



REPORT OF THE FIRST ATS COORDINATION MEETING OF
BAY OF BENGAL, ARABIAN SEA AND INDIAN OCEAN (BOBASIO)
REGION

NEW DELHI, INDIA, 05 – 06 MAY, 2011.

Organised by

AIRPORTS AUTHORITY OF INDIA

Under the aegis of ICAO

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History of the Meeting

1.1 Introduction

1.1.1 The First ATS Coordination Meeting of the Bay of Bengal Arabian Sea and Indian Ocean (BOBASIO) Region was held in New Delhi, India from 5 - 6 May 2011 at the Indian Aviation Academy.

1.1.2 The meeting was hosted by the Indian ANSP, Airports Authority of India and was attended by Sri Lanka, Thailand, Nepal, Oman and the host nation India. However, the scope of participation extends further to Maldives, Pakistan, Malaysia, Myanmar, Singapore, Indonesia Seychelles, Bhutan and Bangladesh.

1.1.3 The objective is to bring the integration of both the BOB subgroup and the ASIO subgroup, so that the issues of seamless service and resource sharing in the BOBASIO sub region of the APAC Region of the participating States can be enhanced to better proportions, thus resulting in high levels of user satisfaction.

1.2 Officers, Secretariat and Participants

1.2.1 Mr. John Richardson, ICAO ATM Consultant, Mr. M.K.Basnet, CAAN(Nepal), Mr. P.K. Kapoor, ED(CNS-OM), AAI, Mr. Sunun Nimfuk, Aero Thai, Mr. Prashant Sanglikar, IATA, Mr. Abdullah, Oman, Mr. Dissnayake, SriLanka acted as Chairperson(s) for different sessions. Mr. Satyajit Dutta JGM (ATM) acted as secretaries to the meeting for preparation of the report.

1.2.3 The meeting was attended by 41 participants including 12 delegates from Oman, Nepal, Sri Lanka, Thailand, IATA, DGCA India, and other aviation experts from Airports Authority of India across the country. A list of participants is attached in Appendix A.

1.3 Opening of the Meeting

1.3.1 The meeting was inaugurated by Shri Bharat Bhushan, Director General of Civil Aviation, India. He delivered a key note address on the role played by India in the Region. He mentioned that the meeting assumes enormous significance and importance with participation of many neighboring countries around India in their collective quest for finding common solutions through a collaborative approach for safe efficient and environment friendly aircraft operations in Asia Pacific Region. DGCA India while appreciating the efforts of Airports Authority of India in organizing such a meeting called for a collaborative approach in sharing information, resources, expertise and procedures among the States of the APAC and adjoining region and keeping themselves abreast with the international best practices.

1.3.2 Shri V.P. Agrawal, Chairman Airports Authority of India elaborated on the recent CNS-ATM initiatives by Airports Authority of India in implementing RVSM, R-NAV Routes, Performance Based Navigation, En-route Monitoring Agency and Reduction of Longitudinal Separation Minima. He called for close cooperation among the States for deriving optimum benefits from similar initiatives by the other states.

1.3.3 Mr. V. Somasundaram, Member (ANS), Airports Authority of India (AAI), welcomed the participants from neighbouring states of Nepal, Oman, Sri Lanka and Thailand to Delhi. He informed that Airports Authority of India as a major Air navigation Service provider in the Region has embarked on many ANS-improvement initiatives for meeting not only the challenges of ensuring Safety and Efficiency of aircraft operations but also optimizing capacity against the demand posed by increasing traffic growth in the Asia Pacific Region. He noted that this was the first meeting of the BOBASIO Region and delivered an outlined purpose for the establishment of BOBASIO region along with the benefits of exchange of information amongst the member states who are immediate neighbor to each other. He expressed that this would be an excellent platform to resolve various ATM related issues concerning coordination between ATS units, search and rescue, air traffic flow management, ATS route structure, contingency plans, development of latest technologies and other related issues.

1.3.4 Mr. John Richardson, Consultant (ICAO) expressed his pleasure to be part of the meeting and appreciated India on behalf of ICAO for taking initiative in coordinating with neighbouring countries in areas which require close coordination amongst neighbours. He mentioned that ICAO APAC region will provide full support to such initiatives.

1.3.5 The inaugural session concluded with a vote of thanks by Mr. Jyoti Prasad, Executive Director (ATM) Airports Authority of India.

1.4 Documentation and Working Language

1.4.1 The meeting was conducted in English. All meeting documentation was in English.

1.4.2 Ten (10) working papers were presented to the meeting. A list of the papers is at Appendix B.

Report of the Meeting

Agenda Item 1: Adoption of Agenda

1.1 The meeting adopted the following agenda:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Satellite based Navigation

Agenda Item 3: Implementation of RHS 50 NM

Agenda Item 4: BOBASMA – EMA, India

Agenda Item 5: ATM contingency plan

Agenda Item 6: Air Traffic Flow Management (ATFM) in India

Agenda Item 7: Automatic Message Handling System (AMHS) & ATS Interfacility Data-link Communication (AIDC)

Agenda Item 8: ATS Automation System

Agenda Item 9: Implementation of FPL 2012

Agenda Item 10: Search and Rescue Plan

Agenda Item 11: Discussions on review of existing LOA

Agenda Item 12: Proposal for constitution of ATS coordination group in BOBASIO region

Agenda Item 13: Date and Venue for the next BOBASIO meeting

Agenda Item 2: Satellite based Navigation

2.1 An overview of GPS Aided Geo Augmentation Navigation (GAGAN) – the Indian Satellite Based Navigation System (SBAS) was presented in the meeting. To affirm India's commitment to future Communications Navigation and Surveillance/Air Traffic Management (CNS/ATM) developments, major steps are taken towards the development of India's regional Satellite Based Augmentation System (SBAS) called GAGAN (The Sky).

2.2 India is working towards attaining APV1/APV 1.5 capability over the entire land mass. As the footprint of the GAGAN space segment covers large portion of the Asia-Pacific region i.e., the whole of Indian region and neighboring countries such as Sri Lanka, Pakistan, Afghanistan, Bhutan, Nepal and Bangladesh, all can derive benefit of the Indian experience to provide SBAS services by appropriately augmenting ground segments.

2.3 India lies in the equatorial anomaly region where solar activities are relatively high. In the equatorial region the ionospheric variations are very predominant which affect the GPS as well as GEO signals. It has therefore been decided to go for Iono modeling over Indian airspace after collecting TEC data over an extended period of time from 26 TEC stations, which have been established for the purpose. An algorithm working group (AWG) which was formed has finalized the most suitable ionosphere algorithm to ensure the integrity of GAGAN signal in space.

