



International Civil Aviation Organization

The Twelfth Meeting of the FANS Implementation Team, Bay of Bengal (FIT-BOB/12) and the Second Meeting of the Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF/2)

Bangkok, Thailand, 22– 26 February 2010

Agenda Item 3: Operational Issues

INDIA'S PROGRESS TOWARDS IMPLEMENTATION OF BOB-RHS

(Presented by India)

SUMMARY

This working paper presents the progress made towards implementation of BOB-RHS and the various factors relevant in the implementation process.

1. Introduction

1.1 The first meeting of Reduced Horizontal Separation Task Force had set the agenda for a phased programme to implement Reduced Horizontal Separation in Bay of Bengal area and Mumbai FIR. It was decided to implement widespread 50NM longitudinal separation using CPDLC communications in the Bay of Bengal and the Mumbai FIR in the first phase.

1.2 It was also decided that only one ATS route, N571 should be used for initial implementation of DCPC CPDLC and 50NM longitudinal separation. This route traverses the Kuala Lumpur, Chennai and Mumbai FIRs through to Muscat FIR.

1.3 The purpose of the working paper is to give summary of tasks accomplished so far in India and list some issues noticed in this period.

2. Participation by Airlines

2.1 The number of airlines using ADS/CPDLC services in India which is currently around 27. The percentage of aircraft using ADS/CPDLC in Mumbai FIR is 40% and in Chennai FIR is 52% and in Kolkata FIR is 60%. There is no significant increase in the number of FANS 1 A aircraft in comparison to previous years.

2.2 The data link services are provided on 12 international routes, Over the Bay of Bengal within Chennai FIR i.e. routes N877, L510, P628, L759, N571, N563, P762, P574, L896, N564, P761 & L645

2.3 The data link services are provided on 15 international routes over Arabian Sea and Indian Ocean i.e. routes M638, P518, L301, N571, P574, N563, M300, P570, R456, G465, A451, A474, A214, B459, G450, and G424.

3. Data collection and analysis

3.1 Chennai and Mumbai have collected data for the month of December 2009 and submitted to BOB CAT management team for analysis. An additional data for ten days for the month of February for the route N571 has also been collected by Chennai. Efforts are being made to establish the mechanism and procedures for automatic data collection by including the ATFMU address (VTBBZDZX) for all the appropriate flight plan and estimate messages.

3.2 In addition the monthly data on flights using the N571 route and the FANS 1A equipped aircraft has also been collected and analysed. The statistics are shown in Table 1 & 2. Only fifty percent of the aircraft are CPDLC equipped. The low percentage of FANS 1A equipage is a matter of concern. In the light of this the implementation RHS at all the flight levels may have to be reconsidered.

3.3 *Traffic sample data submitted by Mumbai and Chennai FIR*

TABLE 1

Mumbai	All routes in Mumbai FIR	December 2009	33353ATMs
Mumbai	N571	24 th Dec to 30 th Dec 09	436 ATMs
Chennai	N571, P628	1 st Feb to 10 th Feb 10	784 ATMs
Chennai	N571, P628, N877, L510 routes in Chennai FIR	December 2009	2600 ATMs

3.4 *Traffic sample data on ATS (RNP10) route N571 in Mumbai FIR*

TABLE 2

Month	Overflights	Arrivals	Departures	Total	No. of CPDLC equipped A/c	Percentage
Aug 09	1204	178	180	1562	795	51
Sep 09	1146	167	372	1685	825	49
Oct 09	1234	204	200	1638	788	48
Nov 09	1230	215	479	1924	964	50
Dec 09	1326	155	568	2049	1001	48
Jan 09	1342	145	542	2029	1021	50

3.5 *Traffic sample data on ATS (RNP10) routes N571/N877/P628 in Chennai FIR*

3.5.1 The traffic data analysis has been made taking into consideration those flights which were operating on ATS routes P628, N571 and N877. The traffic sample data considered for the traffic analysis was around 2600 flights operated in the month of December 2009 out of which the east bound flights were 1250 and no. of west bound flights were 1350. Apart from the TSD for December, 2009 some more TSD pertaining to those flights which operated in the first ten days of the month of February has also been included for the Study.

