

Report of Design Session of BIMT Airspace (BIMT DS/1)

3-5 February 2015, RSO Beijing, China

1. Introduction

1.1 The Design Session of BIMT (Bangladesh, India, Myanmar and Thailand) Airspace was held at ICAO Asia and Pacific Regional Sub Office (APAC RSO), Beijing China from 3rd to 5th February 2015. The purpose of the meeting was to discuss

- the application of suitable longitudinal separation on existing routes;
- the enhancement of traffic flow through realignment of current route;
- the establishment of parallel routes; and
- the revision of the current FL allocation scheme in the northern Bay of Bengal area.

1.2 The meeting was facilitated by Mr. Noppadol Pringvanich, Chief of APAC RSO and assisted by Mr. Huho Ha, PBN Officer of APAC RSO and Mr. Pehrinba Renganathan, AOM Officer of APAC RSO.

1.3 Twelve (12) participants from Bangladesh (Civil Aviation Authority of Bangladesh : CAA Bangladesh), India (Airports Authority of India : AAI), Myanmar (Department of Civil Aviation Myanmar, DCA Myanmar), Thailand (Aeronautical Radio of Thailand : AEROTHAI), International Air Transport Association (IATA) and ICAO Asia and Pacific Regional Sub Office (APAC RSO) attended the meeting. The list of participants can be found in **Appendix A**.

1.4 Mr. Noppadol Pringvanich, Chief of APAC RSO welcomed the participants and remarked on the importance of collaboration between Bangladesh, India, Malaysia, and Thailand in working toward harmonized air traffic flow within the Bay of Bengal sub-region. Participants were encouraged to have open discussion in a relaxed collaborative atmosphere throughout the meeting.

1.5 English was used as working language and for documentation.

2. Discussions

2.1 APAC RSO proposed the tentative agenda for the meeting. The meeting adopted the following agenda:

Agenda 1: Introduction of Participants

Agenda 2: Outcomes of BIMT/1

Agenda 3: Objectives and Expected Outcomes of this Design Session

- Joint Design Proposal

- Joint Work Plan
- Agreed Way Forward
- Agenda 4: Global PBN Progress
- Agenda 5: Applications of PBN in En-route Airspace
- Agenda 6: Coverage of Surveillance and Communication
- Agenda 7: Joint Design Session
 - Review of G463
 - Design Parallel to L507
 - Realignment of P646 and N895/G472
 - Design Parallel to L301
- Agenda 8: Discussion on suitable PBN Navigation Specification and appropriate Separation
 - Identification of implementation conditions including FLOS/FLAS
- Agenda 9: Development of Joint Work Plan and Agreed Way Forward
- Agenda 10: Other Business

Agenda 2: Outcomes of BIMT/1

2.2 APAC RSO introduced outcomes of BIMT/1 and reviewed conclusions and action items which are closely related to the design session, i.e. Conclusion2, Conclusion3, Conclusion 5 and Action Item 3. The list of Conclusions and Action Items by BIMT/1 can be found in **Appendix B**.

Agenda 3: Objectives and Expected Outcomes of this Design Session

2.3 Based on the outcomes of BIMT/1, APAC RSO proposed expected activities during the design session. These activities included redesigning target routes, assigning navigation specifications, reviewing separation minima and setting up future work plan. The meeting accepted the proposal from APAC RSO.

Agenda 4: Global PBN Progress

2.4 APAC RSO presented global PBN implementation status and ICAO's activities related to PBN implementation. The presentation showed the number of PBN SID and STAR in APAC Region has progressed considerably comparing to global status while the number of PBN instrument approach needs more development to catch up the global progress.

2.5 India asked APAC RSO its roles related to regional ATS route improvements. APAC RSO introduced its roles and responsibilities in supporting PBN and ATFM/CDM Implementation efforts and current activities including ATS route improvements in the region.

Agenda 5: Application of PBN in En-route Airspace

2.6 APAC RSO presented PBN navigation specifications and route spacing table extracted from PBN manual (Doc 9613). The table shows conditions required for each navigation specifications and minimum spacing between two parallel routes. The table can be found in **Appendix C**.

