INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

REPORT OF THE FOURTH MEETING OF THE BAY OF BENGAL REDUCED HORIZONTAL SEPARATION IMPLEMENTATION TASK FORCE (BOB-RHS/TF/4)

BANGKOK

18 – 22 OCTOBER 2010

The views expressed in this Report should be taken as those of the Task Force and not of the Organization

Published by the ICAO Asia and Pacific Office, Bangkok

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1.1 Introduction

1.1.1 The Fourth Meeting of the Bay of Bengal Reduced Horizontal Separation Implementation Task Force (BOB-RHS/TF/4) was held at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand from 18 to 22 October 2010.

1.2 Attendance

1.2.1 BOB-RHS/TF/4 was attended by 33 participants from Afghanistan, India, Indonesia, Malaysia, Maldives, Myanmar, Pakistan, Singapore, Thailand, United States, IATA, ARINC and BOEING. A complete list of participants is at **Appendix A** to this Report.

1.3 Officers and Secretariat

1.3.1 The meeting was chaired by Mr. Edmund Heng, Deputy Chief of Singapore ATC Centre, CAAS. Mr. John E. Richardson, ATM Expert, ICAO Asia and Pacific Office, acted as Secretary to the Meeting, assisted by Mr. Leonard Wicks, Regional ATM Officer, ICAO Asia and Pacific Office, and Mr. Syed Yousuf Abbas, Regional ATM Officer, ICAO Asia and Pacific Office.

1.4 Opening of BOB-RHS/TF/4

1.4.1 Mr. Edmund Heng welcomed the participants to the 4th Meeting of the Bay of Bengal Reduced Horizontal Separation Implementation Task Force. He mentioned that there were a few items that were agreed at the last meeting, such as the Safety Assessment and Gross Navigation Error Letter of Agreement which the meeting would need to review, in order to assist the Task Force to decide on the way forward and the priority of tasks to achieve the planned implementation target date for phase one.

1.4.2 Mr. Heng also advised that the task force will need to finalise the Gross Navigation Error Letter of Agreement, signed by the relevant States, to ensure that the procedures for reporting of navigation errors and traffic movement counts are administered accurately and consistently by all States involved. He also stressed the need to carry out safety and monitoring activities to support implementation of reduced separation minima. The appropriate data and information provided is required to support the functions of the Enroute Monitoring Agency (EMA).

1.4.3 A safety assessment by States would need to be conducted in order for the Task Force to decide whether the 'Go' decision can be taken for the implementation of 50NM longitudinal separation on N571, P628 and P762.

1.4.4 The meeting also recalled that India had submitted their intention to establish the Bay of Bengal/Arabian Sea Monitoring Agency (BOBASMA) at the last RASMAG meeting and had already commenced the collection of Gross Navigation Error (GNE) data, on selected routes within the Indian FIR. They were also collating comments for the GNE letter of agreement in line with ICAO Asia Pacific Enroute Monitoring Agency Handbook.

1.4.5 Finally, the Chairman, Mr. Edmund Heng advised the meeting that, in order for the work of this Task Force to progress, it would need all stakeholders to collaborate to analyze, develop and implement appropriate measures to improve enroute airspace efficiency while ensuring that, where possible, environmental and efficiency benefits were positively enhanced.

1.4.6 Mr. John Richardson welcomed all the participants on behalf of Mr. Mokhtar A. Awan, Regional Director, ICAO Asia and Pacific Office.

1.4.7 Mr. Richardson also welcomed the appearance at the task force of Mr. Len Wicks, who had recently joined the ATM section as ATM 1 in the ICAO Regional Office, Bangkok. Mr. Wicks was formally employed by CAA New Zealand and brings with him the long awaited expertise into this vacant position. He also welcomed the attendance and support of Mr. Syed Yousuf Abbas, Director of Operations, Civil Aviation Authority of Pakistan, who was presently assigned to the ATM Section in the ICAO Asia and Pacific office.

1.4.8 The meeting further noted and welcomed the representatives from Myanmar, which added further strength to the work required by the meeting. It was mentioned that Myanmar, with its large FIR extending into the Bay of Bengal, had a vital role to play in the decision making process of the task force.

1.5 Documentation and Working Language

1.5.1 The working language of the meeting as well as all documentation was in English.

1.5.2 Eighteen (18) Working Papers and two (2) Information Papers were presented to BOB-RHS/TF/4. A list of papers is included at **Appendix B** to this Report.

Agenda Item 1: Adoption of Agenda

1.1 The meeting reviewed the provisional agenda proposed by the Secretariat for BOB-RHS/TF/4, and adopted the following agenda:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Review Outcomes of Related Meetings

Agenda Item 3: Operational Issues

Agenda Item 4: Safety Analysis and Airspace Monitoring Issues

Agenda Item 5: Post-Implementation Management Considerations

Agenda Item 6: Future Direction and Arrangements

Agenda Item 7: Preparation of BOB-RHS/TF Task List

Agenda Item 8: Any Other Business

Agenda Item 9: Date and Venue for the Next Meeting

Agenda Item 2: Review Outcomes of Related Meetings

2.1 The meeting was advised that the BOB-RHS/TF/3 meeting was held on 18-21 May in Singapore. The change of venue from Bangkok was necessitated due to the civil unrest occurring in Bangkok at this time. Singapore generously offered the facilities of the Singapore Aviation Academy where the task force meeting was successfully held.

Operational Issues

2.2 Malaysia gave the meeting a comparison of traffic operating on Bay of Bengal routes who had or did not have operable FANS-1/A equipment. FANS-1/A aircraft equipage is necessary for 50NM longitudinal spacing outside of VHF coverage to ensure Direct Controller/Pilot Communications (DCPC). This information was based on one month of flight plans submitted in March/April 2010 on 3 major routes, P628, L510 and N571.

2.3 Analysis indicated that with respect to P628/L510, 85% were FANS equipped, whereas on N571, 55% were FANS 1 equipped. With respect to N571, it was decided to provide 50NM separations on an opportunity basis during Phase 1 of the project.

2.4 It was noted that P762 may also be considered for 50NM longitudinal separation on an opportunity basis provided CPDLC is available within the Yangon and Colombo FIRs prior to the introduction of Phase 1.

Summary of Discussions of the ASIOACG/5 Meeting

2.5 The meeting was given a summary of discussions from the Arabian Sea – Indian Ocean ATS Coordination Group (ASIOACG/5) meeting, which was held in Dubai, UAE in 19-21 April 2010.

2.6 Maldives presented the "Male Free Route Airspace Concept" which will enable aircraft to transit freely within the Male FIR, although they will be required to cross specific FIR entry/exit points.

2.7 IATA presented as general information to the TF their vision for the establishment of a User Preferred Routes (UPR) geographic area. This would not interfere with the major route structures where the traffic is low-medium density with two primary flows, Middle East - Australia and South/ South East Asia - Africa. UPRs were the primary objective for this part of the region and would be specified as part of the work program for the CNS/ATM Sub-Group of ASIOACG.

2.8 ASIOACG was reminded about the role of the CRA and how it should function in the Indian Ocean region noting the increasing availability of data link capabilities throughout the region. They noted the existence of the FIT-BOB and that Melbourne FIR were covered by the FIT as part of ISPACG.

Exclusive or non-exclusive use of 50 NM longitudinal separation

2.9 It was noted that RNAV10 50NM longitudinal separation has been implemented in many parts of the world. Normally, the application of 50NM separation was achieved on an opportunity basis between data link equipped aircraft. In case where one aircraft was non-data link, 10 minutes (approximately 80NM) separation was used.

2.10 The meeting accepted that in Phase 1 of the task force, implementation of 50NM longitudinal separation was confined to three RNAV routes, N571, P628 and the crossing route, P762. It was finally agreed that during this Phase 1 period, reduced horizontal separations would be applied on an opportunity basis.

2.11 To enable ATC to become accustomed to the provision of reduced separations, priority handling could be applied to data link equipped aircraft on N571 for a period of two AIRAC cycles after Phase 1 as part of a step-by-step implementation.

Safety Analysis and Airspace Monitoring Issues

Letter of Agreement (LOA) for monitoring of aircraft navigation errors in the Bay of Bengal area

2.12 The implementation of reduced horizontal separation minima requires continuous monitoring of aircraft navigation errors which includes identification and reporting of any Large Lateral Deviations (LLD) or Large Longitudinal Errors (LLE), to ensure that the target level of safety (TLS) of the operations within the airspace in question meets regional requirements.

2.13 The meeting recalled that the first step in the monitoring process is to identify suitable designated areas where monitoring can be done by means of surveillance. This is usually from the point an aircraft leaves the surveillance coverage until the point where it will again enter surveillance coverage. There are also occasions that the monitoring is done within total surveillance coverage. On a day-to-day basis, air traffic controllers carrying out their ATC duties should be the first party to initiate the report should they encounter any aircraft with navigational errors. There are also occasions where the monitoring is achieved within total surveillance coverage. The traffic movements along with any occurrences of navigational errors are computed on a monthly basis. As such there is a need to collect monthly traffic movement counts.

Unidirectional Routes already established within the APAC region

2.14 It was explained to the meeting that, in other areas of this region such as the South China Sea (SCS), unidirectional routes have already been established, based on laterally separated routes using special procedures. The ability for a wider range of levels gives more flexibility and efficiency to all aircraft operations in the area.

Unidirectional Routes over the Bay of Bengal and the Arabian Sea

2.15 It was suggested that there may be an opportunity for this type of procedure to be considered for RNAV routes crossing the Bay of Bengal and the Arabian Sea. A procedure similar to the SCS example would also take into consideration the crossing aircraft, as well as allowing a flexible and more efficient use of the present airspace for the majority of aircraft operating on the major East/West/Northwest/Southeast traffic flows.

Agenda Item 3: Operational Issues

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

3.1 Malaysia advised the meeting that, based on the data collected and feedback from all the air traffic controllers involved, 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. Upon completion, 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.

3.2 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.

3.3 An ADS/CPDLC ATS 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 Contact Advisory Data (CDA) features that were installed during the previous upgrading process for seamless transfer of traffic to adjacent ACCs. 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.

3.4 The meeting was advised that the Kuala Lumpur (KL) ACC commenced 24-hour Operational Trials commencing on 11 October 2010 at 1500UTC. The purpose of the trial was to collect additional information on the System's stability and reliability. A further purpose was to collect additional data for analysis to ensure that the results comply with the GOLD document.

ADS-C/CPDLC Training

3.5 With respect to training and refresher courses for KL ATCC personnel, all training requirement 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

3.6 An Aeronautical Information Circular (AIC 03/2008) has been published for ADS/CPDLC Operational Trials in the KL FIR. When closer to Full Operational Status of the system, an AIP Supplement and NOTAM is planned to be published.

Ongoing Initiatives in CNS Activities within the Yangon FIR

3.7 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

3.8 As an example of these capabilities, Myanmar invested in the purchase of a CNS/ATM work Station which had the ability to provide an ADS-C/CPDLC function to aircraft equipped with FANS 1/A equipment. Unfortunately due to various reasons, optimum use of this facility had not been fully realized.

3.9 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 positive testing of the equipment has been regularly held with selected airlines during their flights through the Yangon FIR.

3.10 Myanmar gave their appreciation to the airlines concerned in these tests and 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 conditions.

3.11 The meeting was advised that Myanmar wish to be considered for inclusion in the Phase 1 implementation plan which includes P762 passing through their oceanic airspace. Recognizing the importance and benefits gained by using the CNS/ATM workstation, Myanmar advised that they were confident of being ready to provide this service along this RNAV route within their designated airspace.

3.12 Collected data over a 15-day period specifically for P762 was supplied and will be used along with other data in the safety assessment process. This information is contained in **Appendix C** to the report.

3.13 The meeting also noted that, with regard to Phase 2 of the implementation process of 50NM longitudinal separation in the Bay of Bengal, Arabian Sea and Kabul FIR, where the majority of 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 new ACC displays at the Yangon ACC. This will allow the whole 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.

Involvement of neighboring FIRs during the testing period

3.14 It was suggested by Myanmar that, during this testing of CPDLC equipment and procedures within the Yangon FIR, other adjacent FIRs 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 their staff, airlines and crew who may be new data-link procedures.

3.15 The meeting gave thanks to Myanmar for their information and ongoing work in data link. India and Boeing advised that they will work with Myanmar in the testing phase on a suitable time programme to ensure all aspect of moving to data link operations are fully covered prior to implementation.

3.16 IATA advised that there are 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 onaother 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 put forward to the meeting are resolved.

Kabul ACC Status Report

3.17 Afghanistan presented the meeting with an update of conditions within the Kabul FIR concerning air traffic as well as present and future upgrade in CNS abilities.

3.18 The meeting noted that the current communications system throughout the country complies with the requirement for DCPC over Afghanistan. Furthermore, there are ongoing efforts to develop a more robust system of communications by installing additional Very Small Aperture Terminal (VSAT) communications capabilities. There are efforts by Germany with contributions from Australia to initiate a multi-lateration surveillance system for the country. There are continuing discussions on this matter and the implementation of this enhancement project is awaiting many critical decisions such as locations, number of sensors and site security.

3.19 The meeting was advised that, while improvements to the overall numbers of commercial traffic had increased, the primary mission of the Kabul ACC and ATC services in Afghanistan is to support the coalition forces in Afghanistan. Some of this priority support affects the overflight traffic to and from the South Asia region. However, it was stated that Kabul ACC uses all resources and capabilities at its disposal to minimize the adverse effects on civil operations, but there are always going to be accommodations, within safety parameters, asked of these operations.

3.20 Afghanistan advised the meeting that the Kabul ACC is ready to initiate reduced longitudinal separation in concert with all States present to 50NM throughout Afghanistan. These new separation standards will need final approval by the Afghanistan Airspace Control Authority in concert with the Ministry of Transportation and Civil Aviation prior to implementation. They did not anticipate any delays in receiving approvals after they receive the final proposal regarding 50NM longitudinal separation, along the major international traffic flow within Afghanistan airspace.

3.21 Finally, the meeting observed that the Kabul ACC is patiently waiting on 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

3.22 The meeting recalled that the ATFM/BOBCAT system has been in operation since July 2006. Since that time, aircraft have been planned by BOBCAT with a minimum spacing of 15 minutes entering the Kabul FIR on the same Route/Level.

3.23 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 these transiting routes, there was an opportunity to decrease the spacing presently used by the BOBCAT system in accordance with the new procedures.

Phased Approach to introduction of 50NM Spacing

3.24 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 would need to be undertaken. In addition, so as to install uniformity, aircraft using these two routes in an eastbound direction could also be longitudinally spaced at 50NM.

Coordination with other affected FIRs North and West of Kabul FIR

3.25 A further consideration which should be taken into account refers to the coordination requirements when planning to introduce this 50NM spacing through the Kabul FIR, which then enter or leave FIRs such as Tehran FIR and FIRs bordering Kabul FIR to the North. It is anticipated that these mentioned FIRs would have little difficulty in the change due to the use of en-route radar procedures. Regional Office will follow-up on the Islamic Republic of Iran Surveillance status.

3.26 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

3.27 With the proposed 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 spacing parameters used by the BOBCAT system in accordance with the new procedures.

3.28 The meeting was advised that rather than use 15 minutes spacing between aircraft operating on the same route at the same level, the BOBCAT system would be able to be modified to 12 minutes spacing, a saving in time of 3 minutes. This figure is made up from 7 minutes (approximately 56NM) spacing plus the additional 5 minutes delay factor on the allocated wheels-up time on departure. This would allow aircraft entering the Kabul FIR to be comfortably spaced entering the Kabul FIR airspace.

3.29 The meeting was advised that, while the BOBCAT configuration to accommodate 50NM separation implementation took a relatively short time, announcements via 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 50NM separation within the Kabul FIR.

3.30 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 as shown in the following table:

Waypoint	Total Spacing	Separation-based Spacing	Buffer Spacing
DI	10 minutes	5 minutes	5 minutes
SITAX	12 minutes	7 minutes (~50NM)	5 minutes
PAVLO	12 minutes	7 minutes (~50NM)	5 minutes
ROSIE	12 minutes	7 minutes (~50NM)	5 minutes
PAROD	12 minutes	7 minutes (~50NM)	5 minutes
SERKA	12 minutes	7 minutes (~50NM)	5 minutes

Proposed Phase 2 BOBCAT waypoint spacing configuration

3.31 The meeting also noted that ATS arrangement at 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, rather than the present procedure whereby all aircraft proceeding on either N644 or A466 through the Kabul FIR are required to use a single route to Dhera Ismail Khan (DI), then diverge to meet their respective entry points into the Kabul FIR. In such a case, the proposed BOBCAT waypoint spacing configuration below could be applied.

Waypoint	Total Spacing	Separation-based Spacing	Buffer Spacing
LAJAK	12 minutes	7 minutes (~50NM)	5 minutes
PAVLO	12 minutes	7 minutes (~50NM)	5 minutes
ROSIE	12 minutes	7 minutes (~50NM)	5 minutes
PAROD	12 minutes	7 minutes (~50NM)	5 minutes
SERKA	12 minutes	7 minutes (~50NM)	5 minutes

Proposed Alternate Phase 2 BOBCAT waypoint spacing configuration in case of SAMAR – LAJAK route segment implementation

Datalink and ADIZ Procedures

3.32 IATA 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.

3.33 Following significant effort by States, data link is now the primary means of communication in many areas. IATA therefore requests that States review their ADIZ procedures and consider data link as a viable means of communication. The meeting agreed with the proposal and individual States would review their requirements and consider changes as necessary following appropriate coordination with other State authorities.

Data Link Environment of the Bay of Bengal and Arabian Sea

3.34 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.

3.35 The meeting noted that while HF/SELCAL is not related to the data link program, it will remain the backup means of communication in many areas and therefore must continue to be available. IATA and the airlines will continue to work with both States and the CRA to identify problems and improve levels of service in the region.

Route Enhancements

3.36 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 Arabian Sea area. 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. Most of these enhancements have been proposed for some time and IATA requests States review their status as soon as possible.

3.37 For long and ultra-long haul aircraft departing out of Delhi (e.g. VIDP-KEWR) on M875, it can be difficult at certain times of the year for aircraft to reach the MEA of F280 (F290 in Lahore) prior to crossing the FIR boundary between Delhi/Lahore. This has at times resulted in aircraft being given extra track miles to facilitate climb above MEA. IATA requested that consideration be given to enabling these aircraft the ability to cross the FIR boundary still climbing (it is expected that all aircraft will be able to achieve at least FL240 or above).

3.38 Both India and Pakistan confirmed that nothing in their Letter of Agreement precluded 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.

3.39 IATA also advised that there were limitations in the hours of availability of M875 within the Indian FIRs with the route only being available until 2230 UTC. On the other side of the FIR boundary through Lahore/Kabul FIR there is unrestricted access until 2359 UTC which better represents the flow of traffic heading Northwest during the BOBCAT hours. The meeting noted that the time restrictions required the aircraft to be clearing the designated portion of the route by the specified time.

3.40 India undertook to assess whether the extensions in timings was possible and advised that they would coordinate with the appropriate authorities. They will provide feedback as soon as possible and at least by the next task force meeting or BBACG.

3.41 A route between SAMAR-LAJAK has been under consideration for some time and would provide a much needed link with L509 to the East for aircraft mainly out of and into Bangkok. The route could potentially reduce CO_2 emissions by 46,000,000 kilograms and will assist relieving congestions with traffic operating along M875.

3.42 Pakistan advised that discussions with States authorities continued and they hoped for positive news towards the end of the year. Pakistan undertook to coordinate requirements with adjacent States as appropriate and will advise status as soon as possible.

3.43 With regard to the route PRA-SERKA, this has also been under consideration for some time and is included in the ICAO Route Catalogue as IND7. This route provides a linkage between N877 and UL333. Currently aircraft do not use this route often during BOBCAT hours as the 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 EUR and could potentially relieve some loading on the other routes entering the Kabul FIR. The primary benefit of

this extension would be for westbound traffic operating during BOBCAT hours so a route established with restrictions that accommodated this traffic would be acceptable.

3.44 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.

3.45 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

3.46 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.

3.47 To assist States and international organizations in planning for regional projects, Thailand is endeavouring 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. These charts are presented in **Appendix D and E.** In addition, the coordinates of SSR and VHF sites was displayed in **Appendix F and G** to the Report.

3.48 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.

3.49 The meeting was advised that the CNS information presented is intended exclusively for regional or sub-regional ATM planning only under auspices of ICAO.

Proposed Implementation of RVSM in Russia and Other Central Asian States

3.50 The meeting was invited to note that 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.

3.51 A plan has now been established whereby the Russian Federation, along with many other present non-RVSM States adjoining or close to Russian airspace, would change to RVSM levels in accordance with agreed ICAO RVSM procedures, either in metric or imperial format, in November 2011. The difference to transition to/from metric to imperial type levels or vice-versa using the ICAO RVSM format is approximately 100 feet.

3.52 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.

3.53 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.

3.54 Under RVSM level allocation, 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

3.55 The meeting was advised that, to ensure consistency in the use of RNAV route designators, certain present 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 could 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.

Formation of two Small Working Groups (SWGs)

3.56 During the course of the plenary task force meeting, it was decided that, to expedite the work required in overcoming some of the issues presented, to form two small working groups (SWGs) to resolve these outstanding matters. SWG/1 was to look at operational issues and SWG/2 to concentrate on ADS-C/CPDLC and FANS 1/A matters. The reports of the two SWGs are at **Appendix H and I** to this Report.

Agenda Item 4: Safety Analysis and Airspace Monitoring Issues

Bay of Bengal Arabian Sea Monitoring Agency (BOBASMA)

4.1 The meeting was reminded that, at previous task force meetings, it had agreed to support India in their proposal to develop and implement the Bay of Bengal/Arabian Sea Safety En-route Monitoring Agency (BOBASMA) in accordance with ICAO EMA provisions. This Agency had not yet formally been approved by RASMAG and was currently undertaking traffic sampling tasks as part of the pre-approval process.

4.2 The 13th Meeting of RASMAG encouraged India to continue their work to develop capabilities that would enable them to be endorsed as an EMA.

4.3 The meeting was invited to note that at the BOB-RHS/TF/3 meeting, India advised that productive work had already been undertaken to implement BOBASMA.

4.4 The meeting noted that India's ADS/CPDLC systems have been operational on H24 basis in all Indian oceanic FIRs. India is also conducting ATS Interoperability test within Indian FIRs and Kuala Lumpur FIR with Boeing.

4.5 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 States towards implementation and continued safe use of reduced separation minima. However, the meeting was reminded that responsibility of safe implementation and continued operations rest with States, ANSPs and users.

4.6 With regards to 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.

4.7 In this respect, Singapore agreed to this request for SEASMA to carry out the safety assessment for Phase 1 implementation. Singapore welcomed this opportunity to work together with India and also contribute to the region's initiative to further enhance air traffic management in the area under consideration. In order to progress with required resources at CAAS/SEASMA for this interim arrangement, Singapore requested that India provide an official letter in writing to Singapore to finalize their request.

4.8 India expressed their appreciation to Singapore for their assistance and the meeting agreed to this interim arrangement in the interest to move forward in the Phase 1 implementation process without delay.

