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AIP SUPPLEMENT

167/15
22ND DECEMBER

INTRODUCTION OF AIRPORT COLLABORATIVE DECISION MAKING (A-CDM) OPERATIONAL TRIALS AT SINGAPORE CHANGI AIRPORT

1. Introduction

- 1.1. A-CDM aims to optimise airport operations by having an efficient turnaround process and improving the predictability of operational events. It also helps to improve gate management, flight punctuality, reduce apron taxiway and holding point congestion which is beneficial to all airport partners. A-CDM involves sharing of accurate and timely information amongst airport partners through different airport systems and implementing a set of operational procedures and automated processes.
- 1.2. On 9 July 2015, CAAS and CAG had published AIC 3/15 to notify aircraft operators on the plan to introduce A-CDM at Singapore Changi Airport. The AIC includes information on the A-CDM systems and operational procedures to allow aircraft operators to plan ahead and make necessary arrangements to comply with the procedures.

2. A-CDM Operational Trial

- 2.1. The purpose of this AIP supplement is to detail the timings of the planned A-CDM operational trial and the required actions by pilots, aircraft operators (AO) and ground handling agents (GHA). The trial will be introduced in 4 progressive phases to allow all airport partners involved an opportunity to review and refine their planned A-CDM workflow processes prior actual implementation.

Phases of Operational Trial

- 2.2. Phase 0 - A-CDM Operational trial involving all scheduled departing flights will commence from 22 February to 20 March 2016 from 0400 UTC to 1200 UTC daily.
 - a. Only TOBT information will be used and displayed in this phase.
 - b. AO / GHA to follow A-CDM pre-departure procedures (refer to A-CDM Pre-Departure Procedures paragraphs 3.5 to 3.7 below).

- c. Pilots to follow TOBT for request of ATC clearance and update if necessary (refer to A-CDM startup procedures paragraphs 4.1 to 4.3 below)
- 2.3. Phase 1 - A-CDM Operational trial involving all scheduled departing flights will commence from 21 March to 17 April 2016 from 0400 UTC to 1200 UTC daily.
- a. Both TOBT and TSAT information will be used and displayed in this phase.
 - b. AO / GHA to follow A-CDM pre-departure procedures and pilots to follow the A-CDM startup procedures.
- 2.4. Phase 2 - A-CDM Operational trial involving all scheduled departing flights will commence from 18 April 2016 to 22 May 2016 from 0000 UTC to 1500 UTC daily.
- a. Both TOBT and TSAT information will be used and displayed in this phase.
 - b. AO / GHA to follow A-CDM pre-departure procedures and pilots to follow the A-CDM startup procedures.
- 2.5. Phase 3 - A-CDM Operational trial involving all scheduled departing flights will commence from 23 May 2016 from 0000 UTC to 2359 UTC daily till implementation.
- a. Both TOBT and TSAT information will be used and displayed in this phase.
 - b. AO / GHA to follow A-CDM pre-departure procedures and pilots to follow the A-CDM startup procedures.

Definition of commonly used terms in A-CDM

- 2.6. Target Off Block Time (TOBT) – The time an AO or GHA estimates that an aircraft will be ready, all doors closed, boarding bridge removed, pushback vehicle available and ready to start-up / pushback immediately upon receipt of clearance from ATC.
- 2.7. Target Start Up Approval Time (TSAT) – The time provided by ATC that an aircraft can expect start-up / push back approval.
- 2.8. Calculated Take Off Time (CTOT) – A time calculated as a result of tactical slot allocation, at which a flight is expected to become airborne.

3. A-CDM Pre-Departure Procedures

- 3.1. The A-CDM procedures apply to all scheduled flights departing Singapore Changi Airport except for VVIP, CASEVAC, SAR and aircraft on special tasks.
- 3.2. Singapore Changi Airport's A-CDM portal will automatically calculate a system TOBT for each departure flight taking into account the estimated or actual in-block time

(EIBT / AIBT), minimum turnaround time (MTT) and scheduled time of departure (STD).

