



*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

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**Agenda Item 4: Implementation of CNS/ATM Systems**

**SMALL WORKING GROUP UPDATES**

(Presented by the Secretariat)

**SUMMARY**

This paper requests updates from the reports of the Small Working Groups originally formed by the SEACG/19 and the SAIOACG/2 Meetings that were intended to:

- a) Assess the current status and planning of implementation;
- b) Identify barriers to implementation;
- c) Make recommendations to assist harmonized ATM procedures and applications;
- d) Make recommendations that assist implementation in accordance with the Asia/Pacific Air Navigation and ATFM Concepts of Operations, and the Asia/Pacific Seamless ATM initiatives, related to the ATFM, COM and SUR fields.

**1. INTRODUCTION**

1.1 The SAIOACG/2 and the SEACG/19 Meetings formulated the decisions to establish small working groups to address issues related to ATFM, Communications and Surveillance.

**2. DISCUSSION**

2.1 The following items should be reviewed and any progress updated to the meeting.

ATFM SWG	
City Pair CDM trials between Bangkok, Singapore Changi Airport, and the Hong Kong Daily Capacity Notification Scheme	States were encouraged to support the tests and plan for future expansion and development; with the trial results reported to SEACG/21 (SEACG Task List)
Large Scale Weather Deviations (LSWD)	Tripartite agreement should include consideration of appropriate ATFM measures distributed via A-CDM ensuring maximum utilization of airport and en-route capacity during LSWD contingency procedures on L642 and M771; results reported to SEACG/21

Pakistan-India-Afghanistan Special Coordination Meeting	<ul style="list-style-type: none"> <li>• BOBCAT Prioritisation;</li> <li>• acceptance of 50NM separation;</li> <li>• removal of unnecessary ATS route restrictions;</li> <li>• availability of FL280/FL310 within Kabul FIR;</li> <li>• status of COM and SUR facilities to support ATS surveillance-based separations and procedures;</li> <li>• transition from BOBCAT to a more comprehensive ATFM system (SAIOACG Task List).</li> </ul>
States with traffic capacity issues (Conclusion ATFM Capacity)	States to commence aerodrome and airspace capacity analysis at the earliest opportunity addressing: <ul style="list-style-type: none"> <li>• capacity in various weather conditions;</li> <li>• exchange of schedule information and flight data;</li> <li>• efficient meteorology data exchange;</li> <li>• collaborative pre-tactical daily ATFM planning.</li> </ul>
ATFM at a sub-regional level (Conclusion ATFM Steering Group)	Start from sharing information on arrival capacity, common traffic demand and anticipated delay, then evolving into collaborative ATFM implementation among the virtual ATFMUs.
COM SWG	
South China Sea Communications (Conclusion)	Possible mitigators: <ul style="list-style-type: none"> <li>• urgent attention to Manila FIR HF capability;</li> <li>• review of SCS service provision in airspace without ADS-B or radar surveillance or VHF voice communications;</li> <li>• Cooperative agreements to exchange COMs and SUR capability in the South China Sea.</li> </ul>
Controller Pilot Data-link Communications (CPDLC) controller – pilot communications (DCPC) (Conclusion)	CPDLC systems must be integrated with the workstation of the controller responsible for the relevant sector of airspace.
Limited implementation of ATS Inter-facility Data-Link Communications (AIDC) messaging has occurred	This is the subject of numerous APANPIRG Conclusions and is a Seamless ATM Plan priority element
SUR SWG	
Direct Speech Circuits	States with overlapping surveillance coverage should implement direct speech circuit to allow direct coordination between the surveillance controllers instead of relaying the information through third parties.
Radar Handoff Procedures	States with overlapping surveillance coverage should introduce surveillance handoff procedures.
ADS-B Data Sharing	ADS-B with VHF Communications should be considered in areas with lack of infrastructure and sharing agreements enacted (updates from Singapore, India, Maldives, Myanmar, Malaysia