2.7 States reviewed the table and compared current situations in the Bay of Bengal area such as separation minima, communication capability, surveillance coverage and future communication and surveillance implementation plan. After deliberation, States agreed to apply RNP4 and RNAV5 navigation specifications to airspace design in the Bay of Bengal area while RNP2 was considered as future candidate navigation specifications for this region as its operational approval criteria has not been published yet.

2.8 States were informed that the table would be presented to upcoming the First Meeting of PBN Implementation Coordination Group (PBNICG/1, 10-12 March 2015, Beijing China) for the adoption as a regional guidance material.

Agenda 6: Coverage of Surveillance and Communication

2.9 States reviewed surveillance and communication coverages and upcoming implementation plans of each State which were presented to BIMT/1 meeting. States recognized that surveillance service for the northern area of N895 could be provided once ADS-B data sharing between India and Myanmar was implemented.

2.10 Bangladesh informed the meeting of the operation plan on Chittagong ADS-B which will cover the northern area of Bay of Bengal.

2.11 Recognizing the increasing number of ADS-B in the BIMT region and its benefits on surveillance, the meeting discussed the possibility of ADS-B mandate in the region. IATA informed the meeting that most IATA member airlines have ADS-B capability in their aircraft but some airlines such as low cost carrier (LCC) and domestic airlines may be incapable of the use of ADS-B. However, if a State publishes an ADS-B mandate plan at least 5 years before, airlines can sufficiently prepare for it.

2.12 To facilitate RNP4 implementation in the region, the meeting proposed partial ADS-B mandate segregated by a certain level, i.e. FL330 to give room for RVSM approved but no ADS-B capability aircraft. In this regard, the meeting asked States to provide IATA with their ADS-B implementation plan.

Action Item 1 – By the next BIMT meeting, States provide IATA and RSO with their ADS-B implementation plan.

2.13 Recognizing some gaps on SSR and VHF coverages within the northern Bay of Bengal area, States agreed to choose following standards for the region;

- RNAV5 with 30NM lateral and 50NM longitudinal separation
- RNP4 with 30NM lateral and 30NM longitudinal separation including CPDLC and ADS-B capabilities

2.14 To find out the feasibility of RNP4 implementation, IATA asked to provide member airlines' fleet readiness information on these requirements.

Action Item 2 – By the next BIMT meeting, IATA report member airlines' fleet readiness

information on RNP4.

Agenda 7: Joint Design Session

2.15 Based on the outcomes of BIMT/1, APAC RSO proposed the changed ATS route structure including establishment of new PBN routes in the region. The meeting reviewed APAC RSO's proposal one by one and agreed following ATS routes and transition routes considering traffic requirements of each State.

Route	Route
G463'	CEA-AVPOP-HUHOO-AVLED-G463-BGO-L507-LIMLA-BKK
L507'	CEA-AVPOP-CONV1-NTEBO-CONVR-XXXXX-L507-BGO-L507-LIMLA-BKK
L507S	TEPAL-SWAMI-PASAN-NKADA-FIZUL-NKAYA-ISMO1-HGU-NLIBE-BKK
SWIW1	ISMO1-XXXXX
P646'	LEGOS-NDOPI-NIBIT-CHUDA-BETNO-BKK
SWIE2	SAGOD-CHUDA-HGU
N895	BBS-BOLUS-PALCO-BIXON-BUBKO-SAGOD-BETNO-BKK
L301N	NNP-ELBAB-DORIL-ISMON-N301A-N301B-NL301-NMEPE-MOSOE-MASAR-NOPPA-BKK
SWIE3	SAGOD-MASAR
L301'	VVZ-POTAS-OLSOR-DOGEM-URKOK-MABUR-RINDA-SADUS-DWI-TANEK-BKK
SWIW4	MOSOE-UTIKE-DWI

The approximated locations of the associated waypoints can be found in **Appendix D**. BIMT States were requested to review the proposed locations of all the waypoints and to identify proper WGS-84 coordinates and 5LNC names.

Agenda 8: Discussion on suitable PBN Navigation Specification and Appropriate Separation

2.16 Considering various factors including surveillance and communication coverage, ADS-B implementation and data sharing plan and traffic flows, the meeting decided PBN navigation specifications on agreed PBN routes as follows.

