



ICAO

International Civil Aviation Organization

Eleventh Meeting of the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/11)

Video Teleconference, 02 – 06 August 2021

Agenda Item 5: Regional ATFM Framework and Guidance Material

UPDATING THE REGIONAL FRAMEWORK FOR COLLABORATIVE ATFM

(Presented by the Secretariat)

SUMMARY

This paper presents an initial draft of a proposed update to the Regional Framework for Collaborative ATFM.

1. INTRODUCTION

1.1 The *Regional Framework for Collaborative ATFM* Version 3.0, developed by ATFM/SG and approved initially by APANPIRG and subsequently by the ATM Sub-Group (ATM/SG) of APANPIRG, is available on the ICAO Asia/Pacific Regional Office eDocuments web-page (ATM section, ATFM sub-section):

<https://www.icao.int/APAC/Pages/eDocs.aspx>

1.2 Version 3.0 of the Framework was approved by ATM/SG/5 in 2017.

1.3 Referring to document review, paragraph 1.15 of the Framework document states:

The Framework is intended, as a minimum, to be first reviewed coincident with the first planned review of the Seamless ATM Plan in 2016 and thereafter each three years, also coincident with the regular review of the Seamless ATM Plan. Earlier or more frequent review and amendment will be conducted as recommended by ATFM/SG and agreed by APANPIRG, through its Air Traffic Management (ATM) Sub-Group (ATM/SG).

1.4 The ATFM/SG/8 meeting (New Delhi, India, 14 – 18 May 2018) was presented with information relating to the alignment of the Framework document with the new Third Edition (2018) of ICAO Doc 9971 – *Manual on Collaborative ATFM*. ATFM/SG/8 Flimsy 01 referred (**Attachment A**).

1.5 ATFM/SG/9 (Bangkok, Thailand, 22 – 26 April 2019) further discussed the revision of the Framework document (ATFM/SG/9 WP/30), summarized as follows in the meeting report:

6.1 *The Secretariat informed the meeting of the need for an update of the Regional Framework for Collaborative ATFM, taking into account the following considerations:*

- *Alignment of the Regional ATFM Framework and Doc 9971 (ATM/SG/9 WP30 Attachment A);*

- *Global Air Navigation Plan 2019 update, including a major restructure of the ASBU framework;*
- *Asia/Pacific Seamless ATM Plan 2019 update;*
- *The new suite of basic phrases for Cross-Border GDP facilitation (WP/24);*
- *ATFM Post Ops Analysis Framework (WP/26) and Proposal for Post-Operations Analysis for MINIT/MIT and CTO with KPIs (WP/25);*
- *PfA to the Regional Framework – Origination of DLA Message (WP/28);*
- *PfA to ICAO Regional Supplementary Procedures (WP/29); and*
- *Rationalization of the document and its appendices, including the need to establish some large appendices as separate documents.*

1.6 **Table 1** lists relevant action items from the ATFM/SG Task List as updated by ATFM/SG/10 (Video Teleconference, 04 to 08 May 2020), that should be considered for inclusion in the Framework document:

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY
5/13	Research ATFM for long range flights	Ongoing	Australia/India/Japan/New Zealand /Singapore/Thailand/CANSO/IATA
9/1	Draft regional guidance for advance notice of ATFM measures	ATFM/SG/11	China/Japan/Singapore/Thailand/Secretariat
9/2	Review and Update Regional ATFM Framework per ATFM/SG/9 Report para 4.11 (maximum achievable airborne delay) para 4.16 (ATFM qualification schemes) para 4.30 (use case for CTO) para 5.7 (example post-ops analysis) para 5.11 (example demand analysis) para 6.23 (DLA messages) para 6.29 (major review)	ATFM/SG/11	China, Hong Kong China, India, Japan, Mongolia, Singapore, Thailand, USA
9/3	Develop operational scenario for CTO for airborne flights	ATFM/SG/11	Australia, Japan, New Zealand, Singapore, Thailand
10/1	Streamline Status Reporting requirements	ATM/SG/8	Secretariat
10/2	Additional case studies for inclusion in Post Operations Analysis Recommended Framework	24 July 2020	Australia/Thailand
10/6	Nominate experts to work on offline tasks for Review of Regional ATFM Framework	15 May 2020	States/IOs

Table 1: ATFM/SG Action Items for Potential Inclusion in the Regional Framework for Collaborative ATFM.

1.7 The following discussion lists the work that should be done to update the Framework document. In all cases, amendments to the Framework must remain aligned with the APANPIRG-approved Asia/Pacific ATFM Concept of Operations, which is also available on the ICAO Asia/Pacific Regional Office eDocuments web-page.

2. DISCUSSION

Framework Preliminary Sections

2.1 The following preliminary sections of the Framework should be redrafted to reflect changes made under this project in subsequent sections:

- Section 1 - *Scope of the Framework*;
- Section 2 - *Development and Objectives of the Framework*;
- Section 3 - *Executive Summary*

2.2 The redrafting of the above sections should be done by the ATFM/SG Chair in consultation with ICAO.

2.3 Section 4 – *Abbreviations and Acronyms* should be reviewed by the Secretariat to remove any entries that are not used elsewhere in the document, and to include any new abbreviations and acronyms as required.

Document Review

2.4 Section 1 currently includes the following paragraph:

1.15 The Framework is intended, as a minimum, to be first reviewed coincident with the first planned review of the Seamless ATM Plan in 2016 and thereafter each three years, also coincident with the regular review of the Seamless ATM Plan. Earlier or more frequent review and amendment will be conducted as recommended by ATFM/SG and agreed by APANPIRG, through its Air Traffic Management (ATM) Sub-Group (ATM/SG).

2.5 The Asia/Pacific Seamless ANS Plan, to which the ATFM Framework is subsidiary, is currently intended to be reviewed each three years, with a major review coinciding with the six-year update cycle of the Global Air Navigation Plan (GANP), which coincides with and requires the approval of the ICAO Assembly. The Seamless ANS Plan is therefore scheduled for a mid-cycle review in 2022, and its next major review in 2025.