2.2 The following table 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	Singapore, Malaysia
2	Reduce the agreed spacing at the Transfer of Control point between Singapore and Jakarta FIR	Singapore Indonesia

3	Reduce longitudinal separation from 50NM to 30NM on L642/M771	Hong Kong, China, Vietnam, Singapore
4	Reduce the agreed spacing at the Transfer of Control point between Kuala Lumpur and Bangkok FIR	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	Hong Kong, India, Singapore (SWG lead)
6	Continue efforts to conclude LOA for ADSB data sharing between India and Myanmar	India, Myanmar
7	Spread the information among IATA member airlines to assist in the Sanya FIR ADSB trials.	IATA, China

### 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) provide information to ensure tasks are relevant, updated or completed; and
- c) discuss any relevant matters as appropriate.

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## **JOINT REPORT OF THE SAIOCG ATFM SMALL WORKING GROUP (SAIOACG ATFM SWG) AND SEACG ATFM SMALL WORKING GROUP (SEACG ATFM SWG)**

### **1. INTRODUCTION**

#### SAIOACG ATFM SWG

1.1 The SAIOACG ATFM SWG was formed at SAIOACG/2 with the objectives to determine:

- a) current ATFM status and planning of implementation;
- b) identify barriers to implementation;
- c) make recommendations to assist harmonized ATM procedures and applications; and,
- d) make recommendations that assist implementation in accordance with the Asia/Pacific Air Navigation and ATFM Concept of Operations, and the Asia/Pacific Seamless ATM initiatives related to ATFM.

#### SEACG ATFM SWG

1.2 The SEACG ATFM SWG was formed at SEACG/19 with the objectives to determine:

- a) major capacity and demand issues within SEACG airspace;
- b) the status of ATFM development within SEACG airspace, including Collaborative Decision-Making (CDM);
- c) current Large Scale Weather Deviation procedures;
- d) barriers to effective ATFM, including CDM, and for effective response to LSWDs;
- e) recommendations to assist the development of ATFM, including CDM within the SEACG area; and
- f) recommendations to improve Large Scale Weather Deviation (LSWD) responses.

### **2. DISCUSSION**

#### Initial findings of SAIOACG ATFM SWG

2.1 Initial discussion of the SAIOACG ATFM SWG during SAIOACG/2 regarding information submitted by India on BOBCAT operations was as follows:

- a) changes of routes within the Delhi FIR: IATA stated that they supported the prioritization of BOBCAT approved routing and levels. India noted a reduction in the incidence of these events, but they remained a problem. India would ensure that it would reiterate to its controllers to take into account the BOBCAT approval for each aircraft wherever possible.
- b) time and level allocation at the Delhi FIR exit point in addition to Kabul FIR entry: this was not considered by the meeting to be required or useful, as the airspace operations were too tactical in nature, and depended upon both Pakistan and India to enact the restrictions.

- c) FL280 and FL300 exclusively reserved for Delhi and Lahore departures: the meeting agreed that restrictions of this nature were contrary to the need for flexibility and capacity enhancement.
- d) BOBCAT Slot allocations may be made mandatory for all flights: the meeting considered that BOBCAT approval status had already been promulgated, and that aircraft without BOBCAT approvals would have a lower priority.
- e) BOBCAT slot allocation extension beyond 2000 – 2359UTC: the meeting considered WP20, and on the data provided, and did not agree that BOBCAT hours needed to be extended. However, there was a need for Afghanistan to consider the availability of FL280 and FL310 outside BOBCAT hours.
- f) Traffic distribution evening on all four exit points: the meeting did not concur that traffic distribution was necessary, considering this could be counter to the need for a flexible system.
- g) 50NM should be accepted for all aircraft on routes P628, L333, M875 and L509: the meeting agreed that all States involved should be accepting 50NM separation when this was possible.

