

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE**



**SUMMARY OF DISCUSSION
SPECIAL ATS COORDINATION MEETING
FOR THE BAY OF BENGAL AIR TRAFFIC FLOW MANAGEMENT
OPERATIONAL TRIAL
(SCM BOB ATFM TRIAL)**

BANGKOK, THAILAND

16 & 17 FEBRUARY 2006

The views expressed in this Summary of Discussion should be taken as those of the Meeting and not the Organization

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SCM BOB ATFM TRIAL
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1.1 **Introduction**

1.1.1 The Special ATS Coordination Meeting for the Bay of Bengal Air Traffic Flow Management Operational Trial (SCM BOB ATFM TRIAL) was held at the ICAO Asia and Pacific Regional Office, Bangkok, Thailand on 16 and 17 February 2006. The meeting was held in order to progress the work programme of the ATFM/TF and establish a date for the implementation of an operational trial of ATFM in the Bay of Bengal.

1.2 **Officers, Secretariat and Participants**

1.2.1 The meeting was opened by Mr. Andrew Tiede, Regional Officer ATM, on behalf of Mr. L. B. Shah, ICAO Asia Pacific Regional Director.

1.2.2 Mr. Ron Rigney, ATM International Liaison Manager, Airservices Australia presided over the meeting. Mr. Tiede acted as the Secretary of the meeting.

1.2.3 Twenty-three (23) participants from Australia, Bangladesh, India, Malaysia, Pakistan, Singapore, Thailand and IATA attended the meeting. A list of participants is in **Appendix A** to the Summary of Discussion.

1.3 **Documentation and Working Language**

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

1.3.2 Six (6) working papers and two (2) information papers were presented to the meeting. A list of the papers is at **Appendix B**.

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Agenda Item 1: Adoption of Agenda

1.1 The meeting adopted the following agenda:

Agenda Item 1:	Adoption of Agenda
Agenda item 2:	Review Outcomes of BOBCAT Paper Trials
Agenda item 3:	Safety Assessment
Agenda item 4:	AIP Supplement
Agenda item 5:	Flow Management Handbook
Agenda item 6:	Operational Trial Arrangements
Agenda Item 7:	Any other business

Agenda Item 2: Review Outcomes of BOBCAT Paper Trials

2.1 Thailand briefed the meeting about the process and algorithms used by BOBCAT in allocating slots. Details of this briefing are at **Appendix C**.

2.2 In order to adequately test the BOBCAT system, in accordance with the guidance from the ATFM/TF/5 meeting (January 2006) Thailand had constructed a synthetic data set based principally on the slot request information received from IATA airlines for the 17-22 December 2005 paper trials. This data formed the foundation of the synthetic data set, and additional 'test' flights were included to add complexity and bulk to the data set. A total of 17 paper trials were then conducted under various scenarios based on the synthetic data set and the following scenarios were examined. An analysis by Thailand of each scenario had been included as **Appendix D**.

- a) 78 aircraft entering Kabul FIR within the period 2000 – 2359UTC with spacing parameter set at 10 + 2 and 10 + 5 minutes at Kabul entry waypoints, with and without spacing at Kabul exit waypoints taken into account;
- b) 55 aircraft out of the 78 aircraft in scenario **a)** entering Kabul FIR within the period 2000 – 2359UTC with spacing parameter set at 10 + 2 and 10 + 5 minutes at Kabul entry waypoints, with and without spacing at Kabul exit waypoints taken into account;
- c) Same 55 aircraft as in scenario **b)** entering Kabul FIR within the period 2000 – 2359UTC with spacing parameter set at 10 + 2 and 10 + 5 minutes at Kabul entry waypoints, with and without spacing at Kabul exit waypoints taken into account, with at least 30% of aircraft from eastern Bay of Bengal not requesting FL280;
- d) 54 aircraft out of the 78 aircraft in scenario **a)** entering Kabul FIR within the period 2100 – 2300UTC with spacing parameter set at 10 + 5 minutes at Kabul entry waypoints and same spacing at Kabul exit waypoints;

- e) Same 54 aircraft as in scenario **d)** entering Kabul FIR within the period 2100 – 2300UTC with spacing parameter set at 10 + 2 and 10 + 5 minutes at Kabul entry waypoints, with and without spacing at Kabul exit waypoints taken into account, with at least 30% of aircraft having MAD factor in increasing order;

2.3 In accordance with the outcomes of ATFM/TF/5, the results of the paper trials and associated analysis were distributed to concerned States and organizations in soft copy on 9 February 2006 to facilitate analysis by respective States, organizations and airlines. The results of the paper trials were also available electronically from the Regional Office on request.

2.4 Malaysia raised the matter of the bunching of traffic at intermediate waypoints, using an example included as **Appendix E**. The meeting recalled the discussions at previous task force meetings, in which it had been recognized that BOBCAT was not a tactical air traffic management tool and simply provided defined spacing at Kabul FIR entry points. The meeting agreed that it remained the responsibility of air navigation services providers to tactically manage air traffic flows.

2.5 Malaysia expressed concern that tactical management was currently restricted to two methods, vertical or time separation. Provision of vertical separation was hampered by the availability of only FLs 280 and 320. This was further constrained by the small level band acceptable to the B744s during the initial phase of the flight. To overcome this, Malaysia requested an additional level, e.g. FL300. In the absence of an additional level, stretching would be required to achieve time separation. This would impact the eventual spacing at Kabul entry points negating the objective of BOBCAT. Thailand confirmed that tactical air traffic management which delayed aircraft beyond allocated wheels up times could jeopardize the ability to meet allocated slots into Kabul FIR.

2.6 IATA also presented results of an analysis of some of the scenarios (**Appendix F** refers), which showed a break down of the results of the paper trial delays against respective departure airports. It was anticipated that this process would identify whether the distribution of delays was random and equitable, or whether a particular airport was receiving a greater or lesser share of delays. IATA urged Thailand to provide this type of data breakdown in order to assist with the review by States of the outcomes of the paper trials. Thailand agreed to review the data, taking into consideration the useable levels and available routes from each specific airport, as well as the number and ETD configurations of aircraft departing from the three main airports of Bangkok, Kuala Lumpur and Singapore.

2.7 During further discussions on the traffic data supplied by Thailand, the meeting queried why there was additional spacing given by BOBCAT between two aircraft flying through the Kabul FIR, which was above the parameters prescribed in this particular traffic data set. The traffic data set under review was that comprising 78 aircraft with 10 minutes plus 2 minutes buffer, entry/exit point included.

2.8 On investigation and reporting by Thailand during the meeting, it was noted that the correct spacing for entry into the Kabul FIR of 10 minutes plus 2 minutes buffer was in fact applied between these two aircraft. However, as the second like type aircraft had a time interval of 4 minutes greater than the first aircraft for the comparatively short time to transit the Kabul FIR, the exit point time interval had increased to 16 minutes (an additional 4 minutes). Further investigation highlighted that, in the data supplied by the airlines involved, the first aircraft had a mach no. of 0.01 faster than the second aircraft leading to the time discrepancy.

2.9 It was evident that further analysis of the recent paper trial data should be carried out by the States and airlines concerned, and issues identified brought directly to the attention of Thailand for review and resolution. Thailand would also continue to run developmental paper trials in the

period prior to the next task force meeting and provide appropriate reporting to the Task Force in this respect.

Agenda Item 3: Safety Assessment

3.1 As a result of the limited meeting time available, delegates conducted a brief overnight review of the Safety Assessment and associated Hazard Log (**Appendices G and H** refer). Although there was insufficient time for substantive discussion in relation to the Safety Assessment, the meeting agreed that the Safety Assessment and Hazard Log were sufficiently mature to be clearly marked as “Draft” documents and displayed on the BOBCAT website. This would facilitate a wider review and would prompt relevant feedback.

3.2 A full review and adoption of the Safety Assessment and Hazard Log would be completed at the ATFM/TF/6 meeting in May 2006.

Agenda Item 4: AIP Supplement

4.1 The meeting reviewed and finalized the model AIP Supplement for the ATFM operational trial (**Appendix I** refers).

4.2 In conducting this work, the meeting recognized the critical role that would be played by airline operators and ATC Units in applying the procedures contained in the AIP Supplement. As such, it was necessary for all participants likely to be affected by the conduct of the operational trial to be fully aware of, and comply with, the procedures contained in the AIP Supplement.

4.3 In addition, the meeting recognized that although Annex 15 provisions recommended a minimum of two AIRAC cycles promulgation (i.e. 56 days), an earlier promulgation of the AIP Supplement would provide the maximum opportunity to raise industry awareness of the trial and facilitate the conduct of suitable training programmes by operators and ANSPs. The early promulgation of the AIP Supplement would enable all participants to interact with the BOBCAT website, prepare standard BOBCAT dispatcher templates and become fully familiar with BOBCAT processes and requirements.

4.4 Accordingly, the meeting recommended that all States with affected operators and/or ATC Units should publish the AIP Supplement as soon as possible. In addition, the meeting considered that States overflown by flights subject to slot time requirements may also wish to publish the AIP Supplement to ensure air navigation services providers were able to provide appropriate handling of these flights.

4.5 In this context, the meeting requested the Regional Office provide, via State Letter, a copy of the model AIP Supplement to all States that may be affected by the conduct of the ATFM operational trial. In order to enable to commencement of the trial on 6 July 2006, States should be requested to publish the AIP Supplement on AIRAC date 16 March 2006, or in any event not later than AIRAC date 13 April 2006. The Regional Office agreed to transmit a State Letter in this respect as soon as possible.

4.6 The meeting also requested that the model AIP Supplement be displayed on the BOBCAT website.

Agenda Item 5: Flow Management Handbook

5.1 The meeting reviewed the ongoing work on the draft ATFM Handbook presented by Thailand (**Appendix J** refers) and India (**Appendix K** refers) and agreed that the material should now be combined into a single Handbook using the original structure agreed by the Task Force (**Appendix L** refers).

5.2 A small working group comprising the Chairman (Mr. Ron Rigney), Thailand (Mr. John Richardson) IATA (Mr. Soon Boon Hai) and ICAO (Mr. Polawat Chootai) would continue work on the Handbook, with the intention of providing an advanced draft copy for display on the BOBCAT website by 16 March 2006.

5.3 The meeting agreed that the Handbook should be as comprehensive as possible and, noting the useful material in the BOBCAT electronic “Help” file, requested that the “Help” file be included as a Chapter or Appendix to the Handbook.

5.4 The meeting recognized that the Handbook would comprise the main training aid for the ATFM operational trial and therefore as much useful material as possible should be contained in the Handbook, including the relevant components of the BOBCAT Concept of Operations, AIP Supplement, Safety Assessment, BOBCAT Slot Allocation Mechanism Overview and any training syllabi or programmes prepared for training of ATFMU staff. Particular attention should be paid to highlighting the process for taking advantage of unallocated slots.

Agenda Item 6: Operational Trial ArrangementsBOBCAT Website Available

6.1 In early February 2006 the official website for BOBCAT <https://www.bobcat.aero> was commissioned, and the service was now available on a 24/7 basis, with short outages to enable software upgrades, developmental maintenance etc.

*Note: An update of the status of BOBCAT software features was received from Thailand shortly after the close of the meeting and has been included as **Appendix O**.*

6.2 IATA stressed the importance of a “stable platform” in gaining user confidence and familiarity and requested that unnecessary software changes and interruptions to the service be kept to a minimum. Thailand agreed that, subject to a few weeks of fine tuning, no new requested software development would be commenced until after the trial had commenced. Thailand also agreed to clearly identify successive versions of the software by using a different version or build number with each update, and to retain a record of comments and suggestions from users to enable incorporation into later software development. It was further requested by Thailand that, regarding requests by individual IATA airlines for changes to the interface between the ATFMU and dispatchers, these changes should be agreed to by all IATA airlines before being implemented.

6.3 The meeting recognized that there were presently a limited number of airlines entering data on a regular daily basis, resulting in a small daily data set for BOBCAT to compute. Therefore, a slot allocation cycle based on the small number of daily requests entered would essentially mean that slots were always allocated as requested. In order to artificially load the daily data set, the meeting requested that Thailand incorporate a standard set of up to 30 “dummy” flights into each day’s data, to supplement the genuine slot requests. This was anticipated to provide a more pragmatic slot allocation scenario; in that some of the slot requests would be subject to delays as a result of other flights.

6.4 Many operators and ANSPs (**Appendix M** refers) had already contacted the ATFMU and been provided with usernames and passwords. This had enabled them to access the BOBCAT website, practice inputting data and, after the 1200UTC daily cutoff, view the results of the slot allocation process.

6.5 Affected parties that had not yet obtained username and password details from the ATFMU were encouraged to do so immediately. Contact information for the ATFMU was contained in the AIP Supplement.

Commencement Date of ATFM Operational Trial

6.6 In establishing the scheduled implementation date for the operational trial, the meeting reviewed the primary work items of the Task Force. The model AIP Supplement had been finalized during this meeting and the Regional Office would distribute it on behalf of the task force as soon as possible. Publishing of the AIP Supplement by States in a timely manner was expected to precipitate increased usage of the BOBCAT website and increase preparedness significantly.

6.7 Progress in ensuring staff and equipment availability for the ATFMU was well advanced, and ATFMU staff training would commence in February. The programmes and materials prepared for this training would be made available on the BOBCAT website.

6.8 Measurable progress had also been made on the ATFM Handbook and a small working group had been identified and tasked, in accordance with **paragraph 5.2** above, with producing a final draft document by 16 March 2006, for display on the BOBCAT website. The Safety Assessment was mature and, although subject to final acceptance by the task force, would be displayed as a draft document on the BOBCAT website in accordance with **paragraph 3.1** above.

6.9 It was evident that further analysis of the recent paper trial data should be carried out by the States and airlines concerned, and issues identified brought directly to the attention of Thailand for review and resolution.

6.10 Additionally, work still needed to commence on a methodology and set of objective criteria against which the trial performance could be measured, in order to facilitate objective assessment of the ATFM trial and the provision of high integrity information to enable States and users to evaluate the effectiveness of the BOBCAT system. The week of ghosting operations immediately prior to the live trial would provide a good opportunity to collect suitable data to serve as the reference point. IATA (Mr. Soon Boon Hai) agreed to commence work on drafting this material and would call upon other core team members for assistance as required. It was anticipated that this work would be substantially completed prior to the next task force meeting in May.

6.11 After consideration of the status of works, the meeting agreed on an implementation date of AIRAC 6 July 2006 for the commencement of the operational trial. A seven day period of ghosting operations would commence on 29 June 2006.

6.12 The commencement of the operational trial would be subject to the final decision of ATFM/TF Core Team, after a review of the level of preparedness. A Special ATS Coordination Meeting of Core Team members in respect of the Go/No Go decision was scheduled on 15 and 16 June 2005.

Work Programme

6.13 The meeting agreed to the following work programme in order to ensure preparedness for the commencement of an ATFM operational trial on 6 July 2006:

Date	Activity	Responsible	Remarks
February 2006	Distribute model AIP Supplement to all States with affected operators and ATC Units	Regional Office	Request States to publish AIP Supplement on AIRAC 16 March 2006, in any event not later than 13 April 2006
February 2006	Contact DGCA Pakistan to propose visit by Chairman and members of BOBCAT development team to Karachi to provide briefing to Pakistan.	Regional Office	Subject to approval by Pakistan, coordinate dates/times of mission to Pakistan.
February 2006	Load model AIP Supplement and Safety Assessment to BOBCAT website	Thailand	
16 March 2006	Publish advanced draft of ATFM Handbook to BOBCAT website	ATFM Handbook working group (CM, Thailand, IATA, ICAO)	
16 March 2006	Publish AIP Supplement	All	
9 – 11 May 2006	ATFM/TF/6 – Three day Task Force Meeting	Full Task Force Meeting	Finalize & adopt: <ul style="list-style-type: none"> • ATFM Handbook, • Safety Assessment, • Establish benchmarking arrangements Review Paper Trial results, analysis Draft Trigger NOTAM
15 & 16 June 2006	SCM Core Team Meeting	ICAO & Core Team Members	Go/No Go meeting
19 June 2006	Issue Trigger NOTAM	All	
29 June 2006	Commence ghost operations	All	Stage 1 – 1 week ghost;
6 July 2006	Commence ATFM Operational Trial	All	Stage 2 – full ATFM trial operations

Date	Activity	Responsible	Remarks
1-3 August	ATFM/TF/7 – Three day Trial Review Meeting	ATFM Task Force	Review outcomes of ATFM operational trial

Agenda Item 7: Any other business

Contact with Pakistan

7.1 All previous Task Force and Special Coordination Meetings had noted and regretted the absence of Pakistan, recognizing the critical role that Pakistan played in feeding traffic into the Kabul FIR. The meeting considered that Pakistan was an integral part of the flow management arrangements proposed for the operational trial and that without involvement from Pakistan the operational trial could not proceed

7.2 The Secretariat informed the meeting that in accordance with the request of ATFM/TF/4, the Regional Office had transmitted two letters (ref: T3/8.13.2-AP-ATM0469 & T3/8.13.2-ATM0470) dated 8 and 9 December respectively via the MID (Cairo) Office of ICAO to Pakistan on behalf of the Task Force. The letters provided a paper copy of the ATFM/TF/4 report for Pakistan and sought clarification of some aspects of Lahore FIR ATS traffic management to assist in establishing BOBCAT operating parameters, as well as seeking confirmation of the continued support of Pakistan for the operational trial. Unfortunately no reply had yet been received from Pakistan in these respects.

7.3 Accordingly, the meeting was very pleased to welcome Mr. Rana Muhammad Zamman, Senior ATCO, Civil Aviation Authority, Pakistan to the Regional Office for this meeting. This was the first occasion that a delegate from Pakistan had been able to attend a meeting of the ATFM/TF.

7.4 Mr. Zamman expressed his thanks for the support offered by the task force, with regrets that Pakistan had been unable to attend previous meetings. However, some preliminary work had commenced in Pakistan based on the reports of the ATFM/TF and Mr. Zamman would ensure that the explanations and material from this meeting would be carried back to CAA Pakistan and that the matters described in respect of Lahore FIR ATS traffic management (**Appendix N** refers) would be considered by the CAA.

7.5 The meeting, noting the complexity and history of the Task Force discussions, recognized that Pakistan may need some additional assistance in taking full advantage of the work of the Task Force. The meeting considered that providing direct assistance to Pakistan by way of on-site briefings/training in Karachi would be of benefit to Pakistan. In this respect, the meeting requested that the Regional Office contact the DGCA Pakistan as soon as possible and propose a visit to Karachi by the Chairman of the Task Force, Mr. Ron Rigney, on behalf of ICAO and up to two officers from Thailand who were part of the BOBCAT development team.

7.6 Upon acceptance by Pakistan of this offer, arrangements for travel and meeting formalities could be finalized to enable such a meeting to be held in Karachi in March/April, prior to the next Task Force meeting in May 2006.

Next Task Force Meetings

7.7 In considering arrangements for the next meetings of the Task Force, a meeting schedule was agreed as described below. All meetings would be held at the Regional Office premises in Bangkok, Thailand:

- 9-11 May 2006 ATFM/TF/6 – Full Task Force meeting;
- 15-16 June 2006 SCM – Core team, Go/No Go Decision;
- 1-3 August 2006 ATFM/TF/7 – Review of ATFM Operational Trial.

