



International Civil Aviation Organization

**The Eighth Meeting of the Performance Based Navigation Task Force
(PBN/TF/8)**

New Delhi, India, 12 – 13 May 2011

Agenda Item 4: PBN Implementation Issues

RNP4 Survey

(Presented by the Secretariat)

SUMMARY

This paper presents the results of the two Regional RNP4 Surveys.

This paper relates to –

Strategic Objectives:

- A: *Safety – Enhance global civil aviation safety*
- C: *Environmental Protection and Sustainable Development of Air Transport – Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:

- GPI-5 RNAV and RNP (Performance-based navigation)
- GPI-11 RNP and RNAV SIDs and STARs
- GPI-21 Navigation systems

1. **INTRODUCTION**

1.1 Japan informed APANPIRG/19 that a trial application of 30 NM longitudinal minimum separation between aircraft with RNP 4 approval within the Fukuoka FIR had commenced in August 2008. Japan were also planning to develop tracks where 30 NM lateral separation would be applied, taking into account the preparedness of operators and the growth of the number of RNP 4 approved aircraft. This resulted in the following Conclusion:

Conclusion 19/7 – RNP 4 capability for operators

That, recognizing the significant benefits expected from the implementation of 30 NM longitudinal separation based on RNP 4, operators of Pacific fleets be urged to equip with RNP 4 avionics for oceanic airspace operations and obtain approval from the States of Registry/Operators as early as possible, but no later than 2012.

1.2 At the time, Air Navigation Service Providers (ANSPs) and operators recognized that RNP4 could allow aircraft to fly at or closer to an optimum altitude, as well as increase airspace capacity and ATC flexibility, contributing to a reduction of fuel use and emissions. Japan conducted an environmental benefits study of the RNP 4-based separation, which indicated estimated annual:

- fuel savings of approximately 11,273,000 kg; and
- reductions of CO2 emissions of about 34,400,000 kg.

1.3 Australia noted that the rate of the RNP 4 equipage in the oceanic airspace in the Fukuoka FIR was as low as 20 percent. IATA supported the RNP implementation in the region and endorsed the expansion of the RNP 4 requirement to the other key ATS routes.

1.4 APANPIRG/20 recalled APANPIRG Conclusion 19/7, and agreed that a survey of aircraft RNP 4 equipage and certification would be useful in establishing the current situation and establishing the intentions of operators in terms of equipage and certification.

Conclusion 20/15 – Survey of RNP 4 Equipage and Approvals

That during 2010 the Regional Office conducts a regional survey to establish the current and near term equipage and approvals status for RNP 4 operations.

2. DISCUSSION

2.1 The results of the 2010 RNP4 Survey are provided in **Table 1**. Although all of the five States that responded had airlines that operated through RNP4 airspace, only three had an RNP4 approval process. In those States, the number of aircraft that were actually RNP4 approved varied from 0% to 100%, so it is likely there are several reasons for this. According to the survey, prominent among these reasons were the cost of approval and training, and a perceived lack of benefits for RNP4.

Question	Australia	Japan	Malaysia	Pakistan	Philippines
Do you operate aircraft in RNP4 airspace?	Yes	Yes	Yes	Yes	Yes
How many and what type of aircraft?	104	265; B777, B747, B767, A320, B737	115; A330, B737, B747, B777, A340, A320	9; B777	2; A340
Is there a State approval process?	Yes	Yes	No	Yes	No
How many aircraft are RNP4 approved?	73 (70%)	0 (0%)	0 (0%)	9 (100%)	2 (100%)
Is there a plan to establish an RNP4 approval?	-	-	Yes	-	Yes
What reasons are there for no RNP4 approval?	Cost, no merit	No merit, crew cost	No merit, uncertain	-	-
Is there a request for an RNP4 approval process?	-	-	No	-	-
How long is RNP4 crew training completed?	Typically 3- 12 months	Typically 3- 6 months	Typically 6 months	-	Varies
Will there be RNP4 compliance by 2012?	Operators urged to comply	Yes	1 No, 2 Yes	-	Yes
Notes	15 airlines of 31 responded	3 airlines	3 airlines	1 airline	1 airline

Table 1: 2010 RNP4 Survey

2.2 As the 2010 survey sample was not large, and did not provide enough information on the level of RNP4 operations within respondent's airspace, the Regional Office conducted a second survey by State Letter T3110.0 -AP002/11 (ATM), dated 12 January 2011. The results of this survey are summarised in **Table 2**.