2.2 The Secretariat emphasized that we should not be engineering more complex procedural systems to solve a problem that had its genesis in tactical demand and capacity issues. It was recognized that there was a need to transition from a BOBCAT system to a more comprehensive ATFM solution, allowing more tactical and pre-tactical changes and CDM. It was suggested that South Asia sub-region needed one permanent H24 ATFM system just as Southeast Asia did to service Bangkok, Kuala Lumpur, Singapore and Jakarta as well as traffic flow among major ATFM areas.

2.3 India was ready to share the ATFM platform and expertise being developed with the FAA. Thailand would consider working with India to assist a seamless integration of BOBCAT into a synchronized regional ATFM implementation plan as it was not practical to have two different ATFM systems being run by two entities in the same airspace operating in the same phase of operation and/or phase of flight. The United States had been working with India for the past two years on developing ATFM and in particular CDM. Of importance was an ATFM stakeholder's meeting at the outset to involve airlines and ANSPs concerned. The FAA was committed and prepared to assist the region and had noted a major political change in India to support this. Thailand stated that there needed to be more sub-regional ATFM and tactical operations in the region. IATA stated that harmonization of implementation was important, so was a barrier.

2.4 India advised that they supported a sub-regional ATFM system, and would formally commit to such a project at a later date, possibly the ATFM/SG/2 meeting. India advised that their ATFM system had been planned with an open architecture, which should allow interaction with other States and their systems. The meeting agreed that it was important to establish a transitional plan to ensure the smooth change from BOBCAT operations to a sub-regional ATFM system, and that interoperability was the key for different ATM systems. The meeting agreed that this could be an item for the ATFM/SG to define (Draft Decision SAIOACG/SEACG 3 refers).

2.5 The meeting noted that a high level of traffic growth was expected for members of the Association of South-East Asia Nations (ASEAN) due to expected establishment of the ASEAN Economic Community in 2015 along with ASEAN Single Aviation Market (ASAM) and Seamless ASEAN Sky (SAS) initiatives, with some major cities resorting to dual- or multiple-airport operations to accommodate short- to medium-term traffic growth. The majority of SAIOACG States were servicing mainly international traffic, reducing the effectiveness of national ATFM implementation.

2.6 Exchanges prior to the joint meeting of the SAIOACG and SEACG ATFM SWGs resulted in identification of the following barriers to implementation:

- a) the multi-partner nature of CDM required involvement of many partners from the beginning;
- b) potential difficulties expected in aggregating data from key stakeholders such as airport operators, airlines, ANSPs and military operations to enable effective strategic ATFM planning;
- c) difficulties in exchanging necessary data to enable effective CDM/ATFM operations, such as effective surveillance data exchange;
- d) slow adoption of up-to-date digital AIM enabling automated data exchange; and
- e) lack of capacity planning and reporting (airport and airspace capacity measurement and sharing issues).

#### Findings

2.7 The combined SAIOACG/SEACG ATFM SWG discussion resulted in the following findings.

1. The pre-tactical determination of airport and airspace capacity on a daily basis, as opposed to strategic capacity, was not widespread within the SEACG region. This resulted in ATFM measures mostly being imposed reactively, rather than proactively. Major en-route capacity and demand issues were found to be centred on the widespread use of procedural longitudinal separation on major trunk routes. Moreover, the meeting noted that the use of separation based on ATS surveillance where this was possible was an important capacity building measure, and should be prioritized (SAIOACG/SEACG SUR SWG).
2. ATFM development in the SEACG airspace was found to be piecemeal and focused on protection of internal demand rather than a coordinated sub-regional approach. Acknowledging the challenges associated with a centralized type of Regional ATFM Unit in the short-medium term, participants felt that improved harmonization of ATFM measures through CDM could provide similar results. The meeting agreed that this would be a possible item for discussion at the ATFM Steering Group, if this was held.
3. Barriers to effective ATFM included a lack of data sharing to enable an overall traffic demand awareness and a low level of predictability and confidence to enable the appropriate level of ATFM measures to be applied. Some participants also voiced their opinion that there was an urgent need to review the SCS Flight Level Allocation Scheme (FLAS), as traffic patterns have changed significantly compared to when the current Schemes were devised. The meeting noted the FLAS issue could not be resolved until the communications and surveillance gaps in the South China Sea no longer existed, at which time the FLAS could be considered for removal and at the same time ATS surveillance-based separations implemented. Moreover, the meeting noted that on-going planning for South China Sea enhancements were a key part of the Asia/Pacific Seamless ATM Planning Group's work.
4. The meeting noted that LSWD procedures were clarified as not being ATFM measures in themselves, but the cause of a reduction in capacity which required associated ATFM measures to be developed to enable a more predictable and efficient application of available levels.