2.4 The GAGAN project is implemented in two phases namely the Technology Demonstration Phase and the Final Operations Phase. Technology Demonstration Systems (GAGAN - TDS) has been completed. This phase required implementation of a minimum configuration system to demonstrate the capability of the SBAS over limited region of the Indian airspace to serve as proof of concept. The performance objective was to meet the limited ICAO SARPs requirements. The TDS –extended consisted of eight Indian Reference Stations (INRES) at Delhi, Kolkata, Guwahati, Port Blair, Ahmadabad, Bangalore, Jammu and Trivandrum; an Indian Mission Control Center (INMCC) at Bangalore; Indian Land Uplink System (INLUS) at Bangalore; required communication links; and necessary software for navigation and communication. The INMARSAT 4F1 navigation transponder (space segment) was hired in the month of January 2007 for integration of GAGAN ground segment, to complete Final System Acceptance Test (FSAT) and also to conduct the user level testing of GAGAN SIS in May-2007. Results were better than 7.6 meters accuracies in both vertical and horizontal over 95% of the time within the perimeter of the reference stations. Using type 62 (test) messages, the TTA was better than 6.2 seconds. Several experiments were conducted with the signal in space, including the verification of the accuracy with certified airborne SBAS receiver.

2.5 Final Operational Phase (FOP) has started in June 2009. GAGAN–FOP is being deployed in a spiral deployment methodology, building incrementally on the TDS phase equipment and architecture, using lessons learnt, and data generated from TDS phase to guide the deployment of the Final Operation phase. The ground based elements (GBE) of the GAGAN-FOP will consist of all subsystems established in TDS phase and additional 7-INRES, redundant INMCC and Indian land uplink station-signal generation subsystem (INLUS-SGS). The communication links are planned to have redundancies in terms of 2 OFC links and 2 VSAT links between the GAGAN ground elements, to provide the required availability for GAGAN-FOP. The deliverables include ionospheric modeling and implementation on the operational system as per software standards, final RNP0.1, APV1.0 or APV 1.5 certification data preparation, safety design and HMI assessment documentation/reports.

2.6 An algorithm review team (ART) has reviewed and finalized the recommendation made by the AWG. The objective is to develop a single frequency user-based method for characterizing ionospheric delays that provides mitigation to the depletion problem. The format and resolution of the data have been determined by the AWG and Algorithm Review Team (ART). During the GAGAN-FOP the AWG and ART will collaborate on a plan for implementation and certifications of the equatorial GIVE (Grid

Ionospheric Vertical Error) identified on the operation of GAGAN and provide the details and objectives for the parameters of the ionospheric scintillation model.

2.7 Initially, GSAT-4 was planned to be positioned in the Indian Ocean region at 82°E longitude. The failure of launch in April 2010 has had slight impact on the planned schedules. However, the next payload, GSAT-8 is planned to be launched during May 2011. This will be followed by a launch of GSAT-10, to meet the operational requirement of GAGAN.

2.8 The first milestone is to deliver an RNP 0.1 capability provided over the Indian FIR as specified in the ICAO specification. The second milestone is to deliver APV1 /APV 1.5 service as specified in the ICAO specification over 90% of the Indian land mass. A certification package to demonstrate the service requirements associated with this milestone will be delivered with the APV 1.5 service milestone.

2.9 DGCA (India) officials are involved in the process for certification of the system. The draft certification plan is prepared and is in the process of evaluation. The process of certification has started concurrently with GAGAN- FOP and will proceed as a parallel activity in coordination with all concerned participants and appropriate assistance from FAA, the authority who has certified WAAS, is being sought.

2.10 Indian Space research organization (ISRO) in association with the Airports Authority of India (AAI) will be developing the entire system through all the stages of TDS-Extended, and FOP. The Ground Segment will be maintained by AAI whereas ISRO will continue to provide technology support, maintenance and replenishment of the space segment of the system, as and when required, to maintain the system as a robust system.

2.11 The system with its entire space segment of three GEOs (GSAT 8, GSAT10 and GSAT 9), ground segments, and uplink stations shall be ready by 2013. However, GAGAN SIS will be available with the integration of GSAT8. The certified GAGAN system for aviation users within the defined service volume will be available with availability of the entire system including appropriate redundancies and safety assurance mechanisms by June 2013.

2.12 GAGAN has a capability to provide the augmentation service within its footprint, which covers a large portion of the Asia-Pacific region. Necessary Ionosphere models for GAGAN are under development. GAGAN system takes into account the fact that in the equatorial ionosphere the spatial and temporal variability is high and therefore a model specifically for this region is being developed to take care of the variations. GAGAN would be developed to meet the ICAO GNSS SARPs and it will be interoperable with WAAS, EGNOS, MSAS and GRAS.

2.13 IATA opined that a detailed study may be carried out regarding cost benefit analysis of GAGAN system and wanted that it will very useful if the system is used for

precession and non-precession approaches in hilly areas of North-East India where it is not possible to install ILS.

2.14 On query from Nepal delegates, the advantages of GAGAN in eliminating ground based systems navigation systems viz. VOR, DME and NDB and how it will be helpful in implementing PBN procedures was explained.

2.15 Kolkata was keen to know about the future effect of GAGAN on the recently implemented PBN procedures at Kolkata airport, to which it was explained that GAGAN will enhance the performance. Kolkata was also eager to know whether GAGAN can be used for CAT II or III ILS in the airport where there is no ILS instrument. It was explained that in the first phase of GAGAN implementation, it can be used for Non Precession Approaches only and even during proposed second phase the performance of CAT I ILS is expected.

2.16 The meeting concluded with a note from the chair appreciating the Indian effort to provide a wide SBAS footprint in the region, especially the development of the Ionospheric model and an approved and validated algorithm for iono-corrections of the signals. The meeting also urged India to provide more details on the methodology of establishment of INRES stations and uplink protocols in the APAC countries, which desire to benefit from the Indian technical expertise, including the technical, operational and financial aspects.

Agenda Item 3: Implementation of RHS 50 NM

3.1 The Bay of Bengal ATS Coordination Group (BBACG) in its twentieth meeting held in January 2009 decided to introduce widespread 50NM Longitudinal Separation in the Bay of Bengal, Arabian Sea and Indian Ocean region and established the Reduced Horizontal Separation Task Force (BOB-RHS/TF) to support its implementation. The BOB-RHS Task Force in its various meetings through 2009 and 2010 decided to undertake the implementation in a phased manner.

3.2 During the BOB-RHS/TF/1 meeting, India recognizing the need for a formal monitoring program, for lateral and longitudinal navigation errors in the Bay of Bengal Arabian Sea region to support implementation of Reduced Horizontal plane separation, volunteered to establish an En-Route Monitoring Agency for the same.

3.3 The India EMA (BOBASMA) has been established at Chennai in association with Indian Statistical Institute, New Delhi and undertook the Airspace analysis and Safety Assessment of the Bay of Bengal and Arabian Sea region and submitted the report in the 14th meeting of RASMAG.