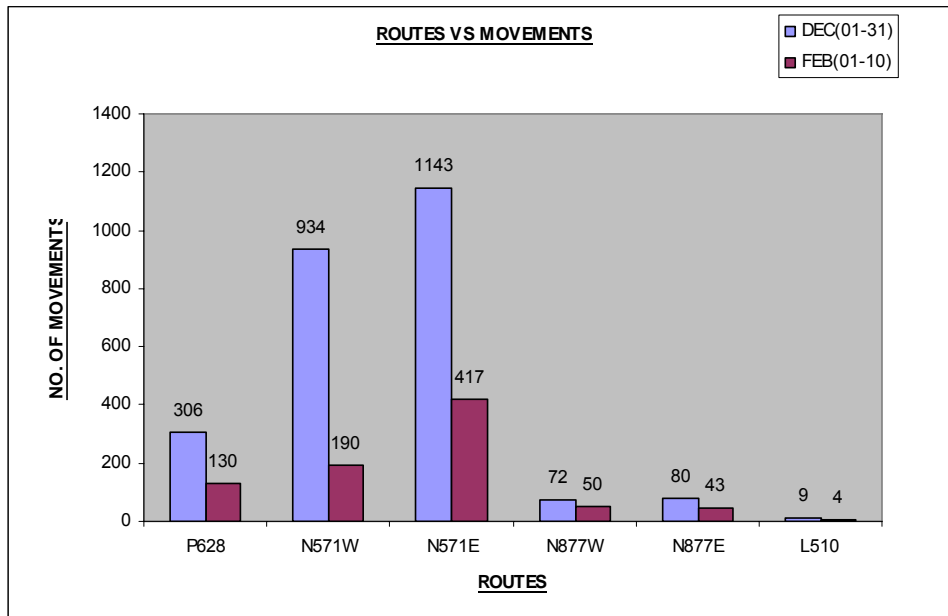


FIG -1 ROUTE WISE TRAFFIC DATA

3.5.2

Traffic sample data for the month of February 2010 from 01st to 10th.

TABLE – 3

DAYS \ ROUTES	FEBRUARY									
	01	02	03	04	05	06	07	08	09	10
P628*	15	12	14	19	15	16	5	9	13	11
N571 E	42	39	38	43	53	46	32	44	38	40
N571 W	16	18	19	19	29	19	18	19	18	21
N877 E	05	04	02	03	01	05	04	07	07	04
N877 W	04	05	02	05	06	07	02	04	03	02
Total	85	78	75	89	95	93	61	83	80	78
FANS 1 A aircraft	40	37	36	41	44	42	28	38	35	39

* - ATS ROUTE P628 is unidirectional (westbound).

3.5.3

On an average about 10% of the flights equipped with ADS/CPDLC do not log on to the ADS/CPDLC system. Thus only 45 to 50 % of the flights operating in Chennai FIR are provided with data link services.

