



*International Civil Aviation Organization*

**The Fourth Meeting of the Bay of Bengal Reduced Horizontal Separation  
Implementation Task Force (BOB-RHS/TF/4)**

Bangkok, Thailand, 18 to 22 October 2010

---

**Agenda Item 8: Any Other Business**

**BOBCAT OPERATIONAL UPDATES AND FUTURE ENHANCEMENTS**

(Presented by Thailand)

**SUMMARY**

The purpose of this working paper is to present an analysis and overview of operational data on Westbound flights operating through the Kabul FIR associated with the ATFM BOBCAT process from the commencement of the ATFM Operational Trials in July 2007 to August 2010. This working paper also presents BOBCAT software update plan, related Collaborative Decision Making development for BOBCAT departures from Bangkok Suvarnabhumi Airport and hardware migration plans.

**1. INTRODUCTION**

1.1 The meeting would recall that on AIRAC 5 July 2007, international long range ATFM procedure using the BOBCAT system became fully operational.

1.2 It was agreed at the 13<sup>th</sup> meeting of the ATFM Task Force held in September 2009 that monthly traffic data would continue to be collected by all States for one agreed week each month, sent to the ATFMU and analyzed by the BOBCAT Development Team for presentation to the periodic meetings of the ATFM Task Force.

1.3 The meeting would also note APANPIRG/20 decision to dissolve the ATFM Task Force, forcing BOBCAT matters to be discussed at the Regional ATFM Steering Group meeting, BBACG meeting or BOB-RHS Task Force meeting, of which participants are also involved in the ATFM procedure.

**2. DISCUSSIONS**

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

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

2.3 The meeting is also advised that the slight decrease in traffic in April 2010 could be associated to the Iceland volcanic ash situation, which resulted in a reduction of average BOBCAT slot request from 60 aircraft per night to 6 aircraft per night on affected days.

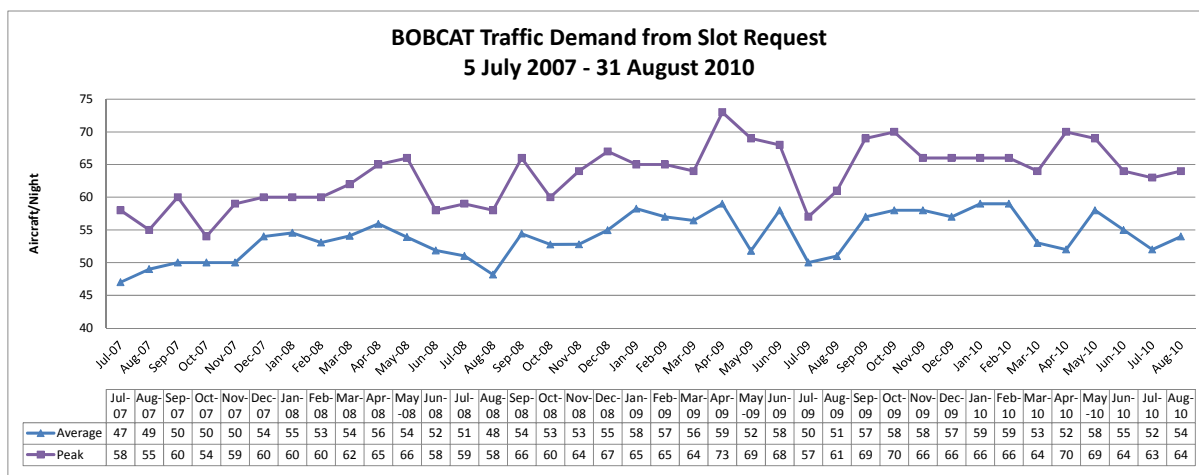


Figure 1: BOBCAT Slot Request Statistics (5 July 2007 – 31 August 2010)

2.4 While slot requests continue to increase, the number of airline involved has also increased to 49 airline operators in August 2010. The updated airline participation since operational trials is shown in Figure 2.

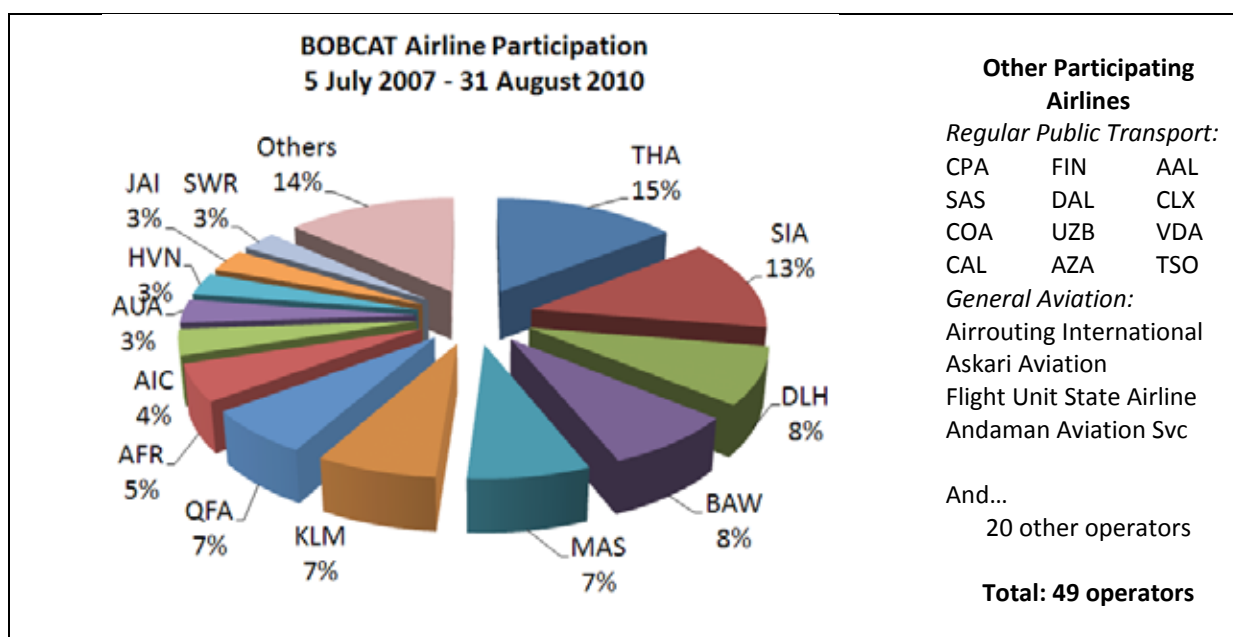


Figure 2: BOBCAT Airline Participation since ATFM Implementation (5 July 2007 – 31 August 2010)

