INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SIXTH MEETING OF THE BAY OF BENGAL TRAFFIC FLOW REVIEW GROUP (BOBTFRG/6)

BANGKOK THAILAND, 14 – 15 NOVEMBER 2024

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

CONTENTS

APPENDIXES

INTRODUCTION

Meeting

1.1 The sixth meeting of the Bay of Bengal Traffic Flow Review Group (BOBTFRG/6) was held in Bangkok Thailand, from 14 to 15 November 2024.

Attendance

2.1 The meeting was attended by 32 participants from Bangladesh (online), Indonesia, Malaysia, Mongolia, Pakistan, Singapore, Sri Lanka, Thailand, IATA, and ICAO.

2.2 A list of participants is appended at **Appendix A** to this report.

Officers and Regional Office

3.1 Mr. Xu Zhi Feng, Regional Officer, Air Traffic Management (ATM) and Mr. Hyuk Jin Kwon, Regional Officer, ATM, ICAO Asia and Pacific Regional Sub-Office were the Secretaries for the meeting.

Opening of the Meeting

4.1 On behalf of Mr. Tao Ma, Regional Director of ICAO Asia and Pacific Office, Mr. Xu Zhi Feng welcomed participants to the meeting.

Documentation and Working Language

5.1 The working language of the meeting and all documentation was English. There were nine Working Papers (WP), two Information Papers (IP) and one Flimsy considered by the meeting.

5.2 A list of papers is included at **Appendix B** to this report.

Draft Conclusions, Draft Decisions and Decisions of BOBTFRG – Definition

6.1 BOBTFRG recorded their 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 BOBTFRG that related solely to matters dealing with the internal working arrangements of these bodies.

List of Decisions and Draft Conclusions/Decisions

7.1 <u>List of Draft Conclusions/Draft Decisions</u>

Nil

7.2 <u>List of Decisions</u>

Nil

REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Agenda

Adoption of Agenda

1.1 The Agenda (WP/01) was adopted by the meeting, which noted the Provisional List of Working and Information Papers (IP/01) and the Tentative Order of Discussion (IP02).

Agenda Item 2: Review of the Current and Planned CNS/ATM Capabilities and Identifying Associated Reduced Horizontal Separation

The Outcomes of the Relevant Meetings (WP/02)

2.1 At the BOBTFRG/6 meeting, ICAO provided a summary of formal outcomes from AN-CONF/14, ATM/SG/12, FIT-Asia/14, and RASMAG/29 that were pertinent to the discussion.

2.2 ICAO emphasized several critical recommendations from AN-CONF/14, urging member States to enhance airspace optimization, share early alerts for disruptions, and strengthen air traffic contingency management to support resilience within the navigation system (Recommendation 1.1/2). ICAO's Project 30/10, aimed at reducing longitudinal separation to 30 NM in oceanic and 10 NM in non-oceanic areas, was highlighted as a key initiative for improving global navigation efficiency, with a call for States to collaborate regionally on this effort (Recommendation 3.1/1). The organization also encouraged the expedited implementation of Trajectory-Based Operations (TBO) to boost predictability and efficiency in flight operations, with ICAO committed to providing guidelines for synchronized air-ground trajectories (Recommendation 3.1/3). Further, ICAO recommended regional collaboration to expand Free Route Airspace (FRA) to enhance operational efficiency and reduce fuel consumption, considering additional provisions for harmonized implementation (Recommendation 3.1/4). Finally, ICAO set a 2034 goal to phase out the 2012 Flight Plan, urging States to develop national plans for transitioning to Flight and Flow Information for a Collaborative Environment (FF-ICE) (Recommendation 3.2/2).

2.3 ICAO presented updates from ATM SG/12, highlighting the revision of the Seamless Air Navigation Services (ANS) Plan to improve air navigation services, in alignment with the Aviation System Block Upgrade (ASBU) framework. Progress was also made toward aligning FIR boundaries, strengthening the legal framework for airspace management.

2.4 ICAO reported that FIT-Asia/14 approved revised reporting templates for data link performance, aiming to standardize data collection and enhance performance monitoring across the Asia-Pacific region.

2.5 ICAO announced that the Asia-Pacific region met the Target Level of Safety (TLS) for both vertical and horizontal collision risks in 2023. However, the increase in lateral and longitudinal deviations (LHDs) highlighted the need for ongoing monitoring and safety measures. The progress in mitigating specific airspace risks led to the removal of certain long-standing hot spots, although others continue to require further monitoring and safety improvements.

