



ICAO

International Civil Aviation Organization

**The Combined Tenth Meeting of the South Asia/Indian Ocean
ATM Coordination Group (SAIOACG/10) and Twenty—
Seventh Meeting of the South East Asia ATS Coordination
Group (SEACG/27)**

Bangkok, Thailand, 30 March – 03 April 2020

Agenda Item 4: Implementation of CNS/ATM Systems

AIR TRAFFIC FLOW MANAGEMENT UPDATE

(Presented by the Secretariat)

SUMMARY

This paper presents an update on Air Traffic Flow Management issues.

1. INTRODUCTION

1.1 The Ninth Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/9) was held in Bangkok, Thailand, from 22 to 26 April 2019.

2. DISCUSSION

Related Meeting Outcomes

2.1 The ATFM/SG/9 meeting was provided with information on a number of other relevant meetings.

2.2 Among the information provided was an update on the progress of the *Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations*. In accordance with **Conclusion APANPIRG/29/25** the document had been posted on the ICAO APAC e-Documents web-page in working draft form. APAC Administrations were requested to provide comments to the Meteorological Requirements Working Group (MET/RWG), through the ICAO

2.3 The ATFM/SG/9 meeting was informed of the progress of its ATFM Information Requirements Small Working Group (ATFM/IR/SWG), which had been formed by ATFM/SG to draft an Operational Requirements Document (ORD) and a technical Interface Control Document (ICD) for the exchange of, and interaction with, ATFM information. Included in the information highlighted by the ATFM/IR/SWG was the practice of some Administrations issuing NOTAMs to promulgate ATFM measures with immediate effect. ICAO noted that NOTAM were not intended to be used for promulgation of tactical ATC actions, including ATFM measures, and that the goal of ATFM was predictability through ATFM information exchange using Collaborative Decision-Making (CDM) processes.

Successful Operation Trial of ATFM Tool

2.4 Indonesia informed ATFM/SG/9 of the operational trial of a new tool used for ATFM during the meeting of the International Monetary Fund (IMF) at Bali, Indonesia in 2018. The ‘Mini ATFM’ tool, used in conjunction with the ‘Chronos’ slot management application, enabled the Bali/Denpasar ATFM Unit (ATFMU) to predict demand, and to calculate and generate a Ground Delay Program (GDP). The trial had resulted in a reduction of airborne delay by 60%, when compared to the Asia/Pacific Economic Cooperation (APEC) meeting in Bali in 2013.

ATFM Measure for L301 Westbound Flights

2.5 Thailand informed the ATFM/SG/9 meeting of the plan to deploy ATFM measures to manage traffic on ATS route L301 during peak hours due to capacity limitations in Bay of Bengal and Arabian Sea airspace. Several traffic flows were merged into a 10-minute longitudinal separation that applied on L301, illustrated in **Figure 1**. A Flight Level Allocation Scheme (FLAS) limited traffic on the route to only two flight levels, F260 and F320.