2.6 The Secretariat is considering whether a proposal should be made to ATM Sub-Group, and subsequently to APANPIRG, to revise the Seamless ANS Plan review cycle to conduct its six-year major review in the year after the Global Air Navigation Plan. This would then allow the relevant experts in the APAC Region the opportunity to study the updated GANP and develop the revised Seamless ANS Plan accordingly.

2.7 Similarly, it is proposed that after 2022 the review of the Regional Framework for Collaborative ATFM should be conducted in the year following the update of the Asia/Pacific Seamless ANS Plan. Table 2 illustrates the potential update cycle.

Year	Responsible Body	Document to be Updated
2022	ATM/SG APANPIRG	Asia/Pacific Seamless ANS Plan • <i>mainly editorial amendments</i>
2022	ATFM/SG ATM/SG	Regional Framework for Collaborative ATFM • <i>current review proposal</i>
2025	ICAO Assembly	Global Air Navigation Plan
2026	ATM/SG APANPIRG	Asia/Pacific Seamless ANS Plan

Year	Responsible Body	Document to be Updated
		<ul style="list-style-type: none"> • <i>major review to respond to updated GANP</i>
2027	ATFM/SG ATM/SG	Regional Framework for Collaborative ATFM <ul style="list-style-type: none"> • <i>Consequential amendments arising from Seamless ANS Plan review; and</i> • <i>Major review</i>
2029	ATM/SG APANPIRG	Asia/Pacific Seamless ANS Plan <ul style="list-style-type: none"> • <i>Mid-term review</i>
2030	ATFM/SG ATM/SG	Regional Framework for Collaborative ATFM <ul style="list-style-type: none"> • <i>Mid-term review and consequential amendments</i>

Table 2: Possible Review Cycle for Asia/Pacific Seamless ANS Plan and Regional Framework for Collaborative ATFM

2.8 However, regardless of whether or not the review cycle of the Seamless ANS Plan is revised, the meeting is invited to agree that routine reviews of the Regional Framework for Collaborative ATFM should be conducted in each year following the routine reviews of the Seamless ANS Plan. A similar review cycle will also be proposed for other Asia/Pacific ATM-related plans and guidance including the Asia/Pacific Regional Plan for Collaborative AIM, Regional ATM Contingency Plan, and Regional SAR Plan.

Section 5 – Background Information

2.9 **ATFM Principles** (and Framework Appendix A) to be updated in line with any relevant changes to the Seamless ANS Plan, and improved knowledge and experience gained since publication of Version 1.0 of the Framework. Principles should also be reviewed to remove duplication of principles now included in Doc 9971, except where deemed necessary for APAC significance. Reference to principles in Doc 9971 should be included.

2.10 **ATFM-Related Aviation System Block Upgrades (ASBU)** to be revised to reflect regional priorities in the Seamless ANS Plan, the updated ASBU scheme in the latest version of the GANP, and any ASBU modules that impact upon the performance objectives of the ATFM Framework.

2.11 **ATFM-Related Performance Objectives of the Seamless ANS Plan** to be revised to reflect the ATFM/CDM-related performance objectives and implementation phases in the latest update of the Seamless Plan.

2.12 **Collaborative Decision-Making** (and Framework Appendix B) to be reviewed against the latest guidance in ICAO Doc 9971 – *Manual on Collaborative ATFM*, and updated in recognition of the development of the APAC Multi-Nodal ATFM Collaboration (AMNAC) from the original multi-nodal ATFM operational trial upon which Appendix B to the framework was based.

2.13 **ATM Phases** to be reviewed and rationalized against the latest guidance in Doc 9971.

2.14 **Airspace and Airport Capacity Improvement** to be reviewed against the latest guidance in Doc 9971 (with unnecessary duplication deleted), and any parallel information in the *Asia/Pacific A-CDM Implementation Plan*.

2.15 **Capacity Planning, Assessment and Declaration** to be reviewed against the latest guidance in Doc 9971. An example of a demand and capacity analysis should be considered, to be included as a new appendix to the Framework document (ATFM/SG Task List action item 9/2)

2.16 **ATFM Daily Plan** (Framework Appendix C) to be reviewed against the latest guidance in Doc 9971, and updated to reflect any revised or additional experience gained by APAC ATFM units exchanging ADP.

2.17 **Advance Notice of ATFM Measures** (new element) – insert guidance on advance notification requirements for ATFM measures, including time parameters for the locking in of measures. ATFM/SG/10 Task List action item 9/1.

2.18 **ATFM Post-Operations Analysis** (new element) – insert brief discussion of the need for, and benefits of, post-operations analysis of ATFM, including reference to the separate *Asia/Pacific ATFM Post-Operations Analysis Recommended Framework*.

2.19 **ATFM Terminology** (Framework Appendix D) to be reviewed and updated to include the Basic Phrases for Cross-Border ATFM Coordination (Working Draft), currently published on the ICAO Asia/Pacific Regional Office website, and the updated guidance in Doc 9971. The subsequent section *ATFM Phrases* should also be consolidated here.

2.20 **ATFM System Communications, ATFM Information Distribution, and ATFM Communications by AFS** to be consolidated and updated to align with latest guidance in Doc 9971, and to refer specifically to the Asia/Pacific AFTN/AMHS-Based ICD for ATFM and the Asia/Pacific FIXM version 4.1 Extension.

- **Table 2 – Minimum ATFM Information for Distribution and Sharing** should be updated according latest ATFM knowledge, and to take into account elements of A-CDM information supporting the integration of A-CDM with cross-border ATFM (**Table 3**).

2.21 Consideration should also be given to the development of an appendix detailing ATFM milestones and their application (operational scenarios), aligned with that provided in the APAC A-CDM Implementation Plan (**Attachment B**). Priority should be given to operational scenarios for CTOT and CTO (ATFM/SG Task List action item 9/3)

Estimated	Calculated	Actual	Applicable
EOBT		AOBT	Terminal Gate
	CTOT	ATOT	Departure Runway
ETO	CTO	ATO	RFIX or AFIX
ELDT	CLDT	ALDT	Arrival Runway
Other			
ADP			

Table 2: Minimum ATFM Information for Distribution Sharing – Regional Framework for Collaborative ATFM.