Overall Data Analysis – Traffic Distribution by Airport

2.5 The meeting is invited to note weekly traffic number from Top-9 airports entering the Kabul FIR between May 2007 and January 2010 in Figure 3.

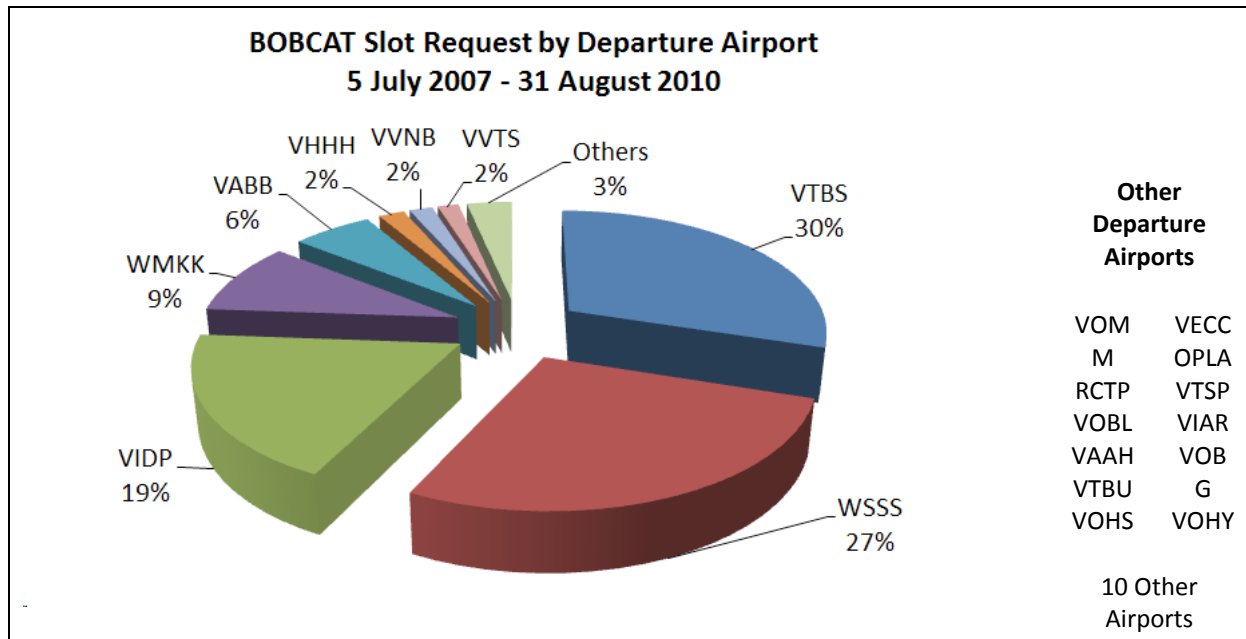


Figure 3: BOBCAT Traffic Demand from Slot Request Information organized by Departure Airport (5 July 2007 – 31 August 2010)

2.6 Based on traffic distribution by departure airports in Figure 3, the top-8 airport providing most traffic to the BOBCAT system are:

- a) **VTBS:** Bangkok, Thailand
- b) **WSSS:** Singapore
- c) **VIDP:** Delhi, India
- d) **WMKK:** Kuala Lumpur, Malaysia
- e) **VABB:** Mumbai, India
- f) **VHHH:** Hong Kong, China
- g) **VVNB:** Ha Noi, Viet Nam
- h) **VVTS:** Ho Chi Minh, Viet Nam

Overall Data Analysis – Flight Level Allocation

2.7 The meeting is advised that the number of flights achieving same or higher preferable flight level has been on an increasing trend from approximately 90% in September 2009 to 93% in August 2010. Figure 4 shows further information on percentage of traffic achieving higher preferable flight level between January 2009 and August 2010. Notwithstanding slight decrease in number of flights transiting the Kabul FIR at a same or higher preferable flight level in February and April 2010, the percentage of flights obtaining the same or higher flight level appears to be on an increasing trend reaching highest since BOBCAT operational implementation at 93.43% in August 2010.

