



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWENTY-THIRD MEETING OF THE
ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/23)**

Bangkok, Thailand, 10-14 September 2012

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation
3.5: Other Air Navigation matters
CAMBODIA, LAOS, AND VIETNAM PBN IMPLEMENTATION PLAN

(Prepared by Cambodia, Lao PDR and Vietnam and Presented by Cambodia)

SUMMARY

This paper presents a summary of progress of the Performance Based Navigation Implementation Plan in Cambodia, Lao PDR, and Vietnam under the JICA Project of the Capacity Development for Transition to the New CNS/ATM System.

This paper relates to –

Strategic Objectives:

A: Safety

C: **Environmental Protection and Sustainable Development of Air Transport**

Global Plan Initiatives:

GPI-5 RNAV and RNP (Performance-based navigation)

GPI-21 Navigation systems

1 INTRODUCTION

1.1 The project will assist the three countries in Indochina region- Cambodia, Lao PDR, and Vietnam (CLV) in formatting the plans for introduction and transition of Future Air Navigation Systems related to Communications, Navigation, Surveillance, and Air Traffic Management which PBN project is part of its.

1.2 The joining three countries PBN project is an important resources is to be able to assist each country to go for success PBN Implementation.

1.3 The PBN activities will consist of five phases: Pre-Planning Phase, Planning Phase, Pre-Implementation Phase, Implementation Phase and Post-Implementation.

2. FIVE PHASES OF PBN ACTIVITIES

2.1 Pre-Planning Phase

Under this project of CLV PBN plan, each country appointed CNS/ATM Project Director, State PBN Manager and also the PBN Task Force leaders. Each of country projects consist of Civil Aviation Authority, stakeholders and other concerned organization.

2.2 Planning Phase

Formulate each state PBN roadmap

PBN Roadmap for Cambodia

	2012	2016	2020	2025
Oceanic Routes	RNP4	RNP4 & RNP2		GNSS, 4D RNP
Continental Routes	RNAV5	RNAV5 & RNP2		
TMA	RNP1 SID/STAR			GNSS, 4D RNAV
Approach	RNP APCH LNAV/VNAV			GNSS LANDING SYSTEM
	RNP AR APCH			

Between the Year 2013 – 2016

1. ENROUTE	
1). Oceanic Routes	
RNP4	N891 and R588
2). Continental-Routes	
RNAV5	All International routes All Domestic routes as required All new routes
2. TMA	
1). RNP1 SID/STAR	- Phnom Penh International Airport by Q2 2013 - Siem Reap International Airport by Q4 2013
2). RNAV1	- Sihanouk International Airport by Q2 2014
3. Approach	
1). RNP APCH LNAV/VNAV	- Phnom Penh International Airport by Q2 2013 - Siem Reap International Airport by Q4 2013 - Sihanouk International Airport by Q2 2014 - Other Domestic Airports (if required)
2). RNP AR APCH	- Sihanouk International Airport by Q2 2014 - Siem Reap International Airport (feasibility for RWY 23) by Q4 2013 - Other Domestic Airports (if required)

PBN Roadmap for Airports in Cambodia

YEAR	2012	2013	2014	2015	2016
# PBN FP Designer	1 + 2	2 + 3	3 + 4	4 + 4	5 + 3
Phnom Penh International Airport		RNP1 RNAV1 RNP APCH			
Siem Reap International Airport		RNP1 RNAV1 RNP APCH RNP AR If required			
Sihanouk International Airport			RNP1 RNAV1 RNP APCH RNP AR If required		
Battambang, Rattanakiri, and Preah Vihear Airports				RNP APCH RNP AR APCH If required	
Koh Kong, Stung Treng, Mondulkiri, and Kampong Chhnang Airports					RNP APCH RNP AR APCH If required

PBN Roadmap for Lao

	2012	2016	2020	2025
Oceanic Routes		RNP 4	RNP 2, RNP 4	
Continental Routes	RNAV5		RNAV5 & RNP2	GNSS, 4D RNP
TMA	RNAV 1 SID/STAR	RNP1 SID/STAR (non Radar)		GNSS, 4D RNAV
Approach	RNP APCH LNAV/VNAV			GNSS LANDING SYSTEM
		RNP AR APCH		

