International Civil Aviation Organization

The Sixth Meeting of ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/6)

Bangkok, Thailand, 06 – 10 June 2016

Agenda Item 4: Review of Current CDM/ATFM Operations and Problem Areas

BOBCAT OPERATIONAL UPDATE

(Presented by Thailand)

SUMMARY

The purpose of this paper is to present an operational analysis and overview of westbound flights through the Kabul FIR associated with the BOBCAT system from the commencement of its ATFM operation in July 2007 to March 2016, encompassing implementation of enhanced Flexible Use of Airspace (FUA) in Afghanistan and full implementation of RNP10 50NM Separation on 30 September 2015.

1. INTRODUCTION

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

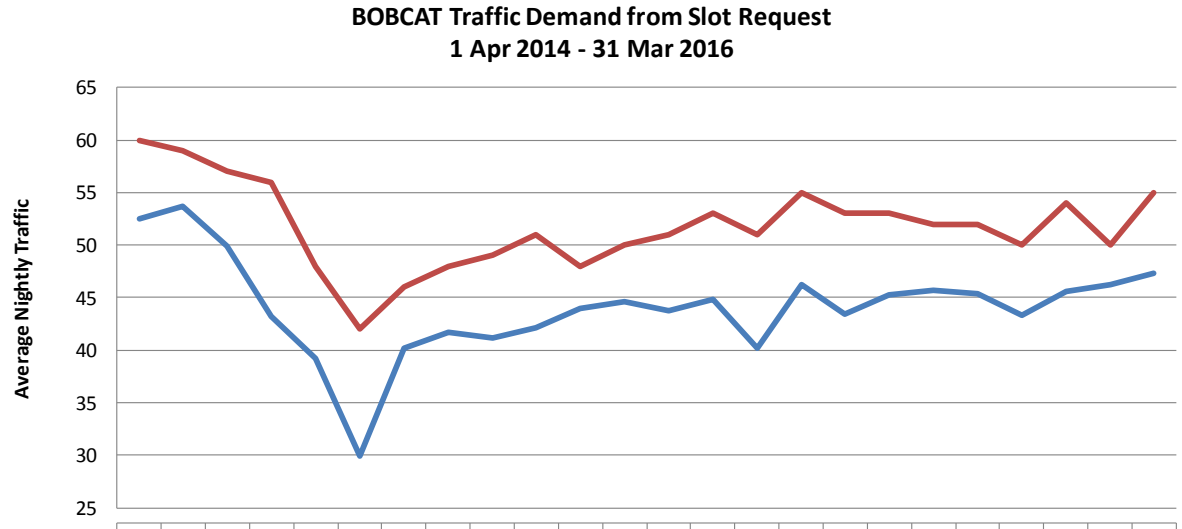
1.2 It was agreed at the ATFM/TF/13 meeting held in September 2009 that sample monthly traffic data would be collected by all States in the third week of each month, sent to the ATFMU and analyzed by the BOBCAT Development Team for presentation to the periodic meetings of the ATFM/TF, which was later dissolved by APANPIRG/20 decision. Thenceforth, BOBCAT matters were followed up at SAIOACG meetings.

1.3 It was discussed at the SAIOACG/5 that Action Items related to ATFM Operations for Afghanistan airspace (Kabul FIR) should be reported to the ATFM/SG meetings.

2. DISCUSSION

2.1 During the eight (8) year period from the start of operational implementation of BOBCAT in July 2007 to March 2016;BOBCAT operations, based on IATA estimate, has contributed to over 115 million kilograms of fuel saving or approximately 460 million kilograms of carbon dioxide emissions.

2.2 The meeting is invited to note the summary of BOBCAT Slot Request volume received between April 2014 and March 2016 in **Figure 1**.



	Apr 14	May 14	Jun 14	Jul 14	Aug 14	Sep 14	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15	Mar 15	Apr 15	May 15	Jun 15	Jul 15	Aug 15	Sep 15	Oct 15	Nov 15	Dec 15	Jan 16	Feb 16	Mar 16
Average	53	54	50	43	39	30	40	42	41	42	44	45	44	45	40	46	43	45	46	45	43	46	46	47
Peak	60	59	57	56	48	42	46	48	49	51	48	50	51	53	51	55	53	53	52	52	50	54	50	55

Figure 1: BOBCAT Traffic Demand from Slot Request

2.3 The meeting is also invited to note that the number of airlines involved has increased slightly to 60 airlines. Top 12 airlines involved are illustrated in **Figure 2**.