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SCM BOB ATFM TRIAL

Appendix A

LIST OF PARTICIPANTS

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Appendix A

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Appendix A

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Appendix A

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

WORKING PAPERS

NUMBER	AGENDA	WORKING PAPERS	PRESENTED BY
WP/1	1	Provisional Agenda	Secretariat
WP/2	6	ATFM/TF Task List	Secretariat
WP/3	5	ATFM Handbook	Secretariat
WP/4	4	Review of Draft AIP Supplement	Secretariat
WP/5	2	Results and Analysis of BOBCAT Paper Trials based on Synthetic Data	Thailand
WP/6	3	Safety Assessment for Operational Trial of BOBCAT	Secretariat

INFORMATION PAPERS

NUMBER	AGENDA	INFORMATION PAPERS	PRESENTED BY
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	6	Username and Password	Thailand

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BOBCAT

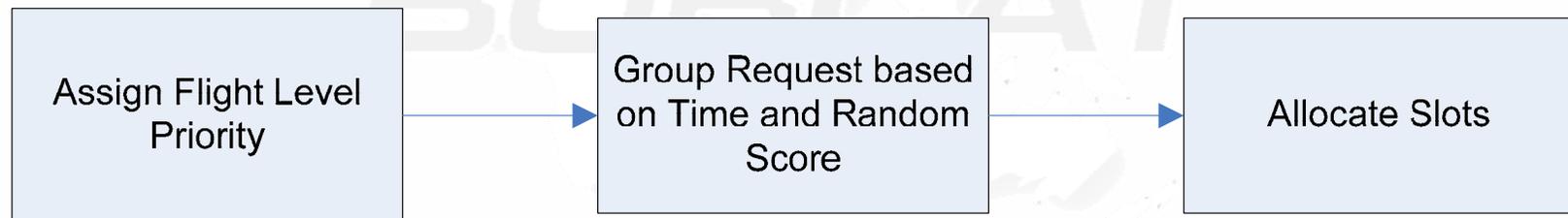
**SCM BOB ATFM TRIAL
APPENDIX C**

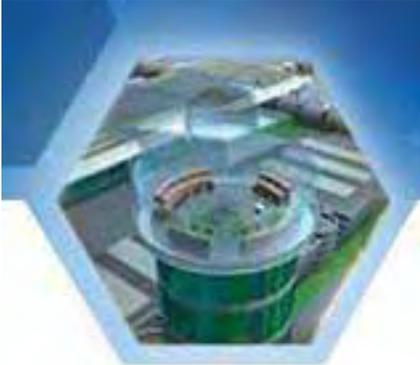
**Bay of Bengal Cooperative
Air Traffic Flow Management
Advisory System**

**BOBCAT Slot Allocation
Mechanism Overview**

Presented by **AEROTHAI** 

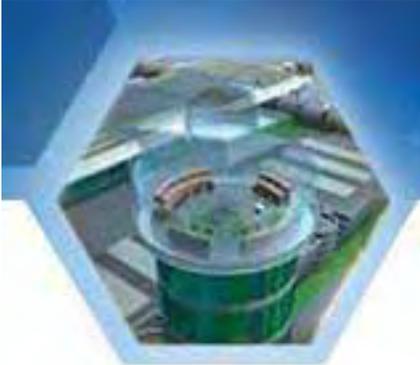
Process Overview





Assign FL Priority

- Indian Departures
 - Requesting FL280
 - Priority: **+1**
 - Requesting FL310, FL350 or FL390
 - Priority: **-1**
- Other Departures
 - Priority: **0**



Indian Departures?

- ICAO prefix **VA** – Mumbai
 - ICAO prefix **VE** – Kolkatta
 - ICAO prefix **VI** – Delhi
 - ICAO prefix **VO** – Chennai
 - ICAO prefix **OP** – Pakistan
-
- Do we need to change or any others missing out?



Group Flight Based on Time

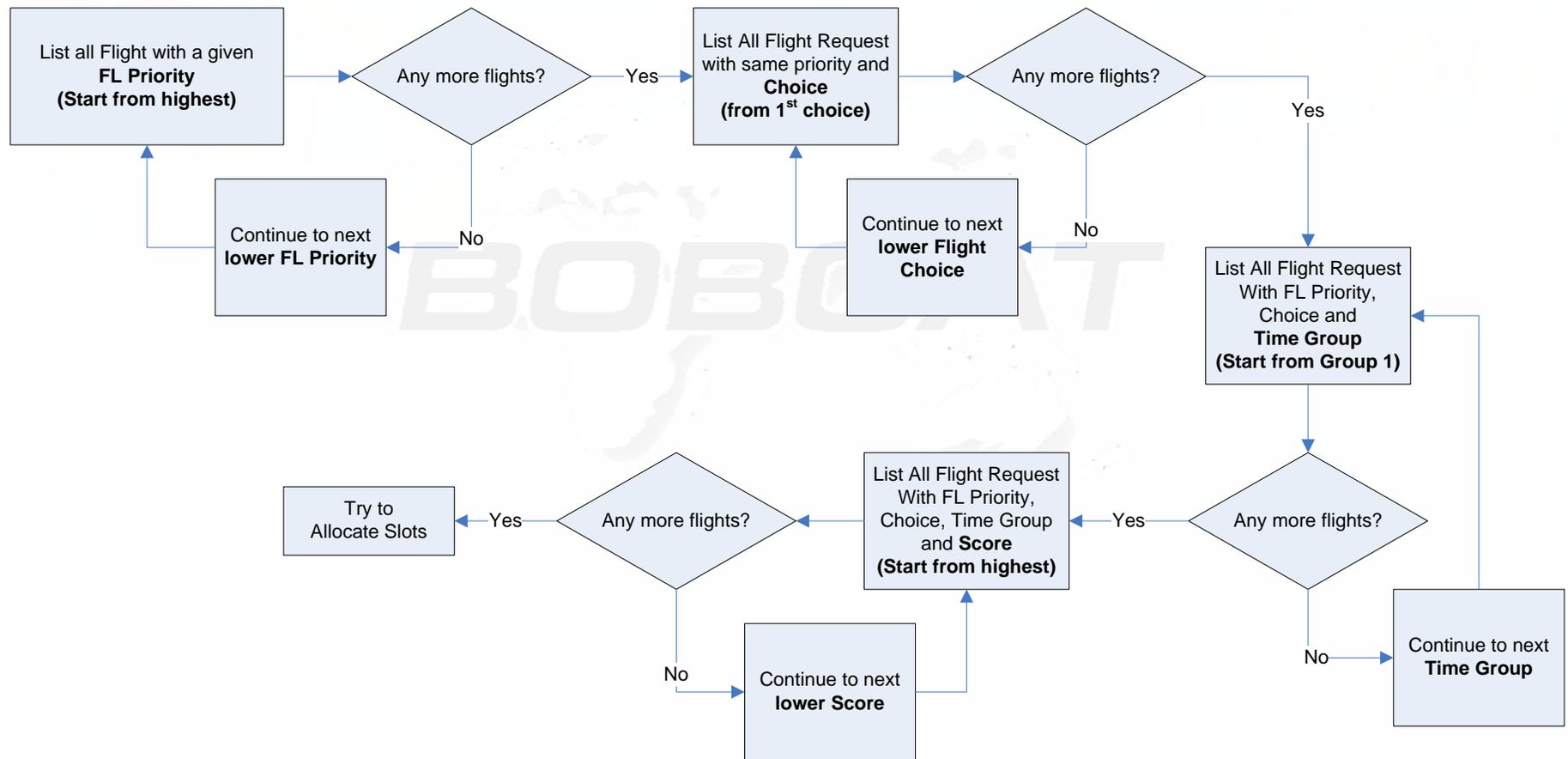
- Time Group
 - Based on time at last BOBCAT waypoint
 - 240 Time Groups to reflect entry into Kabul between 2000-2359
 - 2000UTC entry time = Group 1
 - 2359UTC entry time = Group 240



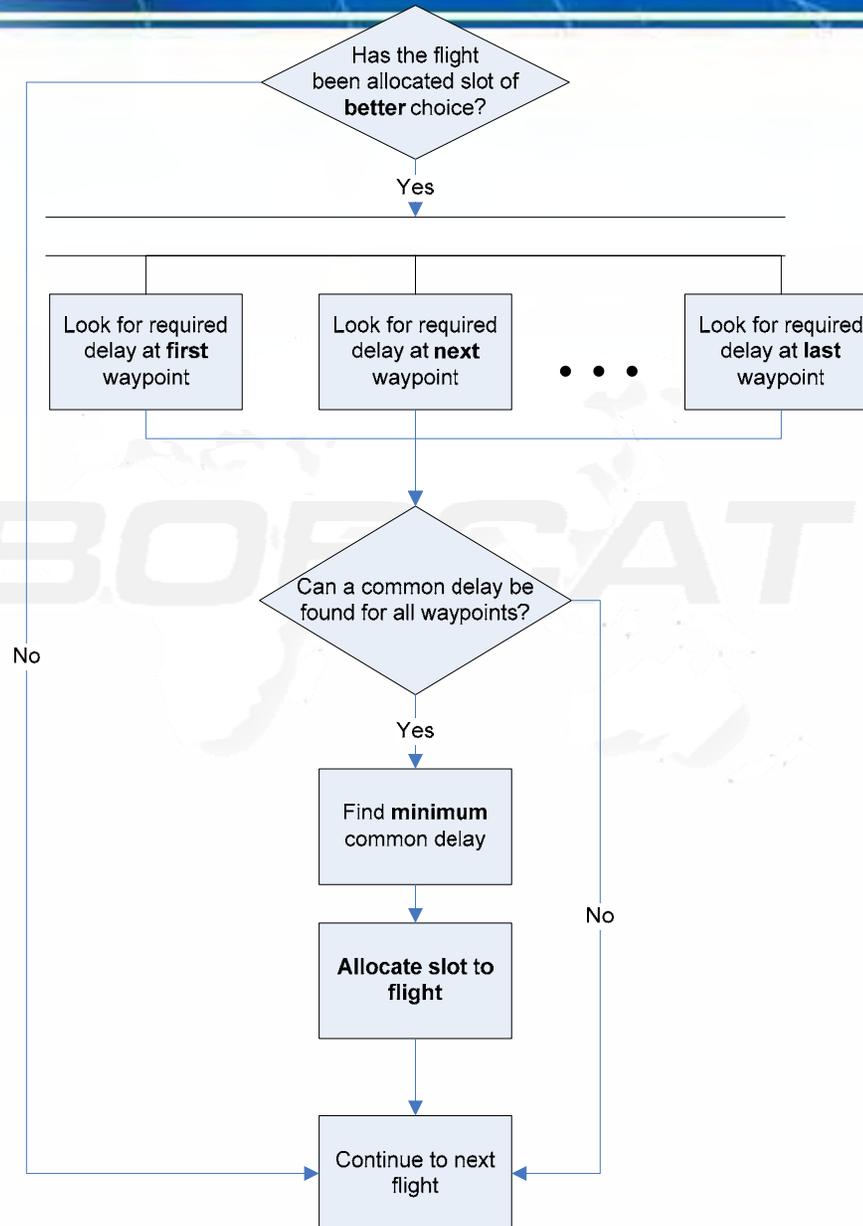
Random Scoring

- Random Score
 - Randomly generated score
 - Range between 0 and 255
 - Random Number Generator used to generate secure password used to generate the score for each aircraft

Slot Allocation Process



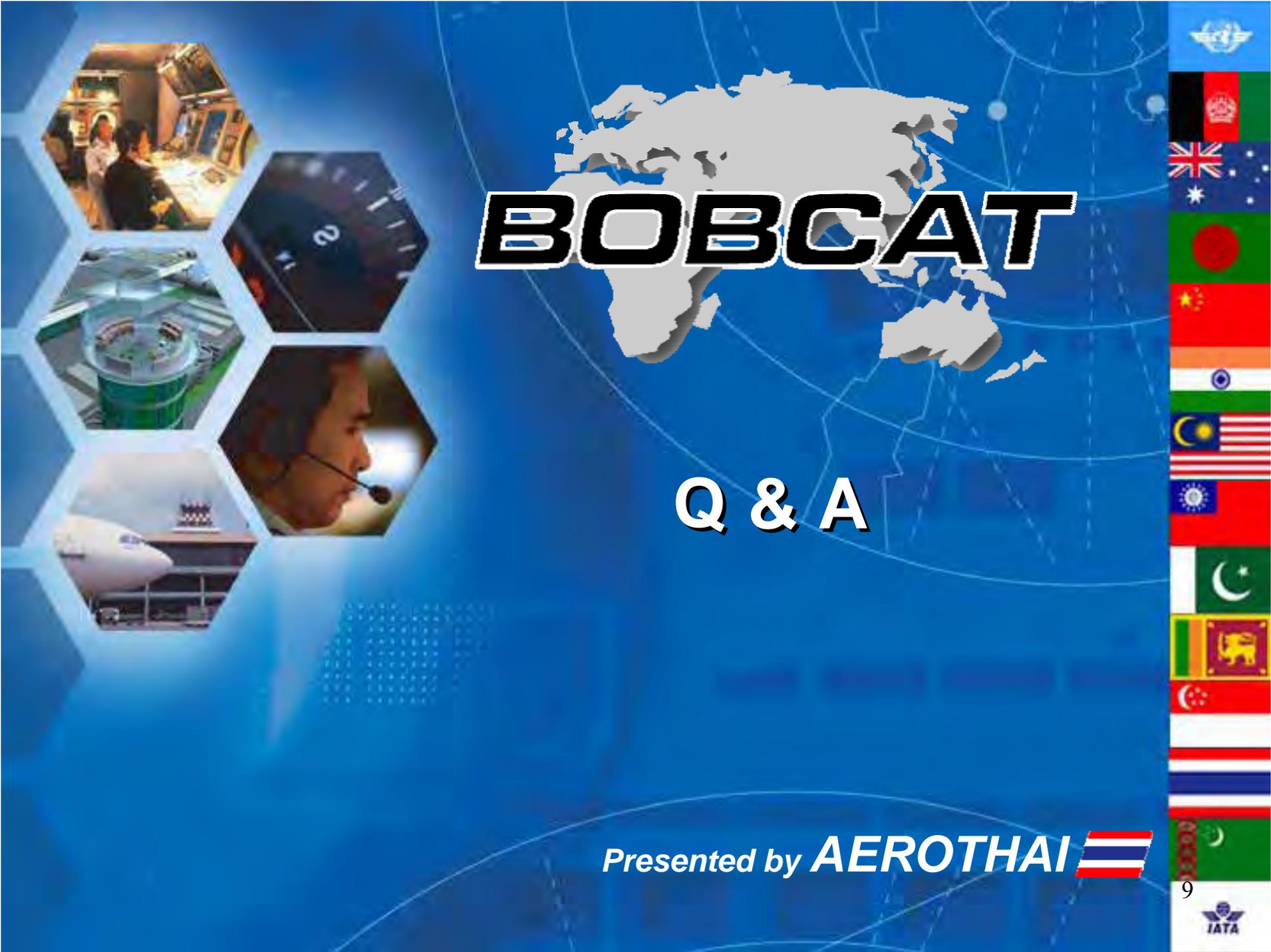
Slot Allocation Attempt



BOBCAT

Q & A

Presented by **AEROTHAI** 



BOBCAT

Thank You!

Presented by **AEROTHAI** 



**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
1.	Kabul Entry/Exit points included-10 +2 minutes	78	<ul style="list-style-type: none"> a) 77 aircraft received slots b) 39 minutes maximum delay c) 12 minutes average delay d) 28 aircraft with zero delay e) 12 other aircraft delay below 10 minutes f) 68 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	One aircraft missed a slot out of Delhi due no slot request at FL280.
2.	Kabul Entry/Exit points included-10 +5 minutes	78	<ul style="list-style-type: none"> a) 77 aircraft received slots b) 40 minutes maximum delay c) 13 minutes average delay d) 32 aircraft with zero delay e) 3 other aircraft delay below 10 minutes f) 59 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	One aircraft missed a slot out of Delhi due no slot request at FL280.

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
3.	Kabul entry point only included 10+2 minutes	78	<ul style="list-style-type: none"> a) 77 aircraft received slots b) 39 minutes maximum delay c) 12 minutes average delay d) 30 aircraft with zero delay e) 11 other aircraft delay below 10 minutes f) 66 aircraft received first slot g) 1 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<ul style="list-style-type: none"> - One aircraft missed a slot out of Delhi due no slot request at FL280. -One aircraft with 8 minutes spacing at exit point
4.	Kabul entry point only included 10+5 Minutes	78	<ul style="list-style-type: none"> a) 77 aircraft received slots b) 39 minutes maximum delay c) 12 minutes average delay d) 30 aircraft with zero delay e) 3 other aircraft delay below 10 minutes f) 66 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<ul style="list-style-type: none"> - One aircraft missed a slot out of Delhi due no slot request at FL280.

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
5.	Kabul Entry/Exit points included-10+2 minutes	55	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 33minutes maximum delay c) 8 minutes average delay d) 25 aircraft with zero delay e) 12 other aircraft delay below 10 minutes f) 51 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	One aircraft missed a slot out of Delhi due no slot request at FL280.
6.	Kabul Entry/Exit points included-10 +5 minutes	55	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 37 minutes maximum delay c) 9 minutes average delay d) 28 aircraft with zero delay e) 2 other aircraft delay below 10 minutes f) 46 of 54 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	One aircraft missed a slot out of Delhi due no slot request at FL280.

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
7.	Kabul Entry point only included 10+2 minutes	55	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 38 minutes maximum delay c) 9 minutes average delay d) 24 aircraft with zero delay e) 10 other aircraft delay below 10 minutes f) 51 of 54 aircraft received first slot g) 1 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<p>One aircraft missed a slot out of Delhi due no slot request at FL280.</p> <p>One aircraft with 8 minutes spacing at exit point</p>
8.	Kabul Entry point only included 10+5 Minutes	55	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 39 minutes maximum delay c) 10 minutes average d) 29 aircraft with zero delay e) 1 other aircraft delay below 10 minutes f) 46 of 54 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<p>One aircraft missed a slot out of Delhi due no slot request at FL280.</p>

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
9.	Kabul Entry/Exit points included-10+2 minutes- no FL280 except India	55	<ul style="list-style-type: none"> a) 53 aircraft received slots b) 33 minutes maximum delay c) 8 minutes average delay d) 22 aircraft with zero delay e) 12 other aircraft delay below 10 minutes f) 50 of 53 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	The two aircraft out of Delhi missed their slots because of no FL280 in his requests.
10.	Entry/Exit points included-10 +5 minutes no FL280 except India	55	<ul style="list-style-type: none"> a) 52 aircraft received slots b) 32 minutes maximum delay c) 8 minutes average delay d) 25 aircraft with zero delay e) 3 other aircraft delay below 10 minutes f) 44 of 52 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	3 aircraft, all out of Delhi missed slots due to no FL280 in their requests.

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
11.	Entry point only included 10+2 minutes no FL280 except India	55	<ul style="list-style-type: none"> a) 53 aircraft received slots b) 38 minutes maximum delay c) 9 minutes average delay d) 20 aircraft with zero delay e) 11 other aircraft delay below 10 minutes f) 51 of 53 aircraft received first slot g) 1 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<p>2 aircraft out of Delhi missed their slots because of no FL280 in his requests.</p> <p>One aircraft with 8 minutes spacing at exit point</p>
12.	Entry point only included 10+5 Minutes no FL280 except India	55	<ul style="list-style-type: none"> a) 52 aircraft received slots b) 39 minutes maximum delay c) 11 minutes average delay d) 22 aircraft with zero delay e) 3 other aircraft delay below 10 minutes f) 45 of 53 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<p>3 aircraft, all out of Delhi missed slots due to no FL280 in their requests.</p>

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
13.	Busiest period between 2100-2300 – Entry/Exit points included-10 +5 minutes	54	<ul style="list-style-type: none"> a) 53 aircraft received slots b) 37 minutes maximum delay c) 11 minutes average delay d) 25 aircraft with zero delay e) 4 other aircraft delay below 10 minutes f) 39 of 53 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	One aircraft missed a slot out of Delhi due no slot request at FL280.
14.	Busiest period between 2100-2300 - MAD changes to 30% of aircraft. Entry/Exit points included-10 +2 minutes	54	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 38 minutes maximum delay c) 8 minutes average delay d) 25 aircraft with zero delay e) 10 other aircraft delay below 10 minutes f) 42 of 54 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
15.	Busiest period between 2100-2300 - MAD changes to 30% of aircraft. Entry/Exit points included-10 +5 minutes	54	<ul style="list-style-type: none"> a) 53 aircraft received slots b) 38 minutes maximum delay c) 9 minutes average delay d) 30 aircraft with zero delay e) 5 other aircraft delay below 10 minutes f) 38 of 53 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	One aircraft missed a slot out of Delhi due no slot request at FL280.
16.	Busiest period between 2100-2300 - MAD changes to 30% of aircraft. Entry point only included 10+2 minutes	54	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 37 minutes maximum delay c) 8 minutes average delay d) 23 aircraft with zero delay e) 11 other aircraft delay below 10 minutes f) 42 of 54 aircraft received first slot g) 2 aircraft with less than 10 minutes spacing leaving Kabul FIR 	<p>The Mad factor for this period for 30% of aircraft was changed to 15, 30 and 45 minutes depending on the amount of slot request provided. 3 slot requests, MAD was 15, 30 and 45. 6 slot requests, was 15, 15, 30, 30 and 45, 45.</p> <p>2 aircraft with 9 minutes at the exit point of Kabul FIR.</p>

**Thailand - BOBCAT Development Team
Summary of Analysis of Synthetic Bobcat Data
Under Various Scenarios -2000 to 2400UTC entering Kabul FIR
Completed on 9 February 2006**

Serial No.	Trial Name	No. of Aircraft	Results	Remarks
17.	Busiest period between 2100-2300 - MAD changes to 30% of aircraft. Entry point only included 10+5 minutes	54	<ul style="list-style-type: none"> a) 54 aircraft received slots b) 40 minutes maximum delay c) 8 minutes average delay d) 30 aircraft with zero delay e) 10 other aircraft delay below 10 minutes f) 39 of 54 aircraft received first slot g) 0 aircraft with less than 10 minutes spacing leaving Kabul FIR 	The Mad factor for this period for 30% of aircraft was changed to 15, 30 and 45 minutes depending on the amount of slot request provided. 3 slot requests, MAD was 15, 30 and 45. 6 slot requests, was 15, 15, 30, 30 and 45, 45.

