

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**REPORT OF COMBINED FOURTH MEETING OF THE SOUTH
ASIA/INDIAN OCEAN ATM COORDINATION GROUP (SAIOACG/4) AND
TWENTY-FIRST MEETING OF THE SOUTH-EAST ASIA ATS
COORDINATION GROUP (SEACG/21)**

HONG KONG, CHINA, 24 – 28 FEBRUARY 2014

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

SAIOACG/4 and SEACG/21
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INTRODUCTION

Meeting

1.1 The combined Fourth Meeting of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/4) and Twenty-First Meeting of the South-East Asia ATM Coordination Group (SEACG/21) was held at the Headquarters of the Hong Kong Civil Aviation Department, Hong Kong, China from 24 to 28 February 2014.

Attendance

2.1 The meeting was attended by 43 participants from Bangladesh, Cambodia, Hong Kong China, India, Indonesia, Lao PDR, Malaysia, Maldives, Philippines, Singapore, Sri Lanka, Thailand, United States, Viet Nam, IATA, IFALPA, IFATCA, and ICAO. A list of participants is appended at **Appendix A** to this report.

Officers & Regional Office

3.1 Mr. Sylvester Israel, General Manager (ASM) of the Airports Authority of India, and Chairperson of SAIOACG and Mr. Raymond Li, Chief Air Traffic Control Officer, Civil Aviation Department, Hong Kong, China, and Chairperson of SEACG co-chaired the combined meeting.

3.2 Mr. Len Wicks, Regional Officer ATM, ICAO Asia and Pacific Office was the Secretary for the meeting.

Opening of the Meeting

4.1 Mr Colman Ng, Deputy Director-General of Civil Aviation, Civil Aviation Department of Hong Kong, China welcomed participants to the meeting.

4.2 On behalf of Mr. Arun Mishra, Regional Director of ICAO Asia and Pacific Office, Mr. Len Wicks thanked the Hong Kong Civil Aviation Department for graciously hosting the meeting.

Documentation and Working Language

5.1 The working language of the meeting and all documentation was English. There were 23 Working Papers (WP), 13 Information Papers (IP), and 3 Flimsy considered by the meeting. A list of papers is included at **Appendix B** to this report.

Draft Conclusions, Draft Decisions and Decisions of SAIOACG and SEACG – Definition

6.1 SAIOACG and SEACG recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

- a) **Draft Conclusions** deal with matters that, according to APANPIRG terms of reference, require the attention of States, or action by the ICAO in accordance with established procedures;
- b) **Draft Decisions** deal with the matters of concern only to APANPIRG and its contributory bodies; and
- c) **Decisions** of SAIOACG and SEACG that related solely to matters dealing with the internal working arrangements of these bodies.

List of Decisions and Draft Conclusions/Decisions7.1 List of Draft Conclusions**Draft Conclusion SAIOACG4/SEACG21-1: ADS-B Airspace Mandates**

That, States considering airspace mandates for aircraft Automatic Dependent Surveillance-Broadcast (ADS-B) equipage are urged to ensure that the effective date of any such mandate is determined after consideration of the following:

- a) appropriate consultation with affected airspace users;
- b) the area of airspace requiring carriage and operation of ADS-B to be coordinated with affected Air Traffic Control (ATC) units, including those adjacent to the ADS-B airspace;
- c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of the ADS-B data with the ATC workstation;
- d) pilot and ATC training for the provision of ADS-B surveillance-based separation;
- e) the ability to provide an enhanced service delivery; and
- f) promulgation of the ADS-B airspace with appropriate notice, and in accordance with the provisions of Annex 15.

Draft Conclusion SAIOACG4/SEACG21-3: ATS Route Catalogue Version 13

That Version 13 of the *Asia and Pacific Region ATS Route Catalogue* replaces Version 12 on the Asia/Pacific Regional Office's web site.

7.2 List of Decisions**Decision SAIOACG4/SEACG4 2: Establishment of a Major Traffic Flow Review Group**

That, recognizing the need for high capacity major traffic flow routes (MTF) between Southeast Asia and East Asia, and the effect of the current modified single alternate Flight Level Orientation Scheme (FLOS) that caused conflicts with crossing traffic, a group consisting of China, Hong Kong China, Malaysia, the Philippines, Singapore, Viet Nam, IATA, IFATCA and the ICAO RSO be established to review:

- a) MTF conflicts with ATS routes A461 and A583; and
- b) the overall South China Sea airspace, air route and the suitability of the FLOS to optimise airspace capacity and enhance flight safety in the long term; and
- c) report outcomes of the review and recommendations to the ATM/SG/2 or SEACG/22 meetings.

REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Agenda (WP01)

1.1 The meeting noted the minor proposed change to Agenda Item 6, in order to include reference to Search and Rescue. The provisional agenda was adopted by the meeting.

Agenda Item 2: Review Outcomes of Related Meetings

Relevant Meeting Outcomes (WP02)

2.1 ICAO presented information relevant to the SEACG4/SAIOACG21 meeting from recent ICAO meetings including the:

- Regional ATM Contingency Plan Task Force (RACP/TF/2 and RACP/TF/3);
- Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/2);
- Regional Airspace Safety Monitoring Advisory Group (RASMAG/18);
- Aeronautical Information Management Implementation Task Force (AAITF/8);
- APANPIRG Air Traffic Management Sub-Group (ATM/SG/1);
- ICAO Asia/Pacific Seamless Air Traffic Management Planning Group (APSAPG/4);
- Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/24);
- Conference of Directors General of Civil Aviation Asia and Pacific Regions (DGCA/50);
- Europe – Asia Trans-regional Special Coordination Meeting; and
- Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/2).

2.2 The RACP/TF had noted that of the 15 responding administrations, there were six with 'Robust' Level 1 (Domestic or Internal State) ATM contingency plans; eight 'Marginal' and one 'Incomplete'. Overall Regional implementation was found to be Marginal. Analysis for Level 2 (Inter-State) Plans indicated that four administrations had 'Robust' Level 2 ATM contingency plans; five 'Marginal' and 'six' were Incomplete. The SAIOACG4/SEACG21 meeting noted the relatively poor state of preparedness of Annex 11-required ATM contingency plans in the region.

2.3 The FIT-Asia/2 meeting had recognised that monitoring, reporting and analysis of data-link performance and problems was essential for the achievement and maintenance of the level of system performance required for application of RNP-based separation standards. Participants at the SAIOACG4/SEACG21 meeting noted that Conclusion 24/24: *ADS/C and CPDLC Problem Reporting and Analysis* had urged States to register on the FIT-Asia website (<http://www.ispacg-cra.com>) and report any data-link related Problem Reports (PRs) but only one State had done so.

2.4 RASMAG had noted the overall Regional Monitoring Agency (RMA) assessment of non-Reduced Vertical Separation Minimum (RVSM) approved aircraft reflected a worldwide reduction that occurred after September 2012, mainly due to enhanced cross-checking and follow-up of aircraft approval status, but previous the APANPIRG Conclusion 23/15: *Long-Term Non- RVSM Approved Aircraft* had not resulted in a significant reduction of long-term errant operators.

2.5 The SAIOACG4/SEACG21 meeting was informed that APANPIRG had adopted *Conclusion 24/26: Repetitive Non-RVSM Approved Aircraft Operating as RVSM Approved Flights*, which urged States to deny entry to operate within RVSM airspace for aircraft that have been confirmed as non-RVSM approved over a significant length of time, or by intensive checking.

2.6 Stemming from an analysis of LHD hot spots, RASMAG had recognised the urgent need for prioritisation of AIDC (ATS Inter-facility Data Communications) implementation as a priority risk mitigation measure at Australian, Chinese, Indian, Indonesian, Japanese, Malaysian, Mongolian, Pakistani, Philippines, Singaporean, and Vietnamese FIR interfaces (*Conclusion 24/27: Prioritization of AIDC Implementation to Address LHDs*). These hot spots were mainly where category E Large Height Deviations (LHDs – ATC to ATC transfer errors as a result of human factors issues) formed a significant portion of the total reports. An overview of regional safety assessment results for RVSM by RASMAG indicated the following significant issues.

- **South Asia**- India had previously noted potential lack of reporting of safety issues by ATC, and there appears to have been a lack of reporting within Pakistan airspace.
- **Southeast Asia**- there were a large number of LHD hot spots associated with the Manila Flight Information Region (FIR).
- **East Asia**- there were a number of LHD hot spots at the interface between Mongolia and China, Pakistan and China, and internally within China near Wuhan and Beijing. The continued lack of reporting over many years from the Pyongyang FIR was also a concern.
- **Southwest Pacific**- had maintained an upwards trend from RASMAG/17 to be consistently above the TLS. There were a number of LHD hot spots, including the interface between Australia and Indonesian airspace (particularly Jakarta FIR), and between Australia and Papua New Guinea airspace.

2.7 Malaysia advised the SAIOACG4/SEACG21 meeting that the Flight Level Orientation Scheme (FLOS) transition in their airspace had caused Large Height Deviations (LHDs) because of the need for controller intervention to remedy reciprocal conflicts at the same level. The meeting was informed that ICAO preferred that States used the standard FLOS as per Appendix 3a of Annex 2 and in accordance with the Seamless ATM Plan, but recognised that the South China Sea (SCS) system was put in place to address a specific capacity need some years ago.

2.8 India and Malaysia announced that they were already testing AIDC and Malaysia had AIDC capability between Kuching and Kota Kinabalu. Ujung Pandang and Kota Kinabalu were testing a type of ATS data transfer facility called IDCF (Inter-ATS Data Coordination Facility)

2.9 The SAIOACG4/SEACG21 meeting noted the progress of AIS – AIM transition based on the AIS-AIM Roadmap reported to the AAITF. Phase 1 was intended to be completed on 18 November 2010, in line with the effective date of Amendment 36 to Annex 15 and Phase 2 by November 2013 (Amendment 37). The SAIOACG4/SEACG21 meeting noted that the AAITF agreed that the Deficiencies List should be updated to record AIS – AIM related deficiencies where States have reported that they have not yet completed Phase 1 Steps, or where they have failed to provide any progress reports. The following overall regional implementation was expected when Amendment 37 came into effect last year, indicating that Asia/Pacific was well behind the expected implementation schedule:

- Phase 1 AIM Transition would be 33% completed;
- Phase 2 AIM Transition would be 25% completed
- Phases 1 and 2 Transition would be 28% completed.

2.10 The AAITF had noted that instances of non-compliance with Annex 15 accuracy and advance notification requirements continued to occur; thus there were a number of States not complying with the APANPIRG *Conclusion 23/8: Annex 15 Promulgation Requirements Compliance*. To improve the effectiveness of corrective action on this safety-critical issue, ICAO Regional Office, using verifiable reports received from IATA or other valid sources, would provide a summary of all reported instances of non-compliance to future ATM Sub-Group meetings for further consideration by APANPIRG. The United States underlined to the SAIOACG4/SEACG21 meeting the importance of critical aeronautical information exchange, and urged States to improve. IATA commented that there were still issues with the quality and timeliness of aeronautical information

2.11 The SAIOACG4/SEACG21 meeting noted the work of the APSAPG and the following Conclusions related to Seamless ATM: *Conclusion 24/54: Asia/Pacific Seamless ATM Plan, Conclusion 24/55: State Seamless ATM Planning*.

2.12 The APSAR/TF had discussed potential problems with management of Personal Locator Beacons (PLBs) and in-flight activation of second generation Emergency Locator Transmitters (ELTs). The regional SAR overview indicated significant Annex 12 compliance weaknesses in South Asia and the Southwest Pacific areas, and some weaknesses in Southeast Asia and the Democratic People's Republic of Korea.

Review of BOBASIO/03 Meeting (WP13)

2.13 India provided a brief review of the Third Bay Of Bengal, Arabian Sea and Indian Ocean Region meeting (BOBASIO/03), held at Hyderabad, India from 22-24 October 2013. BOBASIO/03 noted the development of the Seamless ATM Plan, and agreed to comply with the requirement to provide comments through the regional seamless ATM reporting form to the ICAO Regional Office by 01 March 2014. The following key issues were also discussed:

- India's development of an Air Traffic Flow Management (ATFM) system;
- Airport- Collaborative Decision Making (A-CDM);
- use of Automatic Dependent Surveillance-Broadcast (ADS-B) data for monitoring aircraft height-keeping performance;
- ADS-B implementation and data sharing;
- Aeronautical Telecommunication Network/ATS Message Handling System (ATN/AMHS) and AIDC implementation;
- Space Based Augmentation System (SBAS);
- Indian airspace and Air Traffic Services (ATS) route changes;
- Implementation proposals for 30NM separation standards;
- Flexible Use Airspace (FUA) implementation;
- reporting of ATS incidents based on the principles of 'Just Culture';
- ATM contingency planning and SAR agreements; and
- establishment of an Arabian Sea Indian Ocean User Preferred Route (UPR) Zone.

2.14 IATA asked for clarification regarding the Indonesian plan for an ADS-B mandate in 2016. Indonesia was formulating a workshop and task force to discuss operational and technical aspects of the ADS-B implementation. The SAIOACG4/SEACG21 meeting noted IATA's concern at the truncated schedule for domestic and Low Cost Carriers (LCCs).

Group of Five ANSPs Informal ATM Coordination Meeting (IP10)

2.15 On behalf of Indonesia, Malaysia, Philippines, Thailand and IATA, Singapore presented IP10, which described the close collaboration between five Air Navigation Service Providers (ANSPs) in the region to enhance cross-border safety and efficiency to cope with the future growth of air traffic in Asia Pacific region. The meeting of ANSPs discussed the possibilities of implementing 'green' initiatives that used gate-to-gate operational procedures to reduce fuel burn and emissions during all phases of flight.

2.16 The meeting of ANSPs recognised the need for a harmonised regional contingency plan to minimise flight disruptions in the event of weather phenomena such as volcanic eruptions. A proposed regional volcanic ash contingency plan required each State to provide a Point of Contact (POC) so that sub-regional coordination arrangements could be planned.

2.17 Discussions at the meeting focused on concept development and explored the potential for ATFM implementation at a sub-regional scale. The development of sustainable sub-regional ATFM would also serve the Asia/Pacific Region's vision of Seamless ATM, which was consistent with ICAO's Aviation System Block Upgrade (ASBU) concept.

Mekong ATM Coordination Group (IP13)

2.18 On behalf of Cambodia, Lao PDR, Myanmar, Viet Nam and IATA, Thailand presented IP13, which provided an update of collaboration among ANSPs bordering the Mekong River to enhance cross-border safety and efficiency. The first Mekong Meeting (MK-ATM/CG/1) was held in 2011 at Bangsaen, Chonburi, Thailand, and the second meeting (MK-ATM/CG/2), was conducted from 29 to 30 May 2013 at Bangkok, Thailand.

2.19 MK-ATM/CG/2 discussed the drive ATM harmonisation towards the Seamless Association of South East Asia Nations (ASEAN) Sky supporting the ASEAN Single Aviation Market (ASAM) initiative. The main focus of the meeting dealt with Area Navigation (RNAV) 5 en-route harmonization, AIDC implementation and ATS surveillance data sharing, designed to enhance and optimise airspace capacity in the region

2.20 The meeting was apprised of concerns that the Sanya FIR was occasionally imposing using increased longitudinal spacing requirements. The ICAO Regional Sub-Office (RSO) agreed to follow up on this matter.