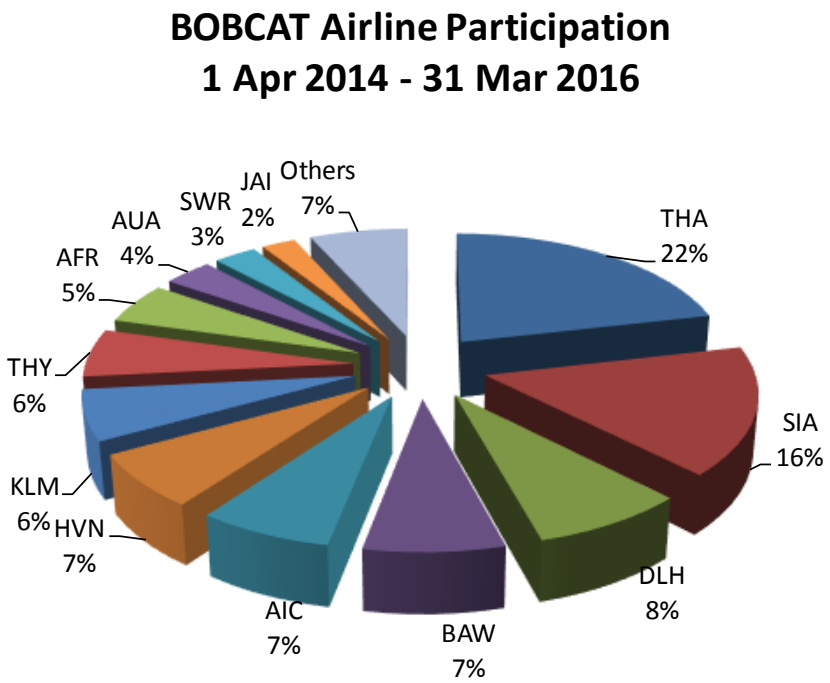


Figure 2: BOBCAT Airline Participation

2.4 The meeting is invited to note that 8 major airports continue to contribute 98 percent of total BOBCAT traffic based on April 2014 – March 2016 data as illustrated in **Figure 3**.

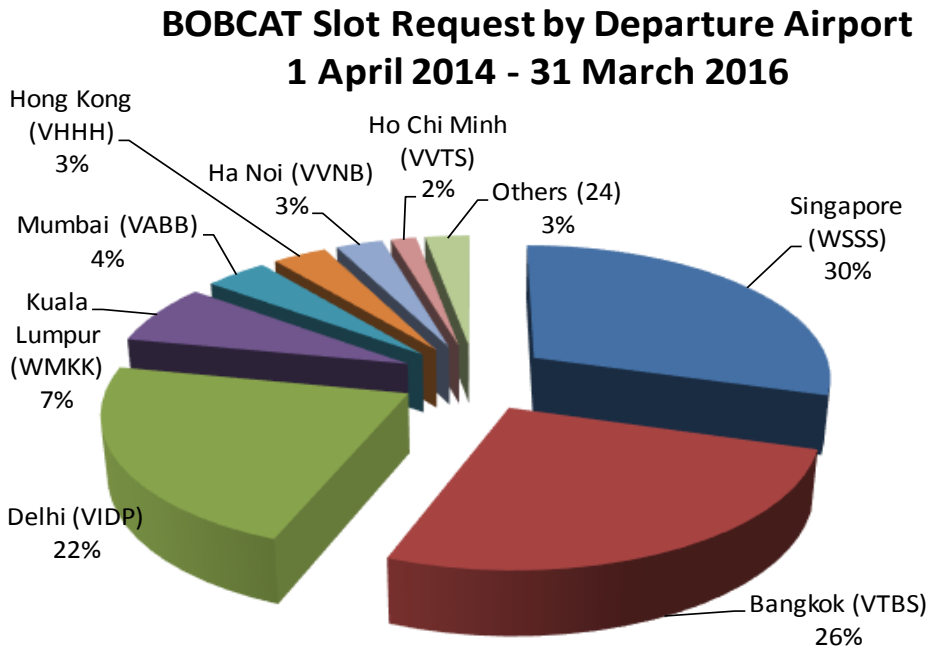


Figure 3: BOBCAT Slot Request by Departure Airports

Cut-off Time Slot Allocation Release Performance

2.5 As more major airports involved in facilitating flight departures based on BOBCAT AWUT begin to adopt Airport Collaborative Decision Making (A-CDM), the demand for timely release of BOBCAT Slot Allocation increases to ensure aircraft operators can submit flight plans at least 3 hours before Estimated Off-Block Time (EOBT). Accordingly, Bangkok ATFMU began monitoring, as an additional performance indicator, the percentage of days in each month in which BOBCAT Slot Allocation is released within 10 minutes after the cut-off time. The data for the period between January – April 2016 is shown in **Figure 4**.