2.16.1 Recognizing surveillance gaps in the Bay of Bengal area, RNP4 navigation specifications will be applied to L507 parallel routes and L301 parallel routes while maintaining RNP10 requirements on P646 and N895.

2.16.2 RNAV5 navigation specifications will be applied to G463 which is fully covered by communication and surveillance services and new ATS route designator suitable for PBN routes will be assigned.

2.17 The meeting agreed to operate the PBN routes bi-directionally in principle. However, considering traffic flow requirements of each State, flight directions were assigned at specific segments of the routes.

Route	NavSpec	Direction	Direction Note	Remarks
G463'	RNAV5	Bi	BGO-BKK : West	New (need new name)
L507'	RNP4	Bi	BGO-BKK : West	Amend
L507S	RNP4	Bi	HGU-BKK : East	New (need new name)
SWIW1	RNP4	Uni	West	New (need new name)
P646'	RNP10	Bi	CHUDA-BKK : West	Amend
SWIE2	RNP10	Uni	East	New (need new name)
N895	RNP10	Bi	SAGOD-BETNO :West	Amend
L301N	RNP4	Bi	MOSOE-NOPPA : East	New (need new name)
SWIE3	RNP10	Uni	East	New (need new name)
L301'	RNP4	Bi		NavSpec Change from RNP10 to RNP4
SWIW4	RNP4	Uni	West	New (need new name)

Agenda 9: Development of Joint Work Plan and Agreed Way Forward

2.18 The meeting discussed on how to proceed the internal process to implement the agreed PBN routes and developed a joint work plan. IATA agreed to support the work plan including inputs from the member airlines. The joint work plan can be found in **Appendix E**.

Agenda 10 : Other Business

2.19 None

3. Closing of the Meeting

3.1 In closing, Mr. Noppadol Pringvanich, as facilitator of the meeting, thanked all delegates for attendance and active participation to the meeting discussions.

3.2 The meeting thanked ICAO APAC for providing the support and venue for the meeting.

Appendix A. Lists of Participants

No.	Name	Title	Address	Contact
1	Bangladesh(2)			
1	Mr. AKM Faizul Haque	Assistant Director(ATS) Civil Aviation Authority of B angladesh	Headquarters, Kurmitola, Dhaka -1229	Tel: +880-28901914/EXT.3431 Fax: +880-28901411 Email: faizul_bsl@yahoo.com
2	Mrs. Sabera Rahman	Senior Aerodrome Officer Civil Aviation Authority of B angladesh	Headquarters, Kurmitola, Dhaka -1229	Tel: +880-28901417 Fax: +880-28901411 Email: mitasr@gmail.com
2	India (2)			
3	Mr. Subramanian Swaminathan	Officiating G.M.(A.S.M) AIRPORTS AUTHORITY OF INDIA	R.G.BHAWAN, SAFDARJUNG, NEWDELHI 110003	Tel: +91-11-24617385 Fax: +91-11-24617385 Email: swamy64aqua2003@yahoo.com
4	Mr. Borah Diganta	Joint GM(ATM) AIRPORTS AUTHORITY OF INDIA	FLAT NO.403, SEC 11, DWARK A, NEWDELHI RAMAAPT	Tel: +91-11-45610112 Fax: Email: diganta@aai.aero
3	Myanmar (2)			
5	U Tike Aung	ANS Director Civil Aviation Authority of Myanmar	Yangon International Airport, Mingaladon 111021, Yangon, Myanmar	Tel: Fax: Email: utikeaung@gmail.com
6	U Tint Wai	PANS-OPS Designer ATM Civil Aviation Authority of Myanmar	Yangon International Airport, Mingaladon 111021, Yangon, Myanmar	Tel: +95-1-533008 Fax: +95-1-533016 Email: dcatint@gmail.com
4	Thailand (2)			
7	Miss. CHANANYA PINKEAWPRASERT	AIR TRAFFIC CONTROL MANAGER (BANGKOK CONTROL AREA CENTRE) AEROTHAI	102 NGAMDUPLEE SATHORN BANGKOK 10120, Thailand	Tel: +660-86-892-0466 Fax: Email: CHANANYA.PI@AEROTHAI.CO.T H
8	Mr. CHANCHAI RATTANOPATH	ENGINEERING MANAGER AEROTHAI	102 NGAMDUPLEE SATHORN BANGKOK 10120, Thailand	Tel: +660-81-267-2113 Fax: Email: CHANCHAI.RA@AEROTHAI.CO.TH
5	ICAO (3)			
9	Mr. Noppadol	Chief, ICAO APAC RSO	1 st Floor, Section C, China Service	Tel: +86-10-64557172