### Percentage of Flights Transiting the Kabul FIR at a Same or Higher Preferable Flight Level

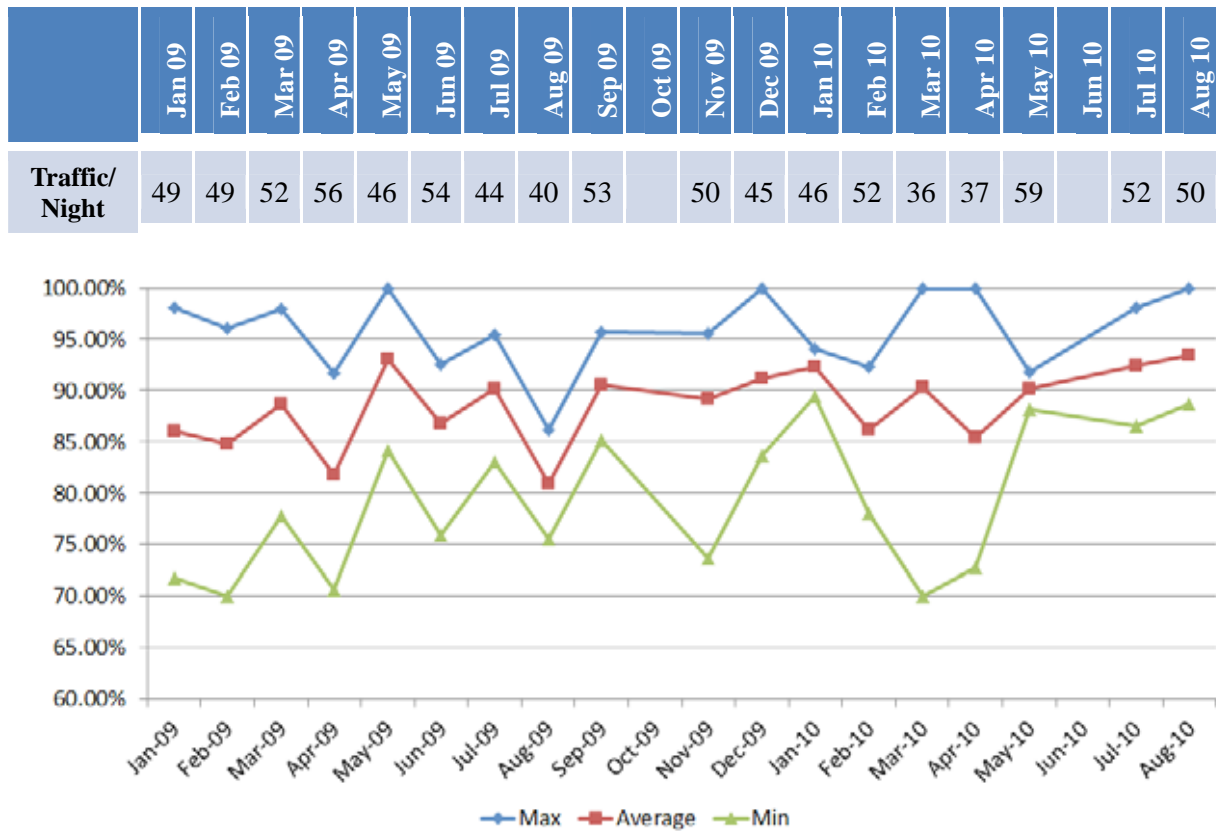


Figure 4: Percentage of Aircraft Achieving Same or Higher Preferable Flight Level

#### Flights Transiting the Kabul FIR at a Flight Level Lower than Slot Allocation

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

2.9 The meeting is also advised that relatively high percentage of flights transiting the Kabul FIR at a flight level lower than slot allocation flight level in April 2010 may be related to the Iceland volcanic ash situation, which happens to be within April 2010 data collection period.

### Number of Flights Transiting the Kabul FIR at a Flight Level Lower than Slot Allocation

|                   | Jan 09 | Feb 09 | Mar 09 | Apr 09 | May 09 | Jun 09 | Jul 09 | Aug 09 | Sep 09 | Oct 09 | Nov 09 | Dec 09 | Jan 10 | Feb 10 | Mar 10 | Apr 10 | May 10 | Jun 10 | Jul 10 | Aug 10 |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Traffic/<br>Night | 49     | 49     | 52     | 56     | 46     | 54     | 44     | 40     | 53     |        | 50     | 45     | 46     | 52     | 36     | 37     | 59     |        | 52     | 50     |