- 3.3. If the calculated TOBT (EIBT / AIBT + MTT) is earlier than STD, the system will take the STD as TOBT.
- 3.4. If the calculated TOBT (EIBT / AIBT + MTT) is later than STD, the amount of turnaround delay that system predicts is equal to TOBT – STD.
- 3.5. AO are required to assess the system generated TOBT at 40 minutes prior to departure and update it if the prediction of departure readiness is different. Thereafter, TOBT needs to be monitored and updated constantly if it is expected to differ by 5 minutes or more until the flight commences pushback. AO can consider delegating the responsibility of TOBT submission to their GHA subject to prior internal arrangements between AO and GHA.
- 3.6. TOBT shall be updated through the following systems:
 - a. Airport Operations Centre System (AOCS) A-CDM web based portal; or
 - b. Gate Message Input Display (GMID) at T1 and T2 boarding rooms;
 - c. iPad TOBT Application at T3 boarding rooms.
- 3.7. AO/GHA is encouraged to update TOBT through ONLY one of the above systems in order to avoid any chance of a miscommunication.
- 3.8. TOBT information is available through the following channels:
 - a. AOCS A-CDM portal;
 - b. GMID;
 - c. iPad TOBT Application;
 - d. Aircraft Docking Guidance System (ADGS) at contact stands;
 - e. Radio communication with GHA or AO.
- 3.9. The Pre-Departure Sequencer (PDS) will calculate the TSAT automatically by taking into account factors such as TOBT, calculated take-off time (CTOT), variable taxi times (VTT), wake turbulence category, departure separation, etc. A pre-departure sequence is determined from the calculated TSATs, thus the accuracy of TOBT is vital to an optimal TSAT.
- 3.10. Failure to complete the departure preparation activities with no updates in TOBT, when required, will lead to an automated TOBT revision by the system. The new TOBT will be at least 15 minutes later. Delays can be expected as a result of the re-sequencing based on the penalty revision. AO or GHA are strongly encouraged to

update TOBT as soon as any expected delay to the aircraft readiness for pushback is made available to avoid unnecessary hold-ups.

3.11. TSAT information is available through the following channels:

- a. AOCS A-CDM portal;
- b. GMID;
- c. iPad TOBT Application;
- d. ADGS at contact stands;
- e. Radio communication with GHA or AO;
- f. ATC - Upon issuance of ATC clearance (for flights parked at aircraft stands without ADGS).

4. A-CDM Start-up Procedures

- 4.1. Pilot shall ensure aircraft is ready for pushback at TOBT.
- 4.2. Pilot to maintain communication with the AO / GHA as they are responsible for updating the TOBT. Notify the AO / GHA to update the TOBT if it is expected to differ by 5 minutes or more.
- 4.3. Pilot to contact Clearance Delivery and request for ATC clearance within 5 minutes of TOBT.
- 4.4. ATC will update TSAT changes if any, during issuance of ATC clearances. Note that TSAT displayed on ADGS may not be final and can be revised due to en-route clearance restrictions, ground congestion or flow measures.
- 4.5. Pilot shall contact Ground Movement Control for pushback at TSAT after obtaining ATC clearance, or as directed by ATC.
- 4.6. A flight issued with gate hold (TSAT > TOBT) but chooses to commence pushback before the assigned time will be allowed to do so subject to traffic. However, the flight should not expect an earlier departure time as the planned pre-departure sequence will be maintained.
- 4.7. If a flight is unable to pushback by TSAT + 5 minutes due to the aircraft being unready, ATC clearance and TSAT will be cancelled. Pilot must notify the AO / GHA to update the TOBT for a new TSAT before requesting for a new ATC clearance.
- 4.8. Non-compliance of initial TSAT may result in an aircraft losing its existing position in the pre-departure sequence. Delay can be expected as a result of re-sequencing based on new TOBT input.

