



International Civil Aviation Organization

ICAO

The Third Meeting of the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG/3)

Bangkok, Thailand, 16 – 19 April 2024

Agenda Item 5: ATS Route Development

**PBCS IMPLEMENTATION STRATEGY IN INDIAN OCEANIC AIRSPACE
(CHENNAI)**

(Presented by India)

SUMMARY

This paper presents the proposed initiatives by AAI, wherein it has upgraded its ATM automation system for application of PBCS based separation minimums with

- a. PBCS monitoring & alerting; and
- b. identification & display of PBCS designator from flight plans data;

ATM automation system at Chennai & Mumbai to allow this information to be presented on-screen to the Oceanic Controllers and also provide for visual alerts to be depicted on the controller's workstation.

DGCA of India has issued an operational circular in 2018 for PBCS guidance to aircraft operators.

1. INTRODUCTION

India is experiencing rapid growth in aviation to support the growing Indian economy both within and outside India. The successful upgradation of the ATM automation systems at Chennai and Mumbai for PBCS compliance which would enable application of the PBCS based reduced minimum thereby allocation of more optimum level to flights through its oceanic airspace.

2. DISCUSSION

Overview

Automation systems in Chennai and Mumbai FIR have been upgraded for PBCS compliance, enabling the implementation of PBCS based separation minima. 50 NM separation minima based on position reporting has been implemented between Chennai and Malaysia. The inclusion of RNP4/RNP2 capable aircraft and PBCS would enable to reduce the separation minima further as specified in PANS-OPS (ICAO Doc 4444) summarized in the following table

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

- 2.1 India's automation system at Mumbai & Chennai Fir complies with the PBCS requirement for communication capability defined by RCP240 standard and surveillance capability defined by an RSP180 standard.
- 2.2 As of DEC 2022, performance was measured against RCP240 performance criteria of 180 and 210 seconds for 95% and 99.9% criterion, respectively. Meanwhile, performance against RSP180 performance criteria of 90 and 180 seconds for 95% and 99.9% criteria, respectively.
- 2.3 Table 1 summarizes RSP180 ADS-C Downlink Latency for messages sent within the Chennai FIR.

FIR	VOMF					
Criteria	RSP180					
Period	January 2022 - June 2022			JULY 2022 - DECEMBER 2022		
	Message Counts	95%	99.90%	Message Counts	95%	99.90%
		% < = 90 SEC	% < = 180 sec		% < = 90 SEC	% < = 180 sec
By Media Type				By Media Type		
SATCOM	64350	98.00%	99.15%	SATCOM	95639	97.80% 99.07%
VHF	118163	98.73%	99.45%	VHF	145595	98.72% 99.42%
HF	86	30.23%	59.42%	HF	388	25.26% 40.98%
ALL	182599	98.44%	99.32%	ALL	241622	98.24% 99.19%

Table 1

- 2.4 Table 2 summarizes the overall CPDLC Actual Communications Performance (ACP) for messages sent within the Chennai FIR.

FIR	VOMF				
Criteria	RCP240				
Period	JULY 2022 - DECEMBER 2022				
By Media Type	Message Counts	95% Benchmark		99.9% Benchmark	
		ACP % < = 180 sec	ACTP % < = 120 sec	ACP % < = 210 sec	ACTP % < = 150 sec
SATCOM	31211	99.83%	99.80%	99.91%	99.85%
VHF	64672	99.82%	99.93%	99.87%	99.95%
HF	6	86.94%	80.86%	89.64%	85.28%
ALL	95889	99.82%	99.88%	99.88%	99.92%

Table 2

2.5 The above table indicates the performance of the ADS-C & CPDLC in conformance to the RCP240 & RSP180 requirements to facilitate PBCS based separation minima based on aircraft performance characteristics.

