trial Operations in the Manila FIR**

**4.5.1** The Philippines informed the meeting that their ADS-C/CPDLC trials in the East Oceanic airspace of the Manila FIR was ongoing. Currently, they are in phase1-B of the trial operation in which CPDLC is used as the primary means of communications and HF as secondary means. According to the plan, the ADS- C/CPDLC trial operations will progress to Phase 2, covering the western portion of the Manila FIR in the 4th quarter of 2016. Some of the issues that were observed have been submitted as problem reports to FIT-ASIA ISPACG-CRA for analysis. The ATM related problems are being handled by the vendor.

#### **4.6      Agenda Item 6: Decisions/Recommendations to SEACG**

**4.6.1    SCS MTFRG/2 Draft Decision 01: The name for this group shall be :”South China Sea Traffic Flow Review Group (SCS TFRG/n). References in the TOR shall be duly amended**

**4.6.2    SCS MTFRG/3 Conclusion 01: That the preferred navigation specifications to be used in areas where there is adequate surveillance and communications coverage shall be RNAV2 as an interim measure with subsequent transitioning to RNP2 in line with the APAC Seamless ATM Plan.**

**4.6.3    SCS MTFRG/3 Conclusion 02: The airspace concept planning objectives for the SCS-MTFRG shall be:**

- 1. Improve Safety**
- 2. Increase Capacity**
- 3. Harmonise ATM Procedures in SCS**
- 4. Leverage on the excellent Surveillance and Communications capabilities**

#### **4.7      Agenda Item 7: Any Other Business**

##### **Update from the 9th Distributed Multi-Nodal ATFM Operational**

**4.7.1** Thailand briefed the meeting on the 9th Distributed Multi-Nodal ATFM Operational Trial Project Meeting (Multi-Nodal/9) held in Bangkok, Thailand on 22-25 February 2016.

**4.7.2** The Multi-Nodal/9 was attended by representatives from 5 Core ANSPs from Australia, China, Hong Kong China, Singapore, Thailand, IATA, CANSO as well as representatives from Cambodia, Myanmar, Indonesia, the Philippines, Viet Nam , airline and airport operator representatives.

**4.7.3** The Multi-Nodal/9 Project Team agreed to progress further collaboration of 10-State/Administration group towards implementation of Cross-Border ATFM in the Asia-Pacific region by agreeing to a common ATFM Standard Operating Procedure for executing Ground Delay Program (GDP) ATFM Measure in accordance with ICAO Manual on Collaborative ATFM (Doc 9971) through generation and distribution of Calculated Take-Off Time (CTOT) in the event that caused arrival airport / airspace capacity beyond expected traffic demand.

**4.7.4** In order to further validate the agreed ATFM Standard Operating Procedure Multi-Nodal/9 meeting agreed to organize series of Multi-Nodal ATFM Demonstration Flights in March - April 2016 similar to the Asia-Pacific Initiative to Reduce Emissions (ASPIRE) project. These demonstration flights will be provided CTOT with no actual delay. These few selected demonstration flights would enable evaluation of ATFM Standard Operating Procedures under live environment and determine enhancements needed.

**4.7.5** Continuing from the Multi-Nodal ATFM Demonstration Flight activities, the Multi-Nodal ATFM Project Team would review ATFM Standard Operating Procedure with the focus on transitioning to Limited-Scope Live ATFM Trial to demonstrate effectiveness of Distributed Multi-Nodal ATFM Network Concept of Operations in actual environment.

**4.7.6** In order to support joint development of Multi-Nodal ATFM Network, the project Core Team agreed to establish Technical Subgroup tasked to develop minimum Multi-Nodal ATFM user requirements, end state ATFM System-to-System Interface and system development roadmap. It is expected that the work of the Multi-Nodal ATFM Technical Subgroup would become a key input to the ICAO APAC ATFM Information Requirement Small Working Group (ATFM-IR/SWG) established to support ICAO APAC ATFM Steering Group development of information sharing framework for regional Cross-Border ATFM implementation. The Technical Subgroup would provide consistent updates to the ICAO ATFM/SG in the same manner as the Multi-Nodal ATFM Project Core Team.

**4.7.7** It is expected that for majority of airport operations activating Ground Delay Program ATFM Measure through CTOT would not initially be able to release CTOT to majority of flights. Therefore, initial set of ATFM Measure deployed during the Limited-Scope Live ATFM Trial will include Ground Delay Program using CTOT and conventional ATFM Measures / Flow Restrictions such as Miles-in-Trail, Minutes-in-Trail or Minimum Departure Interval issued to other flights to ensure effectiveness of ATFM operations. It is also further emphasized that the ATFM environment designed would provide natural incentive to transition from conventional ATFM Measures / Flow Restriction to Ground Delay Program further enhancing operational predictability, ATFM operational effectiveness and associated environmental benefits.

**4.7.8** It is expected that the Limited Scope Live ATFM Trial would tentatively commence in July 2016.

**5. Closing of the Meeting**

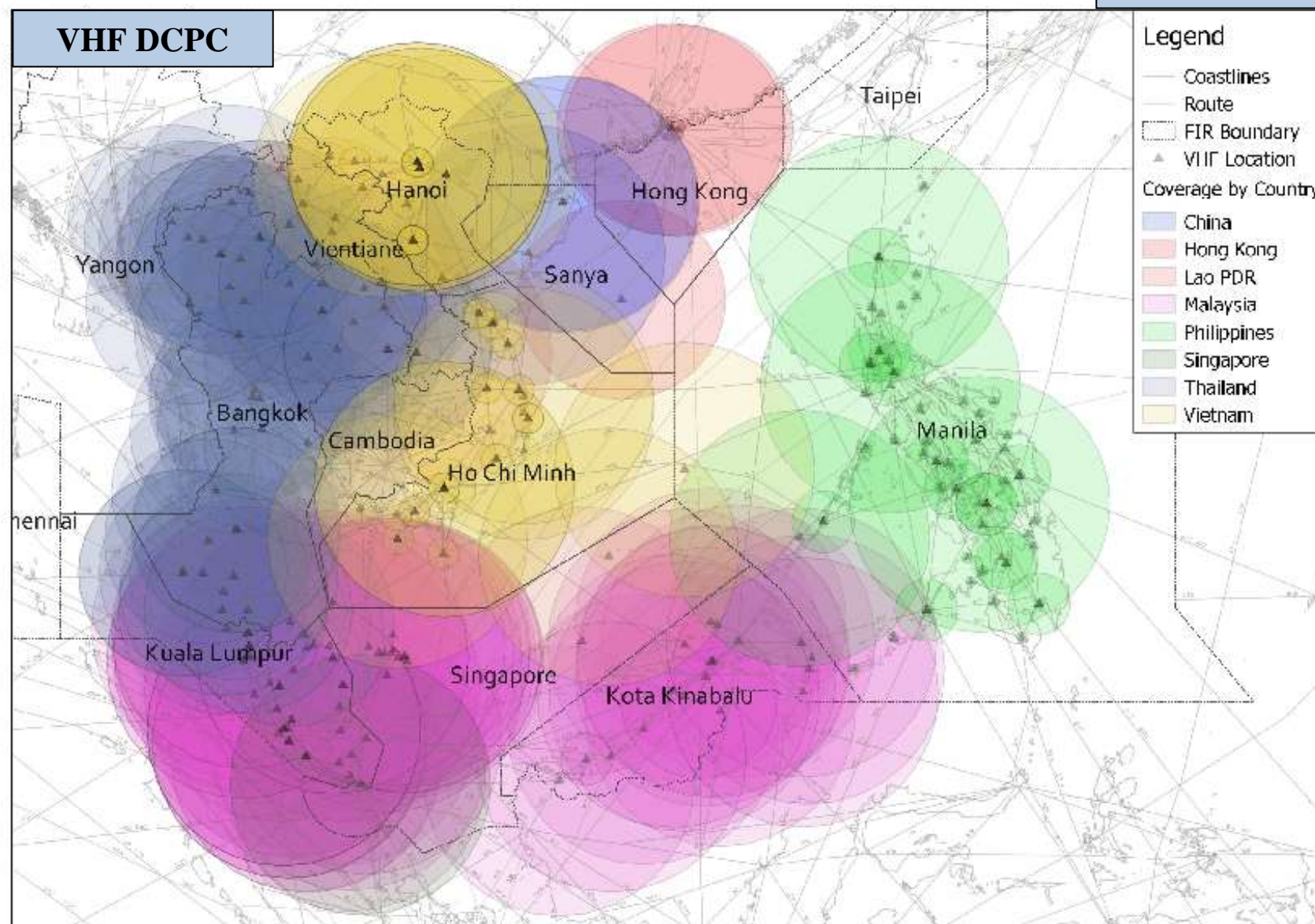
**5.1.1** The secretariat thanked all members for their tremendous efforts in making it possible for the SCS-MTFRG/3 achieve some tangible progress towards meeting the goals the group was tasked to do. The secretariat hoped that members will keep the momentum going in order to ensure the objectives assigned to this group are met sooner rather than later.

