



International Civil Aviation Organization

**The Sixth Meeting of the APANPIRG ATM Sub-Group
(ATM/SG/6)**

Hong Kong, China, 30 July – 03 August 2018

Agenda Item 4: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

AIR TRAFFIC FLOW MANAGEMENT STEERING GROUP OUTCOMES

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the Eighth Meeting of the Air Traffic Flow Management Steering Group (ATFM/SG/8).

1. INTRODUCTION

1.1 The Eighth Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/8) were held in New Delhi, India, from 14 to 18 May 2018.

2. DISCUSSION

Related Meeting Outcomes

2.1 The ATFM/SG/8 was provided with information on a number of relevant meetings. Among the information provided was an update on the progress of the Asia/Pacific Regional Guidance for Meteorological Information Supporting ATM, agreed by ATM/SG under **Conclusion ATM/SG/5-2: Asia/Pacific Regional Guidance for Meteorological Information Supporting ATM**, drafted by ATFM/SG/7.

2.2 The guidance had not been agreed by the Meteorological Sub-Group (MET SG) of APANPIRG in time for the APANPIRG/28 meeting. It was expected that this would be further progressed at MET SG/22 in 2018.

2.3 The MET SG/22 meeting, held in Bangkok, Thailand, from 18 to 21 June 2018, subsequently identified the need for further editorial improvements to the guidance material, which would be made by the designated MET SG ad-hoc group. MET SG/22 agreed to the following Draft Conclusion for consideration by APANPIRG:

Draft Conclusion (APANPIRG) 29/XX – APAC Regional Guidance for MET Information Supporting ATM

That, APANPIRG approve the Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations as reference for States and Organizations concerned.

BOBCAT Operational UPDATE

2.4 The meeting was presented with an operational analysis and overview of westbound flights through the Kabul FIR associated with the Bay of Bengal Cooperative Air Traffic Flow Management (BOBCAT) system for the two-year period between April 2016 to March 2018. A BOBCAT Operational Update is provided in a separate ATM/SG/6 WP.

Review of Flow Control Restrictions on Airways M771 and M772

2.5 Indonesia presented a review of the flow control restrictions on ATS routes in the South China Sea area that had been affecting flights from Jakarta FIR, and the expectation that operational improvement in ATFM should be made by the originating airport and sectors. Unpredictable take off times including substantial delays had been recorded, in the worst case being a flight from Jakarta to Shanghai/Pudong delayed by 5 hours.

2.6 The meeting was informed that M771 was one of several converging ATS routes, and that the method used to determine the minutes-in-trail (MINIT) promulgated in NOTAM from the miles-in-trail (MIT) flow restriction was not ideal. Consideration was being given to moving the convergence point further south, and to widening the scope of the current Miles-in-Trail/Minutes in Trail (MIT/MINIT) to Calculated Take-off Time (CTOT) conversion trial to include other routes, possibly including M772.

ATFM Implementation in India

2.7 India presented several papers on ATFM implementation progress, including an update on the implementation of the Central ATFM (C-ATFM) system, the integration of the C-ATFM with Airport Collaborative Decision-Making/Airport Operations Command Centre (A-CDM/AOCC), C-ATFM post-operations analysis, and the establishment of Airspace Management Cells.

2.8 Phase I of C-ATFM implementation focused on six metro airports at Bengaluru, Chennai, Delhi, Hyderabad, Kolkata and Mumbai. Phase II implementation was planned for the introduction of procedures for handling airspace capacity issues. Phase III of the implementation plan would introduce cross-border ATFM information sharing with adjacent countries.

2.9 The timing of implementation of Phase III of C-ATFM (Cross-Border ATFM) had not yet been determined. India was monitoring the progress of other cross-border ATFM implementation activities in the Region.

2.10 The C-ATFM specification, when written, included the use of Flight Information Exchange Model (FIXM) version 3.0, and noted the challenge of communicating system requirements to vendors during a period of continuing change in the model.

2.11 The integration of C-ATFM with A-CDM/AOCC was a feature of Phase II of the C-ATFM project. In response to a query, India advised that CTOT were distributed from the C-ATFM system to A-CDM using ADEXP¹ format. India was moving towards FIXM but had not yet specified a version due to the changing landscape in this area.

¹ The Asia/Pacific Regional Framework for Collaborative ATFM includes ADEXP version 3.1 as an agreed format for ATFM message exchange via the Aeronautical Fixed Service (AFS) where an ATFM network FIXM interface has not been established.

2.12 The meeting noted that the performance measurements in use for post-operations analysis in India were largely the same or similar to those used in the Multi-Nodal ATFM Project, and that it would be beneficial were India to participate in the joint, collaborative development of the Regional post-operations analysis framework.

2.13 Information was presented on India's plans for the establishment of Airspace Management Cells (AMC) and the efforts to synchronize their activities with the ATFM system. India noted that Flexible Use of Airspace (FUA) was a key enabler of ATFM, and that timely and judicious allocation of flexible airspace structures was essential to achieve demand-capacity balancing in both terminal and en-route phases of flight. A trial operation of the Delhi Regional AMC (R-AMC) was conducted in early 2017, highlighting important issues that needed to be addressed before AMCs could be established on a permanent basis. It was expected that the combined National AMC (N-AMC) and R-AMC, collocated in the ATFM CCC at Delhi, would be established before the end of 2018.

2.14 In response to a comment, the meeting noted that ATM/SG/5 had assigned a task related to the harmonization of the format of airspace use plan NOTAM to India, Japan and Thailand. This matter is discussed under a separate ATM/SG/6 WP.