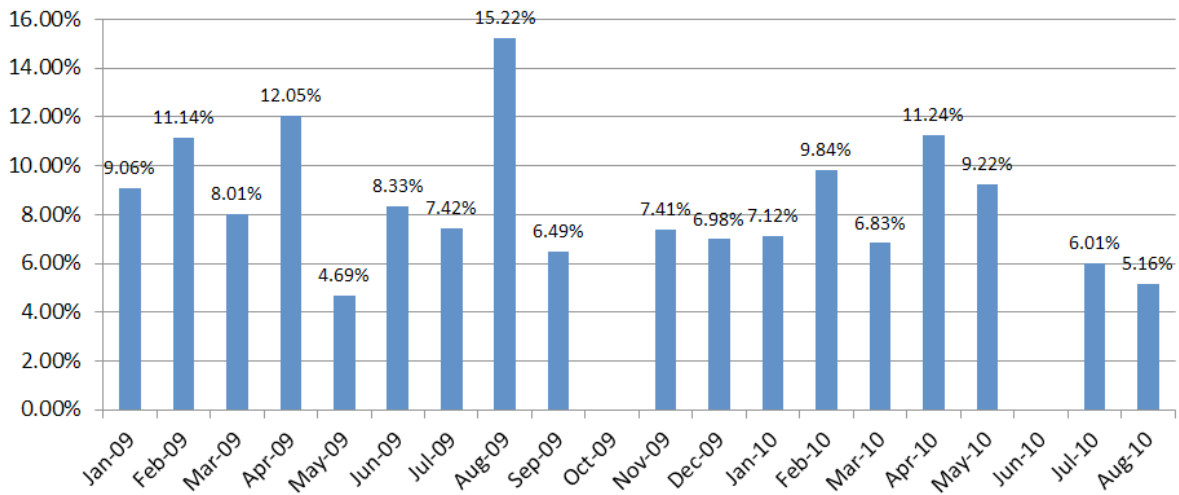


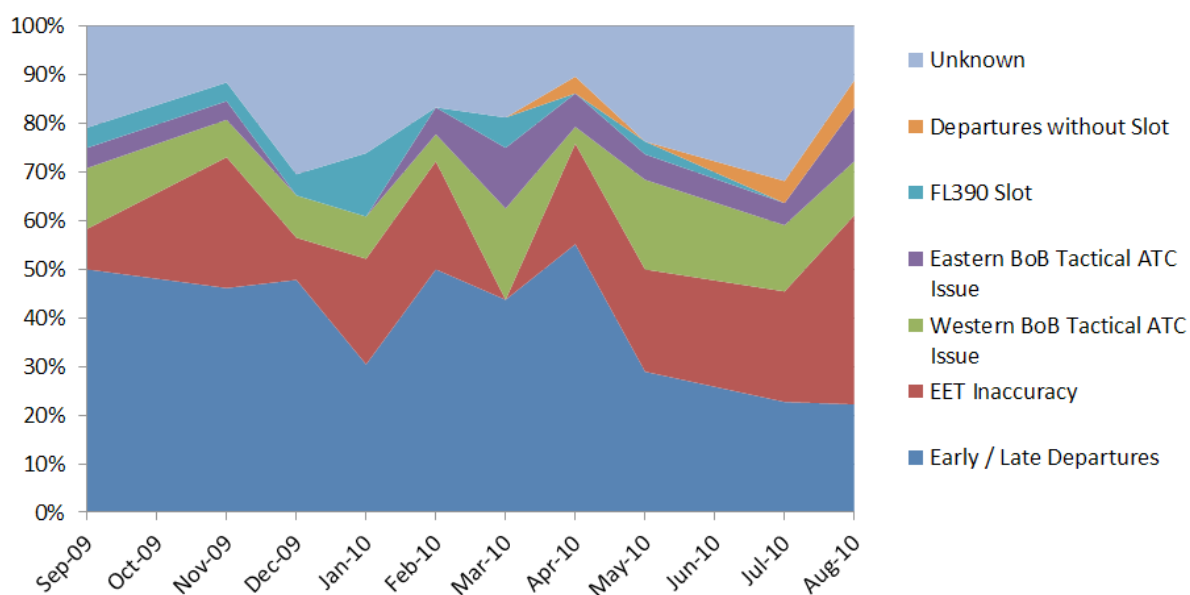
Figure 5: Number of Flights Transiting the Kabul FIR at a Flight Level Lower than Slot Allocation

2.10 From analysis of data collection, there are four major reasons for aircraft to be unable to achieve slot allocation flight level:

- a) Early or Late departures of the aircraft or other aircraft;
- b) EET inaccuracy;
- c) Western Bay of Bengal tactical ATC issue;
- d) Eastern Bay of Bengal tactical ATC issue;
- e) FL390 Slot Allocation;
- f) Departures without slot allocation; and,
- g) Unknown reason due to insufficient data.

2.11 Percentage breakdown of aircraft unable to achieve slot allocation flight level is shown in Figure 6.

**Flights Transiting the Kabul FIR at a Flight Level Lower than Slot Allocation**  
**September 2009 - August 2010**



*Figure 6: Breakdown of Aircraft Unable to Achieve Slot Allocation Flight Level (September 2009 – August 2010)*

2.12 From Figure 6, the meeting should note that the percentage of flights transiting the Kabul FIR at a flight level lower than slot allocation caused by early or late departures in relation to AWUT appears to be on a decreasing trend from 50% in September 2009 to 22.22% in August 2010. This change is most likely attributable to much enhanced AWUT compliance from major airports supplying the BOBCAT traffic.

2.13 Notwithstanding the decrease in the major cause of flight transiting the Kabul FIR at a flight level lower than slot allocation being associated to early or late departures, it would appear that EET inaccuracy issues where an aircraft may depart in accordance to AWUT but is unable to transit the Kabul FIR in accordance to the slot allocation is becoming a major cause instead. The percentage associated to this particular cause has increased from 8.33% in September 2009 to 38.89% in August 2010.

2.14 EET in accuracy is rather quite complex when compared to early or late departures. The BOBCAT development team will need to perform further study on the issue and report findings to the next BOB-RHS/TF or BBACG meeting, whichever is earlier.

2.15 In addition, while tactical ATC issues, where aircraft with higher flight level slot in the Kabul FIR were organized below those with lower flight level slot, resulting in transit at a lower flight level, appears to be slightly increasing from a combined 16.67% in September 2009 to 22.22% in August 2010

Departures Punctuality

2.16 The meeting is invited to note departures punctuality from major airports supplying BOBCAT traffic between January 2010 and August 2010 based on flight plan, ATS messages and other information received by the Bangkok ATFMU shown in Figure 7.

2.17 Departures punctuality is defined by the core 5-minute window after AWUT padded on both sides by the number of hours aircraft normally transit between these airports and entering the Kabul FIR. This is due to the key assumption that aircraft can speed up or slow down by approximately Mach 0.01 to adjust their timing. For example, since a flight takes about five (5) hours from Ha Noi (VNVB) to Kabul FIR entry, departure punctuality for Ha Noi would be defined as departures between five minutes before AWUT and ten minutes after AWUT. On the other hand, departures from Delhi (VIDP) would take about one (1) hour from departure to Kabul FIR entry, thus departure punctuality for Delhi would be defined as departures between one (1) minute before AWUT and six (6) minutes after AWUT.

