

INTERNATIONAL CIVIL AVIATION ORGANIZATION



REPORT OF THE THIRD MEETING OF THE ASIA/PACIFIC AIR TRAFFIC FLOW MANAGEMENT STEERING GROUP (ATFM/SG/3)

SINGAPORE, 10 – 14 MARCH 2014

The views expressed in this Report should be taken as those of the
Meeting and not the Organization

Approved by the Meeting

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ATFM/SG/3
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INTRODUCTION

Meeting

1.1 The Third Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/3) was held at the Raffles City Convention Centre, Singapore, from 10 to 14 March 2014.

Attendance

2.1 The meeting was attended by 66 participants from Australia, Bangladesh, China, Hong Kong China, India, Indonesia, Japan, Malaysia, Nepal, New Zealand, Philippines, Republic of Korea, Singapore, Thailand, United States, Viet Nam, ACI, CANSO, EU/AATIP, IATA, IFATCA and ICAO. A list of participants is at **Appendix A** to this report.

Officers & Secretariat

3.1 Mr. Mr. Sylvester Israel, General Manager (ATM), Airports Authority of India, and Mr. Peter Chadwick, Senior Operations Officer (Support), Hong Kong China Civil Aviation Department, co-Chaired the meeting.

3.2 Mr. Shane Sumner, Regional Officer ATM, was Secretary for the meeting.

Opening of the Meeting

4.1 On behalf of Mr. Arun Mishra, Regional Director of ICAO Asia and Pacific Office, Mr. Sumner welcomed all the participants to the meeting.

4.2 Mr. Soh Poh Theen, Assistant Director General, Civil Aviation Authority of Singapore, formally opened the meeting.

4.3 In his opening address, Mr. Soh Poh Theen mentioned the importance of achieving results under the Aviation System Block Upgrades (ASBU), which should not be viewed merely as concepts. He emphasized the Asia/Pacific Region's need for ATFM, with sustained traffic growth above 5-6% expected into the foreseeable future. That need was demonstrated by the evidence that most airports and ANSPs were operating at or above their capacity, while infrastructure improvements such as new runways that were necessary to increase capacity would take time to deliver. He highlighted the exciting opportunity for the ATFM/SG to provide ATFM outcomes unique to this region, and the Hong Kong China/Singapore/Thailand tri-partite collaboration project which had potential to provide a framework for the wider region. Collaboration was the key to avoiding silos, as it would lead to common principles and agreed rules, interoperability and harmonization. The Framework document, when complete, could serve as high quality, reliable guidance for the Region.

Documentation and Working Language

5.1 The working language of the meeting and all documentation was English. There were 15 working papers and 11 information papers considered by the meeting. A list of papers is included at **Appendix B** to this report.

Draft Conclusions, Draft Decisions and Decisions of ATFM/SG – Definition

6.1 A recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

- a) **Draft Conclusions** deal with matters that, according to APANPIRG terms of reference, require the attention of States, or action by the ICAO in accordance with established procedures;
- b) **Draft Decisions** deal with the matters of concern only to APANPIRG and its contributory bodies; and
- c) **Decisions** of ATFM/SG that relate solely to matters dealing with the internal working arrangements of ATFM/SG.

List of Decisions and Draft Conclusions/Decisions7.1 List of Decisions**ATFM/SG Decision 3/1: Distributed Multi-Nodal Networked ATFM Concept**

That, the distributed multi-nodal networked ATFM concept be considered as a viable foundation to be incorporated into the regional ATFM framework for the development and implementation of ATFM for the Asia/Pacific Region, taking into account the guidance of ICAO Doc 9971.

ATFM/SG Decision 3/2: Interoperability of Existing and Future ATFM Capabilities

That, recognizing that the region is in the early stages of ATFM development, the regional ATFM framework will foster the harmonization of the development of various ATFM concepts to ensure cross-border interoperability of existing and future ATFM capabilities in the Asia/Pacific region.

ATFM/SG Decision 3/3: Suitability, Interoperability and Alignment of ATFM Concepts

That, the ATFM Steering Group takes into consideration the diverse ATFM needs of States and other stakeholders in the Asia/Pacific region in developing the regional ATFM framework which takes into account suitability, interoperability and alignment with various concepts in the Asia/Pacific and other regions.

7.2 List of Draft Decisions

ATFM/SG Draft Decision 3/4: ATFM/SG Terms of Reference

That, the proposed Terms of Reference appended at **Attachment X** to this report be adopted for the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG)

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REPORT ON AGENDA ITEMS**Agenda Item 1: Adoption of Agenda (WP01)**

1.1 The provisional agenda was adopted by the meeting.

Agenda Item 2: Review Outcomes of Related MeetingsRelated Meeting Outcomes (WP02)

2.1 The Secretariat provided information on meeting outcomes related to ATFM/SG from the following meetings:

- a. The Ninth Meeting of the South East Asia and Bay of Bengal Sub-Regional ADS-B Implementation Working Group (SEA/BOB ADS-B WG/9), held in Beijing, China, from 30 October to 1 November 2013.
- b. The Third Meeting of the Regional ATM Contingency Plan Task Force (RACP/TF/3), held in Bangkok, Thailand, from 12 to 15 November 2013.
- c. The Meteorology/Air Traffic Management (MET/ATM) Seminar and the Third Meeting of the Meteorological Requirements Task Force (MET/R TF/3), held in Bangkok, Thailand, from 26 to 29 November 2013.
- d. The Combined Fourth Meeting of the South Asia/Indian Ocean ATM Coordination Group (SAIOACG/4) and Twenty-First Meeting of the South-East Asia ATS Coordination Group (SEACG/21), held in Hong Kong, China from 24 to 28 February 2014.

SEA/BOB ADS-B WG/9

2.2 The Working Group meeting was updated on ADS-B implementation progress by Australia, China, Singapore, Hong Kong China, Viet Nam, Malaysia, Maldives and India. Several of these States had planned ADS-B equipage mandates. The first mandates implemented by Australia and Singapore were planned to become effective on 12 December 2013.

2.3 The Secretariat had presented information on separation standards applicable in airspace served by ATS surveillance, and their contribution to improvements in airspace capacity and efficiency. The information included references to the Standards and Recommended Practices defined in ICAO Doc 4444 (PANS/ATM) and the Asia/Pacific Region's expectations of the application of appropriate separation minima as agreed by APANPIRG/24 in its adoption of the Asia/Pacific Seamless ATM Plan. Airspace capacity and efficiency improvements would be achieved through the implementation or extension of ATS surveillance services where accompanied by implementation of surveillance based separation standards.

2.4 It was suggested at the Working Group meeting that minimum surveillance separation standards were not always used within surveillance airspace across FIR boundaries due to a range of issues including the incidence of pilot non-compliance with clearances in or approaching boundary areas, ATC coordination deficiencies, traffic demand and ATC system and display limitations. It had been observed that there was a significant difference between minimum separation derived by ATM capability and that required to manage traffic for various reasons. Setting separation at conservative distances in all circumstances regardless of traffic demand penalized aircraft when there was no need.

RACP/TF/3

2.5 The RACP/TF/3 meeting had noted that, unlike the cases of North America and Europe, the Asia/Pacific Region did not have the benefit of a networked ATFM capability that would help to manage contingency events. The meeting had noted the outcome of the Combined Third Meeting of the South Asia/Indian Ocean ATM coordination Group (SAIOACG/3) and Twentieth Meeting of the South East Asia ATS Coordination Group (SEACG/20), held in Bangkok, Thailand, from 18 – 22 February 2013 with respect to Large Scale Weather Deviations (LSWD); that the tripartite agreement between Hong Kong China, Singapore and Thailand should include appropriate CDM/ATFM measures to ensure maximum utilization of airport and en-route capacity. This was in accordance with the outcomes from ATFM/SG/1, which considered that each of the Major Traffic Flows (MTF) should have ATFM planning regardless of traffic density, to cater for contingency operations in addition to traffic loading.

2.6 In considering ATS contingency route structures, RACP/TF/3 had considered the work being undertaken by the ATFM/SG, which was expected to lead to a networked ATFM solution for the Region, and agreed that the establishment of a linkage between the Regional ATM Contingency Plan and the Regional Framework for Collaborative ATFM should be further explored.

