



ICAO

*International Civil Aviation Organization*

**The First Meeting of the South Asia, Indian Ocean and  
Southeast Asia ATM Coordination Group (SAIOSEACG/1)**

Video Teleconference, 28 March – 01 April 2022

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### Agenda Item 3: Review of Outcomes of Related Meetings

#### **BOBTFRG MEETING OUTCOMES**

(Presented by the Secretariat)

##### **SUMMARY**

This paper presents outcomes from the Third Meeting of the Bay of Bengal Air Traffic Flow Review Group (BOBTFRG/3) for the review and action by the SAIOSEACG.

#### **1. INTRODUCTION**

1.1 The Bay of Bengal Traffic Flow Review Group (BOBTFRG) was established by SAIOACG to analyse the traffic flows in the Bay of Bengal airspace and air routes, to consider the safety issues, and to optimise airspace capacity in the long term.

1.2 The Third Meeting of the Bay of Bengal Air Traffic Flow Review Group (BOBTFRG/3) was held via Video Teleconference from 14 to 15 December 2021. The meeting was attended by 61 participants from Bangladesh, India, Indonesia, Malaysia, Myanmar, Pakistan, Singapore, Sri Lanka, Thailand, IATA, IFALPA, IFATCA and ICAO. The relevant presentations and papers are available at <https://www.icao.int/APAC/Meetings/Pages/2021-BOBTFRG-3.aspx>.

#### **2. DISCUSSION**

##### Updates on ADS-C/CPDLC and PBCS Implementation

2.1 The Civil Aviation Authority of Bangladesh provided information on the initiatives undertaken to upgrade the Communications, Navigation and Surveillance (CNS) and Air Traffic Management (ATM) systems in Bangladesh. The Project was expected to be completed in 2024. Bangladesh confirmed that with the Modernization Project of CNS-ATM System of Bangladesh, the entire Dhaka FIR and extended areas in the Bay of Bengal would be communications and surveillance covered.

2.2 The meeting was informed of the implementation of Performance-Based Communication and Surveillance (PBCS) in oceanic airspace of Chennai FIR, including the various steps undertaken to upgrade the Chennai Oceanic Control Centre (OCC) ATM automation system, to ensure the PBCS compliance as per ICAO requirements and facilitate the application of performance-based separations. India informed the meeting that the ATM automation system for PBCS in Chennai and Mumbai FIRs were expected to be implemented in six months, however, the implementation in Kolkata FIR had not been fixed.

##### Updates on the Implementation of Improved Horizontal Separation Standards

2.3 The meeting was informed that the communications and surveillance facilities at Banda

Aceh had the coverage in the area of Large Height Deviation (LHD) Hot Spot A2 (Chennai – Kuala Lumpur interface), which could support the mitigation of LHDs at this interface.

2.4 As Jakarta Area Control Centre (ACC) had the advantage of communications and surveillance coverage in the area of Hot Spot A2, and as an effort to mitigate the LHD occurrences at this interface, Indonesia proposed the following options, for consideration by India and Malaysia.

- Option 1: tactically delegate the airspace in the area of Hot Spot A2 to Jakarta ACC Banda Aceh Sector for the provision of ATS.
- Option 2: permanently delegate the portion of airspace in the area of Hot Spot A2 in Kuala Lumpur FIR to Jakarta ACC Banda Aceh Sector for the provision of ATS. The delegated airspace would remain as part of Kuala Lumpur FIR.

2.5 The meeting noted that the issues of LHD surge in 2019 had been solved after successful AIDC implementation between Chennai OCC and Kuala Lumpur ACC from February 2020, along with India's Space-based ADS-B (SB ADS-B) surveillance coverage extending beyond the FIR boundary.