Between the Year 2013 – 2016		
1. ENROUTE		
1). Oceanic Routes		
2). Continental-Routes		
RNAV5	The route between major airports: B218 Vientiane – Luang Phabang, R474: Vientiane – Hanoi All Domestic routes as required All new routes	
2. TMA		
1). RNAV1 SID/STAR	- Vientiane International Airport - Luang Phabang International Airport	by 30/05/ 2013* by late 2013**
2). RNP1 SID/STAR	- Pakse International Airport - Savanakheth International Airport	by late 2013 by Q2 2015
3. Approach		
1). RNP APCH LNAV/VNAV	- Vientiane International Airport - Luang Phabang International Airport - Pakse International Airport - Savanakheth International Airport - Other Domestic Airports	by 30/05/ 2013* by late 2013** by late 2013 by mid 2014 (if required)
2). RNP AR APCH	-Vientiane International Airport - Luang Phabang International Airport - Pakse International Airport - Savanakheth International Airport - Other Domestic Airports	by early 2014(if required) by late 2014 (if required) by early 2015 (if required) by late 2015 (if required) (if required)

* Postpone from 2012

** Postpone from 2012, subject to availability of WGS-84 survey data

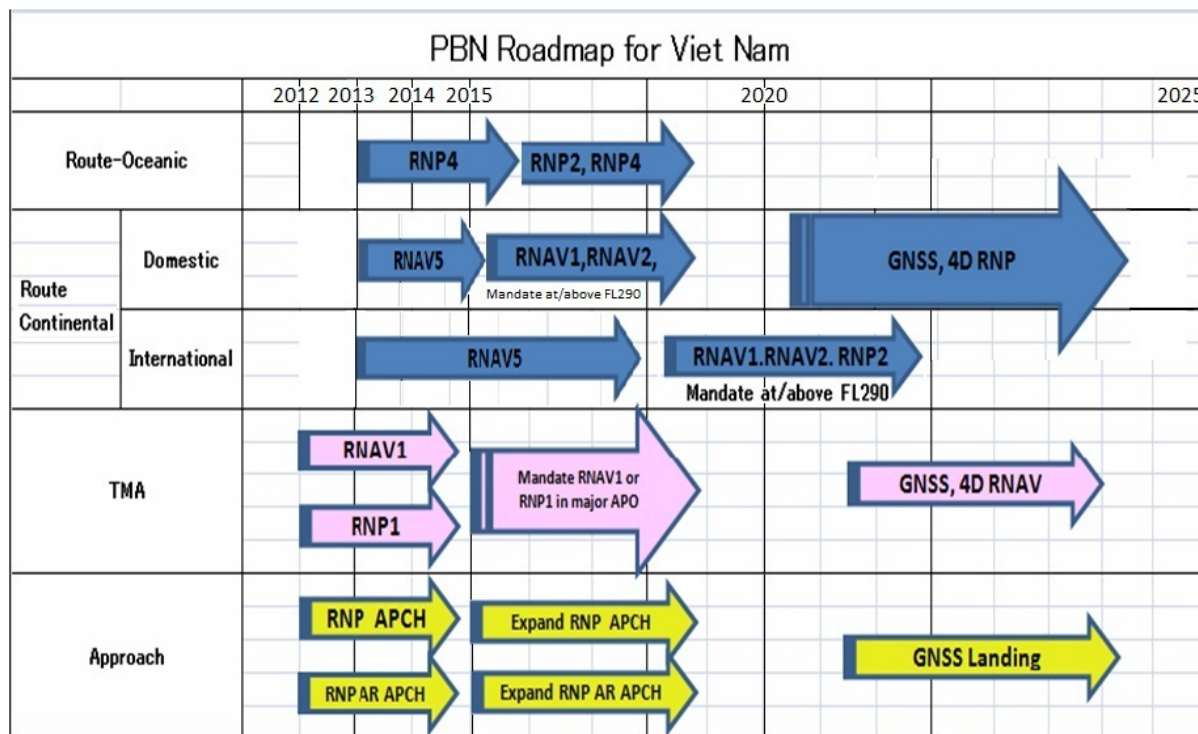
PBN Roadmap for Airports in Lao PDR

YEAR	2012	2013	2014	2015	2016
# PBN FP Designer	1 + 2	2 + 4	3 + 5	3 + 5	
Vientiane International Airport	 		 (If required)		
Luang Phabang International Airport		 Subject to availability Of WGS-84 survey data		 If required	
Pakse International Airport		 		 If required	
Savanakheth International Airports			 	 If required	

<p>Xiengkhouang, Oudomsay, Luangnamtha Airport</p>			<p>RNAV 1 SID/STAR RNP APCH</p>		<p>RNP1SID/STAR RNP AR APCH If required</p>
<p>Sayabouly, Samneua, HoueiSay, Phongsaly Airports</p>			<p>RNAV 1 SID/STAR RNP APCH</p>		<p>RNP1SID/STAR RNP AR APCH If required</p>

PBN Roadmap for Vietnam

- + Training Surveyor of WGS-84
- + Training PBN Designers, ATC
- + Formulate State PBN Implementation action
- + Plan for implementation of WGS-84
- + Establishment of CLV Flight Procedure office in Hanoi, Viet Nam with Panades Software (02 sets)



1- PHASE 1 (2013-2015)

A) Oceanic Route:

- RNP4 (30/30NM separation) for Oceanic Routes Routes of L642, M771, N892 and L625.
- Currently we are applied on to Oceanic Routes (east sea) of M771 L642, L625 and N892.