2.6 Some of the notable features in the ATM upgradation are as shown in Fig 1, fig 2 & fig 3

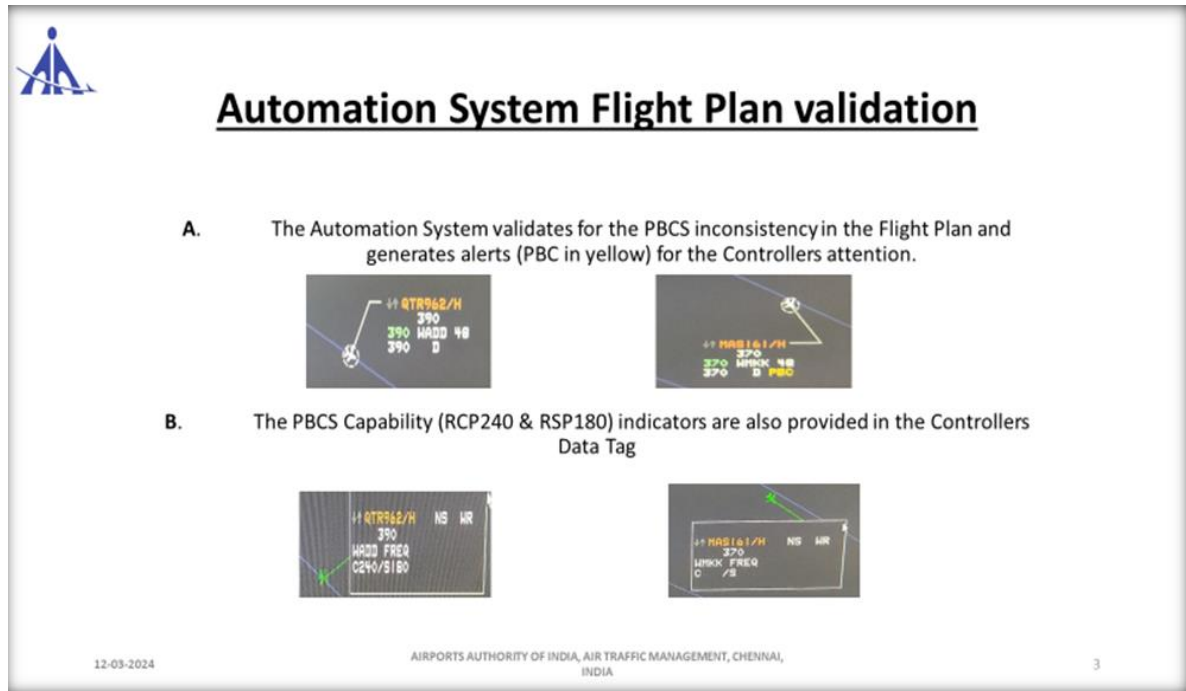


Figure 1

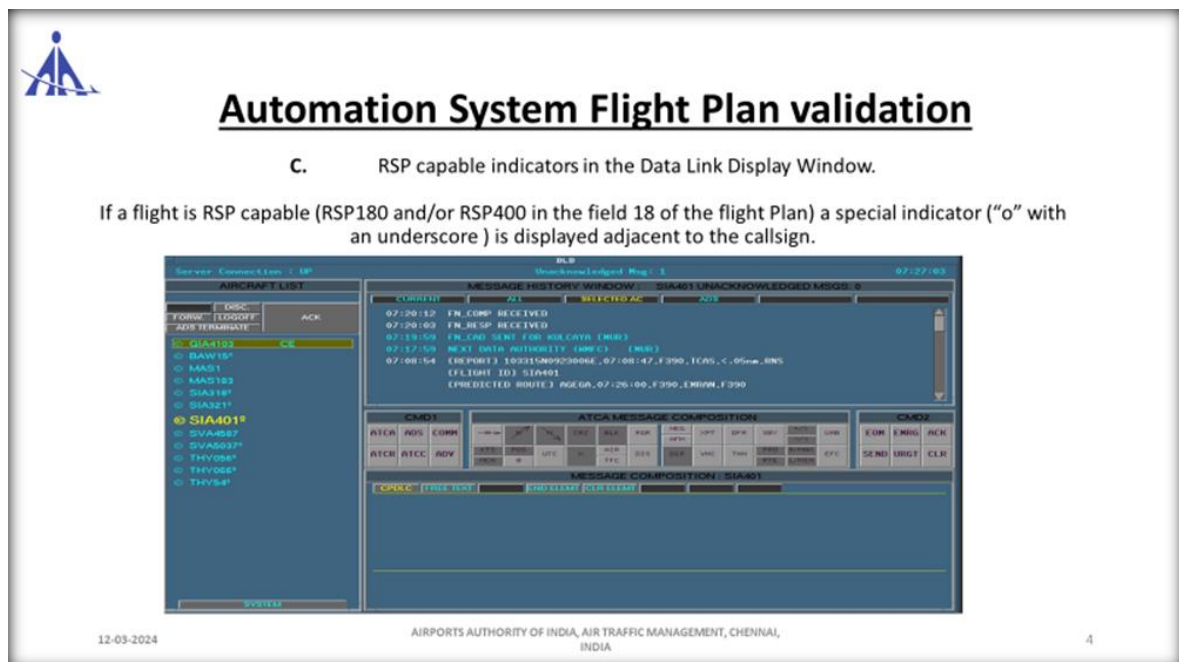



Figure 2




Automation System Flight Plan validation

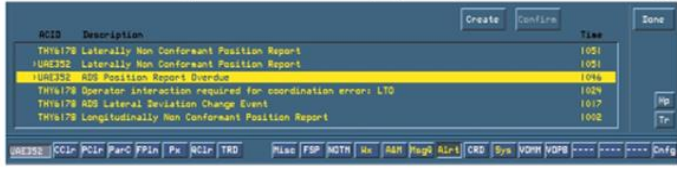
ADS Overdue Periodic Report/ADS Overdue Waypoint Change Report

If an ADS-C periodic report is overdue by 3 minutes based on its configured periodic reporting interval, the following indicators are provided to the controller:

- Adapted report overdue mnemonic "RO" is displayed in yellow colour in the alert line of the data tag.



- Announcement "ADS Position Report Overdue" is displayed in yellow Colour in the Flight Announcement List



12-03-2024
AIRPORTS AUTHORITY OF INDIA, AIR TRAFFIC MANAGEMENT, CHENNAI, INDIA
5

Figure 3

2.7 The identified segments of ATS routes in India (VOMF, VABF) where PBCS based reduced separations have been planned to be implemented as soon as possible are as follows

1 ATS ROUTE	2 SEGMENT IN VOMM FIR	3 SEPARATION LONGITUDINAL CURRENT	4 CNS EQUIPAGE CURRENT	5 GROUND BASED SURVEILLANCE & VHF (VOMF – VABF)	6 ADJACENT FIR
N571	IDASO - IGOGU	50NM	VHF/ HF/ ADS-C (CPDLC)	IDASO - SUGID	WMKK, VABB
P574	GIRNA - NOPEK	50NM	VHF/ HF/ ADS-C (CPDLC)	GIRNA - BISET	WMKK, VABB
N563	ADKIT - MEMAK	50NM	VHF/ HF/ ADS-C (CPDLC)	ADKIT - LEGEN	WIII, VABB
N877	MANPU - AGEGA	50NM	VHF/ HF/ ADS-C (CPDLC)	DUMAR - AGEGA	VECC, WMKK
L510	BIDEX - EMRAN	50NM	VHF/ HF/ ADS-C (CPDLC)	LEGIN - EMRAN	VECC, WMKK

2.8 The two oceanic centers namely Chennai (VOMM) and Mumbai (VABB) are separated by India continental airspace supported by extensive redundant surveillance and VHF. This would enable application of reduced surveillance separation minima (below PBCS minimum) over continental airspace along the specified ATS routes.

