



International Civil Aviation Organization

THE TENTH MEETING OF PERFORMANCE BASED NAVIGATION

IMPLEMENTATION COORDINATION GROUP (PBNICG/10)

Bangkok, 19 - 21 April 2023

Agenda Item 4: States' PBN Implementation Progress and the challenges faced by the States and lessons learnt

PBN IMPLEMENTATION PROGRESS IN INDONESIA

(Presented by Indonesia)

SUMMARY

This paper presents the update on the progress of Indonesia's PBN implementation including the updated PBN implementation plan, challenges and lesson learnt.

1. INTRODUCTION

- 1.1 Indonesia has presented the state PBN implementation progress and status at PBNICG/9 meeting on 2022. Since then, Indonesia has updated and make some adjustments to the plan to accommodate the development of airports.
- 1.2 Indonesia is focusing in increasing the safety and smooth operation of aircraft throughout the country by implementing PBN flight procedure in some of the airports.

2. DISCUSSION

PBN Implementation status

- 2.1 Since reported in PBNICG/9 on 2022, Indonesia has increase the implementation PBN by 10% for international airports and 20% for domestic airports.
- 2.2 The summary of airports that already implement fully/partly PBN flight procedures are as follows:
 - a. International Airport with PBN IAP: 30 from total 32 airports (3 airports with RNP AR).
 - b. International Airport with PBN SID/STAR: 18 from total 32 airports.
 - c. Domestic Airport with PBN IAP: 78 from total 110 airports (1 airport with RNP AR).

d. Domestic Airport with PBN SID/STAR: 14 from total 110 airports.
The list of the airports are attached on this paper.

- 2.3 By collaboration with DGAC France, AirBus and NavBlue, Indonesia has designed the RNP AR procedure for Sultan Babullah Airport in Ternate. The procedure is targeted to be published in 2023.
- 2.4 Indonesia also have collaboration with EASA to design the RNP APCH procedure for 5 remote airports: Sultan Muhammad Salahuddin Airport Bima, Kasiguncu Airport Poso, Morowali Airport Morowali, Frans Sales Lega Airport Ruteng, and Wunopito Airport Lewoleba. The procedure is targeted to be published in 2023.
- 2.5 As addition with data above, there are 18 remote airports in Indonesia with PBN procedures.
- 2.6 In terms of the enroute, Indonesia has added 6 PBN ATS routes since reported in PBNICG/9 as follows:

ATS Route	Routes	Publication	Navspec
T15	Surabaya - Papua	8 Sep 2022	RNAV 2
T16	Surabaya - Papua	8 Sep 2022	RNAV 2
T17	Surabaya - Papua	8 Sep 2022	RNAV 2
T18	Surabaya - Papua	8 Sep 2022	RNAV 2
T5 EXT	Makassar – Papua	8 Sep 2022	RNAV 2
T6 EXT	Papua - Makassar	8 Sep 2022	RNAV 2

The list of all the PBN enroute are attached on this paper.

- 2.7 DGCA Indonesia continued to increase the PBN certification and operation approval for aircraft operator that have the PBN capability. By 15 March 2023, there are 95% of aircraft with PBN capability that have complied the PBN certification and operation approval in Indonesia.
- 2.8 The PBN certification and operation approval are given based on the navigation specification RNP APCH, RNP AR APCH, RNAV 1, RNP 1, RNAV 10, RNP 4, RNP 2, RNAV 5, and RNAV 2.