Update on the Progress of Northeast Asia Regional ATFM Harmonization Group – NARAHG

2.15 China, Japan and Republic of Korea together presented papers on the outcomes of the 6th meeting of the Northeast Asia Regional ATFM Harmonization Group (NARAHG), held in Seoul, Republic of Korea, from 12 to 14 March 2018, and on the progress of the Cross Region ATFM Collaborative Platform (CRACP). Information was provided on:

- ATFM/CDM development status in Northeast Asia;
- CRACP implementation, operating procedure, and updated Interface Control Document (ICD);
- ATFM Daily Plan (ADP) exchange; and
- Post-operations analysis.

2.16 The CRACP project was divided into three stages, the third being the connection of each NARAHG State's ATFM systems directly to the CRACP, in accordance with an ICD. Successful Stage 1 connection tests between Fukuoka (Japan) and Shanghai (China) had been conducted, and tests between Daegu (Republic of Korea) and Shanghai were being conducted from April 2018.

2.17 The meeting was informed that the timeframe for Stage 3 completion could possibly be 2020, but was not yet a firm decision.

2.18 In response to a query on how States not connected to CRACP would communicate with it, the meeting was informed that CRACP information exchange was *comparable* to FIXM. Referring to a query on whether CRACP would use SWIM-based technology, the meeting was informed that CRACP was essentially a 3-State system.

2.19 In discussing the use of CTO, it was observed by the meeting that ICAO Doc 9971 – *Manual on Collaborative ATFM* stated that the use of CTO, which also entailed the use of the aircraft Required Time of Arrival (RTA) function, was a gradual process that required education and collaboration to ensure that requirements were understood and met, and that such techniques should be considered as advanced, and require substantial experience for their implementation.

2.20 The compliance window for CTO had not yet been determined.

2.21 The meeting noted that the CRACP was an information sharing platform, and that there was a need for clarification of the differences between the CRACP concept and the Regional ATFM Concept of Operations.

ATFM/CDM Activities in Japan

2.22 Information was presented on ATFM/CDM activities in Japan, including the ATM Operational Evaluation Report, the deployment of ATM Workstations (ATWs) in CDM airlines to facilitate CDM, and mitigation of airspace congestion by the use of congestion avoidance routes.

2.23 The meeting noted the value of congestion avoidance routes, and that other parts of the Asia/Pacific Region were too rigid on the use of published ATS routes.

2.24 ATFM Ground Delay Programs (GDPs) using Estimated Departure Clearance Times (EDCT, equivalent to CTOT) were implemented at least several times per day in Japan. It was noted that compliance with EDCT at congested airports was not always ideal, and that compliance rates were thought to be improved by introducing and developing A-CDM at airports.

2.25 Japan also provided the meeting with information on the use of conditional routes (CDRs). There were 25 CDR in the Fukuoka FIR, either fixed CDR published in AIP (CDR 1) or promulgated by NOTAM published each day by the airspace management (ASM) system, in coordination with the Japan Air Self Defence Force (CDR 2). About 35,000 flights had used CDR in the Fukuoka FIR in the last year.

Progress of the Distributed Multi-Nodal ATFM Project

2.26 The meeting was provided with an update on the Distributed Multi-Nodal ATFM Project, focusing on recent achievements in implementation of ATFM measures (GDPs), and the work plan for the development of ATFM measures for airspace congestion. The project was arranged in two phases (**Table 1**), with three levels of engagement by participating Administrations (**Table 2**).

Phase	Key Focus
Phase 1 (2015 – 2016+)	Airport Program: Distributed GDP / CTOT to regulate traffic into arrival airports where demand is exceeding capacity
Phase 2 (2017 onward)	Airspace Program: Distributed GDP / CTOT to regulate traffic into airspace where demand is exceeding capacity

Table 1: Distributed Multi-Nodal ATFM Project Phases

Tiered Level	Capabilities
Level 3	Capable of generating, distributing, receiving, and complying to ATFM measures
Level 2	Capable of receiving and complying to ATFM Measures
Level 1	Observe and participate in the trial progress
Project Advisor	Provide advice to the project (*Australia*)

Table 2: Distributed Multi Nodal ATFM Project Engagement Levels

2.27 Activation of ATFM measures under Phase 1 included responses to several planned and ad hoc (weather induced) events in Singapore, planned and emergency situations in Thailand, and tropical cyclone events in Hong Kong, China. Challenges were mostly related to cross-border coordination difficulties, highlighting the pressing need for more efficient communication protocols and information exchange. Lack of awareness of procedures and of the reach and limitations of ATFM services were also challenges. It was crucial that all stakeholders continued to ensure effective communication and sharing of ATFM knowledge among operational personnel.

2.28 Initial work on Phase 2 had begun with a focus on alleviating problems with compounding MINIT flow restrictions on major South China Sea ATS routes illustrated in the example in **Figure 2**. A post-operations analysis of an ATFM Operational Trial on ATS route M771 is provided in a separate ATM/SG/6 WP.