MET/ATM Seminar and MET/R TF/3

2.7 The MET/R TF/3 meeting had noted the re-convening of the ATFM/SG, and the outcomes from ATFM/SG/2, including the proposed revised Terms of Reference (ToR) that included tasks relating to factors affecting capacity such as weather information, and also noted a number of early draft elements of the ATFM framework that would require MET support.

2.8 MET/R TF was of the view that current and future developments in the provisions for aeronautical meteorological information exchange should support interoperability and noted that any future exchange of meteorological information in addition to OPMET defined in Annex 3, and yet to be defined within the Regional ATFM framework, would also need standardization to support interoperability.

2.9 MET/R TF/3 agreed that there was considerable benefit in formalizing a link between MET/R TF and ATFM/SG, and agreed to ***Draft Decision TF 3/1: Revised Terms of Reference***. The MET/R TF meeting also agreed to ***Draft Decision 3/2: Revised ATFM/SG Terms of Reference***, requiring that the Secretariat propose a corresponding revision of ATFM/SG ToR. This matter was further discussed by ATFM/SG/3 under Agenda Item 6.

2.10 It had been recalled that a number of States were developing or had developed customized MET products beyond the current scope of ICAO provisions, to support terminal area and ATFM operations. The 2010 regional survey of ATFM requirements for MET services/products was recalled, and the meeting agreed that a similar survey could be conducted to determine what MET products and tailored MET services are being provided to ANSPS, particularly those services/products not governed by ICAO provisions. To facilitate alignment of systems the survey would also seek information on product formats used. MET/R TF agreed to a work programme addressing, inter alia, Regional ATM requirements for MET information, sub regional exchange of MET information, integration of MET information into ATS/aircraft operator decision support tools, Meteorological Services for the Terminal Area (MSTA) and related Annex 3 developments, and a regional implementation plan for MSTA.

2.11 The ICAO Meteorology Divisional Meeting would be held in Montreal, Canada from 7 to 18 July 2014, in part conjointly with the 15th Session of the WMO Commission for Aeronautical Meteorology (CAeM-XV).

2.12 The Co-Chair suggested that appropriate Aviation Meteorology experts from the MET/R TF should be invited to participate in ATFM/SG Specialist Team activities.

SAIOACG/4&SEACG/21

2.13 The combined SAIOCG/4&SEACG/21 meeting was informed of the Group of Five ANSPs Informal Coordination Meeting (Indonesia, Malaysia, Philippines, Singapore and Thailand), where discussions focused on concept development of ATFM on a sub-regional scale, consistent with the Asia/Pacific Seamless ATM Plan and ICAO's Aviation System Block Upgrade (ASBU) concept.

2.14 The SAIOCG/4&SEACG/21 meeting had been informed that The Asia/Pacific Regional Performance Dashboard on Safety (based on ICAO Doc 10004 - *Global Aviation Safety Plan – GASP*) would become active on the ICAO HQ website during 2014. The initial ATFM performance indicator would be the percentage of FIRs within which all Area Control Centres (ACCs) utilize ATFM measures.

EU/AATIP Cross Border ATFM Workshop (IP02)

2.15 The meeting was provided with a report on discussions at the EUROCONTROL/ASEAN Air Transport Integration Project (AATIP) Cross-Border ATFM Workshop, which had the objectives of developing a common understanding of the requirements for cross-border ATFM in the ASEAN area and discussing priorities for the development of initial ATFM requirements including operational concept, training, pre-ATFM CDM processes, information exchange protocols and inter-organizational agreements.

2.16 The Workshop had discussed the preliminary list of principles for ATFM in the ASEAN area that had been presented to ATFM/SG//2.

2.17 Further information was provided on issues affecting capacity in the ASEAN area. The workshop had discussed the importance of harmonization of different ATFM terms and definitions, and the regulatory basis for ATFM (ICAO Annex 11).

2.18 The workshop concluded that AATIP would put forward clear proposals on the various issues discussed, and would provide them to ICAO as input to the development of the Regional Framework for Collaborative ATFM.

Agenda Item 3: ATFM/CDM Global Update

North America/Caribbean ATFM Task Force Work Programme (IP03)

3.1 The Secretariat provided a briefing on the work programme of the North America/Caribbean ATFM Task Force, which had been developed as a guideline used by the Task Force to establish ATFM goals.

3.2 The work program detailed activities being undertaken by the Task Force. The meeting was advised that progress would be updated through the Secretariat, and opportunities to include initiatives from the Task Force's work in the Asia/Pacific Regional Framework for Collaborative would be examined.

3.3 USA commented that the work programme illustrated that the challenges of ATFM implementation were common to all States, including the issues of tools and automation, bilateral agreements and their multilateral effect, ATFM responses to contingency situations, civil-military cooperation and the clear and unambiguous communication of information.

Agenda Item 4: Review of Current CDM/ATFM Operation and Problem Areas

ATFM/CDM in Japan (Presentation 1)

4.1 Japan provided a presentation on the current status and operations of ATFM/CDM in Japan. The presentation included information on fundamental ATFM steps of management and coordination of flight plan route, management of the airspace and airport capacity, and implementation of air traffic flow control.

4.2 The presentation provided an outline of the history of ATFM development in Japan, route management procedures, flow control initiatives including conditional routes, CDM and CDM tools, ATM strategic conferencing, and information sharing with neighbouring ANSPs.

Agenda Item 5: Development of Regional ATFM Framework

IATA Study Update

5.1 IATA provided an update on progress in establishing the ATFM study project that was agreed by ATFM/SG/2 under *ATFM/SG Decision 2/2: Asia/Pacific Region ATFM Study*.

5.2 The project was in the final stages of review and selection of vendors, and this was expected to be completed in April, as expected by ATFM/SG/2. IATA was very aware of the value of working closely and coordinating activities with all other parties involved.

5.3 It was imperative that States were actively engaged with the study project when it commenced, to ensure that the required information would be available in the study report to ATFM/SG/3. The greatest risk to the project was non-engagement by States.

5.4 Meeting participants were requested to assist the process by providing appropriate contact points for their State or Administration.

Airport Collaborative Decision Making – A-CDM (WP05)

5.5 IATA presented an overview of its 2013 A-CDM project, and recommended adoption of the EUROCONTROL A-CDM manual as regional guidance, together with a minimum set of milestones and terminologies as a regional expectation.

5.6 During 2013 IATA had successfully conducted a series of 5 A-CDM workshops in Singapore, Beijing, Shanghai, Haneda and Narita, to increase understanding of A-CDM and its benefits and to foster harmonization of terminology and processes. The workshops were based on the *EUROCONTROL A-CDM Implementation Manual version 4*, which was developed with inputs from Airports Council International (ACI) and IATA, and appeared to be commonly used and widely accepted by airports and ANSPs as the predominant A-CDM development and implementation guidance.

5.7 The criticality of harmonization of systems, procedures and terminologies from the User perspective was stressed, as pilots would interface with multiple systems at multiple locations in different States, and expected common interface protocols and terminology.

5.8 It was recognized that the full implementation of the EUROCONTROL A-CDM manual's processes may be unnecessarily complex in the APAC Region, and it was recommended that States should take a "fit for purpose" view and tailor programs to suit local operating conditions.

5.9 Differences between the EUROCONTROL manual and the FAA's Surface Collaborative Decision Making program were acknowledged. Some systems implemented under the EUROCONTROL manual may not have directly followed its guidance. It was important to ensure synergy with other airports globally and the adoption of best practices to facilitate future interoperability.

5.10 A set of minimum milestones and terminologies was proposed for adoption by the meeting.

5.11 Airports Council International (ACI) advised the meeting that they supported the A-CDM initiative, had worked with IATA and CANSO to promote it, and had offered consultancy services and planned to provide guidance material to members.

5.12 In discussing the proposal, the meeting was informed that several States and airport operators had borrowed heavily from the EUROCONTROL manual. It was noted, however, that the manual included many considerations that were unique to the Europe/EUROCONTROL operational ATM and ATFM/CDM environments which would not be either suitable or necessary for the Asia/Pacific Region.

5.13 It was also noted that the next version of ICAO Doc. 9971 Manual on Collaborative ATFM would include A-CDM guidance.