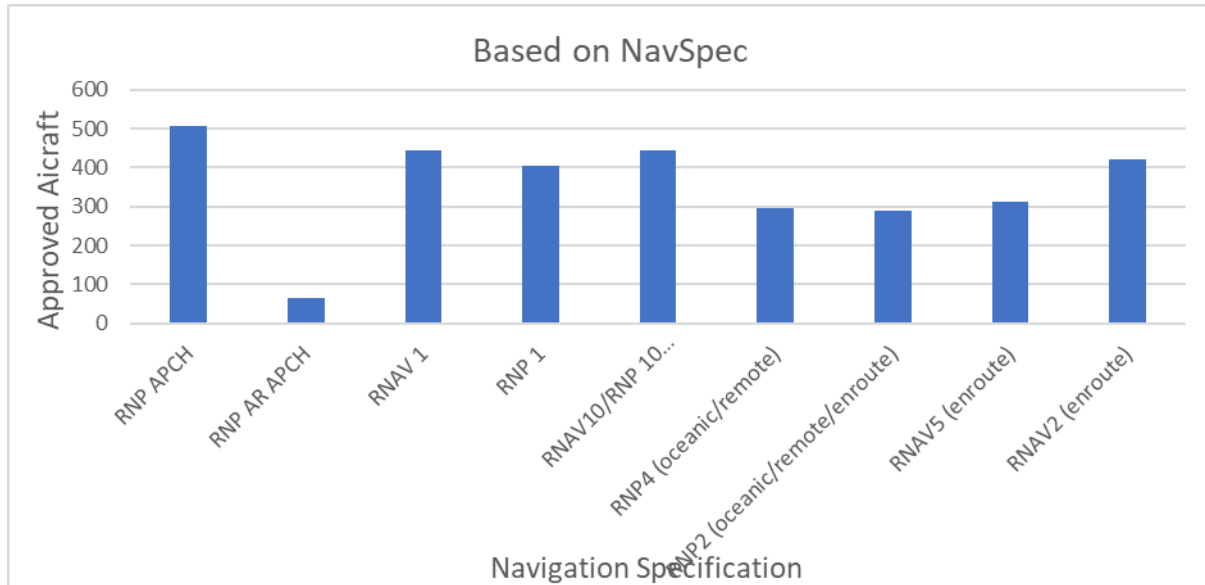


Figure 1. Number of PBN operational approved aircrafts based on the navigation specification

2.9 The Indonesia National PBN Stakeholders forum is actively monitoring the implementation of PBN in Indonesia and evaluating the PBN implementation plan.

New PBN Implementation plan until 2024

2.10 The Indonesia PBN implementation plan until 2024 are as follows:

	Airport / Route	Status	Target Year
International Airport IAP	Raja Haji Fisabilillah, Tanjung Pinang	Validation process	2023
	Hang Nadim, Batam	Validation process	2023
	Sultan Syarif Kasim II, Pekanbaru (RWY 18)	Publication process	2023
	Hasanuddin, Makassar (RWY 03, RWY 13)	Publication process	2023
	Supadio, Pontianak (Rwy 33)	Design process	2023
	Pattimura, Ambon (RWY 22)	Design process	2023
International Airport	Raja Haji Fisabilillah, Tanjung Pinang	Validation process	2023

SID/STAR	Hang Nadim, Batam	Validation process	2023
	Sam Ratulangi, Manado	Publication process	2023
	Banyuwangi, Banyuwangi	Publication process	2023
	Supadio, Pontianak	Design process	2023
	Minangkabau, Padang	Design process	2023
	Zainuddin Abdul Madjid Madjid, Lombok	Design process	2023
	El Tari, Kupang	Design process	2023
	Sultan Syarif Kasim II, Pekanbaru	Design process	2023
	Pattimura, Ambon	Design process	2023
	Sentani, Jayapura	Plan	2024
	Frans Kaisiepo, Biak	Plan	2024
	Adi Sumarmo, Solo	Plan	2024
	Juwata, Tarakan	Plan	2024
Domestic Airport RNP AR	Sultan Babullah, Ternate	Design process	2023
Domestic Enroute RNAV 2	Cluster 4 : Jakarta – Manado & Semarang–Surabaya-Balikpapan	Design process	2023
	Denpasar – Balikpapan - Tarakan	Plan	2024
	Yogyakarta – Semarang - Pontianak	Plan	2024
Lower ATS Domestic Enroute RNP2	Luwuk – Gorontalo - Palu	Plan	2024
International Route RNP2	City Pair connecting Jakarta-Singapore	Plan	2023-2024
	City Pair connecting Jakarta-Australia	Plan	2024