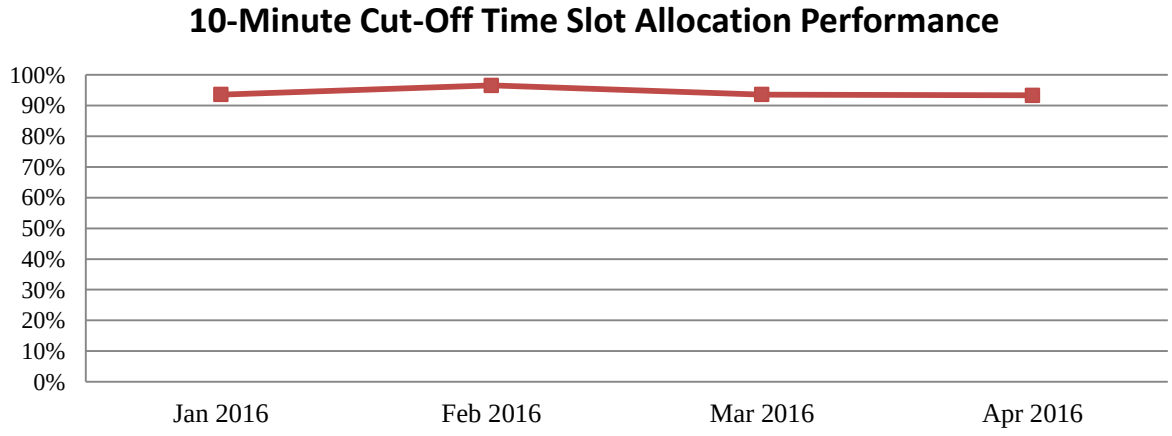


Figure 4: *Ten-Minute Cut-off Time Slot Allocation Release Performance*

Traffic Sample Data and Post-Operational Analysis

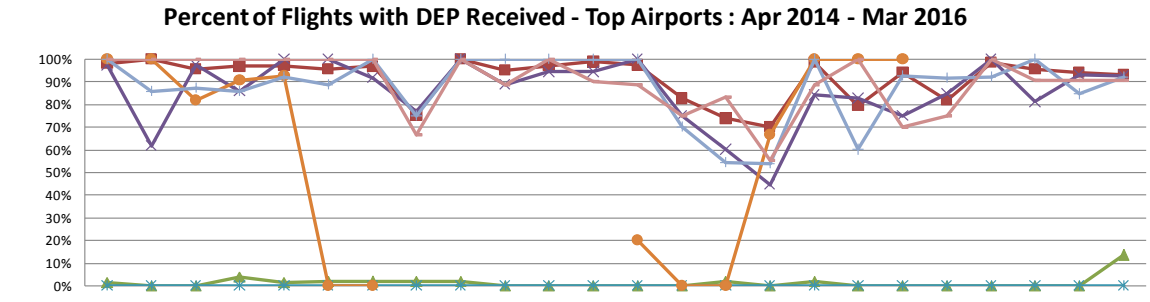
The meeting should be advised that one-week Traffic Sample Data used in post-operational analyses is collected from member ANSPs on the week starting with the third Sunday of each month.Addressing of Flight Movement Message

2.6 In accordance to Action Item BBACG-20/1 (updated at SAIOACG/3), States were requested to ensure that flight plans and movement messages (DEP, CHG, CNL, etc) for flights subjecting to ATFM measures (e.g. BOBCAT AWUT) are sent via AFTN to Bangkok ATFMU (VTBBZDZX).

2.7 Accordingly, as part of the Post-Operational Analysis, Bangkok ATFMU continuously monitors the percentage of flights whose DEP messages were received with data summarized in **Figure 5** and **Figure 6**.

2.8 The meeting should be reminded that flight movement messages should continue to be forwarded to the Bangkok ATFMU via AFTN (VTBBZDZX). Additinally, for Post-Operational Analysis purpose, monthly one-week Traffic Sample Data from concerned ANSPs should also contain departure times from relevant aerodromes.

2.9 Additionally, it should be noted that there are flights departing Hong Kong (VHHH) to / through Afghanistan only during summer season (April – October) with 1 – 2 departures with BOBCAT Slot Allocation per night. This results in substantial fluctuation of VHHH DEP message statistics as shown on the figures.



	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016
WSSS	98%	100%	96%	97%	97%	96%	97%	75%	100%	95%	97%	99%	98%	83%	74%	70%	99%	79%	94%	82%	99%	96%	94%	93%
VIDP	1%	0%	0%	4%	1%	2%	2%	2%	2%	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%	0%	13%
WMKK	97%	62%	97%	86%	100%	100%	92%	77%	100%	89%	94%	94%	100%	75%	60%	44%	84%	83%	75%	85%	100%	81%	93%	93%
VABB	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
VHHH	100%	100%	82%	91%	93%	0%	0%						20%	0%	0%	67%	100%	100%	100%					
VVNB	100%	86%	88%	86%	92%	89%	100%	75%	100%	100%	100%	100%	100%	70%	55%	54%	100%	60%	93%	92%	92%	100%	85%	92%
VVTS	100%	100%	100%	100%	100%	100%	100%	67%	100%	89%	100%	90%	89%	75%	83%	56%	89%	100%	70%	75%	100%	91%	91%	91%

Figure 5: Percent of Flights with DEP Message Received - Top Airports: Apr 2014 - Mar 2016