Estimated	Calculated	Actual	Applicable
EOBT		AOBT	Terminal Gate
	CTOT	ATOT	Departure Runway
ETO	CTO	ATO	RFIX or AFIX
ELDT	CLDT	ALDT	Arrival Runway
Other			
ADP			
Target	Calculated	Actual	Applicable
		AIBT	Turn Around
TOBT	TSAT		Turn Around
Other			
SIBT SOBT			

Table 3: ATFM (minimum) and **A-CDM** (required) Information Sharing

2.22 *Meteorological Information for ATFM* to be updated to include examples of latest information available to advanced ANSPs, and to include direct reference to the *Regional Guidance for Tailored MET Information to Support ATM*.

2.23 *Asia/Pacific Region ATFM Implementation Study* may be replaced by updated information. However, due to the considerable specialist effort required the previous study was funded by IATA. Considering constrained resources available to States and International Organizations, this information may also be considered for removal. See also discussion of Section 6 of the Framework in paragraph 2.31, below.

2.24 *Asia/Pacific Region ATFM Operational Concept* – no change is proposed to this element of the Framework document as the Regional ATFM Concept of Operations remains unchanged.

2.25 *Training and Competencies for ATFM Personnel* (Framework Appendix E) – no change is proposed to this element of Section 5 of the Framework document. However, it is proposed that Appendix E (31 pages) be removed to form a separate document, with reference to that document included in the Framework.

2.26 *ATFM Qualification Schemes* (new element) – discussion of ATFM qualification schemes that exist in the APAC region should be considered for insertion, aligned as necessary with the provisions of ICAO Annex 1.

2.27 *ATFM for Long Range Flights* (new element) – include any relevant information, supported by proposed performance objectives in Section 7 and revision of associated information in Section 8. ATFM/SG Action Item 5/13 refers.

2.28 *Advance Notice of ATFM Measures* (new element) – include any relevant information supported by proposed performance objectives in Section 7. ATFM/SG Action Item 9/1 refers.

2.29 **Regional ATFM Implementation Guidance** (Framework Appendix F) – this element may be shortened to provide reference to the implementation guidance provided in Doc 9971, which integrated the guidance provided in Appendix F. The appendix should then be removed.

2.30 **Regional ATFM Implementation Monitoring** (Framework Appendix G) should be updated, with any consequential amendments as necessary, to expand its reporting categories to take into account proposed amendments to Framework Section 7 – Performance Improvement Plan.

Section 6 – Current Situation

2.31 This section of the Framework document is a snapshot of information provided by a 2014 study funded by IATA. While an update of the study would be welcome, current pandemic-related resource constraints on all States and International Organizations should be taken into account. Accordingly, it is proposed that this section be reviewed to remove redundant information, and to insert the 2022 regional ATFM implementation status data gathered under the Regional ATFM Implementation Monitoring process described in Section 5.

Section 7 – Performance Improvement Plan

2.32 This key section of the Framework document, provided in **Attachment C**, should be reviewed and amended as follows, as a minimum:

- Review the structure of the Performance Improvement Plan. The plan was structured into three phases (Phases IA, IB and II) commencing 12 November 2015, with the final phase expected to be implemented by 08 November 2018. If required after the review of the Framework against ATFM-related performance objectives of the Asia/Pacific Seamless ANS plan, a further implementation phase or phases should be considered. All existing performance expectations should be consolidated;
- Review the definition of *ATFM Program Airports*, taking into account Seamless ANS Plan performance expectations for both ATFM and A-CDM, and any relevant elements of the Asia/Pacific A-CDM Implementation Plan;
- Review the use of high density FIRs and busiest city pairs to define performance expectations;
- Update of the regionally agreed FIXM version to the Asia/Pacific FIXM Version 4.1 Extension;
- Reflecting APAC experience review the use of MINIT and MIT, with a view to limiting their use to tactical application by ATC in response to unexpected short-notice capacity constraints pending the formulation of a program of more mature ATFM measures by ATFM Units/Centres;
- Include reference to the Asia/Pacific ATFM Post-Operations Analysis Recommended Framework;
- Revise performance expectations to take into account ANSPs in geographical locations where their ATFM time horizon does not require them to distribute cross-border ATFM measures.

Section 8 – Research and Future Development Possibilities

2.33 This section should be updated to take into account trial projects currently underway in the cross-border ATFM environment, and any relevant updates in earlier sections of the Framework document.

Working Arrangements

2.34 This work should be undertaken by the ATFM Information Requirements Small Working Group (ATFM/IR/SWG). Noting the ATFM/SG/10 discussion of future arrangement of ATFM/IR/SWG activities, the SWG should convene regular online meetings coordinated by an appropriate rapporteur. The ICAO Secretariat may act as rapporteur for the initial meeting/s, after which the rapporteur should be provided by a State that has well-developed implementation of ATFM that complies with Regional ATFM Concept of Operations and the Regional ATFM Framework.

2.35 A final draft of the reviewed Framework should be provided to the ATFM/SG/12 meeting in 2022.

2.36 In order to ensure the efficiency of this ATFM/IR/SWG activity, participating States/IOs should nominate a single point of contact to participate in its online meetings and contribute proposed Framework revisions, and to arrange any internal coordination within their own organizations.

2.37 Relevant action items in the ATFM/SG Task list will be updated, and new action items included as necessary, after discussion of this paper.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) agree to the proposed work outline;
- c) discuss any relevant matters as appropriate.