2.21 Laos described upgrades to their ATM system to support the improvements mentioned in the paper. ICAO noted the goal of RNAV 5 in 2018 in IP13 was not consistent with the RNAV 2/RNP 2 capability described in the Seamless ATM Plan. Lao PDR, Cambodia, Thailand and Viet Nam undertook to conduct a side meeting (**Appendix C**) with the RSO on this matter. The RSO would support the States involved in the development of their new routing schemes, in coordination with the AATIP project.

Agenda Item 3: Review of Current Operations and Problem Areas

SAIOACG/SEACG Small Working Group Updates (WP03)

3.1 Small Working Groups (SWG) were formed by SAIOACG/2 and SEACG/19 to make recommendations that assisted implementation in accordance with the Asia/Pacific Seamless ATM initiatives, related to the Air Traffic Flow Management (ATFM), Communication (COM) and ATS Surveillance (SUR) fields. Key SWG actions were reviewed and the SAIOACG4/SEACG21 meeting was updated on any progress (**Table 1**).

ATFM SWG	Summary of Actions
City Pair CDM trials Bangkok, Singapore, and Hong Kong	Support the tests and plan for future expansion and development; trial results reported to SEACG/21 (SAIOACG4/SEACG21/IP11).
Large Scale Weather Deviations (LSWD)	Tripartite agreement should include ATFM measures distributed via A-CDM ensuring maximum utilization during LSWD affecting L642 and M771; results reported to SEACG/21 (SAIOACG4/SEACG21/IP11).
Pakistan-India-Afghanistan Special Coordination Meeting	BOBCAT Prioritisation; acceptance of 50NM separation; removal of unnecessary ATS route/altitude restrictions; status of COM and SUR; transition from BOBCAT to ATFM system. India and Pakistan had conducted a coordination meeting. 50 NM spacing was now accepted on ATS route P628. Lahore requires acceptance by Kabul before accepting from India, and FL280 was still not available (SAIOACG Task List).
States with traffic capacity issues	States to commence aerodrome and airspace capacity analysis at the earliest opportunity (now managed by the ATFM/SG).
Sub-regional ATFM (Conclusion ATFM Steering Group)	Start with sharing information, then evolving into collaborative ATFM implementation among the virtual ATFMUs (now managed by the ATFM/SG).
COM SWG	
South China Sea Communications (Conclusion)	Urgent attention to Manila FIR HF capability; review of SCS service provision; cooperative agreements to exchange COMs and SUR capability in the South China Sea. At SEACG/21 the Philippines advised the HF improvements were 'on hold', and ADS-C/CPDLC trials were due to start by 2015. Malaysia was planning a surveillance handover with Viet Nam, but Viet Nam already shared data with Singapore.
CPDLC (Conclusion)	CPDLC systems integrated with the workstation of the controller responsible for the relevant sector of airspace (Seamless ATM Plan).
Implementation of AIDC	This is the subject of numerous APANPIRG Conclusions. (Seamless ATM Plan).
SUR SWG	
Direct Speech Circuits	Implementation of direct speech circuit between surveillance controllers (Seamless ATM Plan).
Radar Handoff	Surveillance handoff procedures (Seamless ATM Plan).
ADS-B Data Sharing	ADS-B with VHF communications in areas with lack of infrastructure and sharing agreements (updates from Singapore, India, Maldives, Myanmar, Malaysia) WP09, WP13 IP12.

Table 1: Small Working Group Actions

3.2 **Table 2** indicates specific actions resulting from the SUR SWG:

1	Identify areas to implement radar hand-off procedures so that the agreed spacing between FIRs can be reduced. Action completed.	Singapore, Malaysia
2	Reduce the agreed spacing at the Transfer of Control point between Singapore and Jakarta FIR. Actioned, now 20NM.	Singapore Indonesia
3	Reduce longitudinal separation from 50NM to 30NM on L642/M771 Hong Kong agreed to surveillance based separation in 2015, subject to a moratorium period of six months after the implementation of the new Hong Kong system (Task List).	Hong Kong, China, Vietnam, Singapore
4	Reduce the agreed spacing at the Transfer of Control point between Kuala Lumpur and Bangkok FIR (20NM was in final trial for implementation during late March 2014).	Malaysia, Thailand
5	Develop further the coverage charts to incorporate new ADSB data by Hong Kong and India. To obtain more information from Vietnam relating to their coverage in VHF and surveillance capabilities (Seamless ATM Plan).	Hong Kong, India, Singapore (SWG lead)
6	Continue efforts to conclude LOA for ADS-B data sharing between India and Myanmar ICAO to assist if requested	India, Myanmar
7	Spread the information among IATA member airlines to assist in the Sanya FIR ADS-B trials. IATA had taken action in this regard.	IATA, China

Table 2: SUR SWG Actions

Enhancing En-route Capacity over the Bay of Bengal (WP11)

3.3 Malaysia and Singapore presented WP11, which discussed ATM solutions to enhance en-route capacity over the Bay of Bengal, given the continued growth of air traffic between South East Asia - South Asia and beyond. The current No Pre-departure Coordination (NPDC) flight levels allocated for westbound flights on routes crossing the Bay of Bengal has resulted in a number of flight levels being unavailable on certain routes, and was an inefficient system.

3.4 The Bay of Bengal Cooperative ATFM System (BOBCAT) had managed air traffic flow within the Kabul FIR for years, but the procedures resulted in bunching at segments with constricted en-route capacity. The eastern portion of the Bay of Bengal was an area where convergence of BOBCAT flights from Malaysia and Singapore may result in congestion, partly due to the limited number of cruising levels that were available over the Bay of Bengal. Such occurrences sometimes resulted in ad hoc holding to achieve the procedural longitudinal separation, also affecting the allocated Kabul FIR entry time compliance. WP11 suggested that additional flight levels during BOBCAT operating hours would alleviate such occurrences and enhance compliance with the ATFM measures over Kabul FIR. In addition, activation of a 'by-pass route' whenever bunching occurs was proposed.

3.5 The westbound departures to the Middle East and South Asia were not part of the BOBCAT ATFM procedures departing from Malaysia and Singapore. These flights were typically assigned FL280 and FL300 NPDC, spaced 10 minutes apart given the procedural separation applied over the Bay of Bengal. Some flights had to delay departure for up to 40 minutes as they waited to depart at intervals of 10 minutes. There were also occasions where tropical cyclone would severely impact the operations and efficiency of flights over the Bay of Bengal. During such periods, some routes would not be available leading to converging flights and further compounding the issue of limited flight levels. The meeting noted that with the advent of ADS-B, enhanced surveillance coverage over the Bay of Bengal could allow the application of more efficient surveillance-based separations in the area.

3.6 India clarified that all levels were available except for FL320 for southeast-northwest routes, and India provided FL320 on a tactical basis when it was available. India further advised that Port Blair ADS-B would be operational in April 2014. IFATCA noted the current Flight Level Allocation System (FLAS) was implemented some time ago. The meeting agreed that there was no need for an analysis as proposed by the paper because the majority of issues would be solved by ATS surveillance, and then there should be no need for the FLAS.

Capacity Enhancements in SAIOACG Airspace (WP22)

3.7 Thailand's WP22 also considered the capacity of Bay of Bengal airspace from the perspective of ATS route planning, describing how an improved ATS unidirectional route structure with more parallelism in an improved communications and surveillance environment may allow removal of the FLAS. Thailand announced that it would complete ADS-B testing by the end 2014 and exchange data with Singapore, Malaysia and Myanmar.

3.8 In tandem with approval of ICAO Asia-Pacific Seamless ATM Plan, informal ATM coordination groups such as Mekong ATM Coordination Group (MK-ATM/CG) and the Group of Five ANSPs Informal ATM Coordination Group (G5) supported the concept of en-route PBN harmonization, while selecting the RNAV5 specification in surveillance airspace for November 2015 with transition to RNP 2 in November 2018. Therefore, it was proposed that, in support of the Asia-Pacific Seamless ATM Plan, a new route structure (**Figure 1**) should be designated, at the minimum, RNAV 5 in airspace covered by communications and surveillance (Category S airspace) and RNP 4 or RNAV/RNP 10 outside communications and/or surveillance coverage (Category R airspace), both with the aim to transition to RNP 2 in 2018.

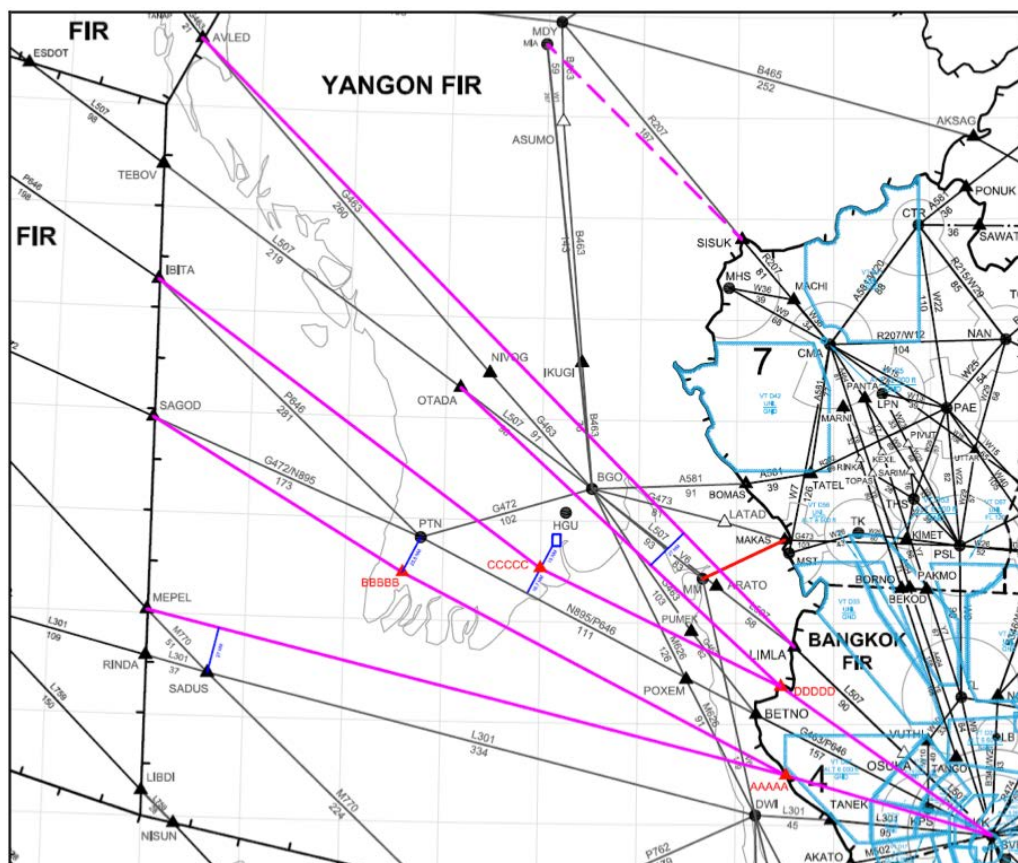


Figure 1: Proposed Northeast Bay of Bengal Route Structure Enhancement

3.9 Route structure enhancements shown in **Figure 1** in the northeast part of the Bay of Bengal were designed to support traffic flow from Southeast Asia to Northern India and Europe, and growth from the introduction of the ASEAN ‘Open Skies’. The proposed route structure enhancement in **Figure 1** had been tabled at India-Myanmar-Thailand ATM Coordination Group Meeting (IMT) in 2011. It was expected that these route structures would also be discussed at the next Bangladesh-India-Myanmar-Thailand ATM Coordination Group Meeting (BIMT) planned in first half of 2014.

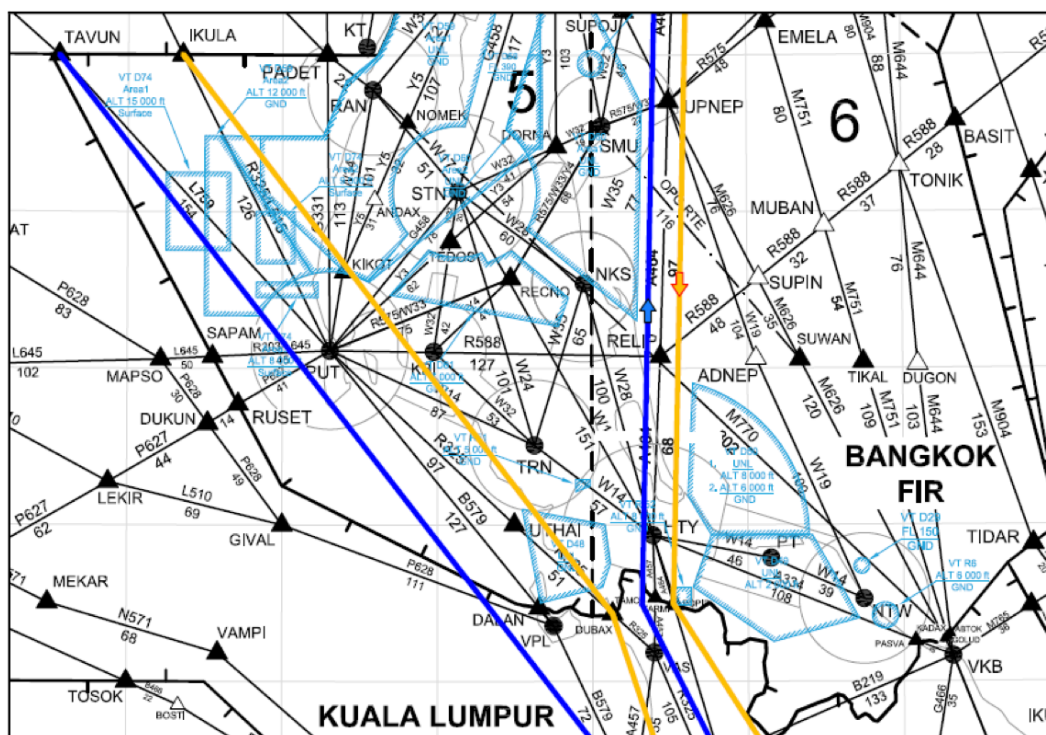


Figure 2: Proposed Southeast Bay of Bengal Route Structure Enhancements

3.10 The route structure enhancement in **Figure 2** attempted to restructure traffic flow between Malaysia – Thailand into more unidirectional flows, supporting overflight traffic between Europe / North India and Singapore/Malaysia as well as traffic flow between Malaysia and Thailand.

3.11 The SAIOACG4/SEACG21 meeting was invited to note that the Asia-Pacific Seamless ATM Plan stated that FLAS should only be utilized for safety and efficiency reasons in category S airspace when crossing track conflicts occurs within 50NM of FIR boundaries, or if ATS surveillance coverage did not overlap the FIR Boundary concerned, or ATS surveillance data is not exchanged between ATC units concerned. Given that route structure enhancements proposed in **Figure 1** and **Figure 2** were expected to move routes into communications and surveillance coverage once Myanmar ADS-B became operational, it was proposed that the FLAS restriction on those route structures be removed, and the FLAS on the remaining ATS routes within the Bay of Bengal be reviewed in order to support expected future traffic growth.

