



*International Civil Aviation Organization*

**The Thirteenth Meeting of the FANS Implementation Team for the Bay of Bengal (FIT-BOB/13) and the Fifth Meeting of the Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF/5)**

Bangkok, Thailand, 07 – 11 February 2011

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**Agenda Item 2: Review Outcomes of Related Meetings**

**SUMMARY OF OUTCOMES OF THE BOB-RHS/TF/4 MEETING**

(Presented by the Secretariat)

**SUMMARY**

The purpose of this working paper is to provide the meeting with a summary of the work accomplished at the BOB-RHS/TF/4 meeting, which were held at the ICAO Regional Office in Bangkok on 18 to 22 October 2010.

**1. INTRODUCTION**

1.1 There was no specific FITBOB meeting held in conjunction with the BOBRHS/TF/4 meeting. Nevertheless, there were some FITBOB matters of interest which were brought to the attention of data specialists present at the BOB-RHS meeting.

1.2 These discussions are also expected to be raised during the FITBOB/13 meeting.

**2. DISCUSSION**

Operational Issues

Progress Report on ADS-C/CPDLC Implementation in the Kuala Lumpur FIR

2.1 Malaysia advised that the ADS/CPDLC system underwent software updates and upgrades for the purpose of customizing some of the application according to ATC needs, which was completed on 7 May 2010. A limited time trial was conducted from 1500-1900UTC daily. This trial period was successful, according to the specifications, and solved many of the issues faced earlier.

2.2 The data analysis indicated that the system was in compliance with the FANS 1/A Operation Manual Document as stated in the contract between DCA Malaysia and the supplier.

2.3 An ADS/CPDLC GOLD interoperability bench test with the Boeing Laboratory, Kuala Lumpur and Chennai ACC was performed on 7 October 2010. The main purpose of this bench test for Malaysia was to test the Next Data Authority (NDA) and Current Data Authority (CDA) features that were installed during the previous upgrade. The operation was a successful bench test even though several new problems arose that required follow-up action. The log data was sent to Boeing Lab for analysis and comment.

2.4 Kuala Lumpur (KL) ACC commenced 24-hour operational trials commencing on 11 October 2010. The purpose of the trial was to collect additional information on the System's stability and reliability, as well as to collect additional data for analysis to ensure that the results comply with the GOLD document.

*ADS-C/CPDLC Training*

2.5 All training requirements were expected to be completed by 29 October 2010. Once completed, the Reduced Horizontal Separation (50/50NM) training course will commence with the target date for completion being 31 January 2011.

*ADS-C/CPDLC Notification Procedures*

2.6 An Aeronautical Information Circular (AIC 03/2008) was published for ADS/CPDLC operational trials in the KL FIR. When closer to Full Operational Status of the system, an AIP Supplement and NOTAM was planned to be published.

Ongoing Initiatives in CNS Activities within the Yangon FIR

2.7 The meeting noted that Myanmar has been steadily upgrading their capabilities in providing an efficient service to aircraft transiting the Yangon FIR, which will enhance ATM services in their area of responsibility.

*CNS/ATM Stand-alone Workstations*

2.8 Myanmar invested in the purchase of a CNS/ATM workstation, which had the ability to provide an ADS-C/CPDLC service to aircraft equipped with FANS 1/A equipment.

2.9 It was recognized that, to gain the most effective benefits from this workstation, there would first be a requirement to move the equipment so that it could be used by the controller responsible for the oceanic area within Yangon FIR. This has now been accomplished and trials of the equipment have been regularly held with selected airlines during their flights through the Yangon FIR.

2.10 Myanmar expressed their appreciation to the airlines involved in these tests. In addition, Myanmar requested IATA to coordinate with other airlines equipped with FANS 1/A to take part in ADS/CPDLC trials so as to evaluate the equipment under normal traffic load conditions.

2.11 The meeting was advised that Myanmar wished to be considered for inclusion in the Phase 1 implementation plan, which includes RNAV route P762 passing through their oceanic airspace. Recognizing the importance and benefits gained by using the CNS/ATM workstation, Myanmar advised that they were ready to provide this service along this RNAV route within their designated airspace. Data was collected over a 15-day period specifically for P762 and will be used along with other data in the safety assessment process.