**5.1.2** The secretariat suggested that the next meeting be held in approximately 6 months. China indicated a willingness to host the next meeting. The secretariat will announce details in due course.

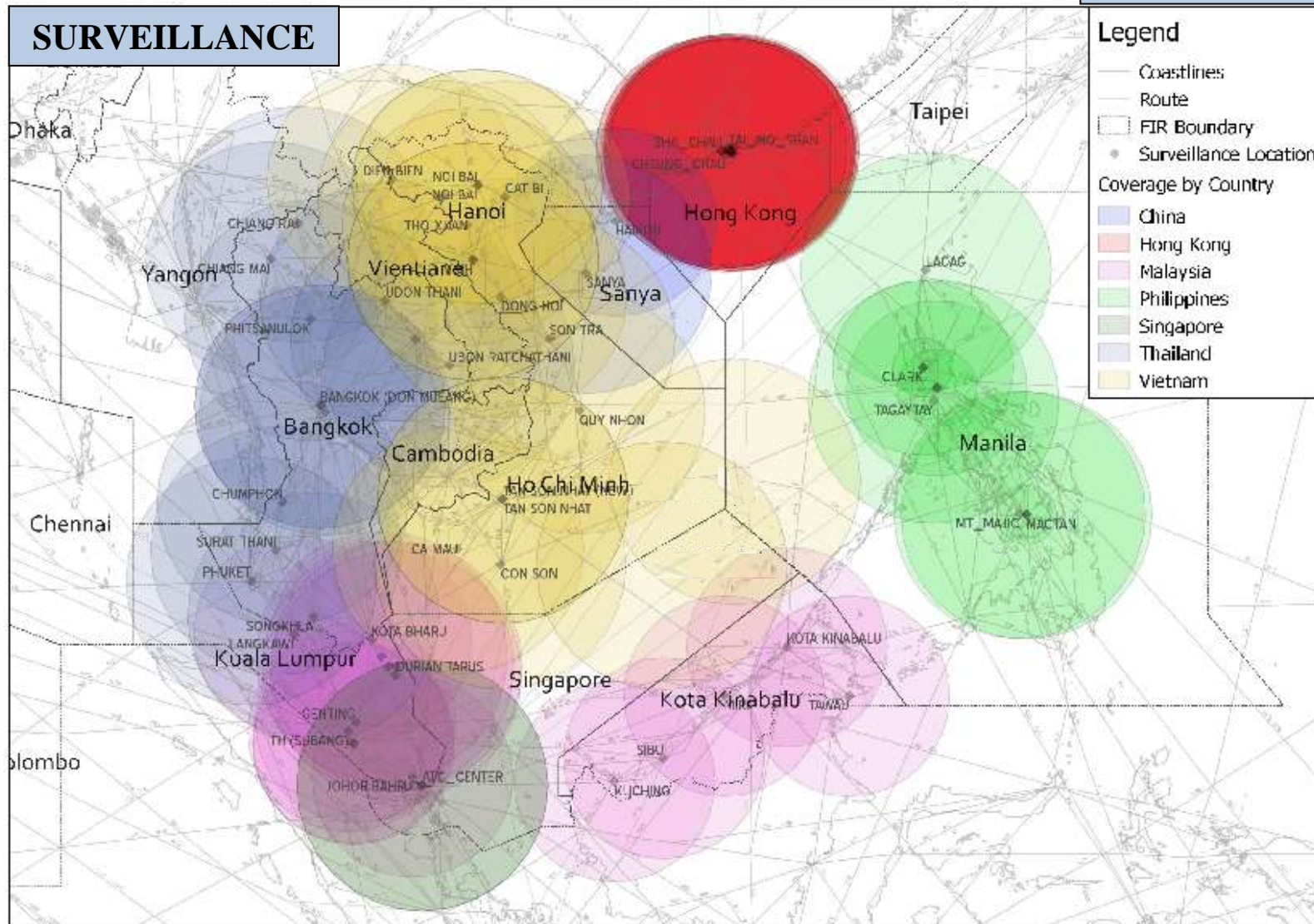
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## Appendix 1