3.4 Based on the Safety Assessments conducted by both the EMAs of India and Singapore, the 5th meeting of the BOB-RHS Task Force in February 2011 decided to implement 50 NM Longitudinal Separation along four Routes, L510, N571, P628 and P762 from AIRAC date 30th June, 2011 as part of Phase 1. In Phase 2, 50NM longitudinal

Separation will be introduced along L301, L759, M300, M770, N563, N877, P570 & P574 and in Phase along the rest of the RNAV routes.

3.5 AIP Supplement 21/2011 dated 07 April 2011 has been issued by India for the reduced longitudinal separation of 50 NM along four international routes in Phase 1 from AIRAC date 30th June 2011.

3.6 The states were advised to finalize the letter of agreement (LOA) between states for the implementation of 50 NM distance based separation, conduct ATS interoperability bench tests between adjacent ACCs to ensure smooth transfer of Control of aircraft equipped with ADS-CPDLC and have AIDC in place for Ground to Ground coordination among adjacent ACCs.

3.7 Mr. Richardson updated the meeting that the whole region is going to be RVSM by Nov 2011 including major part of Russia and Afghanistan.

3.8 IATA welcomed the implementation of RHS as there will be a savings of 1.2 tonnes of fuel per flight when an aircraft fly at its optimum level in comparison with two levels below (for 5 hr of flight).

3.9 Delegates from Oman were also very pleased as it is going to reduce the workload of Omani Controllers by reducing the separation to be maintained between aircraft before releasing to Mumbai as 10 NM longitudinal radar separation is applicable in Oman.

3.10 India urged IATA and ICAO to advise the airline community to install the datalink on board at least on the flight which operates on the busy RHS 50NM routes. India also informed the meeting that many airliners which are equipped with datalink capability do not log-in. Mr. Richardson (representative ICAO) advised India to provide such data ICAO so that it may be taken up with the concerned airlines by APAC region. India also opined that longer and busier route like N571 could be made available for ADS/CPDLC equipped aircraft only so as to achieve the maximum benefit of 50 NM RHS.

3.11 Sri Lanka pointed out that the AIP supplement on RHS issued by India states that if an aircraft is not RNP10 it has to file F270 or below on route P762. Whereas the minimum flight level on the route P762 is F260. As per AIP Supplement issued by Sri Lanka, RNP 10 approved aircraft may flight plan at F260 and above. This discrepancy may be sorted out before implementation of 50 NM RHS.

3.12 The meeting concluded that the transition to 50NM RHS along designated routes will benefit all stakeholders and directed the States to sort out issues connected with the implementation through LOAs. The meeting also urged IATA to sensitise the airlines they represent to actively participate in ADS-C/CPDLC service provided, so that the benefits of increased DCPC and reduced VHF-RTF congestion, frequent position determination, can be optimally exploited.

Agenda Item 4: BOBASMA – EMA, India

4.1 Airports Authority of India established the Bay Of Bengal Arabian Sea Monitoring Agency (BOBASMA) at Chennai. BOBASMA started functioning from New ATS complex, Chennai Airport, Chennai.

4.2 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. The website of BOBASMA is currently being created as link to AAI website and will be made available shortly. Request for State PBN and Data-link approvals data as per Appendix-C of EMA Handbook sent to DGCA India and other member States.

4.3 BOBASMA conducted the Airspace Analysis & Safety Assessment for Bay of Bengal Arabian Sea region, which was presented to RASMAG/14 meeting. The lateral collision risk was estimated to be $.601881 \times 10^{-9}$ & the longitudinal collision risk $.371804 \times 10^{-9}$, both of which are well below the TLS of 5×10^{-9} . The Safety Assessment supports the continued use of 50 NM RNP10 lateral separation and also the implementation of RNP10 50NM longitudinal separation on L510, N571, P628 and P762. The RASMAG/14 meeting decided to work towards preparing a recommendation to be presented to APANPIRG in September 2011 to approve India as an EMA for the identified sub-region.

4.4 Monitoring of aircraft navigation errors is a joint responsibility between the aircraft operators, the States of Registry, and the air navigation services providers of the FIRs concerned. States must have a Letter of Agreement (LOA) with the designated EMA which clearly spell out the responsibilities and procedures to be followed by respective States and FIR authorities. The LOA should identify suitable designated areas where monitoring is to be done. There is also a need to collect the traffic movement count for each route portion in the area. When a State of Registry approves or amends the approval of an operator/aircraft for en-route PBN operations, details of that approval must be recorded and sent to the appropriate EMA without delay.

4.5 India reminded the meeting that it was decided to share the details from SEASMA which is already operational. Unfortunately, none of the official from SEASMA could make it to the meeting. Uncertainty on the implementation of 50 NM RHS on P628 was expressed by some of the members from Kolkata, since there is no VHF coverage between URKOK and VATLA, ADS/CPDLC is the only alternative for direct controller to pilot communication (DCPC). A mixed mode on busy routes like P628 would be very stressful as all aircraft are not equipped with ADS/CPDLC.

4.6 The chair placed on record the good work done by BOBASMA. The meeting concluded by reiterating the need for the timely forwarding of GNEs and TSDs to the EMA. The meeting also advised the States to have LOAs in place, to facilitate smooth data and information exchange between the States and the EMA (BOBASMA).

Agenda Item 5: ATM contingency plan

5.1 Guidelines for contingency measures for application in the event of disruptions of air traffic services and related supporting services were first approved by the ICAO Council on 27 June 1984 in response to Assembly Resolution A23-12. In the year 2007, ICAO APAC urged states to develop ATM Contingency plan for their FIR on the lines of ATM contingency plan developed by Indonesia for Jakarta FIR to meet the requirement of Annex 11 - Air Traffic Services, Chapter 2, paragraph 2.30. Accordingly, Airports Authority of India developed ATM Contingency plan for Delhi, Mumbai, Chennai and Kolkata FIR in February 2008 and was circulated to all neighbouring states for their comments. Till date no state has forwarded any comments on Indian ATM Contingency plan.

5.2 In the twenty first meeting of the Bay of Bengal ATS coordination group (BOBACG/21) held from 7th to 10th March 2011 at Bangkok, ICAO urged states to prepare ATM Contingency plan which is compatible with neighbouring states. All states are advised by ICAO to update the progress in BBACG/22 meeting.

5.3 India has updated the first edition of ATM Contingency plan to include latest contact details and revised route structure for all Indian FIRs. The ATM Contingency plan is developed for safe and orderly flow of international air traffic through upper Indian airspace in case of disruption of Air Traffic Services. There may be partial or total disruption of Air Traffic Services in the FIR which will be notified through NOTAM. It is considered highly unlikely that all facilitates would be out of service simultaneously in all Indian FIRs, therefore, separate ATM contingency plan have been developed for Delhi, Mumbai, Chennai and Kolkata FIR.