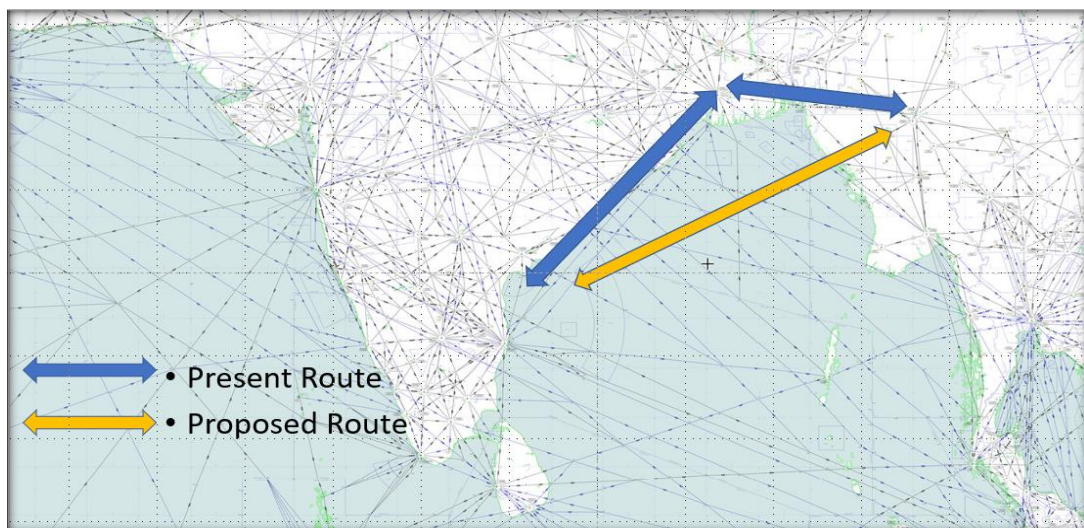
2.6 Malaysia stated that they would review the options proposed by Indonesia, and would consult their higher authority on this matter.

#### Discussion on PBN Routes Development

2.7 ICAO presented selected ATS route proposals from the most recent Version 21 of the *Asia/Pacific Region ATS Route Catalogue* for review and update by concerning States.

2.8 There were updates by States and IATA on HIMALAYA 02, IND 07 (N877 Extension), AFG 01, MID 02 (a), BOB 01, and BOB 02.

2.9 Based on inputs from airlines, IATA made new ATS route proposals BOB 01 and BOB 02, which had a potential to save approximately 12 minutes of flight time between south west Bay of Bengal and Far East destinations (**Figure 1**).



**Figure 1:** Comparison between Present and Proposed Route

2.10 India and Myanmar indicated their positive consideration on this route proposal. In order to conduct better assessment, India requested IATA to provide the analysis of the fleet equipage in ADS-C/CPDLC and PBCS, and IATA would coordinate with its member airlines with regards to the fleet equipage.