MALAYSIA - Analysis of BOBCAT Paper Trials – Synthetic Data

Observation 1 – 54 Aircraft KABUL Entry + DI (10+5 Minutes Spacing)

Date: 3 February 2006 - Revised

- a) 6 aircraft departing from Singapore, Kuala Lumpur and Bangkok were assigned FL280.
- b) The table below illustrates how an ANSP will provide separation to flight proceeding to KABUL FIR during the initial segment of flight. Some of these flights (especially B747s are only capable of operating at certain optimum levels (i.e FL280, FL300, FL320) due to their weight and performance restricted.

Assume all the flights departed on time.

1	B	C	D	E	F	L	M	N	O	P	Y	Z	AA	AB	AC
	Callsign	Dept	Dest	Type	Mach	AWUT	WP1	ET1	ETO1	FL1	REMARK	WP4	ET4	ETO4	FL4
132	TEST29	WSSS	EHAM	B777	0.83	15:25	TAVUN	1:29	16:54	320	320	ROSIE	5:40	21:05	310
138	TEST32	WADD	JUDD	IL96	0.84	13:55	TAVUN	3:05	17:00	340	340	SITAX	7:15	21:10	310
144	TEST28	WSSS	EGLL	B744	0.85	15:35	TAVUN	1:25	17:00	320	280	ROSIE	5:40	21:15	280
150	TEST25	WSSS	EGLL	B744	0.85	15:40	TAVUN	1:25	17:05	320	320	ROSIE	5:40	21:20	310
159	TEST22	WMKK	LSZH	B772	0.82	16:00	TAVUN	1:08	17:08	320	280?	ROSIE	5:28	21:28	350
166	TEST26	WSSS	EGLL	B744	0.85	15:55	TAVUN	1:25	17:20	320	320	ROSIE	5:40	21:35	310
173	TEST23	WMKK	EHAM	B744	0.85	16:15	TAVUN	1:08	17:23	320	280	ROSIE	5:28	21:43	350
176	TEST38	WSSS	LFPG	B744	0.85	16:09	TAVUN	1:25	17:34	320	320	ROSIE	5:39	21:48	280
178	TEST39	WSSS	EHAM	B777	0.83	16:09	TAVUN	1:28	17:37	320	280	ROSIE	5:49	21:58	350
184	TEST48	WSSS	EGLL	B744	0.83	16:11	TAVUN	1:26	17:37	320	?	ROSIE	5:39	21:50	310
188	TEST18	WSSS	EHAM	B744	0.85	16:16	TAVUN	1:26	17:42	280	?	PAVLO	5:45	22:01	280

- i. TEST22 (B772, mach-0.82) would be required to arrive at TAVUN 1710 – FL280, 10 minutes behind TEST28 (B747, mach-0.85)
- ii. Within 22 minutes there are six acft from 1720 to 1742. ANSP will have FL260? or FL300 to be assigned to the fifth and sixth acft. (TEST48 and TEST 18).
- iii. TEST48 (B744, mach-0.83) TAVUN 1737 would be assigned FL260 or FL300 if available. TEST39 TAVUN 1737 – FL280. TEST38 TAVUN 1734 – FL320. TEST18 TAVUN 1742 – FL? Why TEST48 AWUT 1611, instead of 1610.

SCM BOB ATFM TRIAL

Appendix F

IATA - Analysis of BOBCAT Synthetic BOBCAT Data 9 Feb 2006

Sn	Trial name	Airport name (not the full list)	Flights	No slot	No delay	Flights delayed	Duration of delay			
							1-9 mins	10-19 mins	20-29 mins	30 mins or more
1	Kabul entry/exit 10+2min mins(78 dummy flights)	WSSS	21		6	15	3	4	6	2
		WMKK	13		3	10	2	2	3	3
		VTBD	20		4	16	5	4	3	4
		VIDP	10	1	4	5	1	2	1	1
		WADD	1			1		1		
		VVTS	3		2	1			1	
		VVNB	3		2	1	1			
VHHH	3		2	1	8					
2	Kabul entry/exit 10+5min (78 dummy flights)	WSSS	21		8	13	1	6	3	3
		WMKK	13		3	10		3	2	5
		VTBD	20		6	14	2	3	3	6
		VIDP	10	1	4	5		4	1	
		WADD	1			1			1	
		VVTS	3		3					
		VVNB	3		2	1		1		
VHHH	3		2	1		1				

Sn	Trial name	Airport name (not the full list)	Flights	No slot	No delay	Flights delayed	Duration of delay			
							1-9 mins	10-19 mins	20-29 mins	30 mins or more
3	Kabul entry 10+2 min (78 dummy flights)	WSSS	21		5	16	3	5	6	2
		WMKK	13		2	11	2	3	3	3
		VTBD	20		4	16	4	2	6	2
		VIDP	10	1	5	5	1	1	2	
		WADD	1			1		1		
		VVTS	3		2	1			1	
		VVNB	3		2	1	1			
4	Kabul entry 10+5 min (78 dummy flights)	WSSS	21		8	13	1	6	3	3
		WMKK	13		3	10		3	2	5
		VTBD	20		6	14	2	3	3	6
		VIDP	10	1	4	5		4	1	
		WADD	1			1			1	
		VVNB	3		2	1		1		
		VHHH	3		2	1		1		

SCM BOB ATFM TRIAL

Appendix F

Sn	Trial name	Airport name (not the full list)	Flights	No slot	No delay	Flights delayed	Duration of delay			
							1-9 mins	10-19 mins	20-29 mins	30 mins or more
7	Kabul entry 10+2min (55)	WSSS	16		5	11	2	5	2	1
		WMKK	10		1	9	2	2	4	1
		VTBD	13		5	8	5	2	1	
		VIDP	10	1	5	4	1	2		1
		VVTS	2		1	1	-	-	1	-
		VVNB	1		-	1	1	-	-	-
8	Kabul Entry 10+5 (55)	WSSS	15		6	9		6	2	1
		WMKK	10		1	9	1	1	3	4
		VTBD	13		5	8	1	4	2	1
		VIDP	10	1	6	3		2	1	
		VVNB	1			1		1		

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ICAO Bay of Bengal ATS Coordination Group – ATFM Task Force

BOBCAT SAFETY ASSESSMENT

**Operational Trial Implementation of
Bay of Bengal Cooperative Traffic Flow Management System (BOBCAT)**

1 Background

Despite airspace capacity improvements including the EMARSSH realignment of ATS routes (November 2002) and the implementation of RVSM in the Bay of Bengal area (November 2003), recent meetings of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the Bay of Bengal ATS Coordination Group (BBACG) and the RVSM Implementation Task Force (RVSM/TF) had all recognized a continuing need to improve the overall management of traffic flows across the Bay of Bengal and South Asia area.

APANPIRG/15 (August 2004) noted the considerable efforts being made by States to collaborate, together with IATA, to improve the ATFM over the Bay of Bengal area and encouraged all parties to continue their efforts in this respect and to take into account the benefits to be derived from ATM automated systems.

A Special ATS Coordination Meeting – Bay of Bengal (SCM-BOB) was subsequently held in conjunction with the BBACG/16 meeting at the ICAO Regional Office (Bangkok), from 31 January – 4 February 2005. The SCM-BOB concluded that a dedicated Air Traffic Flow Management Task Force (ATFM/TF) should be established under BBACG to progress flow management arrangements for the Bay of Bengal and South Asia traffic flows, and drafted terms of reference accordingly. To meet agreed objectives, the ATFM/TF adopted a phased implementation programme under which Phase One was confined to flights planning to transit the Kabul FIR during the night time peak period.

During the ATFM/TF/2 meeting (Delhi, India, 28 June - 1 July 2005) the Task Force noted Thailand's readiness to proceed to an operational trial and requested Thailand to continue to develop the Bay of Bengal Cooperative ATFM Advisory System (BOBCAT) automated system to the stage of an operational trial, in close cooperation with concerned States, ICAO and IATA. The ATFM/TF considered that an ATFM operational trial should be conducted to enable the States concerned to assess the effectiveness of the system.

In preparing for an ATFM operational trial, the ATFM/TF reviewed the standards and recommended practices relating to the implementation by States of safety management programmes for Air Traffic Services (ATS) contained in Section 2.26 of Annex 11 – *Air Traffic Services* and corresponding provisions in Chapter 2 of the *Procedures for Air Navigation Services – Air Traffic Management* (PANS-ATM, Doc 4444). The ATFM/TF noted the requirement for States to undertake a safety assessment prior to the implementation of any new separation minimum or procedure, in order to ensure that safety is maintained in the provision of ATS within airspaces and at aerodromes.

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2 Safety Assessment

The safety assessment activities undertaken by the ATFM/TF recognized that the Bay of Bengal Cooperative Traffic Flow Management System (BOBCAT) was not intended nor designed to “control” aircraft or relieve any of the traffic separation responsibilities of the ATS providers concerned. ATS providers would retain full responsibility for all ATS functions, including traffic management.

In accordance with Phase One of the ATFM system implementation planning being coordinated by the ATFM/TF, the purpose of BOBCAT was to regulate, by the calculation and distribution of wheels up and gateway fix slot times, the flow of westbound air traffic departing airports from East Asia, South-East Asia and South Asia and which had planned to transit the Kabul FIR between the hours of 2000 and 2359 UTC daily.

The BOBCAT was an advisory system which did not have executive control of aircraft. Nevertheless, BOBCAT would provide scheduling information for aircraft departures and, if the system did not perform to design expectations, this could lead to traffic congestion. However, the ATFM/TF considered that in no case would erroneous advisory information from BOBCAT be expected to lead to breakdown of required ATS separation as ATS providers retained responsibility for tactical ATS and traffic management.

3 Methodology

The ATFM/TF conducted safety assessment activities in accordance with guidance in Chapter 6 the draft ICAO *Manual on Safety Management for Air Traffic Services*. In this context, commencing during the ATFM/TF/3 meeting (Bangkok, Thailand, 6-9 September 2005) the ATFM/TF undertook hazard identification activities in preparation for an operational trial of the BOBCAT system. The seven hazards and associated mitigators identified were recorded in the attached Hazard Log and the Hazard Log was reviewed and updated during subsequent meetings of the ATFM/TF.

Recognizing that the BOBCAT system was an advisory system only and that failure of the BOBCAT system during the operational trial would result in reversion to existing procedures, the ATFM/TF did not formally classify identified Hazards in terms of likelihood and severity. Nevertheless, mitigators were identified in many instances that would be applied with a view to enhancing the conduct of the operational trial.

4 Primary Requirements

As a result of the safety assessment activities and associated works, the ATFM/TF identified the following primary requirements for the conduct of the ATFM operational trial:

- a) Proof of BOBCAT Concept by the conduct of desktop simulations/paper trials;
- b) Preparation and publication of a comprehensive AIP Supplement containing procedures and requirements for the operational trial;
- c) Preparation and publication of comprehensive ATFM Handbook containing procedures and requirements for the operational trial;

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- d) Computer based training capabilities via the BOBCAT website;
- e) Adequate ATFMU staffing and equipment levels, including technical support;
- f) Advanced BOBCAT system Hardware and Software requirements including equipment redundancy, firewall protection, etc
- g) Ghosting of operations for 7 day period prior to live trial;
- h) Immediate reversion capability to pre-trial conditions using existing State bi-lateral arrangements; and
- i) Availability of suitable methodology and set of objective criteria against which trial performance could be measured.

5 Assumptions and Constraints

Assuming the full completion, or planned completion prior to commencement of an operational trial, of the items described above, the ATFM/TF would convene a meeting at a suitable time prior to the scheduled start of the 7 day ghosting period in order to conduct an assessment of the readiness level of trial participants and make a Go/ No Go decision in relation to the commencement, or otherwise, of the ATFM operational trial.

In the event of significant non compliance or lack of readiness in relation to the items described in Section 4 above, commencement of the trial would be delayed until a suitable readiness level was achieved.

6 Post Implementation Review

A post implementation review of trial performance would be completed by the ATFM/TF within approximately 3 weeks of the commencement of the trial using a suitable methodology and set of objective criteria. This would facilitate objective assessment of the ATFM trial and the provision of high integrity information to enable States and users to evaluate the effectiveness of the BOBCAT system.

7 Safety Statement

Having conducted safety assessment activities in accordance with the above, including consideration of the attached Hazard Log and the ongoing work of the ATFM/TF, and recognizing that an immediate reversion to pre-trial arrangements could take place in the event of unforeseen difficulties, the States participating in the ATFM operational trial had not identified safety concerns that would impede the conduct of a Phase 1 ATFM operational trial using the BOBCAT system.

- END -

Note: BOBCAT Safety Assessment Hazard Log (9 pages) at Appendix H.

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ICAO Bay of Bengal ATS Coordination Group – ATFM Task Force

BOBCAT Safety Assessment - Hazard Log

**Operational Trial Implementation of
Bay of Bengal Cooperative Traffic Flow Management System (BOBCAT)**

	Hazard No 1
Description:	Non-standard, incorrect or corrupt data leading to erroneous advisory information.
Remarks:	The BOBCAT is a computerized system with user access via the public internet. This hazard identifies the possibility of incorrect data being presented to or utilized by BOBCAT, resulting in erroneous advisory information being promulgated by BOBCAT.
Mitigation:	<ol style="list-style-type: none">1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management.2) Hardware – The BOBCAT Concept of Operations includes details of system hardware architecture which incorporates contemporary firewall protection to ensure no unauthorized access is obtained, in particular to application and database servers.3) Software – incorporates checking algorithms to ensure aircraft can not be scheduled at the same gateway fix at the same time and at the same flight level.4) AEROTHAI support engineers will monitor BOBCAT Error Log and provide support for ATFMU staff to resolve non-standard, incorrect or corrupt data issues.

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	<p>5) Paper Trial – Paper trials/simulations of full functionality of BOBCAT prior to operational trial comprises validation exercises in order to identify data errors and other issues.</p> <p>6) ATFMU – Structured training programme for ATFMU staff to ensure recognition of non-normal data configurations, and a “reasonableness” check of slot allocation lists is conducted by ATFMU staff prior to the list being published to users.</p> <p>7) ATS Unit – The ATS Units adjacent to or controlling gateway fixes would identify situations where traffic was inappropriately sequenced and provide tactical ATS intervention.</p> <p>8) Ghost Operations – Implementation of operational trial will utilize staged implementation of BOBCAT. Stage one (7 day period) would require full functionality and user input, but slots generated would not be issued to aircraft. Facilitates testing of databases and procedures under operational conditions. Stage 2 commences live operations only provided Stage 1 operations are acceptable.</p> <p>9) Computer based training package for BOBCAT operations and interactive web board (i.e. discussion page) will be provided on BOBCAT web site.</p>
	Hazard No 2
Description:	Errors or bugs in software update leading to erroneous advisory information.
Remarks:	This hazard identifies concerns in respect of major software changes or other major equipment changes which could result in introduction of catastrophic software threats.

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Mitigation:	1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management. 2) Hardware – The BOBCAT Concept of Operations includes details of system hardware architecture which includes duplicated systems throughout enabling redundancy, allows one system to be non operational whilst duplicated system carries the load. 3) Bay of Bengal and South Asia ATFM Handbook includes requirements and procedures for major software updates. Significant system and software changes to be reviewed by suitable oversight authority e.g. Air Traffic Flow Management Task Force, Bay of Bengal ATS Coordination Group, AEROTHAI Senior Engineering Staff prior to implementation 4) Paper trial and ghost operations provide intensive testing of software.
Hazard No 3	
Description:	Hardware or networking failures or incompatibilities leading to absence of advisory information or promulgation of erroneous advisory information.
Remarks:	Hardware and/or hardware networking problems/public internet failures may create a situation where BOBCAT goes off line without warning, leading to an absence of data or erroneous data presentation to users due lack of update capability.

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Mitigation:	<p>1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management.</p> <p>2) Hardware – The BOBCAT Concept of Operations includes details of system hardware architecture which includes duplicated systems throughout enabling redundancy of hardware without compromising entire BOBCAT system.</p> <p>3) Software configuration includes user visible time/date stamp of slot allocation list and other time bound pages.</p> <p>4) AIP Supplement and Bay of Bengal and South Asia ATFM Handbook includes requirements and procedures for internet outage, including manual procedures for contact with ATFMU via telephone, AFTN and fax to allow gateway allocation list to be updated and gateway allocations issued. Fax template will be included in ATFM Handbook.</p> <p>5) ATFMU staffing includes provision for technician qualified and trained on all BOBCAT facilities to be on duty during hours of operation of ATFMU.</p> <p>6) Paper trial and ghost operations provide intensive testing of system. Ghost operations allow testing of hardware and networked system under operational conditions.</p>
Hazard No 4	
Description:	Inadequate or inappropriate information entered into the system by users leading to erroneous advisory information.

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Remarks:	BOBCAT would have a large number of users, particularly dispatchers from many airlines, interacting with the system. Potential for the “wrong” information to be entered, leading to consequential erroneous data being promulgated by BOBCAT.
Mitigation:	<ol style="list-style-type: none">1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management.2) Two day BOBCAT Workshop (9 & 10 November 2005) for airline dispatchers and affected ATS officers conducted during ATFM/TF/4 meeting (7 – 11 November 2005).3) Bay of Bengal and South Asia ATFM Handbook includes comprehensive requirements and procedures for users of the system.4) Comprehensive AIP Supplement, including slot submission procedures, published 2 AIRAC cycles prior to commencement of trial.5) Structured training programme for ATFMU staff to ensure recognition of non-normal data configurations, and a “reasonableness” check of slot allocation lists is conducted by ATFMU staff prior to the list being published to users.6) BOBCAT software makes extensive use of simplified menus for user selection of data input, limited choices in each menu for routes, levels etc, no ability for users to vary menus or input data other than what is contained in the menus. Checking algorithms incorporated to test “reasonableness” of submitted Mach Number, elapsed time from departure to waypoint, wheels up time at least equal to ETD plus standard taxi time, unique aircraft registration number check to ensure single slot per airframe.7) BOBCAT Concept of Operations includes provisions for security of user access to BOBCAT. Access only via password to authorized users with written approval from ATFMU manager.

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	8) Computer based training package for BOBCAT operations and interactive web board (i.e. discussion page) will be provided on BOBCAT web site.
	Hazard No 5
Description:	Unforeseen changes in airspace operational status leads to sudden reduction in airspace capacity.
Remarks:	If the airspace operational status changes without due notification e.g. sudden non-availability of an ATS route, it will take some time before BOBCAT can reschedule slots if the sudden change in status occurs prior to the publication of the nightly slot allocation list. If the change in airspace operational status occurs after the slot allocation list has been published, BOBCAT is unable to assist.
Mitigation:	<ol style="list-style-type: none">1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management.2) Sudden changes in operational status that occur prior to the cut off time for the calculation and promulgation of the gateway allocation list can be managed by BOBCAT, e.g. a route that is suddenly not available is removed from the route selections available to users. Users that have already selected the route that is no longer available would be allocated one of their other preferences that did not include this route.3) In contingency circumstances, flight spacing can be redefined on any route or waypoint without requiring re-submission of slot requests.4) Circumstances where the change in operational status occurs after the gateway allocation list has already been promulgated would require ATS providers to tactically manage the situation in accordance with normal ATS contingency plans/procedures.