5.4 The detail of Indian contingency plan is provided in working paper 4. The meeting is invited to take a note of the contents of the Indian Contingency Plan. States were urged to develop the ATM Contingency plan which is compatible with Indian Contingency ATS routes and sign the Letter of Agreement for the same.

5.5 The ATM Contingency Plan for Nepal and Bangladesh were submitted to India for detailed study and comments. Sri Lankan delegates informed that Sri Lanka has prepared the ATM Contingency Plan and will coordinate and finalize it within a month. Oman Delegates were requested to consider an additional level (F360) on L301. Oman expressed their inability to accept the proposal as F360 was already been allotted to flights from Karachi FIR.

5.6 Nepal expressed their requirement for 2 eastbound and 2 westbound levels for contingency operation and also for inclusion of L626 as contingency route. India expressed her inability to accommodate so many routes within a short area, but conveyed the willingness to discuss/modify the climbing procedure for flights from Kathmandu to India. A similar request was forwarded to Thai delegates by India for additional levels on L301. As the ATM operating procedures are almost similar even in Contingency Plan, therefore India

suggested that vertical separation may be reduce to 1000ft and to take up the matter with ICAO.

5.7 During Contingency Procedure, airlines are to obtain approval from the Regulator for each flight. IATA expressed their concern about the time that regulator (DGCA) may take to clear such flights. Normally DGCS India takes 3-4 days to issue clearance to a flight. IATA opined that system should be in place for immediate clearance of such flights when Contingency Plan in force and urged AAI to pursue this with ICAO and DGCA India. Sri Lankan delegates also asked for a better clarification on the clearance part of Contingency plan.

5.8 The meeting urged all States to take cognizance of the Indian Contingency Plan and prepare similar plans for their States and integrate them into a smooth regional plan. The meeting also stressed the importance of LOAs between States to incorporate the Contingency Plan aspect and also have an easy mechanism for State Regulatory approval.

Agenda Item 6: Air Traffic Flow Management (ATFM) in India

6.1 According to estimates international aircraft movements' will grow by 8% per year for 2010-2013, and 7% per year for 2014-2023. Domestic aircraft movements' will grow by 3.4% per year for 2010- 2013 and 8% per year for 2014-2023. International passenger volume will grow by 10% per year and 9% per year during these time frames. Domestic passenger volume will decline by 0.3% per year from 2010 to 2013, and thereafter grow at an 8% annual rate for 2014 - 2018, and grow at an annual rate of 10% for 2019 - 2023.

6.2 India needs to gear up its facility and technology to sustain this increased demand while operating under difficult weather constraints (e.g., extensive and long-lived fog, turbulence and convective weather associated with monsoons and the occasional cyclonic storms), and living within the national security constraints that result from the extensive airspace used exclusively by the Indian military.

6.3 The current ATM system does not support strategic, pre-tactical, and tactical ATFM automation and processes to efficiently smooth the demand for constrained resources, improve efficiency of the system and decrease the carbon footprint. The current air transportation situation in India experiences periods of significant delay associated with high demand routes (e.g., Mumbai-Delhi). Excessive airborne holding is routine occurrence resulting in increased controller/pilot workload with the associated increase in fuel consumption and emissions. These bottlenecks will be eliminated with the application of existing and proven solution into the next optimization of C-ATFM for the entire system in India. The proposed C-ATFM System will balance demand and capacity in Indian airspace and airports for most efficient operations that will include both international and domestic traffic.

6.4 Today, the primary method for long-term balancing demand with system capacity is to restrict demand by allocating a fixed number of arrival/departure slots to scheduled aircraft

operating into and out of India's major, congested airports. Slot allocations are made on a half yearly basis, with the numbers adjusted for seasonal weather and traffic conditions. The slots equitably distribute the restricted airport and airspace capacity to aircraft operators. Short-term (e.g., during a flight day) balancing is accomplished by air traffic control (ATC) imposing delays on aircraft and airlines' decisions to divert to alternate airports during periods of weather-restricted capacity. Weather information and airport capacity information is not made available to ATC and flights through an integrated system. Each party makes independent decisions about how to restrict and manage flights during problem periods. This often results in less than optimal utilization of available airspace, airports, and aircraft resources.

6.5 **Phase 1:** The C-ATFM baseline would be in place by end of 2011. This would provide AAI and Aircraft Operator users with significant capabilities to perform strategic, pre-tactical, and tactical ATFM and CDM associated with sector demand of Nagpur airspace and arrivals into grade:1 and 2 airports [six (6) airports]: Chhatrapati Shivaji International Airport in Mumbai, Indira Gandhi International Airport in New Delhi, Chennai International Airport, Netaji Subhash Chandra Bose International Airport in Kolkata, Bangalore International Airport, and Rajiv Gandhi International Airport in Hyderabad. With access to aircraft operator schedule data via the Official Airline Guide (OAG) and/or directly from the aircraft operators and operational flight data from AAI's ATC automation system, strategic and pre-tactical demand predictions are provided to AAI to determine periods of excess demand compared to the available capacity. C-ATFM for ANSP provides capabilities to model and implement Traffic Management Initiatives (TMIs) to smooth the demand to the available capacity via Ground Delay Programs. TMIs are shared with aircraft operators as an integral part of the CDM process. For periods of significant, unexpected capacity reductions, Ground Stop TMIs can also be modeled and implemented. Once a TMI is implemented, C-ATFM for ANSP will provide updated demand predictions to monitor TMI performance. Updated predictions are driven by tactical flight data updates from AAI as well as flight specific updates provided by aircraft operators. Aircraft Operators are provided capabilities to perform schedule management adjustments (e.g., slot substitutions) to optimize their operations consistent with the available capacity determined by AAI and the constraints of the TMI. C-ATFM for ANSP provides a web-based interface for Aircraft Operators in addition to the Enhanced Substitution Module interface for advanced scheduled management functions. C-ATFM for ANSP provides real-time and post operational reports to help AAI and their stakeholders evaluate system performance and lessons learned. In addition to the operational capabilities, C-ATFM for ANSP provides System Administration and Adaptation Management functions to monitor and control the operational system and support the preparation and validation of system reference data.

6.6 **Phase 2:** Nationwide ATFM system covering grade: 3,4 and 5 airports would be a fully operational architecture and an expanded use of C-ATFM for ANSP to support ATFM/CDM for airspace programs and arrivals into airports throughout India. Future functionality is driven by customer needs and advances in ATFM, hence some key functional enhancements for including departure programs of additional airport and airspace flow programs to complement the proposed airport arrival programs in phase 1.

