International Civil Aviation Organization

Fourteenth Meeting of the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/14)

Bangkok, Thailand, 22 – 26 April 2024

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

PROCEDURES FOR EOBT UPDATE AND CTOT MANAGEMENT

(Presented by Republic of Korea)

SUMMARY

This paper presents procedures for EOBT Update and CTOT Management of Republic of Korea's ATFMU. It proposes that ANSPs share their EOBT and CTOT procedures with each other and jointly study how to improve them optimally based on the Distributed Multi-Nodal ATFM concept.

1. INTRODUCTION

1.1 The Asia-Pacific region operates an ANSP-specific ATFM system based on the concept of Distributed Multi-Nodal ATFM. ANSPs follow the basic concepts of ICAO DOC 9971, Asia/Pacific Framework for Collaborative ATFM, AMNAC COP and establish internal ATFM operation manuals of each ANSP for detailed procedures.

1.2 For example, the AMNAC COP specifies that the ATFM operation details of individual ANSPs(e.g., CTOT generation algorithm, slot substitution workflow) are autonomously established and operated by ANSPs within a common high-level concept.

1.3 For the Multi-Nodal ATFM, while the Initiating ATFMU generates the CTOT, it is the Facilitating ATFMU that directly coordinates with the ATC units and Aircraft Operators, so the Facilitating ATFMU also needs to understand the CTOT management algorithm of the Initiating ATFMU. Shared CTOT management criteria between the two ATFMUs will allow for more transparent and efficient CTOT and New CTOT coordination, which will ultimately help improve CTOT compliance.

1.4 In addition, since the basic trigger for CTOT generation is EOBT, it is necessary to share EOBT management standards for each ANSP and establish common standards in the Asia-Pacific region in the long term.

2. DISCUSSION

CTOT Management of ROK ATFMU

2.1 ATFMU allocates ATFM slots and generates CTOTs accordingly. If an aircraft is unable to comply with the CTOT, it shall request a New CTOT from the ATFMU. The ATFMU re-allocates the non-compliant aircraft to an ATFM slot in the rear and issues a New CTOT. The ROK ATFMU refers to this as the ‘Procedure for Re-allocating Backward’.

2.2 In the event of an empty ATFM slot or a reduction in regulation, the ATFMU may reallocate an aircraft subject to an existing CTOT to a better slot with less delay and issue a New CTOT. The ROK ATFMU refers to this as the ‘Procedure for Slot Improvement’.

2.3 The ROK ATFMU’s ‘Procedure for Re-allocating Backward’ is as follows.

[Initial CTOT Issuance] ・ The ROK ATFMU issues the initial CTOT no later than 120 minutes before the EOBT. - If the regulation occurs after the (EOBT - 120minutes), the ATFMU issues a CTOT as soon as possible.
[Preventing from Re-allocating Backward] ・ The ROK ATFMU shall not re-allocate an aircraft backward that has arrived within (CTOT - 90 minutes) of the current time. - If the regulation increase, the CTOT may be changed to a later time, but the existing sequence will be maintained.
[Procedure for Re-allocating Backward] ・ If an aircraft is unable to comply with the CTOT, the Aircraft Operator will follow the following procedures. - A-CDM airports : After sending the EOBT DLA/CHG and updating the TOBT in A-CDM system, call the ROK ATFMU to request a New CTOT. - Non A-CDM airports : After sending the EOBT DLA/CHG, call the ROK ATFMU to request a New CTOT. ・ The ROK ATFMU will re-allocate the CTOT non-compliant aircraft to a backward slot and issue a New CTOT according to the following procedures. - Re-allocate to the empty slot closest to the new EOBT. - If all slots are occupied, re-allocate to a slot after other aircrafts that have arrived within (CTOT - 90 minutes) of the current time.

2.4 We could also consider the timing when to apply the [Preventing from Re-allocating Backward] based on EOBT, such as (EOBT - 00 minutes). However, processing by (EOBT - 00 minutes) can lead to the following confusions if the Aircraft Operator updates EOBT DLA/CHG with the latest EOBT, the aircraft can be unintentionally penalized by the start time of [Preventing from Re-allocating Backward] being pushed later. Therefore, the ROK ATFMU applies the start time of [Preventing from Re-allocating Backward] based on CTOT.

2.5 The ROK ATFMU is discussing with ATC units and Aircraft Operators the [Procedure for Slot Improvement] to re-allocate to a better slot when an empty slot occurs or regulations are reduced. A pilot program is planned to be conducted after the stakeholders have jointly established a coordinated procedure.

EOBT Update guidance of ROK ATFMU

2.6 Eurocontrol specifies in their 'Eurocontrol ATFCM Users Manual’ that an aircraft subject to CTOT shall update its EOBT to the accurate time.