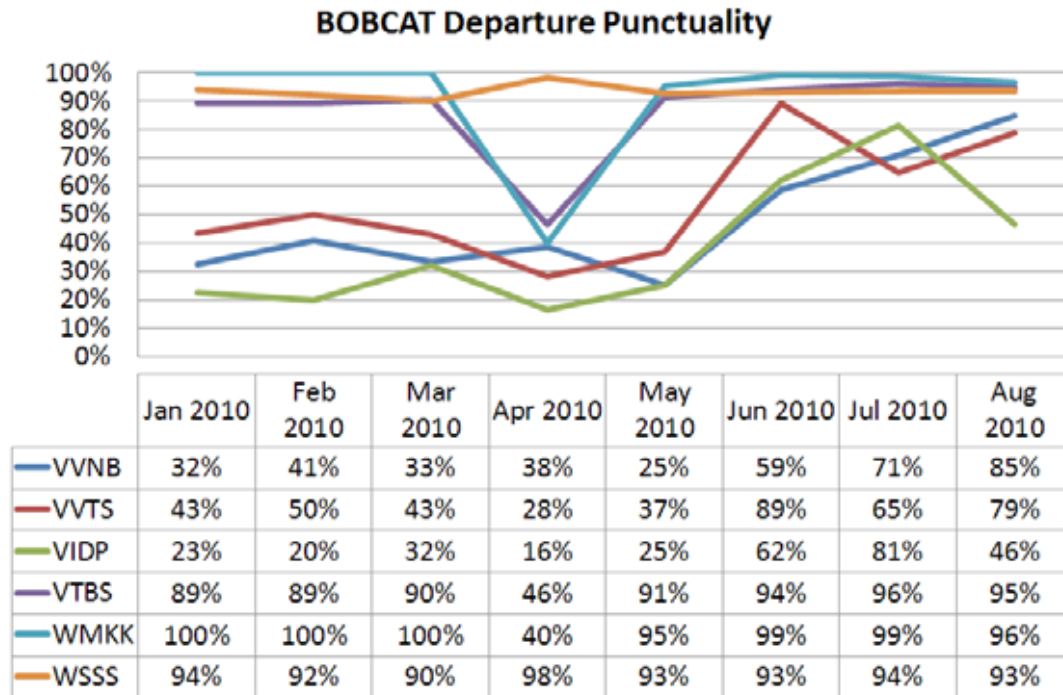


Figure 7: Departures Punctuality from Major Departure Airports  
(January 2010 – August 2010)

2.18 According to Figure 7, the meeting is advised of substantial improvement in punctuality for departures from Ha Noi (VNVB), Ho Chi Minh (VVTS) and Delhi (VIDP).

2.19 Ha Noi departures punctuality increased from approximately 40% between January 2010 and May 2010 to as high as 85% in August 2010. Similarly, Ho Chi Minh departures punctuality increased from approximately 40% between January 2010 and May 2010 to between 65% and 89% between June 2010 and August 2010.

2.20 In the meantime, Delhi departures punctuality increased from approximately 20% between January 2010 and May 2010 to 46% to 81% between June 2010 and August 2010.

2.21 Meanwhile, departure punctuality from Bangkok Suvarnabhumi (VTBS), Kuala Lumpur (WMKK) and Singapore (WSSS) remained consistently high between about 89 percent and 100 percent.

2.22 The meeting is advised that since April 2010 data collection period coincides with the Iceland volcanic ash situation, departures punctuality from all airports appear to be affected with the exception of Singapore Changi Airport, which should be congratulated for handling of AWUT compliance in the face of extraordinary circumstances affecting those flights.

*Participation in Data Collection*

2.23 The meeting is informed of participation in ATFM Data Collection between January 2010 and August 2010 in Figure 8.

|             | Jan<br>2010 | Feb<br>2010 | Mar<br>2010 | Apr<br>2010 | May<br>2010 | Jun<br>2010 | Jul<br>2010 | Aug<br>2010 |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>WSJC</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      |
| <b>WMFC</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      |
| <b>VTBB</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      |
| <b>VYYY</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | N/A         | N/A         | N/A         |
| <b>VOMF</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | N/A         | N/A         |
| <b>VECF</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | N/A         | N/A         |
| <b>VABF</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | N/A         | N/A         |
| <b>VIDF</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | N/A         | N/A         |
| <b>OPKR</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      |
| <b>OPLR</b> | 7 days      | 7 days      | 7 days      | 7 days      | 7 days      | N/A         | 7 days      | 7 days      |
| <b>OAKX</b> | N/A         | N/A         | 7 days      | 7 days      | 7 days      | N/A         | N/A         | N/A         |

Figure 8: Participation in Data Collection by FIR

2.24 According to Figure 8, AEROTHAI would like to express gratitude to all States involved in providing data required for data analysis. Nevertheless, on some occasions, there were some issues with integrity of data submitted from certain FIRs which may have inhibited reliable data analysis on some days of the data collection.

*Operational Messages Sent to the Bangkok ATFMU*

2.25 The meeting is reminded that, according to the ATFM Users Handbook, “[aircraft] operators shall also address flight plan and related ATS messages (e.g. DEP, DLA, CNL, CHG) to the Bangkok ATFMU.” Nevertheless, some flight plans and ATS messages are still not transmitted to the Bangkok ATFMU, especially for departures west of the Bay of Bengal.

2.26 Figure 9 and Figure 10 shows Bangkok ATFMU’s receipt of Flight Plan and ATS messages by departure airport.

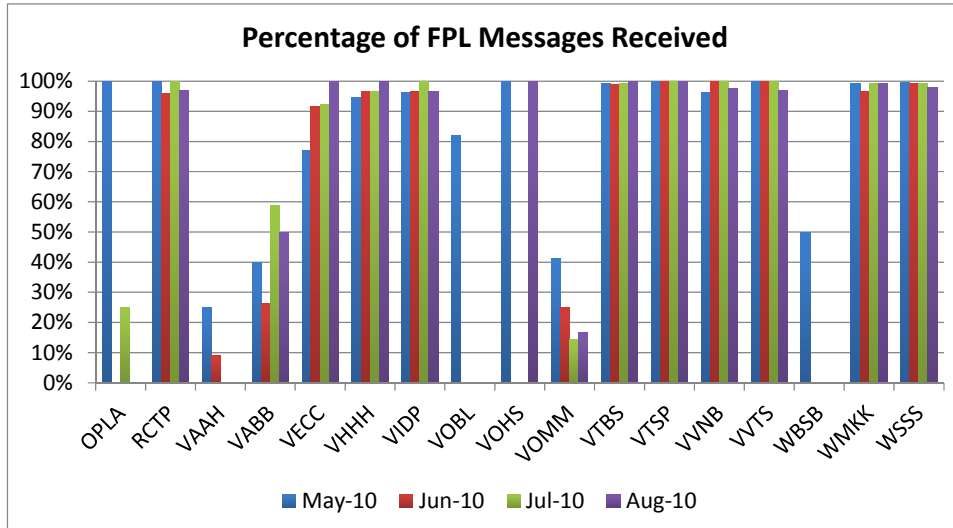


Figure 9: Summary of FPL messages received by the Bangkok ATFMU by Departure Airport