Interim Enroute Monitoring Agency Arrangements

4.9 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. This would assist States to provide SEASMA with the necessary data, reports and information to move forward with the safety assessment in time for a suitable date for the implementation of Phase 1. The original BOBASMA GNE LOA and the associated appendix concerning SEASMA involvement can be found in **Appendix J** of this report.

4.10 The meeting also agreed that an operational capability table in a form of a CNS Infrastructure table also be used to help the Task Force indentify 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. This is shown in **Appendix K** to the report.

4.11 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 in good order by the end of October 2010. This includes the required data, information and reports as detailed in the various attachments to the proposed Appendix E of the GNE LOA.

Air Traffic Controller Training for RNP10 – 50NM

4.12 Singapore presented to the meeting a PowerPoint Presentation which has been used by the organization in preparation for air traffic controllers prior to assuming responsibilities in Singapore FIR 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. The presentation is at **Appendix L**.

Data link environment in Indian airspace

4.13 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.

4.14 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

4.15 It was noted that Boeing has assisted India by conducting Bench-testing of ADS/CPDLC equipage. ATS interoperability tests were conducted in February, 2010 with Chennai and Mumbai ATS centres to identify problems on 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.

4.16 Similar tests by Boeing were conducted on 9th September, 2010 between Chennai and Kolkata ATC centres to ascertain the preparedness of ground systems.

4.17 Another test was conducted 7th October, 2010 between Kuala Lumpur ATC and Chennai ATC. The problems identified during the tests were:

a) Distance to/from a way point on up linking preformatted message 184 was not shown on the ground system;

b) Event change report for vertical deviation was not received when aircraft was above/below the threshold of ± 200 ft;

c) Issues with the hand off between Chennai and Kuala Lumpur for aircraft with 7 character call sign, and;

d) Loss of data communication for more than 16 minutes;

e) Some ATSUs reported problems with ADS level information "becoming stale"; and,

f) FANS-1A problem reports are regularly being sent by India.

4.18 The meeting was advised that, when an aircraft looses the data link connection for more than 16 minutes and a CPDLC and ADS connection is active, the aircraft would automatically disconnect both CPDLC and ADS connections which is as per specification requirements. When the link is re-established the flight crew will re-logon to re-establish a CPDLC and ADS connection per the procedures outlined in the GOLD. However when this happened, some ATSU ground systems would not allow the aircraft to re-connect the CPDLC and ADS connections.

4.19 After further investigation it was determined that the ADS periodic reporting function was working as per specifications by providing reports at the interval specified in the contract. However when issuing climb clearances via CPDLC ATSUs were encouraged to include a report

"LEVEL" message with the altitude clearance. ATSUs could also use an ADS "one-shot" message at any time, in accordance with the procedures outlined in the GOLD Document, to confirm either position or level of the aircraft.

Update on ADS-C/CPDLC capability in Colombo ACC

4.20 The meeting was advised that presently, Sri Lanka has an operational CNS/ATM Workstation capable of providing and receiving ADS-C/CPDLC data on P762 within the Colombo FIR. Use of this equipment with aircraft is ongoing and as such, Sri Lanka 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.

4.21 The meeting was also informed 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). It is expected that this project will be completed by the end of 2010.

Implementation of distance based separation of RNP routes

4.22 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. 1st December, 2010. This would enable controllers to gain experience on using distance based longitudinal separation in a FANS 1A environment.

Agenda Item 5: Post-Implementation Management Considerations

5.1 There was no discussion on this agenda item.

Agenda Item 6: Future Direction and Arrangements

6.1 There was no discussion on this agenda item.

Agenda Item 7: Preparation of BOB-RHS/TF Task List

7.1 The meeting reviewed the draft Task List as shown in **Appendix M.**

7.2 As well as the Task List, the meeting also considered that specific items should be completed prior to next meeting, to ensure that a GO outcome was achievable. These included the actions mentioned in **Appendix N** to this Report:

7.3 States should each prepare a working paper for the BOB-RHS/TF/5 meeting in accordance with Appendix N to this Report, to indicate that they have undertaken all of their tasks and are ready for the introduction of 50NM longitudinal separation within their respective FIRs.

Agenda Item 8: Any Other Business

Contingency plans for South East and South Asia States;

8.1 Taking into account the significant numbers of natural disasters which have occurred within the Asia and Pacific Region over the past decades, a reminder of State responsibilities in the production of suitable Contingency Plans in association with neighbouring FIRs was highlighted so that a continued flow of aircraft through the affected area could be achieved, or specific instructions as necessary to divert around the area affected.

8.2 One of the most crucial areas where a sound contingency plan is important, concerns natural disasters. This phenomena could be contained in one FIR or cover multiple FIRs within one State or adjacent States of the affected area.

8.3 Due to the geographic features of many parts of the APAC region, there have been several occasions where the potential for disruption to aviation facilities have taken place. As an example, volcanic disturbances have occurred causing closure of airspace over particular areas. At other times, severe flooding of vast tracks of land has seen many lives lost and economies severely affected as well as mobilization of thousands of people away from the affected area. Another destructive event has been tsunamis, which have caused havoc to many nations over a wide area.

8.4 The meeting was reminded that, in light of the longstanding difficulties in Contingency Planning, APANPIRG/16 considered (Conclusion 16/15) that an ICAO Special Implementation Project (SIP) would be a suitable means for facilitating the development of contingency plans. Contingency plans would be developed for a selected State, which could then be used as a model for other States. In addition to addressing the contingency provisions of Annex 11, the SIP would be used to identify and prioritize other contingency factors that could impact the continuity of civil aviation operations, with a view to using the output of the SIP in a workshop or seminar format to assist other States of the Region. The completed model was based on the two Indonesian FIRs and was sent to all APAC States for their guidance in developing their own contingency plans for their airspace concerned.

8.5 The meeting was further advised that, although circumstances where a State was unable to provide all the services listed in their AIP, this should not generally result in the closure of international airspace. Situations where difficult circumstances were being experienced by a ground unit were always regrettable, however contingency planning should make adequate provision for ongoing operations (including humanitarian operations) by putting in place alternative arrangements that may include assistance from neighbouring States to temporarily provide services in the affected airspace.

8.6 The meeting acknowledged that one of the major thrusts of this contingency plan model dealt with the coordination and cooperation of the neighbouring FIRs. Of major concern was loss of communications by the State directly affected by the disaster and the necessary agreements with other States in assisting aircraft to communicate with another ACC. Another area was the harmonization of ATS routes crossing the FIR boundary with a neighbouring State(s).

8.7 The meeting observed that, in the age of ultra long haul operations whereby a flight was airborne for 15 hours and crossed a large number of FIRs, timely contingency planning arrangements was required to ensure that sudden circumstances, where an airspace or FIR en-route was not able to be used, did not arise.

ATFM traffic sample data request from CANSO Seamless Airspace Working Group

8.8 The meeting was informed that work of Civil Air Navigation Service Organization (CANSO) under Seamless Airspace Working Group (SAWG) would soon be renamed as ATM Service Harmonization Workgroup (ASH-WG). The CANSO SAWG/ASH-WG is currently conducting a study of traffic flows between various city pairs such as U.S. – Mexico, U.S. – Canada, U.S. – U.K. (London) and London – Singapore, by attempting to identify issues and potential causes of "not-so-seamless" operations and "best practices" between those city pairs.

8.9 Due to nature of the CANSO SAWG/ASH-WG traffic flow study involving Singapore – London traffic, which is subject to the ATFM/BOBCAT procedure, there was a request from MITRE on behalf of the CANSO SAWG/ASH-WG to obtain BOBCAT data which includes:

January 2010 (17 – 23 January 2010) traffic sample data from all participating ANSPs, representing winter traffic; and,

June 2010 (20 – 26 June 2010) traffic sample data from all participating ANSPs, representing summer traffic.

8.10 It was informed that MITRE would be using the information provided to visualize the operational environment using Geographic Information Systems (GIS). The result of the study would then be shared with States and organizations involved.

8.11 The meeting agreed on provision of such a data to CANSO SAWG/ASH-WG. It was also agreed that decision on provision of ATFM traffic sample data on any future request shall be made on case to case basis after obtaining consent of the participating ANSPs.

BOBCAT Operational Updates and future enhancements

8.12 The meeting was invited to note that throughout the three (3) years since operational implementation of the ATFM procedures between AIRAC 5 July 2007 and 31 August 2010, 62,299 aircraft have submitted slot requests, with 93.12% percent (58,012 aircraft) accepting slot allocation. The other aircraft may have had various reasons for not accepting their slot allocations such as delay factor, route availability and sometimes weather which allowed a more efficient and cost-effective route outside the Kabul FIR.

8.13 The meeting was also invited to note that, the average traffic per night had increased from 38 since operational trial's commenced in July 2006, to 59 in January 2010, with peak traffic on 1 April 2009 of 73 aircraft requesting slot allocation. Thus, it can be inferred that westbound traffic demand through the Kabul FIR has been growing at 16% per annum since operational trials' commenced in July 2006. Further information on Slot Request statistics, potentially reflecting westbound traffic demand through the Kabul FIR is shown in Figure below

8.14 While slot requests continue to increase, the number of airline involved has also increased to 49 airline operators in August 2010.

8.15 Based on traffic distribution by departure airports the top-8 airport providing most traffic to the BOBCAT system are:

a) **VTBS:** Bangkok, Thailand

b) **WSSS:** Singapore

c) **VIDP:** Delhi, India

d) **WMKK:** Kuala Lumpur, Malaysia

e) **VABB:** Mumbai, India

f) **VHHH:** Hong Kong, China

g) **VVNB:** Ha Noi, Viet Nam

h) **VVTS:** Ho Chi Minh, Viet Nam

8.16 The meeting was informed that the number of flights achieving same or higher preferable flight level have been on an increasing trend from approximately 90% in September 2009 to 93% in August 2010. Notwithstanding a slight decrease in number of flights transiting the Kabul FIR at a same or higher preferable flight level in February and April 2010, the percentage of flights obtaining the same or higher flight level appears to be on an increasing trend reaching highest since BOBCAT operational implementation at 93.43% in August 2010.

8.17 The meeting was invited to note the number of flights transiting the Kabul FIR at a flight level lower than slot allocation flight level between January 2009 and October 2010 Figure 5. While the percentage of aircraft transiting the Kabul FIR at a flight level lower than slot allocation reached highest point in August 2009 at 15.25%, the figure appears to be on a decreasing trend from 11.24% in April 2010 to 5.16% in August 2010. This could potentially be associated with substantial improvement in departures punctuality performance.

8.18 The meeting was informed that taxi-out time between various gates and runways for a particular airport can vary substantially. However, the current design of the BOBCAT system fixes one taxi-out time for each airport with a default of 15 minutes or 20 minutes at some of the major airports, enabling the airlines to add more taxi time.

8.19 Flexibility in terms of taxi time could potentially be introduced by introduction of "Minimum Taxi Time" below "Standard Taxi Time." This would enable the airlines to enter "Additional Taxi Time" below zero as long as total taxi time is more than "Minimum Taxi Time." For example, if Standard Taxi Time for a hypothetical airport is 20 minutes, while Minimum Taxi Time is 10 minutes, the airlines can use Additional Taxi Time of -5 minutes resulting in the aircraft taxi time being a net number of 15 minutes, still above the Minimum Taxi Time.

8.20 The meeting was also informed that Flexible Taxi Time may also need to be implemented along with departure airport collaborative decision making process of some form in order to ensure proper usage of the taxi time flexibility.

8.21 The meeting apprised of AEROTHAI's purchase of new servers designated to house the BOBCAT system as well as other related pre-tactical ATM systems. The new set of servers leverages virtualization technology, which would provide benefits in the form of system management flexibility, additional system capacity, and energy efficiency as well as enhanced reliability.

8.22 The meeting was informed that the current BOBCAT software has been installed in the new servers available at <https://www.test.bobcat.aero/> for testing purposes from 11 October 2010. During this phase, airlines and ANSPs would be invited to login to the new servers for testing and training purposes.

8.23 The test BOBCAT system on the new servers could be configured to have various cut-off times each day to enable staff training for related units located in various time zones.

8.24 Nevertheless, in order to avoid confusion of activities on the test system with those on the operational system, no e-mail confirmation would be sent from the test system.

8.25 The meeting was also advised that, following satisfactory testing, AEROTHAI engineers were planning to move the operational BOBCAT system from current server to the new set of servers on **18 November 2010 between 0030 – 0330UTC**. During this time period, the BOBCAT system would be offline until the transition is completed to ensure a smooth system transition. BOBCAT announcements would be utilized to update all involved on progress of the transition.

8.26 With regard to BOBCAT updates and operational enhancements, the meeting was informed that the next BBACG meeting was scheduled to be held in March 2011. As ATFM/BOBCAT subjects in this area now come under the consideration of the BBACG, which is scheduled to be held in March 2011, these items should be left for consideration by this meeting.

Establishing Datalink as a Requirement for Operators

8.27 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.

8.28 IATA suggested it would be presumptuous to make any firm decisions at this stage but urged the meeting to consider this as part of the ongoing work plan. It was further suggested that, as well as data link, the operational potential of SATCOM Voice (SCV) should also be taken into consideration.

8.29 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

Agenda Item 9: Date and Venue for the Next Meeting

9.1 The meeting agreed that the Fifth meeting of the BOB-RHS/TF would be held on 8 to 11 February 2011 in Bangkok, Thailand.

Closing of the Meeting

9.2 In his closing remarks, the Chairman, Mr. Edmund Heng applauded the progress made during the meeting; however, he also highlighted that there are numerous outstanding items that needs to be accomplished in order to move forward with Phase 1 implementation. Although the target date for the Phase 1 implementation have been pushed to a later date, the task force should take this in a positive stride and take this opportunity to complete all the outstanding items to ensure that the implementation of reduced horizontal separation over the Bay of Bengal is carried out in a safe and efficient manner. He encouraged the meeting to work together to support SEASMA in the interim arrangement to complete the safety assessment for Phase 1 implementation. Specifically, he highlighted the need to submit the necessary traffic sample data, surveillance (radar) data and the point of contact information by the end of October 2010 to allow SEASMA to move forward in carrying out the safety assessment.

9.3 The Secretariat, Mr. Richardson congratulated the meeting for the way in which cooperation between concerned States allowed positive results to flow forward in achieving the required outcomes. It was noted that all States showed their willingness to work together on many subjects, which would assist in improving the efficiency of operations to the benefit of all stakeholders involved in this project.

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LIST OF WORKING PAPERS (WPs) AND INFORMATION PAPERS (IPs)

WORKING PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
WP/1	1	Provisional Agenda	Secretariat
WP/2	2	Summary of Outcomes of the BOB-RHS/TF/3 Meeting	Secretariat
WP/3	4	Bay of Bengal Arabian Sea Monitoring Agency (BOBASMA)	Secretariat
WP/4	3	Operation of ATFM/BOBCAT based on 50NM Longitudinal Spacing	Secretariat
WP/5	3	Proposed Implementation of RVSM in Russia and Other Central Asian States	Secretariat
WP/6	8	Contingency Plans for Southeast and South Asia States	Secretariat
WP/7	7	Update BOB-RHS/TF Task List	Secretariat
WP/8	3	Kabul ACC Status Report and Overview of Significant Events	Kabul ACC
WP/9	3	BOBCAT Configuration for 50NM Longitudinal Spacing in the Kabul FIR	Thailand
WP/10	8	ATFM Traffic Sample Data Request from CANSO	Thailand
WP/11	3	Combined Regional SSR Radar and VHF Communications Coverage	Thailand
WP/12	3	Datalink and ADIZ Procedures	IATA
WP/13	3,4	Summary of Present and Ongoing Initiatives in CNS/ATM Activities within Yangon FIR	Myanmar
WP/14	3	Datalink Environment of the Bay of Bengal and Arabian Sea	IATA
WP/15	3	Route Enhancements	IATA
WP/16	8	BOBCAT Operational Updates and Future Enhancements	Thailand
WP/17	4	Implementation of Reduced Horizontal Separation in Bay of Bengal, Arabian Sea and Indian Ocean	India
WP/18	4	Report on In-Service Problems reported to the Central Reporting Agency	CRA

INFORMATION PAPERS

NUMBER	AGENDA	TITLE	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	3	Progress Report of ADS/CPDLC Implementation in Kuala Lumpur FIR over Bay of Bengal area	Malaysia

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VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 26. 9. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	HSSLC	B350	VTBS-VOPB	280	TNK/0919	☑	LALIT/1020	☒	LULDA/1140	☒	-	-	-	HSSLC
2.	BKP711	A319	VTBS-VRMM	320	TNK/1100	☑	LALIT/1126	☒	LULDA/1135	☒	-	-	-	HSPGX
3.	ALK889	A332	VTBS-VCBI	360	TNK/1301	☑	LALIT/1326	☑	LULDA/1335	☒	-	-	J	4RALD
4.	CSN3083	A332	ZGGG-VRMM	380	TNK/1346	☑	LALIT/1411	☑	LULDA/1420	☒	-	-	-	B6058
5.	THA325	A333	VTBS-VOBL	320	AKATO/1455	☑	LALIT/1523	☑	LULDA/1532	☒	-	-	J	HSTEH
6.	THA337	A306	VTBS-VOMM	260	AKATO/1509	☑	LALIIT/1534	☑	LULDA/1543	☒	-	-	-	HSTAP
7.	JAE7451	B744	ZGSZ-VOMM	400	TNK/1626	☑	LALIT/1654	☑	LULDA/1703	☒	-	-	J	B2440
8.	THA307	A333	VTBS-VCBI	310	AKATO/1609	☑	LALIT/1637	☑	LULDA/1649	☒	-	-	J	HSTEC
9.	CPA631	A333	VHHH-VOMM	380	TNK/1716	☑	LALIT/1744	☑	LULDA/1753	☒	-	-	J	BHLN
10.	HDA152	A333	VHHH-VOBL	360	TNK/1722	☑	LALIT/1750	☑	LULDA/1758	☒	-	-	J	BHWI
11.	CPA703	B773	VTBS-VCBI	320	TNK/1741	☑	LALIT/1808	☑	LULDA/1815	☒	-	-	J	BHNE
12.	THA703	B772	VTBS-FAJS	320	AKATO/1845	☑	LALIT/1911	☑	LULDA/1920	☒			J	HSTJT
13.	CPA749	A343	VHHH-FAJS	320	TNK/1808	☑	LALIT/1834	☑	LULDA/1843	☒	-	-	-	BHXH
14.	KAL381	B744	VOMM-VTBS	390	LULDA/0247	☒	LALIT/0256	☑	TNK/0324	☑	-	-	-	HL7606
15.	HSSLC	B350	VOPB-VTBS	270	LULDA/1250	☒	LALIT/1307	☒	AKATO/1358	☑	-	-	-	HSSLC
16.	BKP712	A319	VRMM-VTBS	310	LULDA/2019	☒	LALIT/2028	☑	AKATO/2052	☑	-	-	-	HSPGX
17.	CPA018	B744	VOMM-VHHH	290	LULDA/2020	☒	LALIT/2028	☑	TNK/2054	☑	-	-	J	BKEA
18.	THA338	A306	VOMM-VTBS	310	LULDA/2055	☒	LALIT/2103	☑	AKATO/2129	☑	-	-	-	HSTAP
19.	ALK886	A332	VCBI-VTBS	410	LULDA/2221	☒	LALIT/2230	☑	TNK/2300	☑	-	-	J	4RALA
20.	CSN3084	A332	VRMM-ZGGG	410	LULDA/2158	☒	LALIT/2213	☑	TNK/2249	☑	-	-	-	B6058
21.	ALK460	A332	VCBI-RJAA	290	LULDA/2147	☒	LALIT/2200	☑	TNK/2229	☑	-	-	J	4RALD
22.	THA308	A333	VCBI-VTBS	370	LULDA/2229	☒	LALIT/2238	☑	TNK/2204	☑	-	-	J	HSTEC
23.	CPA632	A333	VOMM-VHHH	390	LULDA/2346	☒	LALIT/2355	☑	TNK/0025	☑	-	-	J	BHLN
24.	CPA700	B773	VCBI-VTBS	370	LULDA/2344	☒	LALIT/2351	☑	TNK/0020	☑	-	-	J	BHNE
25.	HDA153	A333	VOBL-VHHH	370	LULDA/2356	☒	LALIT/0002	☑	TNK/0035	☑	-	-	-	BHWI

ADS/CPDLC CONNECTION % = 00%

REMARKS: 260045 UTC TO 261230 UTC ADS/CPDLC U/S.
261230 UTC TO 270240 UTC ADS/CPDLC U/S.

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 27. 9. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK461	A332	RJAA-VRMM	400	TNK/1202	☑	LALIT/1228	☑	LULDA/1237	☒	OK	OK	J	4RALD
2.	ALK887	A332	VTBS-VCBI	320	TNK/1309	☑	LALIT/1335	☑	LULDA/1344	☒	OK	OK	J	4RALA
3.	ALK423	A332	VTBS-VCBI	300	TNK/1506	☑	LALIT/1532	☑	LULDA/1541	☒	-	-	-	4RALG
4.	THA325	A333	VTBS-VOBL	380	TNK/1517	☑	LALIT/1543	☑	LULDA/1552	☒	-	-	J	HSTEG
5.	THA337	A306	VTBS-VOMM		TNK/1724	☑	LALIT/1750	☑	LULDA/1759	☒	-	-	-	HSTAO
6.	CPA749	A343	VHHH-FAJS		TNK/1825	☑	LALIT/1851	☑	LULDA/1900	☒	-	-	-	BHXB
7.	BAW8510	B744	VHHH-VOMM	360	TNK/2029	☑	LALIT/2049	☒	LULDA/2057	☒	-	-	J	GGSSC
8.	UAE9964	B77L	VOMM-VHHH	410	LULDA/1549	☒	LALIT/1558	☒	TNK/1624	☑	OK	OK	J	A6EFE
9.	ALK886	A332	VCBI-VTBS	310	LULDA/2213	☒	LALIT/2226	☑	TNK/2257	☑	-	-	J	4RALD
10.	THA338	A306	VOMM-VTBS	330	LULDA/2244	☒	LALIT/2252	☑	TNK/2349	☑	-	-	-	HSTAO
11.	THA704	B772	FAJS-VTBS	330	LULDA/2209	☒	LALIT/2217	☑	TNK/2246	☑	-	-	J	HSTJT
12.	ALK422	A332	VCBI-VTBS	410	LULDA/0358	☒	LALIT/0406	☑	TNK/0438	☑	-	-	J	4RALG

ADS/CPDLC CONNECTION % = 25%

REMARKS: 271607 UTC TO 271630 UTC ADS/CPDLC U/S.
271850 UTC TO 270030 UTC ADS/CPDLC U/S.