Withdrawal of ATS Route B466 Segment in Chennai FIR

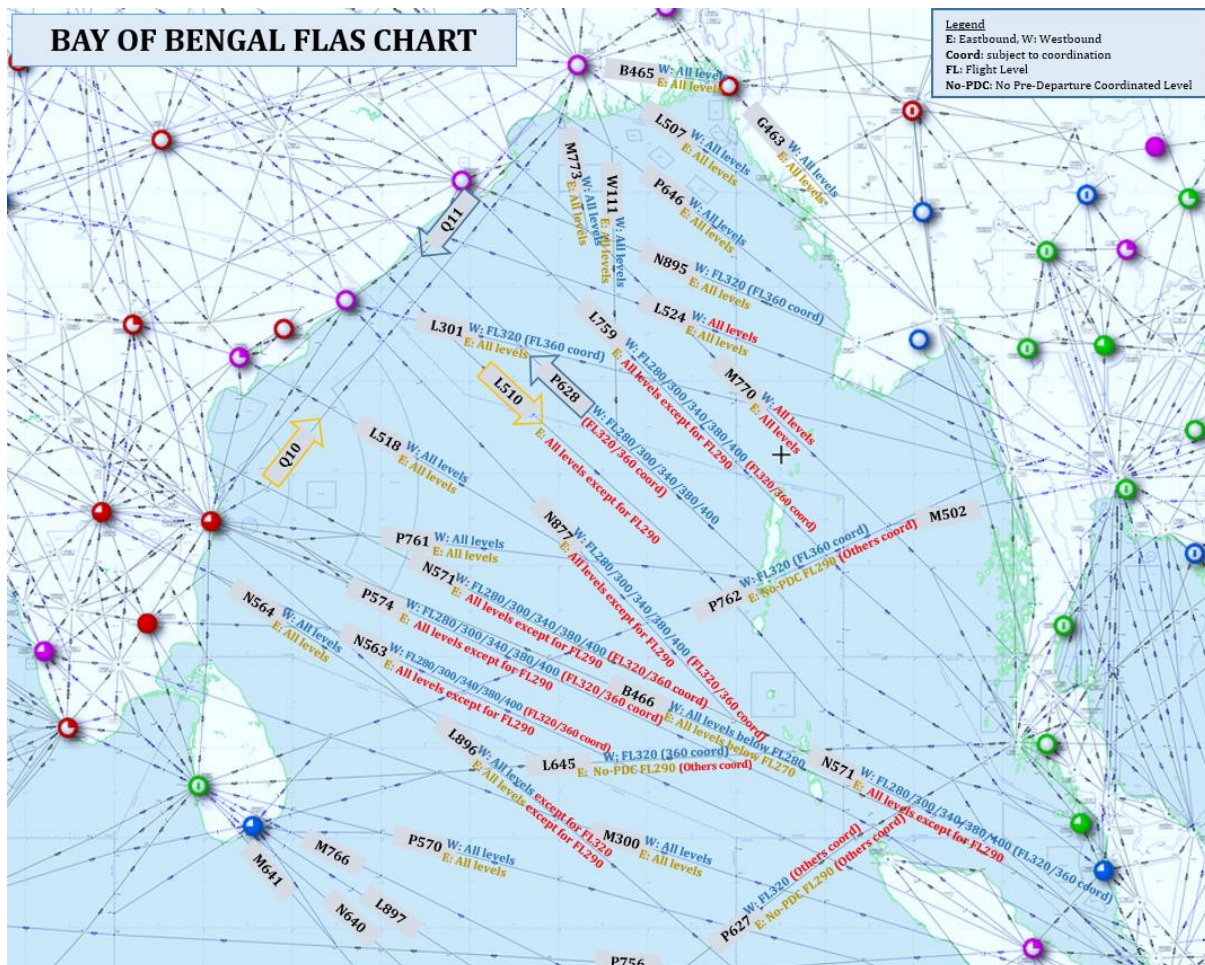
2.11 India presented the proposal to withdraw a segment of ATS route B466 in Chennai FIR between Chennai (MMV) and ANOKO (TOC point between Chennai and Kuala Lumpur FIRs) due to low utilization of ATS route B466 and high fleet equipage rate with RNP 10/RNAV 10 capability over the Bay of Bengal airspace. This proposal still allows non-RNP 10/RNAV 10-capable aircraft which was permitted to operate on RNP 10 routes subject to filing flight plan at or below FL280, which was the minimum flight level for ATS routes N571 and P574 with no impact on flights that were using ATS route B466. And Malaysia commented that they had no objection to the proposal.

2.12 After the meeting regarding the inquiry on the operation of non-PBN equipped aircraft below the lower limits of ATS routes N571 and P574 (RNP 10 routes), ICAO clarified by email that States need to understand what navigation capabilities the non-PBN capable fleets have, and how they will navigate over the Bay of Bengal. Therefore, it is necessary for States to consult the operators on this matter.

Bay of Bengal Flight Level Allocation Scheme Chart

2.13 ICAO presented the Bay of Bengal Flight Level Allocation Scheme (FLAS) Chart based on the data from Bangladesh, India, Indonesia, Malaysia, Myanmar, Pakistan and Thailand to provide the overview of ATS routes in the Bay of Bengal, including the FLAS allocated to each ATS route.

2.14 States were requested to confirm the information and provide update by 31 January 2022. **Figure 2** presents the updated based on input provided by Indonesia, Malaysia, Sri Lanka, and Thailand.



**Figure 2:** Updated (in red) Bay of Bengal FLAS Chart as at 31 January 2022

2.15 For accuracy of the information in the Bay of Bengal FLAS Chart, all States concerned are urged to continue to provide feedback to ICAO Secretariat, via email to [Slee@icao.int](mailto:Slee@icao.int).

