International Civil Aviation Organization

The Combined Tenth Meeting of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/10) and Twenty—Seventh Meeting of the South-East Asia ATS Coordination Group (SEACG/27)

Video Teleconference, 29 March – 02 April 2021

Agenda Item 4: Implementation of CNS/ATM Systems

BOBCAT OPERATIONAL UPDATES

(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 for the two-year period between January 2019 to December 2020.

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.

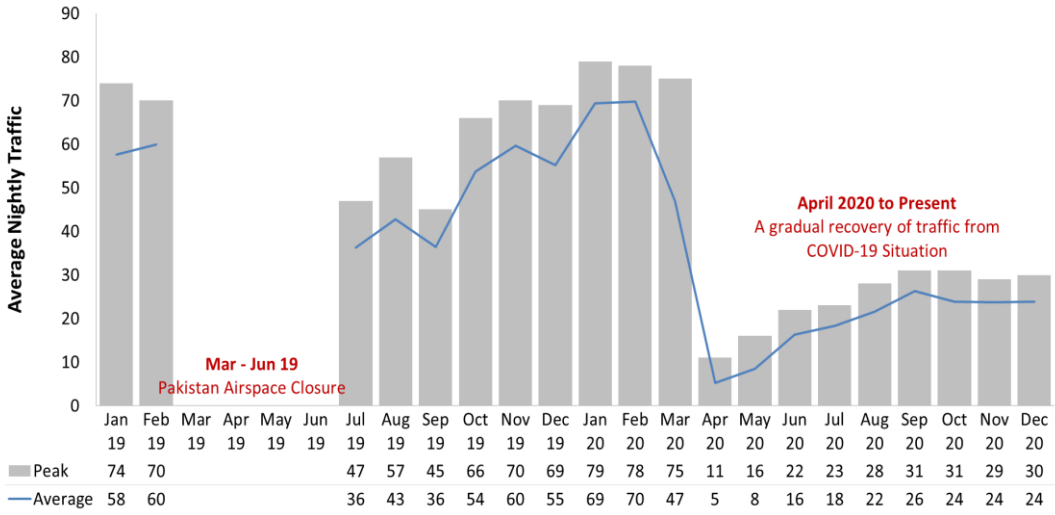
1.2 It was agreed at the ATFM/TF/13 meeting held in September 2009 that monthly traffic sample data would be collected by all affected States in the third week of each month, sent to Bangkok ATFMU and analyzed by the Bangkok ATFMU for presentation to the periodic meetings of the ATFM/TF, which was later 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. Accordingly, the latest post-operations analysis results are presented here for information and discussion.

2. DISCUSSION

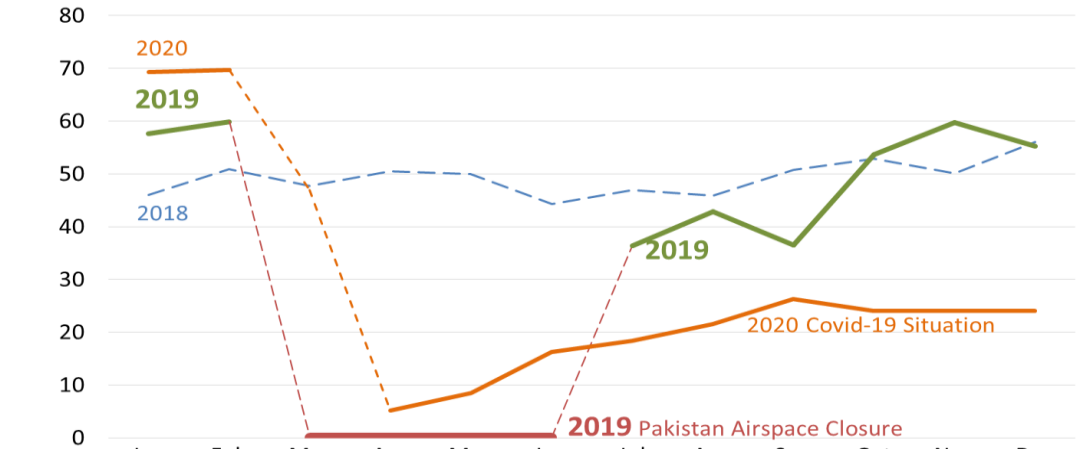
2.1 During the 13-year period from the start of operational implementation of BOBCAT in July 2007 to February 2021; BOBCAT operations, based on IATA estimate, has contributed to over 164 million kilograms of fuel saving or approximately 670 million kilograms of carbon dioxide emissions.

2.2 The meeting is invited to note the summary of BOBCAT Slot Request volume received between January 2019 and December 2020 in **Figure 1**.