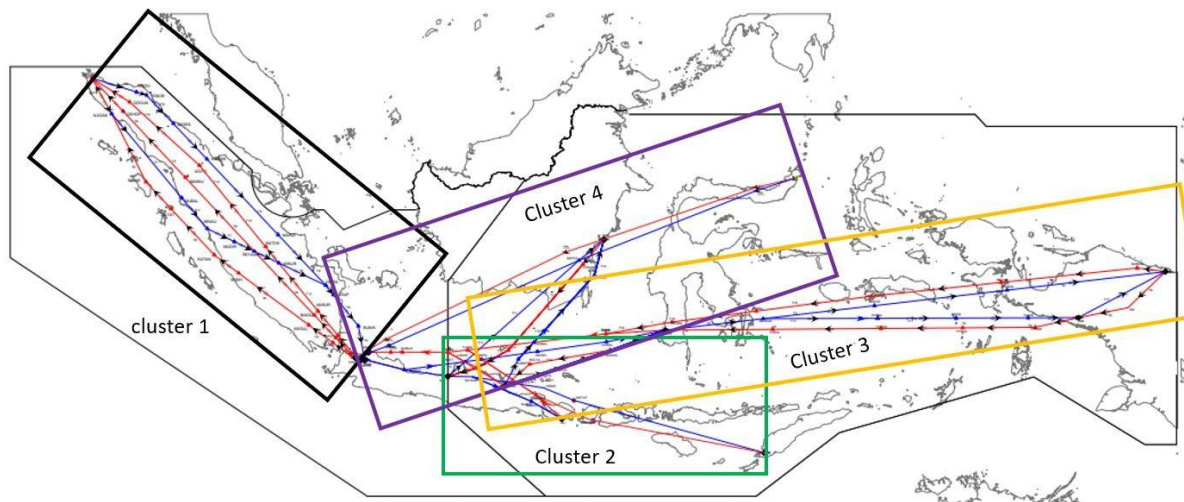


Figure 2. Design of PBN Domestic Enroute RNAV 2

Indonesia Transition Plan for RNP APCH Chart Identification from RNAV to RNP

- 2.11 To support the transition plan for RNP APCH Chart Identification from RNAV to RNP, Indonesia has been renaming/transiting a number of charts.
- 2.12 By 15 March 2023, the number of charts that have been renamed/transited from RNAV to RNP in Indonesia are 72 charts from total 76 charts are published (94.7%). The remaining 4 Charts has been validated and is in coordination with adjacent states for the publication.

Challenges and Lesson Learnt

- 2.13 Throughout the PBN Implementation, Indonesia has faced some challenges as follow:
- The strategy to increase the effectiveness of utilization of a PBN route by considering the population of PBN capable aircraft in an airspace;
 - The handling of mixed between conventional and PBN routes on an airspace;
 - The crossing between the regional routes and domestic RNAV2 routes;
 - The strategy to design a PBN route that is shorter and more effective than a conventional route
- 2.14 The lesson learnt in facing those challenges to ensure the effectiveness of PBN Implementation as follow:
- To conduct an effective PBN Training for ATC Personnel
 - In designing the domestic PBN enroute, Indonesia learn that by dividing the phase based on the trafficflow and operational needs would increase the effectiveness of the implementation and timeline.

3. ACTION REQUIRED BY THE MEETING

- 3.1 The meeting is invited to:
- a) Update the status of Regional Transition Plan RNAV to RNP Chart Identification Change of Indonesia;
 - b) Note the information contained in this paper; and
 - c) Discuss any relevant matters as appropriate.

Attachment

LIST OF AIRPORTS WITH PBN FLIGHT PROCEDURES

Table 1. List of International Airport (with instrument runway) with PBN IAP (30/32 airports)