#### Review of BOBTFRG Priority Areas Implementation Timelines

2.16 ICAO informed the meeting of the updated *Implementation Timelines for BOBTFRG Priority Areas (BOBTFRG/3 WP/08 Attachment B)*, which was developed and agreed at the Second Meeting of the Bay of Bengal Traffic Flow Review Group (BOBTFRG/2, Bangkok, Thailand, 08 – 10 October 2019), based on the data submitted by Bangladesh, India, Indonesia, Malaysia, Myanmar, Pakistan and Thailand.

2.17 ICAO recalled that the BOBTFRG/2 had agreed to recommend to the South Asia/Indian Ocean ATM Coordination Group (SAIOACG) for ADS-C/CPDLC non-exclusive mandate in the Bay of Bengal, tentatively planned by 1 January 2023. However, due to the COVID-19 pandemic, the discussion on this matter had been postponed.

2.18 The meeting noted that for better clarity and in line with *Asia/Pacific Seamless ANS Plan*, the ADS-C/CPDLC non-exclusive mandate should be referred to as “*designation as non-exclusive PBN and PBCS airspace to allow operational priority for PBN and PBCS approved aircraft*”.

2.19 Considering all changing factors by the COVID-19 pandemic and the possible changes in aircraft capability over the Bay of Bengal, and to facilitate progress of BOBTFRG in a realistic timeline, the meeting had agreed with the following expected actions:

- BOBTFRG States should work with local airlines to conduct the analysis on the fleet equipage in ADS-C/CPDLC, RNP 10, RNP 4 and RNP 2;
- States requiring PBCS support to implement performance-based separations should develop its PBCS implementation plan, including the expected timeline; and
- IATA to support States and work with its member airlines to conduct the analysis of fleet equipage.

2.20 Noting the severe impacts by COVID-19 Pandemic to airlines and ANSPs, there were extensive discussions on key considerations when planning non-exclusive mandate for effective PBCS implementation amongst participants.

2.21 IATA suggested the NOPAC implementation be used for designing the non-exclusive mandate for the Bay of Bengal and as a benchmark for deciding on the length of a transition period. The recently introduced non-exclusive mandate in the North Pacific (NOPAC) Route Systems included a transition period, where non-capable aircraft could still plan up to an intermediate/higher level, but capable aircraft would be accorded a priority in a specified level band.

2.22 With regards to the States’ and IATA’s concerns on setting the definitive timeline for the non-exclusive mandate, ICAO emphasised the importance of States and IATA to conduct the analysis on the fleet equipage in ADS-C/CPDLC, RNP 10, RNP 4 and RNP 2. All States concerned were also urged to develop its PBCS implementation plan.

2.23 The meeting agreed that all States concerned should present the analysis outcome of the fleet equipage and the expected date of PBCS implementation at the SAIOSEACG/1. IATA also agreed to survey member airlines on their PBCS readiness for possible non-exclusive mandate of January 2024 and agreed to ICAO’s summary of next steps for forming papers and proposing dates for the non-exclusive mandate for consideration at SAIOSEACG/1.

2.24 The *Implementation Timelines for BOBTFRG Priority Areas V2.0*, as updated by the meeting is appended at **Attachment A** to this report.

Review of BOBTFRG Terms of Reference and Task List

2.25 ICAO presented the BOBTFRG Terms of Reference, noting the *Decision APANPIRG/32-5: Combining SAIOACG and SEACG Groups to form the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG)* and the renaming of the *Asia/Pacific Seamless ANS Plan* (formerly the Asia/Pacific Seamless ATS Plan) in 2019.

2.26 The meeting had agreed to update and reflect the changes in the BOBTFRG Terms of Reference (**Attachment B**), for consideration by the SAIOSEACG.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) continue to provide feedback on Bay of Bengal FLAS Chart for clarification and accuracy;
- c) note and agree with the following; and

<b>Decision SAIOSEACG/1-1: Revised BOBTFRG Terms of Reference</b>	
<b>What:</b> that: noting the SAIOACG and SEACG meetings to be combined under the Decision APANPIRG/32-5 to form the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group, the updated BOBTFRG Terms of Reference at <b>Attachment B</b> to this paper to be adopted.	<b>Expected impact:</b> <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
<b>Why:</b> To reflect the changes	<b>Follow-up:</b> <input type="checkbox"/> Required from States
<b>When:</b> 28-Mar-22	<b>Status:</b> Draft to be adopted by Subgroup
<b>Who:</b> <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: XXXX	

- d) discuss any relevant matters as appropriate.