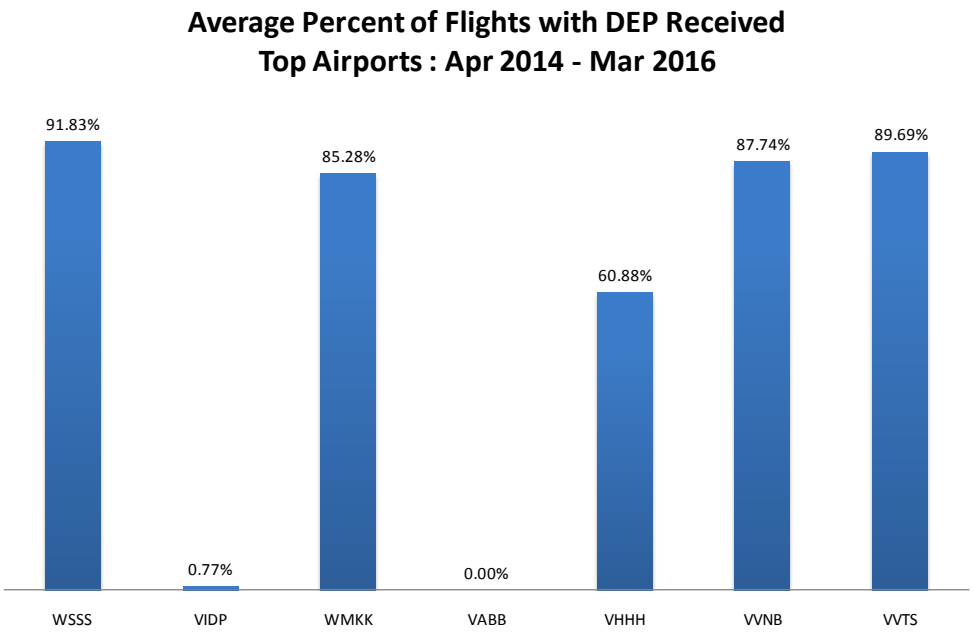


Figure 6: Average Percent of Flights with DEP Message Received - Top Airports: Apr 2014 - Mar 2016

Preferred Flight Levels

2.10 Post-Operational Analysis continues to indicate high percentage of flights operating through the Kabul FIR with the same or better flight levels as those requested, as indicated in **Figure 7**. Overall, the percentage of flights with same or better flight levels are continuously in the range of 83 – 93 percent

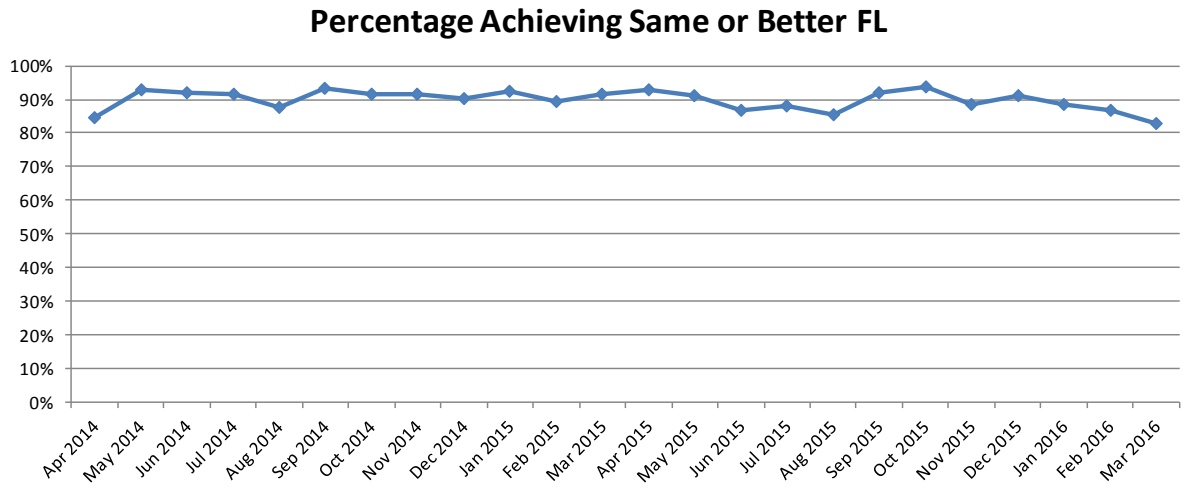
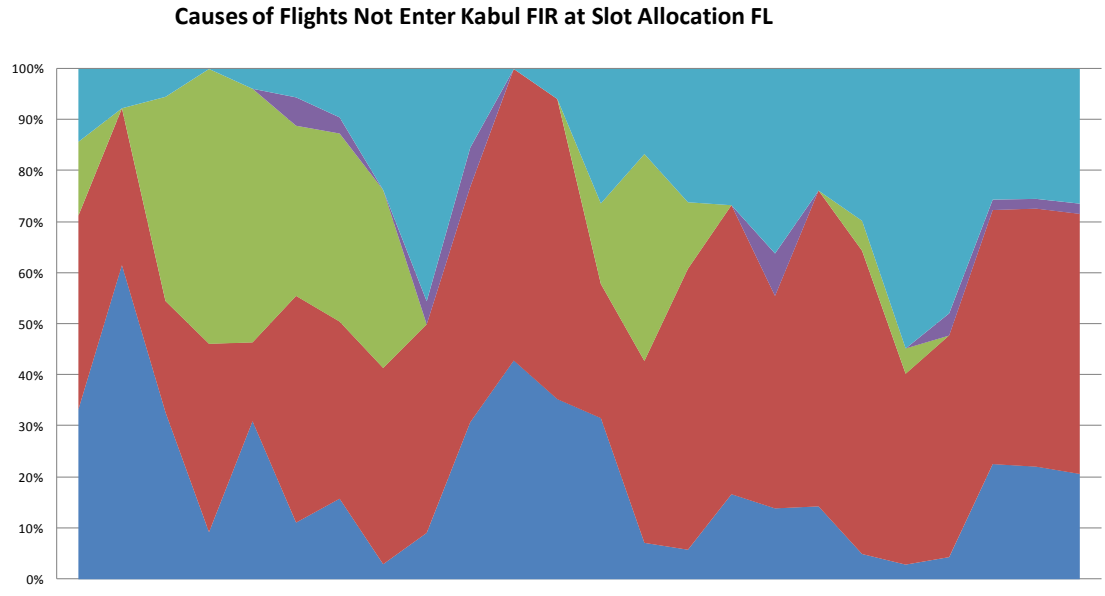