Question	Australia	French Polynesia	Hong Kong China	Macao China	New Zealand	Singapore	Thailand	USA
State RNP4 approval process?		Yes	Yes	No	Yes	Yes	Yes	Yes
If not, when established?		NA	NA	By April 2011	NA	NA	NA	NA
How many aircraft operations*?		8	181	15	62	121	101 (72 Thai Int)	-
How many and what types have RNP4 approval?		7 5-A340 2-A330	158 A320 A330 A340 B747-4 B777-2/3	Nil	15 6-B747-4 8-B777-2 1-B777-3	121 20-B747-4 35-B777-2 31-B777-3 19-A330-3 5-A340-5 11-A380-8	B747-4 B777-3 A340-5 A340-6 A330-3 A319	-
Why are aircraft operations* not RNP4 approved?		Tahiti FIR is not yet RNP4, possibly 2012	No yet applied for	-	Cost of retrofit, crew training, fleet changes, no merit	1-B747-2 equipage, 43-A320-1/2 no need as no RNP4 routes	-	Not equipped, cost of training and comms.
% of RNP4 aircraft operations*?		87.5% (French aircraft)	100%	NA	24% (NZ aircraft only)	Unable to determine	100%	Anchorage FIR 28% Oakland FIR 24%
Aircraft operations* will be RNP4 approved by 2012?		Yes	No	No	No	Yes, except for one B747-200F	Yes	-
If not, why?		NA	Nil GNSS	No plan by airlines	As Q5, 1 airline will upgrade 8xB737-8	Not suitably equipped for RNP4	NA	-

Table 2: 2011 RNP4 Survey *operations in remote or oceanic airspace NA – not applicable

2.3 The data from the 2011 survey strongly suggest that APANPIRG Conclusion 19/7 regarding RNP 4 equipage not later than 2012 will not be met. All of the States surveyed in 2010 and 2011 either had an RNP4 approval process or this was planned. However, the number of operators that had been RNP4 approved varied from zero to 100%, mainly due to cost (approval, crew training, equipage) or a perception there was no merit because of a lack of RNP4 designated airspace/routes. These cost issues were likely to why Japan itself had no RNP4 approved aircraft, despite having an approval process and planning for such applications.

2.4 The United States was able to provide the most accurate indication of the level of RNP4 approved operations within their oceanic or remote airspace, varying between 24-28%. However they also noted that in the New York FIR the rate was only about 8% (North Atlantic longitudinal separations are still largely time-based).

2.5 Unless there is a major change in operator motivation or regulatory requirements, the use of RNP4 standards is likely to be only applied in the short and medium term on an opportunity (tactical) basis, or where a strategic advantage can be derived in a particular geographical area. This has implications for the Asia/Pacific Regional PBN Implementation Plan, which states that RNP4 is the preferred navigation specification for oceanic or 'remote continental'¹ airspace before 2012, before moving to RNP2 and RNP4.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the results of the RNP4 surveys; and
- b) discuss the implications of these outcomes on the Asia/Pacific Regional PBN Implementation Plan.

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¹ 'Remote airspace' may be a better generic term to apply to land masses that are not continental in nature

Appendix 1: Survey on RNP 4 Status Required by APANPIRG Conclusion 20/15

APANPIRG Conclusion 20/15 - Survey of RNP4 Equipage and Approvals

That during 2010 the Regional Office conducts a regional survey to establish the current and near term equipage and approvals status for RNP 4 operations.

State

Q1. Has your State established an RNP 4 approval process?

Yes No

Q2. If the answer to Q1. is no, when does the State intend to establish an RNP 4 approval process?

Date

Q3. How many aircraft registered in your State are operated in oceanic or remote airspace?

Number

Q4. How many and what types of aircraft registered in your State have RNP 4 approval?

NumberTypes.....

Q5. If your State has an RNP 4 approval process, and there are aircraft registered in your State that are not RNP 4 approved operating in oceanic or remote airspace, please advise the reason(s) why.

Reason.....

Q6. If the State provides ATS in oceanic or remote airspace, what percentage of RNP 4 approved aircraft operates within this airspace?

Number

Q7. Is it possible for all the aircraft registered in your State that operate in oceanic or remote airspace to be RNP 4 approved by the end of 2012?

Yes No

Q8. If the answer to Q7. is no, please advise the reason(s) why.

Reason