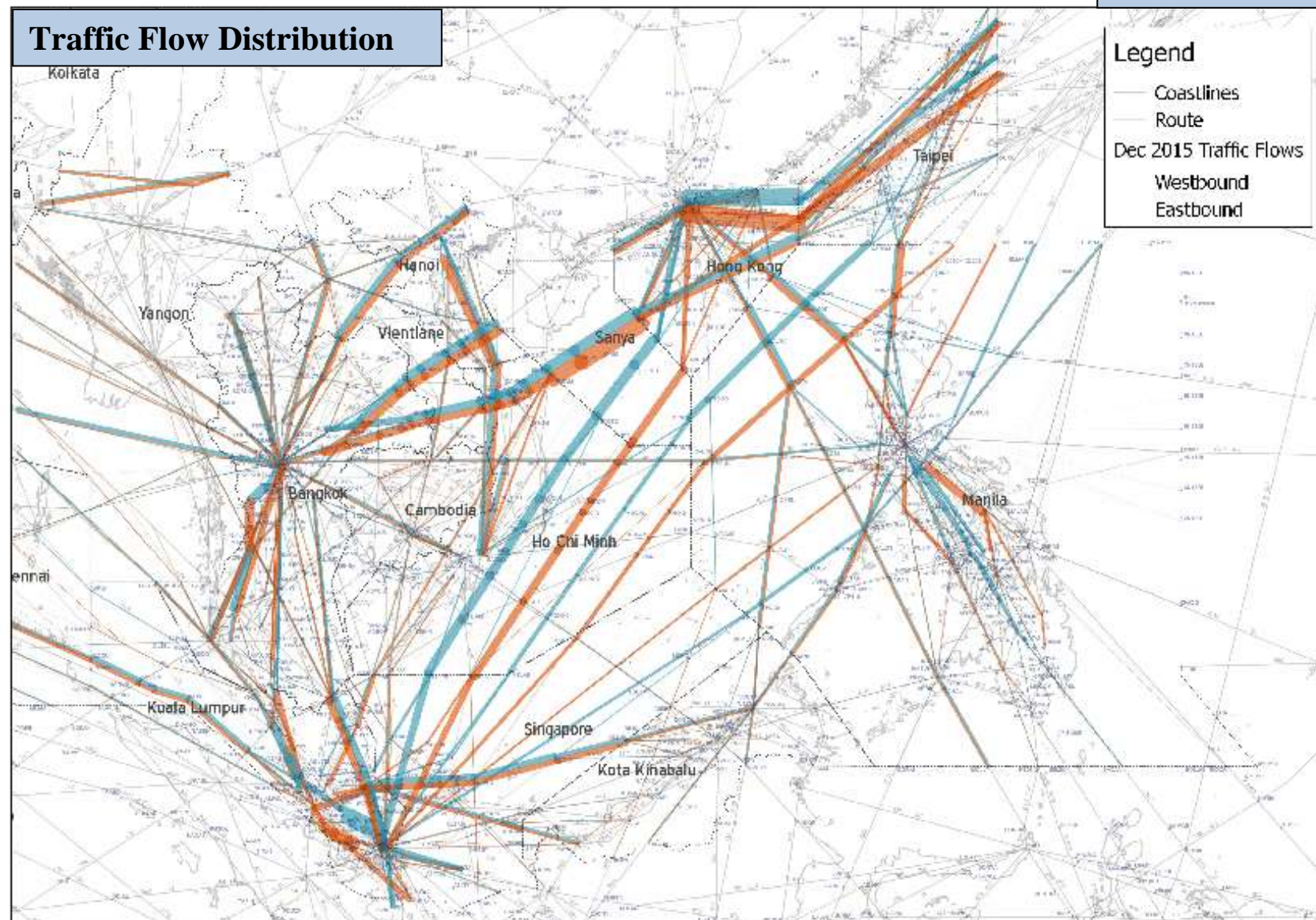


## Appendix 2



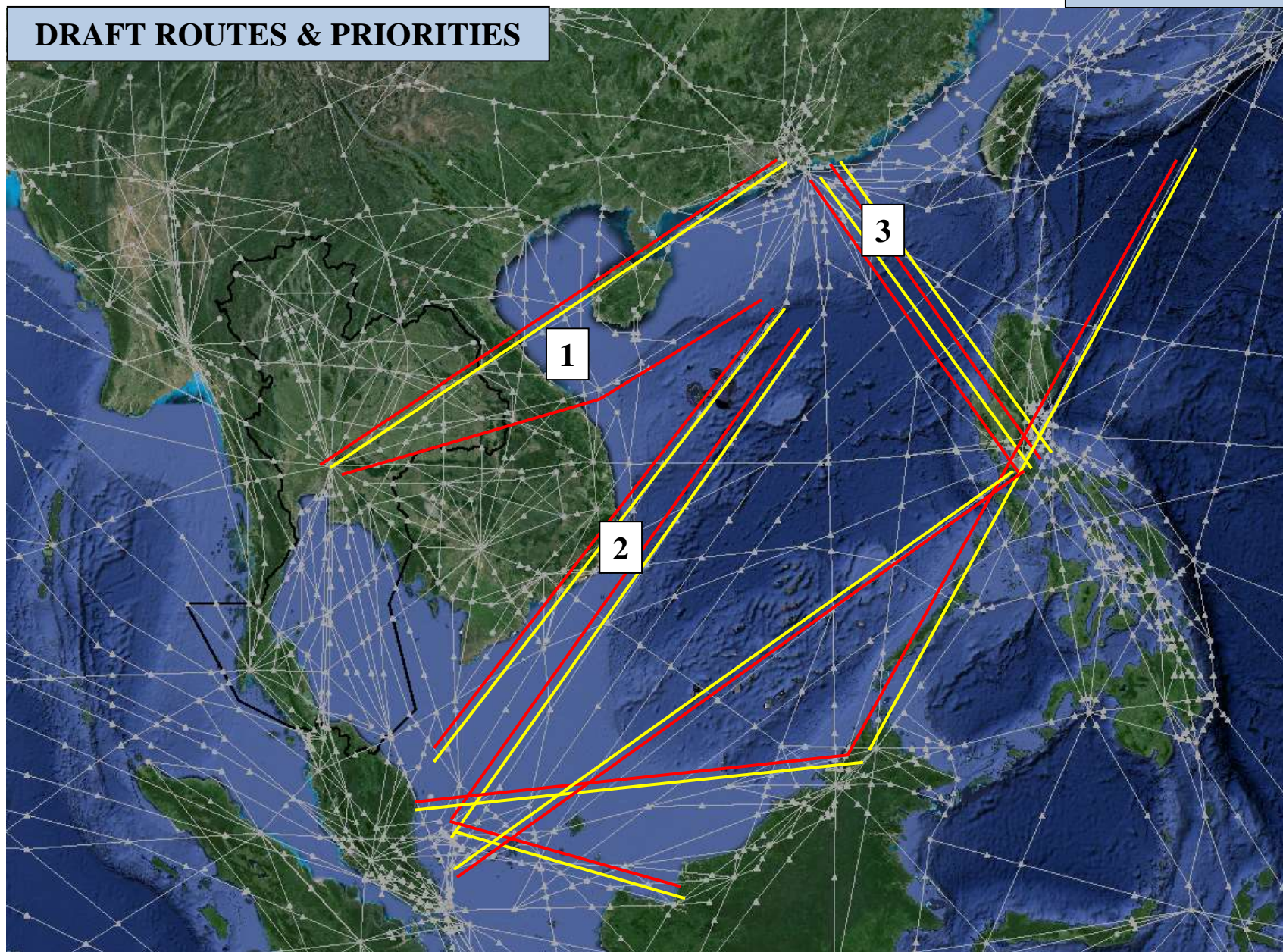


## Traffic Flow Distribution





DRAFT ROUTES & PRIORITIES

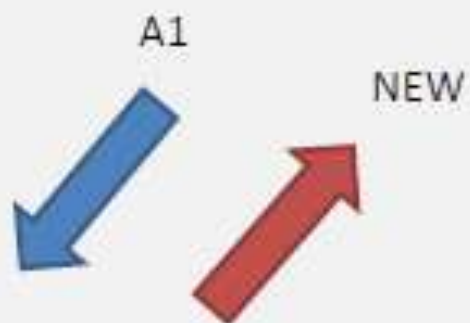




## Possible Traffic Flows for Airways A1

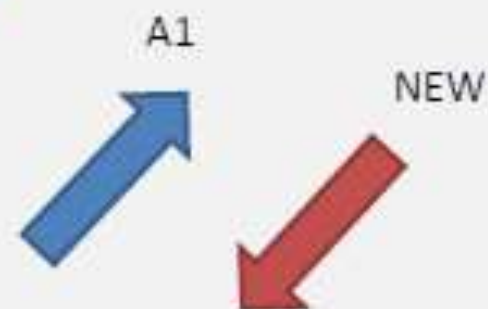
## Appendix 5

1<sup>st</sup>



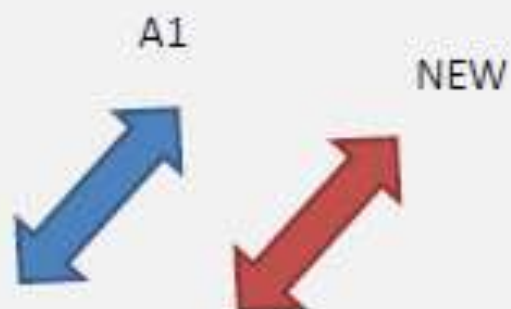
Unidirectional  
Proposed by Thailand

2<sup>nd</sup>



Unidirectional  
Proposed by SANYA

3<sup>rd</sup>



Bi- directional  
(A1 for Hong Kong/ China/ Macau traffic  
New for East-Asia and East- China traffic)