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Hazard No 6	
Description:	Industry does not comply with agreed wheels up and/or gateway fix times leading to congestion and un-flowed traffic sequence.
Remarks:	Inadvertent or willful non compliance by Industry with published wheels up and/or gateway fix times could lead to schedule conflicts at gateway fixes.
Mitigation:	<ol style="list-style-type: none">1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management.2) ICAO PANS ATM (Doc 4444) includes provisions at paragraph 7.8.1 which place responsibility on pilot and operator to ensure that aircraft is ready to taxi in time to meet ATFM requirements.3) Implementation of flow management provided by BOBCAT is as a result of collaborative arrangements between Bay of Bengal ATS providers and IATA, including IATA member airlines. Industry consultation/liaison with/by IATA and ICAO Regional Office provides increased communications and agreement between users and ATS providers.4) Comprehensive AIP Supplement agreed by users and issued by involved States requires compliance by users with gateway slots allocated by BOBCAT.5) BOBCAT software includes tracking/ reporting capability which will be used to identify users that habitually do not comply. ATFMU will contact these users to advise of non compliance and ascertain remediation proposed by users.6) Bay of Bengal and South Asia ATFM Handbook includes comprehensive requirements and procedures for users of the system, including provision for exempted aircraft, and coordination activities required in the event

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	<p>of a missed slot. Includes procedures for ANSPs to submit report of non-compliance with BOBCAT procedures for review by BOBCAT oversight authority.</p> <p>7) Two day BOBCAT Workshop (9 & 10 November 2005) for airline dispatchers and affected ATS officers conducted during ATFM/TF/4 meeting (7 – 11 November 2005).</p>
Hazard No 7	
Description:	ATS Units do not comply with agreed wheels up and/or gateway fix times leading to congestion and un-flowed traffic sequence.
Remarks:	Inadvertent or willful non compliance by ATS Units with published wheels up and/or gateway fix times would lead to schedule conflicts at gateway fixes.
Mitigation:	<p>1) BOBCAT provides advisory information only; ATS providers retain responsibility for tactical ATS and traffic management.</p> <p>2) ICAO PANS ATM (Doc 4444) includes provisions at paragraph 7.8.1 which enable adjustments to be made to sequence of departing aircraft in respect of aircraft subject to ATFM requirements.</p> <p>3) Implementation of flow management provided by BOBCAT is as a result of collaborative arrangements between Bay of Bengal ATS providers and IATA, including IATA member airlines. Industry consultation/liaison with/by IATA and ICAO Regional Office provides increased communications and agreement between users and ATS providers.</p> <p>4) Downstream ATS Units will be required to tactically manage non compliances from upstream ATS Units.</p>

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| | <p>5) Comprehensive AIP Supplement agreed by users and issued by involved States requires compliance by users with gateway slots allocated by BOBCAT.</p> <p>6) BOBCAT software includes tracking/ reporting capability will be used to identify ATS Units that habitually do not comply. ATFMU will contact these ATS Units to advise of non compliance and ascertain remediation proposed by ATS Units.</p> <p>7) Bay of Bengal and South Asia ATFM Handbook includes comprehensive requirements and procedures for users of the system, including provision for exempted aircraft, and coordination activities required in the event of a missed slot. Includes procedures for submission of report of non-compliance with BOBCAT procedures for review by BOBCAT oversight authority.</p> <p>8) Two day BOBCAT Workshop (9 & 10 November 2005) for airline dispatchers and affected ATS officers conducted during ATFM/TF/4 meeting (7 – 11 November 2005).</p> |
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ICAO Bay of Bengal ATS Coordination Group – ATFM Task Force

MODEL AIP SUPPLEMENT – BAY OF BENGAL ATFM OPERATIONAL TRIAL

Note: Text identified as (ANSPs) and/or (ATC units) should be replaced with the name of State organizations and units as appropriate.

IMPLEMENTATION OF AN OPERATIONAL TRIAL OF AIR TRAFFIC FLOW MANAGEMENT (ATFM) OVER BAY OF BENGAL, SOUTH ASIA AND PAKISTAN THROUGH KABUL FIR

1 Introduction

- 1.1 The States of the ICAO Asia/Pacific Region within the Bay of Bengal, South Asia and Pakistan airspace will be implementing an operational trial of an integrated Air Traffic Flow Management (ATFM) service commencing on 6 July 2006. The trial will be conducted under the auspices of the ICAO Bay of Bengal ATS Coordination Group – ATFM Task Force. The ATFM operational trial will be preceded by a 7 day ghosting period commencing on 29 June 2006.
- 1.2 ATFM services will be provided in accordance with the terms of this AIP Supplement for westbound flights transiting the Kabul FIR. The objectives of the ATFM services are to:
 - a) Reduce ground and en-route delays;
 - b) Maximise capacity and optimize the flow of air traffic within the area;
 - c) Provide an informed choice of routing and flight level selection;
 - d) Alleviate unplanned in flight rerouting and technical stops; and
 - e) Assist regional Air Navigation Service Providers (ANSPs) in planning for and managing future workload in the light of forecast increased traffic flows within the area.
- 1.3 The operational trial will manage westbound flights transiting the Kabul FIR at specified times by satisfying minimum spacing requirements at established gateway fix points in the vicinity of the eastern boundary of the Kabul FIR.
- 1.4 Mandatory slot allocation will be managed via internet access to the automated Bay of Bengal Cooperative ATFM Advisory System (BOBCAT) of the Air Traffic Flow Management Unit (ATFMU) operated by Aeronautical Radio of Thailand LTD (AEROTHAI).

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- 1.5 BOBCAT will provide advisory ATFM information only. **(ANSPs)** retain responsibility for tactical ATS and traffic management.

2 Commencement/Duration of BOBCAT Operations

- 2.1 The 7 day ghosting period prior to the ATFM operational trial will commence with effect from 1200UTC on 29 June 2006 (0606291200). Although full participation will be required from operators and **(ANSPs)** and slot times will be allocated by BOBCAT, slot times should NOT be issued to, or applied by, operating crews during the ghosting period.
- 2.2 With effect from 1200UTC on 6 July 2006 (0607061200), the operational trial of BOBCAT will be fully implemented and slot times shall be issued to, and applied by, operating crews.
- 2.3 A trigger NOTAM will be issued on 19 June 2006 to confirm final arrangements for the conduct of the ATFM operational trial.
- 2.4 The trial operations will be reviewed daily by the ATFM Task Force and a comprehensive formal review will be conducted approximately 3 weeks after trial commencement .
- 2.5 **(ATC units)** and airline operators should make an application for the issue of user name and password via email to atfmu@bobcat.aero as soon as possible.

3 Identification of ATS routes, flight levels and applicable hours

- 3.1 All westbound flights intending to transit the Kabul FIR between 2000UTC and 2359UTC daily on ATS routes A466, L750, N644 from FL280 to FL390 inclusive and V390/G792 from FL310 to FL390 inclusive shall participate in the operational trials of BOBCAT.
- 3.2 In order to ensure availability of an initial slot for westbound departures from designated airports in northern India and Pakistan, (currently identified as VIDP, OPKC and OPLA), FL280 has been reserved in BOBCAT for priority allocation to departures from these ports.

4 Provision of ATFM Services

- 4.1 The ATFM service is advisory in nature and will be provided by Aeronautical Radio of Thailand LTD (AEROTHAI) from the Air Traffic Flow Management Unit (ATFMU). The ATFM service will be limited to slot allocation/management.
- 4.2 The ATFMU will utilise the BOBCAT system in exercising its responsibility for the ATFM activities within the Bay of Bengal and South Asia areas for the ATS routes, flight levels and at the times described in this AIP Supplement. This responsibility will be managed in coordination with aircraft operators and ANSPs in the FIRs concerned.

- 4.3 The ATFMU will operate from 0600UTC to 2359UTC daily and will be responsible for westbound flights only. ATFMU contact details are specified in paragraph 10.
- 4.4 Aircraft Operators and **(ANSPs)** are required to have computer equipment capable of connecting to the BOBCAT website <https://www.bobcat.aero> via the internet and satisfying the following minimum requirements:
- a) A personal computer of any operating system with the following characteristics;
 - i) Processor: minimum CPU clock speed of 150 MHz;
 - ii) Operating System: Any that operates one of the following web browsers (i.e. Windows 2000/XP, Linux, Unix, or Mac OS);
 - iii) Web Browser: Internet Explorer 5.5 or newer, Mozilla 1.0 or newer, Mozilla Firefox 1.0 or newer, Netscape 7 or newer;
 - iv) RAM: 64 MB or larger (depending on operating system);
 - v) Hard Disk Space: minimum of 500 MB or larger (depending on operating system);
 - vi) Monitor Display Resolution: Minimum of 800 x 600 pixels; and
 - vii) Internet Connection: 56 Kbps Modem or faster.

5 BOBCAT-Operating Procedures

5.1 Slot Allocation Process

- 5.1.1 The slot allocation process is divided into 3 phases, namely the Slot request, initial Slot allocation and finally Slot distribution to airline operators and ANSPs. All operators concerned are required to submit slot requests to the BOBCAT system by logging onto <https://www.bobcat.aero> and completing the electronic templates provided.

Slot Requests

- a) Slot requests including preferred ATS route, flight level and Maximum Acceptable Delay (MAD) should be lodged between 0001 UTC and 1200 UTC on the day of operation. Slot requests may subsequently be amended up until 1200 UTC, which shall be the cut-off time. Airline dispatchers are encouraged to submit additional options in case their first choice is not available. This may include alternative route, flight level and MAD.

- b) As BOBCAT will allocate FL280 on a priority basis to facilitate departures from northern India and Pakistan underneath over-flying traffic, dispatchers are encouraged to include FL280 in at least one slot request for departures from these ports.
- c) Flights that were not allocated a slot although a slot request was submitted prior to the cut-off time (1200UTC), and flights that did not submit a slot request by the cut off-time, should select a slot from the listing of unallocated slots available immediately after slot distribution has been completed.

Slot Allocation and Distribution

- d) Slot allocation will take place after the cut-off time at 1200UTC. BOBCAT will process and generate the slot allocation based on the information submitted in the slot request, and notify the results not later than 1300UTC via the BOBCAT website. Alternative arrangements for notification of slot distribution (e.g. E-mail, Fax, Telephone) should be coordinated with the ATFMU.
- 5.1.2 Flights departing without an allocated slot will be accommodated after participating flights have been processed and should expect delays for requested routes and flight levels.
- 5.1.3 After the slot allocation has been published at <https://www.bobcat.aero>, aircraft operators can:
- a) View the slot allocation result for flight planning purposes
 - b) Cancel the assigned slot and/or,
 - c) Request a change of slot allocation to another available slot in the published list.
- 5.1.4 **(ATC Units)** can view the slot allocation results at <https://www.bobcat.aero>.
- 5.1.5 Once aircraft operators are satisfied with the slot allocation, they should submit their ATS flight plan using the time, route and level parameters of the allocated slot.
- 5.1.6 In addition to normal addressees, operators should also address flight plan and related ATS messages (e.g. FPL, DLA, CNL, CHG) to the ATFMU via AFTN address VTBBZDZX.

5.2 Pilot in Command Role and Responsibility

- 5.2.1 In accordance with ICAO PANS ATM provisions, it is the responsibility of the Pilot in Command (PIC) and the operator to ensure that the aircraft is ready to taxi in time to meet any required departure time. PIC shall be kept informed via their operators of the Allocated Wheels Up Time (AWUT), gateway fix times and flight parameters (route/level) nominated by BOBCAT.
- 5.2.2 In collaboration with airline operators, **(ATC Units)** shall ensure that every opportunity and assistance is granted to a flight to meet AWUT and allocated waypoint times.
- 5.2.3 The PIC shall include the AWUT in the initial ATC clearance request.
- 5.2.4 The PIC, in collaboration with ATC, shall arrange take-off as close as possible to the AWUT.
- 5.2.5 In circumstances where it becomes obvious that the AWUT will not be met, a new slot allocation should be obtained by the most expeditious means (e.g. via coordination between flight dispatcher, PIC, **(ATC Units)** and ATFMU).
- 5.2.6 PIC shall adjust cruise flight to comply with slot time at Kabul FIR gateway fix, providing advice to ATC of speed variations in accordance with AIP requirements.

5.3 ANSP Role and Responsibility

- 5.3.1 In accordance with ICAO PANS ATM provisions, flights with slot allocation should be given priority for take off over other departures to facilitate compliance with AWUT.
- 5.3.2 AWUT shall be included as part of the initial ATC clearance.
- 5.3.3 When requested by the PIC prior to push back, or if the aircraft has pushed back, **(ATC Units)** shall assist the PIC to coordinate with the ATFMU for a new slot allocation in the event that the aircraft is unable to meet the AWUT.
- 5.3.4 As guidance for airline operators in estimating WUT, **(ANSPs)** shall notify ATFMU via email to atfmu@bobcat.aero by 31 May 2006 of Standard Taxi Time (STT) for the departure aerodromes and any subsequent changes, e.g. taxi way works.
- 5.3.5 The ATFMU (VTBBZDZX) shall be included in the list of AFTN addressees for NOTAMs regarding any planned activities (e.g. reservation of airspace/ closure of airspace, non-availability of routes, etc).
- 5.3.6 The ATFMU (VTBBZDZX) shall be included in the list of AFTN addressees for ATS messages (e.g. DEP, DLA, CHG, CNL) related to flights participating in the ATFM operational trial.

6 Procedures for Operations of Special Flights Exempted from ATFM

- 6.1 The following flights are exempted from ATFM slot allocation:
- a) Humanitarian or medical flights
 - b) State aircraft with Head of State onboard
- 6.2 Flights exempted from ATFM shall indicate the exemption in their flight plan (Field 18 – STS-ATFM EXMP).
- 6.3 **(ATC Units)** shall forward the flight plan information to the ATFMU (at AFTN VTBBZDZX).

ATFM Handbook

- 7.1 Detailed information in respect of the ATFM operations described above, and other pertinent information, has been included in the *Bay of Bengal and South Asia ATFM Handbook* (the “ATFM Handbook”), available at <https://www.bobcat.aero>
- 7.2 ANSPs and Operators shall ensure that they are conversant with and apply the relevant procedures described in the ATFM Handbook.

8 Contingency Procedures

- 8.1 In the event that an airline operator or **(ANSP)** is unable to access the BOBCAT website, the following means of communication shall be used;
- a) AFTN : VTBBZDZX
 - b) Fax : +66-2-287-8027
 - c) Telephone : +66-2-287-8024, +66-2-287-8025
 - d) Tel/Fax: +66-2-287-8026
- 8.2 Contingency procedures for submission of slot request, including activation of Contingency Slot Request Templates (CSRT), are included in the ATFM Handbook.
- 8.3 In the event of system failure of BOBCAT, ATFMU shall notify all parties concerned and advise that ATFM slot allocation procedures are suspended. In this event, procedures will be applied by States concerned in accordance with existing bi-lateral agreements.

9 ATFM System Fault Reporting

- 9.1 An ATFM system fault is defined as a significant occurrence affecting an ATS unit, an aircraft operator or ATFMU resulting from the application of ATFM procedures.
- 9.2 Aircraft operators and (**ATC units**) experiencing an ATFM system fault should complete an ATFM System Fault Report Form from the ATFM Handbook and forward it to the ATFMU at the address indicated on the form. The ATFMU will analyze all reports, make recommendations/suggestions as appropriate and provide feed back to the parties concerned to enable remedial action.

10 Address of Air Traffic Flow Management Unit (ATFMU)

- 10.1 The ATFMU may be contacted as follows;
- Unit Name: Bangkok ATFMU
 - Website: <https://www.bobcat.aero>
 - Telephone: +66-2-287-8024, +66-2-287-8025
 - Fax: +66-2-287-8027
 - Tel/Fax: +66-2-287-8026
 - E-mail: atfm@bobcat.aero
 - ATFN: VTBBZDZX

- END -

BAY of BENGAL COOPERATIVE ATFM ADVISORY SYSTEM



ATFM USERS HANDBOOK

(DRAFT VERSION 0.1 - 16 February 2005)

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Glossary and Terms

[To be completed]

1. Introduction

Purpose of BOBCAT

1.1. The Bay of Bengal Cooperative ATFM System (BOBCAT) has been developed by AEROTHAI, in coordination with ICAO, Air Navigation Service Providers (ANSPs) concerned, the International Air Transport Association (IATA) and their member international airlines to assist in managing the present restrictions for westbound aircraft operating through the Kabul FIR during the busy night time period.

1.2. It is considered that there is a need to introduce an automated air traffic flow management system, due to present flight level constraints at the Kabul FIR gateway points together with the limited route segments over the Kabul FIR. This would ensure a smooth flow of traffic through Kabul waypoints and associated route segments.

ATFM Users Handbook

1.3. This ATFM Users Handbook provides information necessary for airline operators and ANSPs to carry out their responsibilities within the BOBCAT system. The Users Handbook will be updated as BOBCAT functionalities are enhanced.

Principles of BOBCAT

1.4. The following principles have been agreed to:

- a) To introduce an automated air traffic flow management system in accordance with ICAO standards and recommended practices to enhance the smooth flow of westbound aircraft transiting the Kabul FIR during the period of 2000 to 2400UTC;
- b) BOBCAT provides advisory information only. ANSPs retain their responsibility for tactical ATS and traffic management;
- c) BOBCAT will manage mandatory slot selection through interaction with airline dispatchers via the Internet using a dedicated website;
- d) To maintain or improve aircraft operations through the Kabul FIR during the above period;
- e) To maintain a high level of responsiveness to requests from ANSPs, IATA and their airline operators for procedure and system improvements; and,

- f) To provide reports and statistics on ATFM operations for analysis by a body of experts.

2. BOBCAT Operations and Functionality

BOBCAT System

2.1 The BOBCAT will be responsible for the ATFM activities within the Bay of Bengal and South Asia areas for the routes and at the times described in States' AIP Supplements. This responsibility will be managed by the Bangkok Air Traffic Flow Management Unit (ATFMU) in coordination with aircraft operators and ANSPs in the FIRs concerned.

BOBCAT Concept of Operations

2.2 The BOBCAT concept of operations has been formulated on the following parameters:

- a) BOBCAT shall ensure slot allocations at the same level are not less than the agreed required spacing at each Kabul FIR entry waypoints: SITAX (A466), PAVLO (N644), ROSIE (L750) and ASLUM (G792);
- b) In order to efficiently utilize airspace with regard to aircraft diverting over DI on A466 and N644, airline operators should indicate their CVSM flight level for entry into Kabul FIR at the DI waypoint;
- c) Spacing requirements between two aircraft at the same waypoint into Kabul FIR and the same flight level shall be 10 minutes;
- d) An additional buffer time of 5 minutes will be applied within the system to ensure flexibility as well as efficient and safe flow of traffic operating through the Kabul FIR;
- e) In order to ensure availability of an initial slot for westbound departures from Northern India and Pakistan, departures from these airports will be given priority on flight level 280 for entry into Kabul FIR. Conversely, aircraft departing from other airports with longer flight times will given priority on flight levels 310-390 for entry into Kabul FIR;
- f) Allocated Wheel-Up Time (AWUT) assigned by BOBCAT is based on information derived from the airline operators and

ANSPs' input. This time should be based on Estimated Time of Departure (ETD), a Standard Taxi Time (STT) provided by ANSPs, and any additional time that aircraft operator considers necessary (Additional Taxi Time: ATT);

- g) Aircraft sequencing at the departure airport according to AWUT order will be managed by the ANSP concerned;
- h) ANSP should endeavor to assist aircraft operators in order for them to meet the required AWUT;
- i) Airline operators should submit flight plan based on BOBCAT slot allocation for entry into Kabul FIR;
- j) It is the airline operators' responsibility to arrange en route flight profile to arrive over the Kabul FIR entry waypoint as allocated by BOBCAT;
- k) It is an ANSP responsibility to tactically manage aircraft entry into the Kabul FIR in accordance with the assigned route and flight level;

Area of Operation

2.3 All westbound aircraft entering and transiting the Kabul FIR at FL280 to FL390 between 2000 to 2359UTC on ATS routes A466, N644, L750 and G792, en route to their destinations are deemed to be in the BOBCAT area of responsibility. As such, they are required to submit slot allocation requests to the ATFMU for processing.

Bangkok Air Traffic Flow Management Unit

2.4 Bangkok Air Traffic Flow Management Unit (Bangkok ATFMU), located in Bangkok ACC, has responsibility to manage the BOBCAT system on behalf of ANSPs and aircraft operators concerned. It will operate for westbound flights operating through the Kabul FIR during night time period.

ANSP and aircraft operators system requirement

2.5 Aircraft Operators and ANSPs are required to have computer equipment capable of connecting to the BOBCAT website <https://www.bobcat.aero/> via the Internet satisfying the following minimum requirements:

- a) A Personal Computer of any operating system with the following characteristics;

- i) Processor: minimum CPU clock speed of 150 MHz
 - ii) Operating System: Any that operates one of the following web browsers (i.e. Windows 2000/XP, Linux, Unix, or Mac OS)
 - iii) RAM: 64 MB or larger (depending on operation system),
 - iv) Hard disk Space: minimum of 500 MB or larger (depending on operating system)
 - v) Monitor Display Resolution: Minimum of 800 x 600 pixels
 - vi) Web Browser: Internet Explorer 5.5 or newer, Mozilla 1.0 or newer, Mozilla Firefox 1.0 or newer, Netscape 7 or newer,
- b) Internet Connection: 56 Kbps Modem or faster Internet connection.
- c) Printer if required (e.g. printing out information for distribution to concerned persons).