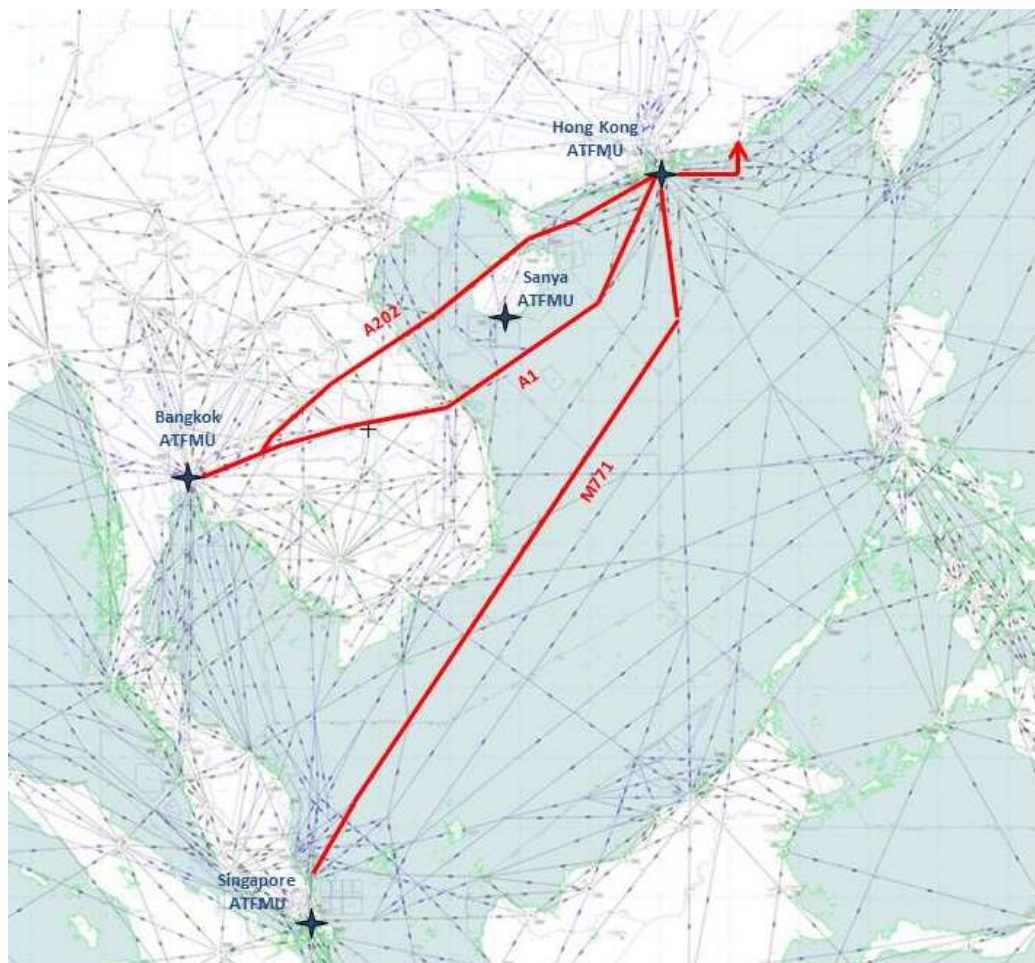


Figure 2: Example Major ATS Routes with Compounding MINIT Restrictions

2.29 Due to the current unavailability of a means of harmonized information exchange stakeholders had been asked to access information in various ATFM systems using different interfaces to obtain ATFM information. This had led to an increase in cross-border coordination workload, which became a major issue due to the number of ATFM programs activated.

2.30 The development of local ATFM implementation plans and establishment of infrastructure had led to States upgrading their participation tier. Cambodia had upgraded their participation tier to Level 3, with their first GDP planned for May – October during the Phnom Penh International Airport runway maintenance project. Viet Nam had established the Ha Noi ATFM Centre, and a national ATFM Master Plan was being prepared.

2.31 The lack of support from some Level 2 participants was noted. **Figure 3** demonstrates CTOT compliance for flights departing aerodromes in participating States.

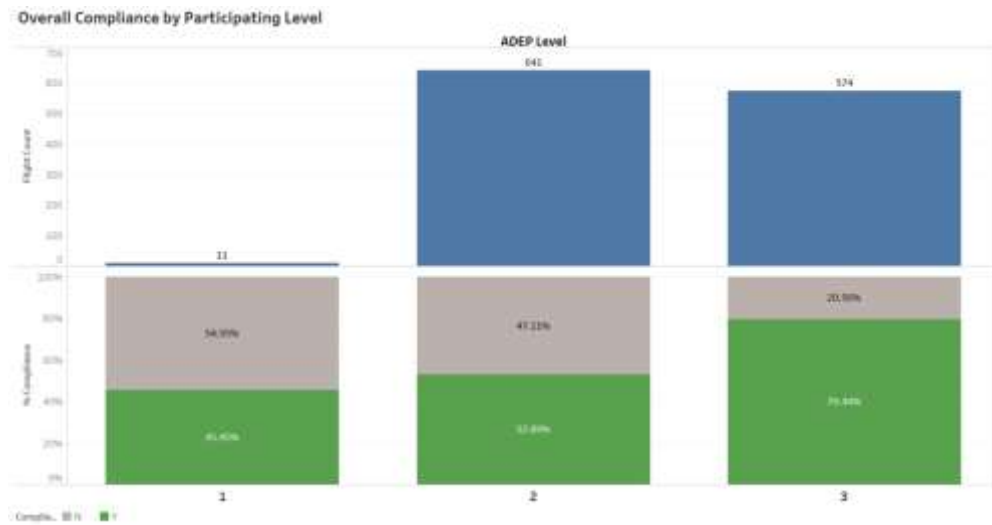


Figure 3: Overall CTOT Compliance per Participation Level

2.32 Low compliance with CTOT resulted in significant delay penalty for CTOT-compliant flights, illustrated in **Figure 4**.