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International Civil Aviation Organization

The Eighth Meeting of the ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFMSG/8)

New Delhi, India, 14 – 18 May 2018

Agenda Item 6: Development of Regional ATFM Framework

ICAO APAC Regional Framework for Collaborative ATFM vs Doc 9971 3rd Edition Review

Regional Framework for Collaborative ATFM v3

- Scope of Framework
 - Regional ATFM - needs updating to update situation (p3 - p4)
 - Document Review - para 1.15 need to updated that review was carried out in 2016 => next cycle 2018 / 2019?
- Executive Summary
 - Need for Regional Framework for Collaborative ATFM
 - para 3.1 - statistics update? (p8)
 - Interoperability is the Key
 - may need to add 3.8 - subsequent development of Framework v2, v3 and upcoming v4
- Background Information
 - ATFM Principles
 - Doc 9971, 3rd edition, Part II, Chapter 1, Section 1.2 - ATFM Objectives & Principles already include some principles
 - Regional Framework may want to refer to Doc 9971, stating difference and/or specify ones of deemed importance
 - ATFM-related ASBUs - needs to be updated in 2019 to align with new GANP
 - ATFM-related Performance Objectives of the Seamless ATM Plan - need to be tracked with Seamless ATM Plan updates
 - CDM -
 - Airspace and Airport Capacity Enhancements
 - para 5.23 - may need to be adjusted to align with concept of "ATFM Solution" introduced in Doc 9971 3rd edition - enhance capacity first, then adjust demand

- Capacity Planning, Adjustment and Declaration
 - para 5.28 - terminology : Airport Acceptance Rate (AAR) => Airport **Arrival** Rate (AAR)
 - para 5.29 - references
 - Chapter 3 : Capacity Determination
 - Chapter 4 : ATFM Phases and Solutions
 - Attachment B : Determining AAR
 - Attachment C : Determining Sector Capacity
 - Attachment D : Capacity Planning and Assessment Process
- ATFM Terminology (p23 | 21)
 - most terminology has been included in Doc 9971 3rd edition - Chapter 6 : ATFM Communication; Section 6.5 ATFM Terminology & Phraseology
 - Difference : General Terminology
 - AAR => Airport **Arrival** Rate
 - GS (Ground Stop) => **GSt** (Ground Stop) : avoid conflict with **GS** in another context
 - Removal of
 - ASD : Air Situational Display - not precisely "ATFM-related"
 - AFIX
 - CDM : defined elsewhere
 - CDR : defined elsewhere or more related to CMAC ops
 - DMAN : defined elsewhere
 - RFIX
 - Difference : Phase-of-Flight Terminology
 - "Phase-of-Flight" renamed "Flight Event Time"
 - Removal of
 - TOBT : defined in Part III - A-CDM
 - TSAT : defined in Part III - A-CDM
 - TTOT : defined in Part III - A-CDM

- TLDT : may be defined in Part III - A-CDM
- STOT : airlines do not define STOT - it's rather derived from SOBT
- SLDT : airlines do not define SLDT - it's rather derived from SIBT
- CIBT : ATFM systems do not define in-block time; it is normally landing time or time over waypoint => back-calculated to take-off time
- Regional Framework may consider referring to Doc 9971 3rd edition on ATFM Terminology instead of using Appendix D
- ATFM System Communication (p23-25 | 21-23)
 - more material in Doc 9971 3rd edition - Part II - Chapter 5 : ATFM Service Interfaces
 - Section 5.7 - ATFM Data Communications (para 5.7.1-5.7.5) mentions ADEXP and FIXM
 - Regional Framework may refer to Section 5.7, then specify ADEXP as present means with plan to transition to FIXM
- ATFM Information Distribution
- ATFM Communication by AFS (p26 | 24)
 - Doc 9971 3rd edition Section 5.7 mentions ADEXP as present means prior to FIXM
 - Regional Framework may be reworded to refer to Section 5.7, then specify ADEXP as present means ...
- ATFM Phraseology (p26 | 24)
 - Air-Ground Comms
 - Doc 9971 3rd edition, Part II, Chapter 6, Section 6.5.4 integrates ATFM Phraseology from Regional Framework
 - Exception: change of the word "SLOT" to "CTOT" to avoid confusion between Airport Slot and ATFM Slot (CTOT)
 - Regional Framework may be amended to refer to Doc 9971 instead of using Appendix D
 - Ground-Ground Comms
- Training and Competency of ATFM Personnel
 - Doc 9971 3rd edition, Part II, Chapter 7, Section 7.5 : Training Requirements : ATFM Training summarizes Training Requirement document, but refers to "Appendix E - Training Requirements" with specific link to Regional Framework file
 - ICAO APAC RO may need to coordinate with ICAO HQ on how this link would be maintained. In the longer run, Appendix E may need to be split from the main document to ensure maintainability

- Regional ATFM Implementation Guidance
 - Doc 9971 3rd edition, Part II, Chapter 8 : ATFM Implementation integrates Regional ATFM Implementation Guidance
 - Suggest removal of Appendix F and reference made to Doc 9971 instead
- Current Situation
 - IATA / Metron Study - review?
- Performance Improvement Plan
- Research & Future Development Possibilities
- Milestones, Timelines, Priorities and Actions