	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20	Apr 20	May 20	Jun 20	Jul 20	Aug 20	Sep 20	Oct 20	Nov 20	Dec 20
Peak	74	70					47	57	45	66	70	69	79	78	75	11	16	22	23	28	31	31	29	30
Average	58	60					36	43	36	54	60	55	69	70	47	5	8	16	18	22	26	24	24	24

Figure 1: BOBCAT Traffic Demand from Slot Request: January 2019 – December 2020



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	46	51	48	51	50	44	47	46	51	53	50	56
2019	58	60	0	0	0	0	36	43	36	54	60	55
2020	69	70	47	5	8	16	18	22	26	24	24	24

Figure 2: BOBCAT Traffic Demand from Slot Request: January 2018 – December 2020

Note: Pakistan Airspace Closure: 27 Feb 19 – 15 Jul 19 and Covid-19 Situation: since Apr 20

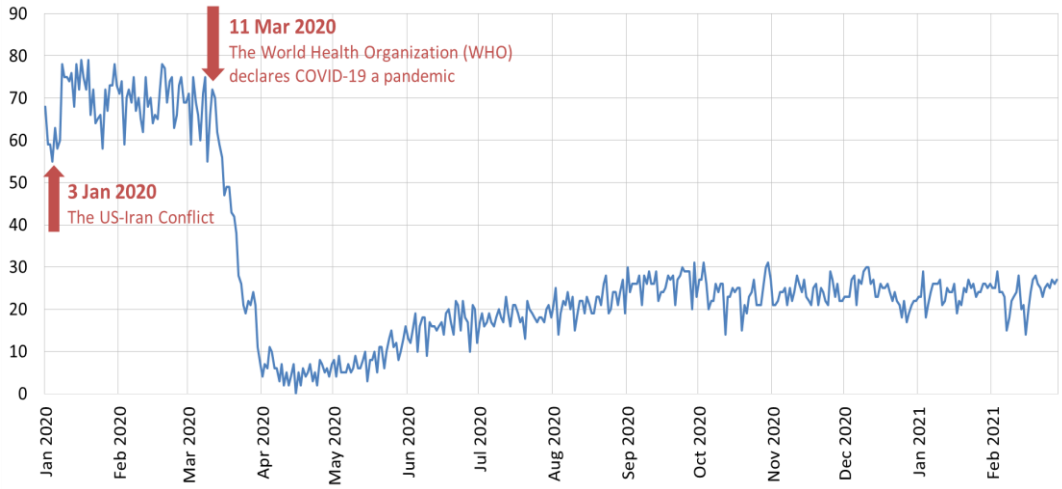


Figure 3: BOBCAT Traffic Demand from Slot Request: 1 January 2020 – 28 February 2021

2.3 As can be observed from **Figure 2** and **Figure 3** traffic through Afghanistan airspace, when compared to traffic in 2018 and 2019, continues to recover from COVID-19 decrease from April 2020. Since October 2020, average traffic demand per night continue to remain at 24 flights within the four-hour BOBCAT operational hours which is still less than half of similar months in 2018 and 2019.

2.4 The meeting is also invited to note that the number of airlines involved between January 2019 and December 2020 are 39 airlines. Top 10 airlines involved are illustrated in **Figure 4**.

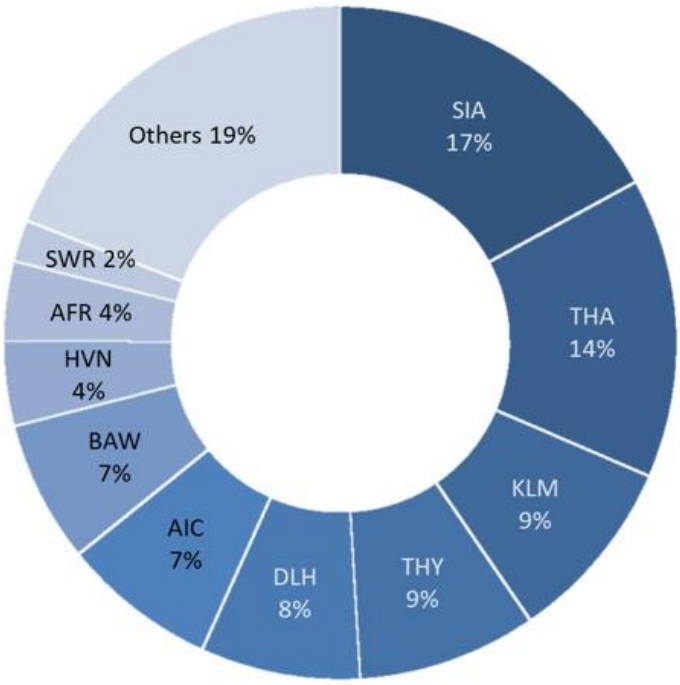


Figure 4: BOBCAT Airline Participation: January 2019 – December 2020

2.5 The meeting is invited to note that 42 airports continue to contribute total BOBCAT traffic based on January 2019 and December 2020 data as illustrated in **Figure 5**.