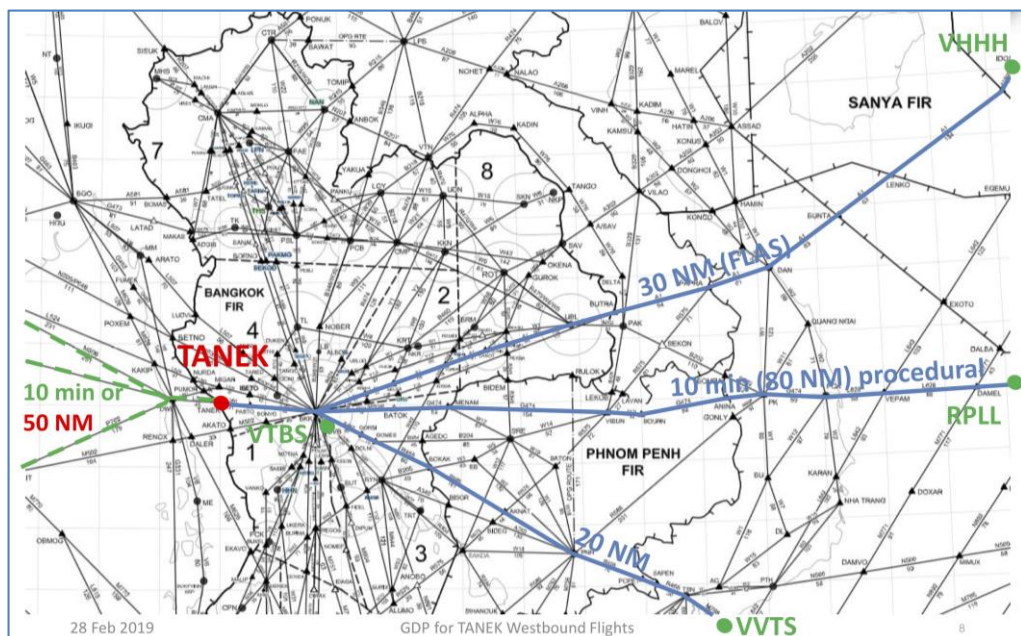


Figure 1: Traffic Merging into L310 Westbound at waypoint TANEK

2.6 Thailand stressed that it was not intended to use ATFM measures in perpetuity in the absence of action to improve the capacity of L301 for westbound traffic.

Update on ATS Route M771 ATFM Operational Trial

2.7 Singapore presented an update to ATFM/SG/9 on the on-going ATFM initiative to mitigate the impact of flow restrictions from downstream Area Control Centres (ACCs) on ATS route M771. The trial leveraged on existing ATFM concepts within the Distributed Multi-Nodal ATFM Network project and the Collaborative Minutes/Miles-in-Trail Conversion Program (CMCP), by assigning CTOT to improve predictability and efficiency for flights affected by Minutes-in-Trail (MINIT) ranging from 25 to 240 minutes, regardless of flight level, for flights bound for Shanghai/Pudong airport. Similar trials were being conducted for ATS routes A1 and A202.

2.8 The meeting was also provided with post operational analysis from data collected over the period from June to December 2018. Operational feasibility of the trial was validated by the Post Operational Analysis (POAs) results. However, wider participation of this initiative would provide better predictability for stakeholders.

2.9 The information provided noted the success of operational trials, the challenges faced resulting from changes to flow restrictions promulgated without sufficient lead time, the benefits of having the initiating ATFMU calculate and distribute CTOT or CTO rather than MINIT.

2.10 In general discussion on the subjects raised in the paper, the meeting also noted the need for predictability, particularly for flights from distant airports, and the need to address the development of the use of CTO for aircraft in flight.

Management of Air Traffic Transiting Hong Kong FIR During Inclement Weather Season and the Limitations of Ground Delay Programs

2.11 Hong Kong, China presented further information to ATFM/SG/9 on the management of air traffic transiting the Hong Kong FIR during the inclement weather season, previously presented in the 26th Meeting of the South-East Asia ATS Coordination Group (SEACG/26, Bangkok, Thailand, 01 to 04 April 2019).

2.12 While it was agreed that ‘traditional’ measures such as MIT and MINIT lacked predictability and quantification of delay, and GDP permitted a much more refined analysis and equitable distribution of delay, Hong Kong China considered that GDP required accurate determination of capacity with sufficient lead time to enable a rational basis for calculation of CTOTs and distribution within agreed timeframes. While good progress was being made, the maturity of Demand-Capacity Balancing (DCB), the need for relevant meteorological information sufficiently in advance of the onset of weather phenomena, and reliable ATFMU participation by other Administrations, resulted in the need for a hybrid ATFM operation, with GDP only able to serve about 25 to 30% of flights in the FIR.

2.13 The Secretariat expressed concern that there were other ATFMUs in the APAC Region that had not made reasonable arrangements for the continuation of necessary ATFM functions outside their hours of operation. The lack of such arrangements did not meet the APAC regional expectations of the Regional ATFM Framework, or the normal expectation of the aviation community of the availability of such services on a 24-hour basis.

2.14 It was further stated by the Secretariat that Hong Kong FIR was one of several that were faced with dealing with the effects of the core issue that was not yet being either acknowledged or addressed by the APAC State primarily concerned - the chronic lack of sufficient ATS routes to provide the capacity necessary to meet demand, and the rigid incapability to manage aircraft requiring deviation from track due to convective weather, which was part of routine operations elsewhere. This was resulting in the problem being effectively exported to and causing extreme difficulty for ATC and airspace users in the airspace of other States and Administrations, both near to and distant from the affected airspace.