4<sup>th</sup>



Unidirectional

**List of Participants**

No	State/Organisation/Name	Title/Organisation	Tel/Fax/Email
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The Third South China Sea Major Traffic Flow Review Group Meeting (SCS MTRFG/3)

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12	Mr. Michael Shee	ATC Manager Civil Aviation Authority of Singapore Singapore Changi Airport, P.O. Box 1 <b>Singapore 918141</b>	Tel: +65-6- Fax: +65-6- E-mail: michael_shee@caas.gov.sg

The Third South China Sea Major Traffic Flow Review Group Meeting (SCS MTRFG/3)

No	State/Organisation/Name	Title/Organisation	Tel/Fax/Email
13	Ms He Pei Ru	ATC Officer Civil Aviation Authority of Singapore Singapore Changi Airport, P.O. Box 1 <b>Singapore 918141</b>	Tel: +65-6- Fax: +65-6- E-mail: he-peiru@caas.gov.sg
<b>6</b>	<b>Thailand (5)</b>		
14	Mr. Suvichan Sthitgitpichead	Director of Network Operations Air Traffic Management Centre Aeronautical Radio of Thailand Ltd 102 Soi Ngarmduplee, Tungmahamek, Bangkok 10120 <b>Thailand</b>	Tel: +662 287 8132 Fax: +662 287 8645 E-mail: suvichan.st@aerorhai.co.th
15	Mr. Thongchai Jamphatippong	Air Traffic Control Manager (Bangkok Area Control Centre) Aeronautical Radio of Thailand Ltd 102 Ngamduplee Tungmahamek Sathorn, Bangkok 10120 <b>Thailand</b>	Tel: +662 285 9059 Fax: +662 287 8645 E-mail: thongchai.ja@aerorhai.co.th
16	Ms. Saifon Obromsook	Engineering Manager (Safety Management System) Aeronautical Radio of Thailand Ltd 102 Soi Ngarmduplee, Tungmahamek, Bangkok 10120 <b>Thailand</b>	Tel: +662 287 8291 Fax: +662 287 8645 E-mail: saifon.ob@aerorhai.co.th
17	Ms. Thanawadee Tiewtrakul	Airspace Design Assistant Manager Aeronautical Radio of Thailand Ltd 102 Soi Ngarmduplee, Tungmahamek, Bangkok 10120 <b>Thailand</b>	Tel: Fax: +662 287 8645 E-mail: <a href="mailto:thanawadee.ti@aerorhai.co.th">thanawadee.ti@aerorhai.co.th</a>
18	Mr. Dolsarit Somseang	Systems Engineer (Safety Management System) Aeronautical Radio of Thailand Ltd 102 Soi Ngarmduplee, Tungmahamek, Bangkok 10120 <b>Thailand</b>	Tel: +662 287 8918 Fax: +662 287 8645 E-mail: dolsarit@aerorhai.co.th



The Third South China Sea Major Traffic Flow Review Group Meeting (SCS MTRFG/3)

No	State/Organisation/Name	Title/Organisation	Tel/Fax/Email
<b>7</b>	<b>United States of America**</b>		
19	Michael Watkins	Senior Asia/Pacific Air Traffic Representative Federal Aviation Administration 27 Napier Road <b>Singapore 258508</b>	Tel (O): +65 6476 9462 Tel (M): +659228 6216 michael.w.watkins@faa.gov
<b>8</b>	<b>Viet Nam</b>		
20	Mr. Dam Tuan Toi	Official Air Navigation Department Civil Aviation Authority of Viet Nam (CAAV) No. 119 Nguyen Son Street, Long Bien District, Ha Noi City <b>Viet Nam</b>	Tel: + 84 944866899 Fax: + 84 4 387274194 E-mail: toidt@caa.gov.vn
21	Dr. Nguyen Dinh Cong	Deputy Director General Vietnam Air Traffic Management Corporation (VATM) No. 6/200 Nguyen Son Street, Long Bien District, Ha Noi City <b>Viet Nam</b>	Tel: +84 438 729050 Fax:+ 84 438 272597 E-mail: ndcong1963@yahoo.com
22	Mr. Bui Thanh Ha	Deputy Director ATM Department Vietnam Air Traffic Management Corporation (VATM) No. 6/200 Nguyen Son Street, Long Bien District, Ha Noi City <b>Viet Nam</b>	Tel: + 84 438 271833 Fax: + 84 438 272597 E-mail: buithanhhaatc@yahoo.com
23	Mr. Tran Thanh Cuong	Deputy Chief of Ho Chi Minh ACC Vietnam Air Traffic Management Corporation (VATM) No. 22 Tran Quoc Hoan Street, 4th Ward, Tan Binh, District , Ho Chi Minh City <b>Viet Nam</b>	Tel: + 84 838457152, + 84 918408250 Fax:+ 84 8 38443774 E-mail: tranthanhcuong404@yahoo.com.vn

The Third South China Sea Major Traffic Flow Review Group Meeting (SCS MTRFG/3)

No	State/Organisation/Name	Title/Organisation	Tel/Fax/Email
	24	Ms. Le Thi Phuong Manager of AIP Division Viet Nam Aeronautical Information Centre (VNAIC) Vietnam Air Traffic Management Corporation (VATM) No. 5/200 Nguyen Son Street, Long Bien District, Ha Noi City <b>Viet Nam</b>	Tel: + 84 4 38728521 Fax: + 84 4 38725687 E-mail: lephuongais@gmail.com
<b>8</b>	<b>IATA (2)</b>		
	25	Mr. David Rollo Assistant Director, Safety and Flight Operations International Air Transport Association 111 Somerset Road, #14-05 Triple One Somerset <b>Singapore</b> 238164	Tel: +65-6499 2251 <a href="mailto:dollod@iata.org">dollod@iata.org</a>
	26	Mr Owen Dell Manager, International Operations International Affairs Department, 9/F Central Tower, Cathay City, Hong Kong International Airport, Lantau <b>Hong Kong</b>	Tel: +852 2747 8829 Fax: +852 2141 3818 E-mail: <a href="mailto:owen_dell@cathaypacific.com">owen_dell@cathaypacific.com</a>
<b>9</b>	<b>ICAO (2)</b>		
	27	Mr. Liu Song Regional Officer ATM (ATM-FUA) ICAO APAC Regional Sub Office 1st floor,C Section, China Service Mansion No.9 Erwei Road, Shunyi District, Beijing, <b>China.</b>	Tel: +86-10-6455 7175 Fax: +86-10-6455 7104 Email: <a href="mailto:sliu@icao.int">sliu@icao.int</a>
	28	Mr. Pehrinba Renganthan Regional Officer (AOM-ASM) ICAO APAC Regional Sub Office 1st floor, C Section, China Service Mansion No.9 Erwei Road, Shunyi District, Beijing, <b>China.</b>	Tel: +86-1368 1095 002 Fax: +86-10-6455 7164 Email: <a href="mailto:prengariathan@icao.int">prengariathan@icao.int</a>

\*\*Observer

The Third South China Sea Major Traffic Flow Review Group Meeting (SCS MTFRG/3)

PARTICIPANTION STATISTICS			
Entities Represented		Participant Numbers	
Total States	8	Cambodia	2
International Organisation	1	China	5
ICAO (APAC-RSO)	1	Hong Kong China	1
		Philippines	2
		Singapore	3
		Thailand	5
		United States	1
		Vietnam	5
		IATA	2
		ICAO	2
Total Entities	10	Total Participants	28

