

**54th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGION**

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**AGENDA ITEM 3: AVIATION SAFETY AND
AIR NAVIGATION**

**HARMONIZATION OF AIRPORT COLLABORATIVE
DECISION MAKING (A-CDM) PRACTICES**

(Presented by Singapore)

SUMMARY

This paper shares Singapore's experience and perspective gained from the implementation of Airport Collaborative Decision Making (A-CDM). The paper emphasizes the importance of harmonization of practices in the implementation of A-CDM, as well as to discuss the synergy between A-CDM and air traffic management (ATM) initiatives such as the cross-border Air Traffic Flow Management (ATFM). It also highlights that a collaborative approach in the implementation of A-CDM would lead to the optimization of airport operations which contributes towards achieving seamless ATM in the Asia Pacific Region.

The Conference is invited to:

- a) encourage States/Administrations to work towards harmonization of A-CDM practices in Asia Pacific Region and to participate in the ICAO A-CDM/TF; and
- b) encourage States/Administrations to implement A-CDM taking into account support for cross-border ATFM operations.

HARMONIZATION OF A-CDM PRACTICES

1. INTRODUCTION

1.1 Airport operations requires close collaboration between stakeholders in order to optimize resources and achieve efficiency in operations. A-CDM is a proven concept which optimises airport operations by creating an efficient turnaround process and improving the predictability of operational events. It helps to improve gate management, flight punctuality, reduce apron taxiway and holding point congestion which is beneficial to all airport partners¹. This is achieved by sharing of accurate and timely information amongst airport partners by means of a common toolset and application of pre-defined processes and procedures.

1.2 Keenly aware of the rising air traffic demand and complexity of airport operations, the Civil Aviation Authority of Singapore (CAAS), which provides air navigation services for Changi Airport, and Changi Airport Group (CAG), the airport operator, collaborated with the airlines and ground handling agents in 2013 to develop an A-CDM programme.

1.3 Operational since October 2016, the Changi A-CDM allows airport partners to respond to the dynamic changes in the operating environment for in a timely manner. Findings from the A-CDM operational trials conducted over an eight month period at Changi Airport demonstrated several benefits. Traffic volume rose by 4% from 2015 to 2016 and taxi-out time reduced by an average of 90secs per flight during departure peak hours over the same period. This equates to minimally 5000kg of fuel savings and reduction of 15 tons of carbon emission per day. In addition, there was an overall improvement in predictability of events for better planning and resource allocation e.g. parking stand and runway utilization. All in, the Changi A-CDM has brought about new and better passenger experience at Singapore Changi Airport.

2. DISCUSSION

2.1 Several airports within the Asia Pacific Region have implemented A-CDM to some varying degree and more airports are in the process of or planning to implement A-CDM in the near future. From the initial interest to the final stage of A-CDM implementation, many steps must be taken. The steps have to be well planned and in a phased manner, as each step deals with different aspects and issues at the different stages of the A-CDM journey. The following paragraphs emphasize the importance of harmonization of A-CDM practices as well as the critical success factors, benefits and key issues identified during the implementation of Changi A-CDM.

Harmonization of A-CDM Practices

2.2 There is no ‘one-size-fits-all’ solution for A-CDM implementations as each depends on scalability and must be based on careful engagement across all airport stakeholders. A-CDM will only be successful when it is custom-built to meet the needs of the airport and the region in which it is implemented.

2.3 Notwithstanding, differences across A-CDM airports such as local constraints and requirements, certain key A-CDM processes e.g. terminologies, start-up procedures, can and should be harmonized to prevent confusion among airlines flight crew. Pilots have highlighted that the differences could potentially cause misunderstanding, leading to workload increases during pre-flight preparation, thus limiting the full potential benefits of A-CDM.

2.4 States/Administrations should recognize that harmonization of key practices is vital in achieving long term operational viability and sustainability of A-CDM across all airports. To foster

¹ Airport partners consists of but not limited to: Airport Operators, Aircraft Operators, Ground Handlers, Air Traffic Control and Air Traffic Flow Management Unit.

harmonized understanding of A-CDM and prevent multiple versions of A-CDM being implemented in the region, States/Administrations should take guidance from ICAO Doc 9971 3rd edition when implementing A-CDM programmes. Considerations can also be given to recommendations published by CANSO and IATA.