Update on Information Exchange Model Development to Support ATFM Operations and ATFM/A-CDM Integration in the Asia/Pacific Region

2.15 China, Hong Kong China, Singapore, Thailand, CANSO and IATA shared the progress of the Technical Sub-Group of the Distributed Multi-Nodal ATFM Network Project in the areas of ADP naming, an Interface Control Document (ICD) for the distribution of ATFM information via the Aeronautical Fixed Telecommunications Network (AFTN)/Aeronautical Message Handling System (AMHS), and a draft-preliminary SWIM-based ICD.

2.16 Accordingly, the ATFM/SG/9 meeting agreed to Draft Conclusion ***ATFM/SG/9-2: AFTN/AMHS-Based Interface Control Document for ATFM***, for consideration by the Aeronautical Communications Services Implementation Coordination Group (ACSICG), which would hold its next meeting (ACSICG/6) in Bangkok, Thailand, from 13 to 15 May 2019.

Draft Conclusion ATFM/SG/9-2: AFTN/AMHS-Based Interface Control Document for ATFM

That, the AFTN/AMHS-Based Interface Control Document at Appendix F to the Report be uploaded to the Asia/Pacific Regional Office website, for use by Asia/Pacific Administrations in implementing cross-border ATFM communications in accordance with the provisions of the Regional Framework for Collaborative ATFM.

2.17 ACSICG subsequently supported the Draft Conclusion, which was subsequently agreed by the Twenty-third Meeting of the Communications, Navigation and Surveillance Sub-Group of APANPIRG (CNS SG/23) in ***Conclusion CNS SG/23/1 – ATFM/AMHS-Based Interface Control Document for ATFM***.

2.18 A SWIM-based ICD, also developed under an initiative launched by ATFM/SG, was presented to the Third Meeting of the Asia/Pacific System-Wide Information Management Task Force (SWIM/TF/3, Bangkok, Thailand, 07 to 10 May 2019). CNS SG/23 subsequently supported a Draft Conclusion proposing the adoption of the Asia/Pacific FIXM Version 4.1 Extension, which was agreed by APANPIRG in ***Conclusion APANPIRG/30/12 – Asia/Pacific Regional FIXM Extension for ATFM***.

2.19 The ATFM/AMHS ICD and the APAC Regional FIXM Extension were subsequently uploaded to the ICAO Asia/Pacific Regional Office eDocuments web-page for use by States, and the FIXM Extension was also uploaded to the FIXM website:

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

<https://fixm.aero/>.

2.20 Based on the operational scenarios developed for the System-Wide Information Management (SWIM) in ASEAN Demonstration, attributes supporting cross-boundary ATFM, including those involving A-CDM operation and supporting integration between ATFM and A-CDM were identified. The data attributes currently included in the FIXM version 4.1 Extension are outlined in **Table 1**.

2.21 The meeting was informed of an effort being made in collaboration between the ATMOPSP and the ATMRPP by the USA to evaluate the accommodation of ATFM data elements in the existing globally standardized information exchange models. After analysis of both technical and non-technical factors such as schedule, potential risks, and potential benefits, it was concluded that developing a new and standalone information exchange model for ATFM-related information exchange was the best option. However, it was noted that the scope of the ATFM information to be included in a new exchange model was yet to be clearly defined, and that data elements considered flight-specific, including those in the APAC FIXM extension, should remain under FIXM.

Estimated	Calculated	Target	Actual
		Target Off Blocks Time (TOBT)	Actual Off Blocks Time (AOBT)
		Target Start Approval Time (TSAT)	
	Calculated Take-Off Time (CTOT)	Target Take-Off Time (TTOT)	
Estimated Time Over (ETO)	Calculated Time Over (CTO)		Actual Time Over (ATO)
Estimated Landing Time (ELDT)	Calculated Landing Time (CLDT)		
Other			
Trajectory		Aircraft Track	
<ul style="list-style-type: none"> • ETO • CTO • ATO • Flight level or Altitude • Waypoint 		<ul style="list-style-type: none"> • Ground speed • Bearing • Flight level or Altitude • Position (Designator or Latitude/Longitude or Relative Point) • Time over position 	

Table 1: FIXM version 4.1 Extension Data Attributes

2.22 The meeting discussed at length the options for identifying and then including any further attributes in the FIXM extension. Noting that the development of the FIXM extension required significant, detailed effort, and that inclusion of additional attributes would cause substantial delay in finalizing the APAC FIXM Extension, it was agreed that any additional attributes for A-CDM purposes should be included in a second, separate extension, to be developed at a later date, and after sufficient experience had been gained. It was also noted that the attributes in Table 1 included sufficient provision for initial ATFM/A-CDM integration in cross-border information exchange, and that many of the A-CDM attributes considered to be of value (ALDT, ATOT etc.) were in FIXM 4.1 Core. There was also no barrier to States developing their own extension attributes for internal use within their ATFM node.