6.7 **Phase 3:** The specific functionality will be defined in collaboration with the international ANSP necessary to support the international ATFM integration identified by AAI. These integrations can be thought in several ways. In case an adjacent FIR of another country is not controlled by an ATFM system, this FIR can be included in AAI's C-ATFM system. In the case adjacent FIRs or countries would have their own ATFM system, a system to system integration can be provided to improve efficiencies across both ATFM systems. There is no specific time line planned to introduce this phase

6.8 Development of ATFM capability in India will be consistent with guidance issued by the International Civil Aviation Organization (ICAO) in the document entitled "Demand and Capacity Balancing". The total aircraft movement (Arrivals & Departures) in Airports per day is around 5200. The ATFM service must take measures to ensure a balance exists between air traffic demand and the declared capacities and help ATC to use, to the maximum extent possible, its capacity.

6.9 A key part of the future ATFM concept is Collaborative Decision Making (CDM) which helps ATC achieve its goal of managing the ATC system and the operators achieve their goal of managing their schedules. The result of CDM is a shared situational awareness and collaborative resolutions for "win-win" solutions for both ATC and stakeholders. Collaboration leads to enhanced options, resulting in improved decision making, stakeholder acceptance and support, and increase service performance.

6.10 Aero Thai commented that the Collaborative Decision Making is the most important aspect of ATM. Aero Thai faces severe congestion in the airspace and unable to allocate the optimum Flight levels to the aircraft departing from Thailand as flights from Malaysia and Singapore already occupy such levels. He stressed the need for seamless and harmonized flow management between neighbouring states and asked them to share ideas mutually for better flow management. Mr. J Richardson, ICAO representative, added that civil military coordination will have a major role in the development of ATFM and also to consider the interests of overflying aircraft also as India has control over a large airspace. Oman was curious to know about the date of implementation of ATFM in India as Oman has a plan to restrict the traffic flow during peak night times 1700-2200 and 2300-0130 over RASKI, PARAR and TOTOX. Oman also wanted to know whether the implementation of ATFM will help to decongest the traffic flow to Muscat FIR. India clarified that the first phase will be implemented by Dec 2011 and ATFM will not be able to solve the congestion traffic flow from Oman as it will affect local traffic only. He added RHS50 and RHS30 will be more useful to Oman. IATA commented that the ATFM will be a great relief to ease the congestion, delays and bottleneck. India informed that Data-link equipage on the traffic flow from SE Asia to Oman has increased significantly with the result of increased operations by Emirates and Etihad. India informed that BOBCAT has helped very much in optimizing the level allocation by reducing climb/descend requirement by controllers thereby reducing work load. India informed that ATFM for overflying aircraft will be considered at a later stage.

6.11 The meeting observed that the Ground delay programs and the Traffic Management initiatives proposed for introduction in India will greatly enhance efficiency, reduce delays

and diversions. Given the double-digit growth expected in the subcontinent, these initiatives and the CDM initiatives will facilitate the optimal utilization of both airspace and airport infrastructure and provide a match between demand and capacity. India informed the meeting that in Phase 1 and Phase 2 a passive web portal access shall be made available to the neighbouring States to have an increased situational awareness of the ATFM in India. However, in Phase 3 of the ATFM implementation, the neighbouring States providing ANS in the adjoining airspace should have a compatible plan for an integrated ATFM in the region.

Agenda Item 7: Automatic Message Handling System (AMHS) & ATS Interfacility Data-link Communication (AIDC)

7.1 The present ground-ground data communications system in India comprises AFTN circuits and centres (tributary and main) that allow the exchange of ATS and other operational messages. To improve the efficiency and reliability of ground message exchanges, India has earlier completed the initiative of full upgrade of the low speed AFTN circuits by establishing high speed point-to-point digital links operating at 64KBPS and carrying voice and data traffic between all the major domestic airports. In similar lines the international AFTN links have also been upgraded to 64 Kbps digital data media.

7.2 With a view to meeting the critical requirement of the aeronautical community for enhancing its ground data communications by means of up to date technology, ICAO has specified that the Aeronautical Telecommunications Network (ATN) may replace the existing networks based on AFTN. The Aeronautical Telecommunication Network (ATN) will enable seamless communications between ground users (e.g. ANSPs, Airlines) and aircraft.

7.3 The ATN systems use two types of applications viz., air-ground applications and ground-ground applications. While applications such as ADS, CPDLC, FIS etc., are used for air-ground purposes, the ATS Message Handling System (AMHS) and the ATS interfacility data communications (AIDC) are the applications for ground to ground communication part of ATN. As part of the transition initiative from AFTN to the ATN, India has already implemented the AMHS equipment installation at Mumbai and has established the ATN Backbone Ground-Ground links between Mumbai and Singapore. Another backbone link with Beijing is under operational trials and is set to go live shortly. The third back bone connection namely between Mumbai and Bangkok would be taken up as and when readiness is received from Thailand.

7.4 As per ICAO Asia Pacific Regional Plans, Mumbai will also have AMHS links with Pakistan, Sri Lanka, Nepal, Bangladesh and Bhutan for routing of aeronautical messages within the Asia Pacific Region and with Middle East (Oman) and Africa (Kenya) for inter-regional connections. Out of these, Mumbai-Karachi AMHS link is in the final phase of implementation. The existing Mumbai-Muscat AFTN link is planned to be converted to AMHS links in coordination with OMAN.

7.5 The existing air traffic management (ATM) systems will benefit substantially from AMHS implementation as it supports:

- Transfer of multiple information format (text, graphics etc).
- Large message lengths.
- Security capabilities that can be adapted to the needs of ATC security policies.

7.6 As part of planning objective to achieve performance based global air traffic management system through the implementation of air navigation systems and procedures, ATS Inter-Facility Data Communication (AIDC) has been recognized as a significant tool to improve coordination and Decision Making capability of the ATCOs. India currently has AIDC capable systems at Delhi, Mumbai, Bangalore and Hyderabad and new ATC Automation systems are under installation at Chennai and Kolkata. As per ICAO Asia Pacific Regional plan, AAI has already taken up the implementation process of AIDC in India on the international front by taking up the AIDC trials with Pakistan (Karachi) which is currently under process. Similar trials is planned to be held between Mumbai and Muscat in coordination with Oman. Further Plans are in hand to implement AIDC capability in the domestic FIRs between Chennai and Mumbai as well as between Mumbai and Hyderabad in the initial phase.

7.7 Introduction of AIDC between adjacent ATS facilities will significantly reduce the coordination errors in controller to controller due to inherent disadvantage of verbal communication such as connection delay, language accent difficulty etc., especially across international FIR boundaries. Aided by the system's automated data exchange environment, the work load on ATCOs will be greatly reduced as controllers will not be tied up to telephone conversations during coordination.

