International Civil Aviation Organization

The First Meeting of ICAO Asia/Pacific Performance based Navigation Implementation Coordination Group (PBNICG/1)

Beijing, China, 10-12 March 2015

Agenda Item 8: Issues and challenges regarding PBN implementations

PROPOSED TRANSITION PLAN FOR ADVANCED RNP (ARNP) IMPLEMENTATION

(Presented by Hong Kong, China)

SUMMARY

This discussion paper provides information on the latest issues encountered during the implementation of ARNP and recommends ICAO to consider a transition plan for a smooth implementation of ARNP.

1. INTRODUCTION

1.1 Advanced RNP navigation specification (Nav Spec) was officially introduced to the latest edition of ICAO Doc 9613, Performance-based Navigation (PBN) Manual in June 2014 for applicability on 13 November 2014.

1.2 It is a new Nav Spec which provides flexibility for States to implement PBN procedures from en-route to approach phase of flight and allow different RNP values to be adopted in the initial and intermediate approach segments without additional equipage and crew requirements.

2. DISCUSSION

2.1 Situation in Hong Kong, China

2.1.1 Hong Kong International Airport (HKIA) is a busy airport surrounded by an array of terrain and complex, limited airspace over Pearl River Delta (PRD) region. (Currently, HKIA has 2 runways with annual movements over 390,000 in 2014; Average daily movement for February 2015 is 1118, busiest is 1179)

2.1.2 HKIA relies heavily on ILS and radar vectors to handle high traffic volume in such a limiting operating environment.

2.1.3 In line with ICAO's PBN implementation initiatives, 8 RNP AR APCH procedures catering for different scenarios have been introduced in order to enhance safety, capacity and reduce impact to the environment. 4 of these procedures are overlay of existing ILS APCH procedures and the rest provide alternate approach routes to HKIA to further enhance the accessibility. Due to terrain and airspace limitations, only RNP AR APCH can be implemented at HKIA.

2.1.4   At the moment, only very little population of aircraft can fly the RNP AR APCH due to the stringent equipage and crew requirements. Hence, the utilization rate of RNP AR APCH procedures is very low.

2.2   Benefits of ARNP

2.2.1   Although RNP AR serves airports with highly complex extreme environment well, it is considered to be a Nav Spec with costly and stringent requirements on equipage and crews. ARNP was supposed to render similar benefits of RNP AR without the need for stringent requirements.

2.2.2   Moreover, the PANS-OPS criteria for ARNP enable much greater flexibility (compare to RNAV 1/RNP 1 or RNP APCH) on procedure design, mainly due to the RNP scalability in certain phases of flight.

2.3   Issues hindering ARNP Implementation

2.3.1   Guidance materials for operational approval and charting

2.3.1.1 Guidance materials for operational approval and charting are not yet available (as of February 2015). States are not certain on the operational approval process and how the ARNP procedure chart should be published.

2.3.2   RADIUS TO FIX (RF) PATH TERMINATOR

2.3.2.1 ARNP is the first Nav Spec to mandate RF path terminator capability. By contrast, there is no such requirement for RNP AR APCH.

2.3.2.2 RF is a well-known "good" path terminator for ATC, pilots and procedure designers. However, the percentage of aircraft that can utilize RF path terminator is still very low.

2.3.2.3 Hong Kong has implemented departure procedures with RF leg (RF SID) for noise mitigation since 2012. The result for noise mitigating has been very positive but there is only around 23% of flight could fly the RF SID as of January 2015, even though aircraft operating in HKIA were considerably new.

2.3.2.4 It is anticipated that the utilization rate of ARNP procedure will also be low if RF is a mandate requirement according to the experience gained during the implementation of RF SID in Hong Kong. This would greatly undermine the potential benefits to be brought by the ARNP and would hinder the implementation of ARNP procedures.

2.5   Recommendation

2.5.1   Hong Kong proposes ICAO to consider removing the mandate RF requirement for ARNP, or developing a transition plan with less demanding interim implementation criteria without mandating RF during transitional period to facilitate the implementation of ARNP. This will allow more States/Administrations and operators to enjoy the benefits of ARNP.

2.5.2   During the transition period, RF path terminator should be made an **optional** functionality.

3.   **ACTION BY THE MEETING**

3.1   The meeting is requested to discuss and consider Hong Kong, China's recommendation in paragraph 2.5 to facilitate the implementation of ARNP.

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