APAC A-CDM Implementation Plan

Table 5: Overview of the 16 A-CDM Milestones

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
MS1 ATC Flight Plan Activated	<ul style="list-style-type: none"> Starts the A-CDM process for a flight To check the data consistency between Airport Slot and Airline's flight plan data (EOBT vs SOBT, aircraft registration and aircraft type) 	<ul style="list-style-type: none"> ATC flight plan is submitted by Aircraft Operator (this happens typically at EOBT-3hrs but can also be later) 	<ul style="list-style-type: none"> Schedule Time of departure and arrival for the flight (STD/SOBT and ETA/SIBT) Flight Plan EOBT Gate/Stand 	<ul style="list-style-type: none"> Calculate: ELDT, EIBT, TOBT, TSAT, TTOT Present/Disseminate: ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> TWR Flight Data Processing System ACC Flight Data Processing System AODB/RMS 	<ul style="list-style-type: none"> Required
MS2 CTOT Allocation	<ul style="list-style-type: none"> To allow early awareness of departure delay if there are en-route/destination airport constraints <p>Note 1: Multi-Nodal ATFM Trial currently issues CTOT at latest time of EOBT-1.5hrs</p> <p>Note 2: BOBCAT CTOT is available at EOBT-2hrs</p>	<ul style="list-style-type: none"> CTOT issued by relevant ATFM Unit/cross-border ATFM nodes 	<ul style="list-style-type: none"> CTOT 	<ul style="list-style-type: none"> Calculate: TSAT BASED on CTOT Present/Disseminate: ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, CTOT 	<ul style="list-style-type: none"> ATFM System or similar capability 	<ul style="list-style-type: none"> Required for a fully integrated A-CDM – ATFM solution but not for a local A-CDM implementation
MS3 Take-off from Outstation	<ul style="list-style-type: none"> To provide an ELDT at early stage by using FPL EET + ATOT. To revise system generated TOBT, TSAT and TTOT if required Allow early awareness of deviation from scheduled in-block time for resource planning. 	<ul style="list-style-type: none"> Take-off from up-station 	<ul style="list-style-type: none"> ELDT 	<ul style="list-style-type: none"> Re-calculate: EIBT, TOBT, TSAT, TTOT Present/Disseminate: ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> ACC Flight Data Processing System ACARS 	<ul style="list-style-type: none"> Optional
MS4 FIR Entry	<ul style="list-style-type: none"> To estimate ELDT and prompt alert if potential gate conflict is anticipated. To revise system generated TOBT 	<ul style="list-style-type: none"> Aircraft crosses a defined fix on FIR boundary or enters the FIR. 	<ul style="list-style-type: none"> ELDT 	<ul style="list-style-type: none"> Re-calculate: EIBT, TOBT, TSAT, TTOT Present/Disseminate: ELDT, EIBT, EOBT, 	<ul style="list-style-type: none"> ACC Flight Data Processing System Extended AMAN ACARS 	<ul style="list-style-type: none"> Optional

APAC A-CDM Implementation Plan

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
	<ul style="list-style-type: none"> Allow early awareness of deviation from scheduled in-block time for resource planning. 			SOBT, TOBT, TSAT, TTOT		
MS5 Final Approach	<ul style="list-style-type: none"> To provide a highly accurate and stable ELDT/TLDT as landing sequence is confirmed To revise system generated TOBT Allow for awareness of deviation from scheduled in-block time for resource planning. 	<ul style="list-style-type: none"> Aircraft enters the TMA 	<ul style="list-style-type: none"> TLDT or ELDT 	<ul style="list-style-type: none"> Re-calculate: EIBT, TOBT, TSAT, TTOT Present/Disseminate: TLDT/ELDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> ACC Flight Data Processing System AMAN ACARS 	<ul style="list-style-type: none"> Optional
MS6 Aircraft Landed	<ul style="list-style-type: none"> To revise system generated TOBT Allow for awareness of deviation from scheduled in-block time for resource planning. 	<ul style="list-style-type: none"> Aircraft touches down on runway 	<ul style="list-style-type: none"> Actual Landing Time (ALDT) 	<ul style="list-style-type: none"> Re-calculate: EIBT, TOBT, TSAT, TTOT Present/Disseminate: ALDT, EIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> ACC Flight Data Processing System AMAN ACARS 	<ul style="list-style-type: none"> Required
MS7 Aircraft In-Blocks	<ul style="list-style-type: none"> To revise system generated TOBT 	<ul style="list-style-type: none"> Aircraft arriving at the parking stand 	<ul style="list-style-type: none"> Actual In-Block Time (AIBT) 	<ul style="list-style-type: none"> Re-calculate: TOBT, TSAT, TTOT Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> A-SMGCS Docking System ACARS AODB 	<ul style="list-style-type: none"> Required
MS8 Ground Handling Starts	<ul style="list-style-type: none"> To revise system generated TOBT <p>Note: For a normal turnaround flight MS8 and MS7 occur at the same time. MS8 and MS7 will not be the same for flights which are on the first operation of the day/are delayed/have been long term parked.</p>	<ul style="list-style-type: none"> Actual start of turnaround activities 	<ul style="list-style-type: none"> AGHT 	<ul style="list-style-type: none"> Re-calculate: TOBT, TSAT, TTOT Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> Same as MS7 	<ul style="list-style-type: none"> Optional

APAC A-CDM Implementation Plan

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
MS9 TOBT Update	<ul style="list-style-type: none"> Confirm and take control of TOBT To check the feasibility of TOBT vs SOBT/EOBT. 	<ul style="list-style-type: none"> TOBT confirmation/update into A-CDM portal from EOBT-“X1” minutes <p>Note: “X1” is need to be determined locally to fit the operations at the airport. Recommended to be 30 to 40 minutes.</p>	<ul style="list-style-type: none"> TOBT 	<ul style="list-style-type: none"> Re-calculate: TSAT, TTOT Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	Manual input via: <ul style="list-style-type: none"> A-CDM Portal Mobile Apps Airline/GHA systems 	<ul style="list-style-type: none"> Required
MS10 TSAT Issue	<ul style="list-style-type: none"> To allow decision making based TOBT and TSAT values Create a stable pre-departure sequence 	<ul style="list-style-type: none"> At TOBT – “X2” minutes, TSAT will be published <p>Note: “X2” is need to be determined locally to fit the operations at the airport. Recommended to be 30 to 40 minutes.</p>	<ul style="list-style-type: none"> TSAT 	<ul style="list-style-type: none"> Re-calculate: TTOT Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> A-CDM/PDS 	<ul style="list-style-type: none"> Required
MS11 Boarding Starts	<ul style="list-style-type: none"> To check if boarding has started as expected. 	<ul style="list-style-type: none"> Actual start for Boarding of passengers 	<ul style="list-style-type: none"> ASBT 	<ul style="list-style-type: none"> Re-calculate: - Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, TSAT, TTOT 	<ul style="list-style-type: none"> AODB/RMS Manual input in A-CDM Portal 	<ul style="list-style-type: none"> Optional
MS12 Aircraft Ready	<ul style="list-style-type: none"> Post analysis to measure aircraft readiness against the TOBT Automate removal of TOBT and TSAT based if rules are not followed based on local procedures 	<ul style="list-style-type: none"> The call from the pilot to ATC to report ready within “X3” minutes of TOBT <p>Note: The value of “X3” is based on local procedures. “X3” is highly recommended to be +/5 minutes</p>	<ul style="list-style-type: none"> Actual Ready Time (ARDT) 	<ul style="list-style-type: none"> Re-calculate: - Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, ARDT, TSAT, TTOT 	Manual input in <ul style="list-style-type: none"> Electronic Flight Strip System A-CDM portal/HMI 	<ul style="list-style-type: none"> Optional
MS13 Start Up Request	<ul style="list-style-type: none"> To measure pilot’s adherence to TSAT. Automate removal of TOBT and TSAT based if rules are not followed based on local procedures 	<ul style="list-style-type: none"> The call from the pilot to ATC to request pushback/start-up clearance within “X4” minutes of TSAT. <p>Note: The value of “X4” is based on local procedures. “X4” is highly recommended to be +/5 minutes</p>	<ul style="list-style-type: none"> Actual Start-up Request Time (ASRT) 	<ul style="list-style-type: none"> Re-calculate: - Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, ARDT, ASRT, TSAT, TTOT 	Manual input in <ul style="list-style-type: none"> Electronic Flight Strip System A-CDM portal/HMI 	<ul style="list-style-type: none"> Optional