Airport CDM – Adverse Weather and Fog Operations (WP14)

3.12 India provided information on their use of Airport Collaborative Decision Making (A-CDM) in adverse conditions and fog. They noted that New Delhi was affected severely by fog despite having a CAT IIIB Instrument Landing System (ILS). The A-CDM process for departures in fog was implemented in November 2011, significantly improving the situation. From 2014, this process would also include arrival and diversion management, and would be used in all adverse conditions, such as fog, thunderstorms and dust storms.

3.13 The A-CDM process involved stakeholders such as airlines, ANSPs, airport operators and meteorological authorities. Advantages of the A-CDM process included:

- a) reduced radiotelephony congestion;
- b) improved airline situational awareness;
- c) less holding and early diversions that enhanced safety and environmental savings;
- d) improved management of congestion after adverse conditions; and
- e) maximising capacity (77 movements/hour has been recorded after lifting of fog).

3.14 IATA congratulated India for their development of the A-CDM systems, noting the better management of an adverse weather event today. IATA noted that CANSO would present information to the next ATFM/SG on a comparison of terms and data presentation to ensure the highest degree of harmonisation of A-CDM systems.

Development of an A-CDM Platform at Mumbai (IP05)

3.15 IP05 also provided further information on India's effort in the development of an A-CDM platform as a pilot project at Mumbai airport. This tool will be useful for many stakeholders, and would also serve the general public with timely and accurate flight updates. The Mumbai A-CDM Project features were:

- automatic calculation of (Target Start-up Approval Time, or TSAT);
- Flight Data processing, independent of the ATC automation system;
- all Indian NOTAMs were processed automatically; and
- real-time information sharing among stakeholders through the A-CDM website.

3.16 The next stage of the project would be the generation of EIBT (Expected In Block Time), which required reliable, real time data source of arriving aircraft. Subsequently, this project would be extended to other large Indian airports and integrated into a single AAI portal, which would be beneficial for interaction with ATFM components.

Establishing a Harmonized Transition Altitude in India (WP15)

3.17 India presented a proposal to enable a nationwide harmonised transition altitudes in accordance with Recommendation 5/1b of the ICAO Air Navigation Conference. WP15 discussed the feasibility of a harmonised regional transition altitude (TA) with neighbouring States. This had also been briefly discussed at the ATM/SG/1 meeting (WP18, Pakistan).

3.18 Seven different transition altitudes were published for 106 airports in India, which varied from 4,000ft to 8500ft. India suggested that a TA above 10,000ft had clear operational advantages in terms of cockpit workload and reduced the probability of gross errors in altimeter setting. The introduction of a Harmonized Indian Transition Altitude (HITA) was part of a project that examined such matters as pressure variations, altimeter setting procedures and ICAO policies.

3.19 The meeting was reminded that equal emphasis should be placed on what the lowest available flight level would be, dependent on the ambient QNH setting, so that 1,000ft separation was maintained between the highest altitude using QNH and the lowest flight level using 1013.2 hectopascals (hPa, QNE); therefore establishing a transition layer. In this regard, India proposed a uniform transition level of FL 150. The meeting was informed that this was consistent with the transition layer in New Zealand, which was determined after considering the mountain heights, pressure gradients and the fact that non-oxygen flights were generally at 13,000ft or below.

3.20 India stated that the introduction of a harmonized TA required establishing QNH regions within which a common pressure value (QNH) was applicable for flights to transitioning from reading its vertical position. A standard operating procedure on exchange of QNH data among the QNH reading stations and determination of regional QNH had to be established to ensure that:

- a) at or above the transition level of F 150, vertical position was by reference to the standard pressure value of 1013.2 hPa;
- b) at or below the transition altitude of 13,000ft, vertical position was by reference to the QNH altimeter setting; and
- c) while passing through the transition layer, vertical positioning was expressed in terms of altitude when descending, and in terms of flight level when ascending.

Note: F 135, F140 and F145 are not available for flight planning. However ATC may authorize flights to maintain F 135, F140 and F145 with in HITA airspace using altimeter setting advised by ATC.

3.21 A comparative table of TA is shown in **Table 3**:

State	Transition Altitude (ft)
United Kingdom, Germany	5,000
Australia	10,000
Brunei, Sri Lanka, Malaysia, Maldives, Singapore, Thailand	11,000
India (proposed)	13,000
New Zealand	13,000
Nepal	13,500
United States and Canada	18,000 (17,500 highest altitude)

Table 3: Comparison of Transition Altitudes

3.22 India advised that there would be an extensive consultation process with stakeholders and subsequent workshops on the HITA. In addition, they suggested an ICAO workshop for a regional harmonised TA. While acknowledging the merits of a workshop, ICAO noted that unbudgeted events were always an issue to support. The meeting was apprised of the situation in Europe, whereby the TA was proposed to be higher but this was not supported by all European States. While acknowledging the difficulties of changing a national standard, in general, the meeting noted the possibility and merits of a sub-regional South Asia TA in the order of 13,000ft and Southeast Asia TA of 11,000ft.

Google Project (IP02)

3.23 The Secretariat presented information on Project Loon, a heavy free unmanned balloon project being trialled by Google, Inc. The project used high-altitude balloons in the stratosphere at an approximate altitude of 60,000ft (18 km), creating an wireless network with 3G-like Internet speeds.

3.24 On 16 June 2013, Google began an experiment in the South Island of New Zealand, launching about 30 heavy free unmanned balloons. The project tested wireless Internet connections to the network of balloons equipped with special antennas. Google planned to release about 300 balloons around the world in the Southern Hemisphere that would provide coverage to New Zealand, Australia, Chile, and Argentina, and eventually hoped to have thousands of balloons flying in the stratosphere.

3.25 The meeting noted that after an incident in United Arab Emirates airspace resulting from a free balloon that strayed off course, ICAO had taken action to alert Google of the requirements of Annex 2 (specifically, Appendix 4) regarding authorisation and operation of unmanned free balloons. In addition, the Annex 15 promulgation requirements when an operation involved a mass release of balloons or was a potential hazard to aviation were noted.

Update on AIS Initiatives (IP04)

3.26 India presents an update on their Aeronautical Information Services (AIS) initiatives. India had large number of airports which required the management of large amounts of aeronautical data by AIS. To meet the requirements of the AIS data users for timely and efficiently receipt of data and to transition from AIS to AIM, India had implemented AIS automation using Aeronautical Information Exchange Model (AIXM) Version 4.5.

3.27 For Aeronautical Data Exchange, the ATN/AMHS system in use at Mumbai had a capability to use Internet Protocol Suite (IPS) for data communication. India had also planned to provide IP-based domestic AMHS at Chennai, Kolkata and Delhi.

3.28 India was planning to implement the electronic Terrain and Obstacle Data (eTOD) by 12 November 2015. The dynamic data provided for Aeronautical Information Briefing was fully automated and delivered to airline operators and flight crew via an Automatic Self- Briefing system. India was committed for an appropriate action for implementation of Digital NOTAM based on future ICAO plan. The e-AIP has been uploaded on the Airport Authority of India's web site at (http://www.aai.aero/public_notices/aaisite_test/eAIP/Home_india_01.html).

Agenda Item 4: Implementation of New CNS/ATM SystemsSeamless ATM Planning and Reporting (WP04)

4.1 ICAO presented an overview of the Seamless ATM planning and reporting required by States, and provided an update on the progress towards the performance-based monitoring regime being implemented during 2014. The meeting recalled that the Asia/Pacific Seamless ATM Plan had been a key APSAPG outcome. The Asia/Pacific Seamless ATM Plan incorporated Block Zero ('0') Aviation System Block Upgrade (ASBU) elements that were now part of the Global Air Navigation Plan (Doc 9750). APANPIRG/24 (June 2014) adopted the following Conclusions/Decision:

Conclusion 24/2 — Establishing Regional Priorities and Targets

Conclusion 24/54: Asia/Pacific Seamless ATM Plan

Conclusion 24/55: State Seamless ATM Planning

Decision 24/56: Seamless ATM Seminars/Workshops

4.2 The meeting noted that Seamless ATM Plan and implementation guidance material was available on the ICAO Asia/Pacific web site at: <http://www.icao.int/APAC/Pages/edocs.aspx>. A key to any effective implementation was to reduce complexity to ensure the maximum understanding and involvement by all concerned parties. In the case of the ASBU/Seamless ATM planning, a number of States and Administrations had expressed concern about the need to minimise the burden of data gathering and reporting. This was a concern not just for administrations and States, but also for the Regional Office to manage, especially with a Regional Performance Dashboard creating another layer of results to consider on top of the regional targets/metrics.

4.3 The State Seamless ATM Plans were intended to be high-level and concise, so that each of the Seamless ATM elements that were applicable to the State could be elucidated in a brief paragraph, explaining the basic benefits and costs, barriers and steps to implementation, and an outline of the expected result. A template of a State Seamless ATM Plan is available on the same web page that the Seamless ATM Plan is located. The meeting noted that it was not necessary to submit the State Seamless SATM Plan to the Regional Office at this juncture.

4.4 The reporting of implementation progress of the Seamless ATM Plan elements in accordance with APANPIRG Conclusion 24/55 c) was crucial for airspace users, neighbouring FIRs, Regional Office and ICAO HQ. Seamless ATM reporting was expected to be as uncomplicated as possible, with the initial manual excel spreadsheet requiring only basic responses, such as whether the Seamless ATM element was applicable or not, and if so, when it would be implemented. The form also had space for feedback on barriers to implementation so ICAO and other States could learn from this experience. As ASBU were incorporated into the Seamless ATM process, the single report from a State was considered all that was necessary for both ASBU and Seamless ATM updates.

4.5 The Regional Office was developing an electronic (Internet) means of reporting in the near future, with automated capability to present charts and maps of regional progress in respect of each element or State. This feature was expected to provide APANPIRG and its Sub-Groups, and States with powerful tools for monitoring and planning.

4.6 An Asia/Pacific Regional Performance Dashboard on safety (based on the Global Aviation Safety Plan-GASP) and air navigation (based on the GANP) would become active on the ICAO HQ's web site during 2014. At first, the Dashboard would be relatively simple, with data from ICAO databases (Datamart) or drawn from global databases that did not require a separate State input to update.

4.7 The meeting noted that the operation of the Dashboard and the regional Seamless ATM reporting and monitoring process should not be confused by States. The dashboard had a linkage with Seamless ATM reporting and monitoring process but as the dashboard was a very high-level 'window' on Asia/Pacific performance, it was expected to be used by the public and high-level decision-makers. The regional process was more comprehensive, using State inputs (through the reporting form), and was expected to be used by technical and operational managers. In the future, it was possible that the Dashboard and the regional system would become one system, managed by the Regional Office.

4.8 ICAO inter-regional coordination resulted in a common group of core global indicators:

- PBN Approach: percentage of runways at international aerodromes (as defined in DOC7910/AIP) with APV (Approach with Vertical Guidance);
- ATFM: percentage of FIRs within which all Area Control Centres (ACCs) utilize ATFM measures;
- AIM: Status of implementation of Phase 1 and 2*;
- Ground-Ground Digital Coordination/Transfer: percentage of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/On-Line Data Interchange (OLDI) with neighbouring ACCs; and
- Environmental Benefit⁺: percentage fuel burn reduction using IFSET (ICAO Fuel Savings Estimation Tool).

*This item was still under discussion.

⁺The indicator Environmental Benefit would measure the sum of the other improvements, and would be calculated by ICAO HQ (no action from States required).

4.9 The 2014 Dashboards would be an early iteration. It was agreed that four of the seven indicators suggested by Asia/Pacific, and shared by some other regions, should form the core that would be used for 2014. The three that were not globally agreed by other regions were ASUR (surveillance), TBO (ADS-C and CPDLC), and FRTO-FUA so these will progress as regional 'customizations' in 2015. PBN Terminal was renamed to 'PBN approach'.

4.10 Once endorsed at the regional level, the regional priorities and targets would be incorporated into the regional dashboards. In the Asia/Pacific region, the target date was September 2014, following APANPIRG/25.

4.11 The Air Navigation Report Forms (ANRFs) have replaced the earlier Performance Framework Forms (PFF). The ANRF were intended to be a means of setting milestones and targets, and monitoring progress with metrics for each of the key Seamless ATM elements (at first, the seven priority elements). The ANRF also identified the implementation challenges, and more efficient tools which could be used for monitoring. The ANRF would be presented to APANPIRG and its Sub-Groups as appropriate to update – and were expected to be where the agreed metrics and targets would ultimately be maintained. The meeting noted that States were not expected to complete ANRF.

4.12 In accordance with APANPIRG Conclusion 24/2, the Chairpersons of Sub-Groups and the APSAPG were invited to consider the further development of Asia/Pacific Regional Priorities and Targets. It was noted that the Seamless ATM Plan contained priorities (paragraph 5.7, Table 1 refers) intended to generally guide States for all 18 ASBU elements.

4.13 The meeting reviewed and endorsed the ten regional targets agreed by the Chairpersons to be shown on the Regional Performance Dashboard, which were based on the highest priority elements. It was noted that all 42 Seamless ATM elements were assigned priorities.

4.14 ICAO HQ had proposed seven metrics, which the Chairpersons compared with the top regional priorities. It was determined that three of the HQ priorities were not suitable for Asia/Pacific because the means to measure successful operation were difficult to quantify (Continuous Climb Operations-CCO, Continuous Descent Operations-CDO, Performance-based Navigation (PBN) En-route and environmental savings using the IFSET tool).

4.15 Two other metrics proposed by ICAO HQ were similar to those already recognised within the Seamless ATM Plan. A seventh proposed HQ metric regarding PBN terminal was considered suitable, so was added to the six from the Seamless ATM Plan to make a total of seven.

4.16 The Asia/Pacific Office had developed a Handbook that contains the priority ASBU elements and their associated ANRF, information on ASBU, the Seamless ATM Plan, Implementation Guidance material, and the Seamless ATM Reporting Form. The SAIOACG4/SEACG21 meeting was informed that the Handbook would be presented later in 2014 to APANPIRG/25.

Separation Minima and Airspace Capacity (WP05)

4.17 ICAO presented information on separation standards applicable in airspace served by ATS surveillance, and their contribution to improvements in airspace capacity and efficiency. It included references to ICAO Standards and Recommended Practices as defined in ICAO Doc 4444 (PANS/ATM), and the Asia/Pacific Region's expectation of the application of appropriate separation minimums as agreed by APANPIRG in its adoption of the Asia/Pacific Seamless ATM Plan.

4.18 It was recognised that extension of ATS surveillance coverage such as ADS-B brought a number of significant capacity, efficiency and safety benefits. This included the improvement in ATC situational awareness from highly accurate, high update rate aircraft position and trajectory information, extension of ATM system safety net alerts for cleared level and route adherence, dangerous area and minimum safe altitude warnings and conflict alerts, display of aircraft generated emergency status and enhanced SAR alerting services through accurate real-time update of last observed aircraft position.

4.19 Significant airspace capacity and efficiency improvements are achieved through the implementation or extension of ATS surveillance services, *where accompanied by implementation of surveillance based separation standards*. Using the example of en-route airspace, such capacity and efficiency improvements were the result of:

- More efficient horizontal separation minimum that reduces the number of conflicts;
- significant reduction in spacing required between ATS routes, permitting capacity and efficiency improvement in ATS route networks; and
- substantial reduction in ATC workload and task complexity due to:
 - removal of requirement for position reports from identified aircraft;
 - replacement of a mixture of procedural horizontal separation standards; and
 - improved monitoring of separation, with tactical intervention only where required.