*Involvement of neighbouring FIRs during the testing period*

2.12 It was suggested by Myanmar that, during this testing of CPDLC equipment and procedures within the Yangon FIR, other adjacent Area Control Centres may wish to join with Myanmar in evaluating their CPDLC and possibly ADS-C facilities during an agreed time period. This would not only be of benefit to the overall performance evaluation required in the safety assessment, but will also allow valuable training to other ACC staff, airlines and crew who may be new to data-link procedures.

2.13 With regard to Phase 2 of the 50NM longitudinal separation implementation process in the Bay of Bengal, Arabian Sea and Kabul FIR, the majority of other RNAV routes will be upgraded to 50NM separation. Myanmar has commenced a course of action to integrate a new ADS-C/CPDLC system into their ACC displays at the Yangon ACC. This will allow all of the Yangon FIR to operate in a data-link environment where it was necessary to do so. The timeline for implementation of this integrated system is planned for the second half of 2011.

2.14 IATA advised that there is presently IATA In-Flight Broadcast Procedures (IFBP) in place within the Yangon FIR, which requires aircraft to maintain watch on a pre-defined VHF frequency with one another due to marginal air ground communications within the Yangon FIR. Nevertheless, with the positive news conveyed by Myanmar, it is expected that these procedures could be removed as communication issues are resolved.

#### Kabul ACC Status Report

2.15 The meeting noted that the current communications system throughout Afghanistan complies with the requirement for DCPC. Furthermore, there are ongoing efforts to develop a more robust system of communications by installing additional Very Small Aperture Terminal (VSAT) communications capabilities. There were efforts by Germany as well as contributions from Australia to initiate a multi-lateration surveillance system for the country.

2.16 The meeting was advised that, while overall numbers of commercial traffic had increased, the primary mission of the Kabul ACC and ATC services in Afghanistan was to support the coalition forces in Afghanistan. Some of this priority support affects the overflight traffic to and from the South Asia sub-region. However, it was stated that Kabul ACC uses all resources and capabilities at its disposal to minimize adverse effects on civil operations, but there were always going to be constraints while military operations continued.

2.17 It was noted that the Kabul ACC was ready to initiate reduced longitudinal separation in concert with other States to 50NM along the major traffic flow through Afghanistan airspace. These new separation standards will need final approval by the Afghanistan Airspace Control Authority in coordination with the Ministry of Transportation and Civil Aviation prior to implementation. There were no anticipated delays in receiving approval.

2.18 Finally, the meeting observed that the Kabul ACC is waiting for the implementation of the new route between SAMAR and LAJAK. This parallel route will alleviate converging traffic issues with eastbound flight into Pakistan, as well as provide some relief at the SITAX waypoint for westbound traffic exiting Pakistan and entering the Kabul FIR.

#### ATFM/BOBCAT Operations based on 50 NM Longitudinal Spacing

2.19 With the proposed implementation of RNAV RNP10 longitudinal spacing of 50NM across the Bay of Bengal, as well as the introduction of 50NM longitudinal separation within the Kabul FIR on the major transiting routes, there was an opportunity to decrease the spacing presently used by the BOBCAT system to take advantage of the new procedures.

#### *Phased Approach to introduction of 50NM Spacing*

2.20 Because of the phased approach in the implementation of 50NM, only two of the routes (P628 and L333) crossing the Kabul FIR would be affected in Phase One. It would therefore require a step-by-step approach in changes to the BOBCAT computer system. In addition, for uniformity, aircraft using these two routes in an eastbound direction could also be longitudinally spaced at 50NM.

*Coordination arrangements with other States*

2.21 Coordination will be required with States bordering Kabul FIR such as I.R. Iran to the West and eventually other States to the North when planning to introduce 50NM longitudinal spacing in this area. It is anticipated that there should be little difficulty in the change due to the use of en-route radar procedures. APAC Regional Office will follow-up on the status of I.R. Iran ATS surveillance capability.

2.22 The meeting noted that, for aircraft operating out of Mumbai proceeding through the Kabul FIR via B466 SERKA – PAROD and ASLUM G792 – PAROD, longitudinal spacing could also be reduced to 50NM, taking into account the present arrangements between Kabul and Karachi ACCs.