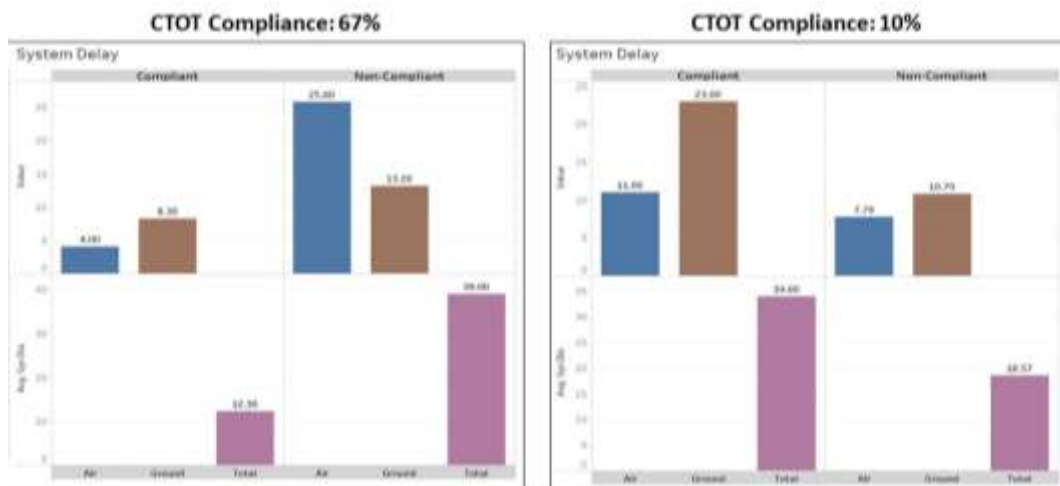


Figure 4: Delay Comparison

2.33 Compliance with ATFM measures was one of the key elements determining their success. The project core team would continue to raise awareness through engagement with and education of stakeholders and other Administrations. There was also a view to establishing an ASEAN ATFM Implementation Support Group. All Administrations were urged to ensure the establishment of local procedures for the facilitation of ATFM compliant departures.

Progress of the Technical Sub-Group of the Multi-Nodal ATFM Project

2.34 The main tasks of the Technical Sub-Group of the Multi-Nodal ATFM Network Operational Trial Project included development of common minimum user interface requirements, development of an information exchange framework based on the SWIM concept to support operational requirements, supporting the implementation of ATFM system-to-system connection and supporting relevant bodies in ensuring SWIM-format data provisions were appropriate for the distributed ATFM environment.

2.35 Information was provided on key achievements, including the development of an operational scenario template and ATFM operational scenarios in coordination with the Asia/Pacific System-Wide Information Management Task Force (SWIM TF), development of a FIXM Extension, development of ATFM-related services description and an initial system connection test between Singapore and Thailand. Further refinement of the FIXM Extension would be conducted in coordination with the SWIM TF, and work would be done to identify the technical requirements for the exchange of ADPs.

2.36 The Technical Sub-Group and the Multi-Nodal ATFM Project Core Team had agreed to use the EUROCONTROL Slot Allocation Message (SAM¹) for the exchange of ATFM data until the establishment of SWIM-based ATFM information exchange. The Technical Sub-Group would also support the effort to identify areas requiring interoperability with NARAHG, and regional ATFM interoperability.

2.37 The meeting noted that Doc 4444 included *flow control messages* in the *movement and control messages* (priority FF) category of ATS messages, but also included in paragraph 11.4.2.6.3 a note stating that the format and data conventions for automated interchange of flow control messages had not yet been developed. It could therefore be necessary to develop a proposal to include SAM in ICAO Doc 7030 *Regional Supplementary Procedures*.

Post-Operational Evaluation of Singapore ATFM Measures at Juanda (Surabaya) International Airport

2.38 Indonesia provided an evaluation of compliance with ATFM measures distributed by Singapore for aircraft departing Surabaya/Juanda International Airport during a period of reduced capacity due to an air show event in Singapore. Surabaya/Juanda was one of three airports in Indonesia that were participating at Level 2 of the Multi-Nodal ATFM Operational Trial, facilitating compliance with CTOTs. **Table 3** summarizes compliance per operator.

Airline	Total of Flight	Comply	(%)
GIA	3	3	100
TGW	5	2	40
SIA	6	4	67
JSA	1	1	100
TOT	15	10	67

Table 3: CTOT Compliance at Surabaya/Juanda International Airport

2.39 The meeting was informed that the next meeting of the Multi-Nodal ATFM Project would discuss CTOT compliance, noting the low compliance levels of some aircraft operators.

¹ The EUROCONTROL Slot Allocation Message (SAM) conforms with the EUROCONTROL ATS Data Exchange Presentation (ADEXP), included in the Asia/Pacific Regional Framework for Collaborative ATFM

2.40 It was also noted that information had been received suggesting that CTOT distributed to Jakarta were not actioned due to a regulatory directive that on-time departure performance must be facilitated. Indonesia advised that no representative from the regulatory body was present at the meeting, and that further enquiry would be made.

2.41 The meeting was also informed that the use of social media platforms for the exchange of operational communications, while possibly suitable for trials, was not likely to meet normal operational requirements for information security, and system availability and reliability.

Long Range ATFM Concept Trials

2.42 New Zealand and Singapore presented information on Long Range ATFM (LRATFM), a concept devised to provide a basis for research into the application of ATFM measures beyond current system timeframes. The concept had been subject to practical trialling by New Zealand and Singapore during the second half of 2017. Information provided included problem identification, the LRATFM concept, operational trial results, joint conclusions, reference to ICAO guidance, and next steps under consideration.