BOBCAT Operating Procedures

2.6 Westbound flights intending to transit the Kabul FIR on ATS routes A466, L750, N644 between FL280 to FL390 inclusive and G792/V390 between FL310 to FL390 inclusive between 2000UTC and 2400UTC daily shall participate in the BOBCAT system.

Application of System Spacing

2.7 BOBCAT is designed to arrange 10-minute spacing plus a 5-minute buffer time for entry into the Kabul FIR.

Wheels-Up Time

2.8 Wheels Up Time will be calculated based on information submitted by airline operators using an aircraft's ETD + ANSP-provided STT + Additional Time if required by the operator. It is defined as:

WUT = ETD + STT + Additional Time required by the operator

Allocated Wheels-Up Time

2.9 Allocated Wheels-Up Time (AWUT) is the adjusted WUT given to an aircraft based on his submitted entry time into Kabul, which is calculated as follows:

AWUT = WUT + BOBCAT-induced delay

Slot Allocation Process

2.10 The slot allocation process is divided into 3 phases, namely the Slot request, initial Slot allocation and finally Slot distribution to airline operators and ANSPs. All operators concerned are required to submit slot requests to the BOBCAT system by logging onto <https://www.bobcat.aero> and completing the electronic templates provided.

Slot Request Procedures

2.11 Slot requests including preferred ATS route, flight level and Maximum Acceptable Delay (MAD) should be lodged by the cut-off time of 1200 UTC. Submitted slot requests may be amended at any time up until 1200UTC. To increase the chances of slot allocation, airline dispatchers are encouraged to submit additional options in case their first choice is not available. This may include alternative route, flight level and changes to MAD.

2.12 As BOBCAT will allocate FL280 on a priority basis to facilitate departures from northern India and Pakistan underneath over-flying traffic, dispatchers are encouraged to include FL280 in at least one slot request for departures from these airports. This should not discourage airline dispatchers who are requesting a slot from other airports to also submit FL280 as one of their request, especially during the busiest period of 2100 – 2300UTC.

2.13 Flights that were not allocated a slot although a slot request was submitted prior to the cut-off time (1200UTC) and flights who did not submit slot request by the cut-off time, will have the opportunity to select a slot from the unallocated slots after the slot distribution has been completed.

Slot Allocation Procedures

2.14 Slot allocation will take place after the cut-off time at 1200UTC. BOBCAT will process and generate the slot allocation based on the information submitted in the slot request, and notify the results not later than 1300UTC via e-mail and the BOBCAT website to concerned parties.

2.15 Flights departing without an allocated slot will be accommodated after participating flights have been processed and should expect delays for requested routes and altitudes, or be offered alternatives by the Bangkok ATFMU.

2.16 The ATFMU will continue to be staffed until 2400UTC, during which time aircraft operators can:

- a) View the slot allocation result for flight planning purposes;
- b) Cancel the assigned slot; and/or,
- c) Request a change of slot allocation to another available slot in the published list.

2.17 ANSPs can view the slot allocation results at <https://www.bobcat.aero>.

2.18 Once aircraft operators are satisfied with the slot allocation, they should submit their ATS flight plan using the route and level parameters of the allocated slot.

2.19 In addition to normal addressees, operators should also address flight plan and related ATS messages (e.g. FPL, DLA, CNL, CHG) to the ATFMU via AFTN address VTBBZDZX.

Vacant Slot Selection After Cut-off Time

2.20 Airline operators will be able to log into BOBCAT website at [https://www.bobcat.aero/](https://www.bobcat.aero) to select slot allocation from vacant slot. Procedure of selecting slot after cut-off time is posted on the “Help” section of the website.

Cancellation or Change of Slot Allocation

2.21 Airline operators will be able to log into BOBCAT website at [https://www.bobcat.aero/](https://www.bobcat.aero) to change or cancel slot allocation. Procedure of cancelling and modifying slot allocation is posted on the “Help” section of the website.

Viewing Available Slots

2.22 Airline operators will be able to log into BOBCAT website at [https://www.bobcat.aero/](https://www.bobcat.aero) to view available slot. Procedure of viewing available slots is posted on the “Help” section of the website.

Pre-Flight Procedures

2.23 Pilot in Command (PIC) shall be kept informed via their operators of the Allocated Wheels-Up Time (AWUT), waypoint times and flight parameters (route/level) nominated by BOBCAT.

2.24 In collaboration with airline operators, ANSPs shall ensure that every opportunity and assistance is granted to an aircraft to meet AWUT and allocated waypoint times.

2.25 The PIC shall include the AWUT in the ATC clearance request.

2.26 The PIC shall arrange take-off as close as possible to the AWUT.

Missing the Allocated Wheels-Up Time

2.27 In circumstances where it becomes obvious that the AWUT will not be met, a new slot allocation should be obtained by the most expeditious means (e.g. via coordination between flight dispatcher/ANSPs and ATFMU).

Operations of Special Flights Exempted from ATFM

- 2.28 The following flights are exempted from ATFM slot allocation:
- a) Humanitarian or medical flights; or,
 - b) State aircraft with Head of State onboard.
- 2.29 Flights exempted from ATFM shall indicate the exemption in their flight plan (Field 18 – STS-ATFM EXMP).
- 2.30 ANSPs shall forward the flight plan information to the ATFMU.
- 2.31 Flights affected by special flight exempted from ATFM shall follow the same procedure as if the aircraft is missing the AWUT.

BOBCAT Username/Password Allocation and Security Policy

BOBCAT Username/Password Allocation

- 2.32 All concerned parties needing access to BOBCAT are required to submit username/password request to Bangkok ATFMU, according to the form to be provided, signed by authorized personnel of the organization as well as the organization seal.
- 2.33 The username/password request should include the following information:
- a) User's Full Name;
 - b) User's E-Mail address; and,
 - c) User's proposed username.
- 2.34 Each organization with users participating in BOBCAT system should maintain uniqueness of BOBCAT usernames within their organization. BOBCAT will then put suffix of organization name after each username to ensure that a BOBCAT user's username is unique.
- 2.35 Airline operators shall submit a form to be provided to Bangkok ATFMU informing of the airline or dispatch organization with permission to submit slot request on their behalf. This form needs to be signed by authorized personnel accompanied by company seal.
- 2.36 If there are any changes to user participating in BOBCAT, each participating organization is responsible to notify Bangkok ATFMU of the change so as to provide reasonable level of access security for the system.

BOBCAT Security Policy

2.37 For the purpose of maintaining access security of BOBCAT, each user of the system is required to have a username/password, which should not be shared with others. Action taken under a username/password will be interpreted as action taken by the registered user.

2.38 Each BOBCAT user is responsible to keep a personal password only known by the user alone. It is recommended that the password be regularly changed to protect against identity theft.

2.39 If a BOBCAT user has lost his username/password, he should contact Bangkok ATFMU to request a password reset. The reset password would then be sent to the registered user via e-mail. The user is responsible for changing the generated password into the personal password.

2.40 To protect users from identity theft issues, users need to logout of BOBCAT website once they are done with their task related to BOBCAT system.

3. Bangkok ATFMU

ATFMU Staffing and Hours of Operation

3.1 The Bangkok ATFMU will operate from 0600UTC to 2400UTC daily for westbound flights only, with contact details as follows:

- a) Telephone : +662 287 8024, +662 287 8025
- b) Tel/Fax: +662 287 8026
- c) Fax : +662 287 8027
- d) ATFN: VTBBZDZX
- e) E-mail: atfmu@bobcat.aero

ATFMU Functions and Responsibilities

3.2 Bangkok ATFMU has the following functions and responsibilities:

- a) Manage operation of BOBCAT system so as to ensure that proper slot request were submitted to the system, slot allocation were completed properly and processes after initial slot allocation process be completed in a timely manner;

- b) Coordinate with airline operators and ANSPs involved in BOBCAT system with respect to:
 - i. Requesting username/password into BOBCAT system;
 - ii. Submitting slot request;
 - iii. Obtaining slot allocation for aircraft missing wheels-up time.

4. Airline Dispatchers and Private Operators

Submitting a Slot Request to BOBCAT

4.1 Slot requests including preferred ATS route, flight level and Maximum Acceptable Delay (MAD) should be lodged by the cut-off time of 1200 UTC. Submitted slot requests may be amended at any time up until 1200UTC. To increase the chances of slot allocation, airline dispatchers are encouraged to submit additional options in case their first choice is not available. This may include alternative route, flight level and changes to MAD.

Use of Multiple Slot Request Options

4.2 Airline dispatchers are reminded that the higher number of slot request options (routes and flight level) generally increases the chance that a flight submitting slot request would be allocated slot based on the request submitted.

Use of Estimated Elapsed Time

4.3 BOBCAT calculates Estimated Time over Kabul FIR entry waypoint based on Estimated Elapsed Time (EET) provided by airline operators and Wheels-Up Time. Airline operators are reminded that BOBCAT slot allocation is only accurate up to the precision of EET provided by airline operators.

Use of Standard Buffer Time

4.4 A standard buffer time of 5 minutes will be applied for entry into Kabul FIR. For example, aircraft allocated slot into Kabul FIR at 2100UTC can arrive at the waypoint up to 2105UTC.

Use of Standard Taxi Time and Additional Time Required

4.5 Standard Taxi Time suggested by ANSPs at the departing airport will be used to compute Wheels-Up Time of an aircraft. Additional Time required by aircraft operator can also be added.

Calculation of Wheels-up Time (WUT)

4.6 Wheels-Up Time will be automatically calculated by BOBCAT user interface based on the following equation:

WUT = ETD + STT + Addition Time Required

Procedures if No Slot Allocated or Missing Cut-off Time

4.7 Flights that were not allocated a slot although a slot request was submitted prior to the cut-off time (1200UTC) and flights who did not submit slot request by the cut-off time, will have the opportunity to select a slot from the unallocated slots after the slot distribution has been completed. Procedure of such operation is posted in BOBCAT Website under the “Help” section.

Use of BOBCAT Slot Request Templates and Past Slot Request

4.8 Airline operators will have the opportunity to save slot request into a slot request template with a name of choice. This slot request template can be used to submit slot request for flights of a later date, or slot request of similar flight on the same date.

4.9 Furthermore, airline operators will have the opportunity to view slot request submitted on previous days and use those past request as a template for the current day’s slot request.

Use of Contingency Slot Request Templates (CSRTs)

4.10 In addition to reducing workload with respect to slot request submission, Slot Request Template can also be useful in the case when airline operators are unable to reach the BOBCAT website, e.g. the airline operators’ Internet connection is down or BOBCAT website’s internet connection is down. In this case, airline operators may contact Bangkok ATFMU via alternate means to provide the name of the contingency slot request template to be used for submission as the current date’s slot request with modification sent to Bangkok ATFMU via fax or other means.

4.11 Airline operators are requested to maintain up-to-date Slot Request Template corresponding to all scheduled flights for the season with template name prefix of “CSRT-”

5. Air Navigation Service Providers (ANSPs)

General ANSP Roles and Responsibilities

5.1 AWUT shall be included as part of the ATC clearance.

5.2 When requested by the PIC prior to push back, or if the aircraft has pushed back, ANSPs shall assist the PIC to coordinate for a new slot allocation with the ATFMU in the event that the aircraft is unable to meet the AWUT.

5.3 ANSPs shall notify Standard Taxi Time (STT) for the departure aerodromes and any subsequent changes, e.g. taxi way works, to the ATFMU as guidance for airline operators in estimating WUT.

5.4 The ATFMU (AFTN Address: VTBBZDZX) shall be included in the list of AFTN addressees for NOTAMs regarding any planned activities (e.g. reservation of airspace/closure of airspace, non-availability of routes, etc).

5.5 The ATFMU (AFTN Address: VTBBZDZX) shall be included in the list of AFTN addressees for ATS messages (e.g. DEP, CNL) related to flights participating in the ATFM operational trial.

Control Tower/ACC Responsibilities – Departure Airport

Standard Push-back and Taxi Time

5.6 ADC/SMC at departure airports are responsible for providing Bangkok ATFMU with representative time between the time an aircraft pushes back and the wheels-up time of the aircraft during the period of BOBCAT operation.

Priority Take-off for BOBCAT Aircraft

5.7 Flights with slot allocation should be given priority for take off over other departures to facilitate compliance with AWUT.

Procedures if aircraft unable to make AWUT

5.8 In circumstances where it becomes obvious that the AWUT will not be met, a new slot allocation should be obtained by the most expeditious means (e.g. via coordination between flight dispatcher/ANSPs and ATFMU).

5.9 Depending on where clearance delivery is located, e.g. Tower or ACC, whoever receives the pilot's request for a change of Wheels-Up Time will pass this information to Bangkok ATFMU for a new slot allocation.

5.10 The PIC has the choice of the following:

- a) Choosing from alternates provided by ANSPs in co-ordination with Bangkok ATFMU, or;
- b) Contacting airline operator's office to lodge a new slot allocation.

ACC Responsibilities – En Route

Coordination with PIC

5.11 En Route ACC should expedite transit for aircraft with BOBCAT slot allocation so that these aircraft would be able to make their allocated Kabul FIR entry waypoint slot allocation.

Coordination with Bangkok ATFMU

5.12 In circumstances where it becomes obvious that the allocated slot into Kabul FIR for an aircraft cannot be met, en route ACC should file a Fault Report and submit to Bangkok ATFMU.

Coordination with ACC Responsible for Downstream FIRs

5.13 In circumstances where it becomes obvious that the allocated slot into Kabul FIR for an aircraft cannot be met, en route ACC should coordinate with ACC responsible for downstream FIRs affected by the aircraft.

AIS Responsibilities – Departure Airports

Coordination with Airlines

5.14 AIS office should provide BOBCAT Slot Request form for airline operators without username/password to BOBCAT website. Once completed, these forms should be submitted to Bangkok ATFMU in order to obtain slot allocation.

5.15 AIS office should ensure that an aircraft submitting flight plan for a flight transiting Kabul FIR during BOBCAT time period has a slot allocation from BOBCAT.

5.16 AIS office should also ensure that flight plan for the affected flights are filed based on BOBCAT slot allocation.

Coordination with ATFMU

5.17 The ATFMU (AFTN Address: VTBBZDZX) shall be included in the list of AFTN addressees for flight plan messages.

5.18 The ATFMU (AFTN Address: VTBBZDZX) shall be included in the list of AFTN addressees for ATS messages (e.g. DEP, CNL) related to affected flights.

5.19 AIS office is responsible for coordinating with Bangkok ATFMU in obtaining slot allocation results for airline operators without BOBCAT website username/password who submitted BOBCAT slot request via their office.

6. Contingency Arrangements

Airspace Contingencies

6.1 ANSP responsible for areas affected by any contingency shall notify Bangkok ATFMU of the contingency and possible consequences as soon as possible, so as appropriate action is taken by Bangkok ATFMU.

Communication Issues

6.2 In the case that BOBCAT website cannot be reached, the following means of communication shall be used:

- a) Telephone : +662 287 8024, +662 287 8025
- b) Tel/Fax: +662 287 8026
- c) Fax : +662 287 8027
- d) ATFN: VTBBZDZX

Failure of BOBCAT System

6.3 In the event of system failure of BOBCAT, ATFMU shall notify all parties concerned and advise that ATFM procedures are suspended. In this event, procedures will be applied by States concerned in accordance with bi-lateral agreements.

6.4 In the event that an airline operator or an ANSP is unable to access the BOBCAT website, the following means of communication shall be used:

- a) Telephone : +662 287 8024, +662 287 8025
- b) Tel/Fax: +662 287 8026
- c) Fax : +662 287 8027
- d) ATFN: VTBBZDZX

System Fault Report

6.5 An ATFM system fault is defined as a significant occurrence affecting an ATS unit, an aircraft operator or ATFMU resulting from the application of ATFM procedures.

6.6 Aircraft operators and ATC units experiencing an ATFM system fault should complete an ATFM System Fault Report Form from the ATFM Handbook and forward it to the ATFMU at the address indicated on the form. The ATFMU will analyze all reports, make recommendations/suggestions as appropriate and provide feed back to the parties concerned to enable remedial action.

BAY OF BENGAL AND SOUTH ASIA ATFM USERS HANDBOOK

Version 2.0
10 November 2005

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ATFM SYSTEM FAULT REPORT FORM

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Annex 11 Air Traffic Services

Doc 4444 Procedures for Air Navigation Services – Air Traffic Management

Doc 9673 Basic Air Navigation Plan – Asia and Pacific Regions

Doc 9750 Global Air Navigation Plan for CNS/ATM Systems

Doc 9426 ATS Planning Manual

I-2 Purpose

As per ICAO Annex 11 Chapter 3.7.5, an ATFM service shall be implemented for airspace where air traffic demand at times exceeds or is expected to exceed the declared capacity of the air traffic services concerned. Further, Annex 11 recommends that an ATFM service should be implemented on the basis of a regional air navigation agreement or through a multilateral agreement, which should make provision for common procedures.

Doc 4444 (PANS-ATM) Chapter 3.2.1.5 states that *“Detailed procedures governing the provision of the ATFM measures, and service within a region or area should be prescribed in a regional ATFM manual or handbook”*.

Accordingly, the purpose of this Handbook is to provide in one document, the procedures for the operation of the Bay of Bengal and South Asia ATFM service, which have been developed through the effective use of Collaborative Decision Making between the States and airspace users concerned.

I-3 Scope

The scope of this document concerns the roles and responsibilities of ATFMU, ANSPs and Airline dispatchers and corresponding procedures in the Slot Allocation /Management process of ATFM operation.

I-4 Intended Audience

The intended readers are the personnel of ATFMU, ANSPs and Airline Dispatchers.

I-5 Interpretation of Words

To ensure a common understanding of meaning of words in this document, the following shall apply:

- "Shall", "is to", "are to", and "must" mean that the instruction is mandatory.
- "Will" is only used for informative or descriptive writing, e.g. "AOs will file" is not an instruction.
- "Should" means that it is strongly advisable that an instruction is carried out; it is recommended or discretionary. It is applied where the more

positive "shall" is unreasonable but nevertheless a controller would have to have a good reason for not doing so.

- "May" means that the instruction is permissive, optional or alternative, e.g. "a controller may seek assistance ..." but would not if he did not need it.

I-6 Area of ATFM Operation

Except where specified elsewhere in this Handbook, the ATFM service within the Bay of Bengal and South Asia shall include those portions of airspace and routes which are defined in Section XX and that are contained within the following Flight Information Regions:

- _ Bangkok
- _ Chennai
- _ Colombo
- _ Delhi
- _ Dhaka
- _ Jakarta
- _ Kabul
- _ Karachi
- _ Kathmandu
- _ Kolkata
- _ Kuala Lumpur
- _ Lahore
- _ Mumbai
- _ Singapore
- _ Yangon

I-7 Document Management

I-7.1 Arrangement of the Manual

The ATFM Handbook has been divided into three parts, with Part I covering the ATFM Business Rules, Part II concerned with the operation of the ATFM system tools and functionality and Part III covering Contingency Arrangements.

I-7.2 Control of the Manual

This Handbook is controlled, edited and produced by the *[insert name of ATFM coordination authority]*, which operates under the auspices of the ICAO Bay of Bengal ATS Coordination Group (BBACG).

The Editor for the Bay of Bengal and South Asia ATFM Handbook is:

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I-7.3 Validity

The date of application of this Edition number .0 is [insert date] and this manual shall not be used operationally before that date.

I-7.4 Changes to the ATFM Handbook

The ATFM Handbook will usually be updated once per year. However intervening amendments may be issued in conjunction with relevant State AIC and AIP documents. Whenever a user identifies a need for a change to this Handbook, a Request for Change Form (RFC) should be completed and submitted to the Editor. A copy of the RFC Form is shown at Annex A.

I-7.5 Amendment Record

Version	Amendment Number	Date	Amended by	Comments

PART II – ATFM BUSINESS RULES

II-1 Overview

The ICAO (Asia/Pacific) Region within the Bay of Bengal, South Asia and Pakistan airspace will be implementing operational trial of an integrated Air Traffic Flow Management (ATFM) service to manage westbound air traffic transiting through the Kabul FIR by satisfying minimum spacing requirements at established gate way points.