2.5 The ICAO Aerodrome Collaborative Task Force (A-CDM/TF) provides an excellent platform to share best practices and to progress on issues related to A-CDM implementation and harmonization.

Communication and Buy-In

2.6 The introduction of any major change to airport operation can bring about a potential risk to the environment, especially for airports that are operating at high densities. Associated changes in air traffic management (ATM) procedures and its impact to the operations of all airport partners cannot be underestimated. In this regard, early engagement with the airport partners would be an essential first step in A-CDM implementation. It sets out to ensure that all affected parties understand the concept well and its benefits. With partners' buy-in, their commitment to support the objectives can be assured and work towards creating a collaborative culture amongst the airport operations community will begin as part of the A-CDM journey.

2.7 It is important to note that the success of A-CDM does not solely depend on systems or procedures. It is the people who believe in the spirit of collaboration and committing to the A-CDM processes that make it feasible and effective. A-CDM entails a culture change, hence a long lead time can be expected before any positive results can start to show. Compliance and adherence to agreed processes will ultimately be the key drivers of performance improvements for all parties in the CDM chain.

Importance of Data Accuracy

2.8 With the introduction of A-CDM, a new set of planning times would be used to manage the pre-departure processes. One of them is the Target Off-Block Time² (TOBT). Substantial number of processes and benefits in the turnaround and outbound phases would be linked to TOBT. For this reason, the compliance of related procedures to ensure TOBT accuracy is important to achieve a successful and sustainable A-CDM system. Poor TOBT accuracy would create confusion rather than improve predictability. It would also result in increased operational complexity for ATC and pilots, which can manifest in the form of increased flight delays. In a worst case scenario, the confidence of airport partners in the A-CDM programme will be shaken, which can cripple A-CDM implementation.

A-CDM Supporting the Vision of Seamless ATM

2.9 A-CDM can also support cross-border ATFM operations. It can further optimize operations at the airport by taking into consideration ATFM programme and its measures. In a scenario where local and regional networks of A-CDM and/or ATFM units are set up and connected, key stakeholders will be able to exchange useful departure and arrival information to further improve predictability of events (as compared to standalone A-CDM or ATFM) to enhance the planning and overall situational awareness for all CDM partners.

2.10 Singapore is currently working with other States/Administrations in the Asia Pacific Region to implement cross-border ATFM based on the Distributed Multi Nodal ATFM

² Target Off-Block Time (TOBT) is time that an Aircraft Operator (AO) or Ground Handler (GH) estimates that an aircraft will be ready, all doors closed, boarding bridge removed, push back vehicle available and ready to start up/push back immediately upon reception of clearance from the tower. A-CDM systems can predict the initial TOBT through automated tracking of flight events that occur prior to landing and during the turnaround process. As system predictions does not take into account real-time operational situations, AO or GH are still required to provide manual TOBT updates when it differs by +/- 5mins.

Network concept. The long term goal is to synchronize the process of A-CDM with the process of ATFM to harmonize information sharing and collaborative decision making at both local and regional levels.

2.11 The early awareness of Ground Delay Programme (GDP) using calculated take-off times (CTOTs) from other ATFM units can be shared with local airport partners through the A-CDM network to enhance their decision making process. The availability of CTOTs will improve pre-tactical planning decisions like stand and gate management for airport operators, re-timing of flights and slot swapping for airlines, and better allocation of resources for ground handling agents. The A-CDM network will be able to complement the ATFM network by improving slot adherence through optimal pushback times and provide early indications on possible deviations from CTOTs due to delay in turnaround activities.

2.12 The region's ATFM and local ACDM network will complement each other and together, create a seamless air traffic environment. This would improve flight and ATM efficiency. The integrated network will benefit airlines in terms of fuel burn and carbon emissions. Ultimately, it will also improve overall passenger experience for the travelling community.

3. ACTION BY THE CONFERENCE

- 3.1 The Conference is invited to:
- a) encourage States/Administrations to work towards harmonization of A-CDM practices in Asia Pacific Region and to participate in the ICAO A-CDM/TF; and
 - b) encourage States/Administrations to implement A-CDM taking into account support for cross-border ATFM operations.

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