B) Continental Domestic Route:

- RNAV5 for the routes between major airports: W1 Hanoi - Da Nang - Ho Chi Minh
- All other domestic routes as required.

C) TMA:

- RNAV1: SID/STAR for the radar airports, 50% of international airports by 2013 and 75% by 2014.
- Basic RNP1 SID/STAR for the non radar airports

D) Approach:

- RNP APCH with Baro-VNAV in most possible airports, 30% of instrument runways by 2014 and 50% by 2015.
- RNP AR APCH for the mountainous or terrain surrounded airport: Dien Bien, Cam Ranh, Con Son, Phu Cat, Pleiku.

2- PHASE 2 (2016- 2020)

A) Oceanic Route

- RNP2 for ocean routes of L642, M771, N892 and L625.
- RNP4 for all other new oceanic routes.

B) Continental International Route

- RNAV5 for the routes between major airports by the year 2016: R474 Hanoi – Vientiane, R468 Ho Chi Minh – Phnom Penh.
- RNAV5 for all new routes by the year 2016.

C) Continental Domestic Route:

- RNAV1 or RNAV2.
- Mandate RNAV1 or RNAV2 approval for the aircraft operating at/above FL290.

D) TMA :

- RNAV1 or RNP1 SID/STAR for 100% of international airports by 2016.
- RNAV1 or RNP1 SID/STAR for 70% of busy domestic airports where there are operational benefits.
- Mandate RNAV1 or Basic RNP1 approval for aircraft operating in higher density TMA:
- Noi Bai (Hanoi), Da Nang and Tan Son Nhat (Ho Chi Minh)

E) Approach

- RNP APCH with Baro-VNAV or APV in 100% of instrument runways by 2016.
- Expansion of RNP AR APCH where there are operational benefits.

PBN Roadmap for Airports in Viet Nam

Airport Priority List for implementing approach procedures: **A** indicating completion by 2013, **B** by December 2014 and **C** by December 2016 except **Phu Bai** International airport will be implemented by December 2013

NUMBER	PRIORITY	AIRPORT	Dom/Intl	Traffic Density	Note
North					
1	A	VVGL Gia Lam	D	M	Military
2	B	VVDB Dien Bien	D	M	RNP AR APCH
3	B	VVNB Noi Bai	I	H	
4	C	VVVH Vinh	D	M	
5	C	VVDH Dong Hoi	D	M	
6	C	VVCI Cat Bi	D	M	
7	C	VVNS Na San	D	L	Closed
Middle					
8	Dec 2012	VVPB Phu Bai	I	H	
9	A	VVDN Da Nang	I	H	RNP AR APCH (RWY17 L/R)
10	B	VVCR Cam Ranh	I	H	RNP AR APCH
11	C	VVPC Phu Cat	D	M	
12	C	VVTH Tuy Hoa	D	L	
13	C	VVCA Chu Lai	D	L	
14	C	VVPK Pleiku	D	M	
South					
15	A	VVDL Lien Khuong	D	M	RNP AR APCH
16	A	VVCS Con Son	D	M	RNP AR APCH
17	B	VVPQ Phu Quoc (present airport)	D	H	
18	B	VVPQ Phu Quoc (new intl airport)	I	H	
19	B	VVBM Buon Me Thuot	D	M	
20	B	VVTS Tan Son Nhat	I	H	
21	C	VVCT Can Tho	I	M	
22	C	VVRG Rach Gia	D	L	
23	C	VVCM Ca Mau	D	L	

- + Training Surveyor of WGS-84
- + Training Designer, ATC Formulate State PBN Implementation Action
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2.3 Pre-Implementation Phase

Execute Corrective Action Plan

- + WGS-84
- + TOD
- + Design SIDs/STARs and IAP
- + Develop PBN regulation and PBN Operational manual
- + SMS

2.4 Implementation Phase

SIDs and STARs will be implemented on 28 June 2013.

2.5 Post-Implementation Phase

Annually joint meeting with three countries

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- a) note the information contained in this paper and
 - b) Discuss any relevant matters as appropriate.

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