Figure 7: Percentage Achieving Same or Better FL (Apr 2014 – Mar 2016)

2.11 **Figure 8** shows the analysis result on major causes of aircrafts not being able to enter Afghanistan at flight levels in accordance to those specified by BOBCAT Slot Allocation between April 2014 – March 2016.



	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016
Unknown	9%	4%	5%	0%	4%	8%	15%	36%	45%	13%	0%	5%	31%	28%	30%	25%	34%	24%	32%	58%	48%	21%	21%	22%
No Slot	0%	0%	0%	0%	0%	8%	5%	0%	5%	6%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	4%	2%	2%	2%
Tactical ATC Issue	9%	0%	33%	49%	46%	50%	58%	54%	0%	0%	0%	0%	19%	68%	15%	0%	0%	0%	6%	5%	0%	0%	0%	0%
EET Inaccuracy Issue	23%	17%	18%	33%	14%	67%	55%	59%	41%	38%	18%	50%	31%	60%	63%	53%	39%	62%	63%	39%	43%	41%	42%	42%
Departures Punctuality	20%	33%	27%	8%	29%	17%	25%	5%	9%	25%	14%	30%	38%	12%	7%	16%	13%	14%	5%	3%	4%	19%	18%	17%

Figure 8: Causes of Flight Not Entering Kabul FIR at Slot Allocation FL

2.12 As shown, major causes for aircrafts being unable to achieve preferred flight levels are:

a) EET inaccuracy: 42 percent

b) Tactical ATC issues: 18 percent

c) Departures punctuality: 17 percent

d) Departure without Slot Allocation: 2 percent

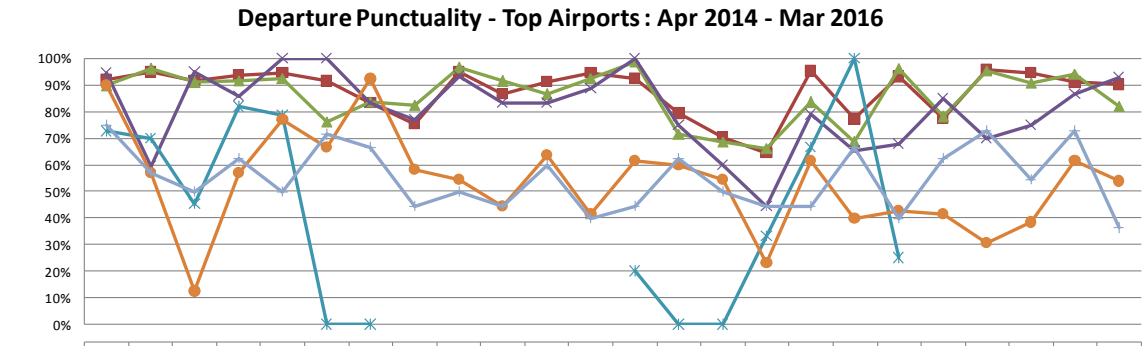
e) Unknown (more data required): 22 percent

2.13 It can be observed from **Figure 8**, there is a significant trend that EET inaccuracy is the major cause of flights not being able to enter Afghanistan airspace at the flight levels specified by Slot Allocation. This is a significant trend change from previous reports when departures punctuality was the major cause of flights not operating in accordance to Slot Allocation Flight Level.