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 28. 9. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	CPA041	B744	VHHH-VOMM	360	TNK/0408	☑	LALIT/0431	☑	LULDA/0440	☒	-	-		?
2.	MPH094	B744	VHHH-VOMM	360	TNK/1427	☑	LALIT/1449	☑	LULDA/1458	☒	-	-	J	?
3.	ALK887	A332	VTBS-VCBI	380	TNK/1232	☑	LALIT/1257	☑	LULDA/1506	☒	-	-	J	4RALD
4.	THA325	A333	VTBS-VCBI	400	TNK/1451	☑	LALIT/1517	☑	LULDA/1525	☒	-	-	J	HSTEG
5.	THA337	A306	VTBS-VOMM	320	TNK/1528	☑	LALIT/1558	☑	LULDA/1605	☒	-	-	-	HSTAO
6.	THA307	A333	VTBS-VCBI	400	TNK/1620	☑	LALIT/1646	☑	LULDA/1656	☒	-	-	J	HSTEJ
7.	CPA703	B773	VTBS-VCBI	360	TNK/1637	☑	LALIT/1703	☑	LULDA/1710	☒	-	-	J	BHNF
8.	CSH9753	B763	ZSPD/VRMM	320	AKATO/1645	☑	LALIT/1708	☒	LULDA/1719	☒	-	-	J	B2500
9.	HDA152	A333	VHHH-VOBL	360	TNK/1711	☑	LALIT/1737	☑	LULDA/1746	☒	-	-	-	BHWK
10.	KQA1887	B763	VTBS-HKJK	320	TNK/1720	☑	LALIT/1747	☒	LULDA/1755	☒	-	-	-	5YKQZ
11.	CPA749	B744	VHHH-FAJS	320	TNK/1815	☑	LALIT/1839	☑	LULDA/1847	☒	-	-	J	BHUD
12.	THA703	B772	VTBS-FAJS	320	TNK/1842	☑	LALIT/1909	☑	LULDA/1917	☒	-	-	J	HSTJT
13.	THA338	A306	VOMM-VTBS	310	LULDA/2114	☒	LALIT/2122	☑	TNK/2143	☑	-	-	-	HSTAO
14.	CPA018	B744	VOMM-VHHH	310	LULDA/2208	☒	LALIT/2218	☑	TNK/2246	☑	-	-	J	BLIE
15.	ALK888	A332	VCBI-VTBS	330	LULDA/2216	☒	LALIT/2225	☑	TNK/2256	☑	-	-	J	4RALD
16.	CPA700	B773	VCBI-VTBS	390	LULDA/2303	☒	LALIT/2310	☒	TNK/2338	☑	-	-	J	BHNF
17.	THA308	A333	VCBI-VTBS	350	LULDA/2250	☒	LALIT/2300	☑	TNK/2329	☑	-	-		HSTEJ
18.	HDA153	A333	VOBL-VHHH	390	LULDA/2358	☒	LALIT/0007	☑	TNK/0036	☑	-	-	-	BHWK

ADS/CPDLC CONNECTION % = 00%

REMARKS: 280040 UTC TO 281230 UTC ADS/CPDLC U/S.
281230 UTC TO 290030 UTC ADS/CPDLC U/S.

VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 29. 9. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK889	A332	VTBS-VCBI	320	TNK/1304	☑	LALIT/1334	☑	LULDA/1343	☒	-	-	J	4RALD
2.	ETH3719	B742	VHHH-VOMM	340	TNK/1323	☑	LALIT/1350	☑	LULDA/1358	☒	-	-	-	N754SA
3.	THA337	A306	VTBS-VOMM	300	TNK/1453	☑	LALIT/1518	☑	LULDA/1527	☒	-	-	-	HSTAK
4.	THA325	A333	VTBS-VOBL	320	TNK/1455	☑	LALIT/1525	☑	LULDA/1534	☒	-	-	J	HSTEI
5.	THA307	A333	VTBS-VCBI	320	TNK/1601	☑	LALIT/1623	☑	LULDA/1632	☒	-	-	J	HSTEE
6.	BAW3462	B744	VHHH-VOMM	320	TNK/1651	☑	LALIT/1720	☑	LULDA/1729	☒	-	-	J	GGSSO
7.	CPA631	A333	VHHH-VOMM	380	TNK/1739	☑	LALIT/180-9	☑	LULDA/1815	☒	-	-	J	BHLQ
8.	CPA749	A343	VHHH-FAJS	320	TNK/1818	☑	LALIT/1841	☑	LULDA/1850	☒	-	-	-	BHXB
9.	HDA152	A333	VHHH-VOBL	380	TNK/1844	☑	LALIT/1911	☑	LULDA/1920	☒	-	-	J	BHWI
10.	KQA887	B763	VTBS-HKJK	260	TNK/1813	☑	LALIT/1842	☒	LULDA/1851	☒	-	-	-	5YKYY
11.	CSH9754	B763	VRMM-ZSPD	370	LULDA/0242	☒	LALIT/0250	☑	TNK/0317	☑	-	-	J	B2500
12.	KAL8381	B744	VCBI-VTBS	350	LULDA/0828	☒	LALIT/0837	☑	TNK/0903	☑	-	-	J	HL7605
13.	ALK460	A343	VCBI-RJAA	310	LULDA/2028	☒	LALIT/2036	☑	TNK/2100	☑	-	-	-	4RADC
14.	THA338	A306	VOMM-VTBS	310	LULDA/2054	☒	LALIT/2102	☑	TNK/2136	☑	-	-	-	HSTAK
15.	CPA018	B744	VOMM-VHHH	330	LULDA/2144	☒	LALIT/2152	☑	TNK/2218	☑	-	-	J	BKAI
16.	ALK886	A332	VCBI-VTBS	410	LULDA/2226	☒	LALIT/2234	☑	TNK/2304	☑	-	-	-	4RALC
17.	THA308	A333	VCBI-VTBS	330	LULDA/2232	☒	LALIT/2258	☑	TNK/2306	☑	-	-	J	HSTEE
18.	CPA632	A333	VOMM-VHHH	390	LULDA/2334	☒	LALIT/2342	☑	TNK/0008	☑	-	-	J	BHLQ

ADS/CPDLC CONNECTION % = 00%

REMARKS: 290030 UTC TO 291230 UTC ADS/CPDLC U/S.
291230 UTC TO 300030 UTC ADS/CPDLC U/S.

VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 30. 9. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	CPA041	B744	VHHH-VOMM	400	TNK/0530	☑	LALIT/0556	☑	LULDA/0605	☒	-	-	J	BKAI
2.	ALK461	A343	RJAA-VRMM	380	TNK/1044	☑	LALIT/1110	☑	LULDA/1119	☒	OK	OK	-	4RADC
3.	BKP711	A319	VTBS-VRMM	340	TNK/1124	☑	LALIT/1150	☑	LULDA/1159	☒	-	-	-	HSPGY
4.	CSN3083	A332	ZGGG-VRMM	360	TNK/1329	☑	LALIT/1355	☑	LULDA/1404	☒	-	-	-	B6059
5.	ALK423	A332	VHHH-VCBI	380	TNK/1323	☑	LALIT/1349	☑	LULDA/1358	☒	OK	OK	-	4RALA
6.	THA325	A306	VTBS-VOBL	320	TNK/1454	☑	LALIT/1520	☑	LULDA/1529	☒	-	-	-	HSTAT
7.	THA337	A306	VTBS-VOMM	360	TNK/1500	☑	LALIT/1526	☑	LULDA/1552	☒	-	-	-	HSTAO
8.	ALK887	A332	VTBS-VCBI	400	TNK/1228	☑	LALIT/1254	☑	LULDA/1303	☒	-	-	-	4RALC
9.	CPA703	B773	VTBS-VCBI	320	TNK/1655	☑	LALIT/1721	☑	LULDA/1730	☒	-	-	J	BHNH
10.	MPH094	B744	VHHH-VOMM	360	TNK/1711	☑	LALIT/1737	☑	LULDA/1746	☒	OK	OK	J	PHCKD
11.	KQA861	B763	VTBS-HKJK	280	TNK/1810	☑	LALIT/1836	☒	LULDA/1845	☒	-	-	-	5YKQZ
12.	CPA749	B744	VHHH-FAJS	320	TNK/1813	☑	LALIT/1839	☑	LULDA/1848	☒	-	-	J	BHUI
13.	HDA152	A332	VHHH-VOBL	380	TNK/1750	☑	LALIT/1816	☑	LULDA/1825	☒	OK	OK	J	BHWH
14.	ALK889	A332	VTBS-VCBI	400	TNK/1228	☑	LALIT/1254	☑	LULDA/1303	☒	-	-	-	4RALC
15.	THA703	B772	VTBS-FAJS	320	TNK/1844	☑	LALIT/1910	☒	LULDA/1919	☒	-	-	J	HSTJT
16.	BKP712	A319	VRMM-VTBS	310	LULDA/2043	☒	LALIT/2052	☒	TNK/2118	☑	-	-	-	HSPGY
17.	THA338	A306	VOMM-VTBS	310	LULDA/2107	☒	LALIT/2116	☒	TNK/2142	☑	-	-	-	HSTAO
18.	THA326	A333	VOBL-VTBS	310	LULDA/2128	☒	LALIT/2137	☒	TNK/2203	☑	-	-	J	HSTEJ
19.	CSN3084	A332	VRMM-ZGGG	410	LULDA/2201	☒	LALIT/2210	☑	TNK/2236	☑	-	-	-	B6059
20.	CPA700	B773	VCBI-VTBS	370	LULDA/2302	☒	LALIT/2311	☑	TNK/2337	☑	-	-	J	BHNH
21.	ALK888	A332	VCBI-VTBS	370	LULDA/2334	☒	LALIT/2343	☑	TNK/0009	☑	-	-	J	4RALB
22.	HDA153	A333	VOBL-VHHH	370	LULDA/0105	☒	LALIT/0114	☑	TNK/0140	☑	-	-	J	BHWI
23.	ALK422	A332	VCBI-VTBS	410	LULDA/0434	☒	LALIT/0443	☑	TNK/0509	☑	-	-	J	4RALA
24.	SVA962	B744	VOTV-VHHH	410	LULDA/1428	☒	LALIT/1437	☑	TNK/1503	☑	-	-	-	TFAMI
25.	HDA153	A333	VOBL-VHHH	390	LULDA/0015	☒	LALIT/0024	☑	TNK/0050	☑	-	-	J	BHWH

ADS/CPDLC CONNECTION % = 16%

REMARKS: 300030 UTC TO 300715 UTC ADS/CPDLC U/S.

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 01. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK889	A332	VTBS-VCBI	320	TNK/1331	☑	LALIT/1337	☒	LULDA/1346	☒	-	OK	J	4RALB
2.	THA337	A333	VTBS-VOMM	380	TNK/1459	☑	LALIT/1525	☒	LULDA/1534	☒	OK	OK	J	HSTEE
3.	THA325	A333`	VTBS-VOBL	300	TNK/1455	☑	LALIT/1521	☒	LULDA/1530	☒	OK	OK	J	HSTED
4.	THA307	A333	VTBS-VCBI	340	TANK/1603	☑	LALIT/1629	☑	LULDA/1638	☒	OK	OK	J	HSTEL
5.	CPA631	A333	VHHH-VOMM	380	TNK/1742	☑	LALIT/1808	☑	LULDA/1817	☒	OK	OK	J	BHLM
6.	CPA749	A343	VHHH-FAJS	320	TNK/1841	☑	LALIT/1907	☑	LULDA/1916	☒	-	-	-	BHXD
7.	THA703	B772	VTBS-FAJS	300	TNK/1842	☑	LALIT/1908	☑	LULDA/1917	☒	-	-	J	HSTJV
8.	HDA152	A333	VHHH-VOBL	380	TNK/1728	☑	LALIT/1754	☑	LULDA/1803	☒	OK	OK	J	BHWH
9.	KQA887	B763	VTBS-HKJK	260	TNK/1822	☑	LALIT/1848	☑	LULDA/1857	☒	-	-	-	??
10.	KAL381	B744	VOMM-VTBS	390	LULDA/0143	☒	LALIT/0152	☑	TNK/0218	☑	-	-	-	HL7608
11.	CPA632	A333	VOMM-VHHH	350	LULDA/2336	☒	LALIT/2345	☑	TNK/0011	☑	OK	OK	J	BHLM
12.	HDA153	A333	VOBL-VHHH	370	LULDA/2336	☒	LALIT/2345	☑	TNK/0011	☑	OK	OK	J	BHWH
13.	ALK886	A332	VCBI-VTBS	410	LULDA/2319	☒	LALIT/2345	☑	TNK/2354	☑	-	-	J	4RALA
14.	THA308	A333	VOMM-VTBS	330	LULDA/2152	☒	LALIT/2201	☑	TNK/2227	☑	-	-	J	HSTEL

ADS/CPDLC CONNECTION % = 57%

VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 02. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	MPH094	B744	VHHH-VOMM	340	TNK/1001	☑	LALIT/1027	☒	LULDA/1036	☒	OK	OK	J	PHMPR
2.	BAW3456	B744	VHHH-VOMM	320	TNK/1232	☑	LALIT/1258	☒	LULDA/1307	☒	OK	OK	J	GGSSA
3.	ALK423	A343	VHHH-VCBI	360	TNK/1251	☑	LALIT/1317	☒	LULDA/1326	☒	-	-	-	4RADC
4.	ALK887	A332	VTBS-VCBI	320	TNK/1327	☑	LALIT/1357	☑	LULDA/1406	☒	OK	OK	J	4RALA
5.	ALK455	A343	RJAA-VTBS	320	TNK/1426	☑	LALIT/1452	☒	LULDA/1501	☒	-	-	-	4RADB
6.	THA337	A333	VTBS-VOMM	320	TNK/1505	☑	LALIT/1531	☑	LULDA/1540	☒	-	-	J	HSTEO
7.	HDA152	A333	VHHH-VOBL	380	TNK/1718	☑	LALIT/1744	☑	LULDA/1753	☒	-	-	J	BHWI
8.	THA325	A333	VTBS-VOBL	360	TNK/1454	☑	LALIT/1520	☑	LULDA/1529	☒	-	-	J	HSTEG
9.	CPA631	A333	VHHH-VOMM	400	TNK/1722	☑	LALIT/1746	☑	LULDA/1755	☑	OK	OK	J	BLAA
10.	CSH9753	B763	ZSPD-VRMM	360	AKATO/1438	☑	LALIT/1504	☑	LULDA/1513	☒	-	-	J	B5018
11.	CPA749	B744	VHH-FAJS	320	TNAK/1818	☑	LALIT/1844	☑	LULDA/1853	☒	OK	OK	J	BHKT
12.	CPA018	B744	VOMM-VHHH	370	LULDA/0204	☒	LALIT/0213	☒	TNK/0239	☑	OK	-	J	BHUR
13.	ALK422	A343	VCBI-VTBS	410	LULDA/0405	☒	LALIT/0414	☒	TNK/0440	☑	-	-	-	4RADC
14.	HSCKS	C750	VRMM-VTBD	410	LULDA/0938	☒	LALIT/0947	☒	TNK/1013	☑	-	-	-	HSCKS
15.	THA338	A333	VOMM-VTBS	330	LULDA/2114	☒	LALIT/2123	☑	TNK/2149	☑	-	-	J	HSTEE
16.	ALK888	A332	VCBI-VTBS	410	LULDA/2218	☒	LALIT/2227	☑	TNK/2253	☑	-	-	J	4RALA
17.	CSH9754	B763	VRMM-ZSPD	330	LULDA/2309	☒	LALIT/2318	☑	TNK/2344	☑	-	-	J	B5018
18.	CPA632	A333	VOMM-VHHH	370	LULDA/2326	☒	LALIT/2335	☑	TNK/0001	☑	-	-	J	BHLM
19.	HDA153	A333	VOBL-VHHH	370	LULDA/2346	☒	LALIT/2355	☑	TNK/0021	☑	-	-	J	BHWI
20.	THA704	B772	FAJS-VTBS		LULDA/	☑	LALIT/	☑	TNK/	☑	-	-	J	HSTJV

ADS/CPDLC CONNECTION % = 30%

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 03. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	KAL9657	A333	RKSI-VRMM	400	TNK/0611	☑	LALIT/0633	☑	LULDA/0641	☒	OK	OK	J	HL7551
2.	BKP711	A319	VTBS-VRMM	320	AKATO/1109	☑	LALIT/1137	☑	LULDA/1252	☒				HSPGX
3.	ALK889	A332	VTBS-VCBI	320	TNK/1333	☑	LALIT/1400	☑	LULDA/1408	☒	OK	OK	J	4RALD
4.	CSN3083	A332	ZGGG-VRMM	320	TNK/1345	☑	LALIT/1411	☑	LULDA/1419	☒	-	-		B6058
5.	THA337	A306	VTBS-VOMM	320	TNK/1453	☑	LALIT/1519	☑	LULDA/1527	☒	-	-	-	HSTAN
6.	THA325	A306	VTBS-VCBI	320	TNK/1503	☑	LALIT/1529	☑	LULDA/1537	☒	-	-	-	HSTAL
7.	THA307	A333	VTBS-VCBI	380	TNK/1600	☑	LALIT/1624	☑	LULDA/1634	☒	OK	OK	J	HSTEB
8.	CPA703	B773	VTBS-VCBI	320	TNK/1651	☑	LALIT/1716	☑	LULDA/1725	☒	OK	OK	J	BHNJ
9.	HDA152	A333	VHHH-VOBL	360	TNK/1712	☑	LALIT/1745	☑	LULDA/1756	☒	OK	OK	J	BHWJ
10.	JAE7451	B744	ZGSZ-VOMM	360	TNK/1717	☑	LALIT/1743	☑	LULDA/1752	☒	OK	OK	J	B2422
11.	CPA631	A333	VHHH-VOMM	400	TNK/1718	☑	LALIT/1743	☑	LULDA/1752	☒	OK	OK	J	BHLV
12.	CPA749	A343	VHHH-FAJS	320	TNK/1827	☑	LALIT/1853	☒	LULDA/1902	☒	-	-	-	BHXD
13.	THA703	B772	VTBS-FAJS	320	TNK/1845	☒	LALIT/1915	☑	LULDA/1924	☒	OK	OK	J	HSTJR
14.	KAL381	B744	VOMM-VTBS	330	LULDA/0236	☒	LALIT/0245	☒	TNK/0317	☑	OK	-	J	HL7602
15.	KQA860	B772	HKJK-VTBS	410	LULDA/0439	☒	LALIT/0447	☑	TNK/0516	☑	-	-		5YKQU
16.	CPA018	B744	VOMM-VHHH	290	LULDA/2041	☒	LALIT/2049	☒	TNK/2115	☑	OK	OK	J	BKAG
17.	BKP712	A319	VRMM-VTBS	310	LULDA/2046	☒	LALIT/2054	☒	TNK/2120	☑	-	-	-	HSPGX
18.	THA338	A306	VOMM-VTBS	290	LULDA/2055	☒	LALIT/2104	☒	TNK/2129	☑	-	-	-	HSTAN
19.	THA326	A306	VCBI-VTBS	310	LULDA/2124	☒	LALIT/2134	☒	TNK/2158	☑	-	-	-	HSTEG
20.	CSN3084	A332	VRMM-ZGGG	310	LULDA/2210	☒	LALIT/2218	☒	TNK/2244	☑	OK	OK	J	B6058
21.	ALK886	A332	VCBI-VTBS	410	LULDA/2217	☒	LALIT/2221	☒	TNK/2247	☑	-	-	-	4RALC
22.	THA308	A333	VCBI-VTBS	310	LULDA/2234	☒	LALIT/2240	☑	TNK/2304	☑	OK	-	J	HSTEB
23.	CPA700	B773	VCBI-VTBS	370	LULDA/2301	☒	LALIT/2309	☑	TNK/2335	☑	-	-		BHNJ
24.	CPA632	A333	VOMM-VHHH	410	LULDA/2330	☒	LALIT/2338	☑	TNK/0004	☑	OK	OK	J	BHLV
25.	HDA153	A333	VOBL-VHHH	370	LULDA/2337	☑	LALIT/2345	☑	TNL/0011	☑	OK	OK	J	BHWJ

ADS/CPDLC CONNECTION % = 56%

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 04. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK461	A332	RJAA-VRMM	400	TNK/1116	☑	LALIT/1142	☑	LULDA/1151	☒	-	-	J	4RALA
2.	THA325	A333	VTBS-VOBL	380	TNK/1501	☑	LALIT/1527	☑	LULDA/1536	☒	-	-	J	HSTEF
3.	THA337	A333	VTBS-VOMM	360	TNK/1459	☑	LALIT/1519	☑	LULDA/1527	☒	-	-	J	HSTEK
4.	ALK423	A332	VTBS-VCBI	380	TNK/1443	☑	LALIT/1509	☑	LULDA/1517	☒	-	-	J	4RALG
5.	HDA152	A332	VHHH-VOBL	360	TNK/1715	☑	LALIT/1743	☑	LULDA/1751	☒	-	-	J	BHWH
6.	CPA749	A343	VHHH-FAJS	320	TNK/1817	☑	LALIT/1844	☑	LULDA/1852	☒	-	-	-	BHXA
7.	ALK887	A332	VTBS-VCBI	320	TNK/1218	☑	LALIT/1245	☒	TNK/1253	☑	-	-	-	4RALC
8.	ALK422	A332	VCBI-VTBS	410	LUDA/0425	☒	LALIT/0433	☑	TNK/0500	☑	-	OK	J	4RALG
9.	THA338	A333	VOMM-VTBS	330	LULDA/2104	☒	LALIT/2117	☑	TNK/2145	☑	OK	OK	J	HSTEK
10.	ALK886	A332	VCBI-VTBS	330	LULDA/2227	☒	LALIT/2237	☑	TNK/2305	☑	-	-	-	4RALC
11.	HDA153	A333	VOBL-VHHH	370	LULDA/2338	☒	LALIT/2347	☑	TNK/2356	☑	-	-	J	BHWH
12.	UAE9964	B77L	VCBI-VHHH	410	LULDA/1318	☒	LALIT/1326	☑	TNK/1357	☑	-	-	?	??