5.14 Several comments were made to the effect that it would be preferable to review the manual further in terms of the proposed Asia/Pacific Regional ATFM framework, to select content suitable for application in this region. IATA emphasized the importance of an agreed minimum set of terms and milestones to avoid the problems caused by the many disparate A-CDM applications around the world, and that ATFM/SG should agree to a foundation set of milestones for A-CDM.

5.15 The meeting agreed that rather than adopt the manual in its entirety it should be adapted or used as a basis for Regional A-CDM guidance. The matter of an agreed set of terms and milestones would be further explored under WP08.

Collaborative Decision Making (CDM) Project Assessment Form (WP04)

5.16 ICAO presented a recently developed CDM project assessment template, aimed to provide States with an overall view of the recommended process of implementing CDM and comparing actual CDM practices against them.

5.17 The CDM Project Assessment Form was used by ICAO during a CDM review visit to Shanghai in January 2014 under an invitation from China. It was proposed that the meeting review the CDM Project Assessment Form and provide feedback for improvement, consider including the form as an Appendix to the Regional ATFM Framework, and encourage States to apply the form during their implementation.

5.18 The meeting was informed that development of the project assessment form was based on Doc 9971 Part I and the EUROCONTROL A-CDM manual. While there was no inconsistency between the guidance in the two documents there were some items included in the EUROCONTROL manual that could be added to Doc 9971.

5.19 The meeting agreed that the form could serve as a useful guide for States, and could be expanded to provide a useful tool for the assessment of ATFM implementation.

Draft Regional Framework for Collaborative ATFM (WP03)

5.20 The Secretariat presented the latest draft version of the Regional Framework for Collaborative ATFM, to update the meeting on the progress and process of its development. Development of the regional framework was the primary task of ATFM/SG, requiring work to be conducted offline for further review and enhancement at ATFM/SG meetings, and was dependent on the development and finalization of the Regional Interim Framework for ATFM.

5.21 The draft contents of both the Regional Framework for Collaborative ATFM and the Interim Framework were circulated for review and comment in a combined document, the *Draft Interim Framework for Collaborative ATFM version 0.1.1*. The documents had now been separated.

5.22 The latest draft version of the separate *Regional Framework for Collaborative ATFM* was provided to the meeting. It included comments received up to 4 March 2014 and Secretariat responses to those comments, and recorded subsequent amendments.

5.23 It was proposed that the Steering Group's effort should initially be focused on finalization of the Interim Framework, as that document would eventually be subsumed into the broader Regional Framework, and was required to be finalized in a short time-frame. This was discussed by the meeting under WP10.

Interim Regional Framework for ATFM (WP10)

5.24 The Secretariat presented the latest working draft of the proposed Interim Regional Framework for ATFM, to provide an early implementation framework and guidance to States, Air Navigation Service Providers, airspace users and other stakeholders during the development of the more comprehensive Regional Framework for Collaborative ATFM.

5.25 ATFM/SG/2 had discussed the need for development of this guidance material to provide earlier benefit to airspace users and to provide States having little experience in ATFM with the opportunity to gain knowledge and experience before embarking on the more complex implementation that would be driven by the broader ATFM framework.

5.26 The draft Interim Framework was constructed from extracts from the Draft Regional Framework for Collaborative ATFM, and would be subsumed by that document in its final form. The final draft of the Interim Framework was expected to be made available for consideration by the ATM Sub-Group of APANPIRG in early August 2014. As further follow-up work was likely to be required after the ATFM/SG/3 meeting it was proposed that any further development should be conducted by the ATFM/SG Specialist Team and, once agreed by the Co-Chairs, presented to ATM Sub-Group.

5.27 The meeting discussed the Interim Framework at length. The reasoning behind the separation of an Interim Framework document from the main Regional Framework was not clear to all participants, and concerns were expressed about the need to work on two separate framework documents that may be better kept in a single form.

5.28 The meeting was reminded that the need for an Interim Framework had been discussed and agreed at ATFM/SG/2, and that the ATFM/SG/2 meeting report included the meeting's agreed position; that the development and promulgation of Regional guidance for interim ATFM solutions would not only provide earlier benefit to airspace users, but would also provide States having little experience in ATFM the opportunity to gain knowledge and experience before embarking on the more detailed implementation that would be driven by the broader ATFM framework. This took consideration of the likely two-year time frame for finalization of the Regional Framework for Collaborative ATFM.

5.29 The meeting decided that the proposed contents of the Interim Framework would be incorporated in the main regional framework document, and after further discussion the meeting decided that work should continue on a single framework document, with the current priority being the finalization of guidance which could be extracted to form an Interim Framework for presentation to ATM Sub-Group in August 2014, for eventual adoption by APANPIRG/25 in September 2014.

5.30 In considering the structure of the draft Regional Framework for Collaborative ATFM, the meeting noted the following:

- The use of appendices to provide technical detail or information requiring the facility of more frequent update than the main body of the document was generally agreed;
- Guidance on ATS route design need not necessarily be included in the document. Instead, statements could be made outlining the expected ATFM outcomes that were dependent on ATS route design considerations;
- The CDM concept should be expanded in the document

5.31 The meeting discussed whether there was a need to provide tactical ATC operations guidance in the framework. The general view was that it was not needed in a document that should be confined to ATFM matters. However, it was also pointed out that there were States in the Region that had limited if any experience in the application of appropriate tactical ATC processes to respond to ATFM requirements.

ATFM Messages, Terminology and Network Interoperability (WP08)

5.32 The Secretariat presented information discussing the need for development and adoption of ATFM terminologies for use in the Asia/Pacific Region to promote harmonization and interoperability of CDM/ATFM systems and procedures.

5.33 Global development of ATFM had largely been undertaken in isolation by individual ANSPs, EUROCONTROL, ICAO Sub-Regions or other informal groups of States, or by ATFM system vendors. This had resulted in differences in concept development and in the technical terms used for operational and technical coordination of ATFM information.

5.34 The development of the Asia/Pacific Regional Framework for Collaborative ATFM provided the opportunity to also develop a standardized set of terminologies, messages and message formats and communications protocols for collaborative ATFM. The first step in this process was agreement on a set of ATFM terminologies. By agreeing to an appropriate set of ATFM terminologies and messages for the Asia/Pacific Region the ATFM/SG had the opportunity to also influence the global interoperability of ATFM/CDM.

5.35 CANSO advised the meeting that the lack of a standard set of terminologies was a global issue of concern that had been raised at every ATFM Global Conference held in the last 12 years.

5.36 CANSO provided a list of terminologies used by Australia, EUROCONTROL, Japan, South Africa, and in North America. Due to the laborious nature of the work of analysing the list to determine an appropriate set of terminologies for the Asia/Pacific Region a group of participants agreed to work offline to develop the list of terminologies, their meanings and application. Led by CANSO, the group included Singapore, Thailand, Japan and India.

5.37 It was further suggested that the list of terms should delineate those that were related solely to A-CDM on-airport operations from those that were used in the wider ATFM environment, and that terms not related to ATFM/CDM, and those that were either already clearly understood in ATM operations and/or detailed in ICAO annexes, should be removed.

5.38 In response to a query, the meeting was reminded that the contents of the Asia/Pacific Region ATFM Communications Handbook had been used in the development of both ICAO Doc 9971 and the Asia/Pacific Seamless ATM Plan, and was now superseded by them.

5.39 IATA again emphasized the importance of commonality of terms and processes, and the need for a small set of definitive requirements.

ATFM Service Categories – Airspace (WP09)

5.40 The meeting was reminded that ATFM/SG/2 had agreed that categories of airspace within which specific ATFM services were applicable should be defined. These service categories would be based on airspace complexity and traffic density, and would be used to define the minimum suite of ATFM capability elements required for each ATC sector.

5.41 ATFM/SG/2 had discussed the categorization of airspace for ATFM services, and noted that such categories should be determined by traffic density and airspace complexity, where complexity measurement included such factors as traffic mix, (IFR and VFR traffic, jet vs. non-jet, military activity, general aviation activity, etc.), airspace constraints, environmental and meteorological factors.