4.20 It was noted that 5NM and 3NM surveillance-based separation minima had been in global use for several decades, including in a number of Asia/Pacific States. The use of these minima provided a quantum leap in airspace capacity and efficiency, improved opportunity for flight at fuel efficient flight levels, and reduced ATC workload and task complexity. The introduction of advanced ATM automation systems had further improved ATC capacity. SAIOCG/3 and SEACG/20 observed that overly-conservative separation minimums were both applied and planned within surveillance coverage in some critical areas of Asia/Pacific airspace.

4.21 The Seamless ATM plan defined airspace categories according to its CNS capability or *potential* capability, with Category S meaning serviced (or potentially serviced) en-route airspace – by direct (not dependent on a CSP) ATS communications and surveillance. The Seamless ATM Plan Preferred ATM Service Levels (PASL) included the expectation to use the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable.

4.22 The SEA/BOB ADS-B Working Group (October 2013) had discussed the reasons why minimum surveillance separation standards were not always used within surveilled airspace. These included the incidence of non-compliance with clearances in or approaching boundary areas, ATC coordination deficiencies, traffic demand and ATC system and display limitations requiring reconfiguration of airspace, ATC sectors and ATM systems. IATA observed that there was a significant difference between minimum separation derived by ATM capability, and that required to manage traffic for various reasons; thus setting separation at conservative distances in all circumstances, regardless of traffic demand, penalised aircraft when there was no need.

4.23 Several Asia/Pacific States had indicated an intention to mandate ADS-B equipage to increase capacity. There were a number of issues arising from some of these proposed mandates.

- route-specific mandates, rather than airspace volume-specific, resulting in differing separation standards applicable within surveillance coverage in individual sectors;
- mandates being imposed before such critical activities such as human factors assessment, procurement, standards and procedures development, operational testing and evaluation, regulatory approvals and ATC training delivery; and
- mandates being imposed before any operational ADS-B services were provided.

4.24 The meeting noted that the imposition of an ADS-B mandate should be the final step in any ADS-B implementation process. SAIOACG/SEACG agreed to the following Draft Conclusion for consideration by the ATM Sub-Group and APANPIRG:

Draft Conclusion SAIOACG4/SEACG21-1: ADS-B Airspace Mandates

That, States considering airspace mandates for aircraft Automatic Dependent Surveillance-Broadcast (ADS-B) equipage are urged to ensure that the effective date of any such mandate is determined after consideration of the following:

- a) appropriate consultation with affected airspace users;
- b) the area of airspace requiring carriage and operation of ADS-B to be coordinated with affected Air Traffic Control (ATC) units, including those adjacent to the ADS-B airspace;
- c) conduct of a safety case, which includes, *inter alia*, a human factors review and the integration of the ADS-B data with the ATC workstation;
- d) pilot and ATC training for the provision of ADS-B surveillance-based separation;
- e) the ability to provide an enhanced service delivery; and
- f) promulgation of the ADS-B airspace with appropriate notice, and in accordance with the provisions of Annex 15.

4.25 IFATCA expressed their complete support of the paper, emphasizing the crucial importance of training to progress from an ATC to a modern ATM environment, and the need to know about pilot performance and aircraft capability. Hong Kong, China asked about the pilot training. IATA advised that their members were well aware of ADS-B, but some States needed to focus on training local pilots. Singapore advised that the ADS-B Implementation and Operations Guidance Document (AIGD) contained ADS-B related phraseologies for ATC. They advised that the LSWD procedures needed to be reviewed in light of the use of surveillance based separation.

4.26 IATA fully supported the principles of the paper, stressing the need to use the capability of the CNS systems. India asked for IATA's support for a greater carriage of FANS 1/A in aircraft. IATA advised that they advocated this to airlines but there was always an issue with legacy and narrow body aircraft, and LCC. IATA supported mandates where there was a service improvement. The meeting discussed the phased approach and recognised the possibility of moving to an RNAV 2 route system instead of using RNP 4 as a start, with progression to a higher performance specification at a later date.

South China Sea Airspace - RNP4 (WP07)

4.27 IATA submitted WP07, which requested States to consider declaring the South China Sea (SCS) airspace RNP4 as a step toward eventual RNP2 designation. The WP noted that with implementation of ADS-B in Vietnam, Malaysia, Indonesia, Hong Kong and Singapore, associated VHF communications and existing radar surveillance coverage, SCS airspace, with the exception of the Manila FIR, now had ATS surveillance coverage; thus enabling Category S airspace surveillance-based separations and efficiencies. IATA acknowledged that the Philippines, Singapore and Vietnam had implemented more efficient longitudinal separations.

4.28 IATA suggested that harmonising the airspace was timely, and requested designation of the SCS (Singapore, Ho Chi Minh, China [Sanya], Hong Kong China and Manila FIRs) as RNP 4 airspace, as a step toward eventual RNP2. Notwithstanding this, IATA stated that separations should be based on appropriate ATS surveillance and Direct Controller Pilot Communications (DCPC).

4.29 The meeting had a lengthy discussion about the capacity problems in the SCS and the advantage of the new PBN navigation specifications. The meeting noted that an alternative consideration may be the use of a more efficient improved longitudinal separation. Singapore noted that RNP4 implementation would require a safety assessment by an EMA. Moreover, they stated that it was difficult to identify the benefit of RNP4 within Category S airspace as they were using ATS surveillance-based separations. The meeting agreed that on balance, there was no requirement to mandate RNP 4 within SCS airspace.

ADS-B Implementation within the Singapore FIR (WP09)

4.30 Singapore presented an update on the implementation of ADS-B within the Singapore FIR. On 6 November 2013, Singapore issued AIP Supplement 243/13 advising that from 12 December 2013, aircraft operating on ATS routes L642, M771, N891, M753, L644 and N892, at or above FL290 must carry a serviceable ADS-B and operational approval. Hong Kong, China ultimately supported exclusive ADS-B airspace. Singapore advised that State aircraft did not normally overfly the mandated ADS-B airspace within the Singapore FIR.

4.31 With the implementation of the enhanced ATS surveillance coverage, 5NM horizontal separation was applied for flights operating within the Singapore FIR. The extended surveillance coverage on ATS routes L642, M771, M753 and N892 allowed Singapore and Viet Nam to agree on a phased approach (from 50NM in 2013 to 20NM in 2015) to reduce longitudinal separation. India advised that they were using 5NM and 3NM within terminal airspace using ADS-B. The main issue for India was that the neighbouring States did not always accept the same standard.

4.32 Singapore advised it was monitoring non-compliant affected airframes, which were not allowed to operate within the ADS-B airspace. Singapore informed the meeting that States were sharing information on non-ADS-B airframes. IATA thanked Singapore for their cooperation in reducing the incidence of non-compliant operations.

4.33 Singapore stated that they had had a very low number of erroneous ADS-B operations. Prior to implementation Singapore noted an ADS-B equipage rate of 70%, but after implementation this had jumped to above 90%. Training for controllers on ADS-B operations was conducted as part of the Long Range Radar and Display System III (LORADS III) training.

4.34 The paper noted that previously weather avoidance deviations would require a descent and/or climb to ensure lateral separation, which was no longer normally required. Thus the reduced need for numerous level changes and coordination with Ho Chi Minh ACCs had markedly improved ATC and pilot workload. The implementation of ADS-B airspace within the Singapore FIR had been successful. However a few issues were discovered during the first two months of ADS-B operations:

- incorrect filed flight-plan with regard to ADS-B equipage;
- aircrew equipment handling; and
- erroneous ADS-B equipment (observed through a monitoring system).

4.35 The meeting discussed the notice required for ADS-B, noting that for some aircraft ADS-B installation could be done quickly but for some airlines and general aviation it may require a longer preparation period.

4.36 Viet Nam announced that they had implemented ADS-B within the Ho Chi Minh FIR on 21 October 2013, while ATS routes M771 and L642 were being served by a radar separation of 10NM.

4.37 The meeting was informed by IATA that that space-based ADS-B was expected to be fully operational in 2017. However the costs to ANSPs were not known at this time.

Mutual Collaboration for Regional SBAS (WP16)

4.38 India recalled that on 14 February 2014, the Global Positioning System-Aided GEO-Augmented Navigation (GAGAN) Space Based Augmentation System (SBAS) signal-in-space was in operational service, capable of meeting RNP0.1 service levels to en-route flight within Indian FIRs covering both the Bay of Bengal and Arabian Sea. The final objective of Approach with Vertical Guidance (APV1) certification to enable SBAS vertical guidance to selected runway ends was planned by the end of 2014.

4.39 APANPIRG 24 acknowledged the need for cooperation for GNSS among states that had implemented SBAS and others which could use the technology. India welcomed active collaboration with Asia/Pacific States to extend GAGAN services, noting that many proximate States could achieve operational benefits through minimal infrastructure development. India clarified that a GAGAN reference station along with performance monitoring and recording facility have to be established to use the GAGAN signal-in- space. The cost estimate may vary from one state to another; however the approximate cost is USD four million for one INRES station. India expressed its willingness to conduct feasibility study for any of BOBASIO states and also to share more details on the subject. States were informed to contact the Nodal officer for GAGAN project through e-mail; svsatish@aai.aero or chq.gmatmgagan@aai.aero for more details.

4.40 India noted that GAGAN also provided GNSS performance monitoring and recording that was vital for provision of PBN services. India was also implementing a pilot project to establish a certified Ground-based Augmentation System (GBAS) at Chennai.

4.41 ICAO Asia/Pacific States were collaborating to develop a regional ionospheric model through the Ionospheric Study Task Force (ISTF). The ISTF and Interoperability Working Group (IWG) acknowledged GAGAN would benefit Asia/Pacific States in respect of GNSS transition planning and development, as dual frequency operations were still a decade away. India encouraged States to evolve a joint project studying the cost-benefits of implementing GAGAN. IATA supported GBAS and the cost benefit project suggested by India. IATA restated that they did not support SBAS, preferring Baro V-NAV if needed for certain aerodromes.-

Thailand AIDC Implementation Airspace Capacity Enhancement (WP23)

4.42 Thailand described their effort to enhance airspace capacity in the Bangkok FIR through the implementation of electronic aircraft handoff via AIDC with its neighbouring FIRs, along with the implementation of a new ATS system. They recalled that the Asia-Pacific Seamless ATM Plan, in accordance with PASL Phase 1 (November 2015), provided expectations for electronic aircraft transfer of control between ATC units via AIDC unless an alternate means of automated transfer of control was available. Moreover, Thailand recalled that this was in accordance with ASBU element B0-FICE, which was categorized as Priority 1 in the Asia-Pacific Seamless ATM Plan.

4.43 The meeting noted that Bangkok FIR's rapid air traffic growth (10–16% per annum from 2010 to 2013, 1,280 flights per day in 2010 to 1,900 flights per day in 2013) had put pressure on the ATM infrastructure. In an effort to support continued growth expected from the establishment of the ASEAN Economic Community (AEC) among the members of ASEAN in 2015, Thailand had procured a new ATS system, and was planning an operational trial in late 2015.

4.44 Informal ATM coordination groups such as Mekong ATM Coordination Group (MK-ATM/CG) and Group of Five ANSPs Informal ATM Coordination Group (G5) had agreed to implement AIDC among the participating States. The ATS system would support AIDC version 3 in accordance to the ICAO Asia-Pacific Seamless ATM Plan. Thailand intended to coordinate with all of its neighbours to implement AIDC at all FIR boundaries based on the following tentative schedule:

- a) Phase 1: Operational Concept and Procedures Coordination (2014);
- b) Phase 2: System Test and Verification (January – March 2015); and
- c) Phase 3: Operational Trial and Implementation (April – October 2015).

4.45 Thailand expected that implementation of AIDC aircraft transfer of control would enable approximately 20% increase in airspace capacity enhancement by freeing controllers from workload related to aircraft transfer-of-control coordination by voice. In addition, it was expected that the AIDC implementation will also bring associated safety benefits in reducing transfer-of-control errors. The meeting noted that the AIDC implementation schedule was dependent upon the success of ATS system operational trial and its implementation timeframe.

Implementation of LORADS III – New Singapore ATM System (IP03)

4.46 Singapore provided information on the implementation of Singapore's new LORADS III ATM system to enhance safety and efficiency. LORADS III was capable of utilising multiple surveillance sources, including ADS-B equipped aircraft up to almost 500NM and communicate directly using VHF relay stations, well beyond the normal 250NM range of radars and radio. LORADS III introduces a new Java-based Human-Machine Interface (HMI), which was designed to help controller's work easier and more efficient with smart menus and highly configurable displays. The system had multiple modes and physical redundancy. It also featured new safety nets coupled with decision making tools (such as AMAN, which was integrated into the controller workstation).

4.47 The lessons learnt in implementation of this project included the need for a strong project management team to ensure tight control of schedule. For controller training, Singapore emphasised that it was essential to finalise the controller's workflow before the commencement of training, in order to maximise training values (more efficient training was achieved based on workflow rather than functions). Besides computer-based training, Singapore found it very beneficial to have controlled live sessions which allowed stress-tests of the system during peak hours. The meeting noted that air traffic controller buy-in and managing controller expectations were also key factors to ensure a successful cut-over.

4.48 The meeting was informed that every controller got almost 100 hours of training on the new LORADS III system, and that controllers preferred more hands-on training and less briefing on theory. Hong Kong emphasized from their experience the need to engage controllers in HMI design, particularly to integrate the data in one display.

4.49 LORADS III was scalable and there were plans to increase the ATC positions in both Area and Approach centres in the next phase of development, which will also see the introduction of more advanced features such as Medium Term Conflict Alerts (MTCD) and additional functionalities.

ATN/AMHS and AIDC Implementation (IP06)

4.50 India reported the current status of ATN/AMHS in India. The AMHS circuit between Mumbai and Singapore had been operational since 23 March 2011. India informed the meeting that it was in the process of implementing AIDC ICD version 3, and some ACCs were already exchanging live AIDC messages. During trials, several interoperability and operational issues were encountered between different ATS automation systems which had been mostly resolved. The present status of AMHS was as follows:

- Mumbai-Beijing: successful pre-operational trials in July 2013, India had already forwarded the draft coordination agreement to China.
- Mumbai-Bangkok: successful pre-operational trials completed. Draft coordination agreement exchanged and agreed. Steps are being initiated to sign and exchange the coordination agreement to commence regular AMHS operation before the end of 4Q.
- Mumbai-Karachi: India and Pakistan (Karachi) had successfully completed an Initial Operational Trial (IOT) in November 2010. Both States had completed the trial operation in 30 March 2012.
- Mumbai-Muscat: The circuit was presently operated on AFTN over a TCP/IP through AMHS gateway. Oman Civil Aviation Authority had agreed to commence preoperational trials.
- The AMHS IOT between India and Nepal was in progress. The draft coordination agreement had been exchanged for mutual consent.
- Bangladesh had recently installed a Comsoft AMHS system. India and Bangladesh were establishing a 64 KBPS leased line connectivity and had commenced trials.
- Sri Lanka had contacted India to establish new circuit for AMHS connectivity. India was sharing its experiences with Sri Lanka for successful AMHS implementation,
- Bhutan had not yet communicated their implementation plan.
- Kenya had planned implementation in July 2013. However, no further input had been received and efforts were being made to further coordinate with Kenya for early implementation.