**Attachment 2****SCS MTFRG/3 List of Papers**

<b>No</b>	<b>Title</b>	<b>Presented by</b>
WP01	Provisional Agenda	Secretariat
WP03	VHF, SSR, and ADS-B Coverage in WPAC/SCS	Thailand
WP04	WPAC/SCS 2015 Traffic Sample Data Visualization	Thailand
WP05	APAC Route Catalogue	IATA
WP06	CNS Replacement Plan in Hong Kong, China and Proposed Re-designation of ATS Routes within Hong Kong FIR	Hong Kong, China
IP01	Update on the ADS-C/ CPDLC Trial Operations in The Manila FIR	Philippines
IP02	Operation on New Air Traffic Control Centre in Ha Noi FIR	Viet Nam
IP03	BANP ATS Route Amendment Template and Steps	Secretariat
PR01	Presentation on SCS FLAS/FLOS	Secretariat
PR01	Presentation on Airspace Concept	Secretariat

**The Third Meeting of South China Sea Major Traffic Flow Review Group  
(SCS-MTFRG/3)  
Bangkok, Thailand, 25-27 February 2016**

**AGENDA**

- |                |   |
|----------------|---|
| Agenda Item 1: | Adoption of Agenda  |
| Agenda Item 2: | Review of the current and planned CNS/ATM capabilities and identifying associated reduced horizontal separation |
| Agenda Item 3: | Review of the existing MTF route structures in SCS Airspace and identifying priorities                          |
| Agenda Item 4: | Discussion on PBN Routes Development and FLAS/FLOS Optimization   |
| Agenda Item 5: | Review and update of the task list of SCS-MTFRG   |
| Agenda Item 6: | Decisions/Recommendations to SEACG  |
| Agenda Item 7: | Any Other Business  |

PBN NavSpecs and Route Spacing (PBN Manual Doc 9613 Volume II, Attachment B & PANS-OPS Doc 8168 Volume II, Part III)

Nav Specs	Flight Phase								Supporting Nav. Infrastructure	Route Spacing (NM)	Additional Functionality (Required or Optional)					Operational Requirements			
	En-route Remote	En-route Continental	Arrival	Approach				Departure			RF	FRT	TOAC <sup>2)</sup>	Baro VNAV	Nav DB	Communication	Navigation	Surveillance	Others
				Initial	Intermediate	Final	Missed <sup>1)</sup>												
RNAV 10	10								Not require ground-based Naviad Dual LRNS (INS, IRS FMS, GNSS)	50			TBD <sup>2)</sup>		O	Voice com through 3rd party, DCPC in some areas	RNAV 10 (RNP 10) Approval, lateral deviation less than 7NM (same direction)/6NM (opposite direction)	Procedural pilot position reports	System safety must be monitored, TLS 5X10 <sup>-9</sup> accident per flight hour
RNAV 5		5	5 <sup>3)</sup>						VOR/DME DME/DME INS or IRS GNSS	16.5 - straight unidirectional racks (same direction route-ECAC) 18 - straight bidirectional tracks (opposite direction route- ECAC) 10 - ATC intervention capability (ECAC) 30 - No ATS Surveillance in high traffic density (ECAC)			TBD		O	DCPC- VHF	RNAV 5/RNP 5 OPS Approval (BRNAV)	Procedural pilot position report (RNP 5) Radar surveillance (RNAV 5)	
RNAV 2		2	2					2	GNSS DME/DME DME/DME/IRU	8 to 9 - straight tracks in high traffic density (en-route) (FAA)			TBD		R	DCPC- VHF	RNAV 2 OPS Approval (PRNAV, US RNAV AC 90-100)	Radar surveillance	
RNAV 1		1	1	1	1		1	1	GNSS DME/DME DME/DMe/IRU	8 - straight tracks in high density (terminal, Eurocontrol) 7 for SIDs/STARs (PANS-ATM)			TBD	O	R	DCPC- VHF	RNAV 1 OPS Approval (PRNAV, US RNAV AC 90-100)	Radar surveillance	
RNP 4	4								Not require ground-based Naviad GNSS	30 (part of the Pacific airspace) 50 or 30 * (PANS-ATM) *23NM proposed by SASP (applicable date : 10 November 2016)		O	TBD		R	DCPC or CPDLC	RNP 4 OPS Approval	ADS with a lateral deviation contract having 5NM	Sytem verification assuring lateral deviation less than 15NM
RNP 2	2	2							GNSS	50, 30 or 15 (PANS-ATM) 7 for climb/descend through other aircraft with VHF DCPC 20 for climb/descend through other aircraft with other type of com.		O	TBD		R	Depend on operational considerations (route spacing, traffic density, complexity, contingency procedures)	RNP 2 OPS Approval (Oceanic/Remote/continental)	Not required except reduced route spacing	
RNP 1			1	1	1		1	1	GNSS	5 for SIDs/STARs (PANS-ATM)	O		TBD	O	R	DCPC (RNP 1 SIDs/STARs)	RNP 1 OPS Approval	Not required except reduced route spacing	
A RNP <sup>4)</sup>	2	2 or 1	1 - 0.3	1 - 0.3	1 - 0.3	0.3	1 - 0.3	1 - 0.3	GNSS Multi-DME may be provided	7 - straight and turning tracks (<90°) in high traffic density (en-route, Terminal, Eurocontrol) 6 to 7 NM with an RNP 0.5 (terminal, Eurocontrol)	R	O	TBD	O	R	DCPC- VHF	A-RNP OPS Approval (Navigation accuracy at least ±1NM, 95% of the flight time)	Radar surveillance (may not be required to certain navigation application)	
RNP APCH (Part A) <sup>5)</sup>				1	1	0.3	1		GNSS (Missed App - RNAV or Conv.)	5 for SIDs/STARs (PANS-ATM)	O		TBD	O	R	Not required	RNP APCH OPS Approval	Not required	
RNP APCH (Part B) <sup>5)</sup>				1	1	Angular	1 or 0.3 (Initial Straight MISAP)		GNSS	5 for SIDs/STARs (PANS-ATM)	O		TBD		R	Not required	RNP APCH OPS Approval	Not required	
RNP AR APCH				1 - 0.1	1 - 0.1	0.3 - 0.1	1 - 0.1		GNSS (DME/DME may be authorized)	5 for SIDs/STARs (PANS-ATM)	R <sup>6)</sup>		TBD	R <sup>6)</sup>	R	Not required	RNP AR APCH OPS Approval	Not required	
RNP 0.3		0.3	0.3	0.3	0.3		0.3	0.3	GNSS		O		TBD	O	R	Not required	RNP 0.3 OPS Approval	Not required	

1) RNP requirements do not apply to initial and intermediate missed approach segments.

2) TOAC (Time of Arrival Control), TBD (To Be Determined)

3) RNAV 5 may be used for initial parts of STARs outside 30 NM from the ARP.

4) Advanced RNP core requirements are limited to RNP 1 in all flight phases except final approach (RNP 0.3) and RNP 2 in oceanic/remote and en-route continental. A scalability option will allow accuracy values between 0.3 and 1.0, in 0.1 NM increments, in all flight phases except oceanic/remote/en-route continental (RNP 1 and RNP 2) and final approach (RNP 0.3).

5) Part A and B refer to the Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, Part C, Chapter 5, Part A — RNP APCH operations down to LNAV and LNAV/VNAV minima and Part B — RNP APCH operations down to LP and LPV minima, respectively.