5.42 The circulated early draft version of proposed airspace categories for ATFM services was a simple suite based on assumed complexity and density expected. The proposed categories were presented on a sliding scale ranging from Terminal Areas (TMAs) servicing major international or high density domestic airports, through en-route sectors overlying such TMAs or containing major ATS routes between them, down to regional TMA/TWR and other non-surveillance airspace. This suite of categories was proposed on the basis of being a simple structure that could be readily implemented.

5.43 Feedback from the ATFM/SG Specialist Team had suggested that caution should be exercised in order to avoid being constrained by rigid categories.

5.44 In discussing the proposal it was noted that several States did not consider such a concept in their operations as ATFM was considered to be an organization-wide function. Several States, however, were of the view that with refinement the concept could assist Asia/Pacific Region States to define and prioritize their implementation of ATFM services. Refinement could include capacity assessment processes to better define an ATFM service category for the airspace being considered. It was also noted that definition of high density airports from the Seamless ATM Plan (airports with >100,000 movements per annum) which had been used in the proposed model was not sufficiently detailed, and a better measurement would be movements per hour.

5.45 It was agreed that the concept should be further developed for later consideration by the Steering Group.

Draft Appendices to the Interim Framework for ATFM (WP11)

5.46 The Secretariat provided proposed appendices to the Draft Regional Interim Framework for ATFM for further development by the meeting. The framework appendices discussed, with comments from the Steering Group annotated, are provided at **Appendix C**. The Specialist Team would further develop the appendices.

CDM Philosophies (Presentation 2)

5.47 To address a perception that the meeting's understanding of the relationship between ATFM, CDM and Airport CDM was becoming unclear, the USA made a presentation on CDM philosophies.

5.48 The meeting discussed the presentation and the information, and it was stressed that CDM was a communications tool to enable collaborative decisions by sharing information, as was Airport CDM. It was further stressed that CDM and ATFM were not interchangeable terms.

Thailand Capacity Enhancement Initiatives (WP14)

5.49 Thailand provided information in its capacity enhancement initiatives, which could be considered for potential integration into the Regional Framework for Collaborative ATFM.

5.50 Traffic increases experienced by Thailand had continued to such an extent that various sectors in the Bangkok ACC would become saturated during peak hours by a margin of 20-30%. These sectors mainly serviced traffic originating from within the Bangkok FIR.

5.51 In response, Thailand planned to implement the following minimum capacity enhancement initiatives:

- a) Route structure enhancements;
- b) Civil-Military ATM Coordination;
- c) Electronic aircraft hand-offs;
- d) New ATS automation eliminating flight progress strips;
- e) Dynamic sector configuration;
- f) Departure and Arrival Manager (DMAN/AMAN); and,
- g) ATFM automation support.

5.52 The introduction of a parallel unidirectional RNAV5 route structure had been initiated, with the goal to transition to RNAV 2 over time. SID/STAR structure surrounding busy airports would also be restructured to enhance capacity and efficiency. It was expected that route structure improvements would enhance safety while reducing ATC conflict resolution workload, thus enhancing capacity by approximately 10 percent in affected areas.

5.53 Some conditional routes through Special Use Airspace (SUA) had already been implemented for congested domestic city pairs. It was expected that availability of conditional routes could be further increased by implementation of a targeted pre-tactical Airspace Management Cell, and consequently a Flexible Use of Airspace (FUA) concept through coordination of pre-tactical availability of conditional routes and relevant airspace. In some cases cross-border civil-military ATM coordination would also prove benefits

5.54 Airspace capacity had been limited due to the unavailability of electronic hand-off between Bangkok ACC and major TMAs, and with neighbouring FIRs. This would be addressed by the procurement of a new ATS automation system, with a delivery timeline in late 2015, including internal hand-off functions and AIDC Version 3.

5.55 Implementation of automated hand-off, which was expected to decrease ATC workload, and increase capacity by about 20 to 30 percent.

5.56 The maintenance of flight progress strips could also raise ATC workload in congested airspace. The new ATM Automation system would feature elimination of paper flight progress strips. This was expected to reduce ATC workload and increase capacity by about 20 percent.

5.57 The new ATM automation system would enable dynamic sector configuration, enabling various configurations to support varying traffic patterns. It was expected that this capability would deliver airspace capacity when and where needed while optimizing resources, subject to regulatory considerations regarding ATC licensing.

5.58 The new ATM automation system would feature AMAN and DMAN at major airports in Thailand. It was expected that AMAN/DMAN would contribute to enhanced predictability, assisting in reduction of schedule buffer and further capacity increases.

5.59 Thailand had secured budget for an ATFM automation support system based on the concepts in the ICAO Manual on Collaborative ATFM (Doc 9971), and the Thailand CDM/ATFM Concept (WP15).

5.60 In discussing this paper, the meeting was informed that in some cases ATFM was seen to be an excuse for not increasing capacity. It was also noted that while AMAN and DMAN did not of themselves increase capacity, they optimized the use of available capacity and ensured no wastage of capacity. When combined with other programs such as improved wake vortex separation the result was improved capacity at the airport concerned.

5.61 The matter of paper flight progress strips was also discussed. The positive experience of other ANSPs in totally dispensing with the use of paper strips immediately on transition to new ATM automation systems was related, and it was suggested that the key to this was ensuring operational ATC engagement with the transition, supported by rigorous training in the use of the new system without paper flight progress strips before commencing operations.

5.62 Reduced capacity during transition to new ATM automation systems was also discussed. Australia commented that their experience was that capacity reduction of about 20% was normal when operationally implementing major systems, and this was usually the result of risk mitigations arising from the project safety assessment. In no case had the reduced capacity exceeded about two weeks.

5.63 The meeting agreed that the capacity improvements suggested by Thailand would be included in the Specialist Team's development work on the Regional Framework for Collaborative ATFM.

Training Curriculum for Flow Management Position Personnel (IP05)

5.64 Thailand presented its draft training curriculum for Flow Management Position (FMP), and proposed the integration of the curriculum into the Regional Framework for Collaborative ATFM.

5.65 Thailand's planned procurement of new ATM and ATFM automation systems, and development of a CDM/ATFM Concept of Operations (WP14 and WP15), would take time and transition effort to complete.

5.66 To address the transition and enable sustainable air traffic growth Thailand had secured budget to implement an ATM Network Management Centre (ATM NMC) comprising an expanded Air Traffic Flow Management Unit (ATFMU), a new Airspace Management Cell (AMC) to coordinate airspace and conditional routes in accordance with the Flexible Use of Airspace concept, supported by an information management unit. The ATM NMC was planned to begin a partial operational trial in mid-2015.

5.67 Draft training curriculum topics had been developed in preparation for the trial and are provided at **Appendix D** to this report.

5.68 The meeting discussed this information paper and noted the importance developing training for ATFM, which was not yet adequately supported in Doc 9971. Thailand also advised that the planned AMC was planned to include military liaison presence to ensure that information on the next day's Special Use Airspace (SUA) planning was readily available.

5.69 It was also mentioned that experience elsewhere had demonstrated the benefits of recruiting staff from ATC backgrounds to fill ATFMU roles.

5.70 The meeting agreed that the draft training curriculum topics should be considered by the Specialist Team for inclusion in the draft framework.

Thailand CDM/ATFM Concept (WP15)

5.71 During the period of initiation of capacity enhancements and arranging procurement of a new ATM automation system, Thailand was developing a CDM/ATFM Concept of Operations based on ICAO Doc 9971 which could be integrated with a distributed CDM/ATFM concept over time. It was envisaged that the system would complement other concepts such as the collaboration between Hong Kong China, Malaysia, Singapore and Thailand.

5.72 Thailand had secured budget to procure an ATFM automation system in line with the CDM/ATFM Concept of Operations. While the system would be largely "domestic", requirements would be included in the upgrade roadmap to ensure interoperability with similar systems and it was envisaged that it would support the Distributed CDM/ATFM trial proposed in a separate joint working paper (WP07).

5.73 Thailand proposed that the Concept of Operations be adapted and integrated into the Regional Framework for Collaborative ATFM. **Appendix E** to this report illustrates the proposed Concept of Operations, which the meeting agreed would provide valuable input to the Regional Framework for Collaborative ATFM.

Concept of Operation for a Distributed Multi-Nodal ATFM Network for the Region (WP06)

5.74 Singapore presented a briefing on the sub-regional distributed multi-nodal ATFM Concept of Operations which was developed through a collaborative research project performed by the Civil Aviation Authority of Singapore with support from an industry partner and the active participation of key stakeholders such as ANSPs, airspace users, airport authorities and international organizations.