2.43 It was noted that the results of the trials exemplified the advanced nature of any end-state solution requiring the use of Calculated Time Over (CTO)/Required Time of Arrival (RTA), as also discussed in ICAO Doc 9971 *Manual on Collaborative ATFM*. The meeting was informed that work done in the SWIM in ASEAN demonstration to develop operational ATFM scenarios had highlighted the challenges of information exchange with en-route ATS units. New Zealand advised that the issue of how to include multiple FIRs had been discussed at multiple meetings.

2.44 In response to a suggestion that this form of ATFM should be extended to ATS routes converging in the Bay of Bengal/Arabian Sea areas, the meeting was reminded of capacity constraints in that airspace including inefficient separation minima which should be addressed. However, India was willing to participate in this kind of initiative.

2.45 CANSO supported the trial, and encouraged all ANSPs in the region to participate.

Training of ATFM Personnel

2.46 India presented information on ATFM training, including the challenges associated with training of ATFM personnel associated with joint user airports, the Flow Management Position (FMP) training program, activation and training at Defence airports, awareness programs, and consideration of personnel licensing of flow managers.

2.47 In discussing the proposal for a review of provisions for licensing of flow managers, the meeting noted there was considerable variation among ANSPs. In some cases, ATFM personnel retained current ATC licenses, in other cases recruitment criteria included the requirement to hold or have held an appropriate ATC license together with substantial ATC experience, and others did not require any ATC experience.

2.48 The CANSO position was that Flow Managers should have an operational ATC background, at least in the case of personnel with an ATFM supervisory role. While a licence may not be necessary, some form of certification should be in place.

2.49 It was noted that the management and oversight of licencing was onerous for the regulatory authority. It was further noted that it was unlikely that the relevant ICAO panel would countenance an amendment to Annex 1 to include standards for licencing ATFM personnel. The most important consideration was the establishment of robust competency criteria, competency assessment criteria and performance assessment processes.

2.50 The meeting agreed to conduct some further research into the implications of different qualification schemes for ATFM personnel.

Flight Plan and Departure Message Analysis

2.51 The meeting was presented with the results of an analysis of missing FPL and DEP messages requiring corrective action to be taken by States and/or airspace users. The data-gathering and analysis activities were conducted in response to **Conclusion APANPIRG/27/12: Origination and Distribution of Departure (DEP) Messages**, and the discussion outcomes of ATM/SG/5 which requested the scope of the analysis of missing DEP messages be broadened to include missing FPL messages. Summaries of data gathered by Australia, China, Japan, Singapore and Thailand were provided.

2.52 **Table 4** summarizes FPL and DEP messages reported as not received by one or more FIRs administered by States participating in the survey.

FPL and DEP messages reported as not received by States participating in the survey		
Reporting State	Missing FPL	Missing DEP
Australia	5	1
China	23/3*	268
Japan	-	62
Singapore	28	104
Thailand	2	147
Total	58	582

Table 4: Missing FPL and DEP messages – APAC States.

* *DEP message received but no corresponding FPL held.*

2.53 **Table 5** further details the information provided in Table 4, according to the APAC State responsible for the departure aerodrome.

FPL and DEP Messages Not Received by One or More FIRs in Reporting States (Departure aerodrome located in APAC States)		
State of Departure Aerodrome	Missing FPL	Missing DEP
Australia	-	9
Bangladesh	-	27
Bhutan	-	-
Cambodia	1	3
China	1	3
India	6	34

FPL and DEP Messages Not Received by One or More FIRs in Reporting States (Departure aerodrome located in APAC States)		
State of Departure Aerodrome	Missing FPL	Missing DEP
Indonesia	-	47
Republic of Korea	2	22
Lao PDR	4	9
Malaysia	33	62
Maldives	-	-
Myanmar	3	43
New Caledonia	-	1
New Zealand	-	3
Pakistan	-	2
Philippines	-	23
Singapore	-	1
Thailand	-	1
USA	-	44
Viet Nam	1	3
Total	50	337

Table 5: Missing FPL and DEP Messages – Departure Aerodrome in APAC States

2.54 States participating in the data gathering activity reported non-reception of 245 DEP messages for flights originating in non-APAC States. Table 6 lists examples of significant numbers of DEP messages apparently not transmitted, indicating systemic issues.

State of Departure Aerodrome – non-APAC States	Missing DEP
Canada	16
France	29
Germany	16
Russia	37
Saudi Arabia	15
Turkey	14
UAE	14
United Kingdom	28

Table 6: Missing DEP Messages – Departure Aerodromes in non-APAC States

2.55 The meeting was informed that the apparent non-receipt of messages did not necessarily reflect failures at the aircraft operator or departure aerodrome ANSP. A number of issues including non-compliant addressing, communication network failures, failure to correctly action rejected message queues, failure of the Centre in charge of the FIR to correctly redistribute messages, and non-inclusion in FPL of Estimated Elapsed Times (EETs) for all FIR boundaries crossed by the flight. There were also some anomalies in the data provided by participating States that required attention.

2.56 However, the data clearly indicated systemic issues in a significant number of APAC and other States that must be addressed.

2.57 The meeting noted that ICAO Doc 4444 – Procedures for Air Navigation Services (PANS-ATM) required that accumulated EET to such points as FIR boundaries be included in FPL item 18 when so prescribed by Regional Air Navigation Agreements. Noting that such agreements must be reflected in ICAO Doc 7030 – Regional Supplementary Procedures, the meeting was informed that no such agreements currently existed in the APAC Region.

2.58 Several States, and CANSO, informed the meeting that the unreliability of DEP messages distribution had been a global problem for a considerable time. Some States and system vendors were exploring alternate avenues of obtaining departure information.