6) Specific requirement for RF and VNAV



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**APAC RSO BEIJING**

# FLAS / FLOS



ATS Route	No-PDC Flight Levels (Other levels available with prior approval)	Remarks
<b>B469 / M751</b>	FL280, FL300, FL320, FL340, FL360, FL380, FL400	For flights to/from airports within Bangkok FIR
<b>M753</b>	Northbound - FL260, FL300, FL380 Southbound - FL270, FL330	
<b>M754</b>	Northbound - FL300, FL340, FL380 Southbound - FL290, FL330, FL370, FL410	
<b>M758</b>	Eastbound - FL270, FL290, FL330 Westbound - FL280, FL300, FL340	
<b>M761</b>	Eastbound - FL270, FL290, FL330 Westbound - FL280, FL300, FL340	
<b>M767</b>	FL310, FL320, FL350, FL360, FL390, FL400	Uni-directional
<b>M768</b>	Eastbound - FL270, FL330, FL410 Westbound - FL300, FL380	
<b>M770</b>	Aircraft requesting FL280, FL300 and FL320 will be cleared to FL280. Succeeding aircraft on the same route will be cleared to FL280 with 10 min longitudinal separation provided there is no closing speed with the preceding aircraft. Additional longitudinal separation as appropriate shall be provided by ATC for the faster aircraft following a slower aircraft on the same route.	The first aircraft from either Singapore or Kuala Lumpur to be over GUNIP on N571 or N571/N877, the Kuala Lumpur/ Bangkok FIR BDRY on M770 or L759 and VPL on P628, can expect its requested flight level.



# FLAS / FLOS



ATS Route	Coordination Flight Levels. <i><u>Other levels available with prior approval</u></i>	Flight Information Regions	Flight Level Transition
L642 M771 N892 L625	Eastbound (EB) & Westbound (WB)  EB & WB FL 310, 320, 350, 360, 390, 400	Hong Kong Sanya Ho Chi Minh Manila Singapore Taibei	For L642 & M771 NIL
			For L625 joining B462 <b><u>Naha ACC</u></b> from FL 320, 360, 400 to odd levels after MEVIN on B462
			For L625 joining B348 <b><u>Manila ACC</u></b> from FL 320, 360, 400 to odd levels, or FL 290 for landing Taibei FIR, by POTIB on B348
			For N892 <b><u>Taibei ACC</u></b> from FL 300, 340, 380 to FL 310, 350, 390 before KABAM

# FLAS / FLOS

ATS Route	No Pre-Departure Coordination Flight Levels. <i><u>Other levels available with prior approval</u></i>	Flight Information Regions	Flight Level Transition
G86	EB – FL 290, 330, 370, 390, 410 WB – FL 280, 300, 340, 380, 400	Hong Kong Taipei	NIL
L628	EB – FL 330, 370, 410 WB – FL 280, 340	Manila Ho Chi Minh	NIL
N500	EB – FL 330 WB – FL 300	Manila Ho Chi Minh	NIL
M765	EB – FL 290, 370, WB – FL 280, 340	Kuala Lumpur Manila Ho Chi Minh	NIL
M768	EB – FL 270, 330, 410 WB – FL 300, 380	Singapore Ho Chi Minh Kota Kinabalu	NIL

# FLAS / FLOS

ATS Route	No Pre-Departure Coordination Flight Levels. <u>Other levels available with prior approval</u>	Flight Information Regions	Flight Level Transition
A1	EB – FL 290, 330, 370, 390, 410 WB – FL 280, 300, 340, 380, 400	Sanya Ho Chi Minh Bangkok Vientiane	NIL
P901	EB – FL 290, 330, 370, 390, 410 WB – FL 280, 300, 340, 380, 400	Hong Kong	NIL
A202	EB – FL 290, 330, 370, 390, 410 WB – FL 280, 300, 340, 380, 400 <b>Note:</b> Implemented AIRAC 22 Nov 2007	Hong Kong Sanya Hanoi Bangkok Vientiane	NIL

# FLAS / FLOS

ATS Route	No Pre-Departure Coordination Flight Levels. <i><u>Other levels available with prior approval</u></i>	Flight Information Regions	Flight Level Transition
M753 M755	Northbound (NB) & Southbound (SB)  NB – FL 260, 300, 380 SB – FL 270, 330	Singapore Ho Chi Minh Phnom Penh	NIL
L644	SB - FL 330, 410	Ho Chi Minh Singapore Jakarta	NIL
N891	NB – FL 260, 300, 380 SB – FL 330	Singapore Kuala Lumpur Ho Chi Minh Phnom Penh Bangkok	NIL



# FLAS / FLOS



ATS Route	No Pre-Departure Coordination Flight Levels. <u>Other levels available with prior approval</u>	Flight Information Regions	Flight Level Transition
N884	FL 310, 320, 350, 360, 390, 400	Singapore Manila Fukuoka	<b><u>Manila ACC</u></b> from FL 320, 360, 400 to odd levels after LBG
M767		Manila Singapore	<b><u>Manila ACC</u></b> from FL300, 340, 380 to FL 310, 350, 390 after TOKON
A341	EB – FL 310, 370 WB – FL 320, 360, 400	Kota Kinabalu Manila	NIL

# FLAS / FLOS

ATS Route	No Pre-Departure Coordination Flight Levels. <i><u>Other levels available with prior approval</u></i>	Flight Information Regions	Flight Level Transition
M754	NB – FL 300, 340, 380 SB – FL 290, 330, 370, 410	Kota Kinabalu Manila Singapore	NIL
A461 R590 B472 B473 B462	EB – FL 290, 330, 370, 410 WB – FL 300, 340, 380	Hong Kong Manila Ujung Pandang	NIL
B462	NEB – FL 310, 320, 350, 360, 390, 400 SWB – FL 300, 340, 380	Fukuoka Manila	NIL
A339 A450	EB – FL 310, 350, 390 WB – FL 320, 360, 400	Ujung Pandang Manila Oakland	NIL
G578	EB – FL 350, 390 WB – FL 320, 360, 400	Ujung Pandang Manila	NIL

# FLAS / FLOS

ATS Route	No Pre-Departure Coordination Flight Levels. <u>Other levels available with prior approval</u>	Flight Information Regions	Flight Level Transition
B583	EB - FL 290, 330, 370, 410 WB - FL 300, 340, 380	Kota Kinabalu Ujung Pandang	NIL
B348 Northbound before OSANU	EB – FL 310, 350, 390 WB - FL 320, 360, 400	Kota Kinabalu Manila	NIL
B348 Southbound before OSANU	NB – Odd flight levels SB - FL 300, 340, 380	Taibei Manila	NIL
M772	NB - FL 300, 340 until ANIPU, 380	Hong Kong Jakarta Manila Kota Kinabalu Singapore	NIL



# FLAS / FLOS

ATS Route	No Pre-Departure Coordination Flight Levels. <i><u>Other levels available with prior approval</u></i>	Flight Information Regions	Flight Level Transition
B584 R223	NEB – FL 310, 350, 390 SWB – FL 320, 360, 400	Kota Kinabalu Ujung Pandang	NIL
A583	SEB – FL 290, 330, 370, 410 NWB – FL 300, 340, 380	Hong Kong Manila	NIL
B592	NEB – FL 310, 350, 390 SWB – FL 320, 360, 380, 400	Kota Kinabalu Jakarta	NIL
N875	EB – FL 290, 330, 370 WB – FL 300, 340, 380	Jakarta Singapore	NIL
M758 M761 G580 B348	EB – FL 270, 290, 330 WB – FL 300, 340, 380	Kuala Lumpur Kota Kinabalu Singapore	NIL