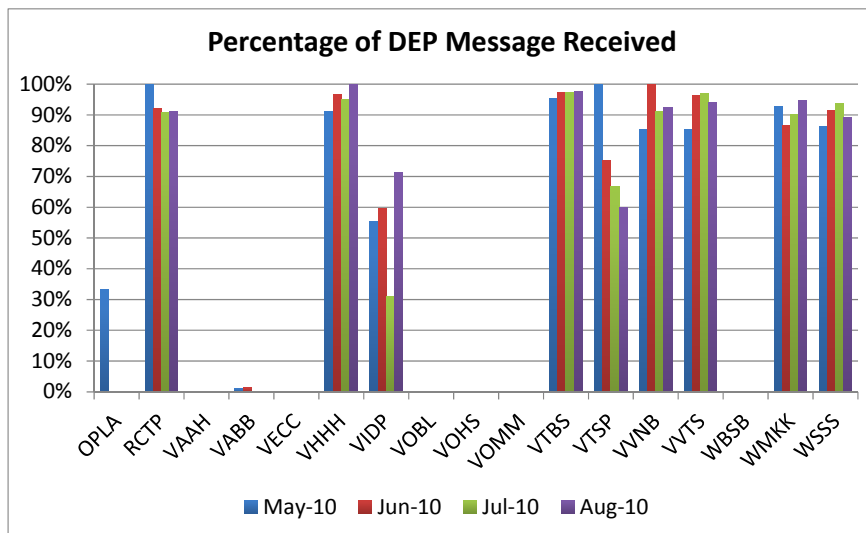


Figure 10: Summary of DEP messages received by the Bangkok ATFMU by Departure Airport

2.27 The meeting would note that, from analysis of ATFM data collection, aircraft departure punctuality is a crucial cause of aircraft transiting the Kabul FIR at a flight level lower than slot allocation.

2.28 These ATS messages can be used in future ATFM data analysis, namely in determining the potential cause of aircraft transiting the Kabul FIR at flight level lower than slot allocation as well as alerting potential issues arising from aircraft departing early or late outside the AWUT window.

2.29 In addition, flight plan and ATS messages will become key enablers for future software updates to the BOBCAT system and the capability to display target handover information between en route FIRs from departures to Kabul FIR entry as well as related Collaborative Decision Making processes.

BOBCAT Software Updates

2.30 The meeting would recall a Working Paper submitted to the BOB-RHS/TF/3 meeting in May 2010 on the BOBCAT Airline Satisfaction Survey conducted in collaboration with IATA with key feature request popularity as shown in Figure 11.

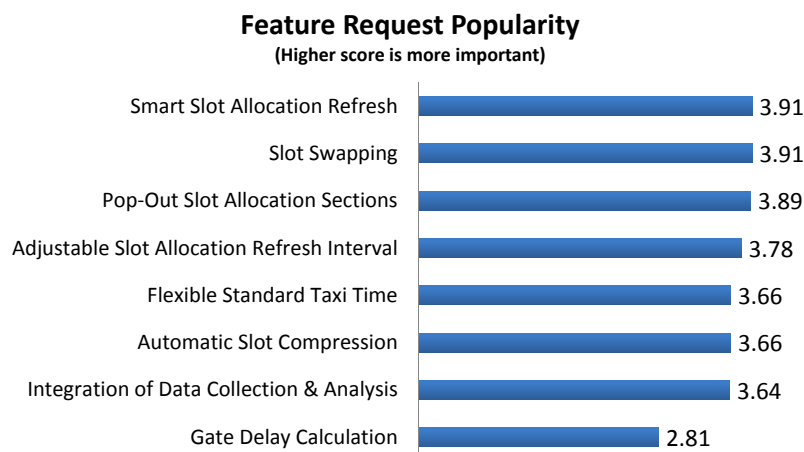


Figure 11: Summary of Feature Request Popularity from BOBCAT Airline Satisfaction Survey

2.31 The meeting is invited to note that, based on further consultation with AEROTHAI software engineers, these features were further grouped as follows:

- a) **Feature Group 1:** Slot Swapping & Automatic Slot Compression
- b) **Feature Group 2:** Flight and ATS Messages Processing
- c) **Feature Group 3:** Slot Allocation page changes & Gate Delay Calculation
- d) **Feature Group 4:** Integration of Data Collection and Analysis
- e) **Feature Group 5:** Flexible Taxi Time

Feature Group 1: Slot Swapping

2.32 Slot Swapping feature can be implemented for two aircraft “controlled” by the user performing swap, whether the user is an airline dispatcher or ATFMU staff. This feature could be enabled as such that ATFMU manager could perform swapping on behalf of the airlines involved if requested.

2.33 This particular feature can be implemented on an open-ended manner where slots being swapped include more than one waypoint, i.e. DI/PAVLO or DI/SITAX slot. In such case, EET difference between the two waypoints must be practical for both aircraft after the swap. This can be illustrated in an example.

2.34 In addition, it must be noted that new ETD and AWUT for the two aircraft must be practical for air traffic management purposes. This means there would be a potential requirement from ATM perspective that new AWUT must be at least some time after swapping operation.

2.35 The meeting is invited to note a hypothetical pair of aircraft in Figure 12 intending to swap slots amongst themselves.

| C/S  | AWUT | WP    | FL  | ETO  |
|------|------|-------|-----|------|
| ABC1 | 1700 | DI    | 350 | 2100 |
|      |      | PAVLO | 350 | 2115 |
| ABC2 | 1600 | DI    | 350 | 2117 |
|      |      | PAVLO | 350 | 2130 |

Figure 12: Hypothetical Pre-Swap Situation

2.36 The meeting is advised that ABC1 may depart from a different airport when compared to ABC2. In addition, EET between DI-PAVLO for ABC1 is 15 minutes, while EET between DI-PAVLO for ABC2 is 13 minutes. In addition, EET from departure to PAVLO for ABC1 is 4:15 hour, while the EET for ABC2 is 5:30 hour.