2.59 A number of follow-up actions were proposed in the working paper, agreed by the meeting, and included in the ATFM/SG Task List. The meeting noted that APANPIRG Air Navigation Deficiencies would be recorded against non-respondent or non-compliant APAC States.

2.60 The following actions have been undertaken by the ICAO Asia/Pacific Regional Office since ATFM/SG/8:

1. Issued ICAO State Letter AP062-18 - *Non-Compliance with ICAO Doc 4444 PANS-ATM 11.4.2.2 – Departure Messages*
 - a) Sent to all APAC States and, through the relevant ICAO Regional Offices, all other States that had been identified as potentially failing to send DEP messages
 - b) Requested all States to conduct analyses and take corrective action to ensure:
 - i. Full compliance with the provisions of PANS-ATM for the distribution of DEP messages to all affected FIRs in the Asia/Pacific Region; and
 - ii. The correct handling of DEP messages received;
 - c) Requested other Regional Officers to address the matter through their Planning and Implementation Regional Groups (PIRGs); and
 - d) Coordinated with ICAO Headquarters on actions that may be undertaken at the global level.
2. Sent individual letters to APAC States where the analysis indicated systemic failure to originate DEP messages:
 - a) Bangladesh, India, Indonesia, Malaysia, Myanmar, Philippines, Republic of Korea and USA;

- b) Requested these States to take immediate steps to:
 - i. Conduct a thorough analysis of the reported data;
 - ii. Report the results of the analysis, the corrective action plan and other relevant information to the ICAO Regional Office by not later than 20 July 2018; and
- c) Informed these States that, in the event of no reply or no corrective action being undertaken, an appropriate APANPIRG Air Navigation Deficiency would be recorded.

2.61 ICAO Headquarters and other Regional Offices are also engaged in coordination on the issue with relevant States, organizations and subject matter experts.

2.62 The meeting generally did not support further data-gathering activities. Thailand, recognizing the importance of this issue, agreed to participate in further analysis in coordination with the Secretariat. ATM/SG/6 participants are requested to consider further data-gathering in the future, to examine whether any improvement in DEP message reception has occurred.

Regional ATFM Implementation Status Monitoring

2.63 The Secretariat provided an update on Regional ATFM implementation status monitoring.

2.64 In accordance with ***Conclusion ATM/SG/5-3: Asia/Pacific Regional Framework for Collaborative ATFM Amendment***, the ATFM Implementation Status Report form had been appended to the Framework document and made available on the ICAO Asia/Pacific Regional Office website. The form had been updated to remove a numbering error, and to provide in a drop-down menu for each item the input values 0, 0.5 and 1, respectively representing *not implemented*, *partial implementation* or *full implementation*.

2.65 The meeting was informed that only one report had been received before the due date (end of April each year). States were reminded that the reporting form provided evidence of implementation of ATFM, which States had for some time been obliged to implement in accordance with the standards of Annex 11. Non-reporting would be treated in the same way as non-implementation for the purpose of ICAO reporting to ATM/SG and APANIRG.

2.66 The meeting proposed that an ATFM points of contact list should be created, and that the designated point of contact should ensure the completion of the reporting form before the due date.

Interoperability among ATFM Developments

2.67 An ATFM interoperability matrix to aid the necessary coordination meetings and discussion between the Multi-Nodal ATFM Project and the NARAHG project to achieve interoperability was proposed by China, Hong Kong China, Singapore, Thailand, CANSO and IATA.

2.68 The proposal noted that the diversity in operating environments in various states would result in variation in operating procedures and processes, and the need to ensure interoperability for an effective and satisfactory level of ATFM services, especially for flights transiting multiple active ATFM operation areas. The matrix included categorization of areas of interoperability; infrastructure, information exchange, ATFM information, ATFM solutions and operating procedures. The purpose of the matrix was to identify similarities and differences in processes, and to serve as a tool to streamline discussions.

2.69 The meeting supported this important work. CANSO noted that the ICAO Middle East (MID) Region was using the Asia/Pacific Regional ATFM Concept of Operations and Framework for Collaborative ATFM as the basis of their ATFM planning.

Proposal to Establish an ATFM Implementation Harmonization Small Working Group

2.70 The Secretariat presented a proposal to establish a Small Working Group (SWG) to manage the harmonized implementation of various ATFM projects in the Asia/Pacific Region to ensure regional network interoperability.

2.71 While the distributed multi-nodal ATFM network was the core concept in the Region, it was noted that there would be the tendency towards discrepancies between individual nodes of the network that could jeopardize interoperability. It was therefore proposed that the work of the ATFM Information Requirements SWG (ATFM/IR/SWG) be merged into the new ATFM Implementation Harmonization SWG (ATFM/IH/SWG), under Terms of Reference (TOR) provided. The work of the ATFM/IH/SWG would be facilitated by the ICAO Asia/Pacific Regional Sub-Office (APAC RSO), which had recently been provided with increased staff resources to support ATFM activities.

2.72 The meeting noted that the proposed amended TOR could be further refined at the first meeting of the SWG, and a recommendation made to ATFM/SG accordingly.

2.73 A Draft Decision was proposed, recognizing the direction provided in the Asia/Pacific Regional Framework for Collaborative ATFM and Regional Concept of Operations. Japan proposed that a meeting of the SWG in conjunction with the next NARAHG meeting may be considered, and Thailand further proposed a similar meeting in conjunction with the next meeting of the Multi-Nodal ATFM Project.