2.14 Airlines and ANSPs should thus be reminded of the importance of accurate flight performance. **Aircrafts should, where possible, attempt to cross the entry waypoint into Afghanistan airspace within the 5-minute window after the Estimated Time Over (ETO) specified by BOBCAT Slot Allocation**.

Departures Punctuality

2.15 Prior to this round of Post-Operational Analysis, the major cause of flights not being able to enter Afghanistan airspace at the allocated flight levels was due to departure punctuality with respect to AWUT. The analysis on departure punctuality continues to be carried out for this period of April 2014 – March 2016 in accordance to Action Item BBACG-20/3 (updated in SAIOACG/5 and transferred to ATFM/SG), with summary shown in **Figure 9** and **Figure 10**.



	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016
WSSS	92%	95%	92%	94%	95%	91%	83%	75%	95%	87%	91%	95%	93%	79%	70%	64%	95%	77%	93%	78%	96%	95%	91%	90%
VTBS	90%	96%	91%	92%	93%	76%	84%	83%	96%	91%	86%	93%	99%	72%	69%	66%	84%	68%	96%	78%	95%	91%	94%	82%
WMKK	95%	60%	95%	86%	100%	100%	83%	77%	93%	83%	83%	89%	100%	75%	60%	44%	79%	65%	68%	85%	70%	75%	87%	93%
VHHH	73%	70%	45%	82%	79%	0%	0%						20%	0%	0%	33%	67%	100%	25%					
VVNB	90%	57%	13%	57%	77%	67%	92%	58%	55%	44%	64%	42%	62%	60%	55%	23%	62%	40%	43%	42%	31%	38%	62%	54%
VVTS	75%	57%	50%	63%	50%	71%	67%	44%	50%	44%	60%	40%	44%	63%	50%	44%	44%	67%	40%	63%	73%	55%	73%	36%

Figure 9: Departure Punctuality - Top Airports: Apr 2014 – Mar 2016

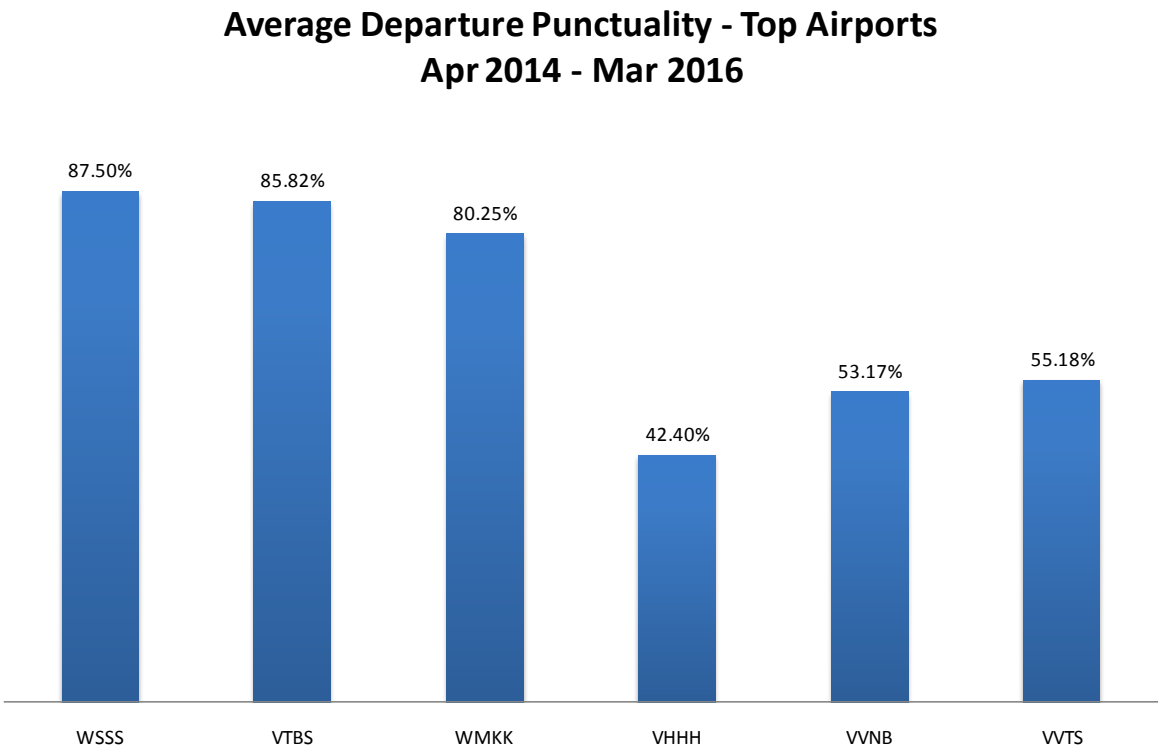


Figure 10: Average Departure Punctuality - Top Airports: Apr 2014 – Mar 2016

2.16 It should be noted that departure compliance at various airports can still be improved. However, for airports with less amount of traffic, AWUT adherence responsibility may fall on aircraft operators.

