*International Civil Aviation Organization*

**Third Meeting of the Bay of Bengal Traffic Flow Review Group (BOBTFRG/3)**

Video Teleconference, 14 – 15 December 2021

**Agenda Item 2: Updates from States and IATA on ADS-C/CPDLC and PBCS Implementation Status**

# STATUS UPDATE ON PBCS IMPLEMENTATION IN CHENNAI FLIGHT INFORMATION REGION

(Presented by India)

**SUMMARY**

This paper presents the status update on the implementation of PBCS in Oceanic airspace in Chennai FIR. The paper details the various processes being followed to upgrade the ATM Automation system at Chennai to make it PBCS compliant as per ICAO requirements which will facilitate application of performance-based separation.

## 1. INTRODUCTION

1.1 ICAO amendment 50A to ANNEX 11 and Amendment No. 7-A to the PANS-ATM (Doc 4444) concerning performance-based communication and surveillance (PBCS) was issued for applicability from 10 November 2016. APANPIRG/27 meeting held in 2016 had adopted that state which apply or plan to apply 30 NM/or 50 NM longitudinal separation minima and/or 23 NM lateral separation minimum are urged to implement the ATM system capability to process and use ICAO PBCS flight plan indicators to determine aircraft eligibility for performance-based separation. India is thus, taking steps to upgrade the automation system at Chennai to make it PBCS compliant as per ICAO requirements which will facilitate performance-based separation.

## 2. DISCUSSION

Enhancements to the ATM Automation System

2.1 The enhancements required in automation system at Chennai for making it PBCS compliant have been identified and are given below in detail.

2.2 **General**: The existing Chennai Air Traffic Management Automation System (Automation System) is being enhanced to support implementation of Performance Based Communication and Surveillance (PBCS) requirements with appropriate new functionalities and/or with enhancements to the existing functionalities. The automation system with new functionalities/enhancements shall meet all the PBCS Global requirements provided in ICAO DOC9869 and DOC10037 Global Operational Data Link [GOLD] Manual.

2.3 **Flight Plan Processing and Validation**: The Automation System will be enhanced with required functionalities to support use of applicable "P" codes in Field 10 (P1 - CPDLC RCP400, P2 - CPDLC RCP240 and P3 - SATVOICE RCP400 and "RSP" codes in Field 18 against indicator SUR/RSP180 or RSP400 of Flight Plan (FPL). The system will also check for inconsistency in FPLs

by comparing the aircraft PBN, PBCS equipage and the route to be flown and if inconsistency exists FPLs may be placed in error queue or as a warning for controller intervention.

2.4 **Air Situation Display at Controller Working Position (CWP)**: The PBCS capability of an aircraft shall be displayed at the controller work position and shall also display suitable alerts to indicate inconsistency between the aircraft equipage and the route flown. Air traffic controllers can also set the ADS-Contract for an individual aircraft and permit setting a different periodic reporting interval while applying PBCS separation. The automation system will also permit the controller to set the Lateral Deviation event threshold for an individual aircraft and provide alert whenever ADS-C periodic or waypoint change event report is overdue.

2.5 **Medium Term Conflict Detection (MTCD)**: The existing MTCD functionality will be enhanced to process conflict detection taking into account the Performance-Based Longitudinal separation minima specified in Para 5.4.2.9 of DOC 4444.

2.6 **PBCS Monitoring**: The automation system will comply with all the requirements for Datalink Performance monitoring and a Data analysis Tool shall be provided to undertake the performance monitoring as per the requirements specified in Append ix D & E of DOC9869 Second Edition 2017.

PBCS Testing

2.7 An initial Engineering Software build was released by OEM which catered to FPL processing and validations without MTCD functionality. The software was tested in the Alternate Segment of the Chennai ATM Automations system for stability and FPL processing and validation and flight overdue report. The display of RCP/RSP indication in the aircraft data tag in the situational data display was also confirmed.

2.8 The ATS Routes adapted in the ATM Automation system for testing PBCS functionality were N571, P628, P762, N877 and L510 (all RNP10 ATS routes).

2.9 A PBCS application software build with the MTCD functionality was then released by OEM and tested, again, in the Alternate Segment of the automation system.

2.10 The MTCD functionality test was conducted with the assistance of M/s Boeing who provided two virtual aircraft datalink capabilities. A separate ADS-C logon ID viz. VOME, was made available in coordination with SITA on a temporary basis. The two virtual aircraft were logged on VOME in order to avoid any operational impact on handling the actual air traffic logged on to VOMF, which is Chennai FIR's ADS-C logon ID. The testing was performed only in the alternate segment of the automation system.

2.11 The following separation minima, which are proposed to be used in PBCS separation, were used to test the application performance:

| *Separation minima* | *RNP* | *RCP* | *RSP* | *Maximum ADS-C periodic reporting interval* |
|---|---|---|---|---|
| 55.5 km (30 NM) | 2 or 4 | 240 | 180 | 12 minutes |
| 5 minutes | 2 or 4 or 10 | 240 | 180 | 14 minutes |
| 93 km (50 NM) | 10<br>4 | 240<br>240 | 180<br>180 | 27 minutes<br>32 minutes |

2.12 At this stage, it can be said that, the above testing has proved to be satisfactory; however, the Site Acceptance Test for Augmentation of Automation System at Chennai for PBCS (Performance Based Communication and Surveillance) Capability are being planned. A final PBCS software application with updated airspace and aircraft performance database has been provided by the OEM.

2.13 The automation system will also comply with all the requirements for Datalink Performance monitoring and a Data analysis Tool shall be provided to undertake the performance monitoring as per the requirements specified in Appendix D & E of DOC9869 Second Edition 2017. A performance analyser tool (PAT) is downloaded as part of the Site Acceptance Test.

Conclusion

2.14 The Performance Based Communication and Surveillance (PBCS) framework promotes efficiency of air traffic operations by supporting the safe application of ATM initiatives that reduce aircraft spacing and streamline communication. The upgradation of ATM Automation at Chennai for PBCS implementation will be an enabler for planning application of PBCS in coordination with concerned neighbouring states.

## 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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