*BOBCAT configuration for 50 NM longitudinal spacing in the Kabul FIR for Phase 1 of BOB-RHS*

2.23 With the proposed phased implementation of RNP10 longitudinal spacing of 50NM across the Bay of Bengal, as well as the introduction of 50NM longitudinal separation within the Kabul FIR on these transit routes, it was agreed that there was an opportunity to decrease the present spacing parameters used by the BOBCAT system. The BOBCAT system would be able to be modified to 12 minutes spacing, a saving in time of 3 minutes.

2.24 It was also agreed that AIP Supplement or NOTAM should be distributed to all involved, ahead of the implementation time in accordance with ICAO procedures. This was to ensure a smooth transition to a phased 50NM spacing within the Kabul FIR.

2.25 In the second phase of 50NM separation, it is envisaged that all other routes feeding into the Kabul FIR would be involved. This would in effect enable BOBCAT waypoint spacing configuration to then be applied to all major transit routes.

2.26 The meeting also noted that ATS arrangement at Dhera Ismail Khan (DI) may change in the near future when a route linking SAMAR – LAJAK is established within the Lahore FIR. This positive change would enable parallel traffic flows from GUGAL (M875) to DI PAVLO (entry point for N644) and SAMAR to LAJAK (entry point for A466 via MURAD to be completely separated. At present all aircraft proceeding on either N644 or A466 through the Kabul FIR are required to use a single route to DI, then diverge to meet their respective entry points into the Kabul FIR. In such a case, a new proposed BOBCAT waypoint spacing configuration could be applied.

*Datalink and ADIZ Procedures*

2.27 It was noted that the increased availability of datalink should be considered with respect to communication requirements associated with Air Defence Identification Zone (ADIZ) requirements. Most ADIZ procedures were written when voice was the only viable means of communication.

*Data Link Environment of the Bay of Bengal and Arabian Sea*

2.28 IATA presented a summary of data collected from Emirates Airline during the period 1 Sep – 15 Sep 2010. The data comprised 86 reports and was presented as a summary as well as being detailed by FIR. The data indicates that while issues do remain, there has been a substantial improvement in datalink quality.

### Route Enhancements

2.29 IATA noted that with the absence of a Bay of Bengal ATS Coordination Group (BBACG) meeting during 2010, the BOB-RHS meeting was the only ICAO group focused on the Bay of Bengal and the Major Traffic Flow AR-4 (South of the Himalayas). As such these issues are being presented to the BOB-RHS TF to highlight that route enhancements also need to be considered as part of the solution to provide increased efficiencies. For long and ultra-long haul aircraft departing out of Delhi (e.g. VIDP-KEWR) on M875, it can be difficult for aircraft to reach the MEA of F280 (F290 in Lahore) prior to crossing the FIR boundary between Delhi/Lahore.

2.30 Both India and Pakistan confirmed that their Letter of Agreement did not preclude individual coordination being undertaken for these flights leaving or entering the respective FIRs. IATA would provide feedback to the airlines that early notification of the fact that they would still be climbing at the FIR boundary was required.

2.31 It was also noted that there were limitations in the hours of availability of M875 within the Indian FIRs with the route only being available until 2230 UTC.

2.32 India undertook to assess whether an extension in timing was possible and advised that they would coordinate with the appropriate authorities.

2.33 Pakistan advised that discussions with other States continued and they hoped for positive news shortly.

2.34 A route between SAMAR-LAJAK has been under consideration for some time and would provide a much needed link with L509 to the East mainly for aircraft operating to/from Bangkok.

2.35 With regard to the route PRA-SERKA, this route provides a linkage between N877 and UL333. Currently aircraft do not use this route often during BOBCAT hours as the present route structure effectively creates a 45NM penalty dogleg. The availability of a direct route between PRA-SERKA would make this route a viable alternative for traffic operating to Europe.

2.36 An alternative proposal that may be possible would be a realignment of N877 from NNP to TASOP and then a direct route established between TASOP – SERKA. This route avoids all of the Military areas within India airspace but is 15 nm further than the direct route. This may negate the potential of this route at times but recognizing the difficulty of PRA-SERKA implementation, it may be possible as a short-term solution. India and Pakistan agreed to coordinate these proposed route enhancements where appropriate and are requested to advise the status as soon as possible.