		Pringvanich	(Beijing)	Mansion, No.9 Erwei Road, Shunyi District, Beijing, China 100621	Fax: +86-10-64557164 Email: npringvanich@icao.int
10	Mr. Ha Huho	Regional Officer, ATM (AOM/PBN) ICAO APAC RSO (Beijing)		1 st Floor, Section C, China Service Mansion, No.9 Erwei Road, Shunyi District, Beijing, China 100621	Tel: +86-10-64557174 Fax: +86-10-64557164 Email: hha@icao.int
11	Mr. Pehrinba Renganathan	Regional Officer, ATM (AOM/ASM) ICAO APAC RSO (Beijing)		1 st Floor, Section C, China Service Mansion, No.9 Erwei Road, Shunyi District, Beijing, China 100621	Tel: +86-10-64557177 Fax: +86-10-64557164 Email: PRenganathan@icao.int

Appendix B. Summary of Conclusions and Action Items of BIMT/1

Summary of Conclusions:

Conclusion 1: AIDC Implementation Plan Sharing

The meeting agreed to the sharing of AIDC implementation plans and experience gained from the implementation process, with India being the leading State in sharing the standardization details and experience.

Conclusion 2: Limitations and Solutions to Current FL Allocation Scheme over Bay of Bengal

The meeting recognized and understood the limitation that the current FL allocation scheme puts on route capacities in the face of growing traffic demand. ICAO RSO has been requested and agreed to be the coordinator and to work with BIMT States in considering several complementary solutions including:

- 1. Reduction of longitudinal separation minima on existing L301 route*
- 2. Revision of the current FL allocation scheme*
- 3. Feasibility study for parallel routes in the vicinity of L301 route*

India expressed that to increase capacity on traffic following L301, the easiest way is to implement 50NM RLS or RNP4 based 30NM RLS already implemented in Indian FIRs. India also brought to the notice of the meeting that L301 is crossing many active ATS routes serving Flights from Malaysia/Singapore/Indonesia and FLAS provide a safety net and revising the same would require traffic analysis and safety assessment. India / Myanmar / Thailand agreed to consider jointly implementing RNP4 based 30NM longitudinal spacing to enhance capacity for traffic on L301 and ICAO RSO agreed to serve as the coordinator in this activity.

Conclusion 3: Enhancement of Traffic Flow in the Northern Bay of Bengal

The meeting agreed on enhancement efforts of traffic flow through route realignment/development/enhancement among several FIRs in the Northern Bay of Bengal region with ICAO RSO as the main coordinator working with points of contact from member States and IATA. The candidate traffic flows to be considered are:

- 1. Bangkok - Yangon - Kolkata flow in the vicinity of L507*
- 2. Bangkok - Chittagong - Dhaka - New Delhi flow in the vicinity of G463*
- 3. Southeast Asia - Bay of Bengal - Middle East flow in the vicinity of P646*
- 4. Southeast Asia - Bay of Bengal - Middle East flow in the vicinity of N895, L301.*

The near-term milestone for this project has been accepted and points of contact assigned. The information is detailed in Appendix C.

Conclusion 4: ATFM Agenda Revision

Upon the presentation of the draft term of reference of NARAHG by the ICAO RSO, the meeting agreed to enhance the existing ATFM agenda of BIMT meetings to include similar discussion topics. Upon consultation with ICAO RSO and ICAO APAC RO, the meeting agreed that BIMT can serve as the initial platform for sub-regional discussion and harmonization on ATFM over the Bay of Bengal.

Conclusion 5: Capacity Enhancement of L301 and L507 Routes

Myanmar presented information on upcoming CNS/ATM modernization, which includes improved surveillance capability. The meeting recognized the opportunity to leverage the benefits from this planned development and agreed to prioritize the reduction of longitudinal separation minima on L301 and L507 routes. Action Item 3 details the activities to be carried out on this project.