No.	Airport Name	Location	Navpsec	Remarks
1	Pattimura	Ambon	RNP AR	
2	I Gusti Ngurah Rai	Bali	RNP APCH	
3	Sultan Aji Muhammad Sulaiman Sepinggan	Balikpapan	RNP APCH	
4	Sultan Iskandar Muda	Aceh	RNP APCH	
5	Husein Sastranegara	Bandung	RNP AR	
6	Halim Perdanakusuma	Jakarta	RNP APCH	
7	Soekarno Hatta International	Jakarta	RNP APCH	
8	Sentani	Jayapura	RNP APCH	
9	El Tari	Kupang	RNP APCH	
10	Zainuddin Abdul Madjid International	Praya	RNP APCH	
11	Sam Ratulangi	Manado	RNP AR	
12	Minangkabau International	Padang	RNP APCH	
13	Sultan Mahmud Badaruddin II	Palembang	RNP APCH	
14	Sultan Syarif Kasim II	Pekanbaru	RNP APCH	Remain RWY 18
15	Jenderal Ahmad Yani	Semarang	RNP APCH	
16	Juanda	Surabaya	RNP APCH	
17	Raja Sisingamangaraja XII	Siborongborong	RNP APCH	
18	Kualanamu International	Deli Serdang	RNP APCH	
19	Kertajati International	Majalengka	RNP APCH	
20	Supadio	Pontianak	RNP APCH	Remain RWY 33
21	Sultan Hasanuddin	Makasar	RNP APCH	Remain RWY 03
22	Yogyakarta International	Kulonprogo	RNP APCH	
23	Banyuwangi	Banyuwangi	RNP APCH	
24	Frans Kaisiepo	Biak	RNP APCH	
25	Juwata	Tarakan	RNP APCH	
26	Radin Inten II	Lampung	RNP APCH	
27	Syamsudin Noor	Banjarmasin	RNP APCH	
28	H.AS. Hanandjoeddin	Tanjung Pandan	RNP APCH	
29	Adi Soemarmo	Solo	RNP APCH	
30	Adi Sucipto	Yogyakarta	RNP APCH	Remain RWY 27

Table 2. List of International Airport (With Instrument Runway) With PBN SID/STAR (18/32)

No.	Airport Name	Location	Navspec	Remarks
1	Pattimura	Ambon	RNP AR	
2	Husein Sastranegara	Bandung	RNP AR	

3	Sam Ratulangi	Manado	RNP AR	
4	I Gusti Ngurah Rai	Bali	RNAV 1	
5	Sultan Aji Muhammad Sulaiman Sepinggian	Balikpapan	RNAV 1	
6	Soekarno Hatta International	Jakarta	RNAV 1	
7	Sultan Hasanuddin	Makasar	RNAV 1	
8	Juanda	Surabaya	RNAV 1	
9	Sultan Mahmud Badaruddin II	Palembang	RNAV 1	
10	Kualanamu International	Deli Serdang	RNAV 1	
11	Yogyakarta International	Kulonprogo	RNAV 1	
12	Kertajati International	Majalengka	RNP 1	
13	Radin Inten II	Lampung	RNP 1	
14	Sultan Iskandar Muda	Aceh	RNP 1	
15	H.AS. Hanandjoeddin	Tanjung Pandan	RNAV 1	
16	Halim Perdanakusuma	Jakarta	RNAV 1	Updated 2023
17	Jenderal Ahmad Yani	Semarang	RNP 1	Updated 2023
18	Syamsudin Noor	Banjarmasin	RNP 1	Updated 2023

Table. 3 List of Domestic Airport with PBN IAP (78/110)

No.	Airport Name	Location	Navspec	Remarks
1	Sultan Syarif Haroen	Pelalawan	RNP APCH	
2	Bersujud	Batulicin	RNP APCH	
3	Fatmawati Soekarno	Bengkulu	RNP APCH	
4	Djalaluddin	Gorontalo	RNP APCH	
5	Sultan Thaha	Jambi	RNP APCH	
6	Wamena	Jaya Wijaya	RNP APCH	
7	Utarom	Kaimana	RNP APCH	
8	Kuabang	Kao	RNP APCH	
9	Halu Oleo	Kendari	RNP APCH	
10	Rahadi Oesman	Ketapang	RNP APCH	
11	Gusti Sjamsir Alam	Kotabaru	RNP APCH	
12	Komodo	Labuan Bajo	RNP APCH	
13	Rendani	Manokwari	RNP APCH	
14	Tjilik Riwut	Palangkaraya	RNP APCH	
15	Muara Sis Al Jufri	Palu	RNP APCH	
16	Mathilda Batlayeri	Saumlaki	RNP APCH	
17	Tebelian	Sintang	RNP APCH	
18	Domestik Eduard Osok	Sorong	RNP APCH	
19	Waikabukak	Tambolaka	RNP APCH	
20	Sultan Baabullah	Ternate	RNP APCH	
21	Mozes Kilangin	Timika	RNP APCH	
22	Syukuran Aminuddin Amir	Luwuk	RNP APCH	