The ATFM service is advisory in nature and will be provided by Aeronautical Radio of Thailand (AEROTHAI) using the Bay of Bengal Co-operative Air Traffic Flow Management Advisory System (BOBCAT).

The Air Traffic Flow management Service will be introduced in a phased manner and is initially limited to Slot management only. The ATFM service will be introduced in three phases.

In Phase I, ATFM service will be applicable to flights planning to transit the Kabul FIR and will be limited to slot allocation/management. In Phase II, ATFM service will be extended to other international flights crossing the Bay of Bengal and/or South and South East Asia areas. In Phase III, it would cater to the increased traffic within the Bay of Bengal and South and South East Asia areas.

II-2 Objectives

II-2.1 The objectives of the ATFM service are to:

- a) Reduce ground and en-route delays
- b) Maximise capacity and optimum flow of air traffic within the area
- c) Provide an informed choice of routing and flight level selection
- d) Assist ANSPs in planning for and managing future workload in the light of forecast increased traffic flow within the area.

II-3 Area of Operations

II-3.1 Area encompassing ATS routes from the eastern side of the Bay of Bengal through the Northern part of India and Pakistan into the Kabul FIR

II-3.2 In Phase I, ATFM service is provided to westbound flights intending to transit through the Kabul FIR on ATS routes A466, L750, N644 and V390/G792 from FL280 to FL390 (both inclusive) between 2000UTC and 2400UTC

II-3.3 ATFM service is also provided to flights intending to utilize the following routes and/or waypoints:

- a) VPL P628
- b) TAVUN L759
- c) IKULA M770
- d) BETNO P646
- e) LIMLA L507
- f) LUCKNOW VOR/DME (LLK)
- g) KHAJURAHO VOR/DME (KKJ)
- h) ASLUM G792/V390 CHARN
- i) ROSIE L750 RANAH
- j) D I KHAN VOR/DME (DI) N644 PAVLO-LEMOD
- k) D I KHAN VOR/DME (DI) A466 SITAX-AMDAR

II-3.4 LONGITUDINAL SEPARATION OF SLOTS

Slots are defined by ATC longitudinal separation minimum plus an additional buffer to allow flights to meet their slots. Therefore, for the current 10 minutes longitudinal separation required by Afghanistan the slots are defined as:

10 minutes longitudinal separation + "X" minute's buffer.

Note: "X" factor is the time allowed for the aircraft to enter into the gateway fix (inclusive of ground delay at the time of departure).

II-4 Hours of Operations

The operational ATFM trial will commence with a 7 day ghosting period with effect from 1200UTC on _____ (0603091200UTC). Although full participation will be required from operators and ANSPs, and slot times will be allocated by BOBCAT, slot times should NOT be issued to, or applied by, operating crews during the ghosting period.

With effect from 1200UTC on _____ (0603091200UTC), the operational trials of the ATFM system will be fully implemented and slot times should be issued to, and applied by, operating crews

BOBCAT Servers will be operational 24 hours daily. However, the ATFMU will only be operational from 0800UTC to 2400UTC daily.

II-5 RESPONSIBILITIES

II-5.1 BOBCAT

BOBCAT is the Air Traffic Flow Management tool Unit for flights passing through Kabul FIR from South Asia airports regardless of the departure location and destination.

BOBCAT interacts with three different groups of users: airline dispatchers, ANSPs and ATFMU Specialist. BOBCAT is responsible for the slot allocation /management activities within the Bay of Bengal and South Asia areas for the routes described in paras 1-3.2 & 1-3.3 and are supported by the Air Traffic Flow Management Unit (ATFMU) in Bangkok and the ANSPs in the FIRs concerned.

BOBCAT shall accord priority to ATFM exempt flight's requests regarding Flight levels/ETD, as and when FPL data of such flights are entered into the system.

II-5.2 Air Traffic Flow Management Unit (ATFMU)

The ATFMU will function from a separate room in the Area Control Centre of Bangkok. The ATFMU will operate from 0800UTC to 2400UTC daily and cater to westbound flights only. Following three positions will be manned during the hours of operation of ATFMU:

- a. ATFMU Manager (Specialist)
- b. ATFMU planning Officer
- c. ATFMU Assistant to Planning Officer

II-5.2.1 ATFMU Specialist

The ATFMU Specialist will be responsible for coordinating with ANSPs in the Bay of Bengal regions to meter traffic incoming to any gateway points, .i.e. modifying minimum spacing property of each route segment within the system as well as modifying route segment flight level/gateway points within the system.

The ATFMU Specialist can

- a. view results of slot assignments.
- b. modify slot assignments without violating the minimum spacing.

ATFMU specialist shall enter the flight details of ATFM exempt flights as and when received into BOBCAT.

Screen in Figure __ shows ATFMU Specialist home portal page after login, which displays status of previous slot allocation as well as menu for other possible administrative options.

(Insert ATFMU Specialist screen for configuring a gateway point/route segment)

(Insert ATFMU Specialist default screen)

II-5.2.2 ATFMU Planning Officer

(Include the role and responsibilities of ATFMU Planning Office)

II-5.2.3 ATFMU Assistant to Planning Officer

(Include the role and responsibilities of Assistant to ATFMU Planning Office)

II-5.2.4ATFMU Contact Numbers

Tel: +662-287-8024, +662-287-8025
Tel/Fax: +662-287-8026
Fax: +662-287-8027
AFTN: VTBBBZDZX
E-Mail: atfm@bobcat.aero

II-5.3 SLOT ALLOCATION PROCESS

Slot allocation processing is divided into 3 phases, Slot request, Slot allocation and Slot distribution,

a) Slot request

All operators concerned are required to submit a slot request to the BOBCAT system by logging onto <http://www.bobcat.aero/> and completing the electronic templates provided.

In order for aircraft to be considered for the initial slot allocation, the aircraft's slot request should be lodged by 1200UTC. Slot requests may be amended up until 1200UTC. Airline dispatchers are requested to submit additional options. This may include alternative levels and/or ATS routes, different time for Maximum Acceptable Delay (MAD). If the slot request has not been lodged by the cut-off time, aircraft operators may not get slots as per their choice. However operators will have the opportunity to select any vacant slot available, once the slot allocation is completed and the slot allocation results are published.

[Note: FL 300 is reserved for crossing westbound flights over BOB as "No-PDC" level (as per LOA between ANSPs). Hence airline dispatchers are requested to take note of this while submitting their slot requests to BOBCAT.]

Airline dispatchers log into the system to submit slot either based on previous slot requests saved in the system or based on new set of requests.

c. Slot Allocation:

Slot allocation will take place at 1200UTC.

d) Slot Distribution

After slot allocation is completed, the system notifies all related stakeholders such as airline dispatchers of each requesting flights, ANSPs and ATFMU Specialist of the results through AFTN and web-site.

Slot allocation is issued as a 'wheels up time' (WUT). While issuing WUT, BOBCAT takes into account the required spacing of 10 minutes at the intermediate/Kabul entry gate way points and an one time buffer of 5 minutes.

The departure slot is issued as a 'wheels –up time' (WUT).

The WUT is issued not later than one and half hour before EOBT.

The WUT issued will be available on the web through one of selectable sub windows of the BOBCAT

- e. The ATFMU will continued to be manned until 2400UTC during which time, aircraft operators can:
 - View the slot allocation result for flight planning purposes
 - Cancel the assigned slot and,
 - Request a change of slot allocation to another available slot in the published list

II-5.4 AIR NAVIGATION SERVICE PROVIDERS (ANSPS)

ANSPs shall

- a. include AWUT as part of the ATC clearance.
- b. notify Standard Taxi Time (STT) or any changes for the departure aerodromes, e.g.–closure of taxiway, to the ATFMU as a guidance for airline operators.
- c. include ATFMU in addresses for NOTAMs regarding any planned activities (e.g., reservation of airspace/closure of airspace, non-availability of routes, etc)
- d. include the ATFMU in the list of addresses for ATS messages (eg. DEP, CNL), related to flights participating in the ATFM Operational trial.
- e. notify ATFMU any change required in the spacing at specific way points.

ANSPs should

- a. ensure that every opportunity and assistance be given to an aircraft to meet its AWUT and Allocated Waypoint Time(s)/level(s).
- b. give priority to flight, with slot allocation, for take off over other departure to facilitate compliance with AWUT.
- c. assist the Pilot In Command to coordinate for a new slot allocation with the ATFMU in the event that the aircraft is unable to meet the AWUT

II-5.5 PROCEDURE FOR ATFM EXEMPT FLIGHTS

The following flights are exempted from ATFM (*slot allocation*):

- a) Humanitarian or medical flights
- b) State aircraft with Head of State onboard

Flights exempted from ATFM shall indicate the exemption in their flight plan (Field 18 – STS/TFM EXMP).

ANSPs should forward the flight plan information to the ATFMU.

II-5.6 AIRLINE OPERATORS

All operators concerned are required to submit a slot request to the BOBCAT system by completing the electronic templates provided by 1200 UTC daily. Airline dispatchers are requested to submit additional options which may include alternative levels and/or ATS routes or change in MAD.

Pilot in Command (PIC) shall be kept informed of the Allocated Wheels Up Time (AWUT) and flight parameters as allocated by the BOBCAT system through their operators

In collaboration with ANSPs, airline operators should ensure that every opportunity and assistance be given to an aircraft to meet its AWUT and Allocated Waypoint Times.

When delay is anticipated, Dispatcher shall coordinate with either the ANSP concerned or the ATFMU and obtain new WUT.

II-5.7 Hardware requirements for Operators and ANSPs

A Personal Computer of any operating system with internet connection and the following minimum characteristics:

- i) Processor: minimum CPU clock speed of 150 MHz
- ii) Operating System: Any that operates one of the following web browsers (i.e. Windows 2000/XP, Linux, Unix, or Mac OS)
- iii) RAM: 64 MB or larger (depending on operation system)
Harddisk Space: minimum of 500 MB or larger (depending on operating system)
- iv) Monitor Display Resolution: Minimum of 800 x 600 pixels
- v) Web Browser: Internet Explorer 5.5 or newer, Mozilla 1.0 or newer, Mozilla Firefox 1.0 or newer, Netscape 7 or newer
Internet Connection: 56 Kbps
Modem or faster Internet connection

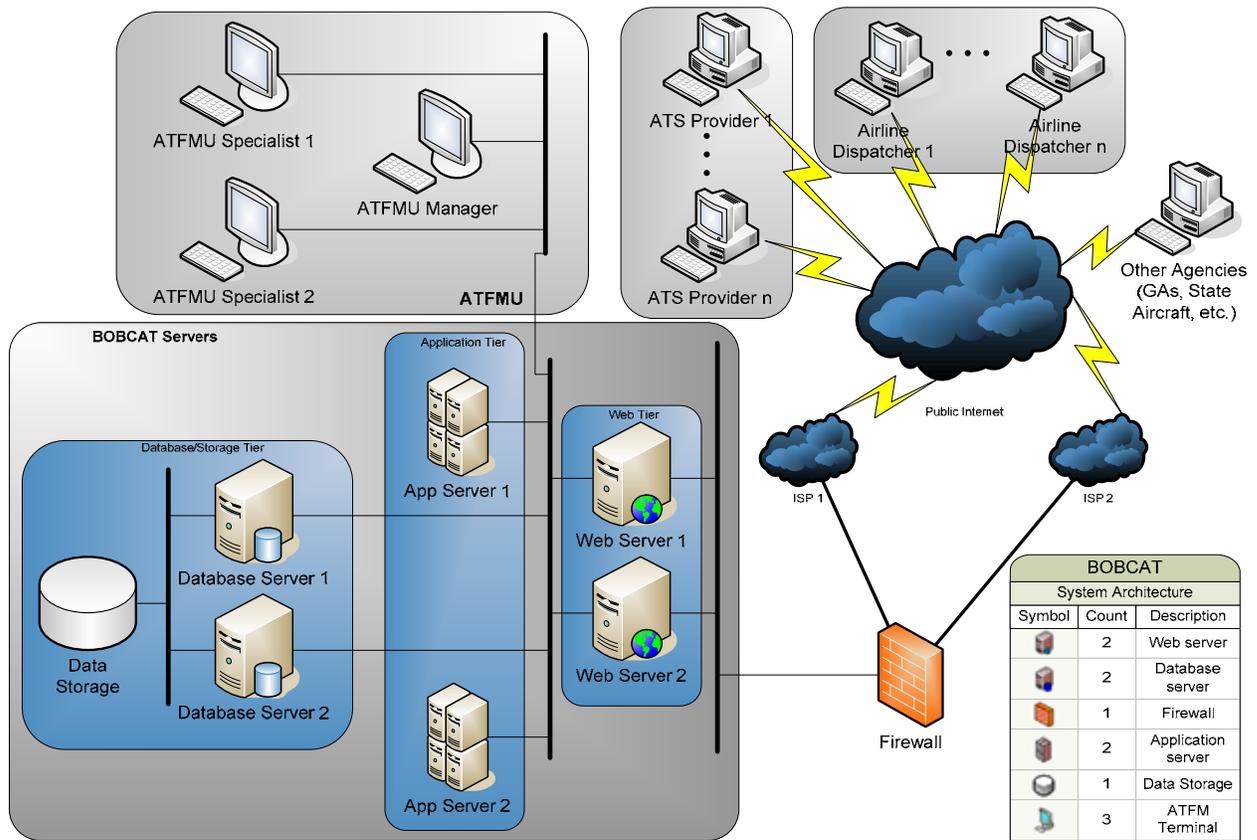
PART III – ATFM SYSTEM TOOL & OPERATIONS

III-1 BOBCAT System

III-1.1 BOBCAT System Overview

BOBCAT stands for Bay Of Bengal Cooperative Air Traffic Flow Management Advisory System. It is developed by AEROTHAI in close coordination with ICAO ATFM/TF, concerned states and airlines through IATA.

BOBCAT consists of two Web Servers, two Application Servers and two Database Servers in addition to Database Server. Web Servers will house Web based Interface for Airline Dispatchers, ANSPs and services for ATFMU Specialist. Application Servers will contain slot allocation services and other business logic related to BOBCAT. Database Servers will house software for managing BOBCAT database, stored on external Data Storage. The overall BOBCAT system architecture is shown in Figure below.



BOBCAT is an interactive Web-Based system between dispatchers and ATFMU BOBCAT has been designed to minimize conflicts in transit to Kabul FIR It provides required spacing between aircraft spacing in order to avoid rerouting causing technical stops.

BOBCAT allocates slots to departures from various airports with required spacing at Kabul FIR entry gates. It allows operators and ANSPs to view details of all flights planning to transit Kabul FIR. It provides information to ANSPs regarding wheels up and ETOs at significant positions to assist en route ACC in planning traffic sequence.

III-1.2 BOBCAT Waypoints

For Phase 1 of the Operational Trials, following are the way points considered for slot allocation for westbound flights transiting through Indian/Pakistan airspace to Kabul FIR:

- ASLUM G792/V390 CHARN
- ROSIE L750 RANAH
- D I VOR/DME (DI) N644 PAVLO-LEMOD
- D I VOR/DME (DI) A466 SITAX-AMDAR

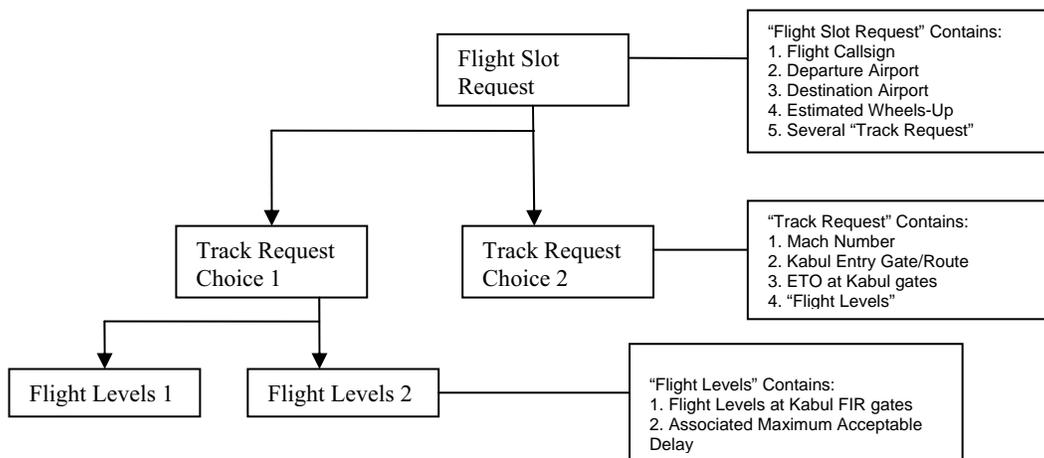
III-2 BOBCAT Operations

III-2.1 Operating Principles

III-2.1.1 Sub section heading

At the time of slot request submission, each request is scored individually according to the following procedure:

- i. BOBCAT accepts slot requests from airline dispatchers (maximum of nine, with Maximum Acceptable Delay (MAD) of ___ minutes in each case) and structures the information as given below:



During the time when airline dispatcher submits each flight's alternate route, scoring of each planned route will be randomized by a random number generator. All route requests are then saved into the BOBCAT's request database for appropriate cutoff-time slot assignment. Airline dispatchers are requested to submit additional options. This may include alternative levels and/or ATS routes.

BOBCAT automatically processes all slot requests within the timeframe and assign slots to requesting flights as per the following procedure.

i. Once the cut-off time arrives, BOBCAT would gather all of the slot requests and rank the slot requests by scores each of the requests was assigned when airline operators submit flight requests into the system.

ii. BOBCAT then further optimizes the slot assignment by filtering the slot requests that are spaced substantially apart from other slot requests at Kabul FIR gate. These requests are characterized by spacing from other aircraft within the region by the sum of required spacing (10 minutes) and wheels-up buffer (+ 5 minutes). Priority (+1) is given to these flights so that they are allocated slots before requests closer to other requests, which would enable more effective use of the airspace.

iii. Flights originating from Indian and Pakistani airports requesting FL280 are be given priority (+1) over others by modification of the random scoring. Retrospectively, flights originating from airports in India/Pakistan region requesting FL300 and above will be given a lower priority (-1) relative to other flight requests.

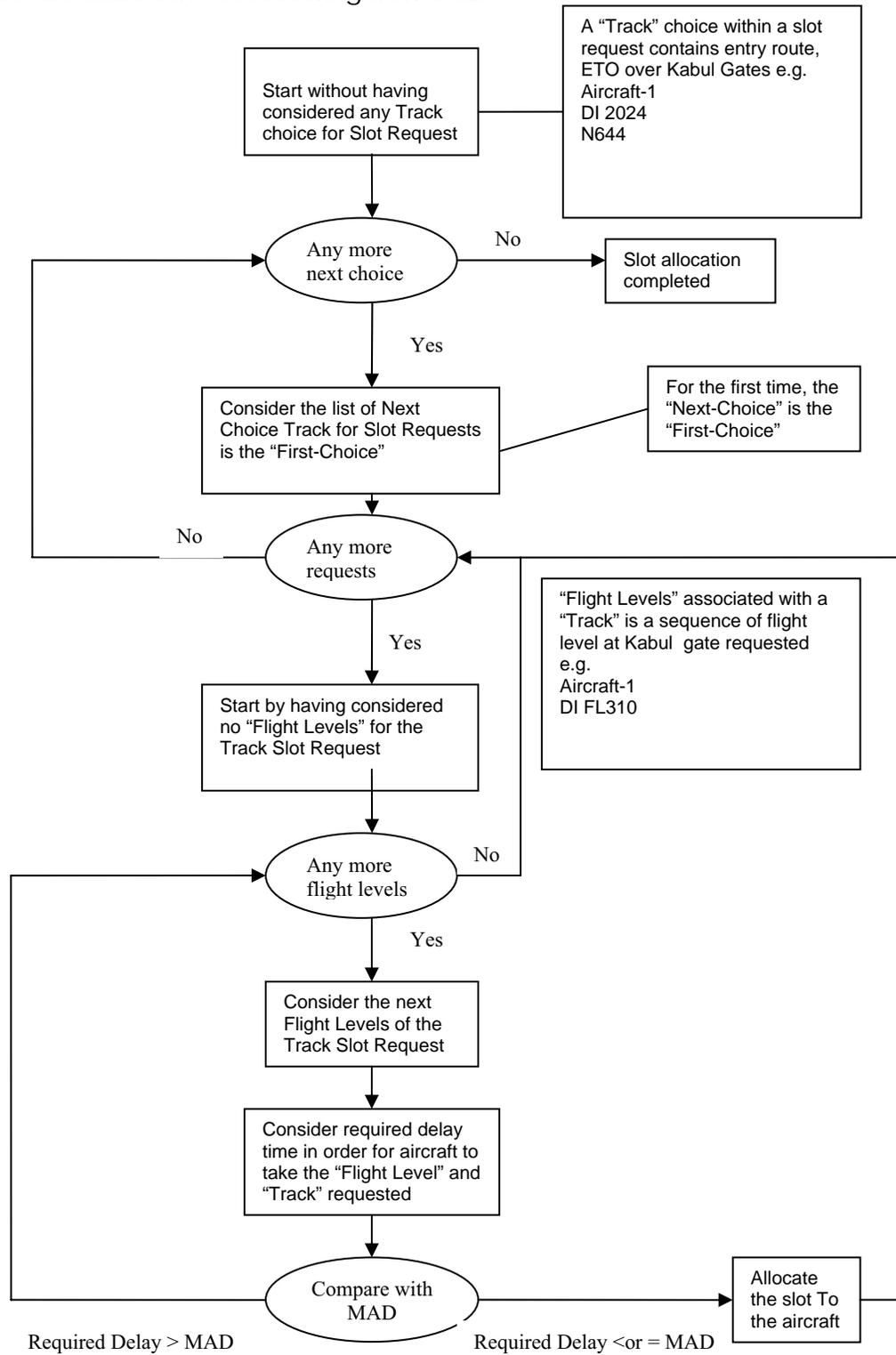
iv. Having been prioritized, requests having same priority will be sorted in random score and processed sequentially by BOBCAT. Slot requests will then be placed into the system in order of priority and random scoring.

v. If flight level request of a planned track is allocated slot within given MAD, other profiles associated with the track and other tracks requested by the flight will be discarded.

vi. If MAD parameter cannot be satisfied, next choice of flight level will be considered by BOBCAT. In the case where there is no more flight profile left to be considered for the track requested, the track request is marked as processed but cannot be allocated.

vii. This process continues until all track requests have been either discarded or processed.