7.8 The chair appreciated the efforts made to improve ATS Message coordination, by replacing legacy networks by modern Automated Message handling Systems. The meeting also urged the States to expedite the AMHS testing, acceptance and exchanges between different States in the APAC Region.

Agenda Item 8: ATS Automation System

8.1 An overview of Indian automation system was presented to the meeting. Automation in India was introduced in 1996 in Delhi and Mumbai in the form of MATS-BD. The obsolete hardware (DG) and software of MATS-BD was up-gradation in two stages –

AT (Auto Track) – 2 (Interim Build) 2007-10

AT(Auto Track) – 3 (Final Build) June 2010 onwards

8.2 The AT – 2 system was comprised of Radar Data Processing System (RDPS), Flight Data Processing System (FDPS), Communications Gateway Processor / Aeronautical Information System (CGP/AIS), Data Recording Facility (DRF), Data Management System (DMS), Supervisor Working Position, Controller Working Position and Voice Processing Facility (VPF).

8.3 AT – 3 has Major Improvements from initial build AT-2 viz. Standard STCA, MSAW, APW, Medium Term Conflict Detection (MTCD), more flexible and powerful graphical reroute function, Advanced Conformance monitoring, integrated data link display (DLD) window on CCWS/GPWS, support of up to 10 RBLs, non jurisdictional data block with level. Major interface enhancements are – capability to support 64 radars, track data output (on LAN in CAT 62 format), data stream for Airport Operator Data Base (AODB), any future external interfaces like ASMGCS, ADS-B, SNMP based monitoring and control, flexibility to add additional nodes without changing software. Major functional Enhancements are – Single glass HMI (Eurocontrol based), Integrated Electronic Flight Strips, Integrated Arrival Manager (AMAN), 4D Trajectories, Point and click adaptable data tags, Predicted Route lines, Wind speed / direction processing (Met GRIB data), Adaptable Flight data posting rules, Emergency-Mode

8.4 After conducting several shadow mode operations continuously for 72 hours, first operational trial mode was conducted in June 2010. During this trial mode several hardware & software issues (workstation freezing/sluggish etc, CGP spiking, FDP related problems) were observed. Resolution of these problems was achieved through user feedback and latest software builds. Innovative developmental activities carried out by AAI personnel during implementation of AT3 such as customization of color scheme etc.

8.5 Synchronization between AT-2 & AT-3 established so that AT-2 System is available as a backup with the same data level as AT-3 & eliminating manpower needed for updating AT-2 System. AAI is considering upgrading AT-2 Automation system (Standby System) into AT – 3 system so that there will not be any HMI problems in case main system fails.

8.6 India also informed the meeting that multi RADAR integration being implemented in Chennai and it is an effort by AAI which will provide redundancy and allow India to establish multiple upper ACC sectors in Chennai for entire Chennai FIR to be controlled from Chennai airport.

8.7 The chair appreciated India's initiatives in Radar Integration in the Southern portion of the subcontinent and its future plans to integrate Radar pan-India. The seamless Radar Coverage over the continental airspace will provide for greater flexibility in traffic handling in times to come.

Agenda Item 9: Implementation of FPL 2012

9.1 On 27 May 2008, amendment No. 1 to the Fifteenth Edition of the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) was approved, calling for substantial changes to ICAO flight plan to take effect from 15 November 2012. The new ICAO model flight plan form and related provisions are necessary to allow ATM systems to make optimum use of advanced aircraft capabilities as well as to meet the evolving requirements of automated ATM systems.

9.2 Considering that the transition from the current flight plan form and associated requirements to the new flight plan may present challenges for States and organizations involved in the processing of flight plans, ICAO has developed the guidance material which was issued on 6th February 2009 vide state letter No. AN 13/2.1-09/9. The primary purpose of this guidance is to support a coordinated global effort during the transition period so that a successful and coordinated transition is achieved by the applicability date of 15 November 2012.

9.3 India informed the meeting that Asia/Pacific ICAO Flight Plan & ATS Message Implementation Task Force (FPL&AM/TF), with terms of reference as outlined in Appendix C to the APANPIRG/19 Report on Agenda Item 3.2, was established to develop a regional transition strategy and procedures to ensure the streamlined implementation of the amended ICAO flight planning and associated ATS Message provisions. The First Meeting of the Task Force (FPL&AM/TF/1) was held from 17 to 20 March 2009, Second Meeting from 17 to 20 November 2009, and third Meeting 23 to 24 August 2010, all at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand.

9.4 ICAO Headquarter has introduced Flight Plan Implementation Tracking System (FITS) through website, <http://www2.icao.int/en/FITS/Pages/home.aspx>, to help Air Navigation Service Providers (ANSPs) and airspace users to monitor the global implementation status of the new ICAO flight plan. States are invited to update FITS particularly on the Contact Person and the Implementation Date of NEW.

9.5 India informed the meeting that Asia/Pacific region has adopted a phased transition, where ANSPs would implement NEW, followed by users. A transition period was declared, commencing 1 January 2012 and ending 15 November 2012. The transition period is subdivided as follows:

- **Phase 1** – ANSPs software delivery and internal testing – 1 January to 31 March 2012,
- **Phase 2** – ANSPs external testing and implementation – 1 April to 30 June 2012,
- **Phase 3** – Airspace users testing and implementation – 1 July to 15 November 2012

9.6 Currently, the ATC systems in India use Flight Plan Application Database of Automatic Message Switching System (AMSS) and automation system consisting of Flight Data Processing systems (FDPS) to manage and process flight plans and associated ATS messages data. Implementation of software changes through in-house initiative has already been completed in AMSS systems to fully adapt to the changes envisaged in the new FPL. Internal testing of AMSS system with new software will be carried in the second week of May 2011. Actions have also been initiated to negotiate with the vendors of automation systems and AMHS to affect the capability of handling the NEW Flight Plan and associated ATS Messages.

9.7 India recognized the critical need for regional coordination between States to develop appropriate guidelines and the need for in depth testing arrangements to be developed to facilitate testing between ANSPs, and between ANSPs and users. India would also take steps to standardize and harmonize the controllers' situation display parameters

commensurate with the new data/information available in the flight plan indicating the avionics capabilities etc. India has set up a dedicated working Group to plan, monitor and implement changes in software for various automation system and is expected to meet the target date of 15th November 2012.

9.8 Sri Lanka informed that they will be ready with new FPL before the deadline. Nepal acknowledged that a working group has been formed and AMSS software will be installed by the end of 2011. Oman is ready for transition and stated that sharing of information is the key of the implementation. Mr. J Richardson insisted that all states need to transition to new ICAO FPL as per ASIA/Pacific plan. States that are unable to transition to new FPL may ask for help from other countries. Aero Thai informed that their software is ready, which is capable of converting old format to new and vice versa and further informed that even if their neighbouring states Laos, Cambodia and Myanmar do not adapt to the new FPL, operations will not be affected.