23	Abdul Rachman Saleh	Malang	RNP APCH	
24	Depati Amir	Pangkal Pinang	RNP APCH	
25	Kalimmarau	Tanjung Redeb	RNP APCH	
26	Silampari	Lubuk Linggau	RNP APCH	
27	Haji Hasan Aroeboesman	Ende	RNP APCH	
28	Oesman Sadik	South Halmahera	RNP APCH	
29	Iskandar	Pangkalan Bun	RNP APCH	Updated 2023
30	Tampa Padang	Mamuju	RNP APCH	
31	Pitu	Morotai	RNP APCH	
32	Cut Nyak Dien	Nagan Raya	RNP APCH	
33	Jenderal Sudirman	Purbalingga	RNP APCH	
34	David Constanctine Sudele	Rote Ndao	RNP APCH	
35	Aji Pangeran Tumenggung Pranoto	Samarinda	RNP APCH	
36	Naha	Tahuna	RNP APCH	
37	Toraja	Tanah Toraja	RNP APCH	
38	Sultan Bantilan	Toli Toli	RNP APCH	
39	Matahora	Wakatobi	RNP APCH	
40	Jenderal Besar Soedirman	Purbanlingga	RNP APCH	
41	Tunggul Wulung	Cilacap	RNP APCH	
42	Soa	Bajawa	RNP APCH	
43	Ngloram	Blora	RNP APCH	
44	Gewayantana	Larantuka	RNP APCH	
45	Haji Muhammad Sidik	Muara Teweh	RNP APCH	
46	Rembele	Takengon	RNP APCH	
47	Fransiskus Xaverius Seda	Maumere	RNP APCH	
48	Maimun Saleh	Sabang	RNP APCH	
49	Trunojoyo	Sumenep	RNP APCH	Updated 2023
50	Lasikin	Sinabang	RNP APCH	Updated 2023
51	Pangsuma	Putusibau	RNP APCH	Updated 2023
52	Sangia Nibandera	Kolaka	RNP APCH	Updated 2023
53	Noto Hadinegoro	Jember	RNP APCH	Updated 2023
54	Nunukan	Nunukan	RNP APCH	Updated 2023
55	Tanjung Harapan	Tanjung Selor	RNP APCH	Updated 2023
56	Raja Haji Abudllah	Tanjung Balai Karimun	RNP APCH	Updated 2023
57	Binaka	Gunung Sitoli	RNP APCH	Updated 2023
58	Malikussaleh	Aceh Utara	RNP APCH	Updated 2023
59	Sugimanuru	Muna	RNP APCH	Updated 2023
60	Betoambari	Bau Bau	RNP APCH	Updated 2023
61	Muko-Muko	Muko-Muko	RNP APCH	Updated 2023
62	Bua	Lagaligo Luwu	RNP APCH	Updated 2023
63	Warukin	Tabalong	RNP APCH	Updated 2023
64	Tanjung Api	Ampana	RNP APCH	Updated 2023

65	Gamar Malamo	Halmahera	RNP APCH	Updated 2023
66	Sultan Muhammad Kaharuddin	Sumbawa Besar	RNP APCH	Updated 2023
67	Muara Bungo	Muara Bungo	RNP APCH	Updated 2023
68	Sibisa	Parapat	RNP APCH	Updated 2023
69	Nusawiru	Pangandaran	RNP APCH	Updated 2023
70	Numfor	Biak	RNP APCH	Updated 2023
71	Kol Robert Atty Bessing	Malinau	RNP APCH	Updated 2023
72	Melonguane	Sangihe	RNP APCH	Updated 2023
73	Miangan	Miangan	RNP APCH	Updated 2023
74	Dr. Ferdinand Lumbantobing		RNP APCH	Updated 2023
75	Ewer		RNP APCH	Updated 2023
76	Tanah Merah		RNP APCH	Updated 2023
77	Namniwel		RNP APCH	Updated 2023
78	Mopah		RNP APCH	Updated 2023