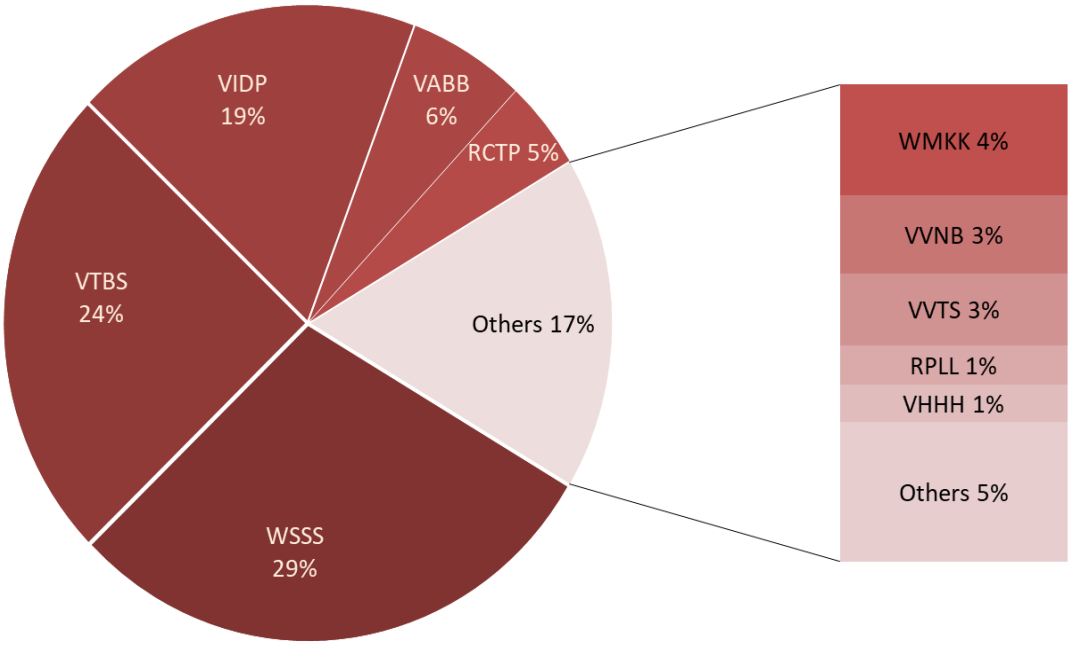


Figure 5: BOBCAT Slot Request by Departure Airports: January 2019 - December 2020

Timeliness of Slot Allocation Release

2.6 As more major airports involved in facilitating flight departures based on BOBCAT CTOT 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 2019 and December 2020 is shown in **Figure 6**.

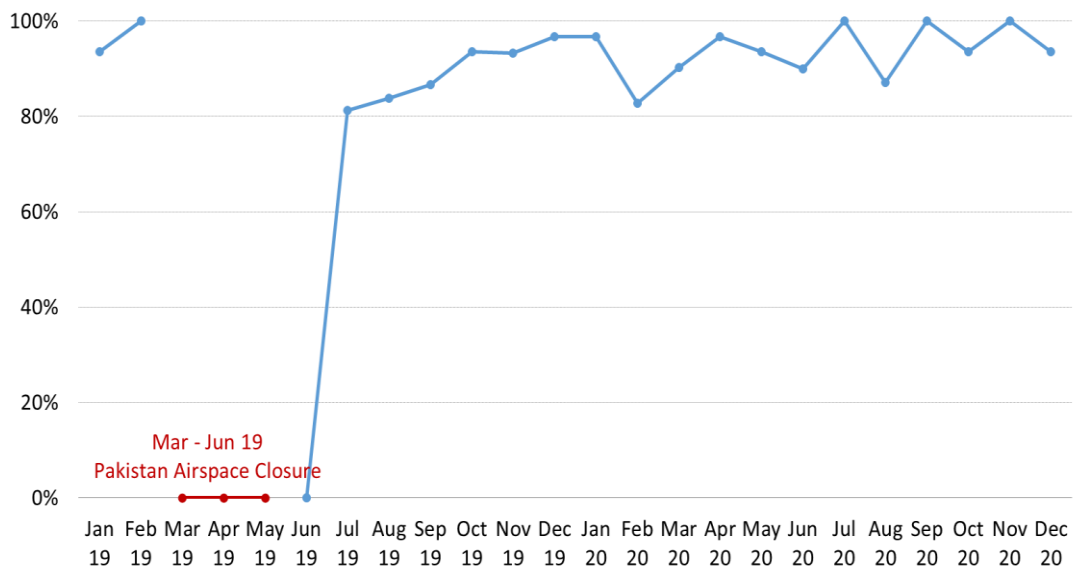


Figure 6: Ten-Minute Cut-off Time Slot Allocation Release Performance: January 2019 - December 2020