ATFM Post-Operations Analysis Recommended Framework

2.23 The ATFM/SG/9 meeting reviewed the first draft of the ATFM Post-Operations Analysis Recommended Framework, presented by China, Hong Kong China, Singapore, Thailand, CANSO and IATA. The document had been developed by the Distributed Multi-Nodal ATFM Project Core Team, in recognition that post-operations analysis is an integral part of ATFM operations, as mentioned in Doc 9971 and the Regional ATFM Framework, but there was little guidance available.

2.24 The meeting agreed that the document should be made available in working draft form to allow its immediate use by APAC Administrations, pending the inclusion of some additional items already identified within the document for further development, and the review of the content and structure of the Regional ATFM Framework and its various (large) appendices.

2.25 The meeting agreed that an important item for consideration for inclusion in the next version of the document was mechanism/s to include stakeholder feedback in collaborative post-operations analyses. USA recommended examination of the CADENA model in this regard.

Basic Phrases for Cross-Border GDP Facilitation

2.26 A list of basic phrases for GDP coordination prepared by China, Hong Kong China, Singapore, Thailand, CANSO and IATA was presented for review by the meeting. ATFM/SG/8 had been informed of the lack of standardized phrases for cross-border ATFM coordination, which presented a significant operational challenge in the APAC Region where English was not the primary language for day-to-day communication. The current distributed ATFM network environment relied heavily on plan-language verbal communications, and misunderstandings could, and did, occur.

2.27 The meeting agreed that the Basic Phrases for GDP Coordination should be made available to APAC Administrations in working draft form for immediate use, pending its incorporation in the re-structured Regional ATFM Framework.

2.28 Accordingly, the meeting agreed to the following Conclusion:

Conclusion ATFM/SG/9-4: Working Draft ATFM Guidance Material

That, the following documents in working draft form be posted to the Asia/Pacific Regional Office eDocuments web-page, pending their inclusion in the 2020 update of the Regional Framework for Collaborative ATFM:

1. *Basic Phrases for Cross-Border GDP Facilitation, at Appendix G to the Report; and*
2. *ATFM Post-Operations Analysis Recommended Framework, at Appendix H to the Report.*

2.29 The two working draft documents were subsequently uploaded to the ICAO APAC eDocuments web-page: <https://www.icao.int/APAC/Pages/eDocs.aspx>

Regional ATFM Implementation Status Monitoring

2.30 APAC Regional ATFM implementation status, updated with information received after ATFM/SG/9, was presented to the Seventh Meeting of the Air Traffic Management Sub-Group of APANPIRG (ATM/SG/7, Bangkok, Thailand, 05 to 09 August 2019). Implementation status was reported against the performance objectives of the Regional Framework for Collaborative ATFM. The regional program of status reporting was supported by ***Conclusion ATM/SG/5-3: Asia/Pacific Regional Framework for Collaborative ATFM Amendment.***

2.31 Reports, due by 30 April each year, had been received from the following 23 Administrations:

Australia Bangladesh, Cambodia, China, Hong Kong China, Macao China, India, Indonesia, Japan, Malaysia, Maldives, Myanmar, Nepal, New Caledonia, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Thailand, Viet Nam and USA

2.32 The ATFM Implementation Status Report form provides for two tiers of status reporting:

A: Administrations that are expected, or intend, to implement and distribute cross-border ATFM measures under the terms of the Performance Improvement Plan of the Asia/Pacific Regional Framework for Collaborative ATFM; and

B: Administrations that are not expected to implement and distribute cross-border ATFM measures as described in A.

Note: Administrations that were not expected to implement and distribute cross-border ATFM measures were expected to implement a number of other elements of the Regional Framework for Collaborative ATFM.

2.33 Administrations reporting against Tier B implementation were requested to note the Regional Framework for Collaborative ATFM and Asia/Pacific Seamless ATM Plan elements referring to *ATFM Program Airports, High Density Airports* and *High Density FIRs*, and commence reporting against Tier A elements where any of their aerodromes or FIRs met these criteria.