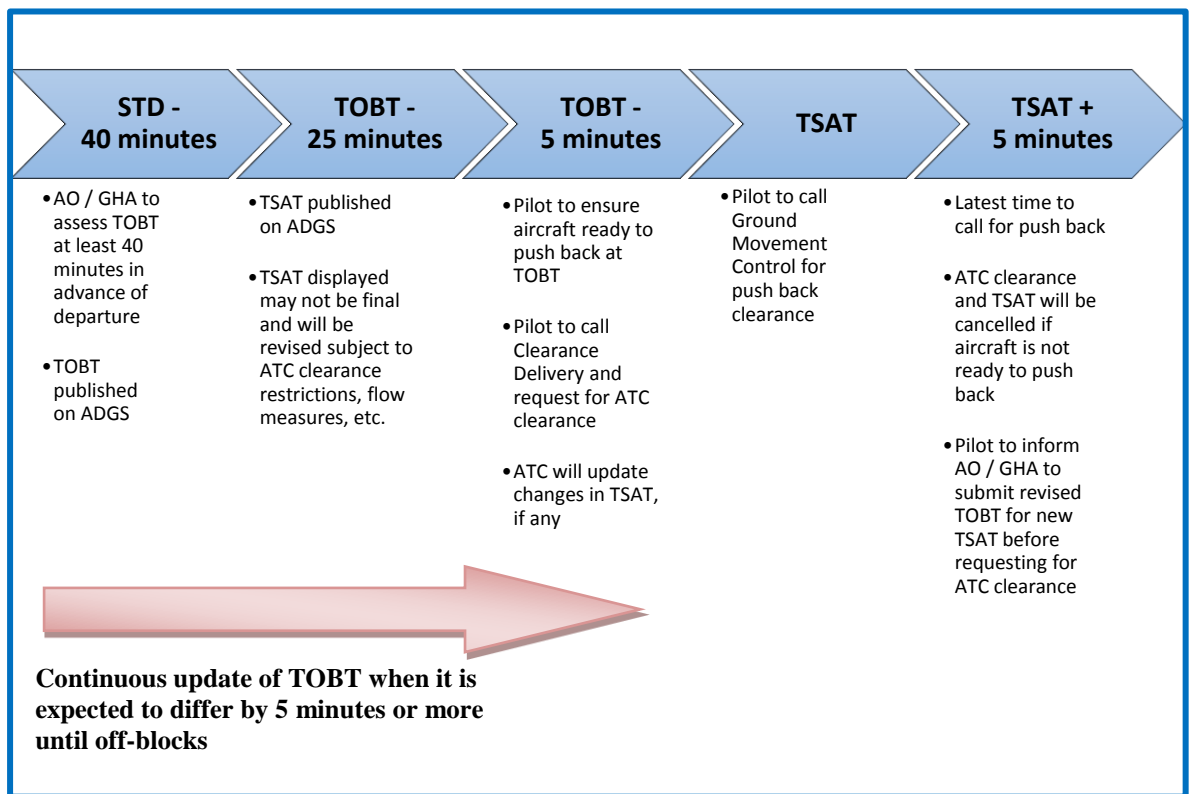
4.9. If delay in pushback is due to ground traffic movement or ATC clearance restrictions, the ATC clearance will remain valid even if it exceeds TSAT + 5 minutes. TOBT need not be updated for such situations.

5. A-CDM information via Aircraft Docking Guidance System (ADGS)

5.1. All contact stands in Singapore Changi Airport will have ADGS. The fundamental operation and usage of ADGS still remain the same for flight crew. Additional information which includes TOBT, TSAT and TOBT count-down timer will be displayed in local times as part of the improvements to support A-CDM operations. (See Attachment A)

6. Summary of the A-CDM Pre-departure Process

6.1 The flowchart below provides a simple overview of the process that AO, GHA and pilots shall follow in A-CDM operations at Singapore Changi Airport. It includes the responsibilities and coordination detailed in paragraphs 3 and 4 above.



7. Reversion to non-CDM procedures

- 7.1. To achieve seamless and immediate transition back to non-CDM mode of operations when unforeseen situation occurs, the following procedures are to be followed if TOBT and TSAT become unavailable due to system issues or maintenance.
- a. If TOBT cannot be submitted or it is unavailable through different channels stated in paragraph 3.6 above, pilots shall follow the existing (non-CDM) pushback procedures published in AIP Singapore page WSSS AD 2-24 which is to request for ATC clearance when aircraft is ready to pushback within 5 minutes.
 - b. If TSAT is unavailable through different means stated in paragraph 3.11 above, AO and GHA shall continue to submit TOBT and pilots shall request for ATC clearance 5 minutes within TOBT. ATC will revert to the gate hold procedures published in AIP Singapore page WSSS AD 2-25 and issue estimated pushback times accordingly.
- 7.2. In the event that the trial needs to be cancelled due to any reason, the termination will be communicated to relevant parties through email and a NOTAM will be issued.

8. Changes

- 8.1. Any changes to the content of this AIP supplement will be notified through NOTAM or superseded by another AIP supplement.

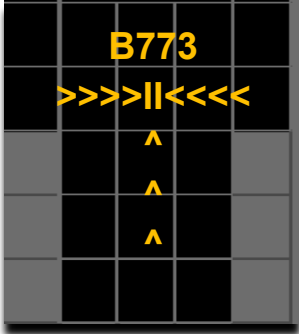
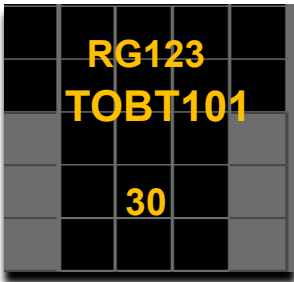
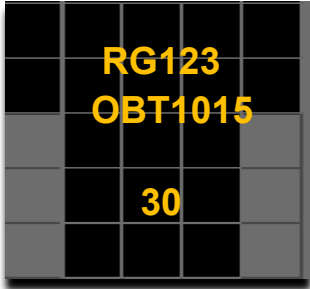
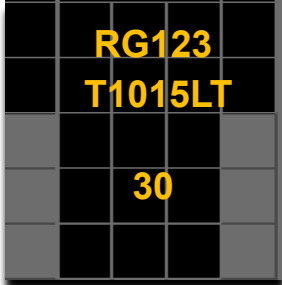
9. Cancellation