APAC A-CDM Implementation Plan

Milestone	Purpose of the Milestone	Milestone is triggered by	Data Elements	A-CDM Actions	Example of system(s) that typically has this data (and should share it)	Required/ Optional
MS14 Start Up Approved	<ul style="list-style-type: none"> To measure ATC's adherence to TSAT Automate removal of TOBT and TSAT based if rules are not followed based on local procedures 	<ul style="list-style-type: none"> The call from ATC to pilot to give clearance for push and start clearance within "X5" minutes of TSAT. <p>Note: The value of "X5" is based on local procedures. "X5" is highly recommended to be +/5 minutes</p>	<ul style="list-style-type: none"> Actual Start-up Approve Time (ASAT) 	<ul style="list-style-type: none"> Re-calculate: - Present/Disseminate: ALDT, AIBT, EOBT, SOBT, TOBT, ARDT, ASRT, TSAT, ASAT, TTOT 	Manual input in <ul style="list-style-type: none"> Electronic Flight Strip System A-CDM portal/HMI 	<ul style="list-style-type: none"> Optional
MS15 Off Block	<ul style="list-style-type: none"> To check if the aircraft has gone off blocks as per TSAT Update Target Take-Off Time (TTOT) generated by DMAN/PDS if required 	<ul style="list-style-type: none"> Aircraft commence pushback 	<ul style="list-style-type: none"> Actual Off Block Time (AOBT) 	<ul style="list-style-type: none"> Re-calculate: TTOT Present/Disseminate: ALDT, AIBT, EOBT, SOBT, AOBT, TTOT 	<ul style="list-style-type: none"> A-SMGCS Docking System ACARS Manual input 	<ul style="list-style-type: none"> Required
MS16 Take Off	<ul style="list-style-type: none"> End of A-CDM process and relevant stakeholders are updated with the take-off information. Flight is removed from the A-CDM process 	<ul style="list-style-type: none"> Aircraft lift-off the runway 	<ul style="list-style-type: none"> Actual Take-Off Time (ATOT) 	<ul style="list-style-type: none"> Re-calculate: - Present/Disseminate: ALDT, AIBT, EOBT, SOBT, AOBT, ATOT 	<ul style="list-style-type: none"> A-SMGCS ACARS 	<ul style="list-style-type: none"> Required

Asia/Pacific Framework for Collaborative ATFM

PERFORMANCE IMPROVEMENT PLAN

Note: prior to implementation, ATFM systems and procedures should be verified by safety assessment under State Safety Management Systems.

Structure of the Performance Improvement Plan

7.1 Regional collaborative ATFM performance objectives are arranged in *Regional ATFM Capability* phases aligned, where practicable, with Phases I and II of the Seamless ATM Plan's Preferred Aerodrome/Airspace and Route Specifications (PARS) and Preferred ATM Service Levels (PASL):

- PARS/PASL Phase I – expected implementation by 12 November 2015; and
- PARS/PASL Phase II – expected implementation by 08 November 2018.

7.2 Recognizing the short lead time between the finalization of the Framework and PARS/PASL Phase I, Regional ATFM Capability Phase I is divided into sub-phases A and B, with expected implementation 12 November 2015 and 25 May 2017 respectively.

7.3 Performance objectives are presented under the following general structure for each Regional ATFM Capability Phase, where relevant:

- ATFM Regulations
- ATFM Systems
- (Strategic ATFM, Pre-Tactical ATFM or Tactical ATFM)
 - Capacity and Demand Monitoring and Analysis
 - Capacity Improvement
 - ATFM Execution
 - ATFM Measures
 - Post-Operations Analysis

ATFM Program Airports

7.4 *ATFM Program Airports*, referenced in the performance objectives, are:

- The busiest Asia/Pacific Region aerodromes as defined in the Asia/Pacific Region Seamless ATM Plan;
- Airports where strategic slot allocation is implemented under these performance objectives; and
- All other airports designated by the relevant authority as requiring or potentially requiring ATFM implementation.

Asia/Pacific Framework for Collaborative ATFM

Note: prior to implementation, ATFM systems and procedures should be verified by safety assessment under State Safety Management Systems.

REGIONAL ATFM CAPABILITY PHASE IA

Expected implementation by 12 November 2015

ATFM Regulations

7.5 All States where air traffic demand at times exceeds, or is expected to exceed declared capacity, should enact regulations for the implementation of ATFM.

Annex 11 to the Convention on Civil Aviation section 3.7.5 refers.