5. The meeting also noted that greater collaboration should exist between States to develop, in the near term, ATFM for short haul/regional flights, as some of these city pairs were very high density. IATA stated that their preference was for long haul aircraft to be provided with priority over aircraft operating up to 5 hours. The shorter haul aircraft could have CTOT restrictions if needed, and should be sequenced accordingly.
6. Examples of collaborative ATFM planning among members of the SWGs have been evident since SAIOACG/2 and SEACG/19.
7. City Pair CDM trials between Bangkok's Suvarnabhumi Airport and Singapore Changi Airport, including the participation of Malaysia, had demonstrated efficiency gains achievable through the integration of airport and en-route CDM. Combining this with the concept of Daily Capacity Notification Scheme and demand/capacity analysis developed for Hong Kong International Airport, Hong Kong, China, Singapore and Thailand had entered a 'tripartite agreement' to explore the concept of networked A-CDM to manage the traffic flows between their respective major hubs.
8. A number of SWG participants attended Global 7 ATFM Conference hosted by Indonesia in Bali on 28 – 30 January 2013. It was agreed at the Conference that the ICAO Manual on Collaborative ATFM (Doc 9971) and Manual on Flight and Flow – Information for Collaborative Environment (FF-ICE) (Doc 9965) should form the basis of CDM/ATFM implementation globally.
9. The Global 7 ATFM Conference also agreed to establish a Global ATFM information sharing website <<http://www.globalatfm.net/>>, hosted by Indonesia with data support from Thailand and other States with ATFM expertise. The meeting noted that this would not be a real time flight data resource.
10. It was recognized that ATFM implementation was not a solution for long-term airspace capacity imbalance, and that there should be plans to enhance ATM/CNS capacity and infrastructure where necessary.

#### Proposed Solutions

2.8 Recognising the City Pair CDM trials between Bangkok's Suvarnabhumi Airport and Singapore Changi Airport, and the Daily Capacity Notification Scheme and demand/capacity analysis developed for Hong Kong International Airport, Hong Kong China, adjacent States were encouraged to support the tests and plan for future expansion and development; with the trial results reported to SEACG/21 (SEACG Task List).

2.9 With respect to LSWD, the tripartite agreement should include consideration of appropriate ATFM measures distributed via A-CDM ensuring maximum utilization of airport and en-route capacity during LSWD contingency procedures on L642 and M771; with the results reported to SEACG/21 (SEACG Task List).

2.10 A Pakistan-India-Afghanistan Special Coordination Meeting should be conducted by ICAO to address:

- Prioritisation of BOBCAT approved aircraft and their level allocation;
- acceptance of 50NM separation whenever this was possible;
- removal of unnecessary altitude and timing restrictions on ATS routes;
- availability of FL280 and FL310 within the Kabul FIR outside BOBCAT hours;

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- the status of communications and ATS surveillance facilities to support ATS surveillance-based separations and procedures;
- the transition from a BOBCAT-based system to a more comprehensive ATFM system (SAIOACG Task List).