The process is described in the following flow chart:



III-3 ATFM Unit

III-3.1 Sub section heading

1. Procedure for ATFM Manager Slot Allocation Result Review and Approval
2. Cooperation with ANSP in modifying availability of Flight Levels at waypoint and/or spacing at waypoints
3. Procedure for Assignment of Slot Request Privilege for Dispatcher Organization in order to submit slot request on behalf of an airline operator
4. Procedure for Assignment of User Login to Dispatcher Organization and ANSP personnel
5. Procedure for Password Reset
6. Procedure for Slot Request Submission on behalf of Airline Dispatchers
7. Procedure for Slot Request Modification on behalf of Airline Dispatchers
8. Procedures for Allocating delay necessary for aircraft unable to meet WUT
9. Guideline on Password Security

III-3.2 Sub section heading

III-4 Airline Operators

Following functionalities are currently available to BOBCAT Airline Dispatchers:

- Ability to submit slot request
 - Ability to view previous slot request and submit and edit as necessary to make current slot request
 - Ability to edit slot request submitted for the current day
- Ability to save slot request as template
 - Ability to manage slot request template (add/remove template)
 - Ability to edit template once loaded into a slot request for current day
- Ability to select an available slot after cutoff time based on colored diagram showing free/used slots
- Ability to request choices for aircraft missing wheels up time
- Ability to view all ANSP functionalities mentioned above

Once slot allocation is completed, dispatchers will have the ability to:

- Change their present allocation
- Select for aircraft who missed the cutoff time, or
- Were not allocated their submitted slots

III-4.1 Procedure for Procuring and Removing Login and Password

Airlines are required to submit to BOBCAT in a prescribed form (see Fig __) authorizing a dispatcher organization to submit slot request on their behalf. Change of authorized dispatcher organization can also be done through similar form, signed and submitted to ATFMU. Once an airline authorizes a dispatcher organization to submit slot request on his behalf, the airline waives its right to submit its own slot requests.

(Insert Fig __)

The authorized Dispatcher Organization submits a form (see Fig __) containing list of new BOBCAT user containing:

- Proposed Username
- Full Name
- Email contact information

(Insert Fig__)

ATFMU creates new usernames with automatically generated password and

New username/password will be e-mailed to new BOBCAT user.

III-4.2 Procedure for Resetting Password

New BOBCAT user logs into BOBCAT and changes his password to his own password

- BOBCAT only stores a digest of the password
- New password will be known by BOBCAT user alone

(Insert BOBCAT user log on window and provide instructions for effecting change of Password)

III-4.3 Change of User Listing

Dispatcher Organization completes a form changing list of BOBCAT user containing:

- Information of user to be removed
 - Username
 - Full Name and contact information

_ Information of new user to be added

- Proposed Username
- Full Name and contact information

(Insert BOBCAT Change of user window and provide instructions for entering information details)

III-4.4 Procedure for Submitting Slot Request

Dispatcher submits slot request to BOBCAT containing:

- Aircraft information
- Wheels Up Time (WUT) based on suggested taxi time at airports to be published on BOBCAT site
- Route choices
- Level choices
-

(Insert Airline dispatcher default screen, BOBCAT User Interface for requesting gateway point/route segment set and BOBCAT User Interface for flight route templates provide guidelines for entering the required data in correct format)

III-4.5 Responsibility of requesting proper times

Airline dispatchers should ensure that their slot requests are submitted before 1200 UTC daily.

III-4.6 Saving Slot Request into Templates

Dispatcher has the option to save the slot requests as templates for subsequent use.

III-4.7 Modifying Previously Submitted Slot Requests

Prior to the cut off time, previously submitted Slot Requests can be viewed and modified. THE modification includes - Re-ordering of route choice, Re-ordering of level choices, any parameter changes.

III-4.8 Guideline on Viewing Slot Allocation

Once slot allocation is completed, e-mail message will be generated and sent to related dispatchers. Dispatchers can login to view slot allocation result anytime after the cut-off time.

III-4.9 Guideline Requesting new Slot Allocation

The dispatcher shall cancel previous slot request prior to requesting new slot allocation.

III-4.10 Changing Slot Allocation

ATFMU may change the slot allocation on the advise of ANSPs on matters regarding unplanned closure of TWYs affecting standard taxiing time/ non-availability of route/level(s) and intimate the operators and ACC/TWR concerned at the earliest.

III-4.11 View Free Slots

Once allocation has been completed, dispatchers can view free slot information based on colored diagram showing free/unused slots.

III-4.12 Guideline on Submitting Slot Request after Cutoff Time

In case a dispatcher could not submit request before the cut-off time, he has the option of viewing the slot allocation screen. The screen will contain information on the vacant slots available.

The dispatcher has to choose information from the available slots and submit request to ATFMU like before cutoff time. Only difference is that he only needs to submit one combination of route choice, flight level choice and MAD

Slot will be allocated on a first-come first-served basis. Dispatchers will shortly receive allocation with confirmation e-mail

III-4.13 Guideline on Password Security

BOBCAT only stores a digest of the password. New password will be known by BOBCAT user alone. BOBCAT user is responsible for keeping his username and password to himself. Actions by a BOBCAT user will be logged and can be tracked based on his username

III-5 Air Navigation Service Providers

III-5.1 ACC Responsibilities

III-5.1.1 Procedure for Procuring and Removing Login and Password

ANSP should submit in the prescribed form list of new BOBCAT user containing:

- Proposed Username
- Full Name
- Email contact information

ATFMU creates new usernames with automatically generated password and the same will be e-mailed to new BOBCAT user.

III-5.1.2 Procedure for Resetting Password

The new BOBCAT user logs into BOBCAT and changes his password to his own password

- BOBCAT only stores a digest of the password
- New password will be known by BOBCAT user alone

III-5.1.3 Guideline on Viewing Slot Allocation Results

Following functionalities are currently available to BOBCAT ANSPs:

- Ability to view Slot Allocation results (both current and past) in the following perspectives:
 - Departure Aerodromes
 - View slot allocation results from a selection of departure airports as required
 - Sort slot allocation results based on the following fields (both in ascending and descending order):
 - Departure Airport
 - ETD
 - Wheels Up Time
 - Callsign
 - Destination Airport

- En-Route:
 - View slot allocation results at BOBCAT waypoint(s)
 - Select sort order of slot allocation results based on the following fields:
 - Waypoint
 - Flight Level
 - ETO
 - Callsign
 - Aircraft Type
 - Mach Number
- Ability to select a default slot allocation results view for both Departure Aerodrome and En-Route
- Ability to view dynamically generated colored charts illustrating free slots at waypoints for the current day (This will change as dispatchers select new slots)

ANSP user can login and view slot allocation result as described above.

Slot Allocation result will automatically refresh itself periodically.

III-5.1.4 Guideline on Password Security

BOBCAT user is responsible for keeping his username and password to himself. Actions by a BOBCAT user will be logged and can be tracked based on his username

III-5.1.5 Procedure for Cooperation with ATFMU in metering waypoint spacing and availability of flight levels at waypoints

Any planned activities (e.g., reservation of airspace/closure of airspace, non availability of routes, etc) shall be notified to ATFMU by ANSPs. For this purpose ATFMU shall be included in addresses for NOTAMs.

In case of unplanned activities, the concerned ACC shall notify ATFMU by the quickest means.

III-5.1.6 Procedure for Cooperation with ATFMU in allocating delay to aircraft unable to meet WUT assigned

If the departing aircraft has started, but delayed during taxi and ATC assumes that the aircraft cannot meet the AWUT, TWR controller shall immediately contact his respective ACC and request for a revised WUT. ACC in turn coordinate with ATFMU through land line and obtain a revised WUT and pass the same to TWR for onward transmission.

If the aircraft has not commenced start up and the Pilot in Command expects delay, he shall contact his company dispatcher and request him to obtain a

revised slot. In this case the flight dispatcher shall contact ATFMU either through internet or DSC and submit the request for revised slot. On obtaining the revised slot, the dispatcher shall pass the same to the PIC and TWR concerned. TWR may countercheck the WUT from the updated slot allocation table.

III-5.2 Control Tower responsibilities

III-5.2.1 Priority for aircraft movement

TWR controllers of departure aerodromes can view slot allocation results from a selection of departure airports as required and sort the slot allocation results based on the following fields (both in ascending and descending order):

- Departure Airport
- ETD
- Wheels Up Time
- Callsign
- Destination Airport .

TWR should give priority for take off to flights with slot allocation over other departure to facilitate compliance with AWUT. TWR should ensure that there is no impediment to aircraft subject to WUT the taxiing phase and also ensure that other aircraft, not subject to WUT, do not affect the Wheels-Up Time of aircraft operating under slot allocation.

TWR shall include AWUT as part of the ATC clearance.

TWR controller should assist the Pilot In Command to coordinate for a new slot allocation with the ATFMU in the event that the aircraft is unable to meet the AWUT.

III-5.2.2 Aircraft unable to meet Wheels Up Time

Please refer to Paragraph II-5.1.6.

PART IV – CONTINGENCY ARRANGEMENTS

(input required from AEROTHAI)

IV-1 BOBCAT SYSTEM

IV-1.1 Sub section heading

IV-2. Emergency Procedures

IV-2.1. Level of Service Failure

IV-2.1.1 Short Term – < 2 hr

IV-2.1.2 Medium Term – 2-24 hr

IV-2.1.3 Long Term – > 24 hr

IV-2.2 “Degraded Mode Operations”

IV-2.2.1 Fax Usage Procedure

IV-2.2.2 Telephone Usage Procedure

IV-2.3 BOBCAT Web Server Failure

IV-2.3.1 Single Server

IV-2.3.2 Dual Server

IV-2.3.3 Complete Failure

IV-2.3.4 Reporting Arrangements

IV-2.4 BOBCAT Application Server Failure

IV-2.4.1 Single Server

IV-2.4.2 Dual Server

IV-2.4.3 Complete Failure

IV-2.4.4 Reporting Arrangements

IV-2.5 BOBCAT Database Server Failure

IV-2.5.1 Single Server

IV-2.5.2 Dual Server

IV-2.5.3 Complete Failure

IV-2.5.4 Reporting Arrangements

IV-2.6 BOBCAT Servers Internet Link Failure

IV-2.6.1 Alternate Facility

IV-2.6.2 Business Resumption Plan

IV-2.6.3 Reporting Arrangements

IV-2.7 ATFMU System Failure

IV-2.7.1 Alternate Facility

IV-2.7.2 Business Resumption Plan

IV-2.7.3 Reporting Arrangements

IV-2.8 Airline Operators Facility Failure

IV-2.8.1 Alternative Facility

IV-2.8.2 Business Resumption Plan

IV-2.8.3 Reporting Arrangements

IV-2.9 Airline Operators Link Failure

IV-2.9.1 Alternative Facility

IV-2.9.2 Business Resumption Plan

IV-2.9.3 Reporting Arrangements

IV-2.10 ANSP Facility Failure

IV-2.10.1 Alternative Facility

IV-2.10.2 Business Resumption Plan

IV-2.10.3 Reporting Arrangements

IV-2.11 ANSP Link Failure

IV-2.11.1 Alternative Facility

IV-2.11.2 Business Resumption Plan

IV-2.11.3 Reporting Arrangements

IV-3 Operational Contingencies

IV-3.1 Flights subject to unusual circumstances:

All flights, including flights exempted from BOBCAT slot allocation, will be affected by the measures applied to handle unusual operational contingencies.

IV-3.2 Closure of airspace/air-route

Sudden changes in operational status of airspace/air-route that occur prior to the cut off time for the calculation and promulgation of the gateway allocation list can be managed by BOBCAT, e.g. a route that is suddenly not available is removed from the route selections available to users. Users that have already selected the route that is no longer available would be allocated one of their other preferences that did not include this route.

In circumstances where the change in operational status of airspace/air-route occurs after the gateway allocation list has already been promulgated, ATS providers would tactically manage the situation in accordance with ATS contingency plans /procedures.

IV-3.3 Reduction in airspace capacity due industrial action

When there is a reduction in airspace capacity due industrial action, with a list of flights allowed to fly, BOBCAT will ascertain the acceptance rate and spacing requirement from the ACC concerned and incorporate the same as parameters for slot allocation till such time normalcy is reported by the ACC. BOBCAT will exclude all the authorized flights according to the request received from the ACC concerned and all the ATFM exempted flights according to the NOTAM (emergency, rescue, etc...) and issue WUT to other flights as appropriate as well as the ATS providers.

The BOBCAT will send a message describing the situation to all other users via e-mail/AFTN.

IV-3.4 Diversions to Original Aerodrome of Departure (ADEP)

If a flight diverts back to its original aerodrome of DEP for technical or other reasons, a "Diversion" Arrival (ARR) message shall be sent by ATC concerned to the ATFMU. The plan of the diverted flight will be "closed" in the BOBCAT systems. The normal practice is to file a replacement flight plan using the original Aircraft Identification (ACID). The BOBCAT system will process this replacement flight plan as a new flight.

Note: If the "Diversion" Arrival message is not sent, the replacement flight plan will supersede the plan of the diverted flight. To overcome this situation dispatcher should file the new flight plan with a different Aircraft Identification (ACID) e.g. ABC123 becomes ABC123D.

PART V -ATFM SYSTEM FAULT REPORTS

V-1 Definition

ATFM system fault is defined as a significant occurrence affecting an ATS Unit, an Aircraft Operator or ATFMU resulting from the application of ATFM procedures.

V-2 Objective

The object of the ATFM system fault reporting system is to establish procedures to:

- I. Ensure all necessary reports and data required for analysis are collected as soon as practicable.
- II. Ensure fault reports are fully analyzed, remedial action taken and feed-back given to prevent a reoccurrence.

V-3 Types

ATFM System Fault may include:

- a. Failure of slot management service to provide adequate spacing.
- b. Departure without a slot of an aircraft which should have received a slot.
- c. Departure of an aircraft with a slot well outside the slot tolerance.

V-4 Reporting Procedure and Analysis

System Fault Report may be originated by an Aircraft Operator, an ATS Unit concerned or ATFMU.

The ATS Unit Concerned, within whose area the incident occurs, will act as the first point of contact for ATFM system Fault Reports. It will collect all essential information and data and forward it to ATFMU.

Aircraft Operators and ATC Units wishing to file an ATFM System fault Report should therefore complete an ATFM System Fault Report Form (Annex B) and send it to the address indicated on the form.

The ATFMU will analyze all reports, make recommendations/suggestions as appropriate and provide feed back to the parties concerned for remedial actions.

Request for Change Form

To be used whenever requesting a change to any part of the ATFM handbook.
This form may be photocopied as required.

1. Subject			
2. Reason for Change			
3. Description of the Proposal: (attach additional pages if necessary)			
4. Reference(s):			
5. Person Initiating: Organization: TEL/FAX/EMAIL:			Date:
6. CONSULTATION		Response Due by date:	
Organization	Name	Agree/Disagree	Date
7. Action required:			
8. Editor			Date Received:
9. Feedback Passed			

ATFM SYSTEM FAULT REPORT FORM

[To be sent to ATFMU, Bangkok]

[Fax : EMAIL : AFTN : VTBDZDZX]

SECTION I - GENERAL INFORMATION

1. Date and time (UTC) of Occurrence [yy/mm/dd/hh/mm] __ __ / __ __ / __ __ / __ __ / __ __

2. Type of incident [Mark appropriate type with an "x" in the box]

2.1 Failure of BOBCAT system 2.2 Communication Link failure 2.3 Non compliance with ATFM procedures by pilot/Airline Operator/ANSP 2.4 Error in FPL and associated messages. 2.5 Failure in ATFM Slot Monitoring (i.e. TWR at Aerodrome of Departure.) 2.6 Non compliance with an allocated slot time.

3. Name of ATC Unit affected _____.

4. Restrictions applicable to the flight _____.

SECTION II - DETAILED INFORMATION

1. Flight data (if applicable) – Call sign _____.
 (Attach copies of Flight Progress Strips indicating -DEP – EOBT, WUT - DES or –Entry Point & ETO over entry point, FL to ATC Unit/Sector area of activity as applicable)

2. Other details necessary for analysis of the fault [Attach copies of FPL, (RPL), subsequent ATS modifying messages etc. if appropriate]

SECTION III - SUPPLEMENTARY INFORMATION

1. Actions already initiated _____.

2. Contact name and telephone number for follow-up action _____

3. Date, Time (UTC) and Name of ATS unit to which the fault has been reported _____

4. Function and signature of person submitting report _____.

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Bay of Bengal and South Asia
ATFM
Users Handbook



Version 2.0

10 November 2005

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A-1 Request for Change (RFC) Form

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INTRODUCTION

References

Annex 11	Air Traffic Services
Doc 4444	Procedures for Air Navigation Services – Air Traffic Management
Doc 9673	Basic Air Navigation Plan – Asia and Pacific Regions
Doc 9750	Global Air Navigation Plan for CNS/ATM Systems
Doc 9426	ATS Planning Manual

Purpose and Scope

As per ICAO Annex 11 Chapter 3.7.5, an ATFM service shall be implemented for airspace where air traffic demand at times exceeds or is expected to exceed the declared capacity of the air traffic services concerned.

Further, Annex 11 recommends that an ATFM service should be implemented on the basis of a regional air navigation agreement or through a multilateral agreement, which should make provision for common procedures.

Doc 4444 (PANS-ATM) Chapter 3.2.1.5 states that “*Detailed procedures governing the provision of the ATFM measures, and service within a region or area should be prescribed in a regional ATFM manual or handbook*”.

Accordingly, the purpose of this Handbook is to provide in one document, the procedures for the operation of the Bay of Bengal and South Asia ATFM service, which have been developed through the effective use of Collaborative Decision Making between the States and airspace users concerned.

Area of ATFM Operation

Except where specified elsewhere in this Handbook, the ATFM service within the Bay of Bengal and South Asia shall include those portions of airspace and routes which are defined in Section XX and that are contained within the following Flight Information Regions:

- Bangkok
- Chennai
- Colombo
- Delhi
- Dhaka
- Jakarta
- Kabul
- Karachi
- Kathmandu
- Kolkata
- Kuala Lumpur
- Lahore
- Mumbai
- Singapore
- Yangon

Document Management

Arrangement of the Manual

The ATFM Handbook has been divided into three parts, with Part I covering the ATFM Business Rules, Part II concerned with the operation of the ATFM system tools and functionality and Part III covering Contingency Arrangements.

Control of the Manual

This Handbook is controlled, edited and produced by the *[insert name of ATFM coordination authority]*, which operates under the auspices of the ICAO Bay of Bengal ATS Coordination Group (BBACG).