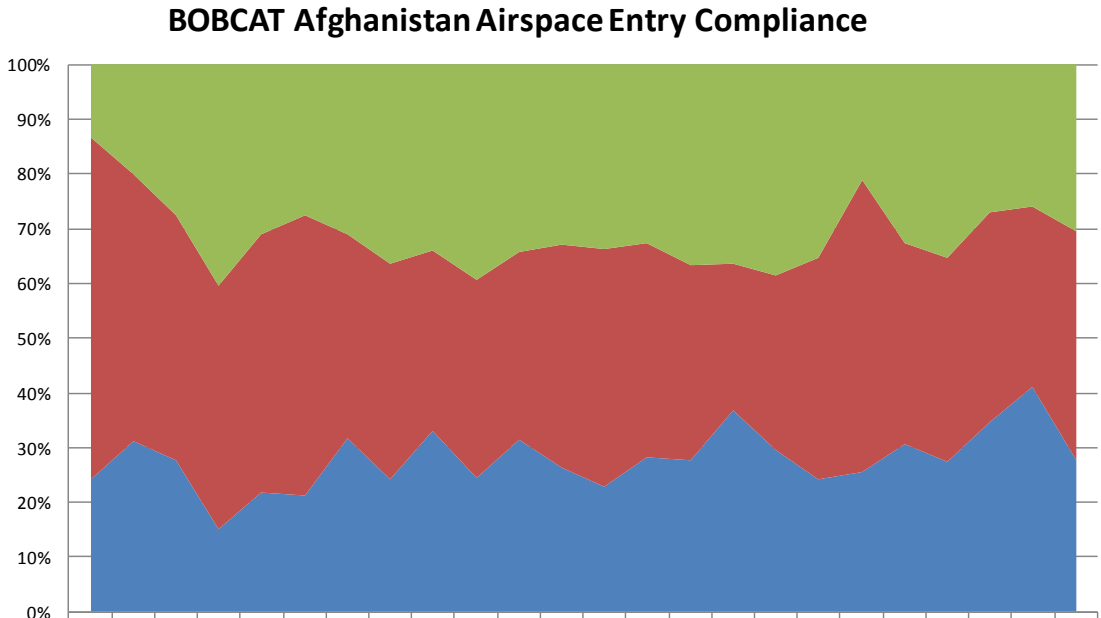
Afghanistan Airspace Entry Compliance

2.17 The meeting would recall that BOBCAT Slot Allocation is generated on the basis that flights are expected to enter Afghanistan airspace at the specified entry waypoints within the window of 5 minutes after Estimated Time Over (ETO).

2.18 **Figure 11** shows the statistical analysis summary of entry compliance on the traffic sample data between the period of April 2014 – March 2016.

2.19 It can be seen that, on average, only 28 percent of flights enter Afghanistan airspace within 5 minutes after ETOs. This is largely in line with indication that EET inaccuracy has become the most significant cause of flights not entering the Kabul FIR in accordance to allocated flight levels.

2.20 This implies that, in the short term, the current 5-minute buffer window cannot be further reduced. Despite low level of entry time compliance, however, over 80 – 90 percent of flights are still able to achieve the same or better flight levels compared to those allocated by BOBCAT upon entering Afghanistan airspace.



	Apr 14	May 14	Jun 14	Jul 14	Aug 14	Sep 14	Oct 14	Nov 14	Dec 14	Jan 15	Feb 15	Mar 15	Apr 15	May 15	Jun 15	Jul 15	Aug 15	Sep 15	Oct 15	Nov 15	Dec 15	Jan 16	Feb 16	Mar 16
Late	13%	20%	28%	41%	31%	27%	31%	36%	34%	39%	34%	33%	34%	33%	37%	37%	39%	35%	21%	33%	35%	27%	26%	30%
Early	63%	49%	45%	44%	47%	51%	37%	39%	33%	36%	34%	41%	43%	39%	36%	27%	32%	40%	53%	37%	37%	39%	33%	42%
Compliance	24%	31%	28%	15%	22%	21%	32%	24%	33%	25%	31%	26%	23%	28%	28%	37%	30%	24%	26%	31%	28%	35%	41%	28%

Figure 41: Afghanistan Airspace Entry Compliance: Apr 2014 – Mar 2016

ATFM Delay

2.21 Recalling that ATFM Delay is defined as the difference between last estimated take-off time submitted with Slot Request and first allocated take-off time through Slot Allocation (AWUT or CTOT in accordance to ICAO APAC Regional Framework for Collaborative ATFM), **Figure 12**

shows average nightly ATFM Delays and associated average traffic demand volume based on the number of slot requests.