2.6 The meeting calls for states to consider these key outcomes in aligning their national and regional aviation safety goals, emphasising the adoption of Project 30/10, collaboration on FRA, and preparation for FF-ICE transition.

Agenda Item 3: Review of the Existing Traffic Flow Route Structures in BOB Airspace and Identifying Priorities

Review of BOBTFRG Priority Areas Implementation Timelines (WP/03)

3.1 This paper aimed to facilitate the discussion to firm up the feasible implementation timelines of PBCS for performance-based longitudinal separation with the key enabler of ADS-C/CPDLC mandate over the Bay of Bengal area to optimise the airspace capacity.

3.2 Based on the BOB route structure and airspace condition, the meeting was highlighted by the expected implementation of PBCS provisions of ICAO Annexes 6 and 11, Doc 4444 PANS-ATM and Guidance Material by not later than 29 March 2018. It is stressed that in the BOB area, the majority of the ATS routes are specified as RNAV 10 (RNP 10), and so far, not so much progress has been made in terms of the implementation of RNP 2 (or RNP 4) routes and PBCS. More efficient application of performance-based separation should not be further deferred to cope with the traffic that is returning after a big halt by COVID-19.

3.3 The trial implementation plan which had reached consensus at BOBTFRG/4 (Virtual meeting, 6-8 December 2022) was also recalled. The phased detailed action plans are listed as follows:

Phase 1– 50 NM longitudinal separation to be applied based on the current capability RNAV 10 (RNP 10) available as soon as possible;

Phase 2 – to start transitional period: trial implementation of 30 NM longitudinal / 23 NM lateral separation with harmonized ADS-C/CPDLC equipage mandate for RNP 4 or RNP 2, RCP 240, RSP 180 requirements.

Phase 3 – permanent implementation of 30 NM longitudinal / 23 NM lateral separation not later than 1 March 2026, subject to post-op evaluation on Phase 2 and ANSP's readiness to give flexibility or earlier implementation.

3.4 The Analysis of the Current Separation being applied in the BOB Area has also been updated, referred to the **Figure 1** below:

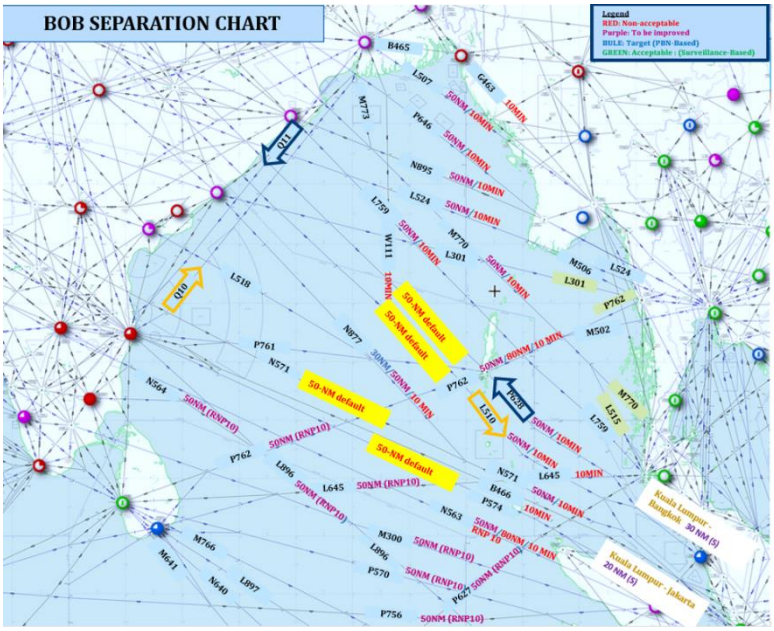

Figure 1: Horizontal Separation Minimus being applied in the BOB area (updated by BOBTFRG/6).

3.5 With the understanding of the requirements of applying 30 NM longitudinal separation with RNP 4 specification, **Table 1** collected the ATM/CNS system readiness among the BOB member States at the meeting.