### Regional SSR Radar and VHF communications coverage

2.37 Thailand advised the meeting that SSR radar coordinates and theoretical coverage diagram are currently available through States' Aeronautical Information Publication (AIP), namely in section ENR1.6 Radar Services and Procedures. To assist States and international organizations in planning for regional projects, Thailand are willing to produce sub-regional pictorials of the area using Google Charts, which could prove beneficial in the planning process with regard to radar and VHF coverage.

### Implementation of ADS-B

2.38 The meeting was also advised that there were several on-going ADS-B implementations in the region. Once planning stages of these facilities are completed, it would also be beneficial that combined coverage diagram of these ADS-B facilities be put together in a fashion similar to SSR radar and VHF communications coverage.

### Proposed Implementation of RVSM in Russia and Other Central Asian States

2.39 Present transition procedures are required by Pakistan to change from RVSM levels to conventional levels for westbound aircraft entering the Kabul FIR and similarly, from CVSM levels to RVSM levels for eastbound aircraft entering Pakistan airspace from the Kabul FIR.

2.40 A plan has now been established whereby the Russian Federation, along with other present non-RVSM States adjoining or close to Russian airspace, would change to RVSM levels in accordance with agreed ICAO RVSM procedures and flight levels, in accordance with Annex 2, Appendix 3A in November 2011.

2.41 During the planning process for the introduction of RVSM into these FIRs, a safety study by the States concerned would be conducted. In regards to Afghanistan, this safety study was expected to also take into account current military operations.

2.42 Once completed, the offer of additional flight levels transiting the Kabul FIR, together with the proposed introduction of RNAV 10 50NM longitudinal separation on the major routes through this airspace, would enhance operational efficiency to both providers and users of Afghanistan airspace, and would also ease the extensive workload on Pakistan and other service providers adjoining the Kabul FIR.

2.43 When RVSM is introduced, the number of flight levels available will approximately double. Over the past four years of the ATFM/BOBCAT operation, westbound air traffic operating through the Kabul FIR has nearly doubled. Therefore the introduction of RVSM may significantly reduce current delays.

### *ATS Route Designator Changes to RNAV Route Designators*

2.44 To ensure consistency in the use of RNAV route designators, certain ATS routes would require to be changed. These routes cross continental airspace of India and Pakistan, leading into Afghanistan which would be a part of the 50NM longitudinal separation project. As an example, two major routes which should be a consistent RNAV route were as follows:

- a) Extend RNAV route L509 from ASARI to SAMAR – INDEK – HUNGU – LAJAK – MURAD – AMDAR (Kabul/Samarkand FIR Bdy) replacing A466
- b) Extend RNAV route P628 from Rahim Yar Khan (RK) to CHARN (Kabul/Tehran FIR Bdy), replacing G792.

### Safety Analysis and Airspace Monitoring Issues

#### *Bay of Bengal Arabian Sea Monitoring Agency (BOBASMA)*

2.45 This Agency had not yet formally been approved by RASMAG. However, India was currently undertaking traffic sampling tasks as part of the pre-approval process. The 13th Meeting of RASMAG encouraged India to continue their work to develop capabilities, which would enable them to be endorsed as an EMA.

2.46 It was also noted that India's ADS/CPDLC systems have been operational on H24 basis in all their oceanic FIRs. India is also conducting ATS Interoperability test along with the Kuala Lumpur FIR with the Boeing Company through their 'bench testing' facilities.

2.47 Operational LOAs for Monitoring of Aircraft Navigation Errors have been sent by India to all States involved in the requested data collection for their agreement and signature. States were reminded that the services provided by an EMA are to support the implementation and continued safe use of reduced separation minima. However, responsibility of safe implementation and continued operations rest with States, ANSPs and users.

2.48 To assist in moving forward towards Phase 1 implementation without delay, India requested that SEASMA, as a competent airspace safety monitoring organization endorsed by RASMAG, assist in carrying out the necessary safety assessment as an interim arrangement. Singapore agreed to this request for Phase 1 implementation.

#### *Interim Enroute Monitoring Agency Arrangements*

2.49 In view of SEASMA's involvement in the interim period to carry out the necessary safety assessment for Phase 1 implementation of reduced horizontal separation, the meeting agreed to Singapore's proposal to an additional appendix be included in the Gross Navigation Error Letter of Agreement to reflect this arrangement. This appendix will contain the necessary detailed information for the States to refer to in supporting SEASMA to carry out the safety assessment.