2.11 It was recommended that all States with traffic capacity issues commenced aerodrome and airspace capacity analysis at the earliest opportunity (Draft Conclusion SAIOACG/SEACG 1: ATFM Capacity Assessments refers).

2.12 With regard to demand and capacity balance, the following issues should be addressed:

- capacity of airports and congested airspace should be developed and shared in various weather conditions;
- Exchange of schedule information and flight data;
- efficient meteorology data exchange;
- collaborative pre-tactical daily ATFM planning, which included flexible sectorisation and runway configuration planning where possible (Draft Conclusion SAIOACG/SEACG 2: ATFM Planning Process refers).

2.13 It was recommended that implementation of ATFM at a sub-regional level would involve careful synchronization of individual A-CDM programs, tightly coupled with collaborative implementation of ATFM in the form of virtual ATFM Units serving catchment areas surrounding the major air-hubs. The project could start from sharing information on arrival capacity, common traffic demand and anticipated delay, then evolving into collaborative ATFM implementation among the virtual ATFMUs (Draft Conclusion SAIOACG/SEACG 3: ATFM Steering Group refers).

<b>Combined ATFM SWG Participant</b>	<b>Organisation</b>
1. Peter Chadwick (SWG Co-Leader)	Hong Kong, China
2. Piyawut Tantimekabut(SWG Co-Leader)	Thailand
3. Saichon Pingsakul	Cambodia
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10. Aung San Oo	Myanmar
11. Sivapirakasam s/o Rengasamy	Singapore
12. Michael Shee	Singapore
13. Nopadol Sang-Ngurn	Thailand
14. Chuman Ruechai	Thailand
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**JOINT REPORT OF THE SAIOCG SMALL WORKING GROUP - COMMUNICATIONS  
(SAIOACG SWG - COMMS) AND SEACG SMALL WORKING GROUP –  
COMMUNICATIONS (SEACG SWG - COMMS)**

**1. INTRODUCTION**

SWG - Communications Report

1.1 The SAIOACG and SEACG Small Working Groups – Communications (SWG – Comms) were established to examine communications capabilities and plans impacting upon seamless ATM implementation among participant States and therefore impacting the wider South Asia – Indian Ocean and South East Asia areas. The objectives were to determine current CNS/ATM System communications capability and gaps, implementation plans and impediments to successful implementation, and to make recommendations for improvement.

1.2 This report summarizes the findings of the SWGs – Comms at the combined meeting of SAIOACG/3 and SEACG/20.

**2. DISCUSSION**

VHF Air-Ground

2.1 The group considered that collation of VHF coverage data, and recommendations for enhancement of coverage, reliability and availability are determined by the requirement to provide direct controller – pilot voice communications, to support current and proposed radar and ADS-B surveillance coverage. As such, these activities should more appropriately be conducted by the Small Working Group – Surveillance.

HF Air-Ground

2.2 Several States did not provide information on whether HF was in use, and no information was provided on any limitations, reliability or coverage issues.

2.3 The meeting noted that there were ongoing issues with the provision of HF communications in the western part of the Manila FIR, in the busy South China Sea area (**Attachment A**), particularly on ATS route M772. Philippines advised that there was a project being considered for rehabilitation of HF equipment by 2013.

2.4 The meeting further noted that the proposed deployment of ADS-B and supporting VHF voice communications facilities on two islands in the South China Sea, one in the Ho Chi Minh FIR and one in the Sanya FIR, both of which would provide substantial surveillance and communications coverage of that portion of the Manila FIR outside Philippines' current surveillance and VHF range. There was some discussion of whether the issue should be managed by:

- i) Urgent attention to Manila FIR HF capability (TASK); and/or
- ii) Review of the service provision in airspace over the South China Sea in areas currently without ADS-B or radar surveillance or VHF voice communications; or
- iii) Cooperative agreements to exchange communications and surveillance capability in the South China Sea.