5.75 As most regional hubs were already operating near the limits of their current capacity, solutions to managing traffic flow efficiently were sought through various collaborative initiatives. As the existing centralized model of ATFM operations such as in Americas, Australia and South Africa were considered to be not suitable for the region ATFM/SG/2 agreed that the distributed multi-nodal network was perhaps the only viable solution to the ATFM needs of the region.

5.76 The ATFM/CDM proof of concept research project was aimed to develop a multi-nodal regional ATFM/CDM concept that was viable for any state to adopt. CAAS together with its industry partner and key stakeholders had embarked on a 10 month ATFM/CDM proof of concept collaborative research project. Fast time simulation and Human in the Loop simulation provided essential operational inputs to the development of the concept. The research project had concluded, and delivered a benefit analysis and the concept of operations.

5.77 The concept involved each ANSP operating an independent, virtual ATFM/CDM node supported by an interconnected information sharing framework. **Figure 1** illustrates a distributed multi-nodal ATFM network.

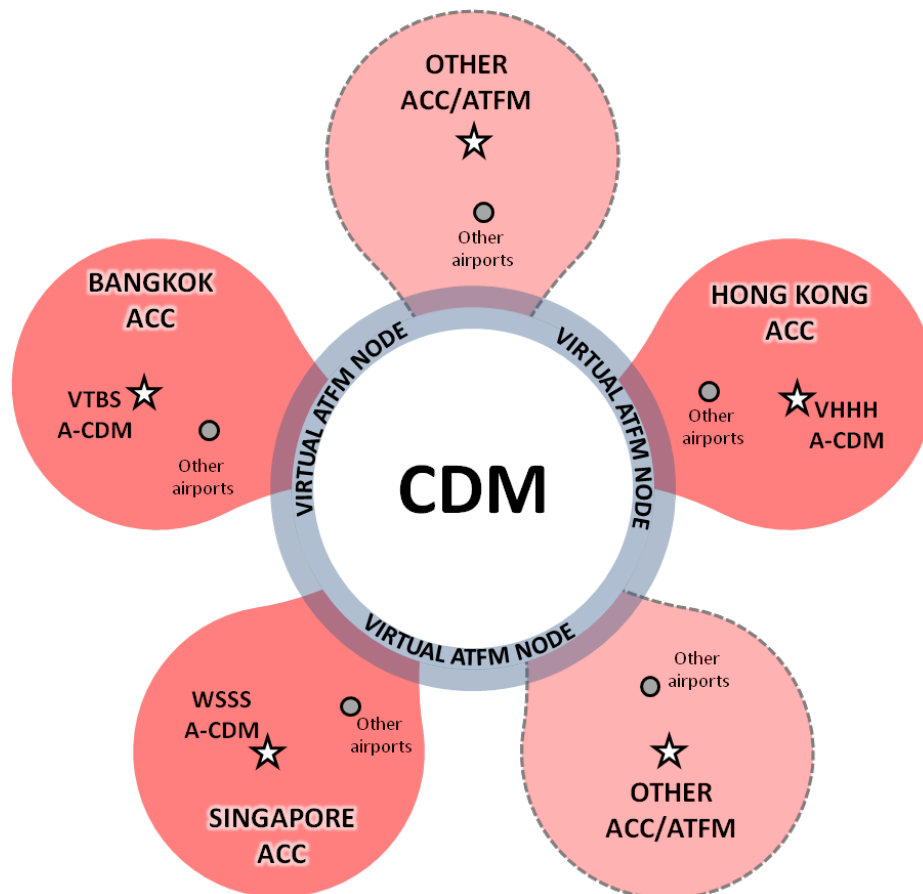


Figure 1: A Distributed Multi-Nodal ATFM Network.

5.78 Where possible, Airport-CDM mechanisms, especially at busy airports, could aid the collaborative decision making process between the ANSPs. The flows of air traffic would then be managed effectively based on a common set of agreed principles among the participating ANSPs and airports. A node comprising an ANSP with associated airports would be able to manage the demand and capacity through adjustments in aircraft Calculated Landing Times (CLDT) which would in turn influence the issuance of Calculated Take-off Times (CTOT) for aircraft at the participating airports.

5.79 Key components of the concept included:

- Regional Stakeholders interconnected via a virtual communications framework;
- Specification of capacity and prediction of demand;
- Evaluation of alternatives and the initiation and modification of Traffic Management Initiatives (TMI); and
- Implementation of TMIs and the associated stakeholder roles;

5.80 The essential requirements for success of the concept were:

- Acceptance of the Regional Concept by neighbouring ANSPs;
- Agreement to common set of business rules for departure, destination and enroute ANSPs, Airport Operators and Aircraft Operators ;
- Participation level exceeding 70% of aircraft operated at any given airport to ensure effectiveness of flow measures;
- Common agreement to share essential data for ATFM by stakeholders; and
- Participating ANSPs to initiate effort to build their individual capabilities and practice ATFM in accordance to ICAO guidance to provide ATFM service

5.81 The concept would enable ANSPs to establish an ATFM framework and accord airspace users greater flexibility to manage delays through collaboration and negotiation with ANSPs and airport operators. Singapore proposed that elements of the concept be included in the Regional Framework for Collaborative ATFM.

5.82 A detailed presentation elaborating on the concept was made to the meeting, and is available on the ICAO Asia/Pacific Regional Office website [here](#).

5.83 The ATFM/SG/3 meeting visited Singapore's CDM/ATFM concept development platform before then further discussing concept.

5.84 The meeting expressed its support for the concept, while noting the following:

- There may be some issues with the differences between the relevant characteristics of the filed flight plan (FPL) such as EET and cruising speeds, and those flown in response to ATFM measures. Singapore advised that in the concept the aircraft operating company was responsible for ensuring the appropriate ICAO FPL or other ICAO ATS messages were originated to reflect any changes;
- The success of the concept would be heavily dependent on the collaboration of ANSPs and other stakeholders such as airspace users and airport operators;

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- The concept was quite revolutionary in conferring the ability to decide where to apportion their delay to the stakeholder. This would demand suitable business rules;
- The concept conformed with the Doc 9971 definition of CDM as multilateral decision making with collaborative goals;
- CDM was a communications tool, but there was an expectation that what it communicates should be realistically achievable;
- The concept would require robust communications capability, much in the same way that the Region had defined requirements for AIDC, AFTN, ATN;
- Active participation by stakeholders was the key to success;
- After three years of talking about CDM/ATFM involving city pairs, major traffic flows and centralized flow management systems, this concept appeared to be the best possible solution providing a solid outcome for the region;
- The concept of delay distribution was recognized as challenge for the airlines and would require change to airline systems and processes, requiring investment;
- The concept of delay distribution was also a change for ATC and would require new procedures and comprehensive training which could be mitigated by phased implementation;
- The reasons for the re-convening of the Steering Group must be kept in mind. These included not only developing the framework, but also fostering interoperable regional or sub-regional ATFM solutions. As the region must also consider how interconnected cross-boundary flow management could be achieved, this concept may be the only viable way forward;
- The work done on the concept would provide a sound basis to move forward;
- Traffic growth will continue while the concept was being trialled and further developed, requiring some earlier cross-boundary ATFM solutions;
- The continued development of the framework document was essential;
- There must be agreement on what type of data must be exchanged, in what format, and how it would be exchanged;
- The idea was viable. Delay at the airport gate was a good idea but would involve changes in ground operations procedures, which would induce some complexity.
- The concept of ATFM delay distribution should be kept simple until the region has some degree of ATFM development;
- Capacity assessment was a key consideration, and having knowledge of airport and airspace capacity was fundamental to progress the implementation of the concept; and

- The concept addressed pre-tactical ATFM, and did not take into account tactical measures such as runway sequencing (AMAN/DMAN). The trial would further clarify what could be achieved.

5.85 Singapore advised the meeting that a driver for the concept was the necessity to expand participation early in its development. The essence of taking the whole of any ATFM delay on the ground imposed a heavy burden on aircraft operators, and the ability to flexibly accept part or all of a delay in the air was needed.

