

**Contact**

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Email: [caas\\_singaporeais@caas.gov.sg](mailto:caas_singaporeais@caas.gov.sg)URL: [www.caas.gov.sg](http://www.caas.gov.sg)URL: <https://fpl-1.caasaim.gov.sg>**AIP Supplement for  
Singapore****AIP SUP  
083/2016****Effective from 31 OCT 2016****UFN****Published on 28 SEP 2016****SINGAPORE CHANGI AIRPORT - IMPLEMENTATION OF AIRPORT  
COLLABORATIVE DECISION MAKING (A-CDM)****1 Introduction**

1.1 The purpose of this AIP Supplement is to notify aircraft operators (AO) of the implementation of A-CDM at Singapore Changi Airport effective 0000UTC, 31 October 2016.

1.2 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 operational information amongst airport partners through different airport systems and improving work processes by implementing a set of operational procedures.

1.3 On 22 December 2015, AIP Supplement 167/15 was published to notify AO of the Changi Airport A-CDM operational trials which commenced on 22 February 2016

1.4 Following a 6 month operational trial, post analysis showed that A-CDM yield positive results. Runway queuing time during peak periods was observed to have reduced by an average of 1 minute per departure. In addition, A-CDM had enhanced common situation awareness through information sharing and helped to improve the decision making process of the airport partners.

**2 Implementation of A-CDM operations at Singapore Changi Airport**

2.1 On and after 0000UTC 31 October 2016, AO, ground handling agents (GHA) and pilots operating at Singapore Changi Airport are required to follow the A-CDM procedures detailed in this AIP Supplement.

Definition of commonly used terms in A-CDM

2.2 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.

2.3 Target Start Up Approval Time (TSAT) – The time provided by ATC that an aircraft can expect start-up / push back approval.

2.4 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 ground handling agent (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 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. Aircraft Docking Guidance System (ADGS) at contact stands;
- d. 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 Flights with an invalid or expired TOBT will be instructed by ATC to update TOBT when requesting for clearance. For non-compliant flights, delays can be expected. 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. ADGS at contact stands;
- d. Radio communication with GHA or AO;
- e. 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.

4.3.1 Pilot shall only request for ATC clearance provided aircraft is ready to pushback at TOBT. Any updates to TOBT after receipt of ATC clearance will result in cancellation of clearance issued as the ATC clearance validity is based on the initial 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 request for pushback from Ground Movement Control within 5 minutes of TSAT after obtaining ATC clearance, or as directed by ATC.

4.5.1 ATC may swap pushback sequence based on real-time readiness of aircrafts to maximise apron and runway capacity and reduce the overall delay to traffic as and when required.

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.

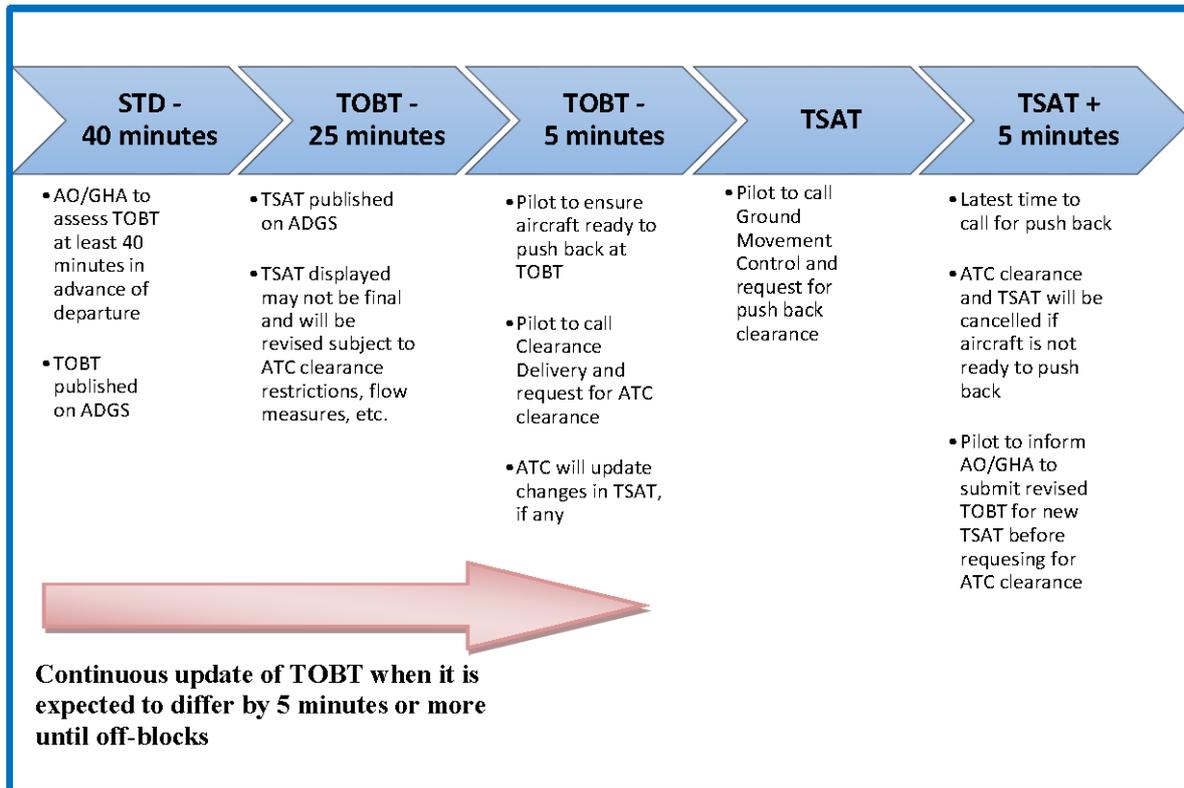
4.9 If delay in pushback is due to ground traffic movement or ATC clearance restrictions, the ATC clearance will remain valid even if it exceeds TSAT + 5 minutes. TOBT need not be updated for such situations.