4.51 India planned to implement AIDC with neighbours but plans and readiness of other states were not available. Given the need to minimize coordination errors, States involved, the meeting urged the parties to plan their activities concurrently and exchange and coordinate their plans to achieve harmonious AIDC implementation in the Region, in accordance with APANPIRG AIDC Conclusions.

4.52 Australia had been in discussions with the Maldives and Sri Lanka to commence AIDC testing. An operational trial period was planned to commence in early 2014. The Maldives had started a trial with India but they had some difficulties so had to suspend the trial, but were hoping to recommence shortly after Australia and the Maldives had resolved the issues. Sri Lanka expressed willingness to conduct AIDC trials with India.

Distributed Regional ATFM Network Operational Trial (IP11)

4.53 Hong Kong China, Indonesia, Malaysia, Singapore and Thailand presented a plan to conduct an operational trial between Hong Kong China, Indonesia, Malaysia, Singapore and Thailand using the concept of distributed regional ATFM network. At the second meeting of ATFM/SG, the concept of a distributed multi-nodal ATFM network resulting from collaboration between Hong Kong China, Singapore and Thailand for the Asia Pacific Region was discussed. It was noted that interconnected ATFM nodes within individual ANSPs could form a virtual regional ATFM system.

4.54 Recognizing the challenges involved in developing a mature multi-nodal virtual ATFM concept, a two-part approach to this endeavour was adopted. The first step was the CDM information sharing trial focusing on the objective of a communication framework enabling effective exchange of relevant operational information between Hong Kong China, Singapore and Thailand. The second phase focused on concept development and exploring potential implementation at a sub-regional scale. The concept development had since been completed would be presented at the ATFM/SG/3.

4.55 Discussion between Hong Kong China, Indonesia, Malaysia, Singapore and Thailand had taken place to review plans to conduct an ATFM operational trials in June 2015 (this was chosen by the States concerned taking into consideration development of the system specification and procedure development). The trial would also involve airspace users, with IATA also supporting this initiative. The proposal was to concentrate on the South East Asia region up to Hong Kong, China before expanding to other parts of Asia/Pacific. Progress on the discussion of the ATFM operational trial among the States would be provided at subsequent forums. Viet Nam announced that they would join the trial.

Kuala Lumpur FIR ADSC/CPDLC Updates (IP12)

4.56 Malaysia provided updated information on ADS-C and CPDLC operational performance, and 50NM implementation within the Kuala Lumpur FIR. An upgrade of the Kuala Lumpur ATS system was implemented in 2013 to enhance ATM capability.

4.57 Among the upgrades included the integrating of the CPDLC/ADS-C system into the main system. It was earlier planned to use a single server for all systems and to manage human resources constraints being faced at the Kuala Lumpur ACC. However the integration plan was not fully successful. It created deficiencies which led to split targets on ATC radar displays. Kuala Lumpur ACC was directed to revert back to a standalone system. This required more controller intervention and manual inputs to process all flights using ADS-C/CPDLC, and glitches during connection requests at the work station. Mitigating the outstanding problems became an issue, as these incurred additional costs outside the contract scope. Thus the operation was conducted only on opportunity basis.

4.58 These issues were raised last November in Hyderabad during the BOBASIO/3 meeting. It was noted during the meeting that, a mechanism should be put in place to take advantage of Chennai ACC's communication capability to assist should the issues within the Kuala Lumpur ACC system not be resolved in time. This might include agreement on an early communication transfer to Chennai ACC before the agreed TOC on real-time basis.

4.59 The problems had been rectified and the ADS-C/CPDLC operation had been back in operation since January 2014. Trials had been conducted and system was deemed to be stable, with a high rate of connectivity. The installation of a long range VHF on frequency 133.4 MHz had provided better communication with aircraft near the FIR boundaries; however its performance was still being monitored as there was some fading in reception for flights operating lower than FL340. This served as a back-up option if the CPDLC failed.

4.60 Training and refresher courses for controllers would be conducted to perform ADS-C/CPDLC operations, despite facing challenges with training for the new runway at Kuala Lumpur being in progress scheduled for 01 May 2014. This would involve major changes in instrument flight procedures and airspace layout within Kuala Lumpur Terminal Control Area.

4.61 Malaysia advised that it would continue to collect PRs, which it would send to the CRA for analysis. With the current system stability, Malaysia had implemented 50NM on current RNP10 routes, and supported the implementation of 30NM with India.

4.62 Indonesia added that the Jakarta ADS-C/CPDLC installation was advised as being trialed for six months by AIP Supplement (04/14) on 20 February 2014, before being operational. Unfortunately, the system was not integrated with the controller workstation, but Indonesia had a plan for integration at a later date.

4.63 Sri Lanka's informed that their ADS-C/CPDLC was operational. They wanted to remove the restriction on 50NM separations from India (because of upstream restrictions from Oman). India had a side meeting with Sri Lanka to resolve this issue. India and Sri Lanka agreed to accept 50NM on P570 and M300.

4.64 Bangladesh, Indonesia, Malaysia, Maldives, Sri Lanka, and India had a side meeting that was facilitated by ICAO to further discuss Seamless ATM progress in the sub-region (**Appendix D**).

Agenda Item 5: ATS Route DevelopmentsImplementation of RNP4 on L642 and M771 within the Hong Kong FIR (WP06)

5.1 Hong Kong, China provided an update of the RNP 4 implementation in Hong Kong FIR (WP06). After reviewing the situation and in order to reap early benefits, Hong Kong, China adopted a more practical approach on PBN implementation within the Hong Kong FIR. Instead of the entire Hong Kong FIR at or above FL290, as stated in AIC 03/12, RNP4 approval would only be required for aircraft operating on L642 or M771 at or above FL290 by 11 December 2014. Non-RNP 4 approved aircraft requesting to operate on M771 or L642 at or above FL290 will be accommodated, subject to air traffic conditions ('non-exclusive airspace).

5.2 Hong Kong, China stressed that there was an operational benefit if an aircraft deviated significantly for weather. Under the current 60NM lateral route spacing, aircraft deviating off course for more than 10 NM were not separated, but with under an RNP4 environment, the aircraft deviating would remain separated as long as the weather deviation was not more than 30 NM resulted in a reduction of the frequency of LSWD procedure activations.

5.3 Hong Kong, China expected to regularly review the situation and consider expanding the scope of the restrictions progressively, to eventually implement exclusive RNP 4 airspace within the Hong Kong FIR when necessary conditions were satisfied.

Re-designation of ATS Routes A461 and A583 to RNP10 (WP08)

5.4 Hong Kong, China announced the proposal to re-designate of conventional ATS routes A461 and A583 to RNP10 routes to relieve the increasing traffic demand of the two routes between Hong Kong, China and the Philippines. It was estimated that route capacities of the two ATS routes would increase by over 35% by such re-designation with the subsequent ability to apply RNP-10 longitudinal separation.–

5.5 Subject to the formal comment during the BANP amendment, Philippines and Indonesia agreed with the concept. IATA thanked Hong Kong for the paper. Hong Kong China would conduct a review of the traffic to determine whether an RNAV route overlay or an RNAV route replacement would be submitted.

Rationalization of Overflight Routes within the Hong Kong FIR (WP10)

5.6 Hong Kong, China presented a plan to rationalise some overflight route segments within the Hong Kong FIR to reduce conflict points in the congested airspace and thereby improve flight safety. With an average of 10% annual growth of overflights in the Hong Kong FIR since 2010, the resultant exponential increase in traffic conflictions from the complex crossing tracks gave rise to safety concerns as well as impediments to the arrival and departure routes to and from Hong Kong. There was an urgent need to reduce the number of conflict points and the complexity of air traffic in Hong Kong FIR for the safe handling of the high level of traffic in the airspace.

5.7 Currently, overflights from Manila FIR through Hong Kong FIR to Guangzhou FIR could route via A583 SABNO to DOTMI A470 and also A461 NOMAN to BEKOL A461/G471. The two tracks resulted in flights crossing at same SCS westbound FLAS levels in a congested airspace sector that relied on a high degree of attention by air traffic controllers and timely intervention to resolve separation conflicts. To address this complexity and level conflicts, Hong Kong, China proposed to route flights from Manila FIR to BEKOL A461/G471 to route via A583 SABNO and those exited via DOTMI A470 to enter the Hong Kong FIR via A461 NOMAN. The crossing route segments SABNO – DOTMI and NOMAN - BEKOL were proposed to be withdrawn.

5.8 IATA expressed concern over the impact the change might have for certain city pairs in terms of additional flight distance. IATA agreed to conduct further analysis of the impact of the change and possible alternative arrangements. Hong Kong, China would provide the data for IATA to conduct further analysis.

5.9 The meeting noted that one of the reasons for the conflicts southeast of Hong Kong was due to the main southwest-northeast traffic flow using a modified single alternate FLOS. This caused reciprocal same level conflicts for traffic on A461 and A583

5.10 The meeting discussed the situation at length, acknowledging that the difficulties being experienced by Hong Kong, China were valid but there needed to be urgent consideration of the short-term actions required to mitigate the risks, but also the longer term changes needed to address systemic causes, which included the abnormal FLOS.

5.11 The meeting noted that the current FLOS had been implemented many years ago to address capacity issues, but there were now better ways of enhancing capacity such as using closely spaced RNAV 5, RNAV2 or RNP 2 routes, and a more efficient ATS surveillance-based separation. The meeting recognised that China (Sanya FIR) was crucial to any such improvement, as they had indicated an inability to make route changes in the near future when the risks of the current FLOS had been discussed at RASMAG. The meeting agreed to the following Draft Decision:

Decision SAIOACG4/SEACG4 2: Establishment of a Major Traffic Flow Review Group

That, recognizing the need for high capacity major traffic flow routes (MTF) between Southeast Asia and East Asia, and the effect of the current modified single alternate Flight Level Orientation Scheme (FLOS) that caused conflicts with crossing traffic, a group consisting of China, Hong Kong China, Malaysia, the Philippines, Singapore, Viet Nam, IATA, IFATCA and the ICAO RSO be established to review:

- d) MTF conflicts with ATS routes A461 and A583; and
- e) the overall South China Sea airspace, air route and the suitability of the FLOS to optimise airspace capacity and enhance flight safety in the long term; and
- f) report outcomes of the review and recommendations to the ATM/SG/2 or SEACG/22 meetings.

ATS Route Catalogue (WP12)

5.12 The Secretariat presented draft Version 13 of the *Asia and Pacific Region ATS Route Catalogue* for review and update. Malaysia and India provided some update comment to ICAO. The meeting agreed to the following Draft Conclusion for consideration by the ATM Sub-Group and APANPIRG:

Draft Conclusion SAIOACG4/SEACG21-3: ATS Route Catalogue Version 13

That Version 13 of the *Asia and Pacific Region ATS Route Catalogue* replaces Version 12 on the Asia/Pacific Regional Office's web site.

Proposal to Implement 30NM Longitudinal Separation (WP17)

5.13 India proposed to implement 30NM longitudinal separation between aircraft with FANS/1A data link capability on an opportunity basis within Bay of Bengal, Arabian Sea, and Indian Ocean airspace in a phased manner, then progress to implementing lateral separation to 30NM. As a first step, India expected to apply longitudinal separation on an opportunity basis for FANS/1A data link equipped aircraft on four routes: N571, M300, P570 and P574.

5.14 The successful leveraging of earlier work conducted by ISPACG by the implementation of RNP4 in the Brisbane and Melbourne FIR could be replicated in the Bay of Bengal and Indian Ocean area. Therefore, the opportunity existed for the regional implementation of RNP4 in the sub-region in order to achieve improvements in capacity, efficiency and environmental benefits similar to those achieved in the Brisbane and Melbourne FIRs. This implementation would also benefit air traffic controllers, particularly in climbing and descending aircraft clear of reciprocal traffic when both aircraft were data link equipped. In addition, the availability of additional separation minima would help air traffic controllers to accommodate more aircraft at optimum flight levels and to gain adequate experience prior to implementation of RNP4.

5.15 India further proposed that a small working group be constituted within SAIOACG to undertake the task of implementation of RNP 4 which would require the restructuring of the present route structure. It was expected that discussions between SAIOACG States and IATA using email would commence planning, and a SWG would be conducted at SAIOACG/5 to finalise this matter.

5.16 India has been making all possible efforts in applying 50NM separation across Indian FIRs, passing on the benefits to the operators. It concluded that with the introduction of 30NM longitudinal separation on the four routes, aircraft stood to benefit even if it was implemented only within the Indian FIRs. India urged all States to support this initiative.

5.17 The meeting noted that airspace should be declared as capable of utilising 50NM and 30NM separations when this is possible, not specific ATS routes and regardless of neighbouring State capability. Sri Lanka was planning to implement 30NM on M300 and P570, noting that at present the airspace was operated on a 'non-exclusive' basis. Malaysia advised that they could expedite more efficient separations on ATS routes N571 and P574 because of ATS surveillance coverage, and could release aircraft early if communications was an issue. The meeting thanked Malaysia for this initiative.

Collaborative PBN Implementation in the Sub-Region (WP18)

5.18 India discussed changes to Indian airspace and route structures between July 2012 and October 2013. It further detailed plans for near term, including the plan to introduce RNAV2 ATS Routes between major airports including Delhi-Chennai extended to Colombo, Delhi-Bengaluru, Mumbai-Kolkata and Delhi-Kolkata, which might be extended to Dhaka.

5.19 In accordance with ICAO Global Plan Initiatives and recommendations of a various high level committees, India progressed with the implementation of Lateral Navigation/Vertical Navigation LNAV- VNAV and LNAV approach procedures, PBN RNAV-1 Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs) in terminal area and PBN based RNP10, RNAV5 and RNAV2 city-pair ATS routes.

5.20 Indian airspace and ATS routes had undergone positive changes with the use of Flexible Use Airspace (FUA), RNAV and RNP, dynamic and flexible ATS route management and collaborative airspace design to generate major user benefits. PBN RNAV1 SIDs and STARs at 10 international airports have been implemented, which were being designed to facilitate Continuous Climb Operations (CCO) and Continuous Descent Operations (CDO). Although there may not be a significant savings due to reduction in track miles, India noted that city pairs connected by RNAV5 routes provided an opportunity to increase airspace capacity through the application of a 50NM longitudinal separation, in comparison to the use of 10 minute longitudinal separation.

5.21 India noted that the Republic of Korea had implemented RNAV 2 unidirectional routes with 8NM spacing and subsequently established ten RNAV 2 routes. The Republic of Korea had invited the 38th ICAO Assembly to encourage States to implement RNAV 2 parallel routes to improve operational efficiency, airspace capacity and operational benefit. India reaffirmed its commitment to introduce RNAV2 routes within continental airspace.

5.22 With the introduction of redundant ATS surveillance coverage and improved DCPC, the SAIOACG/SEACG meeting noted that RNAV 5 routes should be considered with respect to RNAV 2 and RNP 2 navigation specifications, which would become increasingly preferred in the near future. India was in the final stages of implementation of RNAV 2 city pairs with 20 NM lateral spacing between the routes, and a proposed 20NM longitudinal separation.