9.9 The meeting resolved that States should have a transition plans, any State requiring assistance may contact ICAO regional office or Aero Thai or Champion States so that the entire region can make the transition to the new Flight Plan Format by the appointed date.

Agenda Item 10: Search and Rescue Plan

10.1 There has been a tremendous traffic growth centered at Asia Pacific Region resulting in large number of aircraft movements primarily from east to west direction and vice-versa. India has signed operational Letters of Agreement with adjacent states and these agreements have been functioning effectively. The need for entering into Search and Rescue services agreements have always been felt, therefore, the initiative has been taken by India to formalize the required SAR agreements.

10.2 There is a need for agreements with the neighboring countries on SAR services under the provisions of the Standards and Recommended Practices contained in Annex. 12. Also in the BBACG/21 meeting held in March 2011 ICAO desired that States in conjunction with their neighboring state(s), to develop Search and Rescue Agreements, for the purpose of providing a more efficient response to a search and rescue action and increase the possibility of a successful SAR mission. It was also discussed that states should conduct joint training and exercises, as appropriate, to maximum proficiency.

10.3 India hosted International Search and Rescue conference and SAREX in 2005 wherein both land and maritime exercises were conducted. Government of India has already established such arrangement with Govt. of Bhutan for the cooperation of SAR services.

10.4 India is sharing FIR boundaries with Nepal, Bhutan, Bangladesh, Myanmar, Kualalumpur, Male, Indonesia, Sri Lanka, Thailand, Oman, Seychelles, Mauritius, and Sana Yemen. The agreement is expected to broadly cover:

- a) Critical activities near border areas for rescue operations.

- b) Identify the resources which are available near the Search and Rescue area.
- c) International cooperation at the quickest possible time.
- d) Sharing of SAR resources.
- e) Mutual exchange of SAR personnel.
- f) Joint exercises both over marine and land areas.

10.6 Nepal delegates highlighted the need for cooperation between India and Nepal and signing a MOU for SAR. Oman stated that FIR boundary and SAR region boundary between India and Oman is not synchronizing. In fact it is different, because of this reason there should be MOU between states regarding the initiation of SAR activities whenever required.

10.7 Sri Lanka informed that SAR is being finalized with Australia, Male, Jakarta and Chennai. Since there is no common continental boundary with India, Sri Lanka emphasized that SAR plan between India and Sri Lanka should be un-ambiguous. Sri Lanka further informed that they may require help from India for formulating SAR plan and mutual exchange of SAR personal may also be considered. Sri Lanka wanted to know the point of contact in India for SAR.

10.5 The meeting invited states to review the draft Letter of Agreement presented by India for the cooperation of SAR services with India for Indian FIRs in accordance with the broad areas mentioned in 10.4 and in the spirit of Annex-12. India urged the neighbouring states to take initiatives to formalize the Letter of Agreements on mutually agreed basis to set in motion the requirement of providing SAR services for mutual assistance and establish working arrangements, within the respective adjacent RCC/RSC's for effective SAR process, based on Letter of Agreements.

Agenda Item 11: Discussions on review of existing LOA

11.1 LOA between Colombo ACC and Chennai/ Trivandrum ACC was discussed and finalized after a lot of deliberation and discussion. Since authorized signatory from Sri Lanka was not present, Sri Lanka informed that they will send the LOA to India after approval and signature of competent authority.

11.2 LOA between Kathmandu ACC and Delhi/ Kolkata/ Varanasi ACC was discussed and finalized after a lot of deliberation and discussion. Since authorized signatory from Nepal was not present, Nepal informed that they will send the LOA to India after signature of competent authority.

11.3 LOA between Muscat ACC and Mumbai ACC was discussed and finalized after a lot of deliberation and discussion. Since authorized signatory from Oman was not present, Oman took a copy of the LOA and informed that they will send the LOA to India after signature of competent authority.

11.4 The meeting urged the member States to consider the completion of LOA formalities by interacting with the States vested with the responsibility to provide ANS in the adjoining airspace, since only four of the twelve countries invited were present along with the host nation India.

Agenda Item 12: Proposal for constitution of ATS coordination group in BOBASIO Region

12.1 The exponential growth in air traffic is posing a challenge to all the ANSPs in their efforts for providing safe, orderly, expeditious flow of traffic and at the same time satisfying the need of the Airlines for obtaining their preferred flight profile in the Asia Pacific region. All the ANSPs have taken up the challenge by embarking on many initiatives like implementation of RVSM, introduction of RNAV routes, implementation of Performance Based Navigation, Reduction of longitudinal separation minima, ATM Automation, etc. The above initiatives have definitely yielded remarkable success in augmenting safety, efficiency and capacity of Air space/airport in the respective States. While such initiatives would suffice with respect to domestic operations within a particular State, close cooperation among neighboring countries is the most vital ingredient for safe, efficient cross border flow of traffic.

12.2 It is with this objective of establishing a comprehensive coordination mechanism among the neighboring states and supporting a strong regional ATM system that this proposal for constitution of ANS co-ordination Sub group for the BOBASIA Region is proposed for consideration by ICAO and this meeting.

12.3 Considering the States in the Bay of Bengal, Arabian Sea and Indian Ocean Region and the States bordering India, proposed member States for the Sub-Group are Bangladesh, Bhutan, Indonesia, India, Maldives, Malaysia, Myanmar, Nepal, Oman, Pakistan, Seychelles and Sri Lanka.

12.4 Terms of Reference of the meeting of the sub-group shall be:

- i) Consider adopting uniform standards for implementation of ANS facilities/procedures.
- ii) Share the reports of investigation of any ANS related incidents between involved Member States and finalize remedial measures and disseminating the same to other Member States.
- iii) Arrive at decisions on exchange programs between contracting States by nominating ANS officials for mutual benefits of updating on latest ANS developments.
- iv) To deliberate on ICAO State Letters requiring synergic and uniform response from Member States particularly with respect to (i) amendments to ICAO documents (ii) Revision of regional supplementary procedures (iii) application

of separation minima, (iv) creation /restructuring of Routes etc. and arriving at consensus.

- v) Perusing and revising the SAR agreements and coordination procedures among all the member States once a year.
- vi) Conduct of joint SAR exercises between Member States.
- vii) Sharing the expertise/information/technology on any latest ANS related developments of any of the Member States and arrangement of exchange visits by ANS officials of Member States.

12.5 **Benefits**

- Harmonised application of ANS procedures/system for Seamless services across states.
- Sharing of the latest ANS developments in the Region.
- Availability of Updated SAR agreements and Coordination procedures at all times.
- Safe and Efficient management of cross-border air traffic flows.

12.6 The meeting requests ICAO APAC Region to endorse constitution of ANS co-ordination sub-group in the Bay of Bengal, Arabian Sea and Indian Ocean Region and also to consider the terms of reference presented by India and offer comments/suggestions.