5.86 The need to consider the States that were not participating in this meeting was also discussed. Development of the concept must be open to the idea that there may be different ways of cooperating on a sub-regional basis. It was important that all systems/networks exchanged information using common terms and protocols to ensure interoperability. Singapore advised that the concept was not considered as the only solution. If, for example, a group of States agreed on a centralized facility then the important consideration was interconnectivity.

5.87 The meeting recognized the value of the concept as viable and adaptable for the region, and agreed that the elements captured in the concept should be considered for inclusion in the regional ATFM framework. It was also recognized that stakeholders' active involvement would be key to the success of a multi-nodal ATFM/CDM concept.

5.88 ATFM/SG agreed to the following decisions:

ATFM/SG Decision 3/1: Distributed Multi-Nodal Networked ATFM Concept

That, the distributed multi-nodal networked ATFM concept be considered as a viable foundation to be incorporated into the regional ATFM framework for the development and implementation of ATFM for the Asia/Pacific Region, taking into account the guidance of ICAO Doc 9971.

ATFM/SG Decision 3/2: Interoperability of Existing and Future ATFM Capabilities

That, recognizing that the region is in the early stages of ATFM development, the regional ATFM framework will foster the harmonization of the development of various ATFM concepts to ensure cross-border interoperability of existing and future ATFM capabilities in the Asia/Pacific region.

ATFM/SG Decision 3/3: Suitability, Interoperability and Alignment of ATFM Concepts

That, the ATFM Steering Group takes into consideration the diverse ATFM needs of States and other stakeholders in the Asia/Pacific region in developing the regional ATFM framework which takes into account suitability, interoperability and alignment with various concepts in the Asia/Pacific and other regions.

Distributed Sub-Regional ATFM Network Operational Trial (WP07)

5.89 Hong Kong China, Indonesia, Malaysia, Singapore, Thailand and Viet Nam presented information on an operational trial of collaborative Air Traffic Flow Management using the concept of a distributed multi-nodal ATFM network, which had developed from the tri-partite initiative between Hong Kong China, Singapore and Thailand that was discussed at ATFM/SG/2. It had been agreed at that meeting that distributed multi-nodal sub-regional networks were perhaps the only viable solution to the ATFM needs of the Asia/Pacific Region.

5.90 The first part of the trial involved a twice daily exchange of CDM information in a daily teleconference between the tri-partite ANSPs, conducted in late 2013. This had revealed the need for capability building within each ANSP to bring robustness to the information sharing framework in order to support the collaborative decision making process for ATFM.

5.91 The second part was the CAAS ATFM/CDM proof of concept project described and discussed by the meeting under WP06.

5.92 The conclusion of the information sharing trial and the concept development led to the next stage of capability building to support ATFM implementation within the concept of a distributed multi-nodal framework. Once capability and a common set of business rules were developed, and the required level of readiness reached, ANSPs could potentially interconnect their ATFM nodes to form the larger distributed 'virtual' network.

5.93 The collaborative endeavour had received wider interest with the participation of first Malaysia, and more recently Indonesia and Viet Nam. The six participating ANSPs planned to conduct an ATFM operational trial in June 2015. The trials would also involve airspace users, and the initiative was supported by IATA.

5.94 Participating Administrations would adopt a structured capability development plan for such areas as demand and capacity management, ATFM system requirements, common business rules, ATFM personnel management, etc., enabling them to reach the level of readiness to actively participate in the operational trial.

5.95 The meeting was informed that the initial trial exchange of information had included the airport acceptance rates (AAR) at the 3 hub airports involved, weather or other conditions affecting capacity, and information on en-route factors such as weather. The trial started with daily teleconferences but as the situation was usually "ops normal" the frequency of teleconferences was reduced to be required only when necessary.

5.96 Responding to a comment that the trial timetable should include meteorology involvement at commencement, Singapore advised that meteorological considerations also required a further collaborative effort between States. The Secretariat advised that anticipated amendments to Annex 3 would define meteorological products for ATM, including ATFM. It was further noted that a proposed amendment to the ATFM/SG Terms of Reference included a linkage to the Meteorological Requirements Task Force (MET/R TF).

5.97 The Chair commented that a plan was needed for participating states to have a common framework before the trial. Singapore advised that interoperability would hinge on the development of an Interface Control Document (ICD) which would include standards for format and content of exchanged data, but in the meantime other interoperability options such as ATFN/ATS messages were available.

Agenda Item 6: Any Other BusinessRelevant Ideas and Practices of CDM/ATFM in the South China Sea Area (IP10)

6.1 The meeting was provided with an update of the status and discussion of of ATFM requirements in the South China Sea area

6.2 Due to continuously growing traffic and congestion, the impact of typhoon weather and their effect on capacity China had started the construction of an ATFM Centre in the Sanya ACC.

6.3 Problems included:

- Rapidly increasing air traffic in a complex multi-route convergence situation;
- Vulnerability to typhoon weather;
- Lack of information sharing; and
- Multiple air traffic flow constraints

6.4 The initial establishment of the ATFM information platform in the Sanya ACC could provide ATFM information for ATC units, airspace users and other stakeholders. China expressed urgency of the establishment of information sharing and exchange mechanisms as soon as possible in the Asia/Pacific Region, and was willing to exchange information with other participating stakeholders on the basis of a common set of agreed principles.

6.5 ATFM initiatives for the high density and complex air traffic flow during the en-route phase were becoming more important. China was willing to participate in the distributed multi-nodal ATFM framework and establish CDM/ATFM mechanisms including information sharing with Hong Kong China, Singapore, Thailand and other participating States.

6.6 The meeting welcomed and supported the willingness of China to become involved in the distributed multi-nodal ATFM framework concept project, recognizing the important strategic location of the Sanya FIR and the traffic load and complexity within it, and the importance of China's CDM/ATFM programs. Further coordination between the relevant parties would be conducted offline.

North Regional ATFM Harmonization Group –NRAHG (IP07)

6.7 ICAO presented information on three-State cooperative initiative aimed at ATFM/CDM harmonization within North East Asia involving the participation of China, Japan and the Republic of Korea. As one of the largest aviation sectors in the Asia/Pacific region North East Asia would benefit greatly from the introduction of harmonized ATFM/CDM operations.

6.8 China, Japan and the Republic of Korea had agreed to the establishment of the North Regional ATFM Harmonization Group (NRAHG), and had requested the support of the ICAO Asia/Pacific Regional Sub-Office (RSO) to serve as facilitator to the group and coordinate progress meetings, which would be hosted by the States involved. With the development of harmonized technical and operational communications protocols and procedures, in accordance with ICAO Doc 9971 and the Regional Framework for Collaborative ATFM, the NRAHG States could aim to achieve concrete operational improvements that would also provide a good example for other Asia/Pacific sub-regions with similar interests in harmonized ATFM/CDM.

6.9 In fully supporting the initiative, IATA requested whether the States involved could give consideration to IATA/s North Asia Office contributing to the group. ICAO commented that IATA, ACI and CANSO would be kept informed and asked to support the initiative.

Master Plan for the 2nd ACC and ATFM Center (IP11)

6.10 Republic of Korea provided information on the master plan to establish a second ATC and ATFM centre to reduce controller workload, promote flow management and manage contingency situations.

6.11 To cope with increasing air traffic volumes and life-limited equipment a second ACC and ATFM Center was needed as a back-up system for Incheon ACC, normal traffic handling, and to permit well-planned flow management in preparedness for disaster management. The second ACC and ATFM Center, located in Daegu, were planned for construction and trial operations from 2014 to 2016, and full operations in 2017.

Indonesia ATFM Implementation (IP06)

6.12 Indonesia provided an update on planning for implementation of ATFM, involving stakeholders including airport service providers, airline operators, ANSPs, the military, and the weather service provider.

6.13 Activities being undertaken by the Indonesian ANSP, AirNav Indonesia, included:

- Seasonal traffic monitoring from mid-2013 until early 2014;
- Evaluating and assessing traffic sample data compare with basic schedules by the Indonesia Slot Coordinator (IDSC);
- Step by step increases in runway capacity at Jakarta/Soekarno Hatta Int'l Airport, from 64 to 72 movements per hour (June 2014) and from 72 to 86 (June 2015);
- A Manual of Runway Capacity Measurement and Airspace Capacity was established in December 2013 to calculate runway capacity at 26 Indonesian airports; and
- DGCA of Indonesia established the National Flight Plan Data Base, which could be expanded as an ASEAN data base.