5.23 India considered the introduction of RNAV 2 ideal for routes between Delhi – Bengaluru – Trivandrum, Delhi – Chennai – Colombo and between Delhi – Kolkata – Dhaka , which will double available capacity. It was also expected that Delhi – Colombo RNAV2 would connect 12 Airports and Delhi – Dhaka RNAV2 would connect seven airports. India encouraged the development of PBN RNAV routes with neighbouring States in a collaborative manner.

5.24 IATA asked how many RNAV2 aircraft were using the airspace concerned. India informed that the aircraft operating on the proposed RNAV 2 routes were already RNAV 1 certified, and the certification for RNAV 2 was a technical formality. India also informed that the civil aviation requirement for RNAV 2 certification had already been published. IATA emphasised the need for educational material for pilots and airlines on what they need to do to take advantage of the changes. India agreed that educational material had to be provided, especially to general aviation and LCC operators. IATA noted that all new Boeing and Airbus aircraft were factory built to be capable of being approved for RNAV1 to RNP 10.

5.25 ICAO presented Flimsy 3 (**Appendix E**), which provided a summary of the key aspects of various PBN navigation specifications that States might consider in their planning.

PBN Track Shortening Efficiency Case Study (WP21)

5.26 The ICAO Regional Sub-Office presented an example of a case study conducted by the ICAO APAC Regional Sub-Office (RSO) to estimate the benefits of a direct track utilising PBN and draws to attention the need for collaboration among States to achieve such an outcome. ICAO had made available the ICAO Fuel Saving and Estimation Tool (IFSET) to be used to estimate fuel and carbon savings. This tool could be applied to quantify the benefit of ATM enhancement initiatives, such as introduction of more direct PBN routes and implementation of CDO/CCO procedures.

5.27 The expanding traffic between the domestic city pair between Hanoi and Ho Chi Minh City drew attention the benefits of providing a more efficient route by utilising technology such as PBN, compared to currently available conventional routes. To implement a more efficient direct track between the city pair, international coordination and collaboration were required as the direct track would form an international route passing through two additional neighbouring FIRs, namely Vientiane and Phnom Penh.

5.28 Using the ICAO IFSET tool, the potential fuel and carbon savings by implementing a direct route between Hanoi and Ho Chi Minh City would save airlines 200 kg of fuel and 630 kg of carbon emission per flight on a single aisle jet, and could yield approximately USD196 savings in the fuel cost. In addition, this case study estimates other savings in airline operating expenses, such as flight crew and maintenance costs indicated potential reduction of airline operating costs between USD 260 to USD346 per flight on a single aisle jet. However, air navigation charges had not been factored into the analysis, as this case study was only meant to highlight fuel and other operating costs savings through the implementation of PBN. The AATIP representative agreed to provide information on the cost assumptions used in the EUROCONTROL modelling used in the paper, so these could be customised using Asia/Pacific values.

5.29 Viet Nam elaborated that they had established a team to study the redevelopment of ATS route W1 from Ha Noi to Ho Chi Minh, in collaboration with JICA (Japan International Cooperation Agency). Viet Nam noted that the straight route proposed by the RSO in the WP21 study between the city pairs did not take into account the air navigation charges and the track mileage from SID/STAR procedures. The net saving in terms of fuel burn and emissions would be lower. Viet Nam were planning parallel routes contained within Viet Nam airspace.

Agenda Item 6: ATM Contingency Plans and Search and RescueNon-Detection of ELT - Helicopter Accidents (IP07)

6.1 India noted in IP07 the increases in Asia/Pacific traffic, including phenomenal growth in helicopter operations registered for general aviation, Very Important Person (VIP) movement and oil exploration in India. Moreover, most of the helicopters operated at low levels in VFR or Special VFR conditions, resulting in a number of accidents. They observed that locating such accident sites were often difficult due to the non-activation of Emergency Locator Transmitters (ELTs) and the remote accident sites. The focus of IP07 was the delay in locating the site of accident due to non-activation of ELT due to the:

- a) impact forces less than 2G (particularly when the aircraft is over dense forest); or
- b) ELT antenna being detached or the ELT being destroyed in the impact and fire; or
- c) immersion of ELT or antenna in water.

6.2 The APSAR/TF/2 meeting had discussed this, and noted that supplementary devices able to conduct satellite tracking that could record route information could be used to supplement the use of ELTs. Moreover, they observed that the 50 second delay specified before the first 406 MHz beacon burst may not be appropriate in aviation distress incidents, and that a more 'intelligent' transmission scheduling arrangement might be necessary. The meeting noted the on-going discussion regarding requirements for in-flight activation of second generation ELTs.

Standardised Software Application for Search Procedures (IP08)

6.3 India's IP08 discussed the need for developing standardized and common SAR software to support procedures for RCCs in the Asia/Pacific region. The paper suggested that reducing the time lost for site detection and deployment of resources planning could be achieved with the development of standardized and common software, creating more effective searches. India suggested the development of such software could be considered within the context of the Asia/Pacific Regional SAR Plan. Sri Lanka agreed with India in this regard.

6.4 The APSAR/TF/2 meeting had discussed this and agreed that there was great value in having a standard software package. However they noted that at this time there were difficulties to overcome, such as proprietary software and specialised training.

Agenda Item 7: ANSP Coordination and Civil/Military CooperationImplementation of Flexible Use Airspace in India (IP09)

7.1 India presented IP09, which stated that airspace was a national limited resource. On 08 March 2013, the Cabinet Committee on Security approved the proposal for FUA implementation in India and the constitution of a National High Level Policy Body (HLAPB) representing all civil and military service providers or users of airspace. A plan for the implementation of Flexible Use Airspace (FUA) has been submitted and accepted by the Ministry of Civil Aviation.

7.2 A National Airspace Management Cell would be established at New Delhi and Regional Airspace Management Cells will be established at Chennai, Delhi, Kolkata, and Mumbai, with the progress of FUA implementation in a phased manner. There was a near term plan to implement a Central Air Traffic Flow Management System in India, using airspace procedures that had been developed for military Special Use Airspace (SUA) in accordance with the principles of FUA.

7.3 The paper highlighted the plan to introduce RNAV2 ATS Routes between major city pairs including Delhi-Chennai, Delhi-Bengaluru, Mumbai-Kolkata, and Delhi-Kolkata, and the Upper Airspace Harmonization Plan for the Delhi, Kolkata and Mumbai FIRs. The time frame for implementation of FUA, had three definitive phases:

- a) December 2013: Implementation of FUA in Upper Airspace (FL 260 and above);
- b) June 2014: Implementation of FUA in Lower Airspace (FL 150 to FL 255); and
- c) December 2014: Implementation of FUA in terminal Airspace (below FL 150).

7.4 IATA emphasised the need to develop trust as a vital step to improving civil/military cooperation. Bangladesh described the positive progress made with civil/military cooperation for the effective utilisation of airspace in this context. Malaysia shared their civil/military cooperation experience which benefited the military with the release of airspace for military training. Hong Kong, China asked about the daily coordination process. India clarified that the civil/military representatives would be together in a separate Air Space Management Cell location but not in any of the ATS units for daily airspace allocation. The meeting acknowledged and congratulated India for the positive changes in civil/military cooperation.

Agenda Item 8: Review of SAIOACG / SEACG Task ListSAIOACG and SEACG Task Lists (WP10)

8.1 The Secretariat presented WP10, which contained the SAIOACG and SEACG Terms of Reference (ToR) and SAIOACG and SEACG Task Lists (**Appendix F** and **Appendix G** respectively) for SEACG4/SAIOACG21 to review.

Agenda Item 9: Any other businessFuture of the APANPIRG ATM Coordination Groups (WP20)

9.1 WP20 provided future planning information and proposals regarding the future of the SAIOACG and the SEACG. The precursor of the SAIOACG was the Bay Of Bengal ATS Co-ordination Group (BBACG). The BBACG first met in the mid-1990s in response to the challenges posed by the CNS/ATM (Communications Navigation Surveillance Air Traffic Management) concept being evolved at the time. The SEACG had been meeting since its forerunner the South-East Asia ATS Co-ordination Working Group (SEAC/WG) first met in Singapore in 1998.

9.2 The Third ATS Coordination Meeting of the Bay of Bengal, Arabian Sea, Indian Ocean (BOBASIO/3) was conducted at Hyderabad, from 22 to 24 October, 2013. The report of BOBASIO/3 noted that ‘informal’ (non-ICAO) meetings acted as a catalyst for quick changes and excellent solutions to pending ATM issues. BOBASIO/3 discussed numerous items of interest from other bodies such as the SAIOACG, Arabian Sea Indian Ocean ATS Coordination Group (ASIOACG) and Indian Ocean Strategic Partnership to Reduce Emission (INSPIRE). It was clear that there was considerable cross-over in these meetings. In the case of South Asia, it was considered that the SAIOACG meeting could incorporate the BOBASIO and possibly the ASIOACG meetings as one if stakeholders agreed.

9.3 The meeting noted the main value of ‘informal’ meetings being the ability to meet on a schedule suited to the States, and in a format that allowed more open discussion. In addition, as States were driving their own improvements (with advice from ICAO), then there was often greater buy-in and involvement without the constraints of formal APANPIRG procedures. This was evident from the work conducted by the informal meetings in the Pacific, the IPACG (Informal Pacific ATC Coordinating Group) and ISPACG (Informal South Pacific ATS Coordinating Group), which often led the world in implementing new technologies and procedures.

9.4 The meeting discussed the possibility of transforming the two ATM Coordination Groups to informal bodies managed by the States, advising relevant results to the ATM Sub-Group. The SAIOACG Chairperson understood the merit of changing to an informal meeting but believed in the light of recommendations from ICAO, it would be better for BOBASIO to incorporate the changes over a period of one or two years. The SEACG Chair noted that with diverse State interests and cultural background, it was necessary to have a strong international body to lead and drive ICAO initiatives and facilitate collaboration in the region. Hong Kong China and Viet Nam noted that some States needed a formal invitation to attend an international forum, to facilitate visa applications and funding from the civil aviation authorities. Thus the meeting agreed to continue with the current format of meeting.

Agenda Item 10: Date and Venue of the Next Meeting

10.1 The next meetings of the SAIOACG and SEACG were tentatively scheduled for early 2015 (date to be advised), at Bangkok.

11. Closing of the meeting

The Co-Chairpersons thanked the meeting participants for their significant work during a busy meeting program.

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16.	IATA (7)		
	32. Mr. David Rollo	Assistant Director – Safety, Operations & Infrastructure – Asia/Pacific International Air Transport Association 111 Somerset Road, #14-05 Triple One Somerset Singapore 238164	Tel: +65-6499 2251 Fax: +65-6233 9286 E-mail: rollod@iata.org

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39.	Cpt. Brian Legge	Regional Vice President IFALPA 5 th Floor Daily House, 35-37 Haiphong Road TST Hong Kong, China	Tel: +852-6340 2355 Fax: E-mail: brian.legge@hkalpa.org
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40.	Mr. John Wagstaff	Asia/Pacific Representative IFATCA 502 Kwong Loong Bldg, 1016 Tanan West St. Cheung Sha Wan Hong Kong, China	Tel: +852-9034-1561 Fax: E-mail: john.wags@gmail.com
19.	ICAO (3)		

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International Civil Aviation Organization

Fourth Meeting of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/4) and the Twenty-First South East Asia ATM Coordination Group (SEACG/21)

Hong Kong, China, 24 – 28 February 2014

LIST OF WORKING AND INFORMATION PAPERS

(Presented by the Secretariat)

WORKING PAPERS

NUMBER	AGENDA	WORKING PAPERS	PRESENTED BY
WP01	1	Provisional Agenda for SAIOACG-SEACG	Secretariat
WP02	2	Relevant Meeting Outcomes	Secretariat
WP03	3	SAIOACG-SEACG Small Working Group Updates	Secretariat
WP04	4	Seamless ATM Planning and Reporting	Secretariat
WP05	4	Separation Minima and Airspace Capacity	Secretariat
WP06	5	Implementation of RNP4 on L642 and M771 within the Hong Kong FIR	Hong Kong, China
WP07	4	South China Sea Airspace - RNP4	IATA
WP08	5	Re-designation of ATS Routes A461 and A583 to RNP10	Hong Kong, China
WP09	4	ADS-B Implementation Within the Singapore FIR	Singapore
WP10	5	Rationalization of Overflight Routes within the Hong Kong FIR	Hong Kong, China
WP11	3	Enhancing En-route Capacity Over the Bay of Bengal	Malaysia and Singapore
WP12	5	ATS Route Catalogue	Secretariat
WP13	2	Review of BOBASIO/03 Meeting	India
WP14	3	Airport CDM – Adverse Weather and Fog Operations	India
WP15	3	Establishing a Harmonized Transition Altitude in India	India
WP16	4	Mutual Collaboration for Regional SBAS	India
WP17	5	Proposal to Implement 30NM Longitudinal Separation on Routes N571, M300, P570 and P574	India
WP18	5	Collaborative PBN Implementation in the Sub-Region	India
WP19	8	SAIOACG-SEACG Task List	Secretariat
WP20	10	Future of the APANPIRG ATM Coordination Groups	Secretariat
WP21	5	PBN Track Shortening Efficiency Case Study	ICAO (RSO)
WP22	5	Capacity Enhancements in SAIOACG Airspace	Thailand
WP23	4	Thailand AIDC Implementation Airspace Capacity Enhancement	Thailand

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INFORMATION PAPERS

NUMBER	AGENDA	INFORMATION PAPERS	PRESENTED BY
IP01	-	List of Working and Information Papers	Secretariat
IP02	3	Google Project	Secretariat
IP03	4	Implementation of LORADS III – New Singapore ATM System	Singapore
IP04	3	Update on AIS Initiatives	India
IP05	3	Development of an A-CDM Platform at Mumbai	India
IP06	4	ATN/AMHS and AIDC Implementation	India
IP07	6	Non-Detection of ELT - Helicopter Accidents	India
IP08	6	Standardised Software Application for Search Procedures	India
IP09	7	Implementation of Flexible Use Airspace in India	India
IP10	2	Group of Five ANSPs Informal ATM Coordination Meeting	Indonesia, Malaysia, Philippines, Singapore, Thailand and IATA
IP11	4	Distributed Regional ATFM Network Operational Trial	Hong Kong, China, Indonesia, Malaysia, Singapore and Thailand
IP12	4	Kuala Lumpur FIR ADSC/CPDLC Updates	Malaysia
IP13	2	Mekong ATM Coordination Group	Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam and IATA

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Appendix C: PBN Navigation Specification Comparison