STATE	FIR	FPL PROCESSING FOR PBCS	ADS-C /CPDLC	RCP 240	RSP 180	POST IMPLEMENTATION MONITORING	REMARK
BANGLADESH	DHAKA						ATM automation system not implemented yet, planning on 2025
INDIA	CHENNAI	YES	AVAILABLE	YES	YES	YES	System testing required
	KOLKATA	NO	AVAILABLE	YES	YES	YES	
	MUMBAI	YES	AVAILABLE	YES	YES	NO	System testing required
INDONESIA	JAKARTA	NO	TRIAL	NO	NO	NO	The system will be upgraded in Q3 2026.
MALAYSIA	KUALA LUMPUR	NO	AVAILABLE	YES	YES	YES	monitoring only for ADS-C/CPDLC
MYANMAR	YANGON	NO	YES	NO	NO	NO	
SRILANKA	COLOMBO	On testing	YES	YES	YES		The system will be upgraded to PDC by 2024.
THAILAND	BANGKOK	YES	NO	NO	NO	AVAILABLE	En-route airspace is fully covered with SSR. no plan to prescribe PDC.

Table 1: The readiness of ATM/CNS system of BOB States (Updated by BOBTFRG/6).

3.6 The latest updates were provided by Malaysia via an Information Paper (ATM/SG/12 – IP/05) through the ATM/SG/12 (Bangkok, Thailand, 23–27 September 2024). The paper provided information on Malaysia's implementation of default 50-NM longitudinal separation in the area of the Bay of Bengal (BOB) and the additional Flight Level Allocation Scheme (FLAS) of Flight Level (FL) 360. ATS routes involved in this implementation are L510, N571, P574 and P628. In collaboration with India, this initiative significantly enhanced flight capacity over the BOB area and optimised air traffic management efficiency in the Kuala Lumpur FIR.

3.7 The 50 NM longitudinal separation for ATS routes L510, N571, P574 and P628 was effectively implemented on 1 July 2024. Malaysia and India agreed to adopt this default separation standard to enhance traffic capacity over the BOB. This standard applies to flights departing from Kuala Lumpur, Singapore and other overflights that cruise along these ATS routes. Following coordination with Singapore, their implementation will commence on 28th August 2024.

3.8 As highly related to the meeting, the outcome of the Fourteenth Meeting of the FANS Interoperability Team – Asia (FIT–Asia/14), *Data Link Performance Report for Malaysia* (FIT-Asia/14 – WP/09) was also introduced to the meeting. In response to an inquiry from the ICAO, Malaysia highlighted efforts to establish agreements with a Central Reporting Agency (CRA) that were still ongoing and will update the progress in the upcoming ICAO meetings.

3.9 Besides, India and other Member States are actively exploring the implementation of space-based ADS-B, which promises more precise tracking capabilities in oceanic and remote airspace. This technology is expected to support enhanced separation standards in BOB areas previously dependent on ground-based radar systems. In the absence of India, the SAIOSEACG/3 *IP/03* *TRIAL OPERATION OF SEPARATION MINIMA USING SPACE-BASED ADS-B AND CPDLC IN MUMBAI FLIGHT INFORMATION REGION* was introduced to the meeting by ICAO.

Update on the Amendment Concerning Separation Minima Based on an ATS Surveillance System to the PANS-ATM (Doc 4444) (Flimsy/01)

3.10 ICAO updated on the amendment concerning separation minima based on an ATS surveillance system to the PANS-ATM (doc 4444). A new provision that prescribed in PANS-ATM Paragraph *8.7.3.3"where the communications system used satisfies RCP 240, a horizontal separation minimum based on an ATS surveillance system of 28 km (15 NM) may be applied*" has been introduced to the meeting.

3.11 The meeting emphasized the importance of continued collaboration among states, particularly in sharing trial results, exchanging surveillance data, and aligning national standards with new ICAO guidelines. A proposal to hold a workshop alongside the next SAIOSEAG/4 meeting was suggested further to discuss new separation standards and space-based ADS-B implementation.

Traffic Sample Data Visualization Over the Bay of Bengal Airspace (WP/04)

3.12 The Monitoring Agency for Asia Region (MAAR) has compiled the visualization of traffic flow based on the TSD collected in December every year. To assist BOBTFRG, visualizations were first presented in BOBTFRG/2 meeting held in 2019 to illustrate the route structure and the traffic changes over the years. During BOBTFRG/5 meeting, MAAR was asked to extent the TSD analysis to specific routes. In coordination with the ICAO Asia and Pacific Regional Sub-Office prior to BOBTFRG/6 meeting, it was agreed to demonstrate traffic on the routes L759, P628, L510, L645 and N571. Thus, this paper presents the updated visualization of traffic flow over the Bay of Bengal airspace and the number of flights on the specified routes based on TSD from 2018 to 2023.