# FLAS / FLOS

## FLAS for Large Scale Weather Deviations (LSWD) in Western Pacific/South China Sea area

as applicable by

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

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



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**Thank You**



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# **AIRSPACE CONCEPT**

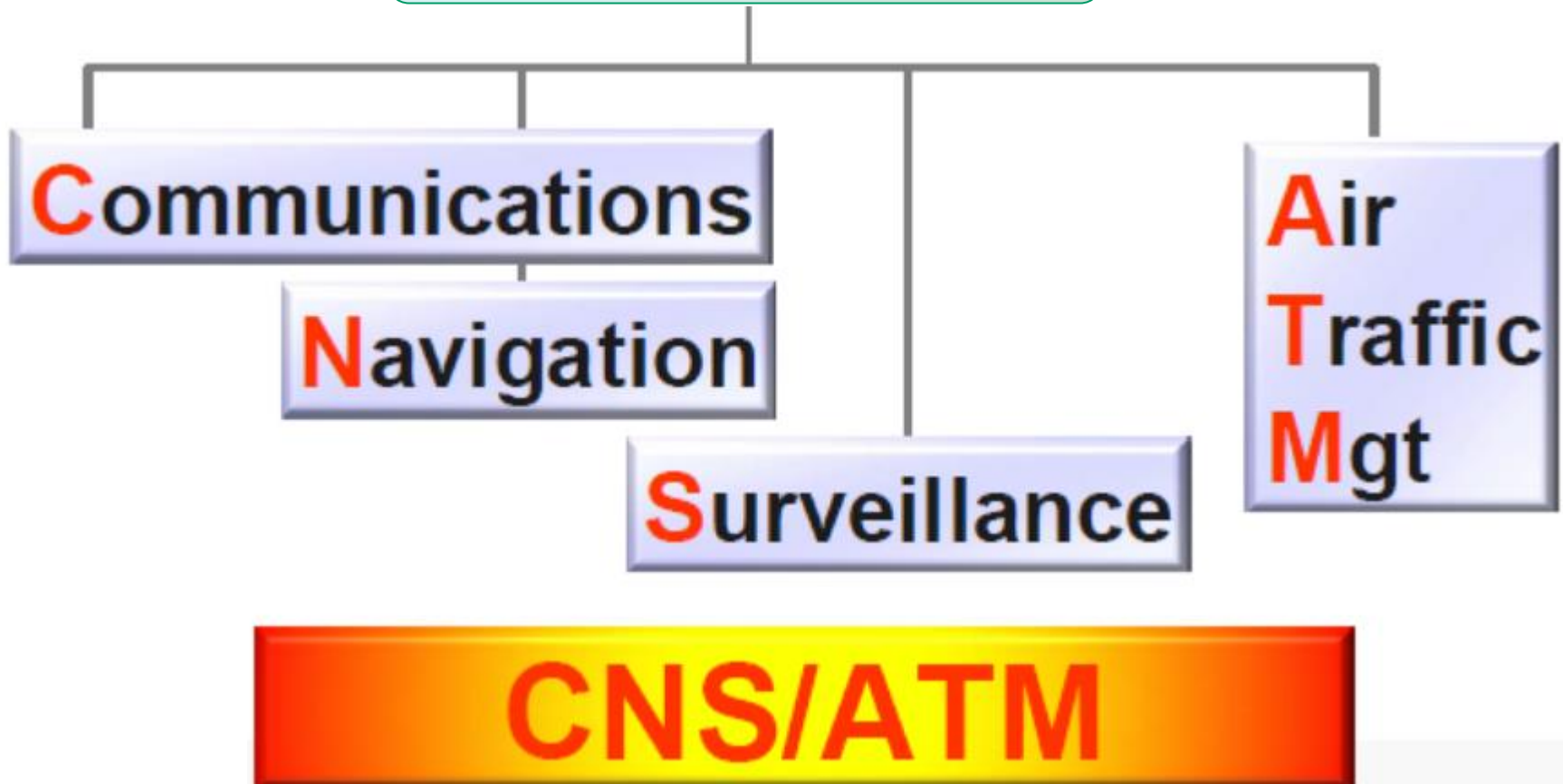
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# Navigation in Context



## Airspace Concept



# What is an Airspace Concept



- ❖ **A master plan of the intended airspace design and its operation**
  - **Describes the intended operations within an airspace**
  - **Developed to satisfy explicit and implicit strategic objectives**  
(improved safety, increased air traffic capacity, improved flight efficiency, mitigation of environmental impact)
- ❖ **A fully developed Airspace Concept:**
  - **Describes in detail the airspace organization and its operations**
  - **Addresses all the strategic objectives identified for the project**
  - **Addresses all CNS/ATM enablers**
  - **Identifies all operational and technical assumptions**



# Why Develop an Airspace Concept



- ❖ **Airspace Concept development provides a structured and systematic way of determining**
  - **What is to be achieved in an airspace, and**
  - **How it will be achieved**
- ❖ **The development process helps ensure**
  - **Goals (expected benefits) of planned airspace structure are clearly stated;**
  - **Objectives of the airspace change are met; and**
  - **The means to achieve these goals are appropriate and feasible within the resources available to the airspace system**

# Context of an Airspace Concept



## Strategic Goals (Expected Benefits)

**Safety?**

**Capacity?**

**Efficiency?**

**Environment?**

**Access?**

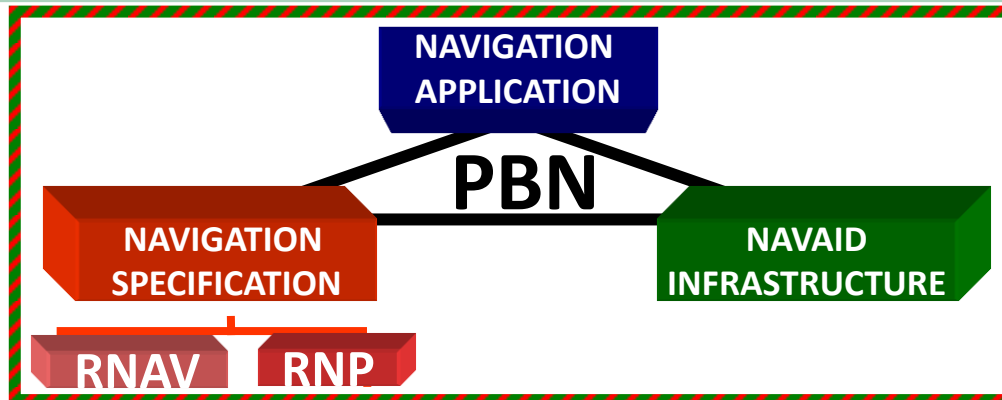
**Airspace Concept**

**Com**

**NAV**

**SUR**

**ATM**



# Context of an Airspace Concept



## Safety

## Capacity

## Efficiency

## Environment

## Access

### Operational Requirements

Reduce Controlled Flight Into Terrain via lateral & vertical course guidance to runway

Increase number of air traffic routes to reduce congestion; accommodate projected growth

Reduce delays that result from excessive "levelling off" flight profiles by implementing CCO/CDO