ADS/CPDLC CONNECTION % = 17%

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 05. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	CPA041	B744	VHHH-VOMM	360	TNK/0308	☑	LALIT/0334	☒	LULDA/0343	☒	OK	OK	J	BHOU
2.	CNV7602	B737	VTBU-VRMM	320	TNK/0345	☑	LALIT/0411	☒	LULDA/0420	☒	OK	OK	J	165835
3.	MPH094	B744	VHHH-VOMM	360	TNK/0411	☑	LALIT/0437	☒	LULDA/0446	☒	OK	OK	J	PHCKI
4.	ALK887	A332	VTBS-VCBI	320	TNK/1230	☑	LALIT/1256	☑	LULDA/1305	☒	-	-	-	4RALC
5.	THA337	A306	VTBS-VOMM	320	TNK/1510	☑	LALIT/1536	☑	LULDA/1545	☒	-	-	-	HSTAZ
6.	THA325	A333	VTBS-VOBL	320	TNK/1500	☑	LALIT/1526	☑	LULDA/1535	☒	OK	OK	J	HSTED
7.	HDA152	A333	VHHH-VOBL	360	TNK/1715	☑	LALIT/1741	☑	LULDA/1750	☒	OK	OK	J	BHWI
8.	THA307	A333	VTBS-VCBI	400	TNK/1010	☑	LALIT/1036	☑	LULDA/1045	☒	OK	OK	J	HSTEC
9.	CPA703	B773	VTBS-VCBI	360	TNK/1636	☑	LALIT/1702	☑	LULDA/1711	☒	OK	OK	J	BHNN
10.	CPA749	B744	VHHH-FAJS	320	TNK/1809	☑	LALIT/1835	☑	LULDA/1844	☒	OK	OK	J	BHOR
11.	CNV7602	B737	VRMM-VTBU	410	LULDA/1222	☒	LALIT/1231	☑	TNK/1257	☑	-	-	J	16583
12.	THA338	A306	VOMM-VTBS	310	LULDA/2057	☒	LALIT/2106	☑	TNK/2132	☑	-	-	-	HSTAZ
13.	THA326	A333	VOBL-VTBS	310	LULDA/2140	☒	LALIT/2149	☑	TNK/2215	☑	-	-	J	HSTED
14.	THA308	A333	VCBI-VTBS	350	LULDA/2236	☒	LALIT/2302	☑	TNK/2311	☑	-	-	J	HSTEC
15.	ALK888	A332	VCBI-VTBS	370	LULDA/2219	☒	LALIT/2228	☑	TNK/2254	☑	-	-	-	4RALC
16.	CPA018	B744	VOMM-VHHH	330	LULDA/2247	☒	LALIT/2256	☑	TNK/2322	☑	-	-	J	BHUQ
17.	CPA700	B773	VCBI-VTBS	350	LULDA/2259	☒	LALIT/2308	☑	TNK/2334	☑	-	-	J	BHNN
18.	HDA153	A333	VOBL-VHHH	390	LULDA/2341	☒	LALIT/2350	☑	TNK/0016	☑	-	-	J	BHWI

ADS/CPDLC CONNECTION % = 44%

VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 06. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK889	A332	VTBS-VCBI	320	TNK/1257	☑	LALIT/1323	☒	LULDA/1332	☒	-	-	-	4RALC
2.	CSH9753	B763	ZSPD-VRMM	360	AKATO/1417	☑	LALIT/1437	☑	LULDA/1446	☒	-	-	J	B5018
3.	ETH3719	B742	VHHH-VOMM	320	TNK/1713	☑	LALIT/1739	☒	LULDA/1748	☒	-	-	-	N754SA
4.	THA337	A333	VTBS-VOMM	360	TNK/1500	☑	LALIT/1526	☑	LULDA/1535	☒	-	-	J	HSTEC
5.	THA325	A333	VTBS-VOBL	360	TNK/1448	☑	LALIT/1514	☑	LULDA/1523	☒	-	-	J	HSTEJ
6.	THA307	A333	VTBS-VCBI	400	TNK/1602	☑	LALIT/1624	☑	LULDA/1633	☒	-	-	J	HSTEF
7.	BAW3462	B744	VHHH-VOMM	360	TNK/1735	☑	LALIT/1801	☑	LULDA/1810	☒	OK	-	J	GGSSC
8.	CPA631	A333	VHHH-VOMM	400	TNK/1745	☑	LALIT/1811	☑	LULDA/1820	☒	-	-	J	BHLU
9.	CPA749	A343	VHHH-FAJS	320	TNK/1828	☑	LALIT/1854	☑	LULDA/1903	☒	-	-	-	BHXA
10.	HDA152	A333	VHHH-VOBL	380	TNK/1708	☑	LALIT/1734	☑	LULDA/1743	☒	OK	OK	J	BHWI
11.	KQA887	B772	VTBS-HKJK	260	TNK/1828	☑	LALIT/1854	☑	LULDA/1903	☒	-	-	-	5YKYZ
12.	CSH9754	B763	VRMM-ZSPD	330	LULDA/2253	☒	LALIT/2302	☑	TNK/2328	☑	-	-	J	B5018
13.	KAL381	B744	VOMM-VT	350	LULDA/0250	☒	LALIT/0259	☒	TNK/0325	☑	-	-	-	HL7486
14.	ALK460	A343	VCBI-RJAA	310	LULDA/2031	☒	LALIT/2040	☑	TNK/2106	☑	-	-	-	4RADC
15.	THA338	A333	VOMM-VTBS	310	LULDA/2140	☒	LALIT/2149	☑	TNK/2215	☑	OK	OK	J	HSTEC
16.	CPA018	B744	VOMM-VHHH	330	LULDA/2022	☒	LALIT/2031	☑	TNK/2057	☑	-	-	J	BKAF
17.	THA326	A333	VOBL-VTBS	330	LULDA/2126	☒	LALIT/2135	☑	TNK/2201	☑	-	-	J	HSTEJ
18.	BLSM	GLF5	VOMM-VHHH	450	LULDA/2028	☒	LALIT/2038	☑	TNK/2106	☑	-	-	-	BLSM
19.	THA308	A333	VCBI-VTBS	330	LULDA/2220	☒	LALIT/2229	☑	TNK/2255	☑	-	-	J	HSTEF
20.	THA704	B77L	FAJS-VTBS	330	LULDA/2315	☒	LALIT/2324	☒	TNK/2350	☑	-	-	?	?
21.	CPA632	A333	VOMM-VHHH	390	LULDA/2351	☒	LALIT/0000	☑	TNK/0026	☑	OK	OK	J	BHLU
22.	HDA153	A333	VOBL-VHHH	370	LULDA/0020	☒	LALIT/0029	☑	TNK/0055	☑	OK	OK	J	BHWI

ADS/CPDLC CONNECTION % = 22%

VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 07. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK887	A332	VTBS-VCBI	360	TNK/1608	☑	LALIT/1633	☑	LULDA/1638	☒	OK	OK	J	4RALA
2.	THA337	A306	VTBS-VOMM	320	TNK/1457	☑	LALIT/1524	☑	LULDA/1535	☒	-	-	-	HSTAK
3.	THA325	A333`	VTBS-VOBL	320	TNK/1449	☑	LALIT/1516	☑	LULDA/1524	☒	-	-	J	HSTEE
4.	CSN3083	A332	ZGGG-VRMM	380	TANK/1402	☑	LALIT/1428	☑	LULDA/1436	☒	-	OK	J	B6057
5.	CPA041	B744	VHHH-VOMM	320	TNK/0432	☑	LALIT/0458	☒	LULDA/0506	☒	-	-	-	B
6.	CPA749	B744	VHHH-FAJS	320	TNK/1816	☑	LALIT/1840	☑	LULDA/1848	☒	OK	OK	J	BHUB
7.	KAL9657	A333	RKSI-VRMM	320	TNK/0559	☑	LALIT/0625	☑	LULDA/0634	☒	-	-	-	HL7587
8.	HDA152	A333	VHHH-VOBL	380	TNK/1706	☑	LALIT/1730	☑	LULDA/1738	☒	OK	OK	J	BHWJ
9.	ALK461	A343	RJAA-VRMM	340	TNK/1101	☑	LALIT/1127	☑	LULDA/1136	☒	-	-	-	4RADC
10.	BKP711	A319	VTBS-VRMM	360	TNK/1103	☑	LALIT/1132	☑	LULDA/1146	☒	-	-	-	HSPGX
11.	ALK423	A332	VTBS-VCBI	320	TNK/1439	☑	LALIT/1503	☑	LULDA/1513	☒	OK	OK	J	4RALB
12	MPH094	B744	VHHH-VOMM	320	TNK/1649	☑	LALIT/1715	☑	LULDA/1723	☒	OK	OK	J	PHCKC
13.	CPA703	B773	VTBS-VCBI	380	TNK/1808	☑	LALIT/1840	☑	LULDA/1840	☒	OK	OK	J	BHNQ
14.	SAA286	A346	FAJS-VTBS	390	LULDA/0112	☒	LALIT/0121	☑	TNK/0147	☑	-	-	-	?
15.	ALK422	A333	VCBI-VTBS	410	LULDA/0412	☒	LALIT/0421	☑	TNK/0447	☑	OK	OK	J	4RALB
16.	SVA962	B744	VOTV-VHHH	410	LULDA/1615	☒	LALIT/1624	☑	TNK/1650	☑			-	TFAMI
17.	ALK886	A332	VCBI-VTBS	370	LULDA/0129	☒	LALIT/0138	☑	TNK/0204	☑	-	-	J	4RALA
18.	BKP712	A319	VRMM-VTBS	310	LULDA/2053	☒	LALIT/2102	☑	TNK/2128	☑	-	-		HSPGX
19	THA338	A306	VOMM-VTBS	290	LULDA/2055	☒	LALIT/2104	☒	TNK/2130	☑	-	-	-	HSTAK
20.	THA326	A333	VOBL-VTBS	310	LULDA/2125	☒	LALIT/2134	☑	TNK/2200	☑	-	-	J	HSTEJ
21.	CSN3084	A332	VRMM-ZGGG	330	LULDA/2109	☒	LALIT/2118	☒	TNK/2144	☑	OK	OK	J	B6057
22.	ALK888	A332	VCBI-VTBS	410	LULDA/2228	☒	LALIT/2237	☑	TNK/2303	☑	-	-		4RALA
23.	HDA153	A333	VOBL-VHHH	370	LULDA/2341	☒	LALIT/2350	☑	TNK/0016	☑	OK	OK	J	BHWI
24.	CPA700	B773	VCBI-VTBS	370	LULDA/0025	☒	LALIT/0034	☑	TNK/0100	☑	OK	-	J	?

ADS/CPDLC CONNECTION % = 46 %

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 08. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	ALK889	A332	VTBS-VCBI	400	TNK/1243	☑	LALIT/1309	☒	LULDA/1318	☒	-	-	J	4RALA
2.	THA307	A333	VTBS-VCBI	400	TNK/1557	☑	LALIT/1623	☑	LULDA/1632	☒	-	-	J	HSTEM
3.	THA703	B772	VTBS-FAJS	280	AKATO/1838	☑	LALIT/1914	☒	LULDA/1923	☒	-	-	J	HSTJV
4.	THA337	A333	VTBS-VOMM	320	TNK/1503	☑	LALIT/1529	☑	LULDA/1538	☒	-	-	J	HSTED
5.	HDA152	A333	VHHH-VOBL	380	TNK/1714	☑	LALIT/1740	☑	LULDA/1749	☒	OK	OK	J	BHWH
6.	THA325	A333	VTBS-VOBL	380	TNK/1506	☑	LALIT/1532	☑	LULDA/1540	☒	-	-	J	HSTEG
7.	CPA631	A333	VHHH-VOMM	400	TNK/1816	☑	LALIT/1842	☑	LULDA/1851	☑	-	-	-	BLAB
8.	CPA749	A343	VHH-FAJS	320	TNAK/1834	☑	LALIT/1910	☑	LULDA/1919	☒	-	-	-	BHWG
9.	CPA018	B744	VOMM-VHHH	290	LULDA/2143	☒	LALIT/2209	☒	TNK/2218	☑	-	-	J	BKAI
10.	KAL381	B744	VOMM-VTBS	350	LULDA/0216	☒	LALIT/0225	☒	TNK/0251	☑	-	-	-	HL7462
11.	THA308	A333	VCBI-VTBS	330	LULDA/2232	☒	LALIT/2241	☑	TNK/2307	☑	-	-	J	HSTEM
12	THA338	A333	VOMM-VTBS	310	LULDA/2106	☒	LALIT/2115	☒	TNK/2141	☑	-	-	J	HSTED
13.	ALK886	A332	VCBI-VTBS	410	LULDA/2311	☒	LALIT/2320	☒	TNK/2346	☑	-	-	J	4RALD
14.	CPA700	B773	VCBI-VTBS	370	LULDA/0025	☒	LALIT/0034	☑	TNK/0102	☑	-	-	J	BHNQ
15.	HDA153	A333	VOBL-VHHH	370	LULDA/2340	☒	LALIT/2349	☒	TNK/0015	☑	-	-	J	BHWH
16.	THA704	B772	FAJS-VTBS	310	LULDA/2138	☒	LALIT/2147	☒	TNK/2213	☑	-	-	J	HSTJV
17.	ALK454	A343	VCBI-RJAA	310	LULDA/2038	☒	LALIT/2047	☒	TNK/2113	☑	-	-	-	4RADB
18.	THA326	A333	VOBL-VTBS	330	LULDA/2140	☒	LALIT/2149	☑	TNK/2225	☑	-	-	J	HSTEG

ADS/CPDLC CONNECTION % = 5%

VHF- ADS/CPDLC CONNECTION RECORD

(Yangon Area Control Centre)

Airway : P762 **Date:** 09. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	MPH094	B744	VHHH-VOMM	360	TNK/0741	☑	LALIT/1004	☑	LULDA/1012	☒	-	-	-	PHMPR
2.	BAW3456	B744	VHHH-VOMM	360	TNK/0322	☑	LALIT/0348	☑	LULDA/0358	☒	OK	OK	J	GGSSA
3.	ALK423	A343	VTBS-VCBI	320	TNK/1441	☑	LALIT/11510	☒	LULDA/1520	☒	-	-	-	4RADA
4.	ALK887	A332	VTBS-VCBI	320	TNK/1245	☑	LALIT/1312	☒	LULDA/1326	☒	OK	OK	J	4RALD
5.	ALK455	A343	RJAA-VCBI	360	TNK/1104	☑	LALIT/1129	☑	LULDA/1137	☒	-	-	-	4RADB
6.	THA337	A333	VTBS-VOMM	320	TNK/1450	☑	LALIT/1524	☒	LULDA/1534	☒	OK	OK	J	HSTEN
7.	HDA152	A333	VHHH-VOBL	380	TNK/1716	☑	LALIT/1743	☑	LULDA/1751	☒	OK	OK	J	BHWH
8.	THA325	A333	VTBS-VOBL	380	TNK/1459	☑	LALIT/1525	☑	LULDA/1534	☒	-	-		HSTEM
9.	CPA631	A333	VHHH-VOMM	360	TNK/1809	☑	LALIT/1835	☒	LULDA/1844	☑	OK	OK	J	BHLV
10.	HSKCS	C750	VTBD-VRMM	320	TNK/0547	☑	LALIT/0616	☒	LULDA/0624	☒	-	-		HSKCS
11.	CPA749	B744	VHH-FAJS	360	TNAK/1830	☑	LALIT/1856	☒	LULDA/1905	☒	OK	OK	J	BHOS
12	SOO9737	B77L	VTBS-VOMM	320	AKATO/1233	☑	LALIT/1259	☑	LULDA/1308	☒	OK	OK	J	N775SA
13.	CPA632	A333	VOMM-VHHH	350	LULDA/0010	☒	LALIT/0018	☑	TNK/0044	☑	-	-	J	BHLV
14.	ALK422	A343	VCBI-VTBS	310	LULDA/0408	☒	LALIT/0417	☒	TNK/0447	☑	-	-	-	4RADA
15.	ALK888	A332	VCBI-VTBS	410	LULDA/2251	☒	LALIT/2300	☑	TNK/2326	☑	-	-	J	4RALD
16.	THA338	A333	VOMM-VTBS	290	LULDA/2221	☒	LALIT/2230	☑	TNK/2256	☑	-	-	J	HSTEN
17.	HDA153	A333	VOBL-VHHH	390	LULDA/0000	☒	LALIT/0010	☑	TNK/0036	☑	-	-	J	BHWH
18.	THA704	B772	FAJS-VTBS	410	LULDA/2151	☑	LALIT/2200	☑	TNK/2226	☑	-	-	J	HSTJV

ADS/CPDLC CONNECTION % = 39%

VHF- ADS/CPDLC CONNECTION RECORD
(Yangon Area Control Centre)

Airway : P762 **Date:** 10. 10. 2010

No	Call Sign	Type	Dep/Dest	FL	Entry-Pt	VHF status	Mid-Pt	VHF status	Exit-Pt	VHF status	ADS	CPDLC	Remarks	Reg
1.	N93M	GLF5	VHHH-VOBL	400	TNK/0240	☑	LALIT/0312	☑	LULDA/0320		-	-	-	N93M
2.	KAL9657	A333	RKSI-VRMM	380	TNK/0611	☑	LALIT/0637	☑	LULDA/0645	☒	OK	OK	J	HL7553
3.	BKP711	A319	VTBS-VRMM	360	AKATO/1059	☑	LALIT/1137	☑	LULDA/1252	☒	-	-	-	HSPGY
4.	ALK889	A332	VTBS-VCBI	380	TNK/1301	☑	LALIT/1327	☑	LULDA/1336	☒	-	OK	J	4RALD
5.	CSN3083	A332	ZGGG-VRMM	380	TNK/1339	☑	LALIT/1405	☑	LULDA/1414	☒	OK	OK	J	B6059
6.	THA337	A306	VTBS-VOMM	280	AKATO/1459	☑	LALIT/1525	☒	LULDA/1534	☒	-	-	-	HSTAN
7.	THA325	A306	VTBS-VCBI	300	AKATO/1455	☑	LALIT/1523	☒	LULDA/1531	☒	-	-	J	HSTAP
8.	THA307	A333	VTBS-VCBI	320	TNK/1547	☑	LALIT/1615	☒	LULDA/1624	☒	OK	OK	J	HSTEB
9.	CPA703	B773	VTBS-VCBI	260	TNK/115	☑	LALIT/1741	☒	LULDA/1752	☒	-	-	J	BHNJ
10.	HDA152	A333	VHHH-VOBL	380	TNK/1708	☑	LALIT/1734	☒	LULDA/1745	☒	-	-	J	BHWJ
11.	JAE7451	B744	ZGSZ-VOMM	400	TNK/1620	☑	LALIT/1645	☑	LULDA/1652	☒	OK	OK	J	B2441
12	CPA631	A333	VHHH-VOMM	360	TNK/1712	☑	LALIT/1741	☒	LULDA/1748	☒	-	-	J	BLAA
13.	CPA749	A343	VHHH-FAJS	320	TNK/1821	☑	LALIT/1846	☒	LULDA/1855	☒	-	-	-	BHXD
14.	KQA861	B772	VTBS-HKJK	360	TNK/1831	☒	LALIT/1857	☒	LULDA/1903	☒	-	-	-	5YKQS
15.	SAA286	A346	FAJS-VHHH	350	LULDA/0030	☒	LALIT/0039	☑	TNK/0108	☑	-	-	?	?
16.	KAL381	B744	VOMM-VTBS	390	LULDA/0205	☒	LALIT/00214	☑	TNK/0237	☑	-	-	-	HL7482
17.	CPA632	A333	VOMM-VHHH	350	LULDA/0010	☒	LALIT/0019	☑	TNK/00047	☑	-	-	J	VHLV
18.	CPA018	B744	VOMM-VHHH	330	LULDA/2230	☒	LALIT/2238	☑	TNK/2106	☑	OK	-	J	BKAH
19	BKP712	A319	VRMM-VTBS	330	LULDA/2055	☒	LALIT/2104	☑	TNK/2132	☑	-	-	-	HSPGY
20.	THA338	A306	VOMM-VTBS	310	LULDA/2050	☒	LALIT/2059	☑	TNK/2126	☑	-	-	-	HSTAN
21.	THA326	A306	VCBI-VTBS	310	LULDA/2121	☒	LALIT/2132	☑	TNK/2158	☑	-	-	J	HSTAP
22.	CSN3084	A332	VRMM-ZGGG	410	LULDA/2157	☒	LALIT/2206	☑	TNK/2237	☑	-	-	-	B6059
23.	ALK886	A332	VCBI-VTBS	330	LULDA/2333	☒	LALIT/2347	☑	TNK/0007	☑	-	-	-	4RALD
24.	THA308	A333	VCBI-VTBS	310	LULDA/2223	☒	LALIT/2233	☑	TNK/2301	☑	OK	-	J	HSTEB
25.	CPA700	B773	VCBI-VTBS	350	LULDA/2323	☒	LALIT/2331	☑	TNK/2357	☑	OK	-	J	BHNJ
26.	CPA632	A333	VOMM-VHHH	310	LULDA/2336	☒	LALIT/2344	☑	TNK/0010	☑	OK	OK	J	BLAA
27.	HDA153	A333	VOBL-VHHH	290	LULDA/2345	☑	LALIT/2353	☑	TNL/0025	☑	OK	OK	J	BHWJ

ADS/CPDLC CONNECTION % = 37%

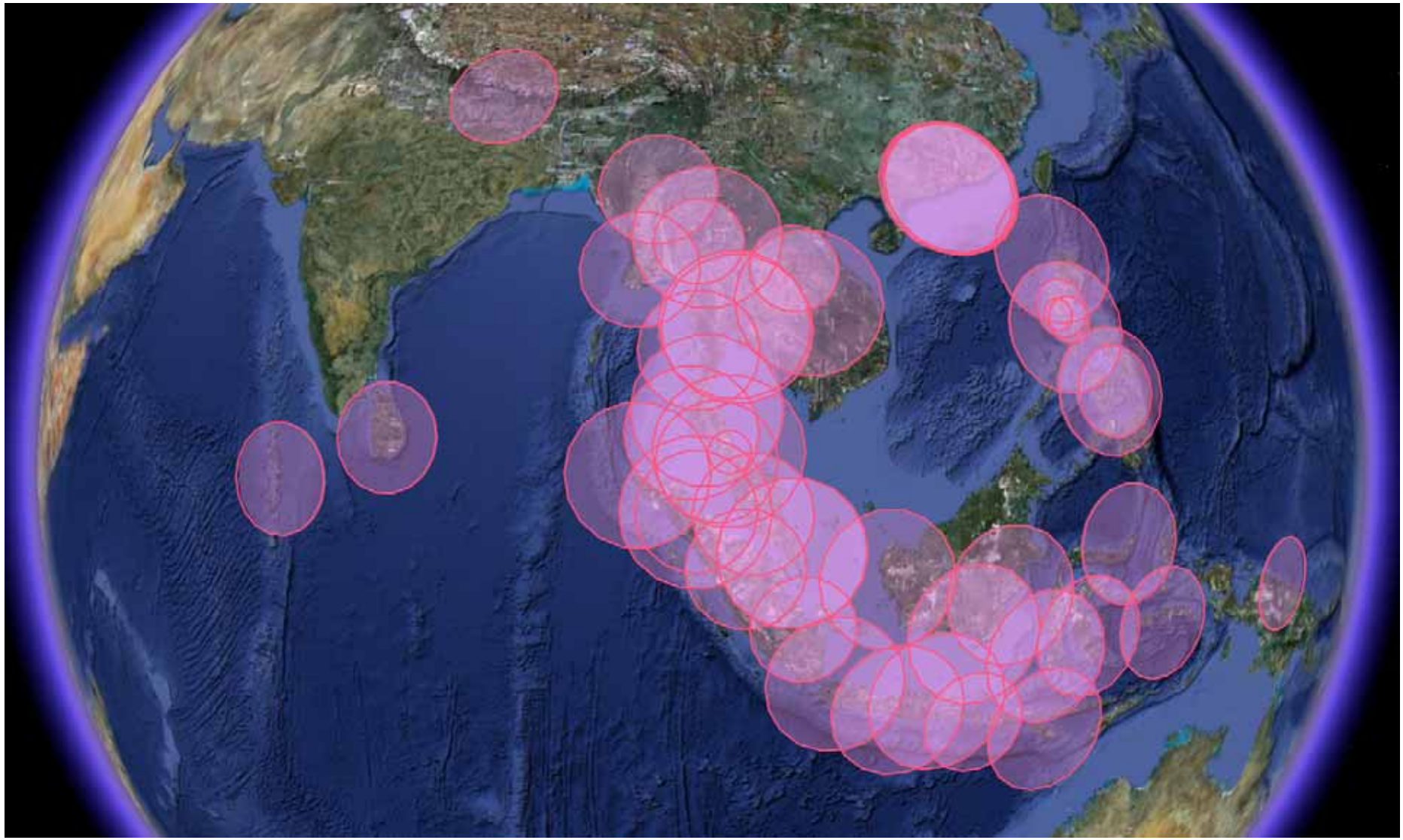
Yangon Area Control Centre (YACC)

