International Civil Aviation Organization

Eleventh Meeting of the Air Traffic Management Sub-Group (ATM/SG/11) of APANPIRG

Singapore, 2 – 6 October 2023

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

FLEET EQUIPAGE IN OCEANIC AIRSPACE

(Presented by India)

SUMMARY

This paper presents the analysis of fleet equipage in the Oceanic Airspace of Flight Information Regions of India and focuses on impediment for implementation of reduced separation in oceanic airspace.

1. INTRODUCTION

1.1 Fleet equipage plays an important part in Air Traffic Management and capacity development in a volume of airspace. While in continental airspace it is easier to reduce separation standard by improving surveillance and communication network, it is difficult to do so in oceanic airspace as the surveillance and communication facility is limited. For reduction of separation in oceanic airspace or establishment of more efficient RNP routes, the fleet equipage is essential. This paper tries to analyze the fleet equipage in the oceanic airspace of FIRs of India.

2. DISCUSSION

Oceanic Airspace of FIRs of India

2.1 ICAO has delegated India to provide Air Traffic Services in oceanic airspace over Bay of Bengal, Arabian Sea and Indian Ocean. These airspaces are distributed within Kolkata, Chennai and Mumbai FIR. Some major routes pass over these region connecting South East Asia with middle east and Europe. The air traffic growth in the APAC region is quite high and these routes are saturated during peak traffic hours demanding enhancement of capacity and efficiency while maintaining safety. This can be achieved by implementation of reduced separation and/or transitioning from RNP10 to more efficient RNP 4 or RNP 2 routes requiring less spacing.

Separation Standards

2.2 Presently in oceanic airspace the routes are RNP 10 requiring 50NM spacing. The minimum longitudinal separation used is 50NM based on position report through CPDLS every 24 minutes as provided in PAN ATM (Doc 4444). Any reduction in separation less than 50NM requires the following conditions of navigational specifications and PBCS compliance as can be seen in the following table.

Separation minima	*RNP*	*RCP*	*RSP*	*Maximum ADS-C periodic reporting interval*
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
37 km (20 NM)	2 or 4	240	180	192 seconds (3.2 minutes)
5 minutes	2 or 4 or 10	240	180	14 minutes

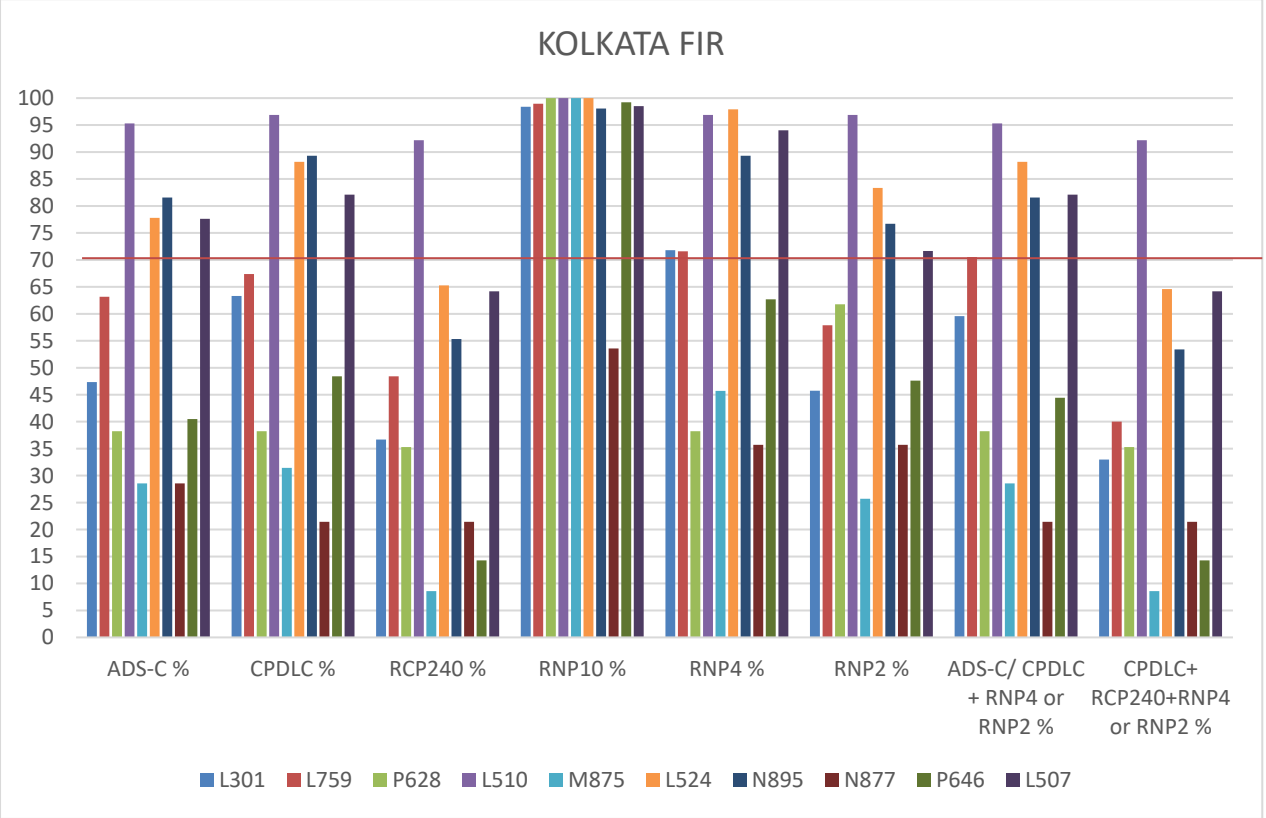
Even with provision surveillance service where VHF is not available (PAN ATM- Doc 4444 Section 8.7.4) which can be provided using space based ADS-B and CPDLC requires aircraft to fulfill the navigation specification and PBCS compliance amongst other condition.