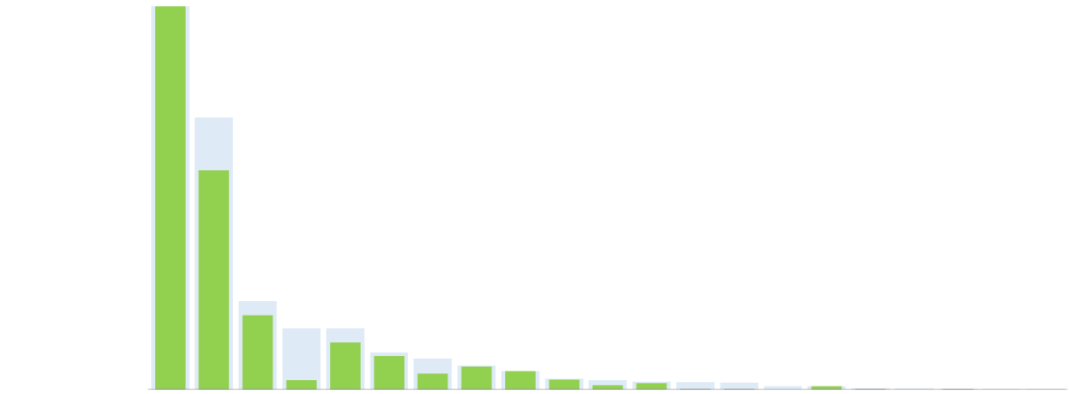
Traffic Sample Data and Post-Operational Analysis

2.7 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

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

2.9 The meeting should be reminded that flight movement messages should continue to be forwarded to the Bangkok ATFMU via AFTN (VTBBZDZX). It should also be noted that States failing to ensure proper transmission of movement messages, in particular, departure messages (DEP), may be given APANPIRG Air Navigation Deficiencies as per APANPIRG Conclusion 27/12. Additionally, for Post-Operational Analysis purpose, monthly one-week Traffic Sample Data from concerned ANSPs should also contain departure times from relevant aerodromes.



	WSSS	VIDP	VABB	RCTP	WMKK	VVTS	VVNB	RPLL	VHHH	WBSB	ZGGG	WADD	VGHS	VOBL	VOMM	WIII	VIAR	YPPH	OPIS	OPLA	VOCI
Total Flight	1439	853	276	192	191	115	97	74	58	34	29	24	23	21	10	10	4	4	2	1	1
Total DEP Received	1336	687	232	29	147	105	49	72	57	30	13	19	1	2	0	10	1	0	2	0	0
% DEP Received	93%	81%	84%	15%	77%	91%	51%	97%	98%	88%	45%	79%	4%	10%	0%	100%	25%	0%	100%	0%	0%

Figure 7: Average Percent of Flights with DEP Message Received: January 2019 - December 2020

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 8**. Overall, the percentage of flights with same or better flight levels are continuously in the range of 84 – 95 percent.

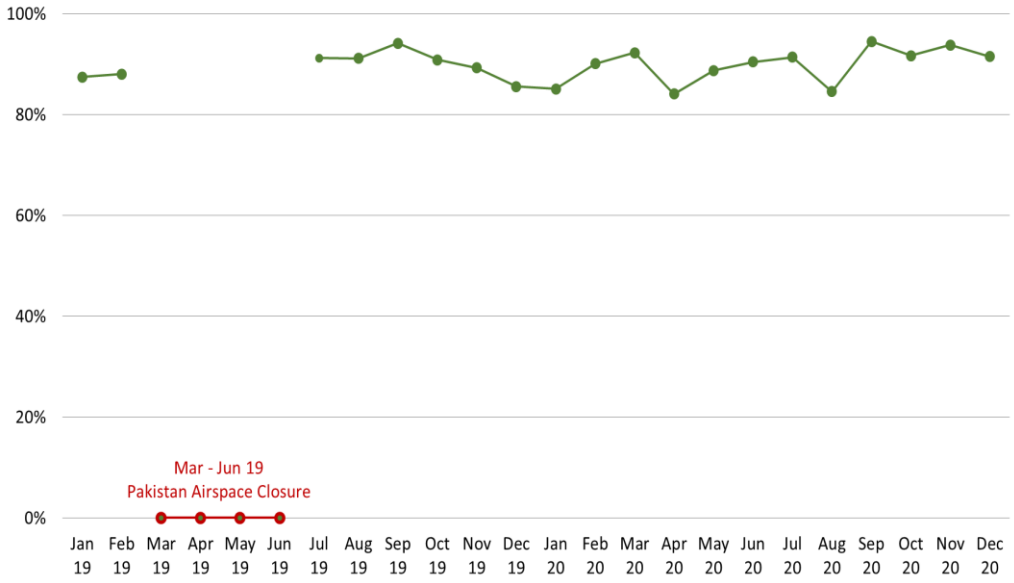


Figure 8: Percentage Achieving Same or Better FL: January 2019 - December 2020

2.11 **Figure 9** 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 January 2019 and December 2020.