ADS/CPDLC CONNECTION SURVEY RECORD

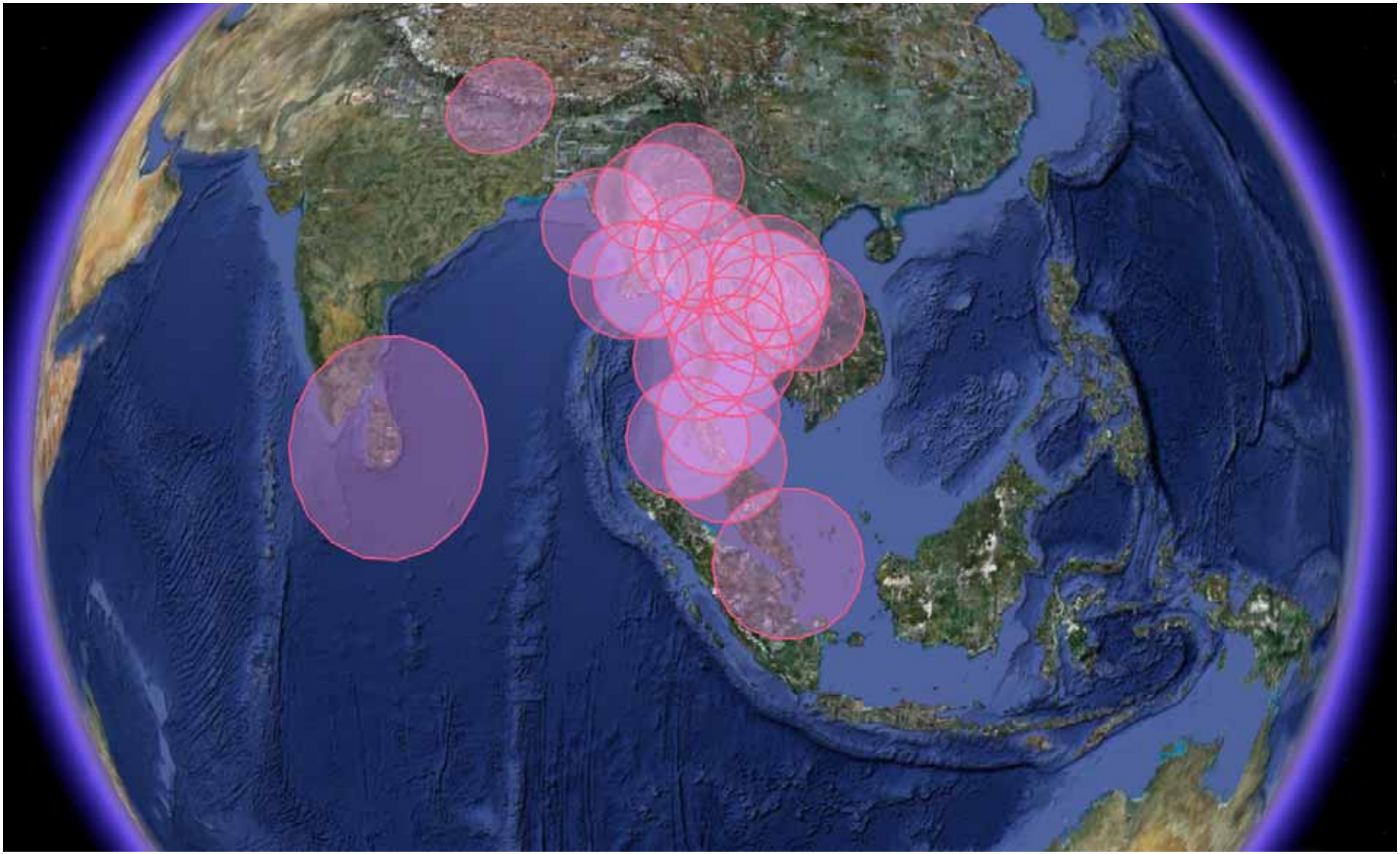
Airway: P762

Date	Total Traffic Movement on P762	Number of Data link equipped aircraft on P762	Data link logged-on with YACC on P762	Logged-on Percentage on P762
26/09/10	25	14	-	00%
27/09/10	12	8	3	25%
28/09/10	18	11	-	00%
29/09/10	18	11	-	00%
30/09/10	25	12	4	16%
01/10/10	14	11	7	57%
02/10/10	20	16	6	30%
03/10/10	25	14	14	56%
04/10/10	12	8	2	17%
05/10/10	18	14	8	44%
06/10/10	22	14	5	22%
07/10/10	24	14	10	46%
08/10/10	18	14	1	5%
09/10/10	18	12	7	39%
10/10/10	27	16	10	37%
Total	**296**	**189**	**77**	**27%**

Remarks: on 26, 28 and 29Sept'10, SITA link is failure due Loop error messages are going up-link.



Attachment 1: *Combined Google Earth SSR Radar Coverage Chart at FL290 (Theoretical Coverage)*



Attachment 3: *Combined Google Earth VHF Communications Coverage Chart at FL290 (Theoretical Coverage)*

Summary of SSR Radar Coordinate and Coverage included in Google Earth Diagram

State	SSR Site Name	Type	Latitude	Longitude	Theoretical Coverage	Reference / Remark
Indonesia	Jakarta	MSSR	06 07 00.000 S	106 40 05.000 E	240 NM	Information on 26 Aug 2010
Indonesia	Palembang	SSR	02 53 45.890 S	104 42 23.580 E	180 NM	Information on 26 Aug 2010
Indonesia	Pontianak	SSR	00 08 28.906 S	109 24 00.575 E	240 NM	Information on 26 Aug 2010
Indonesia	Semarang	SSR	07 01 16.960 S	110 25 45.080 E	200 NM	Information on 26 Aug 2010
Indonesia	Medan	SSR	03 33 54.692 N	098 40 26.015 E	200 NM	Information on 26 Aug 2010
Indonesia	Medan	MSSR	03 32 11.90 N	098 38 33.50 E	250 NM	Information on 26 Aug 2010
Indonesia	Pekan Baru	SSR	00 27 48.210 N	101 26 48.380 E	200 NM	Information on 26 Aug 2010
Indonesia	Banda Aceh	SSR	05 31 01.370 N	095 25 12.930 E	240 NM	Information on 26 Aug 2010
Indonesia	Yogyakarta	MSSR	07 47 06.960 S	110 26 32.996 E	240 NM	Information on 26 Aug 2010
Indonesia	Surabaya	MSSR	07 23 01.290 S	112 46 48.120 E	256 NM	Information on 26 Aug 2010
Indonesia	Denpasar	MSSR	08 44 38.110 S	115 10 05.340 E	192 NM	Information on 26 Aug 2010
Indonesia	Waingapu	SSR	09 40 06.100 S	120 10 36.430 E	250 NM	Information on 26 Aug 2010
Indonesia	Makassar	MSSR	05 03 38.960 S	119 32 55.940 E	256 NM	Information on 26 Aug 2010
Indonesia	Banjarmasin	MSSR	03 26 29.776 S	114 44 45.918 E	256 NM	Information on 26 Aug 2010
Indonesia	Balik Papan	MSSR	01 15 57.990 S	116 53 20.550 E	256 NM	Information on 26 Aug 2010
Indonesia	Manado	SSR	01 19 19.930 N	124 57 22.620 E	240 NM	Information on 26 Aug 2010
Indonesia	Kendari	SSR	04 02 44.240 S	122 24 50.750 E	240 NM	Information on 26 Aug 2010
Indonesia	Ambon	SSR	03 43 46.200 S	128 09 47.420 E	240 NM	Information on 26 Aug 2010
Indonesia	Jayapura	MSSR	02 35 55.08 S	140 31 39.96 E	250 NM	Information on 26 Aug 2010
Malaysia	Genting	SSR	03 28 28 N	101 47 00 E	200 NM	Information on 12 Oct 2010
Malaysia	Langkawi	MSSR	06 20 30 N	99 44 03 E	200 NM	Information on 12 Oct 2010
Maldives	Male'		041125.7N	733152.0E	220 NM	Information from BOB-RHS/TF/3
Myanmar	Yangon		165452.8N	950809.9E	200 NM	AIP Myanmar - 1 July 2010
Myanmar	Mandalay		214151.6N	955849.9E	200 NM	AIP Myanmar - 1 July 2010
Myanmar	Myeik		122637.6N	983709.1	200 NM	AIP Myanmar - 1 July 2010
Nepal			274224.0N	852202.0E	200 NM	Information from BOB-RHS/TF/3
Singapore	ASR I		012159.87N	1035849.89E	250 NM	AIP Singapore – 29 July 2010
Singapore	ASR II		012156.28N	1035844.86E	250 NM	AIP Singapore – 29 July 2010
Sri Lanka	P3		070003.0N	804618.0E	200 NM	Information from BOB-RHS/TF/3
Thailand	Don Mueang		135518N	1003633E	250 NM	AIP Thailand – 29 July 2010
Thailand	Suvarnabhumi		134149.60N	1004615.20E	250 NM	AIP Thailand – 29 July 2010
Thailand	Chiang Mai		185433N	985808E	250 NM	AIP Thailand – 29 July 2010
Thailand	Surat Thani		090751N	990839E	200 NM	AIP Thailand – 29 July 2010
Thailand	Ubon		151420N	1045202E	250 NM	AIP Thailand – 29 July 2010
Thailand	Phu Keaw		170808.0N	1035937.5E	150 NM	AIP Thailand – 29 July 2010 (WGS84)
Thailand	Doi Intanon		183521.2N	982921.0E	150 NM	AIP Thailand – 29 July 2010 (WGS84)
Thailand	Song Khla		065031.5N	1002524.0E	157.5° – 225.0°: 70 NM 225.5° – 157.0°: 200 NM	AIP Thailand – 29 July 2010 (WGS84) (To be replaced by Hat Yai site by December 2010)
Thailand	Phuket		075244.7N	0981909.3E	220 NM	AIP Thailand – 29 July 2010 (WGS84)
Thailand	Hat Yai		065610N	1002340E	250 NM	AEROTHAI (Operational by October 2010)

Note: Information available exclusively for regional ATM planning under auspices of ICAO

Summary of VHF Communications Facility Coordinate and Coverage included in Google Earth Diagram

State	VHF Site Name	Type	Latitude	Longitude	Theoretical Coverage	Reference / Remark
Myanmar	Yangon	128.75 MHz/126.75 MHz (Main)	165420.74N	0960816.34E	200 NM	Information on 12 Oct 2010
Myanmar	Pathien	128.75 MHz (remote)	164849.6N	0944638.0E	200 NM	Information on 12 Oct 2010
Myanmar	Myeik	128.75 MHz (remote)	122656.9N	0983719.7E	200 NM	Information on 12 Oct 2010
Myanmar	Mandalay	126.75 MHz (remote)	214206.4N	0955825.1E	200 NM	Information on 12 Oct 2010
Myanmar	Sittwe	126.75 MHz (remote)	200758.6N	0925233.6E	200 NM	Information on 12 Oct 2010
Myanmar	Lashio	126.75 MHz (remote)	225854.2N	0974513.3E	200 NM	Information on 12 Oct 2010
Nepal			273416N	852424E	200 NM	Email on 30 May 2010
Singapore			012159.87N	1035849.89E	250 NM	AIP Singapore – 29 July 2010
Sri Lanka	P3		070003.0N	804618.0E	400 NM	Information from BOB-RHS/TF/3
Thailand	Mahamek		134257N	1003242E	200 NM	AEROTHAI
Thailand	Khao Mon		124100N	1005000E	200 NM	AEROTHAI
Thailand	Korat		145652N	1021858E	200 NM	AEROTHAI
Thailand	Ubon		151400N	1045200E	200 NM	AEROTHAI
Thailand	Khon Kaen TOT		162530N	1025003E	200 NM	AEROTHAI
Thailand	Khon Kaen TWR		162755N	1024708E	200 NM	AEROTHAI
Thailand	Udon		172310N	1024638E	200 NM	AEROTHAI
Thailand	Samui		092955N	1000000E	200 NM	AEROTHAI
Thailand	Doi Intanont		183524N	982913E	200 NM	AEROTHAI
Thailand	Lampang		181436N	993346E	200 NM	AEROTHAI
Thailand	Nakhon Sawan		154300N	1000600E	200 NM	AEROTHAI
Thailand	Hat Yai		065546N	1002355E	200 NM	AEROTHAI
Thailand	Phuket		080754N	981957E	200 NM	AEROTHAI

Note: Information available exclusively for regional ATM planning under auspices of ICAO

Report of the Small Working Group on Operational Issues (SWG/1)

The BOB-RHS/TF/4 Meeting decided to form a Small Working Group (SWG/1) to look at issues which were discussed but not resolved during the plenary meeting of the Task Force. This report of the SWG/1 supplements or provides additional information to the Report under Agenda Item 3

Item 1 – L510 to be included in Phase 1of the Implementation Process

- L510 is an integral part of the Bay of Bengal route structure, paralleling P628, which should be included in the Phase 1 implementation process. The meeting agreed to this change.
- RNAV routes in Phase 1 are as follows:
  - → P628, L510, N571 and P762

Item 2 – BBACG will assume oversight of ATFM/BOBCAT issues

- It was agreed that, as a result of the ATFM/BOBCAT Task Force completing their work on ATFM procedures for Westbound aircraft entering the Kabul FIR between 2000 – 2359UTC, the Task Force was suspended.
- Any further work on ATFM matters in this area would be given to the BBACG.
- Next BBACG meeting in March 2011

Item 3 – Review of restrictions on present ATFM/BOBCAT operations planning to enter Kabul FIR via SERKA

- Due to departure issues for aircraft operating on P628 to SERKA – L333, the entry point into Kabul FIR on L333 – SOKAM could not be planned using BOBCAT.
- With the proposal to include P628 in Phase 1 of the BOB-RHS project, Malaysia will re-look at this matter after implementation of Phase 1

Item 4 – SAMAR – INDEK – HUNGU - LAJAK routing.

- Pakistan advised that this proposed routing should be available from December 2010.
  - → Initial restricted time for usage only for BOBCAT operations period.
  - → DI - SITAX will remain open at the moment with agreement by Pakistan and Afghanistan
  - → Agreed that Pakistan will supply 50NM longitudinal spacing to aircraft at same level tracking via SITAX and LAJAK using radar, as both routes converge at MURAD (Kabul)
  - → Target approval date is Dec 10 and target implementation is 2 AIRAC cycles after approval received

Item 5 – M875 – enroute military restrictions

- M875 open in Delhi FIR only from 1630 to 2230UTC. Some restrictions on this route also in Lahore (Pakistan) FIR.
  - → Pakistan advised meeting they will seek approval for H24 operations in their part of M875.
  - → India encouraged in relaxing the restriction of opening times.
  - → Look at alternatives routings to avoid military area within Delhi FIR

Item 6 – Alternative route PRA –SERKA

- Present route PRA – NH – B466 – SERKA (Kabul FIR Boundary) is 46NM longer that direct route.
  - → Involves both India and Pakistan.
- IATA requested direct route PRA – SERKA.
  - → Military areas in India and Pakistan are issues.
- IATA also requested alternative route by realigning N877 from NNP via TASOP direct SERKA
  - → Provides approximately 30NM reduction over the current routing.
  - → Avoids military areas.
  - → While 17 nm further than the direct track, it may be easier to facilitate in the short term.
- India and Pakistan agreed to follow-up on IATA's request by writing to the necessary military authorities for approval

Item 7 – Enhancements to the ATFM/BOBCAT System

- Meeting agreed that any enhancements to the ATFM/BOBCAT system could be addressed by BBACG during their next meeting in March 2011.
  - → States and IATA should study proposals mentioned in Thailand WP/16

REPORT ON SWG ON DATA LINK ISSUES (SWG/2)

A small working group (SWG/2) was convened with the goal of establishing a CPDLC and ADS-C test plan by the CRA (Boeing) for the remainder of this year and into the first quarter of next year in preparation for reductions in longitudinal separations to 50NM

The following test schedule was developed by the Group.

Yangon	16th November 2010
Maldives	17th November 2010
Ujung Pandang	18th November 2010
Malaysia	23rd November 2010
Mumbai	7th December 2010
Chennai	14th December 2010

- It was advised that the CRA will use test benches and proprietary software tools to enable two aircraft to be flown *virtually* through the airspace as well as handoffs to the Boeing ATSU function.
- All aspects of CPDLC and ADS-C will be exercised with particular attention to logons, auto handoffs, conditional clearances, route clearances, weather deviations, offsets, ADS event triggers and emergency situations.
- Successful completion of the testing outlined above will ensure technical and operational capability in support of 50NM longitudinal separations.
- Depending on results, further dates will be coordinated by the CRA after the results of the initial tests mentioned above.

OPERATIONAL LETTER OF AGREEMENT

BETWEEN

Airports Authority of India	**India**
Directorate General of Civil Aviation	**Indonesia**
Department of Civil Aviation	**Malaysia**
Civil Aviation Department Ministry of Transport and Civil Aviation	**Maldives**
Department of Civil Aviation	**Myanmar**
Directorate General of Civil Aviation and Meteorology	**Oman**
Pakistan Civil Aviation Authority	**Pakistan**
The Seychelles Civil Aviation Authority	**Seychelles**
Civil Aviation Authority of Singapore	**Singapore**
The Civil Aviation Authority of Sri Lanka	**Sri Lanka**
Aeronautical Radio of Thailand Ltd	**Thailand**

FOR

MONITORING OF AIRCRAFT NAVIGATION ERRORS

IN THE

BAY OF BENGAL, ARABIAN SEA AND INDIAN OCEAN

AIRSPACE

Operational Letter of Agreement

Document Management

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Appendix C: Summary of Navigation Error Reports	C1 – 2	TBN
Appendix D: Procedures for the Assessment of Aircraft Navigation Errors	D1 – 6	TBN

Operational Letter of Agreement

Overview

Introduction

The following document is a Letter of Agreement (LOA) between those Air Traffic Service (ATS) authorities shown on page one of this document. The letter of agreement details monitoring procedures between the following ATS units:

Bangkok ACC	Chennai OCC
Colombo ACC	Delhi ACC
Jakarta ACC	Karachi ACC
Kolkata OCC	Kuala Lumpur ACC
Lahore ACC	Maldives ACC
Male ACC	Mangalore ACC
Mumbai OCC	Muscat ACC
Nagpur ACC	Seychelles ACC
Singapore ACC	Trivandrum ACC
Yangon ACC	

Objective

The objective of this LOA is to define agreed procedures for the monitoring, notification, investigation, analysis and reporting of aircraft navigation errors in respect of aircraft to which reduced horizontal separation minima is applied when operating on any RNAV routes over Bay of Bengal, Arabian Sea and Indian Ocean airspace.

Scope

The procedures contained in this LOA implement the performance monitoring requirements associated with the introduction of the reduced horizontal separation standard, and for the reporting and monitoring of gross lateral and longitudinal navigational errors.

For the purposes of this LOA, the term ‘Service Providers’ refers to organizations which are responsible for the provision of Air Traffic Control (ATC) services.

The term ‘Regulatory Authority’ refers to those organizations responsible for the investigation of navigational errors. In some cases, the Regulatory Authority may be the same as the Service Provider.

The term ‘En-route Monitoring Agency’ (EMA) refers to the organisation endorsed by the ICAO Asia Pacific Regional Airspace Safety Monitoring Advisory Group for providing airspace safety assessment and monitoring services to support the introduction and continued safe use of en-route horizontal-plane separation minima.

The designated EMA for the Bay of Bengal, Arabian Sea and Indian Ocean airspace is BOBASMA, India.

Operational Letter of Agreement

Overview, continued

Effective Date	This letter of agreement becomes effective on 1 July 2010
Background	The use of these horizontal separation standards is restricted to aircraft which meet the requirements detailed in the respective States' AIP Supplements. This includes a requirement for RNP 10 / RNP 4 Performance Based Navigation (PBN) approval and it is the responsibility of the operator to ensure that such requirements are satisfied when so declared. PBN approval includes operators meeting certain requirements with regard to crew training and in-flight operating procedures. The responsibility for approval for such operations rests with the State of Registry of the Operator. Monitoring navigation errors is a joint responsibility between the aircraft operators, the States of Registry, and the ATC providers. There are established requirements for the operators to monitor navigation performance under the terms of their PBN Approval. This document sets out the responsibilities and procedures to be followed by staff of the signatory organizations to this LOA.
Area of Applicability	The procedures outlined in this LOA shall be applied to all aircraft operating on any RNAV routes in the Bay of Bengal, Arabian Sea and Indian Ocean airspace.

Operational Letter of Agreement

Monitoring Procedures

Lateral Deviations

Monitoring shall be based on surveillance observations. When the surveillance controller observes a lateral deviation of 15NM or more, the controller shall:

- Immediately advise the pilot in command; and
- Provide the 'Duty Supervisor' with the necessary information to enable Part 1 of the Navigation Error Investigation Form (as shown in **Appendix A** to be completed.

Where an aircraft is off-track as the result of ATC approved diversion (e.g. due weather), no notification under the terms of this Letter of Agreement need be submitted.

Longitudinal Deviations

Monitoring of longitudinal errors shall be accomplished by reporting occurrences where the observed longitudinal separation, following a check, is either less or more than the expected longitudinal separation as detailed in the table below.

Category of Error	Criterion for Reporting
Aircraft-pair (Time-based separation applied)	Infringement of longitudinal separation standard based on routine position reports
Aircraft-pair (Time-based separation applied)	Expected time between two aircraft varies by 3 minutes or more based on routine position reports
Individual-aircraft (Time-based separation applied)	Pilot estimate varies by 3 minutes or more from that advised in a routine position report
Aircraft-pair (Distance-based separation applied)	Infringement of longitudinal separation standard, based on ADS, radar measurement or special request for RNAV position report
Aircraft-pair (Distance-based separation applied)	Expected distance between an aircraft pair varies by 10NM or more, even if separation standard is not infringed, based on ADS, radar measurement or special request for RNAV position report

Notification, in accordance with **Appendix A**, shall be submitted in all cases of error

Notification Procedures

Action by ATC Unit	The duty supervisor, when advised of the deviation, shall be responsible for completion and submission of a Navigation Error Investigation Form (as provided in **Appendix A**). A copy of the aircraft's flight plan shall be attached to the Navigation Error Investigation Form, and forwarded to the Chief of ATC. The Chief of ATC shall forward copies of the Navigation Error Investigation Form (Parts 1 to 4) to the aircraft operator and the State of Registry of the aircraft or the State of the Operator, as considered appropriate. In addition, the copy for the aircraft operator shall be sent with a covering letter (as provided in **Appendix B**) requiring the operator to complete the Navigation Error Investigation Form and to provide reasons for the error.

Operational Letter of Agreement

Investigation Procedures

The investigation of errors notifiable under this Letter of Agreement is a joint responsibility of the operator, the Regulatory Authority of the airspace in which the error occurred, and the State of Registry or State of the Operator of the aircraft involved.

The initial investigation shall be undertaken by the aircraft operator, who is responsible for supplying all data and comments needed to complete the form at **Appendix A**. The completed forms are to be returned by the operator to the originating Regulatory Authority. For aircraft registered in States not included in this LOA, these forms are also to be forwarded to the State of Registry of the aircraft or the State of the operator.