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**IMPLEMENTATION TIMELINES FOR BOBTFRG PRIORITY AREAS V2.0**

**BOBTFRG Priority Area 1:** Conduct a review of the air traffic flows in Category S airspace through Thailand, Myanmar, Bangladesh, India, Pakistan and Afghanistan. The objective is to develop a plan to implement improved and harmonised longitudinal spacing on affected ATS route(s) (targeting 20 NM longitudinal spacing, or as close to the separation minima as practicable).

		Activity	Completion Date	Remarks
Phase 1	1	Identify current spacing implemented by States.	BOBTFRG/4	States to fill and submit the Attachment D to BOBTFRG/2 State Letter by 31 October 2019. Updated at BOBTFRG/3: Bangladesh, India, Indonesia, Malaysia, Myanmar, Pakistan and Thailand had submitted data to ICAO. Re: ATM/SG/9 WP/7, ICAO APAC Regional Office would circulate a new survey form, requesting APAC Administrations to provide information about the authorised ATC separation minimums and separation minimums at each FIR TOC point.
	2	Identify impediments to implementation of improved spacing (staffing and ATC sectorisation constraints).	Completed	States to fill and submit the Attachment D to BOBTFRG/2 State Letter by 31 October 2019. Updated at BOBTFRG/3: Reasons provided by States: communication and surveillance coverage limitations; ATM system capability related to PBCS; and low level of ADS-C/CPDLC equipage.
	3	Identify the ATS surveillance and communication gaps and actions taken to fill the gaps.	Closed	Ref CNS SG/23 WP/22. Updated at BOBTFRG/3: ATS Surveillance and DCPC VHF Coverage Charts was included in the <i>Asia/Pacific Seamless ANS Plan V3.0</i> .
	4	Identify ATS Inter-Facility Data Communication (AIDC) and/or direct speech circuits' capabilities.	Closed	States to provide update to the Secretariat latest by 30 November 2019. Updated at BOBTFRG/3: Updated AIDC implementation status in the APAC Region was provided in Appendix B to the APA TF/7 Report.

		Activity	Completion Date	Remarks
	5	Investigate whether appropriate handoff procedures are implemented between controllers providing ATS surveillance in adjacent airspace – review ATS Letter of Agreement (LOA).	31 January 2022	Updated at BOBTFRG/3: Bangkok – Kuala Lumpur ACCs: Yes Bangkok – Yangon ACCs: Yes Jakarta – Kuala Lumpur ACCs: Yes Dhaka – Kolkata ACCs: expected in 2025. Dhaka – Yangon ACCs: expected in 2025. Yangon – Kolkata ACCs (ATS route A201)? Delhi – Lahore ACCs? Delhi – Karachi ACCs? Mumbai – Karachi ACCs? Lahore – Kabul ACCs? Karachi – Kabul ACCs? Colombo ACC – Chennai OCC?
	6	Review the existing Flight Level Allocation Scheme (FLAS) operating within the concerned airspace, with a view to improve efficiencies.	31 January 2022	States to fill and submit the Attachment D to BOBTFRG/2 State Letter by 31 October 2019. Updated at BOBTFRG/3: Reason for FLAS: multiple crossing of higher density routes over Category R airspace. States to confirm the accuracy of the information in the Bay of Bengal FLAS Chart (BOBTFRG/3 Report re: WP/07).
	7	States to identify routes along which reliable surveillance and communication are available to look at the possibility of reduced longitudinal spacing.	31 January 2022	Updated at BOBTFRG/3: India and Pakistan: 50 NM longitudinal spacing implemented at the TOC points of following FIR boundaries: Delhi – Karachi FIRs; Delhi – Lahore FIRs; and Mumbai – Karachi FIRs. Indonesia and Malaysia: 20 NM longitudinal spacing implemented at the following TOC points: GOTLA, PUGER and SALAX. Malaysia and Thailand: 30 NM longitudinal spacing implemented at the TOC points between Bangkok and Kuala Lumpur FIRs. Myanmar and Thailand? India and Myanmar (ATS route A201)? India and Sri Lanka?