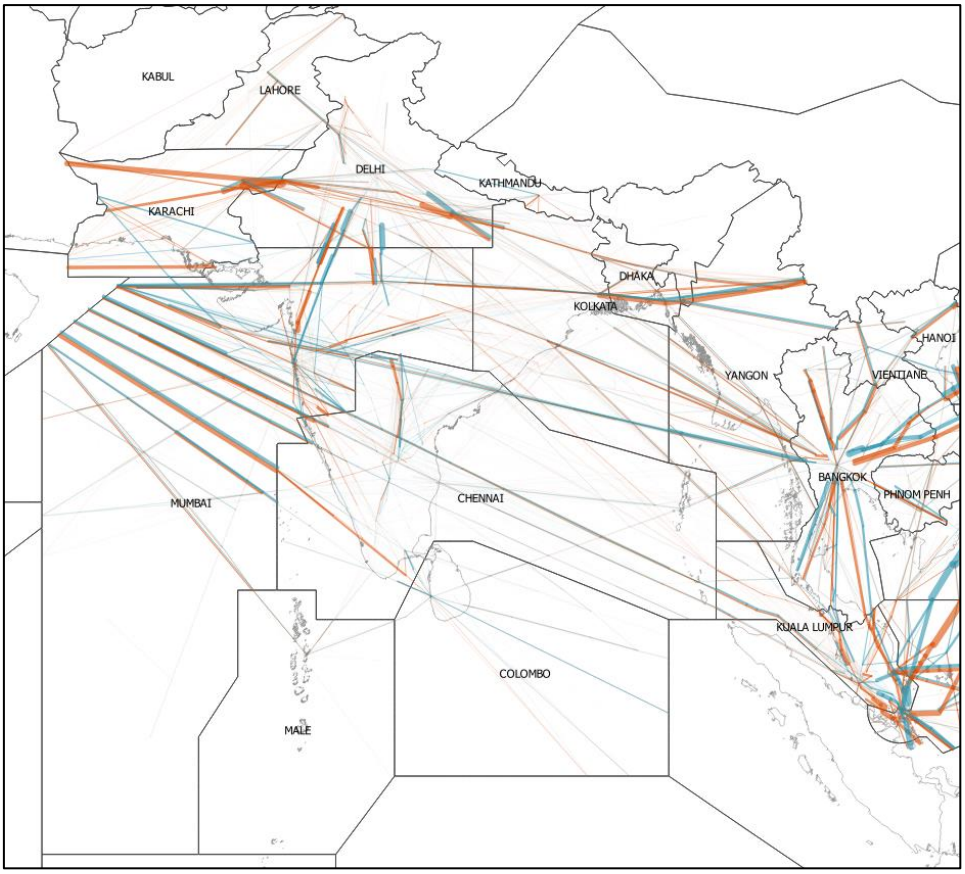

Figure 3: 2023 Traffic Flow from TSD in the Bay of Bengal Area

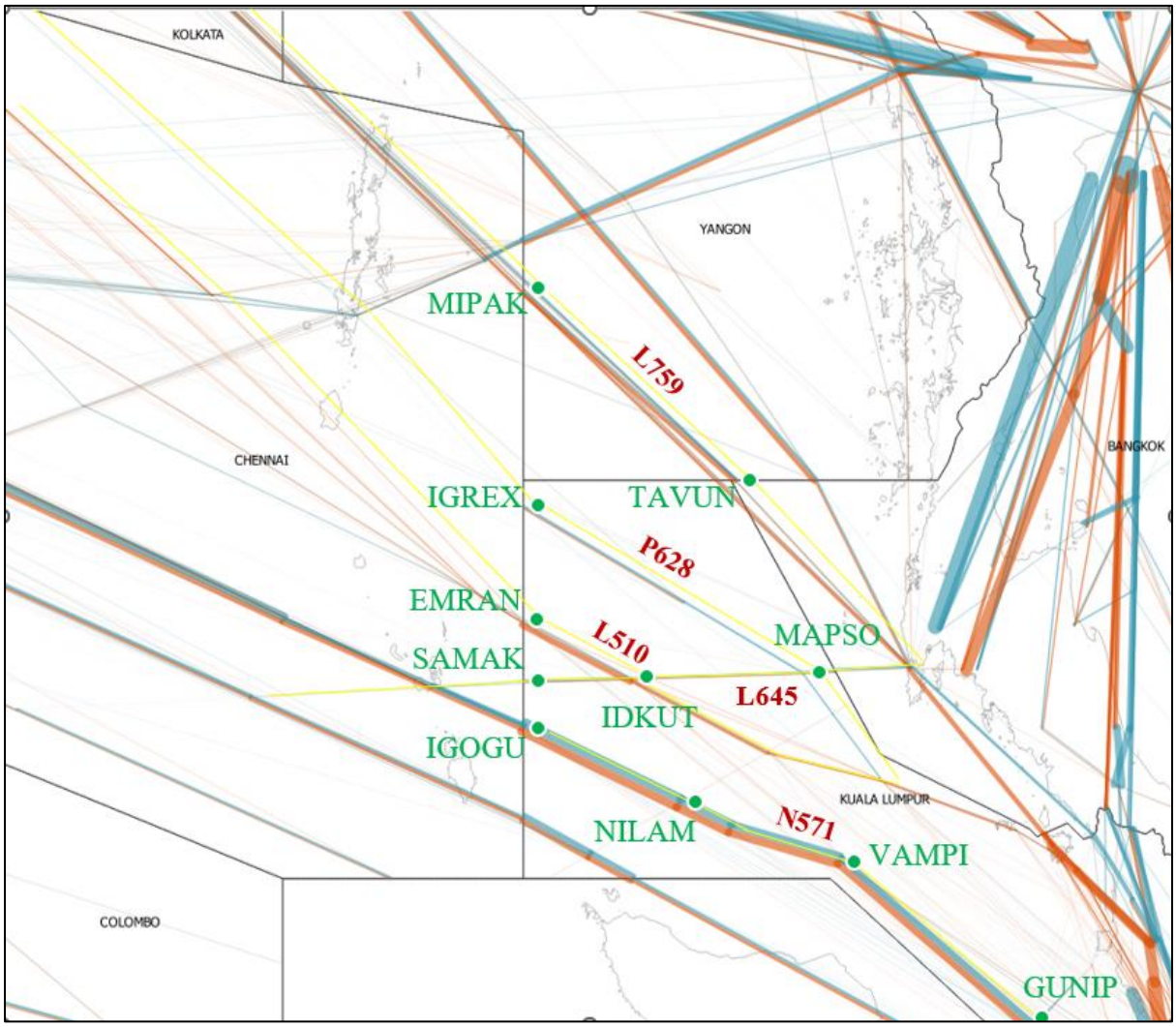

Figure 4: The number of flights in the Bay of Bengal airspace based on Traffic Sample Data (TSD) from 2018 to 2023. (Route L759, P628, L510, L645 and N571)

Route	Portion	Direction	The number of flights					
			2018	2019	2020	2021	2022	2023
L759	MIPAK to TAVUN	Eastbound	1458	947	81	N/A	795	238
L759	TAVUN to MIPAK	Westbound	1250	961	48	N/A	457	510
P628	MAPSO to IGREX	Westbound	432	405	159	184	252	249
L510	EMRAN to IDKUT	Eastbound	551	693	134	N/A	394	638
L510	IDKUT to EMRAN	Westbound	N/A	N/A	N/A	N/A	N/A	107
L645	SAMAK to IDKUT	Eastbound	6	9	10	18	17	138
L645	IDKUT to MAPSO	Eastbound	13	81	11	18	48	98
L645	MAPSO to IDKUT	Westbound	12	211	10	17	107	196
L645	IDKUT to SAMAK	Westbound	108	213	10	16	113	204
N571	IGOGU to NILAM	Eastbound	1684	2096	715	385	1217	866

Route	Portion	Direction	The number of flights					
			2018	2019	2020	2021	2022	2023
N571	VAMPI to GUNIP	Eastbound	1116	1319	495	N/A	937	666
N571	GUNIP to VAMPI	Westbound	1466	1394	387	N/A	693	679
N571	NILAM to IGOGU	Westbound	1706	1599	428	689	1290	971

Table 2: The number of flights in the Bay of Bengal airspace based on Traffic Sample Data (TSD) from 2018 to 2023. (Route L759, P628, L510, L645 and N571).