Further action by States other than signatories to this LOA is outside the scope of this agreement, and shall be at the discretion of that State.

On receipt of the completed forms from the aircraft operator, the relevant Regulatory Authority will first check that all information required has been supplied and, if necessary, the Regulatory Authority shall request for further information from either the operator, the State of the Operator, or the State of Registry of the aircraft.

If the completed form from the aircraft operator is not received within 14 days of the date of dispatch, the Regulatory Authority will contact the operator and request for the completed form.

Once the completed form has been received, the Regulatory Authority will complete Part 5 of the Navigation Error Investigation Form as detailed in **Appendix A**. The cause of the error is to be classified in accordance with the criteria specified in Part 5.

The decision as to whether any further investigation is warranted will be taken by the Regulatory Authority based on their assessment of the seriousness of the error.

Operational Letter of Agreement

Analysis of Errors & Reporting

At the end of each month, Service Providers shall forward to BOBASMA, India the Summary of Navigation Error Reports (provided in **Appendix C**) including 'NIL' returns together with a copy of all completed Navigation Error Investigation Forms Parts 1 to 5 (provided in **Appendix A**) covering reported errors for that month and

For States with designated monitoring areas as stipulated in the Procedures for the Assessment of Aircraft Navigation Errors, **Appendix D**, shall in addition to the above, also provide data on the number of movements on the routes being monitored as recorded by the relevant Flight Data Processing System, or other auditable means.

BOBASMA, India shall be responsible for calculation of the frequency of the errors, in accordance with Doc 7030.

BOBASMA, India should prepare an assessment schedule setting out the results of the monitoring for the preceding twelve-month period and forward a copy of this schedule to:

a. The Chairman of the APANPIRG ATM/AIS/SAR Sub-Group, through the ICAO Asia and Pacific Office.

b. The Chairman of RASMAG through the ICAO Asia and Pacific Office

Permitted Error Rate Exceeded

Where the summary statistics show a long term trend which could result in the Permitted Error Rate being exceeded, ATC Authorities of the States concerned, in conjunction with the ICAO Regional Office, will jointly consider the causes, to determine if the problems can be eliminated, and to take appropriate remedial action.

Revision

This LOA shall remain in force until it is cancelled or superseded.

For any reason, which might make it advisable to change this agreement and its associated attachments, the interested State shall propose the pertinent revision.

Operational Letter of Agreement

Authority

India	Name Designation Department
Indonesia	Name Designation Department
Oman	Name Designation Department
Pakistan	Name Designation Department
Malaysia	Name Designation Department
Maldives	Name Designation Department
Myanmar	Name Designation Department
Seychelles	Name Designation Department

Operational Letter of Agreement

Authority, continued

Singapore	Name Designation Department
Sri Lanka	Name Designation Department
Thailand	Name Designation Department

NAVIGATION ERROR INVESTIGATION FORM

PART 1 - **To be completed by responsible officer in the Service Provider (and aircraft owner/operator if need)**		
ATC Unit Observing Error:		
Date/Time (UTC):		
Duration of Deviation:		
Type of Error: (tick one) ☐ LATERAL ☐ LONGITUDINAL		
Details of Aircraft		
	First Aircraft	**Second Aircraft** (when longitudinal deviation observed)
Aircraft Identification:		
Name of owner/Operator:		
Aircraft Type:		
Departure Point:		
Destination:		
Route Segment:		
Cleared Track:		
Position where error was observed: (BRG/DIST from fixed point or LAT/LONG)		
Extent of deviation – magnitude and direction: (NM for lateral, min/NM for longitudinal)		
Flight Level:		
Approximated Duration of Deviation (minutes)		
For All Errors		
Action taken by ATC:		
Crew Comments when notified of Deviation:		
Other Comments:		

**** (Please Attach ATS Flight Plan)**

NAVIGATION ERROR INVESTIGATION FORM

PART 2 - **Details of Aircraft, and Navigation and Communications Equipment Fit (To be completed by aircraft owner/operator)**			
LRNS	**Number of Systems** (0, 1, 2 etc.)	**Make**	**Model**
INS			
IRS			
GNSS			
FMS			
Others (please Specify)			
COMS			
HF			
VHF			
SATCOM			
CPDLC			
Which navigation system was coupled to the autopilot at the time of observation of the error?			
Which Navigation Mode was selected at the time of observation of the error?			
Which Communication System was in use at the time of observation of the error?			
Aircraft registration			
Aircraft model/series			
Was the aircraft operating according to PBN requirements?		☐ Yes	☐ No

NAVIGATION ERROR INVESTIGATION FORM

PART 3	**Detailed description of incident** **(To be completed by owner/operator – use separate sheet if required)**
Please give your assessment of the actual track flown by the aircraft, and the cause of the deviation:	
Corrective action proposed:	

PART 4	**To be completed by owner/operator, only in the event of partial or total navigation equipment failure.**		
Navigation System Type	**INS**	**IRS/FMS**	**Others (Please specify)**
Indicate the number of units of each type which failed			
Indicate position at which failure(s) occurred			
Give an estimate of the duration of the equipment failure(s)			
At what time were ATC advised of the failure(s)?			

NAVIGATION ERROR INVESTIGATION FORM

PART 5 **To be completed by investigating agency**		
Have all required data been supplied?	☐ Yes	☐ No
Is further investigation warranted?	☐ Yes	☐ No
Will this incident be the subject of a separate report?	☐ Yes	☐ No
Description of Error:		
Classification: (please tick) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H ☐ I		
CLASSIFICATION OF NAVIGATION ERRORS		
Cause of Deviation		
Operational Errors		
A	Flight crew deviate without ATC Clearance;	
B	Flight crew incorrect operation or interpretation of airborne equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of ATC clearance or re-clearance, flight plan followed rather than ATC clearance, original clearance followed instead of re-clearance etc.);	
C	Flight crew waypoint insertion error, due to correct entry of incorrect position or incorrect entry of correct position;	
D	ATC system loop error (e.g. ATC issues incorrect clearance, Flight crew misunderstands clearance message etc);	
E	Coordination errors in the ATC-unit-to-ATC-unit transfer of control responsibility;	
Deviation due to navigational errors		
F	Navigation errors, including equipment failure of which notification was not received by ATC or notified too late for action;	
Deviation due to Meteorological Condition		
G	Turbulence or other weather related causes (other than approved);	
Others		
H	An aircraft without PBN approval;	
I	Others (Please specify)	

Template for Covering Letter to Aircraft Operator

Dear ***[Aircraft Operator]***

Air Traffic Control service providers are monitoring traffic on RNAV routes in the Bay of Bengal, Arabian Sea and Indian Ocean Airspace, as part of the implementation of reduced separation minima on those routes.

These procedures require the reporting and investigation of:

Type of Error	Category of Error	Criterion for Reporting
Lateral deviation	Individual-aircraft error	15NM or greater magnitude
Longitudinal deviation	Aircraft-pair (Time-based separation applied)	Infringement of longitudinal separation standard based on routine position reports
Longitudinal deviation	Aircraft-pair (Time-based separation applied)	Expected time between two aircraft varies by 3 minutes or more based on routine position reports
Longitudinal deviation	Individual-aircraft (Time-based separation applied)	Pilot estimate varies by 3 minutes or more from that advised in a routine position report
Longitudinal deviation	Aircraft-pair (Distance-based separation applied)	Infringement of longitudinal separation standard, based on ADS, radar measurement or special request for RNAV position report
Longitudinal deviation	Aircraft-pair (Distance-based separation applied)	Expected distance between an aircraft pair varies by 10NM or more, even if separation standard is not infringed, based on ADS, radar measurement or special request for RNAV position report

A Navigation Error Investigation Form relating to one of your aircraft is enclosed.

An investigation of this occurrence is required. A detailed explanation should be provided within 10 days, using the attached Navigation Error Investigation Form. In your reply, you are also requested to indicate any corrective action taken to prevent future occurrences.

Yours faithfully,

[Regulatory Authority]

Appendix C

SUMMARY OF NAVIGATION ERROR REPORT

BOBASMA (INDIA)

Report of Large Lateral Deviation or Large Longitudinal Error

Report to ***BOBASMA, India*** *of* a large lateral deviation (LLD) or a large longitudinal error (LLE), as defined below:

*Note: Do not include ATC-approved deviation due to weather or other contingency events.

Type of Error	Category of Error	Criterion for Reporting
Lateral deviation	Individual-aircraft error	15NM or greater magnitude
Longitudinal deviation	Aircraft-pair (Time-based separation applied)	Infringement of longitudinal separation standard based on routine position reports
Longitudinal deviation	Aircraft-pair (Time-based separation applied)	Expected time between two aircraft varies by 3 minutes or more based on routine position reports
Longitudinal deviation	Individual-aircraft (Time-based separation applied)	Pilot estimate varies by 3 minutes or more from that advised in a routine position report
Longitudinal deviation	Aircraft-pair (Distance-based separation applied)	Infringement of longitudinal separation standard, based on ADS, radar measurement or special request for RNAV position report
Longitudinal deviation	Aircraft-pair (Distance-based separation applied)	Expected distance between an aircraft pair varies by 10NM or more, even if separation standard is not infringed, based on ADS, radar measurement or special request for RNAV position report

Name of ATC unit:

Please complete Section I or II as appropriate

SECTION I:

There were **no** reports of LLDs or LLEs for the month of ***[MONTH]***

SECTION II:

There was/were ***[number]*** report(s) of LLD for the month of ***[MONTH]***

There was/were ***[number]*** report(s) of LLE for the month of ***[MONTH]***

Details of the LLDs and LLEs are attached.

(Please use a separate form for each report of lateral deviation or longitudinal error).

SECTION III:

When complete, please return to the following email (preferably), fax or mailing address:

Email : ***bobasma@aai.aero***
Fax: ***+91 11 24610776***

Address of EMA

THE EXECUTIVE DIRECTOR (AIR TRAFFIC MANAGEMENT)
AIRPORTS AUTHORITY OF INDIA
RAJIV GANDHI BHAWAN,
NEW DELHI -110003
INDIA

Procedures for the Assessment of Aircraft Navigation Errors

1. Introduction

1.1 This document provides guidance on the methodology to be adopted in the assessment of navigation errors associated with the implementation of reduced horizontal separation minima in the Bay of Bengal, Arabian Sea and Indian Ocean Airspace.

2. Data Gathering Responsibility

2.1 The States responsible for the gathering and onwards forwarding of data to BOBASMA, India for the designated monitoring areas identified in paragraph 3, shall be

a) Indonesia,
b) Malaysia,
c) Maldives,
d) Myanmar,
e) Oman,
f) Pakistan,
g) Seychelles,
h) Sri Lanka, and
i) Thailand.

2.2 Data gathering requirements are detailed in paragraph 4.

3. Designated Monitoring Areas

3.1 In order to validate the monitoring requirements supporting the reduction in horizontal separation minima, it is necessary to assess the track keeping ability of aircraft operating on the route structure, whilst they have been using on-board RNAV navigation systems only, for a maximum period of time, relative to the route being flown.

3.2 It is also essential that observation of the navigation of the aircraft, using surveillance sensors, occurs before the on-board navigation systems have been able to "up-date" using ground-based navigation aids, such as DME/DME, or VOR/VOR.

3.3 The appropriate areas at which the required monitoring may be undertaken based on the extensive ground-based navigation aid coverage in the Bay of Bengal, Arabian Sea and Indian Ocean Airspace are specified as follows;

*Phase 1 – **Monitoring commences on 1 July 2010**

Route	Segment	FIRs Involved	ACCs involved[#]
N571	IDASO & VAMPI	CHENNAI, KUALALUMPUR	CHENNAI
	SUGID & PARAR	MUMBAI, MUSCAT	MUMBAI

P628	LARIK & VATLA	CHENNAI, KOLKATA	CHENNAI, KOLKATA
P762	ESPAP & BKK	COLOMBO, CHENNAI, YANGOON	CHENNAI
	DUGOS & LULDA	CHENNAI	CHENNAI
L510	GIVAL & DOGEM	KUALALUMPUR, KOLKATA	KOLKATA

*Phase 2 – **Monitoring commence TBD**

Route	Segment	FIRs Involved	ACCs involved[#]
L301	AKTIV & RASKI	MUMBAI, MUSCAT	MUMBAI
	LARIK & BKK	KOLKATA, BANGKOK	KOLKATA
L759	TAVUN & LEMEX	BANGKOK, KOLKATA	KOLKATA
M300	ESPAP & BULVA	COLOMBO, JAKARTA	
	IGAMA & LOTAV	CHENNAI, MUSCAT	MANGALORE
M770	PADET & BUBKO	BANGKOK, KOLKATA	KOLKATA
N563	MEMAK & AKMIL	JAKARTA, CHENNAI	CHENNAI
	KAKIB & REXOD	CHENNAI, MUSCAT	MANGALORE
N877	ORARA & RIBRO	KOLKATA, MUMBAI	NAGPUR, KOLKATA
P570	MABIX & TEBIT	JAKARTA, COLOMBO	
	POMAN & KITAL	CHENNAI, MUSCAT	MANGALORE
P574	ANSAX & GIRNA	JAKARTA, CHENNAI	CHENNAI
	TOTOX & BISET	MUSCAT, MUMBAI	MUMBAI

*Phase 3 – **Monitoring commence TBD**

Route	Segment	FIRs Involved	ACCs involved[#]
TBD	TBD		

* Phase 1, 2 & 3 are to be finalized by FIT-BOB.
[#] Respective States shall include concerned ACCs before issuing the amended LOA to all the States for their signature.

3.4 Monitoring of aircraft on these route segments should be undertaken as soon as possible after the aircraft enters surveillance coverage.

3.5 It should be noted that navigation error reports relating to areas other than those stated above, should also be processed and reported on, in order to support data gathering for future reductions in lateral and longitudinal separation. Details on the processing of these reports are given at paragraph 6.

4. Collection and Forwarding of Data

4.1 Those States identified in Paragraph 2 are required, at the end of each month, to collect the following data:

a) Recorded navigation errors at the required monitoring areas, by way of the "Navigation Error Investigation Form", as detailed in Appendix A of the Letter of Agreement for the Monitoring of Aircraft Navigation Errors in the Bay of Bengal, Arabian Sea and Indian Ocean airspace; and

b) Total monthly movement statistics relating to air traffic passing the designated monitoring areas within the designated monitoring height band.

Note: The recording of monthly traffic movement statistics in the monitoring areas should be auditable – in other words, some formal method of recording the movements – eg copies of flight progress strips or data from Flight Data Processing Systems – should be available for audit if required.

4.2 After collection, the required data should be forwarded to BOBASMA, India for assessment, to arrive not later than 15 days from the end of the month within which the data was collected. This will allow time for the Navigation Error Investigation Forms relating to occurrences near the end of a month, to be processed and returned as detailed in that form.

4.3 In respect of paragraph 4.1.a), if there have been no error report received, a "Nil Return" should be submitted to BOBASMA, India using the form in **Appendix C**.

5. Assessing of Navigation Errors

5.1 The monitoring requirements associated with the introduction of the reduced horizontal separation minima will be in accordance with the requirements for RNP10 / RNP4 PBN, i.e. aircraft navigation performance shall be such that the standard deviation of lateral track errors shall be in accordance with the PBN requirement.

5.2 The requirements will be met, if the number of navigation errors by approved flights, measured in the monitoring area, divided by the total number of approved flights over those monitoring points, is less than the required parameters, over a period of time for the PBN requirement. (See **Attachment B**).

5.3 The assessments for each month should be recorded separately, and also cumulatively, on a month-to month basis. If the assessment in any particular month exceeds the required parameter, a check should be made to ensure that the cumulative assessment does not also exceed the required parameter.

5.4 If a trend is identified, which indicates that the required parameter is being exceeded regularly, or the cumulative assessment indicates a upwards trend, the BOBASMA, India should notify, though the ICAO Asia and Pacific Office, the APANPIRG ATM/AIS/SAR Sub-Group and RASMAG which should then investigate the need for a review of the applicable procedures.

5.5 An example of an assessment schedule is shown at **Attachment B**.

6. Processing of Navigation Error Reports Relating to Areas Other Than Required Monitoring Areas

6.1 All participating States to this LOA shall notify all appropriate navigation errors to BOBASMA, India. This data should be collated and assessed in the following manner.

6.2 If the navigation error report relates to aircraft tracking on RNAV routes as specified in para 3.3 the error should be assessed and processed in accordance with paragraph 5 above.

6.3 If the report relates to aircraft tracking on other routes, the errors should be assessed, and recorded separately. This information should be assessed by the APANPIRG ATM/AIS/SAR Sub-Group meeting and RASMAG, for appropriate action.

7. Reporting Procedures

7.1 BOBASMA, India should prepare an assessment schedule (refer to **Attachment B**), and forward a copy of this schedule, at least every 12 months, to:

a) The Chairman of the APANPIRG ATM/AIS/SAR Sub-Group, through the ICAO Asia and Pacific Office, and

b) The Chairman of RASMAG through the ICAO Asia and Pacific Office

7.2 In addition, a report should be prepared on those errors reported in accordance with paragraph 6.3 above.

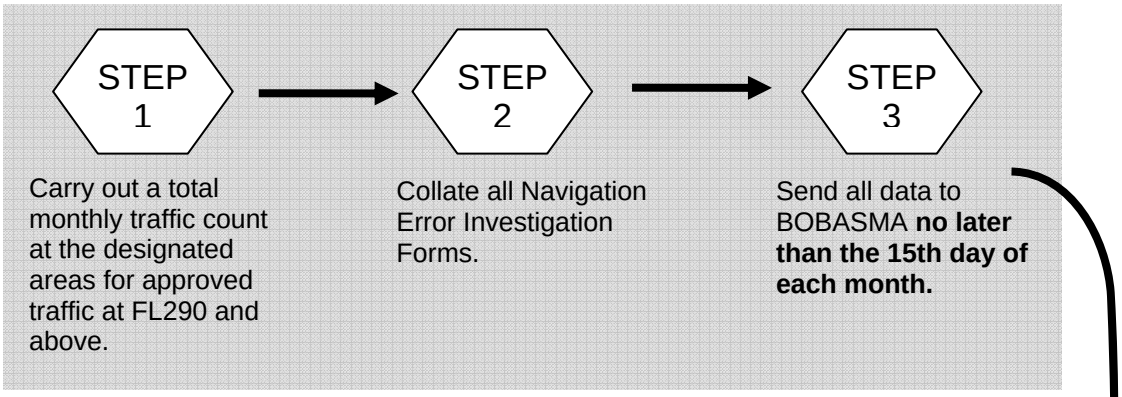
8. Attachments to Appendix D

Attachment A – Assessment Schedule Process
Attachment B – Sample Assessment Schedule

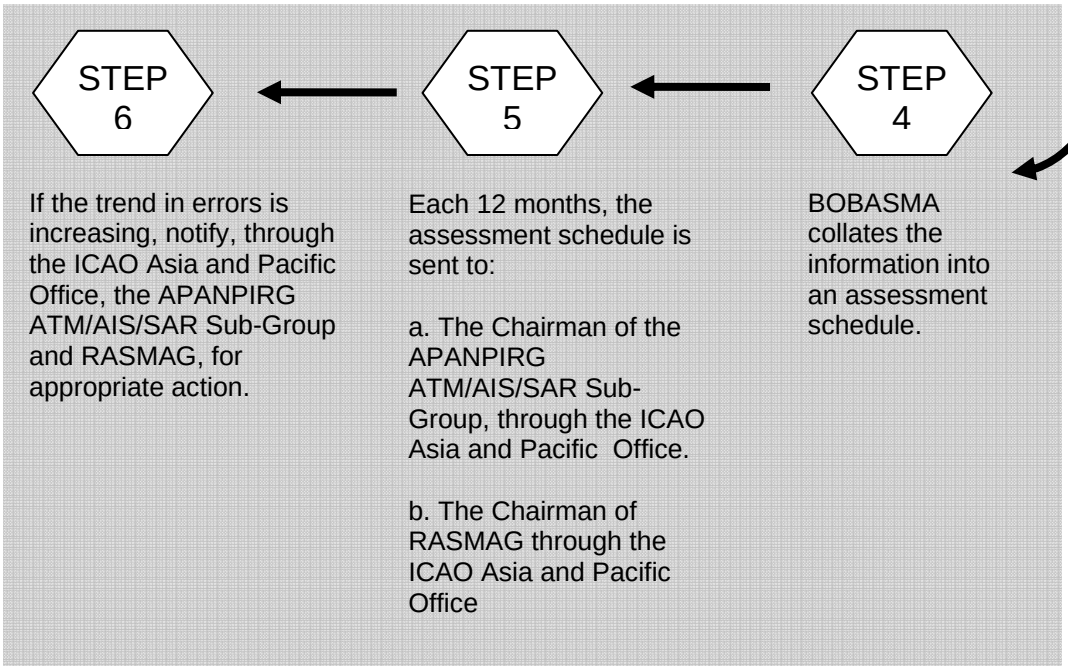
Attachment A

Assessment Schedule Process for Designated Monitoring Areas

ACTIONS BY: INDONESIA
MALAYSIA
MALDIVES
MYANMAR
OMAN
PAKISTAN
SEYCHELLES
SRI LANKA
THAILAND



ACTIONS BY: BOBASMA, INDIA



Attachment B
Example of Navigation Error Assessment Schedule
For Designated Monitoring Areas

a. Example of Monthly Total – Single RNP 10 route

Month/ 2009	Total traffic at (Relevant waypoint) (Ex. IDASO)	Errors Category 1 (LLD)	Errors Category 2 (LLD)	Errors Category 3 (LLE)#	Errors Category 4 (LLE)*
April	3105	1	0		
May	3042	2	0		
June	2810	0	0		
July	2995	1	1		

Category 1 = >15NM Category 3 =Estimate varies by 3 mins or more
Category 2 = 25 – 35NM Category 4 =Distance varies by 10 Nm or more
- Category 3 to be recorded for the entry and exit waypoints of RNP 10 routes over Oceanic airspace applicable to the ACCs in the respective States.
* - Category 4 to be recorded if the 80 Nm RNAV distance based separation is in force.

b. Example of Cumulative Monthly Total – Single RNP 10 route

Month/ 2009	Total traffic at (Relevant waypoint) (Ex. IDASO)	Errors Category 1 (LLD)	Errors Category 2 (LLD)	Errors Category 3 (LLE)#	Errors Category 4 (LLE)*
April	3105	1	0		
May	6147	3	0		
June	8957	3	0		
July	11952	4	1		

Category 1 = >15NM Category 3 =Estimate varies by 3 mins or more
Category 2 = 25 – 35NM Category 4 =Distance varies by 10 Nm or more
- Category 3 to be recorded for the entry and exit waypoints of RNP 10 routes over Oceanic airspace applicable to the ACCs in the respective States.
* - Category 4 to be recorded if the 80 Nm RNAV distance based separation is in force.

c. Example of Monthly Total – All RNP 10 routes within ACC

Month/ 2009	Total traffic at (Relevant ACCs) Ex. Chennai ACC	Errors Category 1 (LLD)	Errors Category 2 (LLD)	Errors Category 3 (LLE)#	Errors Category 4 (LLE)*
April	7852	2	0		
May	8311	2	0		
June	8263	1	0		
July	7678	1	1		

Category 1 = >15NM Category 3 =Estimate varies by 3 mins or more
Category 2 = 25 – 35NM Category 4 =Distance varies by 10 Nm or more
- Category 3 to be recorded for the entry and exit waypoints of RNP 10 routes over Oceanic airspace applicable to the ACCs in the respective States.
* - Category 4 to be recorded if the 80 Nm RNAV distance based separation is in force.

d. Example of Cumulative Monthly Total – All RNP 10 routes within ACC

Month/ 2009	Total traffic at (Relevant ACCs) Ex. Chennai ACC	Errors Category 1 (LLD)	Errors Category 2 (LLD)	Errors Category 3 (LLE)#	Errors Category 4 (LLE)*
April	7852	2	0		
May	16163	4	0		
June	24426	5	0		
July	32104	6	1		

Category 1 = >15NM Category 3 =Estimate varies by 3 mins or more
Category 2 = 25 – 35NM Category 4 =Distance varies by 10 Nm or more
- Category 3 to be recorded for the entry and exit waypoints of RNP 10 routes over Oceanic airspace applicable to the ACCs in the respective States.
* - Category 4 to be recorded if the 80 Nm RNAV distance based separation is in force.