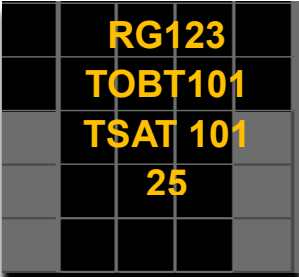
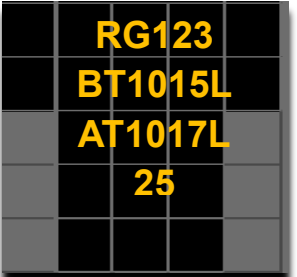
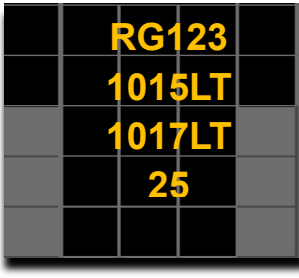
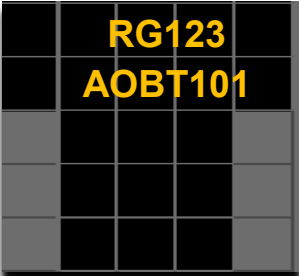

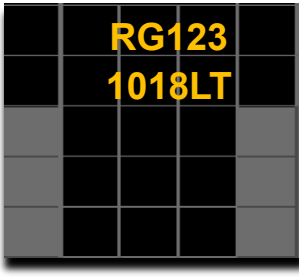
- 9.1. This AIP supplement will be cancelled when all information is incorporated into AIP Singapore upon implementation of A-CDM.

10. Contact and Information

- 10.1. Detailed information on A-CDM processes at Singapore Changi Airport can be found at <http://www.changiairport-cdm.sg>
- 10.2. Please email the Changi A-CDM Team at a-cdm@changiairport.com for application of AOCS A-CDM, GMID and iPad TOBT account or if you have any queries.
- 10.3. Aircraft operators may also contact their ground handling agent directly on queries regarding TOBT submission.

Aircraft Docking Guidance System (ADGS)

Description	Display on ADGS
<p>Aircraft arrival to stand</p> <ul style="list-style-type: none"> No change in existing functionality and display. 	 <p>The display shows the aircraft type 'B773' in yellow on a black background. Below it is a vertical bar with three yellow arrows pointing upwards, indicating the aircraft's position relative to the stand.</p>
<p>40 minutes prior to TOBT</p> <ul style="list-style-type: none"> ADGS will display TOBT submitted by AO / GHA and a count down timer (2 digits) to TOBT in minutes. As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. Timings displayed will be in Local Time (LT). TOBT timings will change instantly if there is an update done by AO / GHA. 	<p>Snapshot 1</p>  <p>Snapshot 2</p>  <p>Snapshot 3</p>  <p>The table shows three snapshots of the ADGS display. Snapshot 1 shows 'RG123' and 'TOBT101' on the top two lines, and '30' on the bottom line. Snapshot 2 shows 'RG123' and 'OBT1015' on the top two lines, and '30' on the bottom line. Snapshot 3 shows 'RG123' and 'T1015LT' on the top two lines, and '30' on the bottom line.</p>

Description	Display on ADGS
<p>25 minutes prior to TOBT</p> <ul style="list-style-type: none"> ADGS will display TSAT derived by PDS. As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. TSAT timings may change as the PDS is continuously optimising push back times based on real time traffic conditions. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p>  </div> <div style="text-align: center;"> <p>Snapshot 2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>Snapshot 3</p> </div>
<p>Aircraft departure from stand</p> <ul style="list-style-type: none"> ADGS will display the actual off-block time (AOBT). As ADGS can only display up to 7 characters per line, the displayed message will be scrolling. TOBT, TSAT and TOBT countdown timer will be removed. AOBT display will be removed 3 minutes after AOBT. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Snapshot 1</p>  </div> <div style="text-align: center;"> <p>Snapshot 2</p>  </div> </div> <div style="text-align: center; margin-top: 20px;">  <p>Snapshot 3</p> </div>