Table 4. List of Domestic Airport (with instrument runway) with PBN SID/STAR (14/32)

No.	Airport Name	Location	Remarks	
1	Muara Sis Al Jufri	Palu	RNP 1	
2	Komodo	Labuan Bajo	RNP 1	
3	Tebelian	Sintang	RNP 1	
4	Mozes Kilangin	Timika	RNP 1	
5	Sultan Baabullah	Ternate	RNP 1	
6	Toraja	Tana Toraja	RNP 1	
7	Oesman Sadik	South Halmahera	RNP 1	
8	Iskandar	Pangkalan Bun	RNP 1	Updated 2023
9	Toraja	Tanah Toraja	RNP 1	
10	Tampa Padang	Mamuju	RNP 1	
11	Jenderal Besar Soedirman	Purbanlingga	RNP 1	
12	Haji Muhammad Sidik	Muara Teweh	RNP 1	
13	Fransiskus Xaverius Seda	Maumere	RNP 1	
14	Rembele	Takengon	RNP 1	

Table 5. List of Remote Airports (non-instrument runway) with PBN IAP

No.	Airport Name	Location	Navspec	Remarks
1	Buli	Halmahera	RNP APCH	
2	Bade	Papua	RNP APCH	
3	Kimam	Papua	RNP APCH	
4	Kokonao	Papua	RNP APCH	
5	Sarmi	Papua	RNP APCH	
6	Ayawasi	Papua	RNP APCH	
7	Teluk Bintuni	Papua	RNP APCH	

8	Inanwatan	Papua	RNP APCH	
9	Kambuaya	Papua	RNP APCH	
10	Merdei	Papua	RNP APCH	
11	Teminabuan	Papua	RNP APCH	
12	Bawean	East Java	RNP APCH	
13	Sinabang	North Sumatra	RNP APCH	
14	Sibolga	North Sumatra	RNP APCH	
15	Torea	Papua	RNP APCH	
16	Sitaro - Siau	North Sulawesi	RNP APCH	
17	Kokonao	Mimika	RNP APCH	Updated 2023
18	Cakrabhuwana	Cirebon	RNP APCH	Updated 2023

LIST OF PBN ENROUTE

ATS Route	Routes	Publication	Navspec
T1	Jakarta – Bali	17 Aug 2017	RNAV 10
T2	Surabaya – Jakarta	27 Aug 2020	RNAV 2
T3	Jakarta – Surabaya – Bali	27 Aug 2020	RNAV 2
T4	Bali – Jakarta	27 Aug 2020	RNAV 2
T5	Jakarta – Makassar	27 Aug 2020	RNAV 2
T6	Makassar – Jakarta	27 Aug 2020	RNAV 2
Z21	Medan – Aek Godang	2 Mar 2017	RNP 2
Z22	Medan – Sibolga	2 Mar 2017	RNP 2
Z23	Medan – Binaka	2 Mar 2017	RNP 2
Z24	Medan – Lasikin	2 Mar 2017	RNP 2
Z25	Medan – Rembele	2 Mar 2017	RNP 2
Z26	Medan – Lhok SUkon	2 Mar 2017	RNP 2
T5 EXT	Aceh – Jakarta – Cirebon	01 Jun 2021	RNAV 2
T6 EXT	Jakarta – Binaka - Aceh	01 Jun 2021	RNAV 2
T7	Aceh – Padang – Bengkulu - Jakarta	01 Jun 2021	RNAV 2
T8	Jakarta - Aceh	01 Jun 2021	RNAV 2
T10	Jakarta – Medan - Aceh	01 Jun 2021	RNAV 2
T19	Semarang – Surabaya - Kupang	02 Des 2021	RNAV 2
T20	Kupang – Surabaya – Semarang	02 Des 2021	RNAV 2
T15	Surabaya - Papua	8 Sep 2022	RNAV 2
T16	Surabaya - Papua	8 Sep 2022	RNAV 2
T17	Surabaya - Papua	8 Sep 2022	RNAV 2
T18	Surabaya - Papua	8 Sep 2022	RNAV 2
T5 EXT	Makassar – Papua	8 Sep 2022	RNAV 2
T6 EXT	Papua - Makassar	8 Sep 2022	RNAV 2