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The Second Meeting of the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG/2)

Bangkok, Thailand, 20 – 24 March 2023

Agenda Item 4: Implementation of CNS-ATM Systems

PROPOSAL OF PROVISION OF SEPARATION MINIMA USING ATS SURVEILLANCE SYSTEMS WHERE VHF VOICE COMMUNICATIONS ARE NOT AVAILABLE

(Presented by INDIA/AIRPORTS AUTHORITY OF INDIA)

SUMMARY

This paper presents India's plan to implement separation minima using ATS surveillance System where VHF Voice Communications are not available.

1. INTRODUCTION

1.1 The 9th amendment to PANS-ATM (Doc 4444) introduced a new separation minima using ATS surveillance System where VHF Voice Communications are not available in Chapter-8 para 8.7.4. These separation minima help states who have implemented surveillance systems for the oceanic airspace under their control to reduce horizontal separation where VHF Voice Communications are not available. India is planning to trial such reduced separation in its oceanic airspace.

1.2 India has implemented Space-Based ADS-B (SADS-B) in the oceanic airspace of Mumbai, Kolkata and Chennai FIR since January 2021. However, the data from SADS-B integrated in ATM Automation Systems were used for situational awareness only. Promulgation of the new separation provides an opportunity for India to reduce horizontal separation in its oceanic airspace.

2. DISCUSSION

2.1 A surveillance System in provision of surveillance services including separation is of great help in Air Traffic services. The separation minima are considerably smaller than that of procedural environment which help enhancing the capacity as well as safety of the airspace. However, one needed direct controller pilot communication (DCPC-voice) through VHF to provide the surveillance-based separation described in PANS-ATM (Doc 4444). Although the states could provide surveillance and VHF network over continental airspace and some portion of oceanic it was not possible to have surveillance over high seas till the advent of technology like Space Based ADS-B. Secondly even if surveillance could be provided, DCPC voice was not available for provision of surveillance separation. There was no separation defined using surveillance system and CPDLC. The new separation in Doc 4444 para 8.7.4 provides such a separation.

The Separation

2.2 These separation minima specified in 8.7.4 shall only be applied between identified aircraft when there is reasonable assurance that identification will be maintained can be applied between identified aircraft pairs only.

2.3 The Note 4. in para 8.7.4 says — Application of the separation minima in 8.7.4.2, 8.7.4.3 and 8.7.4.4 includes elements of both procedural control and ATS surveillance services; refer to Annex 1 — Personnel Licensing for applicable air traffic controller rating requirements.

2.4 As per para 8.7.4.1 Where direct controller-pilot VHF voice communications are not available, separation minima described in 8.7.4.2, 8.7.4.3 and 8.7.4.4 may be applied utilizing positioning information derived from an ATS surveillance system, provided the following requirements are met:

- a) *a navigational performance of RNP 4 or RNP 2 shall be prescribed;*
- b) *the communication system shall satisfy RCP 240;*
- c) *an alternate means of communication shall be available so as to allow the controller to intervene and resolve a conflict within a total time of nine minutes, should the normal means of communication fail; and*

Note.— The total time specified in c) includes the four minutes allocated to RCP 240.

- d) route conformance monitoring shall be ensured by the use of ATS surveillance system lateral deviation alerts with a warning threshold normally set at a maximum 3.0 NM.
 - 1) *Warning thresholds greater than 5.6 km (3.0 NM) may be set, provided the lateral separation minima in 8.7.4.2 a) and 8.7.4.3 are increased by 1.9 km (1.0 NM) for each 1.9 km (1.0 NM) that the warning threshold is increased; and*
 - 2) *ATS surveillance systems shall provide for the display of alerts in a clear and distinct manner to enable immediate action by the controller in the event of a lateral deviation.*

8.7.4.2 Unless otherwise prescribed in accordance with 8.7.4.3 and 8.7.4.4, the separation minima shall be:

- a) *35.2 km (19.0 NM) lateral spacing between parallel or non-intersecting tracks;*
- b) *35.2 km (19.0 NM) lateral separation of aircraft operating on intersecting tracks applied in accordance with 5.4.2.1.5 a) and b);*
- c) *31.5 km (17.0 NM) longitudinal separation of aircraft operating on same tracks or crossing tracks applied in accordance with 5.4.2.9.5 provided that the relative angle between the tracks is less than 90 degrees; and*
- d) *opposite direction aircraft on reciprocal tracks may be cleared to climb or descend to or through the levels occupied by another aircraft, provided that surveillance position reports have been received from both aircraft demonstrating the aircraft have passed each other by 9.3 km (5.0 NM).*

8.7.4.3 The separation minimum in 8.7.4.2 a) may, if so prescribed by the appropriate ATS authority, be reduced, but not below 27.8 km (15.0 NM), provided either:

- a) *the density of traffic in the airspace, as measured by occupancy, is less than 0.6; or*
- b) *the proportion of total flight time spent by aircraft off the cleared track does not exceed*

the following:

1) for aircraft deviating 13.0 km (7.0 NM) or more off the cleared track, 3×10^{-5} per flight hour; and

2) for aircraft deviating 20.4 km (11.0 NM) or more off the cleared track, 1×10^{-5} per flight hour.

8.7.4.4 The separation minimum in 8.7.4.2 c) may be reduced to 26 km (14 NM), provided that the relative angle between the tracks is less than 45 degrees.

8.7.4.5 Vectoring shall not be used in the application of these separation minima.

The Plan

2.5 India is planning to go for a trial of 20NM longitudinal separation based on above criteria between eligible pairs of aircraft on routes L301 and L639 in Mumbai FIR. Depending on the success of the trial and lesson learnt it can be extended to other routes and Kolkata and Chennai FIR.

2.6 Initially other RNP10 approved aircraft shall also be allowed but at a later stage the principle of “Better Equipped- Better Served” principle may be applied.

2.7 An analysis showed that on the two routes, the CPDLC equipped aircraft are 68% only.

FIR	Fleet Equipage of Aircraft in Oceanic Airspace			
	ADS-C/CPDLC (%)	RNP10 (%)	RNP4 (%)	RNP2 (%)
MUMBAI	58.25	99.28	70.21	60.82
CHENNAI	64.97/55.54	95.26	64.356	51.08
KOLKATA	71.81	95.72	77.23	66.45

2.8 It is felt that a mandate may be required for implementation of reduced separation in oceanic airspace.

Flight Equipage of Aircraft in Oceanic Airspace	RNP4	RNP2	CPDLC	RNP4+CPDLC	RNP2+CPDLC
MUMBAI(L301/L639)	68.81%	52.59%	54.52%	53.64%	38.25%

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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