12.7 Oman welcomed the proposal and informed that they will be pleased to have Australia, Africa and Asia Pacific nations in the group. Proudly presented signed BOBASMA LOA to India.

12.8 Aero Thai also congratulated the effort made by India in hosting the meeting and opined that even though there is no common FIR boundary with India, Thailand as a part of the group and can contribute in many way as any change in India will significantly affect Thailand as most of the flight to/from Bangkok over fly Indian FIRs.

12.9 Sri Lanka and Nepal congratulated India for hosting the meeting and wished that such meeting should be held frequently between neighbouring states having many common issues to be resolved.

12.10 IATA congratulated the effort made by AAI in taking lead role in organising the meeting which covered major topics like SAR, Contingency Plan, ATFM, new ICAO FPL, LOA etc.

12.11 Mr. John Richardson, ICAO ATM Consultant and Chairman of the session, congratulated India in organizing the meeting and stated that it will help to harmonize the ATM operations in the region. He opined that Australia and other eastern Africa states may also like to join the group. He pledged his support for the cause of creation of this subgroup and assured that he will pursue the matter with the ICAO Regional Headquarters. The

meeting unanimously extended support to the formation of BOBASIO and its sustained future meetings, expressing hope that the forum will be a great facilitator in attaining the super-ordinate goals of all the stakeholders in the region.

Agenda Item 13: Date and Venue for the next BOBASIO meeting

13.1 The meeting agreed that the next meeting would be held within a year. India invited other states to host the meeting and informed that if no states come forward to hold the meeting, then India would continue to hold BOBASIO meeting. The date and venue of the next meeting will be intimated to all sates in due course.

14. Closing of the Meeting

14.1 Mr. Jyoti Prasad Executive Director (ATM) India congratulated the meeting for the dedicated participation during the two day duration. The meeting resulted in useful outputs which included the Review of LOAs, updated information on GAGAN, ATFM, Contingency Plan, SAR, ICAO new FPL etc. In Mr. Prasad's view, in the very first meeting of BOBASIO, the performance of the group was highly productive. He gave a strong assurance that the close coordination between the neighbouring States of India will continue in future as well.

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List of Working Papers

NUMBER	AGENDA	WORKING PAPERS	PRESENTED BY
WP/1	2	Satellite based Navigation	India
WP/2	3	Implementation of RHS 50 NM	India
WP/3	4	BOBASMA – EMA, India	India
WP/4	5	ATM contingency plan	India
WP/5	6	Air Traffic Flow Management (ATFM) in India	India
WP/6	7	Automatic Message Handling System (AMHS) & ATS-Interfacility Data-link Communication (AIDC)	India
WP/7	8	ATS Automation System	India
WP/8	9	Implementation of FPL 2012	India
WP/9	10	Search and Rescue Plan	India
WP/10	12	Proposal for constitution of ATS coordination group in BOBASIO region	India

**The First ATS Coordination Meeting of
Bay of Bengal, Arabian Sea and Indian Ocean (BOBASIO) Region
New Delhi, India, 05 - 06 May, 2011.**

Day 1: 5th May, 2011 Thursday

TIME	PROGRAM	
0915 – 1015	REGISTRATION	
1015 - 1030	Welcoming the guests, Lighting the traditional lamp	
1030 -1100	<ol style="list-style-type: none"> 1. Welcome address by Mr. V Somasundaram, Member (ANS), AAI 2. Address by Mr. E. K. Bharat Bhusan, DGCA, India 3. Address by Mr. John Richards, ATM Consultant ,ICAO 	
1100 - 1130	<ol style="list-style-type: none"> 1. Address by Mr. V. P. Agrawal, Chairman, AAI 2. Vote of thanks by Mr. Jyoti Prasad, ED(ATM) 	
1130 - 1145	Group Photograph	
1145 - 1200	TEA BREAK	CHAired BY
1200 - 1245	Satellite based Navigation – GAGAN (SBAS) System by Mr. C. R. Sudhir, GM(CNS), AAI	Mr. John Richardson, ATM Consultant, ICAO
1245 - 1330	Implementation of RHS 50 NM by Shri. S. K. Purwar, GM(ATM), AAI	Mr. John Richardson, ATM Consultant, ICAO
1330 - 1430	LUNCH BREAK	
1430 - 1530	Enroute Monitoring Agency (EMA) by Mr. A.P. Udayanarayanan, JGM (ATM), AAI	Mr. John Richardson, ATM Consultant, ICAO
1530 - 1545	TEA BREAK	
1545 - 1630	ATM Contingency Plan by Mr. A. K. Jain, JGM(ATM), AAI	Mr. M K Basnet, Civil Aviation Authority of Nepal
1630 - 1700	Discussion on ATM contingency plan Moderator: Mr. Jyoti Prasad, ED (ATM), AAI	Mr. M K Basnet, Civil Aviation Authority of Nepal

**The First ATS Coordination Meeting of
Bay of Bengal, Arabian Sea and Indian Ocean (BOBASIO) Region
New Delhi, India, 05 - 06 May, 2011.**

Day 2: 6th May, 2011 Thursday

TIME	PROGRAM	CHAired BY
0930 - 1015	Air Traffic Flow Management (ATFM) by Mr. Sylvester Israel, GM(ATM), AAI	Mr. Sunun Nimfuk, Aero Thai, Thailand
1015 - 1045	ATS Automation system – Transition management By Mr. V.V. Rao JGM (CNS) and Mr. Anurag Sharma JGM (CNS)	Mr. P Sanglikar, IATA
1045 - 1130	Implementation of Automatic Message Handling System (AMHS) & ATS Interfacility Data-link Communication (AIDC) by Mr. C. Ravishankar SM (CNS), AAI	Mr. Abdullah, Oman.
1130 - 1145	TEA BREAK	
1145 - 1215	Implementation of FPL 2012 by Mr. Satyajit Dutta, JGM(ATM), AAI	Mr. Abdullah, Oman
1215 - 1300	Search and Rescue Plan, by Mr. S. K. Oberoi, GM (ATM), AAI	Mr. M K Basnet, Civil Aviation Authority of Nepal
1300 - 1400	LUNCH BREAK	
1400 - 1445	Finalization of LOA Moderator: Mr. D. Ghosh, GM (ATM), AAI	Mr. Dissanayake, Srilanka
1530 -1545	TEA BREAK	
1545 - 1615	Proposal for constitution of ATS - Coordination Group in BOBASIO Region By Mr. Jyoti Prasad Executive Director (ATM)	Mr. John Richardson, ATM Consultant, ICAO
1615 - 1645	CONCLUDING SESSION	

PHOTO GALLERY



OPENING OF THE MEETING



PARTICIPANTS ALONG WITH DIGNITARIES