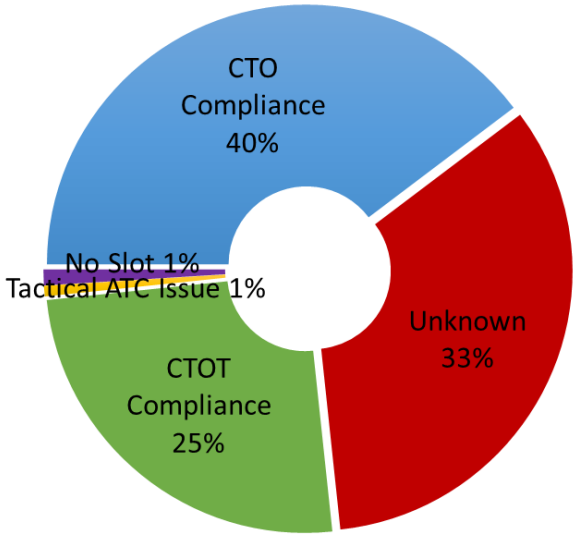


Figure 9: Causes of Flight Not Entering Kabul FIR at Slot Allocation FL: January 2019 - December 2020

2.12 As shown in **Figure 9**, major causes for aircrafts being unable to achieve preferred flight levels are:

a) Kabul FIR Entry Time (CTO) Compliance: 40 percent

b) Unknown (more data required): 33 percent

c) Departures Punctuality (CTOT Compliance): 25 percent

d) Tactical ATC issues: 1 percent

e) Departure without Slot Allocation: 1 percent

2.13 The figure shows that leading major cause for FL difference is Kabul FIR entry-time (CTO) compliance (40%). This situation may arise from factors such as weather variations, tactical ATC operations, or inaccurate provision of estimate elapse time in the flight plan.

2.14 Airlines and ANSPs should note the importance of compliance with allocated Kabul FIR entry-time slot. **Flights should, where possible, attempt to cross the entry waypoint into Kabul FIR within the 5-minute window after the Calculated Time Over (CTO) specified by BOBCAT Slot Allocation (CTO+5)**.

CTOT Compliance

2.15 Prior to this round of Post-Operational Analysis, the major cause of flights not being able to enter Kabul FIR at the allocated flight levels was due to departure punctuality with respect to CTOT. The analysis on departure punctuality continues to be carried out for in January 2019 - December 2020 accordance to Action Item BBACG-20/3 (updated in SAIOACG/5 and transferred to ATFM/SG), with summary shown in **Figure 10**.

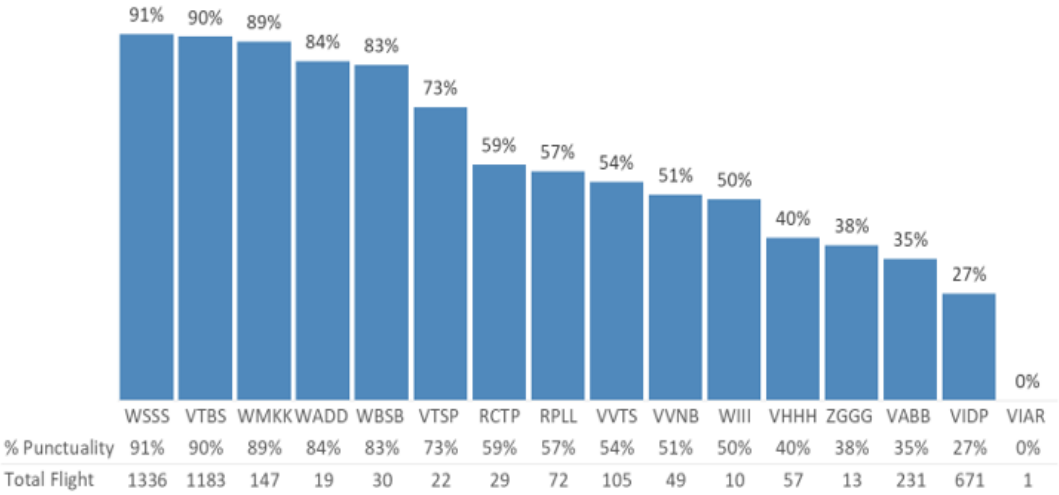


Figure 10: Average CTOT Compliance: January 2019 - December 2020

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

Afghanistan Airspace Entry Compliance (CTO 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 Calculated Time Over (CTO).

2.18 **Figure 11** shows this result from the traffic sample data provided in the period of January 2019 - December 2020. The data shows a low 29% CTO compliance rate, despite high percentage of CTOT compliance rate at top departure airports (**Figure 10**). This indicates that actual flight time still differs significantly from planned EET in the FPLs, which may be due to factors such as weather variations, tactical ATC, or variances on flight performance. It also indicates that the current CTO compliance window should not be further reduced. Further information on list of flights not complying to CTO window can be provided on request.