2.9 Proposed PBCS implementation for Chennai-Mumbai Airspace is outlined below:

Phase 1:

Trial operations of PBCS based separation minimum (30Nm) between aircraft pairs capable of RNP2/4 and RCP240 & RSP 180 in Chennai FIR as specified in column 2 of the table above on ATS route N571 in Chennai Oceanic Airspace Between FL360 - FL410 for a specified period of time in a day.

Phase 2:

Permanent use of PBCS based separation on ATS route N571 between FL360 – FL410 between IGOGU - AGELA. Commencement of trial operations on other ATS routes specified in the above table between FL360 -FL410 for specified period of time in a day. Extended trial operations on ATS route N571 between PARAR & IDASO in Chennai & Mumbai FIR between FL360-FL410 for a specified period of time mutually agreed between Mumbai & Chennai.

Phase 3:

Application of PBCS based separation on ATS routes P574, N563, N877 & L510 in Chennai FIR. PBCS based separation on ATS route N571 from PARAR to IGOGU between FL360 – FL410 in Chennai & Mumbai FIR.

- 2.10 Regular AIDC Message exchanges between Chennai and Kuala Lumpur FIRs will facilitate such PBCS separation.
- 2.11 A bilateral meeting was held between India and Malaysia for an initial discussion for the commencement of trial operations on ATS route N571 at a mutually agreed date and time with specifics to be discussed in the ICAO meeting platform.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
 - a) Note the information contained in this paper; and
 - b) IATA is requested to encourage participation of airlines in the trial procedures as and when commenced.
 - c) Discuss any relevant matters as appropriate.

.....