INTERIM EN-ROUTE MONITORING AGENCY ARRANGEMENT

1.1 This appendix supplements the Letter of Agreement on the interim arrangement for an Enroute Monitoring Agency (EMA) support associated with the introduction of the reduced horizontal separation standard over the Bay of Bengal, Arabian Sea and Indian Ocean airspace.

1.2 The South East Asia Safety Monitoring Agency (SEASMA)[1] shall be the interim supporting EMA for providing airspace safety assessment and monitoring services to support the introduction and continued safe use of en-route horizontal-plane separation minima.

1.3 This interim arrangement shall continue until such time when RASMAG endorse the Bay of Bengal and Arabian Sea Monitoring Agency (BOBASMA) to be a competent airspace safety monitoring organisation for the Bay of Bengal, Arabian Sea and Indian Ocean airspace.

1.4 The States signatories to this Letter of Agreement shall appoint a **Point of Contact** to facilitate transmission of data and information to SEASMA. States shall submit the Point of Contact Detail Form (Form SEASMA A1) in Attachment 1 this appendix.

1.5 States shall submit the following information to SEASMA in a timely manner to facilitate the conduct of safety assessments;

S/N	Items	Descriptions / Reference
i.	Latest Traffic Sample Data (TSD)	Sample field required in Attachment 2
ii.	Surveillance (Radar) data on the routes involved	Sample data required in Attachment 3
iii.	Characteristic of the routes involved	Type of Route, Flight level orientation / assignment arrangements, vertical and lateral limits
iv.	Enroute Chart and aeronautical publications containing route information	State's Aeronautical Information Publication (AIP)
v.	Record of PBN or Data-link Approval	Form SEASMA A2, Attachment 4

1.6 In addition, States shall also provide, **on a monthly basis**, the following;

S/N	Items	Descriptions / Reference
i.	Report on Gross Navigation Errors (GNE)	Appendix C of this LOA
ii.	Report on traffic movement for the routes involve for each monitored fix of the route.	Sample in Attachment 5

1.7 All materials, information and reports and the details of the point of contact stipulated above shall be submitted to both **BOBASMA (bobasma@aai.aero)** and **SEASMA**. SEASMA's contact details are as follows;

South East Asia Safety Monitoring Agency
c/o Civil Aviation Authority of Singapore
Air Traffic Services Division
PO Box 1 Singapore Changi Airport, Singapore 918141
Fax: +65 6545 6516

Contact Information

Valerie Sim, ATC Manager (ANS Safety Office)	valerie_sim@caas.gov.sg
Ying Weng Kit, ATC Manager (ANS Safety Office)	ying_weng_kit@caas.gov.sg

1.8 Further references on the above requirements and softcopies of sample documents and forms are also available for download at SEASMA's website: http://www.seasma.com

[1] SEASMA was endorsed by the ICAO Asia Pacific Regional Airspace Safety Monitoring Advisory Group (RASMAG) as a competent airspace safety monitoring organisation for the South China Sea area in July 2008.

Attachment 1

SEASMA
South East Asia Safety Monitoring Agency

SEASMA A1
POINT OF CONTACT DETAILS
FOR MATTERS RELATING TO PBN OR DATA LINK APPROVALS

This form should be completed and returned to the address below on the first reply or when there is a change to any of the details requested on the form.

NAME OF STATE AUTHORITY OR ORGANISATION	
STATE OF REGISTRY	
STATE OF REGISTRY (ICAO 2 letter identifier)	

If there is more than one identifier for the State, please use the first that appears in the list.

ADDRESS DETAILS	
STREET	
CITY	
STATE/PROVINCE	
ZIP/POSTAL CODE	
COUNTRY/REGION	

CONTACT PERSON	
TITLE	
FIRST NAME	
MIDDLE NAME	
LAST NAME	
JOB TITLE	
EMAIL	

PHONE DETAILS			
COUNTRY CODE		AREA CODE	
DIRECT LINE		FAX NUMBER	

Please Tick One:	☐ Initial Reply	☐ Change of details

When complete, please return to:

South East Asia Safety Monitoring Agency, Air Traffic Division, Civil Aviation Authority of Singapore, Singapore Changi Airport, Terminal Building 2, Room No. 046-043, 4th floor, Singapore 819643
www.seasma.com

Latest Traffic Sample Data (TSD)

1.1 Samples of traffic movement data shall be collected for the entire airspace where reduced horizontal-plane separation will be implemented. States are required to cooperate in providing this data to SEASMA.

1.2 As recorded in APANPIRG Conclusion 16/4, traffic sample data within the Asia/Pacific Region is collected by all States for the month of December each year for purposes of RVSM monitoring. During 2009, APANPIRG 20 expanded the usage of this data under certain conditions to support regional implementations, including reduced horizontal plane separation minima.

1.3 The following information should be collected for each flight in the sample:

a) date of flight;
b) flight identification or aircraft call sign, in standard ICAO format;
c) aircraft registration mark, if available;
d) PBN approval type;
e) aircraft type conducting the flight, as listed in the applicable edition of ICAO Doc 8643, Aircraft Type Designators;
f) origin aerodrome, as listed in the applicable edition of ICAO Doc 7910, Location Indicators;
g) destination aerodrome, as listed in the applicable edition of ICAO Doc 7910, Location Indicators;
h) entry point (fix or latitude/longitude) into the airspace;
i) time (UTC) at entry point;
j) flight level (and assigned Mach number if available) at entry point;
k) route after entry point;
l) exit point from the airspace;
m) time (UTC)at exit point;
n) flight level (and assigned Mach number if available) at exit point;
o) route before exit fix; and
p) additional fix/time/flight-level/route combinations that the EMA judges are necessary to capture the traffic movement characteristics of the airspace.

1.4 The TSD template can be downloaded from the Monitoring Agency for Asia Region (MAAR) website, http://www.aerothai.co.th/maar/

Surveillance (Radar) Data

1.1 States with designated monitoring areas are required to provide surveillance (radar) data to the EMA. The data collection period is 1 full day (24 hours) coinciding with any single day within the month which traffic sample data (TSD) is collected**.

1.2 The surveillance (radar) data to be reported should cover a distance of at least 10NM from the point where the aircraft enters surveillance (radar) coverage. For each reported aircraft, at least 4 surveillance (radar) tracks should be provided with a minimum interval of 10 seconds between tracks.

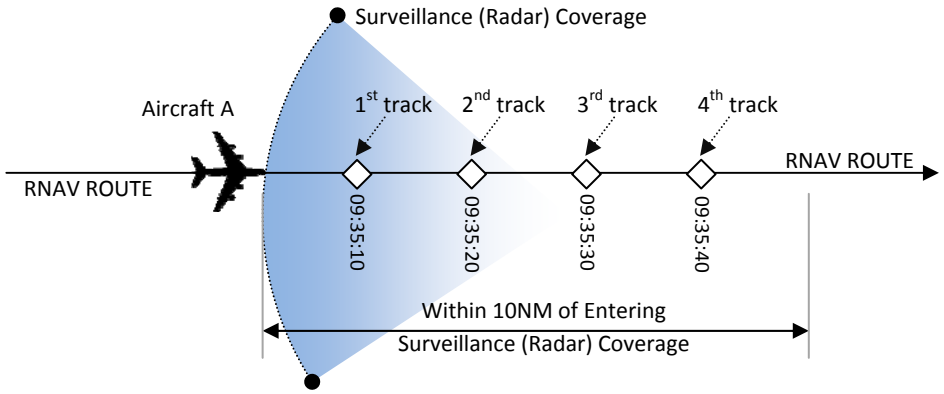
1.3 The following information should be collected for each flight/surveillance track:

No.	Items	Format and Description
i.	Callsign	ICAO Flight Plan Callsign
ii.	Date of flight	dd/mm/yy
iii.	RNAV Route	RNAV Route
iv.	Track timestamp	Surveillance (radar) track timestamp in hh:mm:ss
v.	Track position	Surveillance (radar) track position in latitude and longitude in DDMMSS[N/S] / DDDMMSS[E/W]
vi.	Assigned Mode C code	Four digit discrete code assigned to the flight
vii.	Actual altitude	Actual altitude of the flight in Flight Level (FL)
viii.	Ground speed	Surveillance (radar) track recorded ground speed in knots
ix.	Track heading	Surveillance (radar) track heading in degrees

1.4 The information above should be submitted in a spreadsheet format. An example of a surveillance (radar) data collated with the appropriate data format is shown as follows;

Callsign	Date	Route	Timestamp	Position	Mode C	Altitude	Speed	Heading
ABC123	23/12/10	M789	10:34:05	012315N/1032421E	0412	FL340	486	084
ABC123	23/12/10	M789	10:34:15	012317N/1032429E	0412	FL340	486	084
ABC123	23/12/10	M789	10:34:26	012317N/1032436E	0412	FL340	486	084
ABC123	23/12/10	M789	10:34:36	012317N/1032442E	0412	FL340	486	084
XYZ789	23/12/10	M789	11:41:00	012310N/1032419E	2340	FL290	473	084
XYZ789	23/12/10	M789	11:41:10	012314N/1032428E	2340	FL290	472	084
XYZ789	23/12/10	N234	11:41:20	012317N/1032436E	2340	FL290	473	102
XYZ789	23/12/10	N234	11:41:30	012317N/1032442E	2340	FL290	473	102

1.5 The following illustrate the method for surveillance (radar) track data collection on any given segment of the monitored portion of a given RNAV route.



** The annual traffic sample data collection for Asia Pacific Region is in the month of December. For the purpose of Phase 1 implementation of reducing horizontal separation, the surveillance (radar) data collected may be any single day within July 2010 to December 2010.

SEASMA A2
RECORD OF PBN APPROVAL

When a State of Registry approves or amends the approval of an operator/aircraft for PBN, details of that approval must be recorded and sent to the SEASMA without delay.

Please read the following before attempting to provide information in the next page.

1. SEASMA A2 must be completed for each operator/aircraft granted a PBN or data link approval.
2. The fields in the form should be completed as indicated below.

Fields	Instruction
State of Registry State of Operator Airworthiness Approval (State) Operational Approval (State)	Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the case of there being more than one identifier designated for the State, use the letter identifier that appears first.
Operator Identifier	Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA". If none, place an X in this field and enter the name of the operator/owner in the Remarks row.
Operator Type	Enter or Select Operator Type. E.g. Civil or Military
Registration Date Date of Airworthiness Approval Date of Operational Approval Expiry Date Approval Withdrawn (date)	Enter date in dd/mm/yyyy format, e.g. for 26 October 2007 enter 26/10/2007.
Aircraft Type	Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A320; for Boeing B747-438 enter B744.
Aircraft Series	Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.
Mode S Address Code (Hex)	Enter ICAO allocated Aircraft Mode S address code in hexadecimal format.
Remarks	Any Remarks

Aircraft and Operator Details	
Registration No	
State of Registry	
Registration Date	
Name of Operator	
State of Operator	
Operator Identifier	
Operator Type	
Aircraft Type	
Aircraft Series	
Manufacturers Serial	
Mode S Address Code	

Approval	Airworthiness Approval (State)	Primary Sensor Type (DME-DME/INS/IRS/GNSS)	Time Limit (hrs)	Vertical Guidance (APV/LPV)	RF Leg Capable (Yes/No)	Limitations (Text)	Date of Airworthiness Approval	Operational Approval (State)	Date of Operational Approval	Expiry Date	Approval Withdrawn (date)	Regional Approval
RNAV10												
RNAV5												
RNAV2												
RNAV1												
RNP4												
RNP2												
Basic RNP1												
Advanced RNP1												
RNP APCH												
RNP AR APCH												
RVSM												
VDL												
Mode S												
SATCOM												
HF												
Remarks												

Registration No	State of Registry	Registration Date	Name of Operator	State of Operator	Operator Identifier	Operator Type	Aircraft Type	Aircraft Series	Manufacturers Serial No	Mode S Address Code	RNAV10	Airworthiness Approval (State)	Primary Sensor Type (DME-DME/INS/IRS/GNSS)	Time Limit (hrs)	Vertical Guidance (APV/LPV)	RF Leg Capable (Yes/No)	Limitations (Text)	Date of Airworthiness Approval	Operational Approval (State)	Date of Operational Approval	Expiry Date	Approval Withdrawn (date)	Regional Approval

Monthly Report of Traffic Movements

1.1 States with designated monitoring areas are required to provide data on the number of movements on the routes being monitored at the end of each monitored month and forward it to SEASMA.

1.2 The report shall be submitted in the following format;

Traffic movement report for the month of: **[Month Year]**

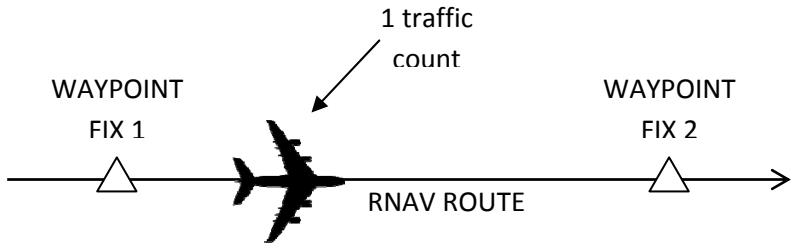
Monitored Fix	Airways	Traffic Count
[Fix1] – [Fix2]	[Airway Designation 1]	nnnn
[Fix3] – [Fix4]	[Airway Designation 2]	nnnn

1.3 An example of a Traffic Movement report would be as follows;

Traffic movement report for the month of: **October 2010**

Monitored Fix	Airways	Traffic Count
IDASO - VAMPI	N571	973
LARIK - VATLA	P628	754
ESPAP - BKK	P762	234

1.4 The following illustrate on the method for reporting traffic count on any given segment of the monitored portion of a given airway.



Aircraft on the same RNAV route passing from monitored fix1 to monitored fix 2 is considered as 1 traffic count.

1.5 The above report shall be submitted to SEASMA via email by the **15th day of the following month**.

Phase 1 Implementation of Reduced Longitudinal Separation over the Bay of Bengal and Arabian Sea

ROUTE: N571					
FIR	**Existing CNS Infrastructure and RNP 10 50 NM/50 NM Requirements**			**Additional Information on Current Mode of Operation For Phase 1**	**Adequate for RNP 10 50/50 Operation?**
	RNP 10 Communications Requirements Direct controller-pilot communication in voice/CPDLC	**RNP 10 Navigation Requirements RNP10 Approval**	**RNP 10 Surveillance Requirements Procedural position reports at least every 24 minutes**		
	Communication Means	**Navigation Specification**	**Surveillance in Place**		
KUALA LUMPUR	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication H24	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes
CHENNAI	VHF direct communication between ATC and pilots, CPDLC available as secondary communication means	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes and Frequent position update by radar	Use of Radar as primary means of separating aircraft, ADS-C for Monitoring FANS 1/A aircraft as added surveillance	Yes
MUMBAI	VHF direct communication between ATC and pilots, CPDLC available as secondary communication means	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes and Frequent position update by radar	Use of Radar as primary means of separating aircraft, ADS-C for Monitoring FANS 1/A aircraft as added surveillance	Yes
MUSCAT	VHF direct communication between ATC and pilots	RNP10 Approval	Frequent position update by radar	Use of Radar to monitor RNP 10 operation	Yes

Phase 1 Implementation of Reduced Longitudinal Separation over the Bay of Bengal and Arabian Sea

ROUTE: P628 – L510					
FIR	**Existing CNS Infrastructure and RNP 10 50 NM/50 NM Requirements**			**Additional Information on Current Mode of Operation For Phase 1**	**Adequate for RNP 10 50/50 Operation?**
	RNP 10 Communications Requirements Direct controller-pilot communication in voice/CPDLC	**RNP 10 Navigation Requirements RNP10 Approval**	**RNP 10 Surveillance Requirements Procedural position reports at least every 24 minutes**		
	Communication Means	**Navigation Specification**	**Surveillance in Place**		
KUALA LUMPUR	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes
CHENNAI	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes
KOLKATA	VHF direct communication between ATC and pilots, CPDLC available as secondary communication means	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes and Frequent position update by radar	Use of Radar as primary means of separating aircraft, ADS-C for Monitoring FANS 1/A aircraft as added surveillance	Yes
MUMBAI	VHF direct communication between ATC and pilots, CPDLC available as secondary communication means	RNP10 Approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes and Frequent position update by radar within radar coverage	Use of Radar as primary means of separating aircraft, ADS-C for Monitoring FANS 1/A aircraft as added surveillance	Yes
DELHI	VHF direct communication between ATC and pilots	RNP10 Approval	Frequent position update by radar	Use of Radar to monitor RNP 10 operation	Yes

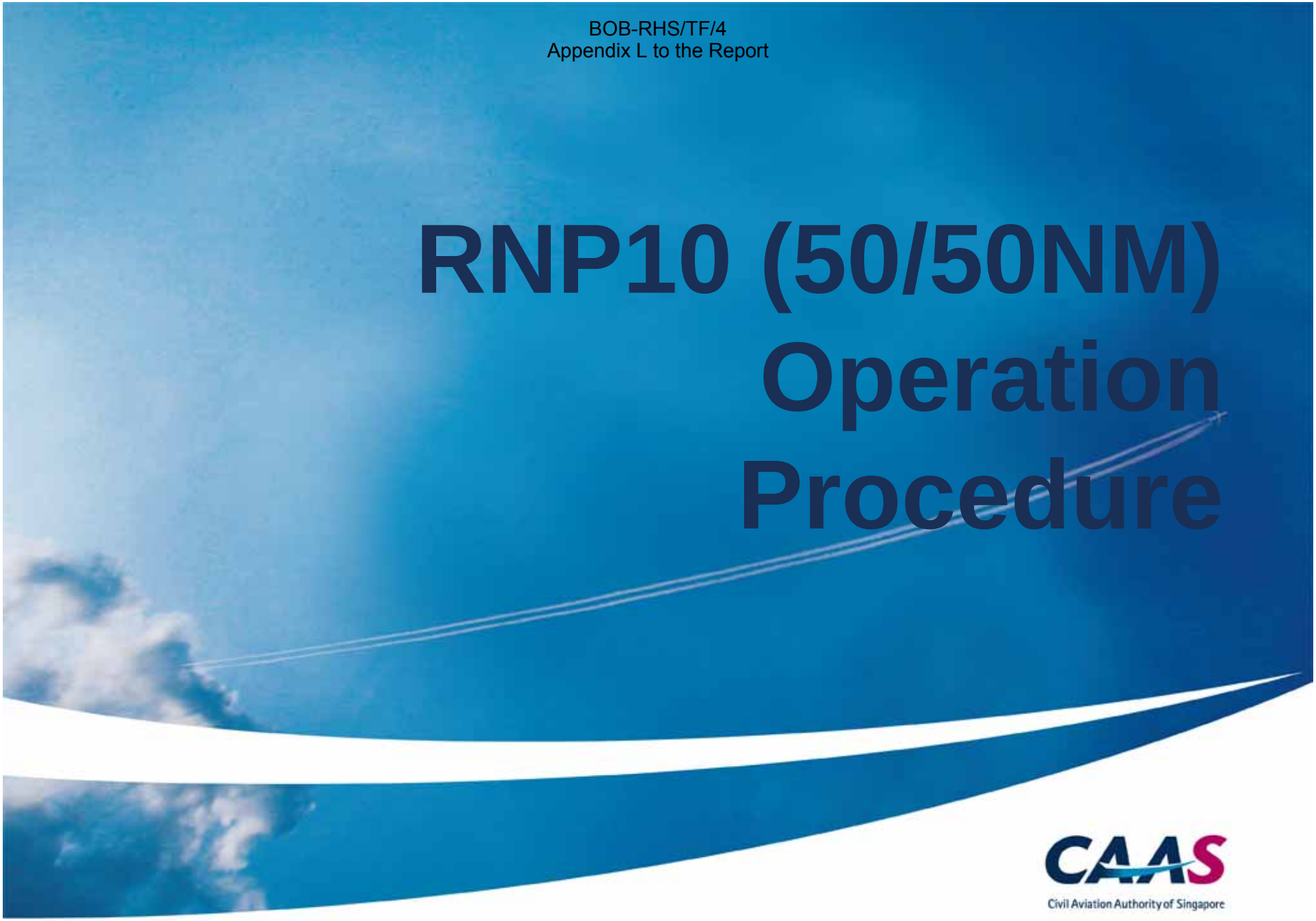
Phase 1 Implementation of Reduced Longitudinal Separation over the Bay of Bengal and Arabian Sea

ROUTE: P628 – L510					
FIR	**Existing CNS Infrastructure and RNP 10 50 NM/50 NM Requirements**			**Additional Information on Current Mode of Operation For Phase 1**	**Adequate for RNP 10 50/50 Operation?**
	RNP 10 Communications Requirements Direct controller-pilot communication in voice/CPDLC	**RNP 10 Navigation Requirements RNP10 Approval**	**RNP 10 Surveillance Requirements Procedural position reports at least every 24 minutes**		
	Communication Means	**Navigation Specification**	**Surveillance in Place**		
KARACHI	VHF direct communications between Pilots/Controllers	RNP 10 Approval (Route Re-designation to RNP10)	Procedural position reporting, intervals between successive waypoints less than 24 minutes	Some ATS routes to be re-designated to RNAV	Yes
LAHORE	VHF direct communications between Pilots/Controllers	RNP 10 Approval (Route Re-designation to RNP10)	Procedural position reporting, intervals between successive waypoints less than 24 minutes	Some ATS routes to be re-designated to RNAV	Yes
KABUL	VHF direct communication between ATC and pilots	RNP10 Approval (Route Re-designation to RNP10)	Procedural position reporting, intervals between successive waypoints less than 24 minutes	Some ATS routes to be re-designated to RNAV	Yes

Phase 1 Implementation of Reduced Longitudinal Separation over the Bay of Bengal and Arabian Sea