2.5 The SWG – COMMS agreed to the following draft Conclusion:

**Draft Conclusion X/X:**

That the provision of surveillance and communications services in the South China Sea area, where radar, ADS-B and/or VHF voice communications are currently not provided, be reviewed by China, Hong Kong China, Malaysia, Philippines, Singapore and Viet Nam, to consider:

- a) Enhancement of current services;
- b) Delegation or amendment of airspace service volumes; and
- c) Cooperative agreements to exchange communications and surveillance capability.

CPDLC

2.6 Several participating States indicated having CPDLC capability, but some have also indicated that their CPDLC system is provided at a stand-alone position in their ATC facility. In order to provide direct controller – pilot communications (DCPC) between the aircraft and the controller responsible for its separation, CPDLC systems must be integrated with the workstation of the controller responsible for the relevant sector of airspace. Without DCPC improved RNP separations outside radar or ADS-B surveillance and/or direct voice communications coverage cannot be achieved.

2.7 The SWG proposed the following draft Conclusion:

**Draft Conclusion X/X**

That, States are urged to ensure that CPDLC systems are integrated with ATM Systems to provide DCPC at the ATC workstation controlling the aircraft concerned.

AIDC

2.8 The SWG – Comms noted that only limited implementation of AIDC messaging has occurred among SAIOCG and SEACG States. Current operational implementation is confined to internal messaging between the FIRs of only one SAIOCG State, and the exchange of a limited set of AIDC messages between 3 FIRs in 2 SEACG States. A significant number of administrations were either not planning to use ATS Inter-facility Data-link Communications (AIDC) or did not have this capability planned in the near future. This was in spite of the previous APANPIRG Conclusion urging States to implement AIDC due to its effectiveness in reducing human transfer errors.

2.9 Technical limiting factors reported include ATM automation system capability and configuration, AIDC version compatibility<sup>1</sup> and AFTN/ATN reliability.

2.10 The SWG discussed the considerable safety, capacity and ATC workload benefits of AIDC messaging. Consideration was also given to the core AIDC messages defined in the *Asia/Pacific Regional Interface Control Document (ICD) for ATS Interfacility Data Communications (AIDC)*, and the identification of a minimum suite of these core messages which may be suitable for initial implementation in States with little or no prior experience in AIDC messaging (Draft Conclusion refers).

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<sup>1</sup> The first meeting of a EUR – Asia/PAC pan-Regional AIDC ICD Task Force was held in Paris in January 2013. The second meeting will be held in Bangkok in November 2013. The expected output of this Task Force is a standardized AIDC ICD for global use.

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**JOINT REPORT OF SAIOCG SUR SMALL WORKING GROUP (SAIOACG SUR SWG)  
AND SEACG SUR SMALL WORKING GROUP (SEACG SUR SWG)**

**1. INTRODUCTION**

**SAIOACG SUR SWG & SEACG SUR SWG**

1.1 At the SAIOACG/2 and SEACG/19 Meetings , Surveillance Working Groups (SWG) were established to look into the surveillance capabilities of each State. The objectives were to determine:

- a) The horizontal separation standards used within Bay of Bengal and Indian Ocean airspace, especially at the transfer of control point;
- b) The status of ANSP's surveillance capability within Bay of Bengal and Indian Ocean airspace;
- c) The gaps in Radar, MLAT and ADS-B coverage;
- d) Planned ATS surveillance installations;
- e) Make recommendations to harmonise surveillance based separations; and
- f) Make recommendations to assist the regional application of ATS surveillance facilities.