Conclusion 6: Communication and Surveillance Data Sharing

The meeting agreed that communication and surveillance data sharing among States would enable more efficient and seamless operations, as well as possibility for improvement in air traffic handling between bordering FIRs. Currently there are ongoing coordination processes between Thailand – Myanmar and Myanmar – India, and all States were encouraged to look at the sharing of both communication and surveillance data for maximum benefits. Related reports and papers from the meeting will highlight this initiative.

Conclusion 7: BIMT Meeting Frequency

The meeting agreed on annual in-person meeting with more frequent teleconferences in between as appropriate. Currently the preference is on quarterly teleconferences. Several suggestions have been made on coupling BIMT in-person meetings with existing ICAO functions. ICAO RSO and IATA have agreed to assist in coordinating the upcoming teleconference using existing infrastructure.

Summary of Action Items:

Action Item 1: Sharing of AIDC Implementation Plan

To lead the effort in AIDC Implementation Plan sharing among BIMT States, India will provide standardization details of the ongoing implementation process in the country.

Action Item 2: Prioritization of Traffic Flow Enhancement in the Northern Bay of Bengal

Referencing Conclusion 3, BIMT States agreed to provide ICAO RSO with prioritizations of the 4 traffic flows presented along with expected operational dates by the end of September 2014.

Action Item 3: Preparation for Reduced Separation Minima on L301 and L507

Referencing Conclusion 5, to support the preparation for reduced separation minima on L301 and L507, the following action items have been agreed by member States:

Action Item 3.1: ICAO RSO to serve the main coordinator supporting the actions leading to reduced separation minima on L301 and L507

Action Item 3.2: IATA to conduct fleet readiness status and near-term equipage plan among airlines on the use of ADS-B and ADS-C / CPDLC

Appendix C. The Table for PBN Navigation Specifications and Route Spacing (PBN Manual Volume II, Attachment B)

Nav Specs	Flight Phase								Route Spacing (NM)	Conditions
	En-route Remote	En-route Continental	Arrival	Approach				Departure		
				Initial	Intermediate	Final	Missed			
RNAV 10	10								50/50	NAV - RNAV 10 (RNP 10) Approval, lateral deviation 7NM (same direction)/6NM (opposite direction) COM - Voice com through 3rd party, DCPC in some areas SUR - Procedural pilot position reports Other -system safety must be monitored
RNAV 5		5	5						30 - No ATS Surveillance, High traffic density 16.5 - same direction traffic flow 18 - opposite direction traffic flow 10 - ATC intervention Capability	NAV - RNAV 5 OPS Approval COM - Direct VHF controller /pilot voice communications SUR - Radar surveillance
RNAV 2		2	2					2	8 to 9 - straight tracks in high traffic density (en-route)	NAV - RNAV 2 OPS Approval COM - Direct VHF controller /pilot voice communications SUR - Radar surveillance
RNAV 1		1	1	1	1		1	1	8 - straight tracks in high density (terminal)	NAV - RNAV 1 OPS Approval COM - Direct VHF controller /pilot voice communications SUR - Radar surveillance
RNP 4	4								30/30	NAV - RNP 4 OPS Approval COM - DCPC or CPDLC SUR - ADS with a lateral deviation contact having 5NM Other - sytem verification assuring lateral deviation less than 15NM
RNP 2	2	2							Refer to A RNP	
RNP 1			1	1	1		1	1	Refer to A RNP	
A RNP	2	2 or 1	1	1	1	0.3	1	1	7 - straight and turning tracks (<90°) in high traffic density 6 to 7 NM with an RNP 0.5	NAV - A-RNP OPS Approval (Navigation accuracy at least ± 1NM, 95% of the flight time) COM - Direct VHF controller /pilot voice communications SUR - Radar surveillance
RNP APCH				1	1	0.3	1			
RNP AR APCH				1 - 0.1	1 - 0.1	0.3 - 0.1	1 - 0.1			
RNP 0.3		0.3	0.3	0.3	0.3		0.3	0.3		