2.50 It was also agreed that an operational capability table in a form of a CNS Infrastructure table would also be used to help the Task Force identify gaps along the routes where the reduction of longitudinal separation would not be possible due to lack of communication, navigation or surveillance capabilities. States agreed to update this table with the current information as soon as possible for the Task Force to review when necessary.

2.51 The meeting agreed that in order to support SEASMA to carry out the safety assessment in time for Phase I implementation, States should work towards providing SEASMA all the necessary data and information necessary.

#### *Air Traffic Controller Training for RNP10 – 50NM*

2.52 Singapore gave a PowerPoint Presentation which they have used for air traffic controllers training for reduced separations within the South China Sea. It was considered that this presentation could also be of assistance to Bay of Bengal and Arabian Sea States involved.

#### Data link environment in Indian airspace

2.53 Currently 29 airlines were using ADS/CPDLC services in Indian FIRs. The percentage of aircraft using ADS/CPDLC is 48% in Mumbai FIR, 51% in Chennai FIR and 60% in Kolkata FIR. There has been no significant increase in the number of FANS/1A aircraft using Indian Airspace.

2.54 The meeting noted that Data link services are provided on 12 international routes N877, L510, P628, L759, N571, N563, P762, P574, L896, N564, P761 and L645 passing over the Bay of Bengal in Chennai FIR and on 16 international routes M638, P518, L301, N571, P574, N563, M300, P570, R456, G465, A451, A474, A214, B459, G450 and G424 passing over the Arabian Sea and Indian Ocean in Mumbai FIR.

*ATS interoperability tests by Boeing*

2.55 Boeing has assisted India by conducting Bench-testing of ADS/CPDLC equipage with Chennai and Mumbai ATS centres to identify any problems in the ADS/CPDLC ground system. Problems, such as event report for lateral/vertical deviation and seven letter call sign etc. were identified and are being addressed.

2.56 Similar tests by Boeing were conducted between Chennai and Kolkata ATC centres to ascertain their preparedness. A further test was conducted between Kuala Lumpur ATC and Chennai ATC.

*Update on ADS-C/CPDLC capability in Colombo ACC*

2.57 Sri Lanka provided details of their CNS/ATM Workstation used where necessary on P762 within the Colombo FIR. Sri Lanka advised that they were prepared to participate in further trials with airlines and their adjacent ACCs as well as Boeing, to validate the accuracy of the system. Depending on the result of these trials, Sri Lanka was ready to introduce 50NM longitudinal separations on P762 in Phase 1 of the project.

2.58 It was noted that Sri Lanka had already taken steps to modernise the existing Colombo ACC/FIC with a new fully integrated ATM System (Radar, ADS-C/CPDLC, ADS-B, etc).

*Implementation of distance based separation of RNP routes*

2.59 As a prelude to the implementation of RHS, India advised that they would implement a distance based separation of 80NM on RNP10 routes w.e.f. 1<sup>st</sup> December, 2010. This would enable controllers to gain experience on using distance based longitudinal separation in a FANS 1A environment.

BOBCAT Operational Updates and future enhancements

2.60 The meeting was advised of further proposed updates to the BOBCAT system which will be coordinated with States and international airlines involved.

Establishing Datalink as a Requirement for Operators

2.61 IATA highlighted the possibility of establishing certain portions/routes as datalink exclusive in the future. Noting the ongoing developments in other regions and the basic capabilities of the current fleet, IATA indicated that they could support the establishment of exclusive zones provided the timeline itself was appropriate. IATA suggested that a minimum timeline of 4-5 years would normally be expected to enable appropriate planning and preparations to be completed by airlines. The use of priority handling could also be introduced in the shorter term provided it is introduced in a timely and managed manner.

2.62 The meeting agreed that States should consider the proposal and be prepared to discuss this item in more detail at the next task force meeting

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) Note and comment on the extensive work discussed, and the progress made at the BOB-RHS/TF/4 meeting; and,
- b) Provide ongoing discussions on these and any other new matters to bring Phase 1 of the Project to implementation.

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