		<b>Activity</b>	<b>Completion Date</b>	<b>Remarks</b>
Phase 2	8	Agreement between States to implement 20 NM longitudinal spacing (or as close to the separation minima as practicable) in Category S airspace through Thailand, Myanmar, Bangladesh, India, Pakistan and Afghanistan.	2025	Updated at BOBTFRG/3: Traffic operating north of Bay of Bengal airspace will traverse through Dhaka FIR, and currently no en-route ATS surveillance service provided in Dhaka FIR. To be reviewed in tandem with the Modernization Project of CNS-ATM System of Bangladesh.

**BOBTFRG Priority Area 2:** Conduct a review of the air traffic flows in Category R airspace within Bay of Bengal. The objective is to develop a plan to implement improved and harmonised 30 NM longitudinal spacing on affected ATS routes.

		Activity	Completion Date	Remarks
Phase 1	1	Agreement between States to implement 50 NM longitudinal spacing between applicable aircraft on affected ATS routes. The application of performance-based separation minima and distance-based separation minima (RNP 10, with procedural position reports not less than 24 minutes apart) in airspace over the high seas requires supporting procedures in ICAO Doc 7030 – <i>Regional Supplementary Procedures</i> .	SAIOSEACG/1	Chennai and Kuala Lumpur ACC to signed revised LoA by 31 January 2020. Jakarta and Colombo had implemented 50 NM longitudinal spacing. Yangon and Kolkata, and Chennai had implemented 50 NM longitudinal spacing. Updated at BOBTFRG/3: Chennai OCC and Kuala Lumpur ACC had signed a new LoA, effected on 01 June 2021. 50 NM longitudinal spacing implemented.
	2	Facilitate potential modernization of Bangladesh CNS/ATM system (meeting tentatively planned for 23 October 2019).	Closed	ICAO RO to provide feedback during SAIOACG/10. Updated at BOBTFRG/3: The Modernization Project of CNS-ATM System of Bangladesh expected to be completed in 2024.
	3	Research and development project conducted by India, Singapore and any other interested States to look at technology capability and benefits, including the business case for enhanced surveillance and communication.	Closed	Subject to the approval from the competent agencies of each State. India and Singapore (ATMRI) would examine the proposal and submit their comments at the BOBTFRG/3. Updated at BOBTFRG/3: On 25 November 2019, Airport Authority of India had an informal meeting with ATMRI Singapore on the ICAO request in BOBTFRG/2 for a joint research and development. In the meeting, ATMRI informed that communications and surveillance was not in their domain of research, and they would not be able to participate.

		Activity	Completion Date	Remarks
	4	Implementation of 50 NM longitudinal separation (RNAV 10/ RNP 10) with PBCS in the BOB airspace, at or above a level to be determined.	To be discussed at SAIOSEACG/1	ADS-C/CPDLC non-exclusive mandate? PFA to ICAO Doc 7030 – <i>Regional Supplementary Procedures</i> . Current fleet equipage is less than 70%. Most of the non-equip aircraft are narrow-body aircraft and low cost airlines. Updated at BOBTFRG/3: For better clarity, the ADS-C/CPDLC non-exclusive mandate should be referred to as “ <i>designation as non-exclusive PBN and PBCS airspace to allow operational priority for PBN and PBCS approved aircraft</i> ”. Due to the COVID-19 pandemic, which has caused severe impact on airlines and ANSPs resources and revenue, the discussion on the plan designation as non-exclusive PBN and PBCS airspace to allow operational priority for PBN and PBCS approved aircraft has been postponed.
		a. States and IATA to conduct analysis on fleet equipage in ADS-C/CPDLC, RNP 10, RNP 4 and RNP 2 (continental and oceanic).	SAIOSEACG/1	BOBTFRG/3 Report re: WP/08. Malaysia - fleet equipage study is on-going, fully PBN KL FIR expected by 2023
		b. States requiring PBCS support to implement performance-based separation to develop its PBCS implementation plan, including expected date of implementation.	SAIOSEACG/1	BOBTFRG/3 Report re: WP/08. <b>PBCS implementation plan and expected implementation date:</b> Malaysia - Ready for PBCS implementation subject to agreement with neighbor ACC (AIP ENR 1.1-22, 20 May 2021)