ROUTE: L301 / M502 - P762 - G465?					
FIR	**Existing CNS Infrastructure and RNP 10 50 NM/50 NM Requirements**			**Additional Information on Current Mode of Operation For Phase 1**	**Adequate for RNP 10 50/50 Operation?**
	RNP 10 Communications Requirements Direct controller-pilot communication in voice/CPDLC	**RNP 10 Navigation Requirements RNP10 Approval**	**RNP 10 Surveillance Requirements Procedural position reports at least every 24 minutes**		
	Communication Means	**Navigation Specification**	**Surveillance in Place**		
BANGKOK	VHF direct communication between ATC and pilots	RNP10 Approval	Frequent position update by radar	Use of Radar to monitor RNP 10 operation	Yes
YANGON	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication	RNP 10 approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes
CHENNAI	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication	RNP 10 approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes
COLOMBO	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication	RNP 10 approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes
MALE	CPDLC as primary communication between ATC and pilots for FANS 1/A aircraft, direct HF as secondary communication	RNP 10 approval	Procedural position reporting, intervals between successive waypoints less than 24 minutes	ADS-C surveillance on FANS 1/A aircraft	Yes Colombo FIR West through Male FIR to be implemented in Phase 2/3

RNP10 (50/50NM) Operation Procedure



Civil Aviation Authority of Singapore

Scope

- Overview on 50NM distance-based longitudinal separation application
- Assignment of NPDC levels during a/c startup
- Position overdue procedures
  - ➢Not using ADS-C
  - ➢Using ADS-C
- Distance verification

RNP10 (50/50NM) Overview

Civil Aviation Authority of Singapore

Overview

Time-based

- Use RP times to estimate separation distance
- Built-in buffer
- Conventional 15mins and 10mins (MNT)

Distance-based

- Verification of distance between aircraft
- No built-in buffer
- RNP10, RNP4, radar sep

Overview

- **RNP10 Operations**
  - Separation Minimum ⇒ 50NM (Lat / Long)
  - Aircraft equipage ⇒ RNP10 Approval
  - General CNS / ATM requirements

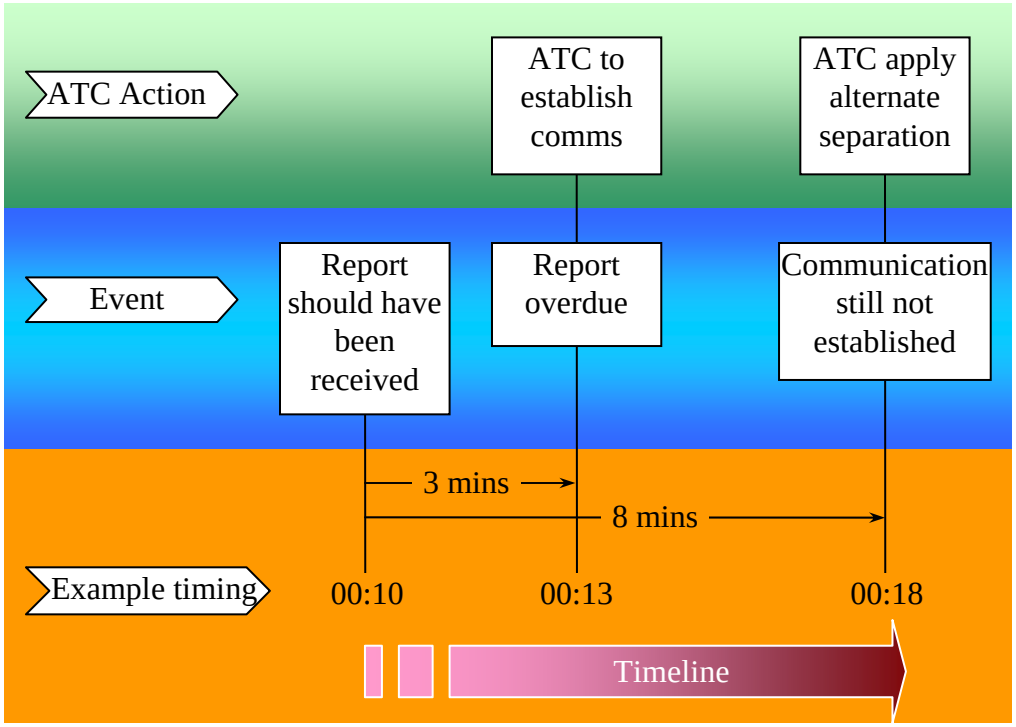
Communication	Navigation	Surveillance		ATM
VHF radio or CPDLC DCPC	RNP10 Routes	Not using ADS-C	Position reports or Radar sighting	Verify distance at least every 24 minutes
		Using ADS-C	ADS-C position update or Radar sighting	Maximum ADS-C periodic reporting interval at least every 27 minutes

Position Overdue Procedure

CAAS
Civil Aviation Authority of Singapore

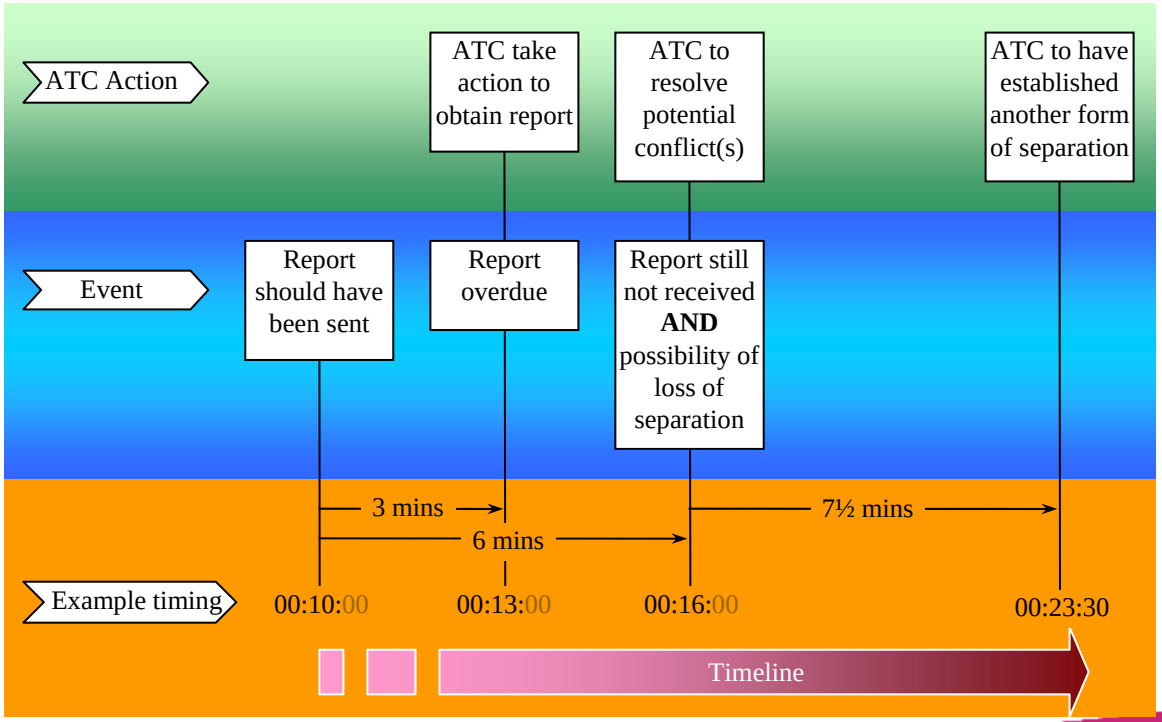
Position Report Overdue – Not using ADS-C

When an aircraft fails to report its position, the controller shall take action within 3 minutes to establish communication. If communication is not established within 8 minutes from the time the report should have been received, the controller shall apply an alternative form of separation.



ADS-C Position Update Overdue – Using ADS-C

For ADS-C periodic or waypoint change event report not received within 3 minutes from the time it should have been sent, the controller shall take action to obtain the report as quickly as possible. If the report is not received within 6 minutes of the time the original report should have been sent and there is a possibility of loss of separation with other aircraft, the controller shall take action to resolve any potential conflict(s) as soon as possible. The communication means should support such conflict resolution within a further 7½ minutes.



Distance Verification

Civil Aviation Authority of Singapore

Distance Verification

Distance between aircraft can be verified by:

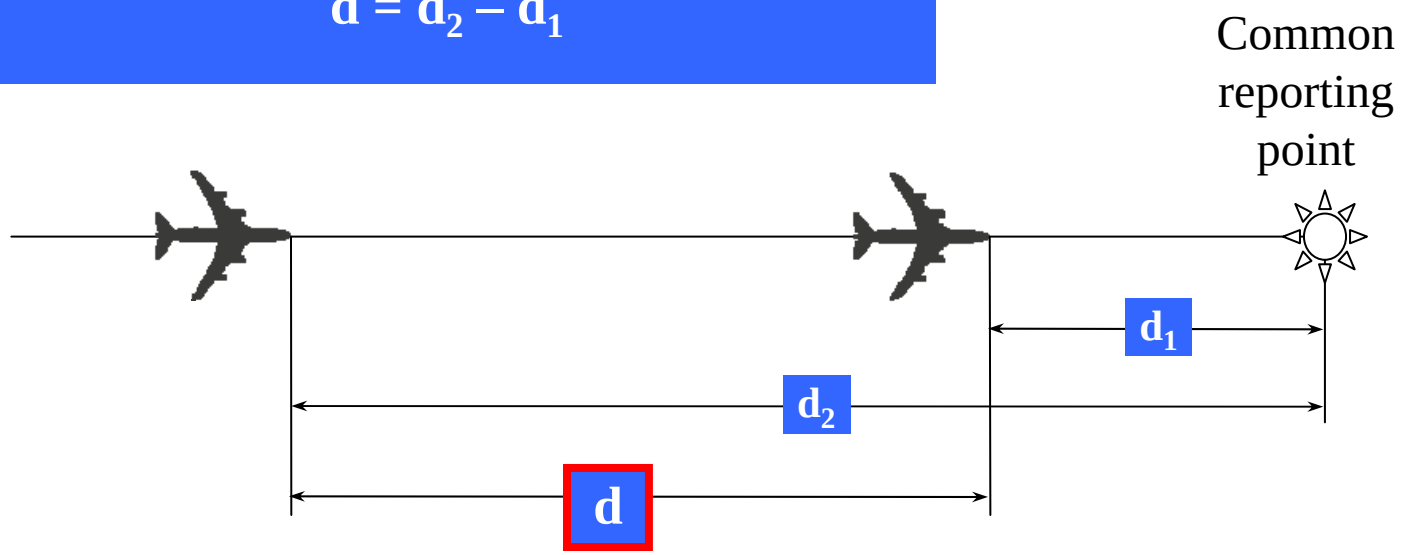
- Calculating distance d based on reported distances d_1 & d_2 from aircraft

- Measuring aircraft's calculated positions on radar or ADS-C PVD:
  - Measure distance between aircraft tracks for aircraft on same **identical** track; or
  - Measure distances d_1 & d_2 from common reporting point and calculate distance d (as above)

Distance Verification – calculation of d

Calculation of d, between aircraft on same identical track

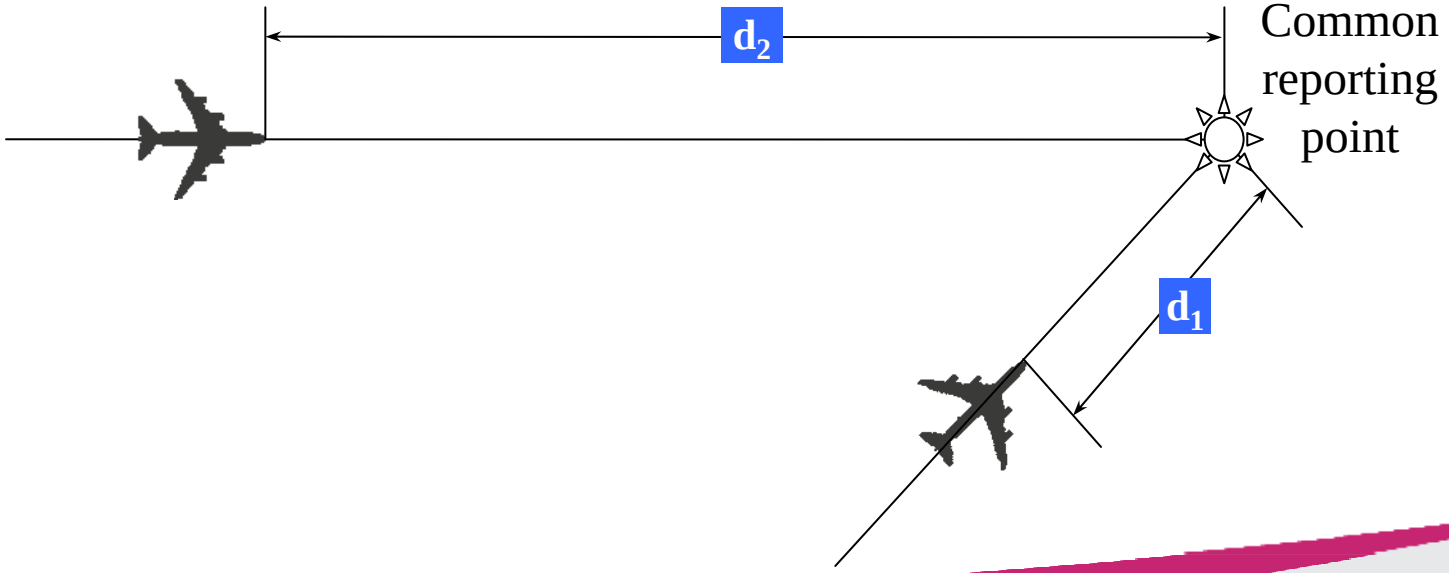
Distance between aircraft is calculated by
$$d = d_2 - d_1$$



Distance Verification – calculation of d

Calculation of d, between aircraft on same track

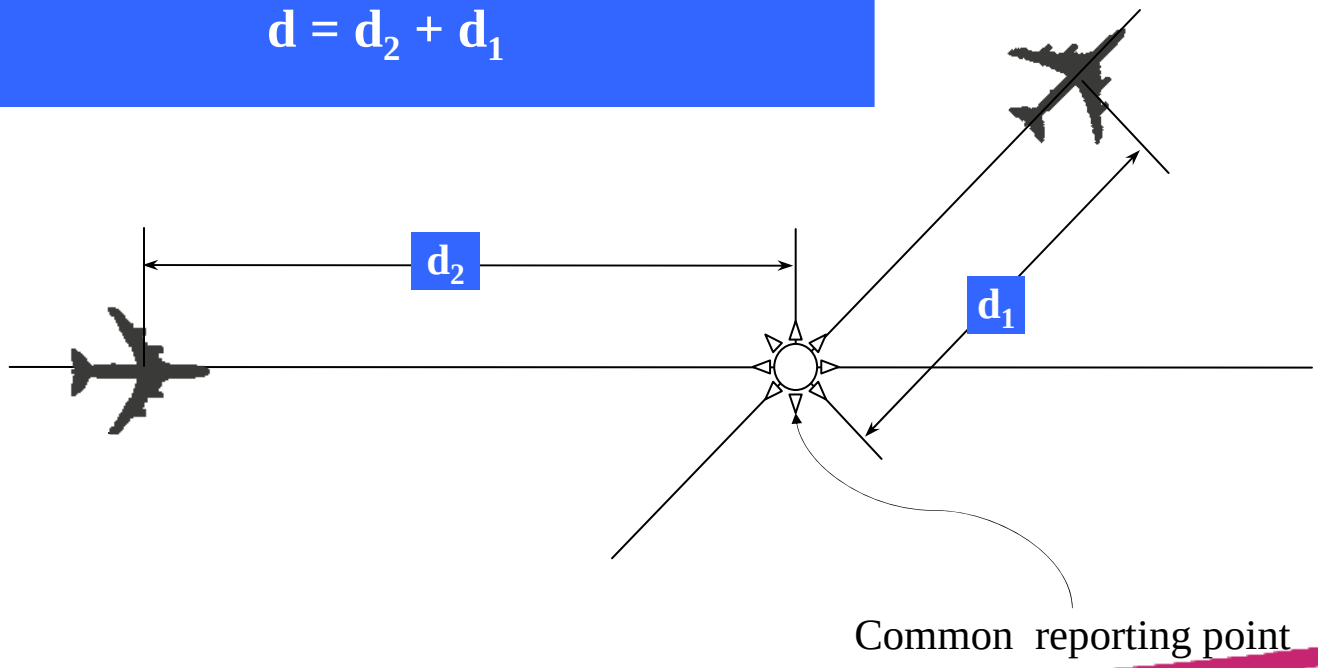
Distance between aircraft is calculated by
$d = d_2 - d_1$



Distance Verification – calculation of d

Calculation of d, between aircraft on same track, opposite sides of common reporting point

Distance between aircraft is calculated by
$$d = d_2 + d_1$$



Distance Verification – Guiding Principles

- Guiding principles on distance verification
  - ✓ Time lag between instruction passed and distance reported
  - ✓ As such, controllers shall exercise discretion in the sequence of requesting such reports
  - ✓ As a guide, distance reporting instructions should normally be issued to the front aircraft first. This is to make certain, as much as possible, that the first received report be from the front aircraft so as to give a more conservative calculated distance between aircraft.

Distance Verification – Phraseology / Msg

- Phraseology
  - ✓ Controller shall use the phraseology:
  - ✓ “Report distance [*to/from*] [*position*]”

- CPDLC uplink
  - ✓ Use preformatted uplink message:
  - ✓ “Report distance [*to/from*] [*position*]”

Note : ‘*To’* shall be used when *position* is an ensuing waypoint.

TASK LIST

SN	Activity	Start Date	Completion Date	Present Status	Group Responsible
	Identify Operational Need				
1	Agree that an operational needs for a 50 NM horizontal separation in the Bay of Bengal and Oceanic Area of the Mumbai FIR	November 2009	November 2009	Agreed	All delegates at the BOB-RHS/TF/1
	Safety Assessment				
2	Appointment of a Bay of Bengal and Mumbai Enroute Monitoring Agency	November 2009	February 2011 (BOB-RHS/TF/5)	Ongoing	India has accepted the responsibility to establish an EMA. Until formally endorsed by RASMAG, India will continue to coordinate with SEASMA (CAAS)
3	States to continue to collect and provide traffic data	1 July 2010	July 2011	Ongoing	States
4	States to provide additional data as required by the EMA	1 July 2010	July 2011	Ongoing	States
5	Examine history of navigational errors and assess possible impact on safety	1 July 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States/EMA
6	Confirm collision risk model assumptions/parameters are consistent with airspace where the 50 NM horizontal separation is to be applied	October 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States - part of safety assessment
7	Report monthly navigational errors (including operational errors)	1 July 2010	July 2011	Agreed by BOB-RHS/TF/3 to collect data	States/EMA
8	Qualitative Safety Assessment to be completed	1 July 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States
	Feasibility Analysis				
9	Examine the operational factors and workload associated with the 50 NM longitudinal separation implementation in BOB/Mumbai FIRs	February 2010	February 2011 (BOB-RHS/TF/5)	To be completed before implementation of Phase 1	States
10	Complete feasibility analysis on the 50NM longitudinal separation implementation on N571, P628, L510 and P762	May 2010	February 2011 (BOB-RHS/TF/5)	To be completed before implementation of Phase 1	States
	Determination of Requirements (airborne & ground systems)				
11	States assess the impact of the 50 NM longitudinal separation implementation on controller automation systems and plan for upgrades/modifications	November 2009	February 2011 (BOB-RHS/TF/5)	To be completed before implementation of Phase 1	States
	Perform Necessary Industry & International Co-ordination				
12	Establish target implementation date on the 50NM horizontal separation on N571, P628, L510 and P762	May 2010	March 2011	10 March 2011	States
13	Report to ATM/AIS/SAR/SG	November 2009	July 2011		ICAO

TASK LIST

SN	Activity	Start Date	Completion Date	Present Status	Group Responsible
14	States to coordinate with Boeing Lab for bench testing ADS/CPDLC system and ADS/CPDLC data collection and problem report to Boeing Lab	November 2009	July 2011	Ongoing	Boeing/States
15	States to report the status and updates on ADS/CPDLC system	October 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States
16	Prepare and submit draft amendment proposal to amend Doc 7030	May 2010	February 2011 (BOB-RHS/TF/5)		BOB-RHS/TF
17	Publish AIP Supplement containing the 50 NM longitudinal separation policy/procedures	December 2010	February 2011 (BOB-RHS/TF/5)		BOB-RHS/TF
18	Review and finalise Letter of Agreement between inter-ACC	December 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States
19	Finalize Gross Navigation Errors Letters of Agreement	December 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States
	Approval of Aircraft & Operators				
20	Establish approved operations readiness targets	BOB-RHS/TF/2	February 2011 (BOB-RHS/TF/5)	Ongoing	States
21	Assess operator readiness	BOB-RHS/TF/2	February 2011 (BOB-RHS/TF/5)	Ongoing	States
	Develop ATC Procedures				
22	States to develop procedures for handling non-compliant aircraft in ATS documentation due to equipment failures in their ATS documentations	October 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States
	ATC Training				
23	Complete training for air traffic controllers on the application of 50 NM horizontal separation	October 2010	February 2011 (BOB-RHS/TF/5)	Ongoing	States
24	Complete ADS/CPDLC system training for Air Traffic Controllers	Jul-10	February 2011 (BOB-RHS/TF/5)	Ongoing	States
	Complete Safety Assessment				
25	Review and accept safety assessment	October 2010	February 2011 (BOB-RHS/TF/5)		BOB-RHS/TF/5
	Final Implementation Decision				

TASK LIST

SN	Activity	Start Date	Completion Date	Present Status	Group Responsible
25	Go/No-Go Decision	October 2010	February 2011 (BOB-RHS/TF/5)		BOB-RHS/TF/5
26	Implementation	10 March 2011	10 March 2011		States
	Post Implementation Review - 90 Day Review				
27					
28					
29					

BOB-RHS TF - GO/NO GO DECISION CHECKLIST

a) Forwarding of TSDs, Traffic Movements and GNE Reports by States to BOBASMA and SEASMA for the conduct of the safety assessment and continued monitoring;
By 31 October 2010

b) States to sign the Operational LOAs for Monitoring of Aircraft Navigation Errors and expedite sending this signed document to the BOBASMA Email Address: ***bobasma@aai.aero***
By 31 October 2010

c) Completion of quantitative safety assessments by the EMA;
By 31 January 2011

d) Complete and review Communications, Navigations & Surveillance (CNS) Operational Requirement Table to ensure seamless application of RNP10 reduced horizontal separation;
By 31 December 2010

e) Completion of States' ATC Procedures for application of RNP10 reduced horizontal separation;
Before BOB-RHS/TF/5 – 8 February 2011

f) Completion of controller training on RNP10 reduced horizontal separation, including contingency procedures;
Before BOB-RHS/TF/5 – 8 February 2-11 or at least before Phase 1 implementation (should be captured in the qualitative safety assessment that it will be completed before implementation if it is still ongoing after BOB-RHS/TF/5)

g) Completion of qualitative safety assessments by ATS providers as part of Safety Management System;
Before BOB-RHS/TF/5 – 8 February 2011

h) Preparation and Publication of AIP Supplement / NOTAMs;
Before BOB-RHS/TF/5 – 8 February 2011

i) Completion of amendments to Operational Letters of Agreement between States involved in Phase 1 implementation:
Before implementation of Phase 1

j) With respect to RNAV RNP 10 operations involved in the BOB-RHS/TF, and in coordination with adjacent States, change ATS routes to RNAV routes where applicable.
Before BOB-RHS/TF/5 – 8 February 2011