3.13 The participants appreciated MAAR's efforts in data collection and analysis, recognizing the need for enhanced data-driven decision-making in air traffic management. And a suggestion has been given by Thailand for further enhancement of such analysis by reflecting the ATS routes such as L301 and P646, which was accepted by MAAR.

3.14 IATA representatives brought attention to the notable improvements in civil-military cooperation in India. The increased air traffic lines observed in the 2022 data compared to 2019 were seen as a positive development in the flexible use of airspace.

Agenda Item 4: Discussion on PBN Routes Development and FLAS/FLOS Optimisation

Review of the Existing FLAS/FLOS in Bay of Bengal Airspace (WP/05)

4.1 The paper presented the Bay of Bengal Flight Level Allocation Scheme (FLAS) Chart that was prepared based on the data submitted by BOBTFRG Administrations. The Bay of Bengal FLAS Chart is provided in **Figure 5**, which is recommended to be utilised for the Group to review the FLAS with a view to enhancing the efficiency of air traffic in the Bay of Bengal airspace (BOBTFRG Terms of Reference refers).

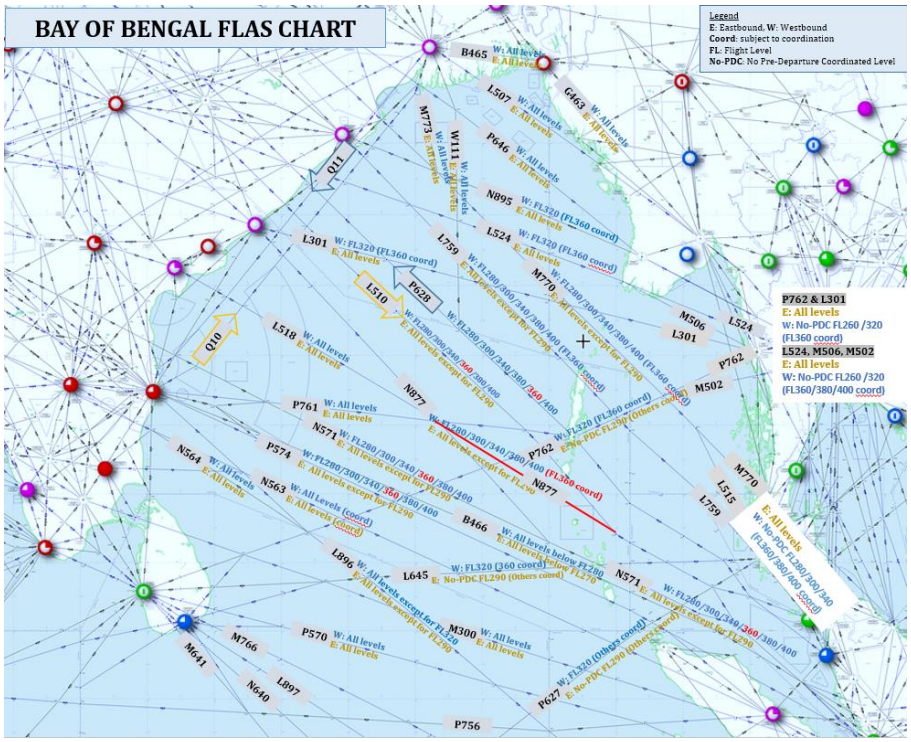

Figure 5: FLAS/FLOS among the ATS Routes

4.2 This group noted the airspace structure's interconnectivity and FLAS/FLOS system. In years of operation, ACCs have become accustomed to this FLAS system and derived a relatively mature risk response plan, such as the Large-Scale Weather Contingency Plan and flexible temporary coordination mechanism. In fact, the current FLAS system has been proven to be reliable, but the following drawbacks should be taken into consideration:

- The reduction of fuel efficiency and increment of carbon emission because of the unavailability of the optimal cruising level, especially on the secondary routes.
- Frequent flight-level changes to accommodate the FLAS requirements among different route segments.
- High demands of extra coordination, causing an increase in the ATCOs' workload, especially in adverse weather conditions.
- Lack of flexibility: some of the secondary crossing routes are now busier than the primary routes compared with the original concept, so timely adjustment is necessary.
- Human factors issues. Systemic risks resulting from the switching from normal FLAS to Large-Scale Detour Procedure, lead to the high possibility of coordination errors in the ATC-to-ATC transfer of control responsibility.
- Excessive longitudinal separation increased the reliance on vertical separation to separate the traffic, leading to insufficient use of limited flight Levels, significantly contributing to the shortage of flight-level resources.
- The capability and efficiency of current FLAS might be insufficient to cope with future traffic growth.