The Editor for the Bay of Bengal and South Asia ATFM Handbook is:

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Validity

The date of application of this Edition number **1.0** is [insert date] and this manual shall not be used operationally before that date.

Changes to the ATFM Handbook

The ATFM Handbook will usually be updated once per year. However intervening amendments may be issued in conjunction with relevant State AIC and AIP documents.

Whenever a user identifies a need for a change to this Handbook, a Request for Change Form (RFC) should be completed and submitted to the Editor. A copy of the RFC Form is shown at **Annex A**.

Amendment Record

Version / Amendment Number	Date	Amended by	Comments
1.0	DD MM 2005		This is the original version

PART I – ATFM BUSINESS RULES

I-1 Overview

I-1.1 Sub section heading

I-1.2 Sub section heading

I-2 Objectives

I-2.1 Sub section heading

I-2.2 Sub section heading

I-3 Area of Operations

I-3.1 Sub section heading

I-4 Hours of Operations

I-5 Responsibilities

PART II – ATFM SYSTEM TOOL & OPERATIONS

BOBCAT System

II-1 Description of BOBCAT System

II-1.1 System Overview

II-1.2 BOBCAT Waypoints

BOBCAT Operations

II-2 Operating Principles

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II-3.1 Sub section heading

1. Procedure for ATFM Manager Slot Allocation Result Review and Approval
2. Cooperation with ANSP in modifying availability of Flight Levels at waypoint and/or spacing at waypoints
3. Procedure for Assignment of Slot Request Privilege for Dispatcher Organization in order to submit slot request on behalf of an airline operator
4. Procedure for Assignment of User Login to Dispatcher Organization and ANSP personnel
5. Procedure for Password Reset
6. Procedure for Slot Request Submission on behalf of Airline Dispatchers
7. Procedure for Slot Request Modification on behalf of Airline Dispatchers
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II-4 Airline Operators

Procedure for Procuring and Removing Login and Password

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Guideline on Submitting Slot Request Prior to Cutoff Time

Submitting Slot Requests

Concept of Route Track and Flight Level Choice

Responsibility of requesting proper times

Saving Slot Request into Templates

Viewing Previously Submitted Slot Requests
Modifying Previously Submitted Slot Requests
Guideline on Viewing Slot Allocation
Guideline Requesting new Slot Allocation
Viewing Free Slot
Changing Slot Allocation
Guideline on Submitting Slot Request After Cutoff Time
Guideline on Password Security

II-4.1 Sub section heading

II-5 Air Navigation Service Providers

II-5.1 ACC Responsibilities

Procedure for Cooperation with ATFMU in metering waypoint spacing and availability of flight levels at waypoints
Procedure for Cooperation with ATFMU in allocating delay to aircraft unable to meet WUT assigned
Procedure for Procuring and Removing Login and Password
Procedure for Resetting Password
Guideline on Viewing Slot Allocation Results
Guideline on Password Security

II-5.2 Control Tower responsibilities

II-5.2.1 Priority of aircraft movement operating under BOBCAT Rules

Sequencing of departing aircraft from each airport – endeavour to give priority to aircraft operating to BOBCAT slot allocation system

Ensure that there is no impediment to aircraft subject to BOBCAT slot allocation during the taxiing phase

Ensure that other aircraft not subject to BOBCAT slot allocation do not affect the Wheels-Up Time of aircraft operating under a BOBCAT slot allocation.

Note other aircraft not involved in BOB CAT could affect WUT of BOBCAT aircraft – prioritisation of bobcat.

II-5.2.2 Aircraft unable to meet Wheels Up Time

If it becomes known that an aircraft operating to a BOBCAT WUT is not going to make the allocated time, then:

TWR to advise ACC in order for ATFMU to make new slot

TWR to keep ATFMU informed via ACC of any other abnormality which could affect aircraft operations under BOBCAT.

PART III – CONTINGENCY ARRANGEMENTS

III-1 Section Heading

III-1.1 Sub section heading

2. Emergency Procedures
 - a. Level of Service Failure
 1. Short Term – < 2 hr
 2. Medium Term – 2-24 hr
 3. Long Term – > 24 hr
 - b. “Degraded Mode Operations”
 1. Fax Usage Procedure
 2. Telephone Usage Procedure
 - c. BOBCAT Web Server Failure
 1. Single Server
 2. Dual Server
 3. Complete Failure
 4. Reporting Arrangements
 - d. BOBCAT Application Server Failure
 1. Single Server
 2. Dual Server
 3. Complete Failure
 4. Reporting Arrangements
 - e. BOBCAT Database Server Failure
 1. Single Server
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 3. Complete Failure
 4. Reporting Arrangements
 - f. BOBCAT Servers Internet Link Failure
 1. Alternate Facility
 2. Business Resumption Plan
 3. Reporting Arrangements
 - g. ATFMU System Failure
 1. Alternate Facility
 2. Business Resumption Plan
 3. Reporting Arrangements
 - h. Airline Operators Facility Failure
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 3. Reporting Arrangements
 - i. Airline Operators Link Failure
 1. Alternative Facility
 2. Business Resumption Plan
 3. Reporting Arrangements
 - j. ANSP Facility Failure
 1. Alternative Facility
 2. Business Resumption Plan
 3. Reporting Arrangements
 - k. ANSP Link Failure

1. Alternative Facility
2. Business Resumption Plan
3. Reporting Arrangements

III-1.2 Sub section heading

III-2 Section Heading

III-2.1 Sub section heading

III-2.2 Sub section heading

III-3 Section Heading

III-3.1 Sub section heading

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ATFM system fault reports

10.1 ATFM system fault is defined as a significant occurrence affecting an ATS Unit, an Aircraft Operator or ATFMU resulting from the application of ATFM procedures.

10.2 The object of the ATFM system fault reporting system is to establish procedures to:

- I. Ensure all necessary reports and data required for analysis are collected as soon as practicable.
- II. Ensure fault reports are fully analyzed, remedial action taken and feed-back given to prevent a reoccurrence.

III. ATFM System Fault may include:

- a. Failure of slot management service to provide adequate spacing.
- b. Departure without a slot of an aircraft which should have received a slot.
- c. Departure of an aircraft with a slot well outside the slot tolerance.

IV. System Fault Report may be originated by an Aircraft Operator, an ATS Unit concerned or ATFMU.

- V. The ATS Unit Concerned, within whose area the incident occurs, will act as the first point of contact for ATFM system Fault Reports. It will collect all essential information and data and forward it to ATFMU.
- VI. Aircraft Operators and ATC Units wishing to file an ATFM System fault Report should therefore complete an ATFM System Fault Report Form and send it to the address indicated on the form.
- VII. The ATFMU will analyze all reports, make recommendations/suggestions as appropriate and provide feed back to the parties concerned for remedial actions.

ATFM SYSTEM FAULT REPORT FORM

[To be sent to ATFMU, Bangkok]

[Fax :

EMAIL :

AFTN :

VTBDZDZX]

SECTION I - GENERAL INFORMATION

1. Date and time (UTC) of Occurrence [yy/mm/dd/hh/mm] __ / __ / __ / __ / __

2. Type of incident [Mark appropriate type with an "x" in the box]

2.1 Failure of BOBCAT system

2.2 Communication Link failure

2.3 Non compliance with ATFM procedures by pilot/Airline Operator/ANSP

2.4 Error in FPL and associated messages.

2.5 Failure in ATFM Slot Monitoring (i.e. TWR at Aerodrome of Departure.)

2.6 Non compliance with an allocated slot time.

3. Name of ATC Unit affected_____.

4. Restrictions applicable to the flight _____.

SECTION II - DETAILED INFORMATION

1. Flight data (if applicable) – Call sign _____.

(Attach copies of Flight Progress Strips indicating -DEP – EOBT, WUT - DES or –Entry Point & ETO

over entry point, FL to ATC Unit/Sector area of activity as applicable)

2. Other details necessary for analysis of the fault [Attach copies of FPL, (RPL), subsequent ATS modifying messages etc. if appropriate]

SECTION III - SUPPLEMENTARY INFORMATION

1. Actions already initiated_____.

2. Contact name and telephone number for follow-up
action_____

3. Date, Time (UTC) and Name of ATS unit to which the fault has been reported_____

4. Function and signature of person submitting report_____.

Request For Change form

RFC Nr:	
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To be used whenever requesting a change to any part of the ATFM Handbook. This form may be photocopied as required.

1. SUBJECT:			
2. REASON FOR CHANGE:			
3. DESCRIPTION OF PROPOSAL: [attach additional pages if necessary]			
4. REFERENCE(S):			
5. PERSON INITIATING:			DATE:
ORGANISATION:			
TEL/FAX/EMAIL:			
6. CONSULTATION		RESPONSE DUE BY DATE:	
Organisation	Name	Agree/Disagree	Date
7. ACTION REQUIRED:			
8. EDITOR			DATE REC'D:
9. FEEDBACK PASSED			DATE:

List of Participants in BOBCAT issued Username and Password

(last updated 18 February 2006)

❖ Airlines

- Air France
- Austrian Airlines
- British Airways
- Cathay Pacific
- Continental Airlines
- EVA Air
- Finnair
- KLM
- Lufthansa
- MAS
- Qantas Airways
- Royal Brunei Airways
- Scandinavian Airline Systems
- Singapore Airlines
- Thai Airways International
- Vietnam Airlines

❖ ANSPs

- Aeronautical Radio of Thailand (AEROTHAI)
- Airport Authority of India
- Civil Aviation Authority of Singapore
- Department of Civil Aviation, Malaysia
- Indonesia – Angkasapura 2
- Civil Aviation Authority of Singapore

❖ Other

- ICAO Regional Office, Bangkok

– END –

LAHORE FIR ATS TRAFFIC MANAGEMENT

In establishing the parameters for application by the Bay of Bengal Cooperative Air Traffic Flow Management Advisory System (BOBCAT) automated flow system under development by Aeronautical Radio of Thailand (AEROTHAI) during the ATFM operational trial commencing on 16 March 2006, the AEROTHAI BOBCAT development team are seeking clarification of the following matters in respect of traffic handling in the Lahore FIR

With regard to aircraft operating via SAMAR (Delhi/Lahore FIR) – A466 to Dera Ismail Khan (DI) and then proceeding through the Kabul FIR either via ATS routes A466 or N644, it is the understanding of the AEROTHAI BOBCAT development team that the following special arrangements or procedures between Delhi and Lahore FIR have been put in place to cater for aircraft using these routes during the busy westbound nighttime period:

- a) aircraft entering the Lahore FIR over SAMAR at either RVSM level FL300 or FL320 will transition the Kabul FIR at CVSM level 310;
- b) aircraft entering the Lahore FIR over SAMAR at either RVSM level FL340 or FL360 will transition the Kabul FIR at CVSM level 350;
- c) in the case of aircraft A and aircraft B who are operating at FL300/320 respectively, and who will diverge at DI and enter Kabul FIR on A466 and N644, the special arrangements allow aircraft to be not less than 5 minutes apart from SAMAR with both repositioned to CVSM FL310 when laterally separated west of DI by radar. This procedure is also used in the case of two aircraft operating at FL340/360 diverging at DI who would be re-cleared to FL350 prior to the Kabul FIR entry points.

The AEROTHAI BOBCAT development team would appreciate confirmation from Pakistan that the procedures described comprise the normal operations in the circumstances described. Confirmation of the applicable procedures in this regard would enable adjustments to the BOBCAT computer database which would effectively streamline the ATFM system allowing more aircraft to safely enter the Kabul FIR during this busy period.

Additionally, in relation to paragraph 4 c) above and the scenario regarding level assignment from RVSM to CVSM levels prior to entering Kabul FIR, if both aircraft were vertically separated until outside the lateral separation points on A466 and N644, is it possible that the 5 minutes spacing may not be required?

For example, if both aircraft were less than 5 minutes apart but vertically separated at, for example, FL300 and FL320 respectively the same situation would apply i.e. aircraft would need to wait until one aircraft is outside the lateral separation point (approximately 15NM west of DI) before both aircraft could be assigned FL310 or FL350.

As the level assignments for eastbound aircraft passing through Kabul FIR are CVSM levels of FL290, 330 and 370, a further option may be that one of the two westbound aircraft could be assigned FL310 prior to the lateral separation point and the second aircraft descended or climbed to FL310 when either of the aircraft are established outside the lateral separation point.

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UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
<u>System Hardware</u>			
Load-Balanced Servers	Redundant server groups simultaneously servicing users, allowing a server to be down while the other server performing identical function takes the load.	Completed	
Redundant Power Supply	BOBCAT servers are connected to two independent power supplies backed up by an Uninterrupted Power Supply (UPS)	Completed	
GPS Clock Time Synchronization	BOBCAT server time synchronized to satellite clocks to provide common time unit.	In progress	GPS Time Synchronization setup will be completed prior to BOBCAT Operational Trials.
<u>System Software</u>			
<i>Overall User Interface</i>			
Automatic Logout after Inactive Period	BOBCAT Users are planned to automatically log out after 10 minutes of inaction. The timeout has been temporarily increased to 20 minutes during the lead up to BOBCAT Operational Trial to assist users' learning process.	Completed	Will be cut back to automatically log out after 10 minutes prior to live operational trials.
<i>ANSP User Interface</i>			
Announcement Page	Default page after successful login shows relevant announcements. After each announcement was made, an e-mail is automatically sent by ATFMU to all concerned.	Completed	

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UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
Slot Allocation Results	<p>Slot Allocation Result view page allows each ANSP user to have their personalized view of slot allocation results for both users at (1) Departure Airports and (2) En-Route ACCs.</p> <p>Slot Allocation Results page is dynamic and refreshes every 3 minutes.</p>	Completed	
Past Slot Allocation Results	Slot Allocation Results from previous 60 days of operation can also be viewed by ANSPs.	Completed	
Feedback Page	Ability to provide feedback, comments, questions and suggestions to BOBCAT Development Team.	Completed	Upgraded features planned in Version 1.01 of BOBCAT.
User Interface Help Page	Help pages provided for all pages related to ANSP user interface.	Completed	
Frequently Asked Questions (FAQ) Page	Help page containing FAQs.	In progress	Feature to be available for Version 1.01 of BOBCAT.
Documentation Page	<p>Following information will be displayed:</p> <ul style="list-style-type: none"> a) AIC; b) AIP Supplement; c) Safety Statement; d) BOBCAT ATFM User Manual; e) BOBCAT Concept of Operations; and, f) BOBCAT Help Pages. 	In progress	Feature to be available for Version 1.01 of BOBCAT, pending data from ATFM/TF.

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UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
<i>Airline Dispatcher User Interface</i>			
Announcement Page	<p>Default page after successful login shows relevant announcements.</p> <p>After each announcement was made, an e-mail is automatically sent by ATFMU to all concerned.</p>	Completed	
Slot Request Submission Page	<p>Ability to enter Slot Request and alternative options:</p> <ul style="list-style-type: none"> a) Automatically checks ETD, EET, Departure Airport, and Destination Airport input formats for submitted information; b) Only accepts aircraft Mach Number submitted between M075 and M090; c) Constrains flight level availability to a group of flight level configured by ATFMU through the Kabul FIR; d) Allows dispatchers to only submit slot request for their own flights as well as other airline flights authorized they are responsible for; e) Allows dispatchers to revise all or part of slot requests at any time up to the Cutoff-Time; and, f) Once dispatchers confirm their slot request, a confirmation e-mail is automatically returned from ATFMU with details of slot request including sender's name. 	Completed	<p>This information needs to be advised to Bangkok ATFMU for programming purposes.</p>

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UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
Slot Request Template	BOBCAT has provision to: <ul style="list-style-type: none"> a) Save a slot request as a template; b) Use all or part of templates for future flights; c) Sharing of slot request templates between dispatchers of the same airline; and, d) Once a dispatcher creates a slot request template, a confirmation e-mail is automatically returned from ATFMU with details of the slot request template including the dispatcher's name. 	Completed	
Past Slot Request	Allows viewing details of slot request for up to past 60 days and using this information to submit slot request for the present day.	Completed	
Slot Allocation Results	Same ability to personalize information as ANSPs.	Completed	
Past Slot Allocation Results	Same ability to view information as ANSPs.	Completed	

UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
Slot Selection after Cut-Off Time	<p>Ability to view available slots and:</p> <ul style="list-style-type: none"> a) Choose an available slot is no slot request was submitted prior to cut-off time; b) Choose an available slot after missing out on allocated slots; and, c) Change previous slot allocation. <p>Once a dispatcher chooses or changes slot for an aircraft, a confirmation e-mail is automatically returned from ATFMU with details of new slot allocation including the dispatcher's name.</p>	Completed	
View Free Slots	Ability to view available slots.	Completed	
Feedback Page	Ability to provide feedback, comments, questions and suggestions to BOBCAT.	Completed	Upgraded features to be available in Version 1.01 of BOBCAT.
User Interface Help Page	Help pages provided for all pages related to airline dispatcher user interface.	Completed	
Frequently Asked Questions (FAQ) Page	Help page containing FAQs.	In Progress	Feature to be available for Version 1.01 of BOBCAT.
Documentation Page	AIP Supplement example and BOBCAT ATFMU Handbook to be available for downloading in Documentations Page.	In Progress	Feature to be available for Version 1.01 of BOBCAT, pending data from ATFM/TF.

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UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
<i>ATFMU User Interface</i>			
Announcement Page	<p>Default page after successful login shows relevant announcements, e.g. system maintenance notification, flight level availability change due to ANSP's requirements, etc.</p> <p>Ability to make announcements to specific types of users.</p>	Completed	After each announcement is made, an e-mail is automatically sent by ATFMU to all concerned.
User Administration	<p>Allows ATFMU Staff to :</p> <p style="margin-left: 40px;">a) Add username for a new BOBCAT user; and, b) Reset password for BOBCAT user forgetting his/her password.</p> <p>Username and password will be generated and sent to BOBCAT user via e-mail.</p>	Completed	New generated password will only be available on e-mail sent to BOBCAT users. Only digest of each user's password will be stored on BOBCAT database for user authentication. This provides additional security to users.
Slot Request Submission on Airlines' Behalf (upon request)	Ability for ATFMU to submit slot request based on slot request templates on behalf of airlines upon request.	Completed	
Missed Wheels Up Time Aircraft	Ability for ATFMU to find and select alternate slot option for aircraft that miss Allocated Wheels Up Time (AWUT).	Completed	
Frequently Asked Questions (FAQ) Page	<p>Help page containing FAQs.</p> <p>Ability for ATFMU to add new question/answer into the list of FAQ available.</p>	In Progress	Feature to be available for Version 1.01 of BOBCAT.

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UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
<i>Slot Allocation Mechanism</i>			
Slot Allocation Results Notification E-Mail	Once Cut-Off Time Slot Allocation result has been completed, a notification e-mail will be automatically generated and sent to all airlines submitting slot requests.	Completed	The e-mail contains details of flights with slot allocation, flights without slot allocation and slots available at the completion of Cut-Off Time Slot Allocation.
System Configuration			
<i>Configurability</i>			
Waypoint Configuration	Ability to change available waypoints in BOBCAT system.	Completed	
Flight Level Configuration	Ability to constrain flight level to appropriate levels at selected BOBCAT waypoints.	Completed	
Aircraft Spacing Configuration	Ability to change aircraft flow spacing requirement at and between BOBCAT waypoints.	Completed	
Flow Buffer Configuration	Ability to change Wheels Up Buffer Time (Flow Buffer) applied to all BOBCAT flows.	Completed	
Problematic Slot Request Detection	Ability to detect and delete part or all of problematic slot request submitted once active waypoint and/or flight level configuration has been changed.	Completed	

UPDATE ON BOBCAT FEATURES – 23 February 2006

Subject	Description	Status	Remarks
<i>Current Configuration</i>			
Waypoint Configuration	Currently active waypoints are: a) DI (required to allow reduced aircraft spacing for two aircraft that diverge onto A466 and N644); b) SITAX; c) PAVLO; d) ROSIE, and e) ASLUM.	Completed	Kabul FIR exit waypoints, LLK, KKJ and Bay of Bengal entry waypoints remain in the system but are currently not shown and not included in slot allocation process.
Flight Level Configuration	CVSM flight levels between FL280 and FL390 inclusive have been configured for all waypoints with the exception that FL280 not available on G792/V390.	Completed	
Aircraft Spacing Configuration	BOBCAT is configured to space aircraft 10 minutes apart at all active BOBCAT waypoints with the exception of 5 minutes at DI.	Completed	
Flow Buffer Configuration	Flow Buffer of 5 minutes is currently configured.	Completed	Aircraft at BOBCAT waypoints will be spaced additional 5 minutes apart.