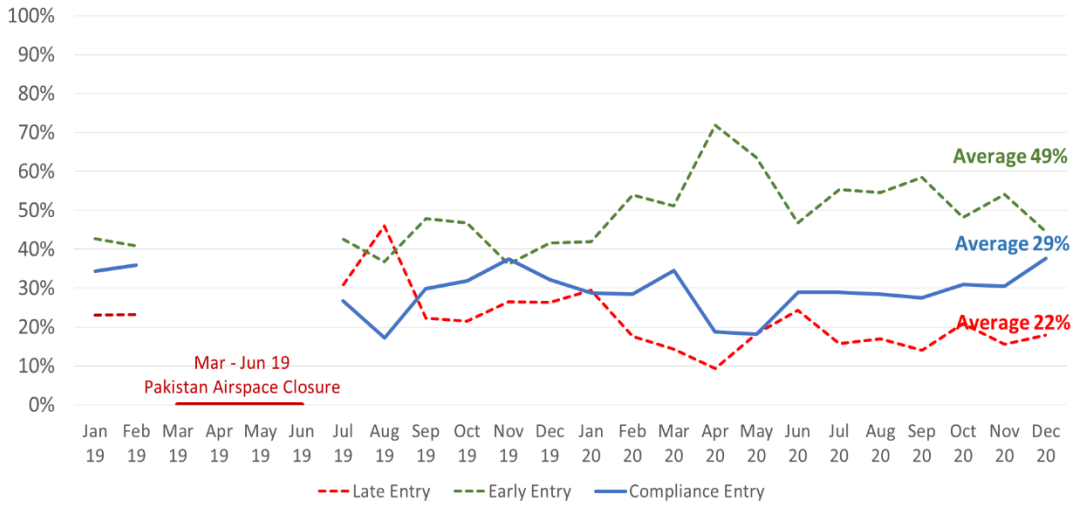


Figure 11: Afghanistan Airspace Entry Compliance: January 2019 - December 2020

2.19 It should also be noted, however, that despite low CTO compliance rate, a majority of flights are still able to achieve the same or better flight levels compared to those allocated by BOBCAT system; as shown in **Figure 8**.

2.20 Further study correlating CTOT Compliance and CTO Compliance was carried out using Traffic Sample Data from January 2019 - December 2020. **Figure 12** summarizes CTOT and CTO Compliance from Traffic Sample Data in 2-year period.

CTOT Compliance	Overall	Early Entry	Compliance Entry	Late Entry
Early Take-Off	**10%**	88%	9%	3%
Compliance Take-Off	***62%***	48%	*39%*	13%
Late Take-Off	**13%**	3%	17%	80%
No DEP Received	**15%**	47%	24%	29%

Figure 12: Correlation of CTOT Compliance and CTO Compliance: January 2019 - December 2020

2.21 It can be observed from Figure 12 that aircraft that departed early outside CTOT window are likely to enter Afghanistan airspace earlier than CTO window. Similarly, aircraft that departed late outside CTOT window are likely to enter Afghanistan airspace later than CTO window.

2.22 A significant finding from the study indicates that, while 62% of flights in the Traffic Sample Data departed within CTOT window, only 39% of those flights enter Afghanistan within CTO window. Significant portion of flights departed within CTOT window but entered Afghanistan earlier than CTO window.

2.23 Further investigation was carried out as CTOT window was constructed with the assumption that flights are capable to speed up or slow down at the rate of one minute per flight hour. Therefore, further study correlating CTOT Compliant flight and CTO Compliance performance is carried out with result summarized in **Figure 13**.

CTOT \ CTO Compliance	Overall	Early Entry	Compliance	Late Entry
CTOT Compliant – expected to slow down	**39%**	74%	23%	3%
CTOT Compliant – no speed modification needed	**44%**	*41%*	48%	11%
CTOT Compliant – expected to speed up	**17%**	10%	50%	40%

Figure 13: CTOT Compliant Flights and CTO Compliance Correlation: January 2019 - December 2020

2.24 **Figure 13** indicated that flights that departed within CTOT window with expectation to slow down were largely unsuccessful in slowing down. Similarly, flights expected to speed up to ensure compliance with CTO window are also largely unsuccessful in speeding up. In addition, it is noted that significant portion of CTOT compliant flights (44%) ended up entering Afghanistan airspace earlier than CTO window. This situation may be due to short-cuts obtained in flight.

ATFM Delay

2.25 Another figure of merit continuously monitored by Bangkok ATFMU is the ATFM delay due to Afghanistan airspace constraint as assigned by BOBCAT system. The analysis result on ATFM delay for the reference period of January 2019 - December 2020 is shown in **Figure 14**.