Fleet Equipage in oceanic airspace of Indian FIRs

2.3 Data, based on flight plans were collected in Kolkata, Chennai and Mumbai FIR to know the fleet equipage for capacity building and better efficiency. The findings are produced below.

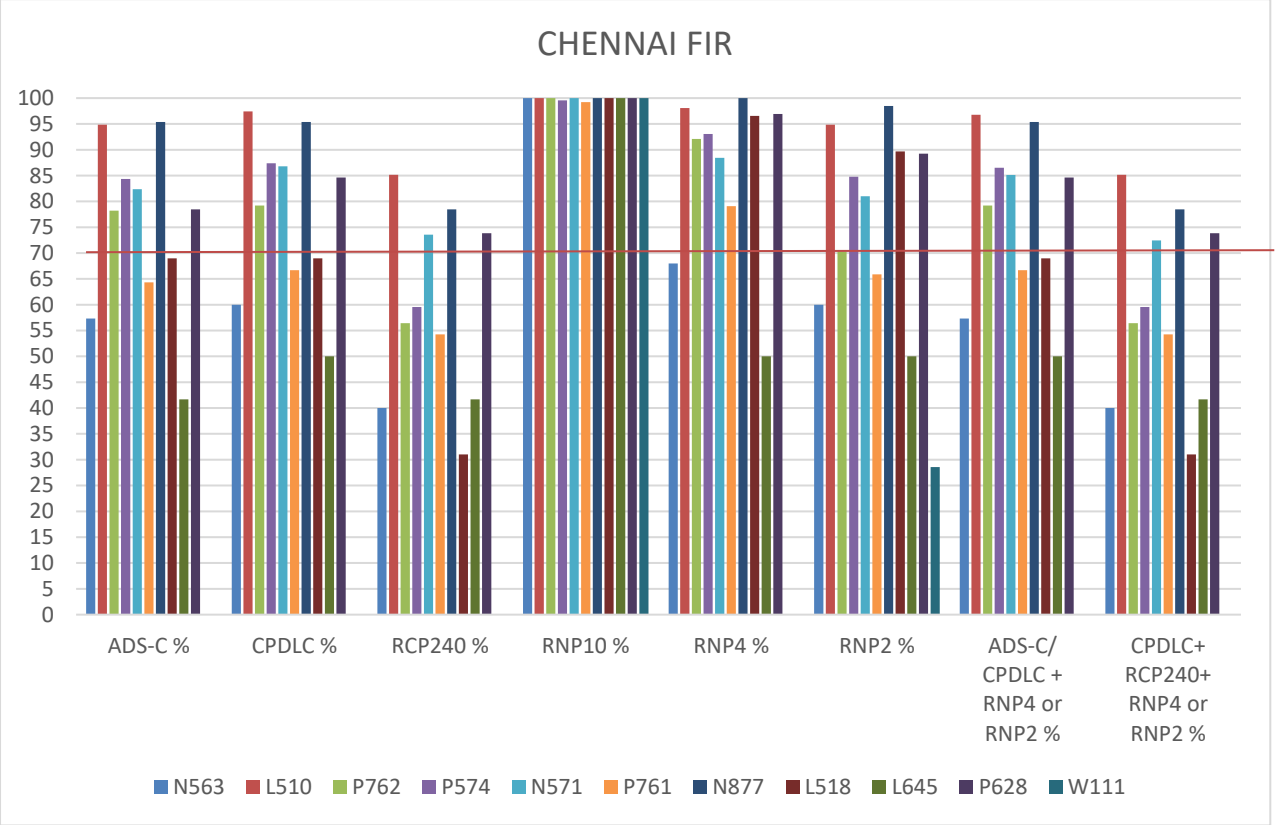
KOLKATA FIR

ROUTES	ADS-C %	CPDLC %	RCP240 %	RNP10 %	RNP4 %	RNP2 %	ADS-C/ CPDLC + RNP4 or RNP2 %	CPDLC+ RCP240+RNP4 or RNP2 %
L301	47.34	63.30	36.70	98.40	71.81	45.74	59.57	32.98
L759	63.16	67.37	48.42	98.95	71.58	57.89	70.53	40.00
P628	38.24	38.24	35.29	100.00	38.24	61.76	38.24	35.29
L510	95.31	96.88	92.19	100.00	96.88	96.88	95.31	92.19
M875	28.57	31.43	8.57	100.00	45.71	25.71	28.57	8.57
L524	77.78	88.19	65.28	100.00	97.92	83.33	88.19	64.58
N895	81.55	89.32	55.34	98.06	89.32	76.70	81.55	53.40
N877	28.57	21.43	21.43	53.57	35.71	35.71	21.43	21.43
P646	40.48	48.41	14.29	99.21	62.70	47.62	44.44	14.29
L507	77.61	82.09	64.18	98.51	94.03	71.64	82.09	64.18