6.14 Information was provided demonstrating the substantial growth in air traffic in Indonesia, and a breakdown of the traffic: 70 to 80% domestic, 18% International (30% of international traffic to Jakarta was to/from Singapore), and local traffic 2%. Traffic growth data for the 7 major airports in Indonesia was also provided.

6.15 The runway capacity at Jakarta/Soekarno-Hatta International Airport was being progressively increased from 64 movements per hour to 72 by June 2014 and 86 by June 2015.

6.16 Further information on ATFM and A-CDM implementation steps was needed. The meeting was informed that such information should be available later in 2014 when a preliminary framework for initial ATFM implementation was expected to be finalized.

6.17 The meeting noted Indonesia's development of a Manual of Runway and Airspace Capacity Measurement and requested that Indonesia consider sharing it with the ATFM/SG Specialist Team to assist in development of the Regional Framework.

Current ATFM Status in China (IP08)

6.18 China provided information highlighting the growth of air traffic movements in China, which had averaged in excess of 10% per annum over the last decade. Developing an ATFM system was a very significant issue in China, and work to improve ATFM operations, systems and organization structure was ongoing, along with efforts to better achieve interactive information sharing between airlines and airports through the introduction of CDM.

6.19 China's CDM-ATFM system objectives were to create a safe, orderly, expeditious and economic operational environment meeting traffic demand, establish a seamless collaborative network, utilize maximum capacity while avoiding overload for controllers, reduce en-route holding time, optimize surface movement to reduce taxiing time, improve traffic predictability, reduce passenger waiting time on board, save fuel and reduce emissions.

6.20 The CDM system had been established at 23 major airports across China, with the function of providing Target Start-up Approval Time (TSAT) and CTOT to units concerned 90 minutes before the estimated departure time.

6.21 Information was provided on the economic benefits of the reduction in ground holding time at Beijing, Shanghai, Guangzhou and Shenzhen as a result of CDM (**Table 1**).

Airports	Total number of departure and arrival	Reduction of taxing time	Economic benefit (million RMB)	Reduction of carbon emission (ton)
Beijing	517,585	3.2	828.14	1,656
Shanghai	332,126	1.1	182.67	365
Guangzhou	329,214	2.9	477.36	955
Shenzhen	216,897	1.6	173.52	347

Table 1: Economic Benefits of CDM at 5 Major Airports in China

6.22 China had completed the assessment of sector capacity, airport acceptance rates (AAR) and airport departure rates (ADR), and had developed dynamic capacity management procedures.

6.23 In January 2014 the Eastern Regional ATMB of CAAC had invited the ICAO Asia/Pacific RSO to Shanghai to conduct a review of the project status of the CDM system. The review increased the RSO's awareness of the Shanghai CDM system, and the RSO provided recommendations that ATMB would consider when developing the next phase of the CDM system.

6.24 Information was also provided on future planning for upgrades of the strategic ATFM system, flight plan management system, traffic situation display and tactical ATFM system.

6.25 The CDM System Construction Project was an ongoing three-phase project to establish CDM at 23 major airports in 2013, then a further 44 regional airports, followed by all remaining airports in China.

6.26 A CDM concept had been introduced into the ATFM system at the national level to achieve the collaborative adjustment of flight plans, monitor national air traffic status in real time, analyse and predict demand and capacity of airspace and airports and notify national air traffic imbalances through the implementation of collaborative ATFM initiatives.

6.27 The meeting noted the impressive scale of the rollout of CDM to 23 major airports.

Current CDM/ATFM Status in the Middle South Regional Area of China (IP09)

6.28 Information was provided on the national, regional and terminal division of ATFM in China, and on the status of CDM/ATFM in the Central and Southern regions of China.

6.29 CDM/ATFM in the Central and Southern regions was managed by regional and terminal (airport) agencies, with functions including collaborative departure management, arrivals prediction, and monitoring and alerting for demand/capacity imbalance situations.

6.30 The primary responsibility of the regional ATFM agency was to calculate CTOT slots for departure flights, while the terminal and/or airport ATFM agency would optimize the take-off sequence and off-blocks sequence, and improve runway capacity utilization. Flights were added to the departure list 2 hours before the estimated time of departure or estimated off-blocks time (ETD/EOBT), and in principle the calculated time over (CTO), CTOT and calculated off-blocks time (COBT) would be sent to ATC units 90 minutes before EOBT. Information sharing was accomplished by the Airport-CDM platform.

6.31 By June 2013 a collaborative departure management trial had been extended to 7 airports and 3 ATS routes, and had involved 6 of the main airlines in China.

6.32 The Middle-South regional ATMB CAAC had engaged in CDM/ATFM cooperation with Hong Kong China Civil Aviation Department (HK CAD). Workshops had been held, and in February 2014 an evaluation version of software for collaborative departure management was provided to HK CAD.

Air Navigation Report Form (IP04)

6.33 The Secretariat provided information on the Air Navigation Report Form (ANRF) relating to Aviation System Block Upgrade (ASBU) Module B0-NOPS – *Improved Flow Performance Based on Planning with a Network-wide View*.

6.34 ANRFs for the Asia/Pacific Region had been reviewed by the meeting of the Chairpersons of APANPIRG Sub-Groups held in Hong Kong, China, 16 to 17 January 2014, which had also agreed to the highest priority regional targets for ASBU implementation and the implementation priorities for ASBU and Seamless ATM Plan elements.

6.35 ANRFs had replaced the earlier Performance Framework Forms (PFF), and were intended to be a means of setting milestones and targets, and monitoring progress with metrics for each of the key Seamless ATM elements.

6.36 The ANRF relating to ASBU Module B0-NOPS is appended to this report at **Appendix F**. Meeting participants were invited to direct any questions or comments to the ICAO Asia/Pacific Regional Office.

Review the ATFM/SG Terms of Reference (WP12)

6.37 The Secretariat proposed a revision to the ATFM/SG Terms of Reference (ToR) to formalize linkages between ATFM/SG, the Regional ATM Contingency Plan Task Force (RACP/TF) and the Meteorological Requirements Task Force (MET/R TF).

6.38 As discussed under WP02 – *Review of Related Meeting Outcomes*, RACP/TF/3 had noted that a regional network of pre-determined contingency routes was unlikely to be achievable, and would not provide for the flexibility necessary to manage contingency events affecting two or more FIRs. It had also noted that the management of Large Scale Weather Deviation (LSWD) events should include appropriate CDM/ATFM measures to ensure maximum utilization of airport and en-route capacity. This could extend also to the management of other contingency events including reduced or withdrawn ATM services, Volcanic Ash Cloud (VAC) and Radioactive Cloud. The outcomes from ATFM/SG1 had been noted, including the consideration that each of the Major Traffic Flows (MTF) should have ATFM planning regardless of traffic density. RACP/TF agreed that the establishment of a linkage between the Regional ATM Contingency Plan and the Regional Framework for Collaborative ATFM should be explored.

6.39 WP02 also reported the deliberations of MET/R TF/3, including the potential MET/ATM work arising from regional collaborative ATFM outcomes and the proposed revised ATFM/SG TOR which included factors affecting airspace capacity such as weather information. MET/R TF had agreed that there was considerable benefit in formalizing a link with ATFM/SG and agreed, to ***Draft Decision TF 3/1: Revised Terms of Reference*** for further consideration by the Aviation Meteorology Sub-Group (MET SG).

6.40 The development of Standards and Recommended Practices in Annex 3 relating to Meteorological Services for the Terminal Area (MSTA) was of particular interest to ATFM/SG, and MET/R TF was the most appropriate body to provide ATFM/SG with meteorological specialist advice and guidance on development of MSTA and other products relevant to ATFM. MET/R TF had also included a range of ATM and ATFM related items in their work programme.

6.41 ATFM/SG had agreed to a Draft Decision amending its TOR (***ATFM/SG Draft Decision 2/1***), which had yet to be presented to ATM Sub-Group. It was proposed that the previously agreed amended TOR be updated to include linkages to RACP/TF and MET/R TF.

