International Civil Aviation Organization

The Eighth Meeting of the APANPIRG ATM Sub-Group

Video Teleconference, 23 – 27 November 2020

Agenda Item 5: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

MUMBAI RNP APCH AND REVISED PBN SIDs/STARs

(Presented by Airports Authority of India)

SUMMARY

Mumbai Airport implemented RNP APCH and revised Terminal Procedures - PBN based RNAV 1 SIDs/STARs in September 2020. This paper presents a brief on the implementation of RNP APCH and also the changes to the then published Terminal Procedures and the expected benefits to the industry.

1. INTRODUCTION

1.1 At Mumbai, AAI introduced PBN in the En-Route phase in the year 2003 by promulgating RNP10 (RNAV10) routes through the continental and oceanic air space. This was followed by introduction of PBN in the Terminal phase through promulgation of PBN based RNAV1 SIDs/STARs in the year 2008. Further, PBN was introduced in the Approach phase by promulgation of RNP APCH in the year 2020.

1.2 This paper gives a brief on the implementation of RNP APCH and revised SIDs/STARs at Mumbai.

2. DISCUSSION

RNP APCH

2.1 Mumbai International Airport is a terrain challenged airport owing to the presence of many natural obstructions around the airport. The Instrument RWYs at Mumbai have been serviced by conventional landing aids for many decades and the published instrument approach procedures have been revisited and revised periodically to further the safety and efficiency objectives. However, the need for PBN Approaches was felt in order to cater to contingency scenarios when conventional landing aids may not be available and sustaining operations during adverse weather conditions may not be feasible.

2.2 In Sept 2020, RNP APCH for RWY 09 and RWY 14 were implemented which resulted in increased limits of usability of RWY 09 and RWY 14.

2.3 The RNP APP RWY 27 shall be applicable with effect from 3rd Dec 2020.

2.4 The LNAV/VNAV OCA value for RNP Y RWY09 is 500 feet (and for VOR APP 09 is 620 feet) and the LNAV/VNAV OCA value for RNP Y RWY14 is 500 feet (and for VOR APP 14 is 730 feet).

2.5 The LNAV/VNAV OCA for RNP Y RWY27 is 540 feet against the OCA of VOR APP RWY27 which is 1020 feet.

2.6 Additionally, the availability of RNP APCH ensures sustenance of operations even during periods of non-availability of VOR/ILS.

Terminal Procedures

2.7 The SID/STARs published in the year 2008 had since been safely servicing the industry. The then published terminal procedures had safely helped deliver progressively increasing daily flight movements-from about 550 ARR/DEPs in 2008 to about 980 ARR/DEPs just prior to the pandemic induced slowdown at Mumbai Airport.

2.8 Even though this progressive increase of air traffic at Mumbai Airport was safely and efficiently managed by ATM all through, the increased traffic resulted in need for frequent tactical interventions for managing conflicts leading to ATC induced track and attitudinal/altitude deviations from the published values.

2.9 These tactical interventions did result into immediate benefits for the arriving/departing flights, however, the flight planning benefits in terms of optimized Speed/Altitude restrictions could not be passed on.

2.10 The revised SIDs/STARs have additionally incorporated INNER HOLDS – to be tactically resorted to – in order to cater to temporary RWY non availability and also can be skillfully used during RWY change scenario and thereby provides for a safe and efficient air traffic management.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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