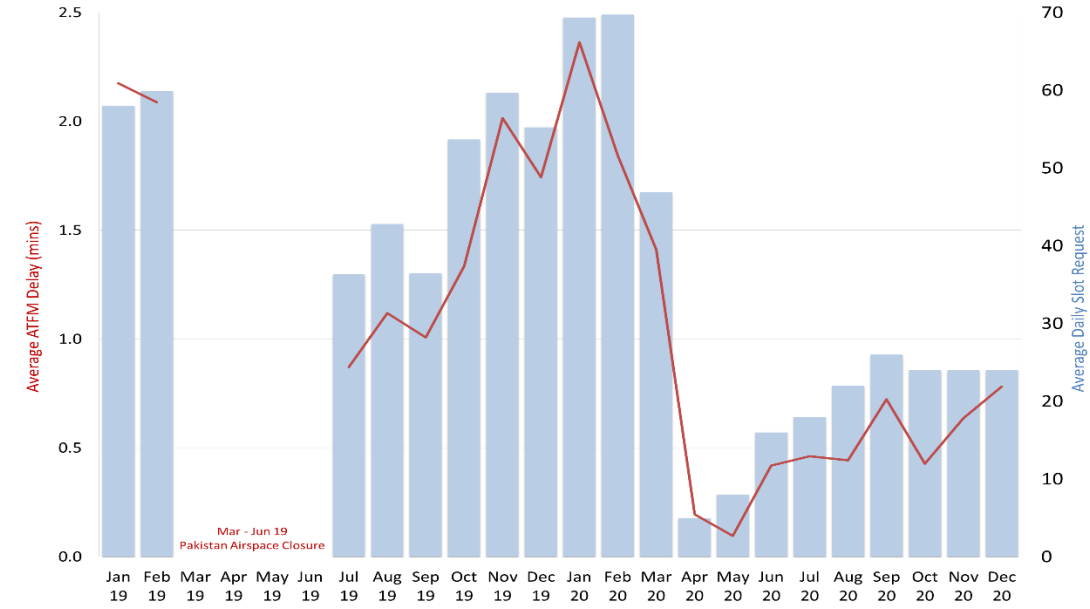


Figure 14: ATFM delay: January 2019 - December 2020

2.26 When **Figure 14** is reviewed with **Figure 2** and **Figure 3**, it can be observed that ATFM delay increases along with increase of average number of slot allocation per night.

Distribution of Flight Level Operated in Afghanistan Airspace

2.27 In response to requests from some stakeholders operating through Afghanistan airspace, additional chart was prepared to show evolution of westbound flight level used by aircraft operating through Afghanistan airspace over time. Resulting chart is shown in **Figure 15**.

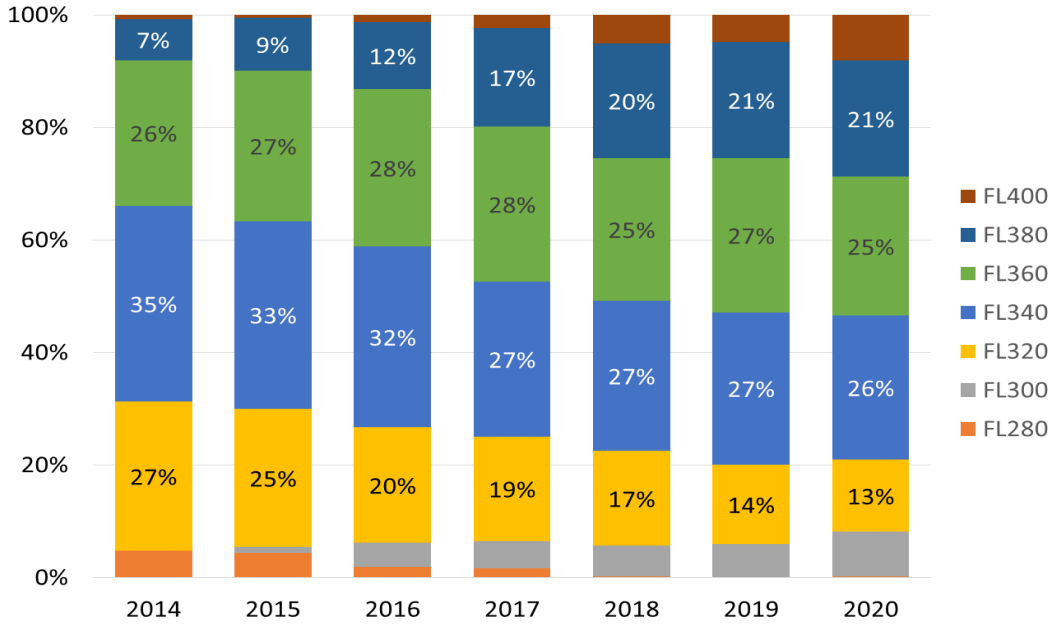


Figure 15: Distribution of Flight Level Operated in Afghanistan Airspace: 2014 – 2020

2.28 Based on **Figure 15**, it can be observed that in 2014, 88 percent of flights through Afghanistan airspace operated on FL320 – FL360 as top 3 FLs operated. Band of top-3 flight levels used changed upwards, so that FL340 – FL380 were operated by 75 percent of flights. Meanwhile, use of FL280 decreased from 5 percent in 2014 to almost no use in 2018, largely replaced by use of FL300. Upward change of flight level usage in Afghanistan airspace may be due to changing fleet mix operating through Afghanistan as more modern aircraft with higher optimal operating altitudes such as Boeing 787 and Airbus A350 operate through the airspace. It is expected that, as COVID-19 pressured airlines to retire older aircraft, the trend on usage of higher flight level will continue.

COVID-19 Impact

2.29 While COVID-19 started impacting air traffic in Asia/Pacific region in late January 2020 prior to Chinese New Year, its impact on BOBCAT slot request started in mid-March 2020 with BOBCAT slot requests falling to 38-56 flights/night on week of 15-21 Mar 2020. By 31 Mar 2020, BOBCAT system registered less than 10 slot requests.