2.34 The collated Regional ATFM implementation status data is provided in **Attachment A**.

2.35 In alignment with the methodology applied to assessment of implementation status in a number of significant ATM technical fields in the APAC Region, implementation status of each Administration is assessed as *Robust* (90 – 100% implementation), *Marginal* (70 – 89%) or *Incomplete* (0 – 69%).

2.36 **Table 2** summarizes current implementation status. Administrations that have filed reports against the incorrect reporting tier, or have not reported at all, are indicated accordingly.

2.37 Where implementation of items 2 or 32 of the report form is reported (handling of FPL and ATS messages in accordance with ICAO Doc 4444 *Procedures for Air Navigation Services – Air Traffic Management - PANS-ATM*), and ICAO is aware that the FPL and ATS message addressing requirements published in their AIP or otherwise promoted by the Administration concerned are not compliant with PANS-ATM provisions, the data has been deleted.

2.38 All data provided is subject to further verification by the ICAO Secretariat, on receiving or becoming aware of information indicating the data provided is not correct. Any changes arising from such verification will be reported for discussion in plenary at ATFM/SG and ATM/SG.

Administration (Tier)	% Implementation	Implementation Status
Afghanistan (B)	<i>no report</i>	Did Not Report
Australia (A)	<i>incorrect report</i>	Incorrect Report
Bangladesh (B)	14	Incomplete
Bhutan (B)	<i>no report</i>	Did Not Report
Brunei Darussalam (B)	<i>no report</i>	Did Not Report
Cambodia (A*)	75	Incomplete
China (A)	88	Marginal
Hong Kong, China (A)	65	Incomplete
Macao, China (B)	22	Incomplete
Cook Islands (B)	<i>no report</i>	Did Not Report
Fiji (B)	<i>no report</i>	Did Not Report
France (French Polynesia) (B)	<i>no report</i>	Did Not Report
DPR Korea (B)	<i>no report</i>	Did Not Report
India (A)	<i>Incorrect report</i>	Incorrect Report
Indonesia (A)	68	Incomplete

Administration (Tier)	% Implementation	Implementation Status
Japan (A)	89	Marginal
Kiribati (B)	<i>no report</i>	Did Not Report
Lao PDR (A)	<i>no report</i>	Did Not Report
Malaysia (A)	50	Incorrect Report
Maldives (B)	20	Incomplete
Marshall Islands (B)	<i>no report</i>	Did Not Report
Micronesia (B)	<i>no report</i>	Did Not Report
Mongolia (B)	<i>no report</i>	Did Not Report
Myanmar (B)	32	Incomplete
Nauru (B)	<i>no report</i>	Did Not Report
Nepal (B)	0	Incomplete
New Caledonia (B)	41	Incomplete
New Zealand (A)	44	Incomplete
Pakistan (B)	30	Incomplete
Palau (B)	<i>no report</i>	Did Not Report
Papua New Guinea (B*)	41	Incomplete
Philippines (A)	38	Incomplete
Republic of Korea (A)	75	Marginal
Samoa (B)	<i>no report</i>	Did Not Report
Singapore (A)	96	Robust
Solomon Islands (B)	<i>no report</i>	Did Not Report
Sri Lanka (B)	<i>no report</i>	Did Not Report
Timor Leste (B)	<i>no report</i>	Did Not Report
Tonga (B)	<i>no report</i>	Did Not Report
Thailand (A)	54	Incomplete
Tuvalu (B)	<i>no report</i>	Did Not Report
United States (A)	97	Robust
Vanuatu (B)	<i>no report</i>	Did Not Report
Viet Nam (A)	26	Incomplete

Table 2: Asia/Pacific Region ATFM Implementation Status

2.39 The ATFM implementation of only two Administrations, Singapore and United States, were assessed as *Robust*.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) provide any updates on ATFM implementation, using the status reporting form; and
- c) discuss any relevant matters as appropriate.

.....

REGIONAL ATFM PLAN MONITORING AND REPORTING FORM

ATFM PERFORMANCE INDICATORS

The following indicators are based on the Performance Improvement Plan of the Asia/Pacific Regional Framework for Collaborative ATFM, which should be read in conjunction with this form. The information provided will be used by the relevant Regional bodies to assess individual Administration and overall regional compliance with the Framework, and may be used by Administrations to internally evaluate their implementation status.