4.3 The meeting was encouraged to initiate the discussion on the improved FLAS operation to enhance efficiency and meet the Group's objectives, with reference to the Asia/Pacific Region Seamless ANS Plan and expected traffic returns from COVID-19.

Review of Selected ATS Route Proposals from the *Asia/Pacific Region ATS Route Catalogue* (WP/06)

4.4 ICAO announced the release of Version 24.0 of *the APAC ATS Route Catalogue,* emphasizing key updates and strategic goals for further development. These updates align with BOBTFRG's core objectives of enhancing airspace efficiency and advancing environmental sustainability across the Asia/Pacific region. The feedback and updates were recorded as follows:

- PAK01: Given the current situation in Afghanistan, IATA and Pakistan agreed that they would discuss it further to move forward.
- AFG03: Given the current situation in Afghanistan, IATA and Pakistan agreed that they would discuss it further at the planned CCT meeting to explore the feasibility of the proposal.

Free Route Airspace Concept Implementation (WP/07)

4.5 IATA presented the Free Route Airspace (FRA) concept and explored steps to its implementation for the Bay of Bengal Traffic flow by identifying a milestone strategy. As mentioned by IATA, The Bay of Bengal is a key transit zone for flights between Europe, the Middle East, Africa, the Asia-Pacific, and Southeast Asia. Currently, in this airspace, air traffic needs to follow fixed routes and flight level allocation schemes (FLAS). This airspace is complex, influenced by geopolitical factors, and faces growing traffic volumes. As a result, traffic congestion, and operational inefficiencies have become a challenge, leading to increased costs, higher carbon emissions and departure delays.

4.6 To address these issues and overcome the operational challenges to a certain extent, Free Route Airspace (FRA) is a key concept that will enable airlines to flight plan and fly more efficient and flexible routes. FRA concept allows adapting to predicted or real-time conditions such as the activation or deactivation of restricted (R) and danger (D) areas, adverse en-route weather, traffic congestion, flight profile efficiency and fuel requirements. This approach is expected to reduce delays, optimize airspace usage, improve flight efficiency and minimize environmental impact. A phased implementation of FRA is proposed for review and consideration by the Bay of Bengal Traffic Flow Review Group (BOBTFRG).

4.7 FRA Trial Operations proposal was also given by IATA: To ensure a smooth transition to FRA, BOBTFRG may consider adopting a phased trial approach. The following steps outline a suggested framework:

a) Identify airspace volumes with suitable entry and exit waypoints, surveillance, and communication coverage for trial operations.

b) Analyze traffic patterns and flight levels to determine optimal trial windows.

c) Engage airlines with advanced flight planning tools, and the necessary operational expertise to participate in these trials.

d) Conduct a comprehensive safety assessment involving operators and ATC before launching the trials.

e) Begin the trials on a limited basis (e.g., a few hours per day), gradually expanding participation and trial hours based on performance and feedback.

f) Share the results of the initial trials and analyze lessons learned before subsequent sessions.

g) After successful trials and reviews, formally promulgate FRA in the designated airspace.

4.8 IATA emphasised that the simple enablers ANSPs could achieve at the current stage, and were identifying the flight-plannable direct-to segments and flight-plannable oceanic airway crossover points (vide a NOTAM/AIP), and also encouraged states to do so as the first step towards FRA implementation.

4.9 Sir Lanka informed the meeting that they had been jointly operating in the UPR zone connecting Maldives, India and Australia since 2014 and confirmed their willingness further to enhance the FRA operation with their neighbouring states.

4.10 Bangladesh also added that the practice of the DCT route already in place within Dhaka FIR and they will start to move in a formalise way. Bangladesh will initiate more studies on FRA upon the completion of the upgrade of upcoming ATM-CNS Automation system.

4.11 Thailand reminded the meeting that guidance materials for FRA implementation are premature and are still being developed by ICAO; states need to approach the FRA implementation with careful consideration in a phased plan, especially for cross-border free route operation.