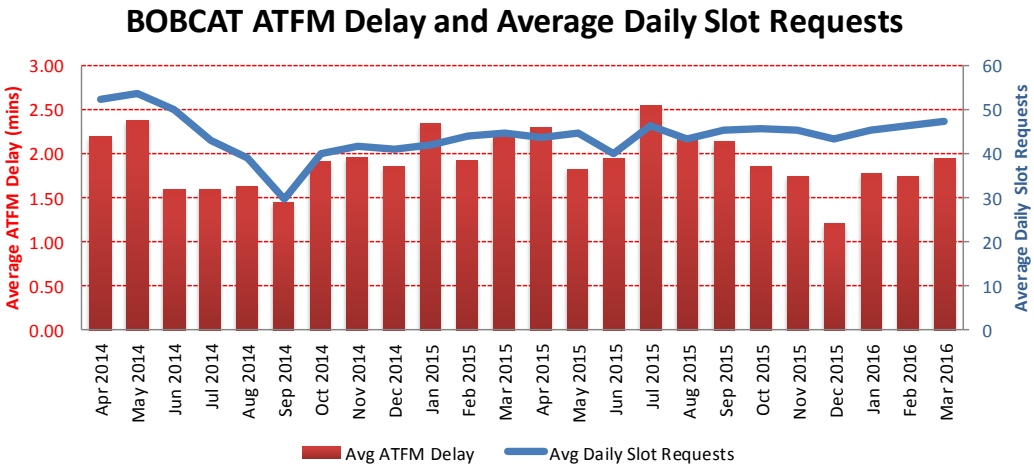


Figure 5: ATFM Delay and Average Daily Slot Request Traffic Demand: Apr 2014 – Mar 2016

2.22 It can be observed that there is some correlation between the traffic volume (slot requests) and the amount of ATFM Delay. A decrease in slot request count seems to be correlated with reduced average ATFM delay.

2.23 The meeting should be reminded that Flexible Use of Airspace (FUA) in Afghanistan came into effect starting 30 September 2015, resulting in FL300 being available for civil flights and Special Use Airspace becoming active only with 3-hour advance notification. Additionally, RNP10 50NM longitudinal separation was also introduced on all routes through the airspace. Both the use of FUA and the reduced separation have enhanced the airspace capacity significantly.

2.24 In order to support increased airspace access, the BOBCAT system was reconfigured to enable slot allocation as shown in **Figure 13**.

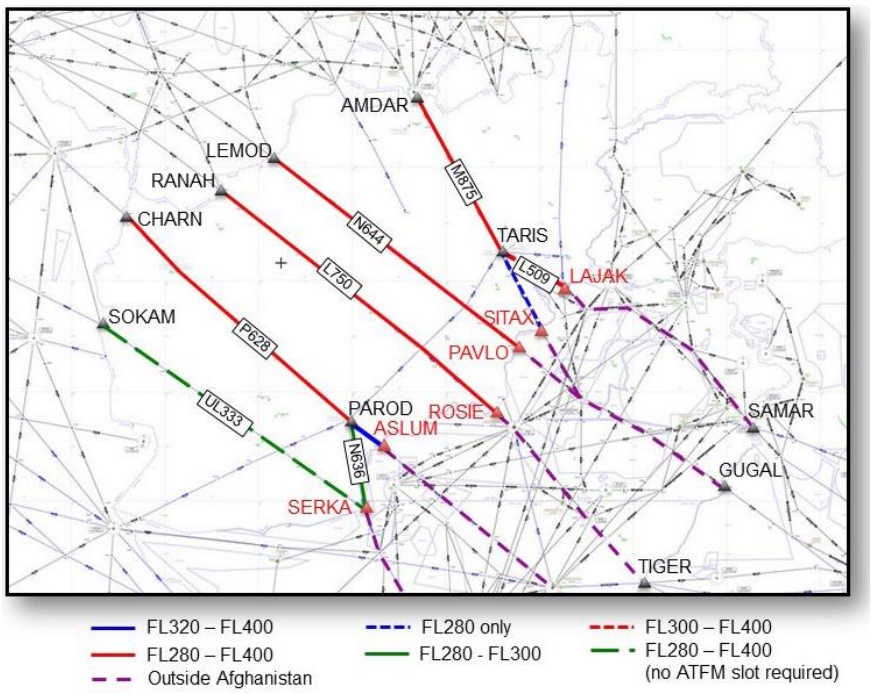


Figure 6: Afghanistan Airspace Configuration: 30 September 2015

2.25 Accordingly, analysis of ATFM Delay in October 2015 – March 2016 showed an **average of 16 percent decrease of ATFM Delay** when compared to the same period in 2014-2015. This is **associated with an average of 8 percent increase of slot request traffic demand** from same period in 2014-2015.

3 ACTION BY THE MEETING

3.3 The meeting is invited to:

a) note the data collated by the Bangkok ATFMU;

b) discuss data collection results; and,

c) discuss relevant matters as appropriate.

……