		Not implemented = 0 Partial implementation = 0.5 Full implementation = 1																						
		Australia	Bangladesh	Cambodia	China	Hong Kong, China	Macao, China	India	Indonesia	Japan	Malaysia	Maldives	Myanmar	Nepal	New Caledonia	New Zealand	Pakistan	Papua New Guinea	Philippines	Republic of Korea	Singapore	Thailand	United States	Viet nam
A. Administrations Distributing ATFM Measures																								
		Indicate whether your Administration has:																						
1	Enacted regulations for the implementation of ATFM	0.0		0.5	0.5	1.0		0.0	1.0	1.0	0.0					0.5	0.0	0.0	0.5	1.0	1.0	0.0	1.0	0.5
2	Ensured the origination, distribution and processing of FPL and ATS messages in accordance with ICAO Doc 4444 PANS-ATM and the Regional Framework for Collaborative ATFM	0.0		1.0		1.0		0.0	1.0	1.0	0.0					1.0		0.5	1.0			1.0	1.0	
3	Implemented common fixes, terminology and communications in ATFM, AMAN/DMAN and A-CDM systems	0.0		0.5	0.5	1.0		0.0	0.5	0.5	0.0					1.0	0.0	0.5	0.5	0.5	1.0	0.5	1.0	0.5
4	Implemented meteorological services to support ATM in the terminal area (e.g. Meteorological Service in Terminal Area - MSTa)	0.0		1.0	1.0	1.0		0.0	1.0	1.0	0.0					0.5	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.5
5	Established ATFM capability with appropriately trained staff and operating procedures	0.0		0.5	0.5	0.5		0.0	0.5	1.0	0.0					0.0	0.5	0.5	1.0	1.0	1.0	1.0	1.0	0.5
6	Implemented local procedures for ATFM operations and communication, including phraseology and terminology for ATFM Units, ATS Units, airspace users, and airport operators, drawn from ICAO Doc. 9971	0.0		1.0	0.5	0.5		0.0	0.5	0.5	0.0					0.5	0.0	0.0	1.0	0.5	1.0	1.0	1.0	0.5
7	Performed an analysis of current traffic demand and expected growth for the next 5 years (rolling)	0.0		1.0	1.0	1.0		0.0	0.0	1.0	0.0					0.5	1.0	1.0	0.5	1.0	1.0	0.0	1.0	0.5
8	Implemented a program of bi-annual strategic airport and airspace capacity, and strategic demand analysis	0.0		1.0	1.0	1.0		0.0	0.0	1.0	0.0					0.0	0.0	0.5	0.0	0.5	1.0	0.0	1.0	0.5
9	Commenced daily pre-tactical airport and airspace capacity-demand analysis for ATFM Program airports and associated terminal airspace as well as enroute ATC sectors supporting the busiest Asia/Pacific city pairs	0.0		0.5	0.5	0.5		0.0	0.5	1.0	0.0					0.0	0.0	0.0	0.5	1.0	1.0	0.5	0.5	0.0
10	Implemented pre-tactical modelling of airport and airspace configuration and traffic demand, and the effect of ATFM measures	0.0		1.0	1.0	0.5		0.0	0.5	1.0	0.0					0.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0	0.0