4 Operational issues pertaining to Chennai FIR

4.1 **LATERAL DEVIATION BY AIRCRAFT ON RNP10 ROUTES OVER BAY OF BENGAL DURING NORTH-EAST MONSOON**

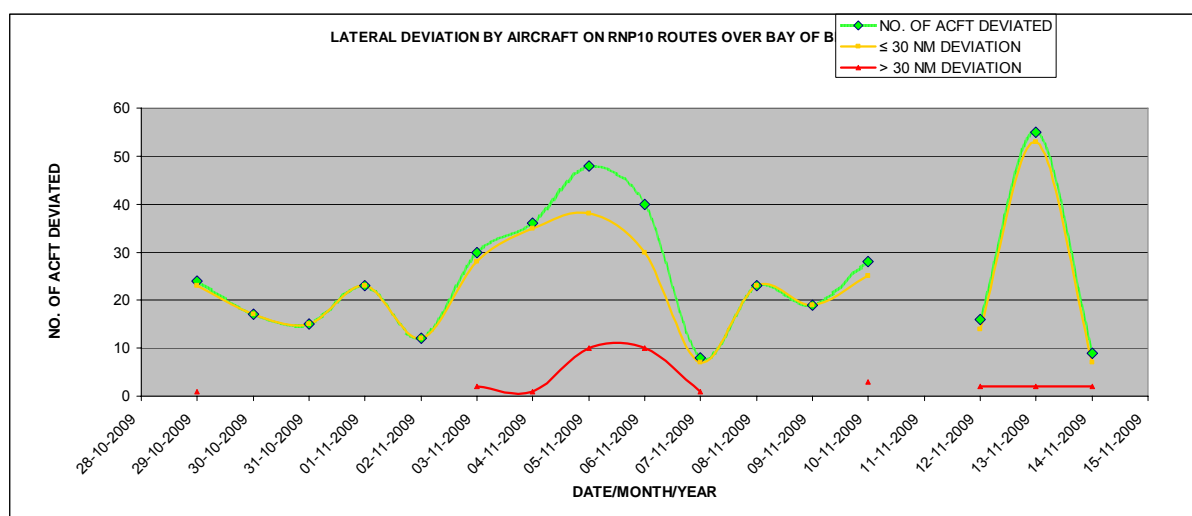


FIG – 2

4.1.1 As indicated in Fig-2, there were many lateral deviations by aircraft operating on RNP10 routes over Bay of Bengal within Chennai FIR during the North East monsoon in the year 2009. The extent of deviation by the aircraft varied from 10 Nm to 60 Nm during the above period. No. of aircraft deviated more than 30 Nm from the intended track which comes around 34 aircraft within a span of 15 days. A suitable contingency plan needs to be worked out in coordination with adjacent centres to resolve the problems which may arise due to weather deviation during the monsoon season.

4.1.2 **WEATHER REPORT OVER BOB:**

Pulsatory model North-east monsoon was active since October 2009 and it continued to prevail over Bay of Bengal until the early week of January 2010.

4.2 **Convergence of ATS routes N571 and N877 & Crossing route – P762**

4.2.1 **Points to be discussed while selecting N571 as an exclusive route for FANS 1-A aircraft since traffic on the following RNP 10 ATS routes would be affected,**

4.2.1.1 N877 (RNP 10), being a converging/diverging route with N571 over common way point LAGOG,

4.2.1.2 P762 (RNP 10), being a crossing route with N571 over common way point BIKEN. Presently F290 has been allocated as a No PDC level.

4.2.1.3 P761 (RNP 10), being a crossing route with N571 route over common way point IDASO.

4.2.1.4 B466W being a converging/diverging route with N571 over common way point DORAM.

COMMON WAY POINT – IDASO (N571 & P761)
Proposed alternate route for N877 East-bound
(N877 - VVZ – L301 – DOGEM – L510)

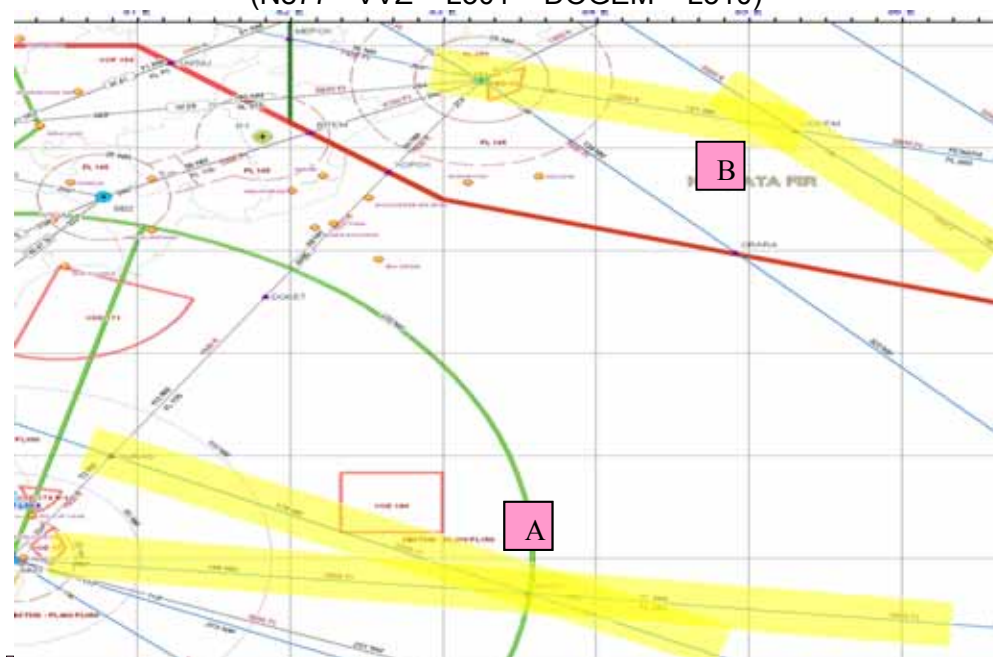


FIG-5

4.2.1 IMPLEMENTATION OF RHS ON ATS ROUTE N571 WITH LEVEL BAND RESTRICTION

4.2.2.1 If a specific level band is provided for exclusive ADS/CPDLC operations on N571 route, operations on ATS (RNP 10) routes P762, N877 and P761 can be made possible below and above the specified level band.