2.74 All Administrations and International Organizations participating at the meeting supported the proposal, except China. China's representative at the meeting relayed information from his Administration, informing the meeting that China did not support the proposal.

2.75 The meeting noted that this position was not aligned with the position reflected in **ATFM/SG/8 WP/15**, jointly presented by China, Japan and Republic of Korea, which in paragraph 2.2 stated:

1. *NARAHG members hasn't have enough discussion of the framework because it hasn't been so long since the CRACP concepts of NARAHG was established. Besides, NARAHG hasn't shared enough information with the other ATFM groups. Therefore, in order to actualize more global ATFM, NARAHG would like to propose as follows.*
2. *NARAHG would like to suggest that it would be better to have a face-to-face meeting organized by the ICAO APAC Regional Sub-Office (RSO) between NARAHG, Multi-Nodal Project group and other groups to discuss on areas of harmonization and interoperability. A full 2 or 3 days meeting would be useful where we can discuss several key items;*
 - a) *Understanding of Concept of Operations*
 - b) *Operational Procedures at the interface between two sub-regions*
 - c) *Jointly work on technical development and SWIM.*

2.76 Noting that the ICAO APAC RSO now had the staff resources in place to actively support SWG activities, the meeting agreed that the RSO would coordinate and facilitate the ongoing work of the ATFM/IR/SWG, and that the next or subsequent meetings of the SWG may consider recommending an expansion of the scope of work and TOR to include the proposed harmonization support role.

Amendment of Asia/Pacific Framework for Collaborative ATFM

2.77 China, Japan and the Republic of Korea proposed that it was necessary to modify the Asia/Pacific Framework for Collaborative ATFM. The information provided noted the work undertaken by NARAHG in the last three years, based on the CRACP concept, and that there were differences between the CRACP concept and the Framework.

2.78 Noting the essential need for collaboration between sub-Regional ATFM projects and the current efforts to establish common understanding, the NARAHG States proposed a two to three-day face-to-face meeting between NARAHG and the Multi-Nodal ATFM Project, organized by the ICAO APAC RSO to discuss areas of harmonization and interoperability, including the key areas of understanding of Concepts of Operations, operational procedures at the interface between the two sub-regions, and joint efforts to work on technical development and SWIM.

2.79 ICAO informed the meeting of the process to amend the Regional ATFM Concept of Operations and/or Regional Framework for Collaborative ATFM, including the following points:

1. Any proposal for amendment must be presented in a suitable format. ICAO could assist with the preparation of the proposal. Examples of such amendment proposals were available in the working papers and meeting reports of ATFM/SG/6 and ATFM/SG/7;
2. Any proposed amendment agreed by ATFM/SG must be supported by a Draft Conclusion for consideration by ATM/SG (and APANPIRG); and
3. Any amendment to Regional ATFM documents would need the unanimous support of ATFM/SG and ATM/SG. It was strongly recommended that the proponent/s therefore engaged fully with and gain the agreement of all relevant Administrations during the preparation of the proposal.

Basic Phrases for Cross-Border GDP Facilitation

2.80 The meeting was presented with information highlighting the need for harmonized phrases to support verbal coordination in cross-border ATFM programs in the APAC Region. In the absence of automated SWIM-based information exchange verbal communication via phone or web-conference facility became a primary means of coordinating changes.

2.81 The guidance on ATFM phraseologies in Doc 9971 provided a high level recommendation for ATFM coordination exchange but did not provide a comprehensive list of terminologies and phrases. The Regional Framework for Collaborative ATFM provided guidance for ATFM-related radiotelephony communication between ATC and pilots, but not for coordination between ATFM units and other ATFM units or airspace users. In the Distributed Multi-Nodal ATFM Network environment the use of plan-language English could, and did, result in misunderstandings.

2.82 Noting that plain-language coordination would remain necessary to a certain extent, as ATFM coordination exchanges were rarely straightforward, a proposed list of phrases for the coordination of GDP was provided, to be considered for inclusion in the Regional Framework for Collaborative ATFM.

2.83 It was agreed that the list provided would be further developed, and when finalized would be proposed for inclusion in the Framework.

Update on FIXM Extension

2.84 Singapore and Thailand presented an update on the FIXM Extension being developed to support the ATFM information exchange required for cross-border ATFM operations in the Asia/Pacific Region, together with an overview of the effort to include ATFM data attributes to be exchanged between ATFM systems and processes in the next version of FIXM.

2.85 It was noted that the Regional Framework for Collaborative ATFM specified that FIXM version 3.0 (or later) was the agreed ATFM information exchange model for the Asia/Pacific Region. The data attributes that ATFM systems and processes should share were identified in **Table 6**.

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

Table 6: Minimum Data Attributes Required to be Exchanged between ATFM Systems.

2.86 In accordance with its Terms of Reference requirement to support APANPIRG groups regarding data exchange models, the SWIM TF in cooperation with the ATFM/SG and its ATFM/IR/SWG developed an *operational scenario* template.

2.87 A FIXM version 4.1 Extension that included CTOT and Calculated Landing Time (CLDT) was developed. Validation of the Extension was completed by the end of April 2018. Further testing on this version and engagement with the FIXM Change Control Board (CCB) would be conducted during 2018.

2.88 Following the coordinated efforts of SWIM TF, ATFM/SG and ATFM/IR/SWG it was intended to include the calculated event times such as CTOT and CLDT, and other necessary ATFM data attributes in the next version of FIXM, probably version 4.3 or 5.0. The meeting was informed that the operational scenario document developed by ATFM/SG was used as the baseline for further development of the ATFM Sub-Group of the ICAO ATM Operations Panel (ATMOPSP) to prepare the operational requirements for ATFM data exchange, to be submitted to the ICAO ATM Requirements and Performance Panel (ATMRPP) for consideration.