11	Implemented dynamic updating of airport and airspace capacity constraints, capacity calculations and demand information	0.0		1.0	1.0	0.5		0.0	0.5	1.0	0.0					0.5	0.0	0.0	0.5	0.5	1.0	0.5	1.0	0.0
12	Implemented strategic airport slot allocation at all international airports where demand significantly exceeds airport capacity	0.0		1.0	1.0	1.0		0.0	1.0	1.0	0.0					1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
13	Made arrangements for relevant ATFMU to chair and/or participate in daily ATFM conferences for pre-tactical ATFM planning	0.0		1.0	1.0	1.0		0.0	0.5	1.0	0.0					0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
14	Commenced daily preparation of an ATFM Daily Plan (ADP) for all ATFM Program airports and associated terminal airspace	0.0		1.0	1.0	1.0		0.0	1.0	1.0	0.0					0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.5
15	Enabled sharing of relevant information between all stakeholders through implementation of CDM capability	0.0		1.0	1.0	0.5		0.0	1.0	1.0	0.0					1.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
16	Developed procedures for ATFMU, ATS Units, airspace users, and airport operators when ATFM program is active	0.0		1.0	1.0	0.5		0.0	1.0	1.0	0.0					0.5	0.0	0.0	0.5	0.5	1.0	1.0	1.0	0.0
17	Implemented tactical ATFM measures for flights inbound to ATFM program airports	0.0		1.0	1.0	1.0		0.0	1.0	1.0	0.0					1.0	0.0	0.0	0.5	1.0	1.0	1.0	1.0	0.0
18	Implemented tactical ATFM measures for flights inbound to constrained airspace	0.0		1.0	1.0	0.5		0.0	0.0	1.0	0.0					0.0	1.0	0.0	0.5	1.0	0.5	1.0	1.0	0.0
19	Promulgated procedures for tactical management of ATFM measures, including revision, cancellation, suspension, de-suspension, where necessary	0.0		1.0	1.0	0.0		0.0	1.0	1.0	0.0					0.5	0.0	0.0	0.0	0.5	1.0	1.0	1.0	0.0
20	Ensured tactical ATFM measures for are only applied during periods of constraint	0.0		1.0	1.0	0.5		0.0	1.0	1.0	0.0					0.5	0.0	0.0	0.5	1.0	1.0	1.0	1.0	0.0
21	Promulgated procedures to avoid subjecting individual flights to more than one tactical ATFM measure	0.0		0.0	1.0	0.5		0.0	0.5	1.0	0.0					0.5	0.0	0.0	0.0	0.5	1.0	1.0	1.0	0.0
22	Implemented local ATC procedures and, where available, CDM processes facilitating compliance with received CTOT	0.0		1.0	1.0	0.5		0.0	1.0	1.0	0.0					0.5	0.0	0.0	0.0	0.5	1.0	1.0	1.0	0.5
23	Implemented distributed multi-nodal ATFM information distribution capability	0.0		1.0	1.0	0.5		0.0	1.0	0.0	0.0					0.0	0.0	0.0	0.5	0.0	1.0	1.0	0.5	0.5
24	Ensured interoperability of implemented ATFM, A-CDM, AMAN, DMAN, ATM automation systems and airspace user systems, where operational interfaces exist or are planned, using FIXM.	0.0		0.0	1.0	0.5		0.0	0.5	0.0	0.0					0.5	0.0	0.0	0.0	0.5	0.5	0.0	1.0	0.0