**2. DISCUSSION**

**South Asia - SAIOACG SUR SWG**

2.1 The SAIOACG SUR SWG discussed issues relating to surveillance during the inaugural meeting including new installations, confirmation of radar coverage in the respective FIRs and separation minima currently employed in both the en-route and terminal airspace of the FIRs (Please see attached). Some of the problem areas identified were:

- a) Lack of direct speech circuit between the surveillance controllers to allow coordination for surveillance separation to be applied even with overlapping surveillance coverage;
- b) Lack of surveillance handoff procedures between adjacent ANSPs with overlapping surveillance coverage;
- c) Infrastructure is absent in areas with surveillance gaps;
- d) Interface issues on different systems used by adjacent ANSPs thus leading to higher costs; and
- e) Application of larger surveillance separation (eg. 15NM or more) within the FIR due to reliability of systems.

2.2 The SAIOACG SUR SWG agreed that States would be provided with the appropriate charts and the table showing the routes (and FIRs' involved), the current separation and proposed future separation, and a table showing the initiatives and the reasons for the provision of procedural separation where surveillance coverage currently exists.

2.3 The following charts were developed using State's Aeronautical Information Publication (AIP) and also inputs provided by some States on their future developments (charts were provided as Appendices to WP03):

- a) Coverage Chart with ADS-B (Pink), SSR (Blue – when ADS-B layer overlaps, it looks purple) and VHF (Green);
- b) Coverage Chart with ADS-B and SSR;
- c) Coverage Chart with ADS-B only;
- d) Coverage Chart with SSR only; and
- e) Coverage Chart with VHF only.

2.4 India clarified that coverage areas are more extensive than shown in the charts. India highlighted that there is a small area in BOB which they are addressing with ADS-C and CPDLC. With regard to ADS-B coverage, India had extended VHF range cover in some areas in the Bay of Bengal. They will provided updated information accordingly.

#### Recommendations

2.5 The SWG agreed to the following recommendations:

- a) Direct Speech Circuit (hotline between controllers transferring control)
  - States with overlapping surveillance coverage should implement direct speech circuit to allow direct coordination between the surveillance controllers instead of relaying the information through third parties.
- b) Radar Handoff Procedures
  - States with overlapping surveillance coverage should introduce surveillance handoff procedures. This could be done on a phase-by-phase basis, starting with a comfortable longitudinal distance for a period of time before reducing the longitudinal distance further. This will be subject to the safety assessment of each individual State. The SWG discussed the issue of agreed longitudinal spacing between aircraft at the transfer of control point between two FIRs and was of the view that there was no need to link it to the applicable separation minima in the concerned FIR.
  - India informed the meeting that it was using AIDC for internal coordination currently and planned to use it with external FIR's. AIDC was the primary means and Direct Speech Circuit was used as a back up. However, in cases of emergency, DSC could still be used. For radar handoff DSC is used between radar controllers.

c) ADS-B data sharing

- ADS-B with VHF Communications should be considered in areas with lack of infrastructure. Sharing of ADS-B data and VHF Communications between adjacent States should also be considered to improve safety and efficiency. India requested that a copy of ADS-B agreement between states be provided to them so that it could be used as an example or model to assist them in their internal processes. Singapore advised that they had provided a copy of their documentation sans sensitive information to the ADSB focus group. India will check and revert. India also highlighted that they had encountered some difficulties in coordinating data exchange agreements with Myanmar.
- Maldives advised that they have installed ADS-B and tables/charts will be updated. Trials have begun. SWG also discussed mandating the use of ADSB as the way forward to ensure that all airlines including LCC's to ensure that the ATC has the full air traffic picture.
- In relation to VHF coverage over the Bay of Bengal, Malaysia informed that they had conducted trials with an "over the horizon" VHF and indications are that they might have the capability to provide VHF cover over the entire western side of the KL FIR.