Strategic Capacity and Demand Monitoring and Analysis

7.6 A regular program of bi-annual strategic airport and airspace capacity and demand analysis should be implemented for all international airports and associated terminal area airspace, and for all en-route ATC sectors supporting the busiest Asia/Pacific city pairs⁶ (**Figure 13**), including consideration of:

- CNS systems;
- ATC resources and capability;
- ATC separation standards and techniques;
- runway occupancy times;
- seasonal schedules; and
- historical traffic data and traffic growth forecasts

⁶ The Asia/Pacific Seamless ATM Plan lists the busiest Asia/Pacific aerodromes:

- Australia (Sydney, Melbourne);
- China (Beijing, Shanghai Pudong and Hong Jiao, Guangzhou, Hong Kong, Xi'an, Shenzhen, Chengdu, Kunming);
- India (New Delhi, Mumbai);
- Indonesia (Jakarta);
- Japan (Haneda, Narita);
- Malaysia (Kuala Lumpur);
- Philippines (Manila);
- Republic of Korea (Incheon);
- Singapore (Changi); and
- Thailand (Suvarnabhumi).

Asia/Pacific Framework for Collaborative ATFM

7.7 Where strategic analysis indicates that demand does not yet exceed capacity, preparation for the implementation of ATFM capability should be based on careful analysis of current traffic and expected growth in the next 5 years;

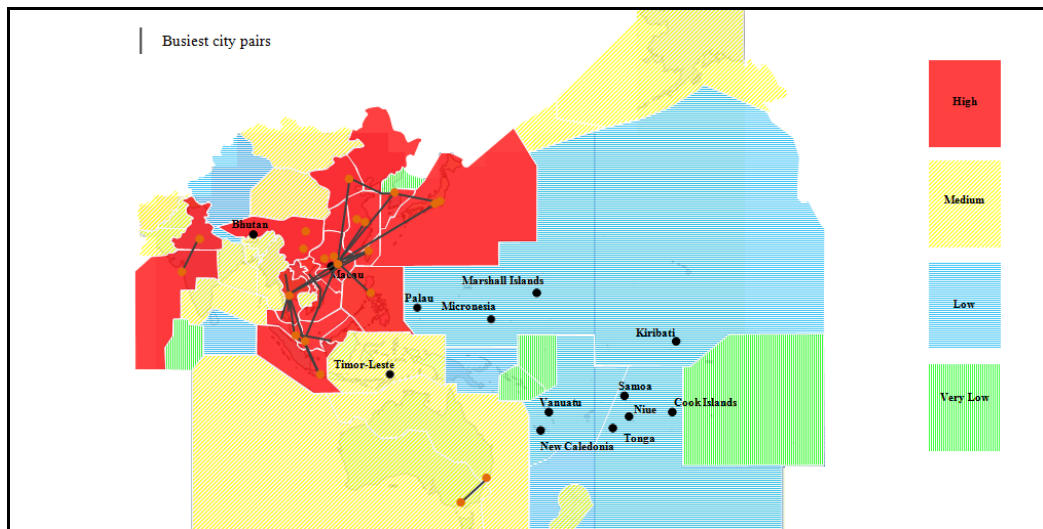


Figure 13: Asia/Pacific High Density FIRs, showing Busiest City Pairs
(Source: Asia/Pacific Seamless ATM Plan)

Pre-Tactical Capacity and Demand Monitoring and Analysis

7.8 Daily pre-tactical airport and airspace capacity and demand analysis should be conducted for all ATFM Program Airports and associated terminal area airspace, and for all en-route ATC sectors supporting the busiest Asia/Pacific city pairs, including consideration of:

- i. expected runway and airspace configurations;
- ii. forecast meteorological phenomena;
- iii. ATC resources, facilities and equipment;
- iv. other known or expected capacity constraints; and
- v. updated flight schedule and flight plan information.

Pre-Tactical ATFM Execution

7.9 ATFM Daily Plan (ADP) for all ATFM Program Airports and associated terminal area airspace, including airport and airspace capacity declarations and related background information, should be prepared and distributed to all relevant stakeholders.

ADP should be distributed to stakeholders by either:

- i. Web-based ATFM network; or*
- ii. Web-pages hosted by each participating ANSP; or*
- iii. Email distribution.*

Asia/Pacific Framework for Collaborative ATFM

Relevant stakeholders include:

- iv. *Neighbouring ATFMUs or, where not provided, ATSU*s
- v. *ATSUs supported by the originating ATFMU;*
- vi. *Relevant airport operators; and*
- vii. *Participating aircraft operators.*

7.10 ADP should be coordinated by the responsible ATFMU or ATSU and agreed with all relevant stakeholders, through chairing and/or participation in scheduled and, where necessitated by changes in airport or airspace capacity or other events, ad-hoc ATFM conferences for pre-tactical ATFM planning.

Post-Operations Analysis

7.11 The accuracy and effectiveness of capacity and demand analyses and ADP preparation and distribution, including supporting information listed in paragraph 7.7, should be verified through comparison with operational outcomes observed, and rectification of discrepancies included in planning for system and process improvements.

REGIONAL ATFM CAPABILITY PHASE IB

Expected implementation by 25 May 2017

ATFM Systems

7.12 Operational FPL and ATS message distribution systems and processes should be analysed and, where necessary, modified to ensure that FPL, CHG, DEP, DLA and CNL messages are originated, distributed and processed in accordance with the requirements specified in ICAO Doc. 4444 PANS-ATM.

7.13 Requirements should be published in all relevant State AIP, specifying that, except where necessary for operational or technical reasons, FPL should be submitted not less than 3 hours prior to EOBT.

7.14 A DLA message should be transmitted when the departure of an aircraft, for which basic flight plan data FPL has been sent, is delayed by more than 15 minutes after the estimated off-block time contained in the basic flight plan data.

7.15 Where the delay is the result of a GDP, the DLA message should be sent by the ATFMU responsible for the destination airport, addressed to the ATS unit serving the departure aerodrome for subsequent transmission in accordance with the provisions of ICAO Doc 4444 PANS-ATM.

7.16 Appropriate procedures should be implemented to ensure that FPL are not discarded from other ATM systems as a consequence of ATFM delay.