## 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.

- 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 AD 2.WSSS-46 paragraph 3.5 which is to request for ATC clearance when aircraft is ready to pushback within 5 minutes.
- 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 AD 2.WSSS-46 paragraph 4 and issue estimated pushback times accordingly.

7.2 In the event that A-CDM operations need to be cancelled due to any reason, the termination will be communicated to relevant parties through email and a NOTAM will be issued.

## 8 Cancellation

8.1 This AIP Supplement will be cancelled when the contents are incorporated into AIP Singapore.

## 9 Contact and Information

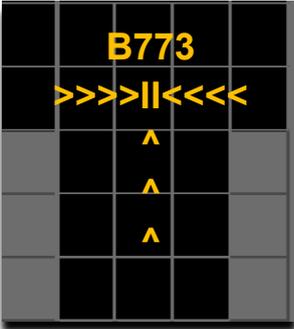
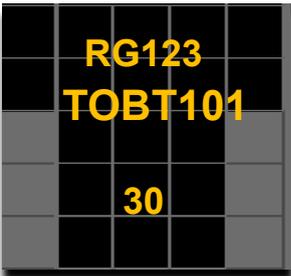
9.1 Detailed information on A-CDM processes at Singapore Changi Airport can be found at <http://www.changiairport-cdm.sg>

9.2 Please email the Changi A-CDM Team at [a-cdm@changiairport.com](mailto:a-cdm@changiairport.com) for application of AOCS A-CDM and GMID account or if you have any queries.

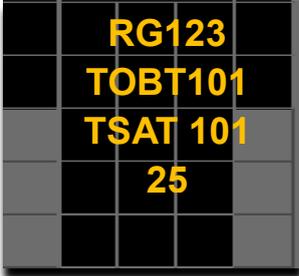
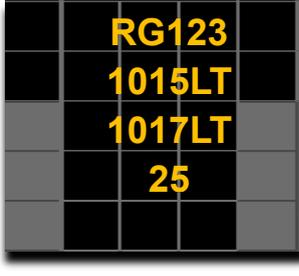
9.3 Aircraft operators may also contact their ground handling agent directly on queries regarding TOBT submission.

**Attachment A**

**Aircraft Docking Guidance System (ADGS)**

Description	Display on ADGS
<p><b>Aircraft arrival to stand</b></p> <ul style="list-style-type: none"> <li>No change in existing functionality and display</li> </ul>	
<p><b>40 minutes prior to TOBT</b></p> <ul style="list-style-type: none"> <li>ADGS will display TOBT submitted by AO / GHA and a count down timer (2 digits) to TOBT in minutes</li> <li>As ADGS can only display up to 7 characters per line, the displayed message will be scrolling.</li> <li>Timings displayed will be in Local Time (LT)</li> <li>TOBT timings will change instantly if there is an update done by AO / GHA</li> </ul>	<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>

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Description	Display on ADGS
<p><b>25 minutes prior to TOBT</b></p> <ul style="list-style-type: none"> <li>ADGS will display TSAT derived by PDS</li> <li>As ADGS can only display up to 7 characters per line, the displayed message will be scrolling.</li> <li>TSAT timings may change as the PDS is continuously optimising push back times based on real time traffic conditions</li> </ul>	<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><b>Aircraft departure from stand</b></p> <ul style="list-style-type: none"> <li>ADGS will display the actual off-block time (AOBT)</li> <li>As ADGS can only display up to 7 characters per line, the displayed message will be scrolling.</li> <li>TOBT, TSAT and TOBT countdown timer will be removed.</li> <li>AOBT display will be removed 3 minutes after AOBT.</li> </ul>	<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>

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