2.89 The meeting was further informed that the SWIM in ASEAN Demonstration had identified a number of data attributes for A-CDM that were also not in FIXM core. SWIM TF would also develop an FIXM extension to support ATFM, but noted that the next meeting of APA-CDM/TF, scheduled for August 2018, may not finalize the suite of recommended milestones in the A-CDM process.

2.90 The meeting discussed the absence of CTO from the FIXM Operational Scenarios, and was informed that the SWIM TF had been unable to develop a valid operational scenario for this attribute as its use was not clearly defined. There was however the possibility that an operational scenario could be constructed for the application of CTO, to support the development of FIXM version 4.1 Extension.

2.91 APAC Administrations were invited to review and provide comment to the SWIM TF on the scenarios provided under this paper by not later than 31 May 2018, and to provide operational scenarios, of the quality necessary for SWIM TF for presentation to the FIXM CCB on behalf of the APAC Region, by not later than 31 July 2018.

ATFM Post-Operations Analysis Recommended Framework Development

2.92 An update on the progress of development of an ATFM Post-Operations Analysis Framework was provided to the meeting by the Multi-Nodal ATFM Project States. The update included the envisaged structure of the document, and some key areas that were planned to be covered. The objective of the work was to develop guidance that was comprehensive and applicable region-wide.

2.93 The guidance document would include six sections: *Introduction, Post-Ops Analysis in the Regional and Global Guidance, Traffic Demand Accuracy and Reliability, Resource Capacity Accuracy, ATFM Measure Metrics and Analyses, and Collaborative Post-Ops Analysis Workflow*. It was also intended that sample data analysis techniques and visualizations for reach recommended indicator would be included in an appendix to the document.

2.94 The meeting supported this work, and requested that a first draft of the document be provided to ATFM/SG/9 in 2019. In addition to the Multi-Nodal ATFM Project States, India, USA and Japan agreed to contribute to the task.

2.95 The meeting discussed the matter of compliance windows at length, noting that no regionally recommended compliance measurement had been established. Noting the CANSO recommendation of a general CTOT compliance window of -5 to +10 minutes, the meeting agreed that this should be used as an initial measure of compliance for GDP run for constrained destination airports. Further regional and local refinement could then be undertaken, based on post-ops analysis results.

Draft Conclusion/Decision ATFM/SG/8-1: Recommended Calculated Take-Off Time Compliance Window			
What: That: 1. Asia/Pacific Administrations implementing Ground Delay Programs (GDP) for flights to capacity-constrained destination airports use a recommended compliance window of -5 to +10 minutes to measure compliance with Calculated Take-Off Times (CTOT); 2. CTOT compliance windows for individual departure airports be subsequently refined on the basis of post-operations analysis, taking into account the requirements at constrained destination airports and subject to the agreement of the Administration responsible for the departure airport; and 3. CTOT compliance windows other than the recommended compliance window be reported to the Air Traffic Flow Management Steering Group.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To establish an initial metric for the analysis of compliance with ATFM measures (Ground Delay Programs - GDPs), to be further refined based on post-ops analysis results		Follow-up: ☒ Required from States	
When: 3-Aug-18		Status: Draft to be adopted by Subgroup	
Who: ☒ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other: XXXX			

2.96 Noting that no APAC Administration had defined a compliance window for CTO or other ATFM measures, the formulation of such compliance windows was a matter for future consideration.

The Activity of the ICAO APAC Regional Sub-Office

2.97 The Secretariat presented information on the ICAO Asia/Pacific Regional Sub-Office (APAC RSO), its history, strategic framework and activities. The RSO conducted various levels of workshops and technical assistance to Asia/Pacific States in their implementation of ATFM/CDM and or A-CDM. States could request the APAC RSO to conduct any level of workshop or technical assistance in these areas.

ASEAN ATM Master Plan

2.98 An overview of the ASEAN ATM Master Plan was provided by Singapore and Thailand, on behalf of the ASEAN Secretariat. ATFM had been identified in the Master Plan as one of the five initiatives that urgently required ASEAN-wide harmonized implementation.

2.99 More information on the ASEAN ATM Master Plan is provided in a separate ATM/SG/6 IP.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) note the MET SG/22 Draft Conclusion proposing that APANPIRG approve the Regional guidance for tailored MET information supporting ATM operations;
- c) note the ongoing issue of major flow control restrictions on ATS routes in the South China Sea area;
- d) note the progress of ATFM implementation by India, the Distributed Multi-Nodal ATFM project, NARAHG, and the Long Range ATFM Concept trials;
- e) note and discuss the issues of non-compliance with slot times (BOBCAT, Surabaya departures);
- f) note the recurrent discussion on ATFM training and qualifications;
- g) note and discuss the FPL and DEP message analysis;
- h) note the current poor rate of reporting ATFM implementation status;
- i) note the process for amending the Regional ATFM Concept of Operations and/or Regional Framework for Collaborative ATFM;
- j) note the ATFM/SG and SWIM TF work on developing an APAC Region FIXM extension;
- k) discuss and agree to the **Draft Conclusion ATFM/SG/8-1: Recommended Calculated Take-Off Time Compliance Window:**
- l) note the availability of the ICAO APAC RSO to support workshops and provide technical assistance to APAC States implementing ATFM/CDM and A-CDM; and
- m) discuss any relevant matters as appropriate.

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