2.7 The ROK ATFMU also advices stakeholders that EOBTs should always be updated with the accurate values, regardless of the application of CTOT.

2.8 EOBT would be the most important information for demand prediction for all FIRs in all phases of the flight(Departure, Overfly, Arrival, Turn around, Departure, and so on) and should always

be updated with accurate values. It is proposed to jointly study and establish common EOBT update rule for the CTOT-issued aircraft in the Asia-Pacific region.

2.9 We can consider the advantages, disadvantages and limitations of the EOBT update rule for the CTOT-issued aircraft with specific examples.

ACRID	EOBT	COBT	ATFM Delay
ABC123	0100	0200	60 Minutes

※ 'ATFM Delay = CTOT – ETOT' from ICAO APAC ATFM POA Recommended Framework

2.10 In the above situation, most Aircraft Operators would not want passengers to wait 60 minutes on board. If an aircraft receives a long delayed CTOT, the Aircraft Operator will change the passenger's boarding time to a later time that is appropriate to minimize the passenger's waiting time on the aircraft while still complying with the CTOT.

2.11 If the Aircraft Operator confirms that the COBT is 0200 and targets a change in aircraft readiness to 0140 accordingly, the TOBT will be entered as 0140.

ACRID	EOBT	TOBT	COBT	ATFM Delay
ABC123	0100	0140	0200	60 Minutes

* In this case, if the EOBT is kept at 0100 of the initial FPL, ATFMU has a 40 minute difference between EOBT and TOBT.

2.12 For the Non A-CDM airports, there is no TOBT information, so the ATFMU cannot determine the exact aircraft readiness time from the EOBT. If a better slot has been found or the regulation was improved, it can be re-allocated to a better slot with less delay, but without the accurate readiness status, the ATFMU cannot determine whether it can comply with the better New CTOT.

2.13 In contrast to the above example, the ATFMU would be able to rely on EOBTs if Aircraft Operators were required to update EOBTs with the accurate value as shown below.

ACRID	EOBT	TOBT	COBT	ATFM Delay
ABC123	0140	0140	0200	20 Minutes

2.14 However, when the EOBT is updated, the ATFM Delay is reduced. The ATFM Delay is calculated as 20 minutes with the new EOBT, even though the passengers still experienced a departure delay of 60 minutes(40 minutes at the terminal + 20 minutes on the aircraft). This can cause discrepancies between the ATFMU's POA results and the actual delay experienced by the passengers.

2.15 The ATFM Delay would be accurately analyzed by separating the EOBT into the FPL's EOBT and the DLA/CHG's EOBT as shown below.

ACRID	EOBT at FPL Message	EOBT at DLA/CHG Message	TOBT	COBT	ATFM Delay
ABC123	0100	0140	0140	0200	60 Minutes

In this case, if it is defined as 'ATFM Delay = CTOT – ETOT(from FPL message)', the accurate ATFM Delay time can be calculated.

2.16 However, the new definition requires a long-term approach as it requires upgrades to the ATFM system to distinguish between FPL and DLA/CHG messages for the source of the EOBT reflection.

2.17 Each of these rules has its own advantages, disadvantages, and limitations when determining whether to update the EOBT of an aircraft subject to CTOT. Joint research is needed to share the EOBT update rule in each ANSP and improve the limitations.

Consideration of the EOBT as a trigger for the New CTOT

2.18 Currently, most ATFMUs coordinate with ATC units and Aircraft Operators via telephone. In particular, there is a lot of telephone cooperation in the issuance of New CTOTs. In the future, EOBT can be utilized as a trigger for New CTOT instead of telephone.

< Trigger for New CTOT coordination >

Current	⇒	Short term	⇒	Long term
Telephone		EOBT		TOBT

2.19 If the ATFMU guides Aircraft Operators to ensure that the EOBT of an aircraft subject to CTOT also updated at the correct value, and the ATFMU can rely on them, the New CTOT coordination could be conducted based on EOBT DLA/CHG messages instead of telephone work.

2.20 Of course, for A-CDM airports, the TOBT can be utilized as a trigger for the New CTOT. However, given the fact that most airports do not have A-CDM in place and that technological advancements are needed to exchange A-CDM information between all ATFMUs in the Departure, Overfly and Arrival processes, the use of EOBTs might be considered for the short-term future.

2.21 In the long-term future, the Eurocontrol's FPL updates procedure that ATFMU sends DLA messages based on TOBT values from A-CDM and New CTOT procedure based on Readiness status such as SWM(SIP Wanted Message) and RFI could be also considered in Asia-Pacific region.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matters as appropriate.

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