2.37 In the case the two aircraft swap slot, potential result would be in Figure 13.

| C/S  | AWUT | WP    | FL  | ETO  |
|------|------|-------|-----|------|
| ABC1 | 1715 | DI    | 350 | 2117 |
|      |      | PAVLO | 350 | 2130 |
| ABC2 | 1545 | DI    | 350 | 2100 |
|      |      | PAVLO | 350 | 2115 |

Figure 13: Hypothetical Post-Swap Situation

2.38 The meeting should note from Figure 12 that, after swapping, ABC1's EET to PAVLO remains at 4:15 hour, while EET for ABC2 remains at 5:30 hour. However, EET between DI-PAVLO for ABC1 decreases from 15 minutes to 13 minutes. Meanwhile, EET for DI-PAVLO for ABC2 increases from 13 minutes to 15 minutes. This is so that both slots are conserved.

#### **Feature Group 1: Automatic Slot Compression**

2.39 In respect to the Automatic Slot Compression feature, the meeting is advised that this feature should be enabled on an "opt-in" basis. In other words, airline dispatchers would need to select "Optimize my slot by up to xx minutes before AWUT" on slot allocation details page for each aircraft requesting automatic compression.

2.40 This timeout can be selected by the airlines, but there should also be a default minimum number requirement from Air Traffic Management perspective as it would affect taxiing operations at the departure airport.

2.41 In any case, slot compression would need to be processed on a first-Kabul-entry-first-served basis after slot allocation changes are made by the airlines.

2.42 Automatic Slot Compression can be demonstrated by the following three cases with three aircraft in a "queue." In this case, ABC1 is in the front of the queue changing slot allocation.

2.43 The meeting is invited to note the Pre-Slot Compression slot allocation for Example 1 in Figure 14.

| C/S   | WP    | FL  | R-ETO | A- ETO | DLA |
|-------|-------|-----|-------|--------|-----|
| ABC1  | ROSIE | 350 | 2100  | 2100   | 0   |
| ABC2* | ROSIE | 350 | 2110  | 2115   | 5   |
| ABC3* | ROSIE | 350 | 2115  | 2130   | 15  |

Figure 14: Hypothetical Pre-Automatic Slot Compression Situation – Example 1

2.44 From Figure 14, the meeting is invited to note that ABC2 and ABC3 requested compression as denoted by “\*” symbol after call sign. Both aircraft were delayed due to them following ABC1.

| C/S   | WP    | FL  | R-ETO | A- ETO | DLA |
|-------|-------|-----|-------|--------|-----|
| ABC2* | ROSIE | 350 | 2110  | 2110   | 0   |
| ABC3* | ROSIE | 350 | 2115  | 2125   | 10  |

Figure 15: Hypothetical Post-Automatic Slot Compression Situation – Example 1

2.45 The meeting should note from Figure 15 depicting situation after automatic slot compression that delay for ABC2 and ABC3 were reduced by 5 minutes so that ABC2 no longer has delays. However, ABC3’s delay cannot be further reduced due to the aircraft following ABC2.

2.46 Situation in Example 2 in the case ABC2 is the only aircraft requesting compression is shown in Figure 16 and Figure 17

| C/S   | WP    | FL  | R-ETO | A- ETO | DLA |
|-------|-------|-----|-------|--------|-----|
| ABC1  | ROSIE | 350 | 2100  | 2100   | 0   |
| ABC2* | ROSIE | 350 | 2110  | 2115   | 5   |
| ABC3  | ROSIE | 350 | 2115  | 2130   | 15  |

Figure 16: Hypothetical Pre-Automatic Slot Compression Situation – Example 2

| C/S   | WP    | FL  | R-ETO | A- ETO | DLA |
|-------|-------|-----|-------|--------|-----|
| ABC2* | ROSIE | 350 | 2110  | 2110   | 0   |
| ABC3  | ROSIE | 350 | 2115  | 2130   | 15  |

Figure 17: Hypothetical Post-Automatic Slot Compression Situation – Example 2

2.47 From Figure 17, it can be shown that ABC2’s delay would be reduced to 0 as ABC1, the cause of ABC2’s delay, has changed slot allocation.

2.48 Situation in Example 3 where ABC2 did not request compression while ABC3 did is shown in Figure 18 and Figure 19.

| C/S   | WP    | FL  | R-ETO | A- ETO | DLA |
|-------|-------|-----|-------|--------|-----|
| ABC1  | ROSIE | 350 | 2100  | 2100   | 0   |
| ABC2  | ROSIE | 350 | 2110  | 2115   | 5   |
| ABC3* | ROSIE | 350 | 2115  | 2130   | 15  |

Figure 18: Hypothetical Pre-Automatic Slot Compression Situation – Example 3

| C/S   | WP    | FL  | R-ETO | A- ETO | DLA |
|-------|-------|-----|-------|--------|-----|
| ABC2  | ROSIE | 350 | 2110  | 2115   | 5   |
| ABC3* | ROSIE | 350 | 2115  | 2130   | 15  |

Figure 19: Hypothetical Post-Automatic Slot Compression Situation – Example 3

2.49 The meeting is invited to note that since ABC2 did not request compression, there is no room for ABC3's slot to be compressed resulting in no change made by Automatic Slot Compression algorithm.

### **Feature Group 2: Flight Plan and ATS Message Processing**

2.50 It is proposed that route fields and FIR boundary crossing EET information in field 18 (free text) of flight plans be processed along with departure messages to obtain target FIR boundary crossing time from departure to Kabul FIR entry.

2.51 The list of FIR boundary crossing time would also have attached with it waypoint and flight level requested in the flight plans. These estimates can also be updated based on departure messages and displayed to all involved for monitoring and traffic management purposes.