**Southeast Asia - SEACG SUR SWG**

2.6 The SEACG SUR SWG discussed various issues during the inaugural meeting including new installations, confirmation of radar coverage in the respective FIRs and separation minima currently employed in both the en-route and terminal airspace of the FIRs (Please see attached). Some of the problem areas identified were:

- a) Lack of direct speech circuit between the surveillance controllers to allow coordination for surveillance separation to be applied even with overlapping surveillance coverage;
- b) Lack of surveillance handoff procedures between adjacent ANSPs with overlapping surveillance coverage;
- c) Infrastructure is absent in areas with surveillance gaps;
- d) Interface issues on different systems used by adjacent ANSPs thus leading to higher costs; and
- e) Application of larger surveillance separation (eg. 15NM or more) within the FIR due to reliability of systems.

2.7 The SWG agreed that States would be provided with the appropriate charts and the table showing the routes (and FIRs' involved), the current separation and proposed future separation, and a table showing the initiatives and the reasons for the provision of procedural separation where surveillance coverage currently exists.

2.8 The following charts have been developed using State's Aeronautical Information Publication (AIP) and also inputs provided by some States on their future developments (charts were provided as Appendices to WP03):

- a) Coverage Chart with ADS-B (Pink), SSR (Blue – when ADS-B layer overlaps, it looks purple) and VHF (Green);
- b) Coverage Chart with ADS-B and SSR;
- c) Coverage Chart with ADS-B only;
- d) Coverage Chart with SSR only;
- e) Coverage Chart with VHF only

#### Recommendations

2.9 The SWG agreed to the following recommendations:

- a) Direct Speech Circuit (hotline between controllers transferring control)

States with overlapping surveillance coverage should implement direct speech circuit to allow direct coordination between the surveillance controllers instead of relaying the information through third parties.

- b) Radar Handoff Procedures

States with overlapping surveillance coverage should introduce surveillance handoff procedures. This could be done on a phase-by-phase basis, starting with a comfortable longitudinal distance for a period of time before reducing the longitudinal distance further. This will be subject to the safety assessment of each individual State. The SWG discussed the issue of agreed longitudinal spacing between aircraft at the transfer of control point between two FIRs and was of the view that there was no need to link it to the applicable separation minima in the concerned FIR.

- Singapore informed the meeting that there was a radar handoff procedure, and the agreed spacing between aircraft without pre-coordination between Kuala Lumpur and Singapore FIR was 15NM. However, the current agreed spacing between aircraft between Singapore and Jakarta was 40NM, but this was under review.
- The agreed spacing between aircraft between Hong Kong FIR and Taipei FIR was 30NM without precoordination. They had a radar hand-off procedure with Taipei. Hong Kong also had a similar agreement Sanya FIR with the same agreed spacing. AIDC was on trial between HK and Sanya and Taipei . Sanya was ready to implement AIDC with Hanoi and Ho Chi Minh ACCs.
- Hong Kong and China agreed that subject to ADS-B and new ACC operations coming on line at around the first half 2015, they would be prepared to implement 30NM longitudinal separation on L642/M771 pair of routes. Singapore agreed. ICAO was requested to inform Viet Nam. SEACG 21 will begin the process to implement this.

c) ADSB data sharing

ADS-B with VHF Communications should be considered in areas with lack of infrastructure. Sharing of ADS-B data and VHF Communications between adjacent States should also be considered to improve safety and efficiency.

Tasks for SEACG/SAIOACG

1	Identify areas to implement radar hand-off procedures so that the agreed spacing between FIRs can be reduced	Singapore, Malaysia
2	Reduce the agreed spacing at the Transfer of Control point between Singapore and Jakarta FIR	Singapore Indonesia
3	Reduce longitudinal separation from 50NM to 30NM on L642/M771	Hong Kong, China, Vietnam, Singapore
4	Reduce the agreed spacing at the Transfer of Control point between Kuala Lumpur and Bangkok FIR	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	Hong Kong, India, Singapore (SWG lead)
6	Continue efforts to conclude LOA for ADSB data sharing between India and Myanmar	India, Myanmar
7	Spread the information among IATA member airlines to assist in the Sanya FIR ADSB trials.	IATA, China



APDX E SAIOCG SUR SWG and SEACG SUR SWG Report

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