2.30 In addition to daily slot request information in **Figure 3**, number of slot request between 1 – 19 Apr 2020 averages at 5 slot requests/night with no slot request submitted on 15 Apr 2020. Maximum number of slot requests in April 2020 was on 4 Apr 2020 with 11 slot requests received.

2.31 In response to Thai government's requirement for State Enterprises to consider as much as practicable Work from Home arrangement in late March 2020, Bangkok ATFMU reduced hour that the Bangkok ATFMU would be physically manned to 0100-1300UTC. Outside these hours, contingency mobile phone number is provided.

2.32 During the period when air traffic decreased significantly, need for ATFM operations also decreased. In order to maintain currency of Bangkok ATFMU staff, social media group was setup with membership from operational Bangkok ATFMU staff. Bangkok ATFMU staff were informed to review ATFM User Manual with online quizzes to be delivered to ensure ATFMU staff are kept up-to-date with current operating procedures. Other recurrent training arrangements are also being developed.

2.33 From April – September 2020, traffic through Afghanistan airspace requesting BOBCAT slots continued to increase reflecting modest recovery. Since October 2020 onwards, traffic requesting

BOBCAT slots stabilized at approximately 24 flights/night, less than half traffic of similar month in 2018 and 2019.

Improved Afghanistan Airspace Access (Aug 2020 and Mar 2021)

2.34 In late July 2020, Bangkok ATFMU received information from the Kabul ACC that, as a consequence of agreement between the Lahore ACC and the Kabul ACC, more flight levels are becoming available for entry waypoints LAJAK (L509) and SITAX (M875) as shown in **Figure 16**.

Entry Waypoint (Route)	Pre-August 2020	August 2020 onwards
LAJAK (L509)	FL280 (1 FL)	FL280 – FL400 (7 FLs)
SITAX (M875)	FL300 – FL400 (6 FLs)	FL280 – FL400 (7 FLs)

Figure 16: Increase in Flight Level Availability for LAJAK (L509) and SITAX (M875)

2.35 In coordination with the Kabul ACC, the Bangkok ATFMU configured the BOBCAT system to provide access to additional flight levels on 4 August 2020, while also updating relevant system documents and coordinated with States involved to amend national AIPs affected accordingly.

2.36 Furthermore, subsequent to publication of Afghanistan AIP Amendment 002-2021 with effect from AIRAC Date 25 Mar 2021, more flight levels are becoming available for entry waypoints ASLUM (P628) and SERKA (N636-P628) as in **Figure 17**.

Entry Waypoint (Route)	Pre-25 March 2021	25 March 2021 onwards
ASLUM (P628)	FL320 – FL400 (5 FLs)	FL300 – FL400 (6 FLs)
SERKA (N636-P628)	FL280 – FL300 (2 FLs)	FL280 – FL400 (7 FLs)

Figure 17: Increase in Flight Level Availability for ASLUM (P628) and SERKA (N636-P628)

2.37 Following coordination with the Kabul ACC, Bangkok ATFMU will be configuring the BOBCAT system to provide access to additional flight levels on 25 March 2021, while updating relevant system documents and coordinated with States concerned to amend national AIPs affected.

Yangon ACC Contingency Situation

2.38 The meeting would recall that in early February (8-16 February 2021), there was a contingency situation concerning the Yangon ACC which required activation of the Myanmar ATS Contingency Plan as well as formation of the Yangon FIR Contingency Coordination Team (CCT).

2.39 During the contingency event, traffic departing Bangkok Suvarnabhumi Airport (VTBS) were facing significant departure delay due to increased separation between aircraft entering the Yangon FIR and lesser number of Flight Levels available as part of the contingency route structure, on top of BOBCAT slots allocated considering demand-capacity balance in Afghanistan airspace.

2.40 In analyzing the situation among Bangkok ACC, Bangkok ATFMU, ICAO and IATA, it was decided that departures from Bangkok Suvarnabhumi Airport (VTBS) during BOBCAT hours would be exempted from the BOBCAT ATFM procedure between 12-16 February 2021. In effect, this reduced number of flights requesting BOBCAT slots by 3-4 flights/night on the affected days. Nevertheless, exemption of VTBS departures from BOBCAT ATFM procedure did not affect overall traffic requesting BOBCAT slots in February 2021, which continued to average at 24 flights/night, as can be observed in **Figure 3**.

2.41 In addition to exemption from the BOBCAT ATFM procedure, departures from Bangkok Suvarnabhumi Airport (VTBS) were asked to re-route via CRMMR001 (L507) instead of the preferred CRMMR003 (L301). According to a major airline operating flights affected, this re-route added a

significant 8 minutes flight time for the affected flights. However, the additional flight time offset departure delay flights were facing, which were reported to approach one-hour delay.

2.42 Fortunately, through collaboration among members of the Yangon FIR CCT and previous publication of Myanmar ATS Contingency Plan in addition to pre-establishment of contingency procedures with at least some neighboring ANSPs, the contingency situation was managed relatively smoothly and concluded in less than two weeks.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the data collated and analyzed by the Bangkok ATFMU.

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