		Activity	Completion Date	Remarks
	5	Develop Performance-based Communication and Surveillance (PBCS) Implementation Plan to support 30 NM longitudinal spacing on RNP 4 (or RNP 2) routes within Category R airspace.	To be determined	States that require PBCS to support 30 NM longitudinal spacing: Bangladesh: To be determined. Sri Lanka: Expected in 2023. India: Expected to be implemented in Chennai FIR in 2020; Mumbai FIR in 2023; and Kolkata FIR to be determined. Indonesia: Expected in 2023 as part of the new Jakarta ACC ATM system project. Malaysia: Expected in second quarter of 2022. Ready for PBCS implementation subject to agreement with neighbor ACC Myanmar: To be determined.
	6	Implementation of RNP 4 (or RNP 2) routes within BOB airspace.	To be determined	Subject to the implementation of PBCS.
	7	Agreement between States to implement 30 NM longitudinal spacing (or as close to the separation minima as practicable) on affected ATS routes.	To be determined	Updated at BOBTFRG/3: Subject to the implementation of PBCS.
Phase 2	8	Review the demand and capacity on the affected ATS routes.	To be determined	
	9	Identify solutions to integrate departing traffic from New Delhi with the BOBCAT traffic.	To be determined	
	10	Review the requirement to retain BOBCAT tool based on the increase in capacity utilising improved longitudinal spacing, taking into account forecast growth in air traffic.	To be determined	
	11	Make recommendations to SAIOACG on the future status of the BOBCAT tool.	To be determined	

## **TERMS OF REFERENCE**

### **BAY OF BENGAL TRAFFIC FLOW REVIEW GROUP (BOBTFRG)**

#### **1. Objective**

1.1. The objectives of the BOBTFRG are to:

- a) identify requirements and improvements for optimising airspace capacity and maintaining an efficient route network across the Bay of Bengal airspace and routes leading towards Afghanistan's airspace;
- b) monitor the status of implementation of the agreed ATS routes and airspace improvement projects; and
- c) report outcomes of the review and recommendations to SAIOACG the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG).

#### **2. Tasks**

2.1. To meet this objectives, with reference to the *Asia/Pacific Region Seamless ATM ANS Plan* and expected traffic growth, the BOBTFRG shall:

- a) Review the existing route structures and airspace improvement projects in the concerned airspaces (Bangkok, Chennai, Colombo, Dhaka, Jakarta, Kabul, Karachi, Kuala Lumpur, Kolkata, Lahore and Yangon Flight Information Regions);
- b) Identify current CNS/ATM capabilities and determine the CNS/ATM requirements which would be needed in order to optimise the airspace to support the implementation of more efficient route network that accommodated enroute traffic (and also departures from India and Pakistan that would join this traffic flow);
- c) Identify the most efficient horizontal separations to be utilised, based on the current and planned CNS/ATM capabilities, taking into account aircraft approval status of the traffic operating on the relevant routes as well as the new CNS capabilities available;
- d) Review the existing Flight Level Allocation Scheme (FLAS) operating within the Bay of Bengal airspace with a view to enhancing efficiencies;
- e) Establish appropriate timelines/milestones/dependencies for activities planned under this Review Group;
- f) Make recommendations to SAIOACG SAIOSEACG on implementation plans for route structures, airspace, FLAS and separation solutions to meet the expectations of the *Asia/Pacific Seamless ATM ANS Plan*; and
- g) Make recommendations to SAIOACG SAIOSEACG on the future status of the Bay of Bengal Cooperative ATFM System (BOBCAT) tool.

**3. Participation**

- 3.1. Participation of the BOBTFRG includes Afghanistan, Bangladesh, India, Indonesia, Malaysia, Myanmar, Pakistan, Singapore, Sri Lanka, Thailand and IATA, and any other body that the BOBTFRG deems appropriate.

Approved by ~~SAIOACG/9, 29 March 2019~~ SAIOSEACG/1, (28 Mar – 01 Apr 2022)

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