Nav Spec	Environment	COM	Route Spacing	Required Sensors	Database, sequencing	On-board monitoring
RNAV 1/2 (P-RNAV)	All IFR En-route RNAV 1 SIDs STARs with surveillance	DCPC*	None specified ⁺²	GNSS; or DME/DME; or VOR/DME; DME/DME/IRU	Yes	No but present with GNSS
RNAV 5 (B-RNAV)	Low-end IFR aircraft En-route with surveillance	VHF only	None specified ⁺¹	GNSS; or DME/DME; or VOR/DME; DME/DME/IRU	Database optional but waypoints capability required	No but present with GNSS
RNP 1	All IFR SIDs STARs	DCPC*	3NM with surveillance	GNSS or GNSS/IRU	Yes	Yes
RNP 2	All IFR En-route Category R airspace en-route (dual systems required)	DCPC*	15NM LAT 20NM LONG 7-10NM Terminal (Draft) ⁺³	GNSS; or GNSS/IRU	Yes	Yes
RNP 4	Category R/S en route	CPDLC	With CPDLC and ADS-C: 30NM LAT 30NM LONG	GNSS or GNSS/IRU	Yes	Yes

*VHF and CPDLC

⁺¹ Europe uses 18NM reciprocal direction, 16.5NM same direction with surveillance, 10NM special cases

⁺² Republic of Korea demonstrated high density 8NM parallel spaced routes with surveillance met TLS

⁺³ Australia uses 7NM CEP en-route (=15NM spacing) in procedural airspace, 5NM with surveillance

Notes:

1. *RNAV 5 does not require a navigation database but the system must have the capability of creating a flight plan with at least 4 waypoints. If a navigation database is used, the standard database management criteria should be applied.*
2. *RNAV 5, RNAV 1 and RNAV 2 are intended for use in a surveillance environment but may be used for short durations without surveillance.*
3. *RNAV 2 is a low accuracy version of RNAV 1.*
4. *RNP 4 is a navigation specification that is normally used to achieve reduced separation in a category R airspace environment that requires CPDLC and ADS-C.*

Appendix D: Lao PDR, Cambodia, Thailand Viet Nam Side Meeting Conclusions

1. It is essential to increase the airspace capacity and operational efficiency by introducing parallel routes between major city pairs based on appropriate PBN specification and in line with the seamless ATM plan step by step.
2. In terms of the national geography, the FIRs in South East Asia are small and come in different shapes and sizes, with hardly any straight line boundaries. The relevant parties are in agreement of the benefits of the cross boarder direct flights, and are willing to collaborate on the establishment of these direct routes provided everybody agrees to common PBN specifications through close coordination and collaborative decision making. It was decided that RNAV5 will be used initially with a view to migrating to RNP2 in due course.
3. The issue of ANS Charges and other relevant factors need to be taken into account when considering these cross border routes
4. There was a general consensus of the ever increasing traffic volumes and the resultant congestion and operational constrains, and agreed to study the possibility to mitigate it through ATFM/CDM and were aware that it may involve neighbouring upstream FIRs along main traffic flows in through the sub-region.
5. ICAO APAC RSO was prepared to provide technical support and assistance where required.

REPORT OF THE SIDE MEETING HELD ON 26th FEBRUARY 2014 AMONG THE STATES BANGLADESH, INDONESIA, MALAYSIA, MALDIVES, SRILANKA AND INDIA

A side Meeting was facilitated by ICAO, RSO APAC region on 26th February 2014 at 1530 hours. Fourteen delegates (List Of participants is attached as Annexure-A) from Bangladesh, Indonesia, Malaysia, Maldives, Srilanka, India and ICAO participated in the meeting. Mr. Pehrinba Renganathan, Regional officer (ATM)-[AOM-ASM] welcomed the participants and gave brief on the work program which could provide immediate benefits to the operators. Mr. Sylvester Israel the Co-Chair of SAIOACG/04 meeting emphasized the need for collaboration among the neighbouring states for successful implementation of ATM program for the early realization of SEAMLESS ATM in the Sub-Region.

The meeting discussed the following points which were considered to be very essential in respect to the implementation of;

- Horizontal Separation of 50NM & 30 NM in the Bay of Bengal, Indian Ocean and Arabian sea airspace,
- ATS Inter Facility Data link Communication-,
- RNAV5/RNAV2 ATS routes across the border between India/Sri Lanka and India/Bangladesh,
- RNAV1 SIDs and STARs connecting Trivandrum, Trichi, Madurai, Chennai and Colombo,
- Mitigation measures to resolve conflict and review of LOA thereof;
 - on ATS routes P762/EMARSSH and L645/.....routes(India /Colombo)
 - on ATS routes P627/N571-(Sri Lanka, Indonesia and Malaysia)
- Conversion of Conventional route into PBN RNP 10 route(A465)-India / Sri Lanka,
- Conduct of ATS-Inter operability test on ADS-C/CPDLC between India/Indonesia, India Malaysia and India/Sri Lanka
- ADS-B Data sharing-India/Sri Lanka, India/Bangladesh and India/Myanmar

The meeting after a prolonged discussion considered the following action to be taken by the respective states;

1. India- Sri Lanka:

Agreed to the following action items;

- ✓ To exchange their design on RNAV1 SIDs/STARs for the stations considered for implementation within their states and enroute RNAV2 for further review and to coordinate with each other for early implementation.
- ✓ To conduct the AIDC trial at the earliest date through established coordination procedures
- ✓ To conduct the ATS-Interoperability bench test- BOBASMA to coordinate with CRA at the earliest
- ✓ The proposal to convert A465 and R461 to RNP10 ATS route
- ✓ To consider ADS-B/radar data sharing
- ✓ To accept aircraft with 50NM/30NM pair as appropriate on N643, P570 and M300 both ways

Estimates to be exchanged forty minutes before TCP on P762 via DUGOS by Sri Lanka for the long haul east bound aircraft operating from far away stations such as South Africa/Seychelles to Hong Kong/Bangkok in order to avoid descending the aircraft to NO PDC level F290 before Changing over to Chennai. The existing LOA to be reviewed accordingly.

2. India-Bangladesh :

Agreed to the following action items;

- ✓ Bangladesh PBN procedures are still in the designing stage and will exchange their design on RNAV1 SIDs/STARs considered for implementation and also will consider enroute RNAV2 design proposed by India for further review and to coordinate with each other for early implementation.
- ✓ The proposal for bi-directional routes by India between Kolkata and North-eastern States transiting through Bangladesh FIR which will require expeditious coordination with the Military authorities.
- ✓ A mega project comprising of ATS automation, ADS-B/Radar is in the pipe line in Bangladesh and expressed that the proposals as placed in the meeting will be reviewed at the appropriate time.
- ✓ ICAO, RSO expressed that Bangladesh initiates early action to resume provision of Area Control Service with the available Route Surveillance facilities.

3. Sri Lanka-Maldives-India :

Agreed to the following action items;

- ✓ Implementation of RNP 10 in the UPR zone
- ✓ Early resumption of facilities by Maldives
 - ADS-C/CPDLC and
- ✓ ADS-B in Maldives is already integrated with ATM System, and is presently under observation prior to commencing trials
- ✓ Introduction of HF for oceanic area
- ✓ To conduct the AIDC trial between Mumbai/Chennai/Maldives at the earliest date through established coordination procedures
- ✓ To conduct the ATS-Interoperability bench test between Mumbai and Maldives - BOBASMA to coordinate with CRA at the earliest.
- ✓ To consider ADS-B/radar data sharing among the states
- ✓ To accept aircraft with 50NM pair as appropriate between Maldives and Sri Lanka.

4. Indonesia-Malaysia-India-Sri Lanka:

Agreed to the following action items;

- ✓ To conduct the AIDC trial at the earliest date through established coordination procedures between India/Malaysia/Indonesia
- ✓ Indonesia informed that ADS-C/CPDLC is made operational on trial basis vide AIP-SUPP 04/204 20 published on Feb 2014, to be effective from 03rd April 2014. Hence to conduct the ATS-Interoperability bench test between Malaysia/Chennai and Indonesia/Chennai - BOBASMA to coordinate with CRA at the earliest.
- ✓ LOA revision to be carried out for the implementation of 30NM with Malaysia/Chennai/Indonesia after AIP SUPP on longitudinal Separation of 30NM is published
- ✓ Estimates to be exchanged at least 40 minutes before by Sri Lanka for east bound aircraft and by Indonesia for west bound aircraft operating on P627 to in order to avoid last minute descending the aircraft on N571 within Kuala Lumpur FIR. The existing LOA to be reviewed accordingly.

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- ✓ To accept aircraft with 30NM pair as appropriate on P574 and N571 by a mutual agreed date between Malaysia/Indonesia/India after AIP SUPP on longitudinal Separation of 30NM is published.
- ✓ To accept aircraft with 30NM pair as appropriate on P570 and M300 by a mutual agreed date between Sri Lanka/Indonesia/India after AIP SUPP on longitudinal Separation of 30NM is published.

India expressed that they have experienced certain difficulties in handling aircraft pair with 50NM in Arabian Sea and in the North West over continental airspace due to Muscat and Pakistan do not accept the aircraft pair with 50NM on all RNP 10 ATS routes as promulgated. In the last special Coordination meeting held between India, Pakistan, Afghanistan and IATA, certain decisions were taken and the states agreed to implement the same. However the situation appears to remain as status quo. Hence India requested that ICAO consider convening a meeting at the earliest inviting Pakistan, Oman, Afghanistan and India to resolve the long pending issues so as to pave way for the early implementation of 50/30NM separation and also to achieve seamless flow of traffic over BOBASIO airspace.

The meeting ended with an assurance by the members that they would pursue the matters with the states authorities for the early and successful implementation of the above said projects.

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LIST OF PARTICIPANTS OF THE SIDE MEETING

Sl. No.	Name of Participant	Title/Organization/State	Remarks
1.	Mr. Pehrinba Renganathan	Regional Officer ATM (AOM-ASM), ICAO, Beijing	
2.	Mr. Sylvester Israel	General Manager (ATM), Airports Authority of India & Chairperson SAIOACG/21	
3.	Mr. Liu Song	Regional Officer ATM (FUA), ICAO, Beijing	
4.	Mr. Masud Rana	Assistant Director, Civil Aviation Authority, Bangladesh	
5.	Mr. Mohammed Kamal Miah Sarker	Senior Aerodrome Officer, Civil Aviation Authority Bangladesh	
6.	Mr. Edwin Arif Wibowo	Directorate General of Civil Aviation, Ministry of Transportation, Indonesia	
7.	Mr. Ranjith Perera	Deputy Director (A&NS), Civil Aviation Authority of Sri Lanka	
8.	Mr. K.T.M Wijesiriwardana	Senior Air Traffic Controller, Colombo Airport, Sri Lanka	
9.	Mr. Nasruddin Bin Zainol Abidin	Principal Assistant Director, Department of Civil Aviation, Malaysia	
10.	Mr. Tan Poh Keat	Technical and Development, Malaysia Airlines, Malaysia	
11.	Mr. S.B.Sharma	Jt.General Manager (ATM), Airports Authority of India, Delhi Airport	
12.	Mr.K.Vasudevan	Jt.General Manager (ATM), Airports Authority of India, Mumbai International Airport	
13.	Ms.Kala P. Nair	Jt.General Manager (ATM), Airports Authority of India, NSCBI Airport, Kolkata.	
14.	Mr.Abdulla Zakariyya	Manager, ATS Operations ATM, Maldives Airports Company Limited, Maldives	

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SAIOACG — TASK LIST

(last updated SAIOACG/4)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
18/2	Chennai/Colombo FIR boundary harmonization	2012	India, Sri Lanka Regional Office	Closed	India informed BBACG that this matter now under consideration by the Govt of India. Timeframe to be updated at the BBACG/22. SAIOCG/2. This was an inter-governmental issue.
18/4	Contingency Planning	2012	All States in the region, Regional Office	Closed	States in co-ordination with its neighbouring States, develop a contingency plan or plans for their airspace, taking into account Conclusion 17/11 Adoption of Model National ATM Contingency Plan. States to update contingency plan status at BBACG/22 SAIOACG/2. RACPTF was addressing the issue.
18/7	Specify RVSM airspace as Class A	Update SAIOACG/3	States Regional Office	Open	India expected to upgrade airspace to class A. To be done in 2015.
18/8	Lowering MEA on G792 from FL310 to FL300 to be in alignment with P628 in India	Update SAIOACG/5	India, Pakistan, ICAO APAC Regional Office,	Open	This matter is in coordination between Pakistan and India. Update at SAIOACG/5
18/9	Search and Rescue Agreements between States	Update BBACG/22	Regional Office All States	Closed	<p>a) States, in conjunction with their neighbouring State (s), will develop Search and Rescue Agreements, for the purpose of providing a more efficient response to a search and rescue action and increase the possibility of a successful search and rescue mission; States conduct joint training and exercises, as appropriate, to maximize proficiency;</p> <p>b) a State, together with a neighbouring State, establish common SAR procedures, where practicable; and</p> <p>c) Pakistan scheduled to meet with I.R. of Iran and Afghanistan on harmonization of SAR Plans</p> <p>SAR agreements are reviewed at APANPIRG.</p> <p>BOBASIO/1 meeting addressed SAR agreements with India's neighbouring States</p> <p>Now monitored by APSAR/TF</p>

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
19/5	<p>Establishment of Indian Ocean UPR (Southern Africa to Southeast Asia)</p> <ol style="list-style-type: none"> 1. Australia - Compile Contact List 2. Australia - Develop Operational Concept which identifies Operators; City Pairs; & Aircraft types for interim application (March 2008) 3. Singapore Airlines to provide Flight Plan Data JNB – CPT - SIN 	2012	Australia, IATA, affected States	Closed	<p>Assist ASIOACG members with this work.</p> <p>Primary coordination point is Mr. Phil Mayo of Airservices Australia, email: (Phil.Mayo@AirservicesAustralia.com)</p> <p>ASIOACG/4 Report contains record of positive progress so far. 2 routes implemented from Sumatra to Johannesburg.</p> <p>Data has been provided to ASIOACG. IATA informed meeting that operational UPRs were planned in June 2012. UPR Zone established 2012.</p>
20/1	Ensure BOBCAT flight plans and movement messages (DEP, CHG, CNL, etc) of flights subject to ATFM procedures (BOBCAT) are addressed by AFTN to Bangkok ATFMU	Update SAIOACG/3	States, IATA	Closed	Improvement noted in BBACG/21, but departure messages are still not being consistently received from certain airports. AEROTHAI to communicate with the relevant ANSPs and airlines. Action by ATFM SWG. Thailand acknowledged an improvement in SAIOACG/4
20/3	<p>Poor on time performance of BOBCAT aircraft subject to ATFM procedures has direct impact on efficiency of ATFM procedures. All parties to undertake investigation as to reason for poor on-time performance including:</p> <ol style="list-style-type: none"> a) Incorrect flight planned EET, b) Non compliance with BOBCAT AWUT – early and late departures c) Non compliance with BOBCAT Kabul entry time – early and late at Kabul entry fix. 	Update SAIOACG/5	Affected States, IATA	Open	<p>Poor punctuality performance is actively being monitored and rectified where possible by IATA/States.</p> <p>Action by ATFM SWG</p>
20/4	India to consider approving use of existing ATS route west of Chennai as connector route for N571/N877 for bypass traffic on L510 to enable efficient and BOBCAT metered traffic feed to UL333 in Kabul FIR	Update SAIOACG/5	India, Regional Office, Malaysia	Open	India to update Regional office by SAIOACG/5
20/5	Progress bulk ANP amendment proposal for re-designation of BBACG conventional routes to RNAV routes (BBACG/20 Appendix M refers). Target date for implementation is June 2011.	Update BBACG/22	Affected States, Regional Office	Closed	Affected routes in Phase 1 and 2 of the 50NM longitudinal separation