7.17 ATFM, AMAN/DMAN and A-CDM systems should be integrated through the use of common fixes, terminology and communications protocols to ensure complementary operations.

FIXM version 3.0 or later, extended where necessary is the agreed format for exchange of ATFM information in the Asia/Pacific Region.

Asia/Pacific Framework for Collaborative ATFM

Where full ATFM network communications capability is not yet established, ATFM messages conforming to ADEXP version 3.1 may be used for distribution of ATFM measures.

Capacity Improvement

7.18 Airport and terminal airspace capacity should be increased through optimized ATC separation standards and techniques and reduced runway occupancy at all ATFM Program Airports and in associated terminal area airspace.

7.19 Where necessitated by demand, and using a performance-based approach, terminal area ATS route structure improvements including CCO/CDO should be implemented to reduce ATC and pilot workload and enable better use of aircraft capability to meet ATFM measures.

Strategic ATFM Execution

7.20 Implement strategic airport slot allocation at all international airports, for periods where demand significantly exceeds the airport's capacity.

Pre-Tactical Capacity and Demand Monitoring and Analysis

7.21 Pre-tactical modelling of expected airport and airspace configuration and traffic demand, and the effect of ATFM measures, should be implemented for all ATFM Program Airports and associated terminal area airspace.

Pre-Tactical ATFM Execution

7.22 CDM capability should be implemented, enabling the sharing of all relevant information with all stakeholders, providing continuous availability of information and common reference material for daily and ad-hoc ATFM conferences.

Tactical Capacity and Demand Monitoring and Analysis

7.23 Dynamic update of airport and airspace capacity constraints, capacity calculation, demand information using schedule, flight plan and ATS messaging, and ATM system information and modelling of tactical ATFM programs should be implemented.

Tactical ATFM Execution

7.24 Tactical ATFM at ATFM Program Airports should be implemented using:

- i. Ground Delay Programs (CTOT), or
- ii. Minutes in trail (MINIT) or miles in trail (MIT) or other ATFM measures specified in ICAO Doc 9971 – *Manual for Collaborative ATFM*.

7.25 All States should ensure that local ATC procedures and, where available, CDM processes facilitating compliance with received CTOT are implemented.

Note 1: At controlled aerodromes, CTOT compliance should be facilitated through the cooperation of the aircraft operator and the issuance of ATC clearances. As a minimum, CTOT should be made available to the relevant ATC tower and the aircraft operator;

Asia/Pacific Framework for Collaborative ATFM

Note 2: For flights departing aerodromes where an ATC service is not provided, CTOT information should be made available to the aircraft operator and the first ATS unit providing services to the flight.

Note 3: States planning to implement ground delay programs should ensure adequate time is provided for local procedure development and promulgation at aerodromes where CTOT will be applied.

7.26 CTOT for individual aircraft should, where necessary, be revised, cancelled, suspended or de-suspended.

7.27 Tactical ATFM should be implemented for operations through constrained airspace sectors, only during periods affected by the constraint.

7.28 As far as practicable, individual aircraft should not be subject to more than one tactical ATFM measure per flight.

Post-Operations Analysis

7.29 Procedures and agreements should be developed to ensure post-operational analysis of cross-border ATFM programs, including the canvassing and consideration of feedback from airspace users, airports operators, ATS and other ATFM units. Daily post-operations analysis conferences should be held, supplemented where necessary by ad-hoc conferences called to assess the outcomes of programs of ATFM measures responding to non-normal situations.

7.30 The results of post-operations analyses should be used for planning ATFM, airspace and ATS route improvements.

ICAO Doc 9971 – Manual on Collaborative ATFM Part II-4-8 provides guidance on post-operations analysis

REGIONAL ATFM CAPABILITY PHASE II

Expected implementation by 08 November 2018

ATFM Systems

7.31 Distributed multi-nodal ATFM information distribution capability utilizing FIXM version 3.0 (or later) should be implemented, including:

- i. Sharing of ADP and dynamically updated demand and capacity data for all ATFM program airports, and for en-route airspace supporting the busiest city pairs and high density major traffic flows;
- ii. Slot allocation information for all flights subject to ATFM programs, including as a minimum CTOT, CTO and CLDT information;
- iii. Authorized user functions for slot amendment, cancellation or suspension (ATFMU), and slot-swapping (aircraft operator and ATFMU); and
- iv. Automated slot compliance monitoring and reporting, supplemented where necessary by authorized inputs by ATFMU, ATSU or airspace operator.

Asia/Pacific Framework for Collaborative ATFM

7.32 Full interoperability of cross border ATFM, A-CDM, AMAN, DMAN, ATM automation and airspace user systems should be implemented, utilizing FIXM 3.0 (or later) , to provide seamless gate-to-gate collaborative ATFM operations.

Pre-Tactical Capacity and Demand Monitoring and Analysis

7.33 Automated modelling of expected airport and airspace configuration and traffic demand, and the effect of ATFM measures, should be implemented for all ATFM Program Airports and associated terminal area airspace and, where possible, en-route airspace supporting the busiest Asia/Pacific Region city pairs and high density major traffic flows.

Tactical Capacity and Demand Monitoring and Analysis

7.34 Meteorological services to support ATM in the terminal area (MSTA) should be implemented, including near-term or *now-casting* forecasts of convective weather activity at or affecting ATFM Program Airports and associated instrument approach procedures, terminal area ATS routes and holding points and other significant locations.

Note: Annex 3 requires that States ensure the quality management of meteorological information.

Tactical ATFM Measures

7.35 ATFM measures including MIT, MINIT and, where necessary, CTO at AFIX or RFIX, should be applied to flights through constrained airspace.

7.36 Ground Delay Programs utilizing CTOT should be applied to:

- i. aircraft destined for constrained ATFM Program Airports, that have not yet departed; and
- ii. aircraft planned to operate through constrained airspace where tactical ATFM measure CTO at RFIX or AFIX is in place, that have not yet departed.

7.37 ATFM systems should have the capability to take into account long haul flights.

7.38 Systems should be in place to ensure the timely update of estimate information for airborne aircraft.

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