2.52 It is envisaged that availability of FIR boundary crossing times would enable collaborative decision making (CDM) process on a tactical level between units involved. An example of such CDM process is being developed to cater for Bangkok Suvarnabhumi Airport departures with BOBCAT slot allocation, which would ultimately contribute to smoother management of BOBCAT traffic, potentially alleviating issues related to EET inaccuracy as well as tactical ATC issues.

2.53 According to the AEROTHAI software engineering team, the feature could be implemented in sub-phases where the first phase would provide no flight plan correction, while the second phase provides the capability to modify flight plan if they are not properly formatted.

### **Feature Group 3: Slot Allocation Page Changes & Gate Delay Calculation**

2.54 *Smart Slot Allocation Refresh:* It is proposed that slot allocation refreshes on a faster interval than current three minutes when AWUT displayed in the page approaches. The faster rate needs to be specified by user after activating the feature.

2.55 *Pop-Out Slot Allocation Sections:* It is proposed that slot allocation page sections such as "Previously Used Slot Allocation" can be "popped out" into another separate window to assist all involved in monitoring changes in slot allocation.

2.56 *Adjustable Slot Allocation Refresh Interval:* It is proposed that slot allocation page refresh interval can be adjustable by user from current default of three-minute refresh.

2.57 *Gate Delay Calculation:* It is proposed that BOBCAT can display ATFM delay or Gate Delay which could be calculated by difference between final slot request's wheels-up time and first slot allocation AWUT after cut-off time (ATFM delay) as well as difference between first slot allocation AWUT and final slot allocation AWUT (reactionary delay) and displayed for information.

**Feature Group 4: Integration of Data Collection and Analysis**

2.58 It is proposed that ATFM traffic sample data collection and analysis could be further automated by enabling entry of ATFM traffic sample data via BOBCAT website from authorized ANSP users as well as generation of charts normally used for presentation at ICAO meetings.

**Feature Group 5: Flexible Taxi Time**

2.59 The meeting is advised that taxi-out time between various gates and runways for a particular can vary substantially. However, the current design of the BOBCAT system fixes one taxi-out time for each airport with a default of 15 minutes, enabling the airlines to add more taxi time.

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

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

**Expected Impact of Feature Groups and Development Time**

2.62 The meeting is invited to note expected impact of each feature group and expected development time summarized in Figure 20.

| Feature Group | Description   | Expected Impact   | Development Time |
|---------------|---|---|------------------|
| 1             | Slot Swapping & Automatic Slot Compression            | More flexible and responsive slot allocation mechanism              | High             |
| 2             | Flight Plan and ATS Messages Processing               | Higher chance of obtaining slot allocation Flight Levels            | Medium           |
| 3             | Slot Allocation Page Changes & Gate Delay Calculation | Lower slot allocation monitoring workload                           | Low              |
| 4             | Integration of Data Collection and Analysis           | More visible comparison of slot allocation result and real traffic  | Medium – High    |
| 5             | Flexible Taxi Time                                    | More flexible off-block, taxiing and departures from major airports | Low – Medium     |

Figure 20: Expected Impact and Development Time for each Feature Group

Collaborative Decision Making Development at Bangkok Suvarnabhumi Airport

2.63 The meeting is invited to note internal AEROTHAI development effort on sharing departures planning information among Bangkok Suvarnabhumi Tower, Bangkok ACC and Bangkok ATFMU in accordance to Collaborative Decision Making (CDM) principle using real-time web-based technology.

2.64 CDM development for Suvarnabhumi departures would leverage flight plan and ATS messages (mainly departure message), BOBCAT slot allocation and Taxi-Out time database for Suvarnabhumi Airport.

2.65 Flight plan and ATS messages processing will use the same technology that would be integrated in Feature Group 2 of BOBCAT software update in advance based on flight plans received by the Bangkok ATFMU.

2.66 Taxi-Out time database is put together based on experience gained from participation in CANSO Global Benchmarking activities in relation to quality of service measurements.

2.67 It is anticipated that the technology can be applicable for CDM process at other major departure airports managing BOBCAT departures as well as departures without ATFM slot.

2.68 It is expected that the CDM process would assist in streamlining off-block time, wheels-up time and flight level used for exiting the Bangkok FIR for flights with BOBCAT slot with a target trial timeframe some time in Q4 2010.

2.69 While changes made in the CDM process would be quite invisible to airlines, it is anticipated that airlines would be requested to provide Departure Flexibility Window, the earliest and latest departure time which would still allow the flight to reach the Kabul FIR in accordance to BOBCAT slot allocation. This information could then be shared among tactical ATM units involved to ensure smoother traffic handling.

Migration of BOBCAT System to New Servers

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

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

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

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

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

### 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the data collated by the Bangkok ATFMU;
- b) Discuss data collection results;
- c) Consider appropriate remedial actions;
- d) Encourage all involved to forward flight plan and ATS messages on flights related to BOBCAT to the Bangkok ATFMU at AFTN address VTBBZDZX;
- e) Congratulate all involved on AWUT compliance progress, while there remains room for further enhancements;
- f) Confirm configuration related to Slot Swapping requirements in respect to minimum time difference between AWUT and time of slot swapping;
- g) Confirm automatic slot compression requirements in terms of timeout ahead of AWUT when slot compression should not be done by default;
- h) Confirm development priority among the five (5) proposed feature groups;
- i) Note development of Collaborative Decision Making process at Bangkok Suvarnabhumi Airport;
- j) Advise airlines to be prepared to provide Departure Flexibility Window for use in the CDM process;
- k) Note upcoming BOBCAT transition to the new server on 18 November 2010

between 0030UTC and 0330UTC;

- l) Encourage all involved to participate in testing of BOBCAT software in the new server between 11 October 2010 and 17 November 2010; and,
- m) Confirm the need to adjust slot allocation cut-off time on the test BOBCAT server during testing time between 11 October 2010 and 17 November 2010.

----- end -----