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
SAIOACG2/1	Flights will be spaced 50nm longitudinally at points where routes converge instead of 10 minutes currently required. Where necessary to ensure separation to apply vertical separation instead. LOAs to be amended to reflect this agreement.	Immediate	Between Afghanistan and Pakistan	Open	<p>Note: State which is sending traffic on converging routes into an adjoining FIR is responsible for ensuring that the flights have 50nm longitudinal separation prior to transferring control. Request to ICAO office to facilitate meeting if required.</p> <p>LOA Delhi Lahore signed 12 January 2012.</p> <p>RSO will initiate communications to convene a meeting with the concerned parties, IATA to be advised of the outcome.</p>
2/2	LOA India /Oman: To Sign LOA and implement 50/50 on P570,M300,N563,P574,L301	Immediate	India/Oman	Open	<p>LOA signed. However 50/50 implementation held in abeyance pending resolution of issues relating to aircraft equipage as filed in FPLs, and other operational issues between Mumbai and Muscat ACC.</p> <p>Oman reports ready to implement 50/50NM eastbound by July 2012.</p>
2/3	Afghanistan to review requirement for blocking FL290 and FL300 in Kabul FIR. Data required on flights which had to avoid Kabul airspace as a consequence of FL 290 & FL300 blocked.	Immediate	IATA, ICAO	Open	IATA has updated Afghanistan authorities. A review meeting is scheduled in late May. Partial lifting of restrictions with FL320 being made available. To be discussed during ICAO Mission to Afghanistan April 2014..
2/4	FL330 Blocked on G325. NOTAM action to rescind the requirement	15 May 2012	Pakistan	Closed	Pakistan removed the requirement in late 2012.
2/5	Resolve the communications issues between Pakistan and Afghanistan ACCs	Immediate	Pakistan Afghanistan ICAO CNS	Open	Pakistan to host a meeting comprising Afghanistan, Pakistan and ICAO CNS, CHECK WITH LI PENG
2/6	M890-to implement 50nm longitudinal separation in India	Immediate	India	Closed	India to consider. To conduct safety assessment as appropriate. Safety assessment completed. On ATS Route M890. 50NM longitudinal separation in India is implemented.
	To implement 50nm longitudinal separation on L509 between Lahore /Delhi FIR	12 Jan 2012	India/Pakistan	Closed	<p>L509 available from 1900-2130 at or above F320.</p> <p>Note: Pakistan has issued an A series NOTAM to make L509 available from 1500-2130UTC.</p>

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	To sign LOA to Implement 50/50 on N563,P574 between Jakarta /Chennai	12 Jan 2012	India /Indonesia/Malaysia	Completed	Completed. India /Indonesia signed the LOA. Malaysia/India the signed LOA. Implemented 3 May 2012
	To sign LOA and implement 50/50NM on P570 and M300	Sept 2012	Indonesia/Sri Lanka	Closed	Indonesia completed and implemented on 3 MAY. Sri Lanka unable to implement due unreliable CPDLC. New date to be decided after commissioning of new ATC Centre. LOA to be signed by Sri Lanka .
2/7	Implement 50/50 on 14 routes as described in TF6 Meeting	8 March 2012	India	Completed	Routes are P570,M300,N563,P574,N877,L759,L510,L759,P646,L509,M770,L301,N895,L507 in Kolkata, Delhi, Chennai and Mumbai FIR.
2/8	DCPC by Jakarta ACC. To confirm whether DCPC capability is via CPDLC or extended range VHF	Immediate	Indonesia	Completed	Indonesia confirms VHF coverage within FIR for DCPC
	CPDLC Yangon ACC. To confirm availability	Immediate Aug 2012	Myanmar	Open	Reported as having connectivity issues due to aging equipment and issues with Service Provider. Discussions with SITA were on-going.
	CPDLC MALAYSIA. To confirm availability	Immediate	Malaysia	Completed	Confirms CPDLC serviceable and implemented 50/50. Integrating into ATC system.
	Sri Lanka CPDLC. To confirm availability	Sept 2012	Sri Lanka	Closed	Reported as moving to new ACC. CPDLC unreliable at this time. Sri Lanka reported the system is now operational at SAIOACG/4
2/9	Lahore/Delhi FIR new routes. Implement additional routes M875, L333	TBN	India/ Pakistan	Open	No agreement on implementation date. Discussions to continue.
	Lahore/Delhi FIR new routes. PRA SERKA		India/ Pakistan	Open	Regional office to follow up with Pakistan to activate the segment in Pakistan. India offer to provide connectivity for westbound thru A325/B210 and N893/G208. India ready to implement within Indian airspace. Draft LOA for connectivity has

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
					been sent to Pakistan for consideration. India exploring A325 as bidirectional to accommodate eastbound.
	Lahore/Delhi FIR new routes. 50/50 for eastbound flights on N893		India/ Pakistan	Open	India can accept eastbound flights on N893 via TELEM. Response from Pakistan required.
2/10	Investigate capability and timeline to implement 30/30	2013	All States	Open	India considering implementing 30/30NM on selected routes in the near term. Adjacent States should consider a coordinated implementation of 30NM/30NM .
2/11	RNP airspace as opposed to RNP operations on specific routes	2013	All States	Closed	
2/12	WP07: ATFM SWG- Airlines should avoid changing of routes within the Delhi FIR	2013	IATA, India	Open	IATA would follow up if any State advised them of non-conforming aircraft and would issue a reminder to airlines about using the suggested routes as far as practicable. India suggested that they would encourage controllers to report non-participating airline problems with BOBCAT. India would ensure ACCs were reminded of the requirement to comply with BOBCAT slot allocation as far as practicable.
2/13	WP07: ATFM SWG- More information from BOBCAT to be made available for tactical decisions in addition to the Kabul FIR entry	2013	Thailand, India	Open	Thailand will communicate with stakeholders about an upgrade in terms of sharing information more like a CDM system. It needs to be clear that the extra information was not a 'controlling' tool.
2/14	WP07: ATFM SWG- suggestion that FL280 and FL300 should be exclusively reserved for Delhi (and possibly Mumbai) and Lahore departures.	2013	India, ICAO	Open	India would provide information on how much of a problem this was, supported by data. If the data supported a need to change, the Regional Office would communicate to Pakistan about allowing aircraft to transition through their airspace to BOBCAT allocated levels. In any case the airspace authority in Afghanistan may change military-reserved levels from FL300-310 to FL290-FL300. Data provided by India as part of WP03
2/15	WP07: ATFM SWG- Mandatory BOBCAT requirements	2013	All States	Closed	The meeting discussed the need for States to promulgate the mandatory requirements for BOBCAT compliance if they had not done so, and flights which plan to enter Kabul FIR without an AWUT and entry slot will be accommodated only after flights with slots have been processed. Such flights should expect delayed pushback and start clearances, non-preferred routes and/or flight levels, enroute holding and/or diversion around Kabul FIR
2/16	WP07: ATFM SWG- BOBCAT slot allocation may be considered beyond 2000 – 2359UTC	2013	India	Open	India to provide data to support an extension. All involved to consider operational impact. Thailand to consider operational impact of the extension – need to share

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
					data and airlines to look at impact. Such change will require a 90-day notice. Data provided by India as part of WP03
2/17	WP07: ATFM SWG- Traffic distribution on all Delhi exit points should be balanced	2013	IATA	Closed	IATA asked that some routes be made more efficient so airlines use them. IATA had been consciously trying to encourage the spread of traffic.
2/18	WP07: ATFM SWG- 50NM longitudinal should be accepted for all aircraft on routes P628, L333, M875 and L509.	2013	India, ICAO	Open	India would provide data on the amount of times 50NM was not accepted. The Regional Office may be able to follow up. It was noted that data-sharing and Seamless ATM would help. Data collection in progress. To date India unable to find traffic for 50NM on LAJAK track during 1900 to 2130 UTC.
3/1	<p>A Pakistan-India-Afghanistan Special Coordination Meeting should be conducted by ICAO to address:</p> <ul style="list-style-type: none"> • more uniform application of 50NM separation whenever this was possible; • removal of unnecessary altitude and timing restrictions on ATS routes; • availability of FL280 and FL300 within the Kabul FIR outside BOBCAT hours; • new ATS route (WP10 and Flimsy 1 refers); • the status of communications and ATS surveillance facilities to support ATS surveillance-based separations and procedures; • transition towards a more comprehensive ATFM service; and • prioritisation of BOBCAT approved aircraft and their level allocation. 	2013	Pakistan-India-Afghanistan, ICAO, IATA, possibly Iran and Thailand	Closed	ATFM SWG item

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ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
	Consideration should be made to include Iran.				
3/2	IATA would support India to improve the uptake of on-airport data-link services.	2013	IATA	Open	SUR SWG item
4/1	SEACG/21 - Lahore requires acceptance by Kabul before accepting transfers from India, and FL280 was still not available within the Kabul FIR.	May 2014	ICAO Pakistan Afghanistan	Open	ICAO to discuss with Afghanistan on mission to Kabul 15-16 April 2014
4/2	India to review Bay of Bengal conflicts and remove FLAS with Pt Blair ADS-B operational if possible	July 2014	India	Open	India to update ATM/SG/2
4/3	Study sub-regional South Asia TA in the order of 13,000ft	August 2014	South Asian States	Open	India to update ATM/SG/2
4/4	India to present paper on the follow up actions of tasks identified in SAIOACG/4 SEACG21 Appendix X	August 2014	India	Open	

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Task List

	ACTION ITEM	RESPONSIBLE PARTY	STATUS	REMARKS
2.	Update the Progress on State Contingency Plan Development	STATES	OPEN	Raised at SEACG/16. States to develop and promulgate contingency plans according to Annex 11 – <i>Air Traffic Services</i> and update the progress to the SEACG/19.
3	Radar Data Sharing	Lao PDR/ Thailand	OPEN	Raised at SEACG/16. Lao PDR and Thailand agreed to share the radar data. Lao PDR and Thailand will further coordinate.
6	FL 400 Restriction on G581	Hong Kong, China Japan	CLOSED EFF 1 JAN 2014	Raised at SEACG/17 A tripartite meeting should be held to seek resolution to FL 400 by Hong Kong, China and report the outcome to the Regional Office as soon as possible. Hong Kong, China has implemented an additional ATC sector in April 2011 and is developing a controller tool with a view to addressing the issue. Hong Kong China will keep in view of the situation and update Japan towards end 2011. Hong Kong discussed this at the EATMCG /5. Still some issues with conflict detection software under development and expected to be resolved by end 2012.

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	ACTION ITEM	RESPONSIBLE PARTY	STATUS	REMARKS
7	Review of the Route Requirements Proposed to SEA-RR/TF by IATA (WP/6 of SEACG/18)	States	CLOSED	Raised at SEACG/18 Noting the SEA-RR/TF has not achieved a single output, States are invited to review Paragraph 2.3 of WP/6 before attending the next SEA-RR/TF. Completed.
8	Enhancement of Coordination and Awareness on LHD Occurrences	Indonesia, Philippines, Singapore and Viet Nam, Malaysia	CLOSED	Raised at SEACG/18 In order to reduce the LHD at the Manila FIR boundary, coordination should be enhanced between the ACCs and heightened the awareness of HF operators with regard to the high LHD occurrence rate at the identified reporting points. Supervisor to Supervisor consultation is currently practiced. LHDs have reduced as reported to RASMAG/18, AIDC implementation planned
9	Consideration of Implication of ADS-B Surveillance	States and IATA	CLOSED	Raised at SEACG/18 Deliverable should be the working paper from IATA and States at the next meeting. Updated at SEACG/20 ADS-B SITF and SEA-BOB ADS-B WG meetings discuss this, and it is now an element in the Seamless ATM Plan
10	ADS-B and VHF Coverage Chart	Regional Office	CLOSED	Raised at SEACG/18. ADS-B and VHF coverage chart will be created basing on the radar coverage chart. Updated at SEACG/20 Completed as part of the Seamless ATM Plan
11	SEA Route Review Implementation Plan Proposals 2 and 9, A202 & A1	Thailand, Laos, Vietnam, China, Hong Kong China	CLOSED	Proposal 2 was already noted as complete. Regarding Proposal 9, China reiterated that route changes within the Sanya FIR in the foreseeable future were not possible, due to the interest of other stakeholders.

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	ACTION ITEM	RESPONSIBLE PARTY	STATUS	REMARKS
12	SEA Route Review Implementation Plan Proposal 5 M756 TSN-ENREP	Thailand, Vietnam, Singapore	OPEN	Singapore and Viet Nam would continue the dialogue on this proposal bilaterally. Both States expressed the view that agreement was possible by the end of 2012, and would advise the results of discussion by SEACG/20.
13	SEA Route Review Implementation Plan Proposal 10, L628	Thailand, Cambodia, Viet Nam, Philippines	OPEN	The meeting discussed the reasons behind this proposal at length, describing the fact that although the route proposed to be duplicated had low traffic density, the change would allow a uni-directional flow to release some level restrictions on the main Southwest-Northeast traffic flow (at present, the crossing tracks utilised FL330, 370 and 410 eastbound and FL280 and 340 westbound). This proposal needed further consideration by the Airspace Authority of Viet Nam.
14	SEA Route Review Implementation Plan Proposal 11, M768	Thailand, Cambodia, Viet Nam, Malaysia, Philippines, Singapore	OPEN	Viet Nam was concerned about the effect of several new reporting points created by the new ATS route proposal. The Secretariat clarified that the number of reporting points should not be a factor within ATS surveillance coverage, as a State was able to advise through the AIP that pilot reports were unnecessary in such airspace, unless specifically requested by ATC. Viet Nam would consider this and advise their position at a later date. -
15	SEA Route Review Implementation Plan Proposal 14 and 15, M771 and L642	Vietnam, Hong Kong China, China	OPEN	China reiterated that route changes within the Sanya FIR in the foreseeable future were not possible, due to the interest of other stakeholders. The Secretariat reminded China about the concern from IATA regarding the need to be responsive to the economic and environmental drivers.
16	Sanya FIR Restrictions	Vietnam, Hong Kong China, China, China, RSO	OPEN	The SEACG/21 meeting was apprised of concerns that the Sanya FIR was regularly imposing using 15 minute longitudinal spacing requirements. The parties to meet and discuss a resolution plan.
17	L642/M771	Hong Kong, China, Vietnam, Singapore	OPEN	SEACG/21 - Reduce longitudinal separation from 50NM to 30NM on L642/M771 Hong Kong agreed to surveillance based separation in 2015, subject to the implementation of the new Hong Kong system

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	ACTION ITEM	RESPONSIBLE PARTY	STATUS	REMARKS
18	Study sub-regional Southeast Asia TA of 11,000ft	SE Asian States	OPEN	Report to ATM/SG/2 or SEACG/22
19	The AATIP representative agreed to provide information on the cost assumptions used in the EUROCONTROL modelling used in the paper, so these could be customised using Asia/Pacific values.	AATIP	OPEN	
20	Establishment of a Major Traffic Flow Review Group	China, Hong Kong China, the Philippines, Viet Nam, IATA, IFATCA and the ICAO RSO	OPEN	Report to ATM/SG/2 or SEACG/22