		Not implemented = 0 Partial implementation = 0.5 Full implementation = 1																						
		Australia	Bangladesh	Cambodia	China	Hong Kong, China	Macao, China	India	Indonesia	Japan	Malaysia	Maldives	Myanmar	Nepal	New Caledonia	New Zealand	Pakistan	Papua New Guinea	Philippines	Republic of Korea	Singapore	Thailand	United States	Viet nam
25	Ensured ATFM systems take long haul flights into account in demand predictions	0.0		0.0	1.0	1.0		0.0	1.0	1.0	0.0				0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	0.0	
26	Ensured ATM and ATFM systems provide timely update of estimate information for airborne aircraft	0.0		1.0	1.0	0.5		0.0	1.0	1.0	0.0				0.5	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.5	
27	Commenced ATFM post-operations analysis and rectification, taking guidance from the Regional Framework as starting point	0.0		1.0	0.5	0.5		0.0	0.0	1.0	0.0				0.5	1.0	0.0	0.0	0.5	1.0	0.5	1.0	0.0	
28	Developed procedures and agreements for post-operational analysis of cross-border ATFM with stakeholders	0.0		0.5	1.0	0.0		0.0	0.0	1.0	0.0				0.0	0.5	0.0	0.0	1.0	1.0	0.0	1.0	0.0	
29	Ensured post-operations analyses are used for planning ATFM, airspace and ATS route improvements	0.0		0.5	1.0	0.5		0.0	0.5	1.0	0.0				0.5	0.5	0.0	0.0	1.0	0.5	0.0	1.0	0.5	
30	Implemented ATS route structure improvements including CCO/CDO to reduce ATC workload and use aircraft capability to meet ATFM measures	0.0		0.0	1.0	0.0		0.0	1.0	0.5	0.0				1.0	0.5	0.5	0.5	0.5	1.0	0.0	1.0	0.0	
31	Optimized ATC separation and reduced runway occupancy times at all ATFM program airports and in associated terminal airspace	0.0		0.0	1.0	1.0		0.0	1.0	1.0	0.0				0.5	0.0	0.0	0.0	0.5	1.0	0.0	1.0	0.5	
B. Administrations Facilitating ATFM Measures (but not expected to implement and distribute cross-border ATFM measures)																								
32	Ensured the origination, distribution and processing of FPL and ATS messages in accordance with ICAO Doc 4444 PANS-ATM and the Regional Framework for Collaborative ATFM	1.0						1.0			1.0	1.0	0.0	1.0										
33	Implemented local procedure with regards to ATFM operations and communication, including phraseologies, among ATFMU, ATS Units, airspace users, and airport operators	1.0	0.0				0.5	1.0		0.5	0.0	0.0	0.0	1.0										
34	Educated ATM staff and stakeholders on the basic of ATFM and its connection with ATS	1.0	0.5				0.5	1.0		1.0	0.5	0.5	0.0	1.0										
35	Made arrangements for relevant personnel from ATSU to participate in daily ATFM conferences for pre-tactical ATFM planning	1.0	0.5				0.0	1.0		0.0	0.0	0.0	0.0	0.0										
36	Enabled sharing of relevant information between all stakeholders through implementation of CDM capability	1.0	0.0				0.0	1.0		0.0	0.0	0.0	0.0	0.5										
37	Developed procedures for ATS units, airspace users, and airport operators when ATFM program is active	1.0	0.0				0.0	1.0		1.0	0.0	0.5	0.0	0.0										
38	Developed procedures for ATS units, airspace users, and airport operators when ATFM program is active	1.0	0.0				0.0	1.0		1.0	0.0	0.5	0.0	0.0										
39	Ensured local stakeholders are able to access CTOT information readily, either directly from the ATFMU distributing it or through local dissemination	1.0	0.0				0.5	1.0		1.0	0.0	1.0	0.0	1.0										
40	Ensured ATM systems provide timely update of estimate information for airborne aircraft	1.0	0.0				0.0	1.0		1.0	0.0	1.0	0.0	1.0										
41	Developed ATFM post-operations analysis workflow among ATFMU, ATS units, airspace users, and airport operators to ensure proper and timely feedback mechanism can be distributed to ATFMU originating the ATFM measures	0.5	0.0				0.5	1.0		0.0	0.0	0.0	0.0	0.0										
42	Developed procedures and agreements for post-operational analysis of cross-border ATFM with stakeholders	0.0	0.0				0.0	1.0		0.5	0.0	0.0	0.0	0.0										
43	Ensured post-operations analyses are used for planning ATFM, airspace, and ATS route improvements	0.5	0.0				0.5	1.0		0.0	0.0	0.0	0.0	0.0										
44	Implemented ATS route structure improvements including CCO/CDO to reduce ATC workload and use aircraft capability to meet ATFM measures	1.0	0.0				0.5	1.0		0.0	1.0	0.0	0.0	0.5										
45	Optimized ATC separation and reduced runway occupancy times at all ATFM program airports and in associated terminal airspace	1.0	0.0				0.0	1.0		1.0	0.0	0.0	0.0	0.0										
46	Performed an analysis of current traffic demand and expected growth for the next 5 years (rolling)	0.5	0.5				0.5	1.0		1.0	0.5	0.5	0.0	0.5										
47	Implemented a program of bi-annual strategic airport and airspace capacity, and strategic demand analysis	1.0	0.0				0.0	1.0		0.0	0.0	0.0	0.0	0.0										
Total (of 47)		13.5	1.5	23.0	27.0	20.0	3.5	16.0	21.0	27.5	8.0	3.0	5.0	0.0	6.5	13.5	9.0	6.5	11.5	23.0	28.5	16.5	30.0	7.5
Implementation %		X	13	75	88	65	22	X	68	89	50	19	32	0	41	44	30	41	38	75	92	54	97	25

Note: State/Administration that did not submit the reporting status are Afghanistan, Bhutan, Brunei, Cook Islands, DPRK, Fiji, French Polynesia, Kiribati, Lao PDR, Marshall Islands, Micronesia, Mongolia, Nauru, Palau, Samoa, Solomon Islands, Sri Lanka, Timor Leste, Tonga, Tuvalu, and Vanuatu