Reduce noise over sensitive area

Improve airport and airspace access in all weather conditions

### Implementation Objectives

RNP approach (LNAV/VNAV) to replace circling approach

Parallel RNAV-2 ATS routes between cities

RNAV-1 SID that allows continuous climb to enroute

Use of RF in intermediate or missed approach segment

RNP approach allowing lower minima



# Airspace Concept Constituents



**Airspace Concept**  
**Assumption: CNS/ATM/RWY/Traffic/MET**

**Airspace Design:**

**Routes,  
Volumes,  
Sectors.**

**Inter-facility  
Letters of Agreement**

**Sector Interaction**

**Traffic assignment  
(including regulation)**

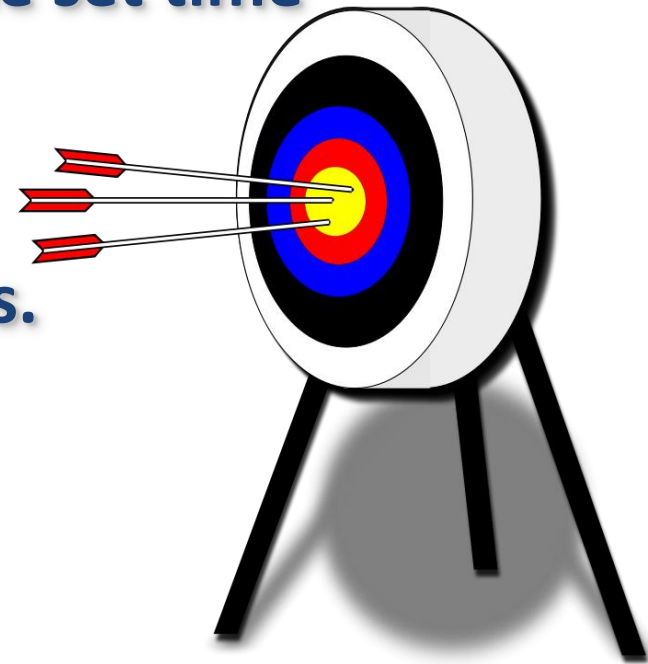
**Special techniques  
(CCO, CDO, etc.)**

***Flexible Use of Airspace***  
***Airspace Classification***

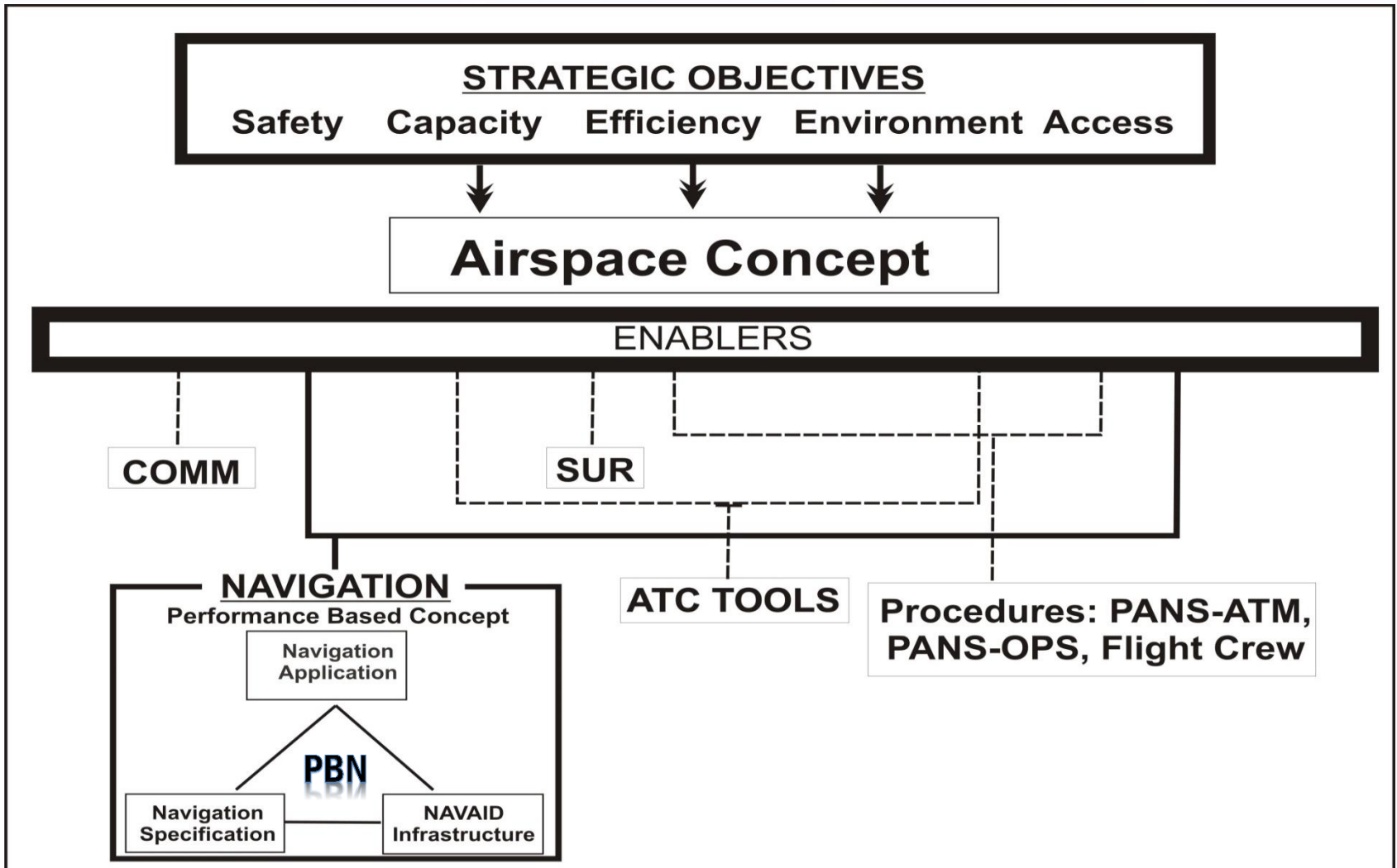
# What is the Most Critical Point ?



- ❖ **Setting the appropriate objectives and scope**
  - **Enables the project team to remain focused and the budget to be managed within the set time**
  - **Most projects which fail to meet the intended goal do so because of poorly defined scope and objectives.**
  - **Beware of project creep!**



# Airspace Concept Summary



# SCS MTRG Objectives



## Objectives

- 1. Improve Safety**
- 2. Increase Capacity**
- 3. Harmonise ATM Procedures in SCS**
- 4. Leverage on Surv/Comms capabilities**



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Regional Sub-Office  
Beijing (APAC RSO)

**Thank You**

## SOUTH CHINA SEA TRAFFIC FLOW REVIEW GROUP

### TASK LIST SCS-MTFRG/3

ITEM NO	DESCRIPTION	TIME FRAME	RESPONSIBILITY	STATUS	REMARKS
1	Traffic Flow Analysis Update (TSD2015)	Next Meeting	Thailand/MAAR	Ongoing-	Update with additional information from Sanya and Vietnam domestic traffic
2	Coordination of actives involving A1	Next Meeting	China, Hong Kong China, Thailand, Vietnam	Ongoing	Coordination/and Communications through email or other means
3	Feedback from States on implementation of new route parallel to M758		Malaysia, Singapore	KIV	Discussions on going due to airspace reorganisation in Malaysia
4	Update on results of ADS-C/CPDLC Trials	Next Meeting	Philippines	-	Trials are ongoing
5	Coordination with EU-AATIP/ATMRI for sharing outcomes of airspace simulation and modelling		Singapore / APAC-RSO	-	Side meeting during SEACG to discuss requirements with AATIP
6	Proposals for possible application of reduced separation in areas with Surveillance and VHF DCPC	ASAP	States / Sub Regional Coordination Groups		Harmonised surveillance based separation standards that can be applied on SCS Routes that pass through category 'S' airspace needs to be identified and applied in the near term.