Agenda Item 5: Review of BOBTFRG Task List

Review of BOBTFRG Task List (WP/08)

5.1 ICAO presented WP/08, which contained the BOBTFRG Terms of Reference for review and the BOBTFRG Task List for updating.

5.2 The BOBTFRG Task List, as updated by the meeting is appended at **Appendix D** to this report.

Agenda Item 6: Decision/Recommentations to SAIOSEACG

Reactivation of BOBCAT ATFM Procedure (WP/10)

6.1 The meeting was recalled that on AIRAC 5 July 2007, international long-range cross-border ATFM procedure using the Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT) became fully operational. Henceforth, the operation has been a routine service provided by Bangkok ATFM Unit for all westbound flights operating westbound through the Afghanistan airspace (Kabul FIR) between 2000-2359UTC.

6.2 The BOBCAT ATFM procedure allocates entry time slots into the Kabul FIR, reflected into Calculated Take-Off Time (CTOT) from associated departure aerodromes, and advises the aircraft of those slot times prior to departure.

6.3 The ATFM procedure was temporarily suspended following suspension of en-route ATS provision in the Afghanistan airspace in August 2021. However, as traffic levels have returned, there is a need to prepare mitigation for the growing congestion of flights electing to transit the Kabul FIR contingency volume.

6.4 At the meeting, IATA provided summary of the need for reactivating the Bay of Bengal Cooperative Air Traffic Flow Management System (BOBCAT) ATFM procedure and the steps required to achieve it.

6.5 According to the meeting discussion, Thailand has agreed to prepare for the reactivation of the BOBCAT system, targeting operational readiness by 20 February 2025. However, this reactivation will require formal approval from ICAO's Afghanistan Contingency Coordination Team (Kabul CCT). Accordingly, ICAO is requested to organize Kabul CCT to facilitate an agreement to resume the BOBCAT ATFM procedure as soon as practicable.

6.6 Considering the tight timeline of 3 months, the meeting deliberated on basic operational preparedness so that as soon as the formal approval is received, it can be reactivated in the shortest possible time. The following points were discussed:

- **Flight Level Concerns**: Pakistan raised concerns regarding flights that are unable to attain FL360 while entering Afghanistan airspace. ICAO was requested to explore the possibility of making lower flight levels available over Afghanistan. If 24/7 availability is not feasible, it was suggested that these lower levels be accessible at least during BOBCAT hours (2000-2359UTC) and beyond, when no domestic flights are scheduled in Afghanistan airspace.

- **Traffic Data Contribution**: Pakistan was requested to provide hourly westbound air traffic data for Afghanistan on an average daily basis. This data could support a review of BOBCAT timings for potential adjustments.
- **Stakeholder Coordination**: The meeting emphasized the need to raise awareness/ refresher training and briefings among stakeholders about the BOBCAT system and to ensure that ATC procedures, as well as Collaborative Decision Making (CDM) processes facilitate compliance with received CTOTs.
- **Regional Readiness**: Pakistan, Malaysia and Singapore confirmed their readiness to implement the necessary procedures to support BOBCAT operations. And it was also mentioned by Malaysia they need to review their current procedures. In light of this situation, IATA suggested other States/Administrations with known westbound traffic through Afghanistan airspace to review BOBCAT's concept of operations and/or contact Thailand for assistance.
- **Geopolitical Changes and New Routes**: Due to evolving geopolitical circumstances, several new flights originating from Southeast/South Asia and Europe are now operating through Afghanistan airspace.
- **Updating Contact details**: In preparation for the re-activation of the BOBCAT ATFM Procedure, ANSPs with known flights operating through Afghanistan airspace westbound such as Hong Kong China, India, Malaysia, Singapore, Indonesia, and Viet Nam and airlines are requested to coordinate with Bangkok ATFMU to update Point of Contact related to AIP content amendments, users with access to the BOBCAT system and preferred means to receive BOBCAT slot allocation information (email: atfmu@bobcat.aero).

Agenda Item 7: Other Bussiness

7.1 None.

Agenda Item 8: Date and Venue of the Next Meeting

8.1 The BOBTFRG/7 was tentatively planned for November 2025 at a location to be determined (preferably in Bangkok). States/Administrations considering hosting the BOBTFRG/7 were invited to contact the Secretariat.

Closing of the Meeting

Mr. Xu Zhi Feng and Mr. Kwon Hyuk Jin thanked the meeting participants for their significant work during a busy meeting program.