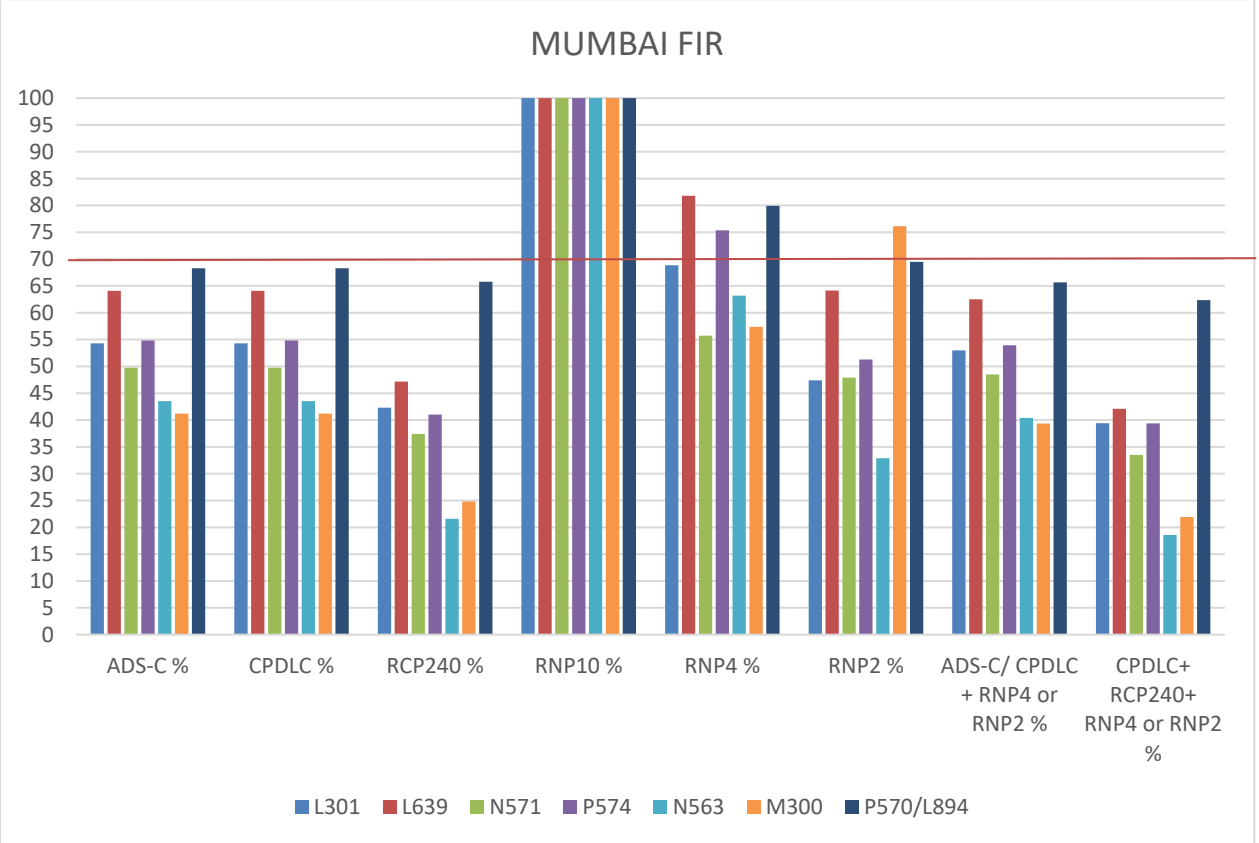
CHENNAI FIR

ROUTES	ADS-C %	CPDLC %	RCP240 %	RNP10 %	RNP4 %	RNP2 %	ADS-C/ CPDLC + RNP4 or RNP2 %	CPDLC+ RCP240+ RNP4 or RNP2 %
N563	57.33	60.00	40.00	100.00	68.00	60.00	57.33	40.00
L510	94.84	97.42	85.16	100.00	98.06	94.84	96.77	85.16
P762	78.22	79.21	56.44	100.00	92.08	70.30	79.21	56.44
P574	84.35	87.39	59.57	99.57	93.04	84.78	86.52	59.57
N571	82.37	86.78	73.55	100.00	88.43	80.99	85.12	72.45
P761	64.34	66.67	54.26	99.22	79.07	65.89	66.67	54.26
N877	95.38	95.38	78.46	100.00	100.00	98.46	95.38	78.46
L518	68.97	68.97	31.03	100.00	96.55	89.66	68.97	31.03
L645	41.67	50.00	41.67	100.00	50.00	50.00	50.00	41.67
P628	78.46	84.62	73.85	100.00	96.92	89.23	84.62	73.85
W111	0.00	0.00	0.00	100.00	0.00	28.57	0.00	0.00



MUMBAI FIR

ROUTES	ADS-C %	CPDLC %	RCP240 %	RNP10 %	RNP4 %	RNP2 %	ADS-C/ CPDLC + RNP4 or RNP2 %	CPDLC+ RCP240+RNP 4 or RNP2 %
L301	54.29	54.29	42.3	100	68.86	47.39	52.99	39.4
L639	64.08	64.08	47.15	100	81.81	64.14	62.49	42.1
N571	49.76	49.76	37.41	100	55.73	47.91	48.51	33.51
P574	54.82	54.82	41.02	100	75.35	51.29	53.94	39.38
N563	43.52	43.52	21.59	100	63.19	32.86	40.38	18.59
M300	41.19	41.19	24.81	100	57.37	76.12	39.36	21.92
P570/L894	68.28	68.28	65.78	100	79.93	69.49	65.66	62.35



2.4 It may be seen that the fleet equipage for application of reduced separation is quite low. Therefore, it is felt that states should advise airlines to equip their aircraft with ADS-C/ CPDLC and get RNP4/RNP2 and RCP 240 operational approvals. It is also felt that for capacity building in oceanic airspace some kind of mandate will be required.

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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