4.2.2.2 The specific level band will also make possible the operations of non ADS/CPDLC equipped aircraft on N571.

4.2.2.3 To decide whether to have N877 as an integral part of N571 for the purpose of implementing RHS between way points IGOGU and LAGOG, the following points may be considered

4.2.2.3.1 If N877 is declared as unidirectional route (for West bound operations) between LAGOG and VVZ, it may facilitate FANS 1 A & non FANS 1 A aircraft to operate on N571 upto LAGOG. Thereafter Chennai OCC will be in position to release the aircraft to Calcutta FIR by giving alternate level since the traffic density is very low on N877(W) (Refer Fig-1 & Table-1).

4.2.2.3.2 Action mentioned in para (a) would be possible by Chennai OCC since VHF communication coverage is available between way points between SADAP and DOTEN on N877 to climb or descend the west bound non FANS 1 A aircraft.

4.2.2.3.3 Non FANS 1 A east bound aircraft on N877 already flying at the required optimum flight level so long until SADAP will be deprived of its level occupancy and is required to fly either below or above the specified level band of N571.

4.2.2.3.4 Alternatively, East-bound aircraft on N877 may fly after VVZ via L301-DOGEM to join the exclusive East bound route L510, where the traffic flow is low (Refer Fig-1 & Table-1).

5. Central Reporting Agency (CRA)

5.1 Boeing assistance to India on Bench-testing of ADS/CPDLC equipage

5.1.1 Three tests were conducted earlier for Mumbai System by Boeing Company from the test bench of B787 and one test was conducted for Chennai system by Airbus Company from the test bench of A380 equipment. The message exchange was satisfactory. Subsequently, as a pre requisite for the implementation of Reduced horizontal separation(50 Nm longitudinal separation over Bay of Bengal and Arabian sea within Mumbai FIR.) Chennai and Mumbai Oceanic Control Centres participated in the Bench test conducted on 3rd, 10th and 17th, February, 2010 by Boeing Company, Seattle.

5.1.2 The exchange of CPDLC messages and functioning of ADS contracts of both the systems is satisfactory. Some minor issues have been identified and are being addressed. A problem each has been identified in Mumbai and Chennai systems in the data link hand offs. The problems are being addressed. More such tests can be conducted after that to ascertain the preparedness of the systems for RHS.

5.1.3 The CRA Report of Boeing/IATA on analysis of the ADS/CPDLC data is still awaited although FANS-1A problem reports are regularly being sent by India. It would be appropriate to examine the findings of CRA reports also in conjunction with the bench test reports.

5.2 The following Problems identified on ADS/CPDLC ground system during ATS INTEROPERABILITY TEST

5.2.1 Chennai ground system

5.2.1.1 Transfer of control with Mumbai ATS unit on data link for aircraft call sign with 7 characters was not successful.

5.2.1.2 Default setting for lateral and vertical deviation did not trigger any event change and the values incorporated in the ground system is not being acknowledged by the aircraft in the event contract.

5.2.2 Mumbai ground system

5.2.2.1 Whenever End Service message (no.161) is uplinked, the error message (no.159) is also uplinked automatically. The system engineers are working to resolve this problem.

5.2.3 Suitable action is being taken to rectify the above problems.

5.2.4 Boeing may also consider similar ADS/CPDLC interoperability test procedures with Chennai and Kuala-Lumpur ATC centres to have seamless surveillance & datalink communication on ADS/CPDLC.

6. Direct Controller & Pilot Communication (DCPC) in Indian FIRS

6.1 The selected exchange of datalink messages between Chennai, Mumbai and the virtual aircraft during the benchtest was found satisfactory.

6.2 The time element taken to receive replies from two or more aircraft was generally within 2 minutes.

6.3 RCAG VHF 126.15 MHz is working satisfactorily as primary back up frequency for CPDLC on routes P762 (between LULDA and BIKEN), N571 (between LAGOG and BIKEN), P628 (between IGREX and VATLA) and N877 (Between LAGOG and ORARA) over Bay of Bengal within Chennai FIR.

7. Establishment of EMA

The process for establishment of EMA is in progress.

8. ACTION BY THE MEETING

The meeting is invited to:

8.1 Note the

- success of the tests of ADS/CPDLC using Boeing test bench,
- progress made for data collection,

8.2 Identify the ATS routes with the level band to introduce RHS (50Nm longitudinal separation) to improve the performance for ANSPs and airlines;

8.3 Formulate a suitable contingency plan to combat weather deviations during North east monsoon over Bay of Bengal.

8.4 Provide an update on CPDLC implementation programme of adjacent States like Malaysia, Indonesia, Sri Lanka etc.

8.5 Note the low percentage of CPDLC equipped aircraft flying on N571 and request IATA to encourage participation of more CPDLC equipped aircraft on this route.

8.6 Formulate the requirements and methodology of additional data collection required for this project and finalize the draft letter of agreement.

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