Appendix D. Approximated Locations of Waypoints

	Waypoint	Approximated Coordinates	Route	Remarks
1	HAHOO	21° 52.168'N 91° 16.329'E	G463	10NM W of D-2
2	CONV1	21° 28.619'N 90° 38.928'E	L507'	30NM from L507S
3	NTEBO	20° 27.035'N 91° 59.959'E	L507'	Adjust location of TEBOV
4	CONVR	20° 12.703'N 92° 18.532'E	L507'	30NM from NKAYA
5	XXXXX	18° 36.799'N 94° 41.432'E	L507'	Switch to L507S
6	SWAMI	22° 43.182'N 87° 49.270'E	L507S	Crossing with A791/G450
7	PASAN	21° 57.894'N 88° 45.390'E	L507S	Crossing with W111/W112
8	NKADA	21° 37.997'N 89° 9.999'E	L507S	FIR boundary : Dhaka/Kolkata
9	FIZUL	21° 21.981'N 89° 53.272'E	L507S	5NM NW of D-34
10	NKAYA	19° 49.046'N 91° 59.999'E	L507S	FIR boundary : Kolkata/Yangon
11	ISMO1	18° 52.274'N 93° 29.797'E	L507S	Switch from L507'
12	NLIBE	15° 21.724'N 98° 35.010'E	L507S	FIR boundary : Yangon/Bangkok
13	NDOPI	20° 39.033'N 89° 12.574'E	P646'	Crossing with W111/ADIZ
14	NIBIT	18° 48.086'N 91° 59.973'E	P646'	50NM from L507S
15	CHUDA	17° 29.950'N 94° 14.855'E	P646'	Crossing with SWIE2
16	N301A	18° 17.885'N 87° 50.817'E	L301N	Crossing with L759
17	N301B	17° 49.806'N 89° 15.607'E	L301N	Crossing with W111
18	NL301	17° 22.453'N 90° 36.111'E	L301N	Crossing with M770/W112
19	NMEPE	16° 53.759'N 92° 0.003'E	L301N	FIR boundary : Kolkata/Yangon
20	MOSOE	16° 06.635'N 94° 12.630'E	L301N	Switch from L301 (DWD)
21	MASAR	15° 40.389'N 95° 24.559'E	L301N	Switch from N895 (SAGOD)
22	NOPPA	14° 29.911'N 98° 31.022'E	L301N	FIR boundary : Yangon/Bangkok
23	UTIKE	14° 57.454'N 96° 32.362'E	SWIW4	15NM from L301N

Appendix E. BIMT En-route PBN Implementation Plan (Ver. 1.0)

	Action Item	By	Assist by	Complete by	Note	Dependency
1	AIC notification	MYA, BAN	RSO			
2a	Review Draft Proposal	BIMT, IATA		2 weeks before BIMT/2 meeting		
2b	Initial performance and benefits assessment	IATA	RSO	28 Feb 2015	1 week before IATA RCG	
2c	Analyze impact on domestic TMA procedures	BIMT		TBD	before BIMT/2	
3	Safety assessment	BIMT	RSO, IATA, COSCAP SA, SEA	30 Jun 2015	by each State individually	3b
4a	Airlines/Stakeholder consultation	IATA	RSO	13 Mar 2015	at IATA RCG meeting in Bangkok	2b
4b	Approval Workplan and design by BIMT			31 Jul 2015	at BIMT/2 (ASAP)	2a
5a	Waypoints and Route Designator	BIMT	RSO	15 Aug 2015		4b
5b	AIP draft	BIMT	RSO	15 Aug 2015		5a
5c	BANP update as necessary	BIMT	RSO	15 Aug 2015		5a
6	LOA update as necessary	BIMT		30 Nov 2015		5c
7a	ATC training(Classroom)	BIMT	RSO	15 Dec 2015		3a,3c
7b	ATC training(Simulation)	BIMT	RSO , Simulator provider	15 Dec 2015		5a
7c	ATC System update	BIMT		15 Dec 2015		6
8a	AIP publication	BIMT		12 Nov 2015	by AIRAC	5b, 5c
8b	Effective date	BIMT		7 Jan 2016	by AIRAC	6,7
9	Post operation review as necessary	BIMT	RSO and IATA	28 Feb 2016		8