6.42 The meeting agreed to the following Draft Decision;

ATFM/SG Draft Decision 3/4: ATFM/SG Terms of Reference

That, the proposed Terms of Reference appended at **Appendix G** to this report be adopted for the Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG).

Agenda Item 7: Review of the Task List

7.1 The meeting agreed that to the updated task list included as **Appendix H** to this report.

Agenda Item 8: Date and Venue of the Next Meeting

8.1 It was proposed that the next meeting will be held from 6 to 10 October 2014, as a venue to be advised. States were invited to consider hosting the meeting and to advise the Regional Office accordingly.

Closing of the Meeting

9.1 The Co-Chairs thanked the meeting participants for their contributions.

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The Third Meeting of ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/3)

Singapore, 10 – 14 March 2014

LIST OF WORKING PAPERS (WPs) and INFORMATION PAPERS (IPs)

WORKING PAPERS

NUMBER	AGENDA	WORKING PAPERS	PRESENTED BY
WP/1	1	Provisional Agenda	Secretariat
WP/2	2	Related Meeting Outcomes	Secretariat
WP/3	5	Draft Regional Framework for Collaborative ATFM	Secretariat
WP/4	5	CDM Project Assessment Form	ICAO
WP/5	5	Airport Collaborative Decision Making	IATA
WP/6	5	Concept of Operations for a Distributed Multi-Nodal ATFM Network	Singapore
WP/7	5	Distributed Regional ATFM Network Operational Trial	Hong Kong China, Indonesia, Malaysia, Singapore, Thailand, Viet Nam
WP/8	5	ATFM Messages, Terminology and Network Interoperability	Secretariat
WP/9	5	ATFM Service Categories (Airspace)	Secretariat
WP/10	5	Draft Interim Regional Framework for ATFM	Secretariat
WP/11	5	Draft Appendices to the Interim Framework for Collaborative ATFM	Secretariat
WP/12	6	ATFM/SG Terms of Reference	Secretariat
WP/13	7	ATFM SG Task List	Secretariat
WP/14	5	Thailand Capacity Enhancement Initiatives	Thailand
WP/15	5	Thailand CDM-ATFM Concept	

INFORMATION PAPERS

NUMBER	AGENDA	INFORMATION PAPERS	PRESENTED BY
IP01	-	List of Papers	Secretariat
IP02	2	EU/AATIP Cross Border ATFM Workshop	EUROCONTROL/AATIP Proj.
IP03	3	North America and Caribbean ATFM Task Force Work Program	Secretariat
IP04	6	Air Navigation Report Form	Secretariat
IP05	5	Training Curriculum for ATFM FMPs	Thailand
IP06	6	Indonesia ATFM Implementation	Indonesia
IP07	6	North Regional ATFM Harmonisation Group	ICAO
IP08	6	Current ATFM Status in China	China
IP09	6	CDM_ATFM Status in Middle South Regional China	China
IP10	6	Relevant Ideas and Practices of CDM/ATFM in the South China Sea Area	China
IP11	6	Master Plan for the 2 nd ACC and ATFM Center	Republic of Korea

Note: Include consideration of Principles for the Regional Framework

APPENDIX X: ATFM Framework Principles

People: Aviation Regulations, Standards and Procedures

1. Increased capacity is the primary and central method for management of increasing demand.
 2. Regional model of inter-connected sub-regional ATFM networks based on system-wide CDM, serving the busiest terminal airspace and major sub-Regional traffic flows.
 3. Harmonized regional or sub-regional ATFM rules and guidelines based on the ICAO Manual on Collaborative Air Traffic Flow Management (Doc 9971).
 4. Regionally harmonized methodology for the collection, analysis and ongoing monitoring of demand and capacity data.
 5. Development of manual processes and skills to promote practical knowledge and understanding of ATFM before implementing technology based solutions, and as a contingency response capability.
 6. Consistency between the ICAO Regional Air Navigation Plan, Asia/Pacific Seamless ATM Plan and Regional ATFM Framework.
 7. An emphasis on delivery of ATFM services based on CNS capability, resulting in flexible, dynamic systems providing equity of access and delivering optimal ATFM network outcomes.
- The IATA position supports best-equipped-best-served. There was comment from Australia that this concept may (or may not) be supported by legislative requirements.
- CANSO advised that most ATFM systems are not capable of using aircraft capability to determine ATFM outcomes.
8. The use of high-fidelity simulators to train controllers and ATFMU personnel involved in in ATFM procedures and techniques.

Comment [SS1]: Discussion on this principle centred on the concepts of “best equipped best served” and “most capable best served”. It was noted that there was not yet acceptance of these concepts, and generally agreed that the delivery of ATFM services should be based on network optimization. There also is a need for equity of access to be considered. Some words to this effect have been included, but any suggestions for improvement would be welcome.

ATM Coordination

9. The prioritization of integrated AIDC systems for timely ATM and ATFM system updates of trajectory data, including preferred implementation of advanced AIDC messaging and configuration of systems for early delivery of AIDC messages.

Facilities: Aerodromes

10. Encouragement for aerodrome operators to actively participate in ATM coordination in respect of Airport CDM development and operational planning, including aerodrome complexity and capacity.

ATS Units

11. Collaboration by ANSPs for evaluation and planning of ATFM facilities.
12. Optimization of ATFM facilities through automated, networked, central flow management centres and units or equivalent virtual platforms.

Technology and Information: ATFM Systems

13. Continuous supervision, operation, adjustment, monitoring and executive control of ATFM systems and their output by ~~qualified~~ trained and competent ATC or ATFM personnel.
14. Encouragement of the use of dual-redundant automated ATFM processing and communications systems, supported by agreed contingency procedures and facilities including ATN/AMHS and public telephone systems.
15. Collaborative development of CDM, ATFM, A/MAN and D/MAN support tools.
AMAN and DMAN are now terms used in GANP, and in the relevant ASBU (B0-RSEQ to B3-RSEQ). The meeting heard that they are systems rather than processes, but GANP defines them as runway sequencing capabilities.
16. Encourage real-time sharing of dynamic air traffic data relating to flights operating or intending to operate in civil-controlled airspace, between military ATM systems and civil ATM/ATFM systems.

ATM Modernisation Projects

17. Inter-regional and sub-regional cooperation ('clustering') for the research, development and implementation of ATFM projects
18. A focus on harmonized technologies for earliest (collaborative?) deployment and best cost benefits. (Cost benefits to whom? Needs better wording or remove)

Some points from the above should go into the main document

Comment [SS2]: The matter of formal qualifications is one for each State to determine.

Comment [SS3]: the terms A/MAN and D/MAN are not in use globally, and are not defined in doc 9971. They should be either defined in a "definition of terms" section of the framework, or replaced by other globally understood terminology.

Suggestions?

Comment [SS4]: This principle should be reworded to ensure military authorities are not misled into believing there would be a requirement for them to share all of their air traffic data, including that related to military flights operating wholly within SUA.

Appendix X: Collaborative ATFM Capability Elements

Planning Tools ~~Tools~~ Capability

- Airspace design and ATS Route Planning including segregated SIDs (CCO) and STARs (CDO)
 - *ATS route planning tools may not be a requirement for ATFM as such, but instead for ATS strategic planning..*
- Capacity Analysis and workload modelling
- Network Operational Plans

ATFM Unit, Centre or Virtual ATFM Centre Structure

- Strategic management unit;
 - Pre-Tactical Management Unit;
 - Tactical Management Unit;
 - Capacity ~~Unit~~ *assessment function*;
 - *Capacity assessments may also be considered to be part of the Strategic, Pre-Tactical and Tactical management functions*
 - Operability Monitoring Unit;
 - Coordination and Decision Unit; and
- The above should be defined as “functions” rather than units, to avoid confusion for States that may infer that this needs the establishment and housing of of specific units.*
- Flow Management Positions (Dedicated ACC, TMA positions linked to external ATFM Units, Centre or Virtual Centre)
 - Tactical Flow Control Function (incorporated in the role of relevant operational ATC supervisory or traffic separating position in TMA or AACC)

Notes Flow management positions and operational ATC positions exercising tactical flow control functions are considered to be ATFM Tactical Management Units.

Prediction and Monitoring Tools

- Demand and workload prediction
- weather prediction
- monitoring tools

CDM Tools

- information exchange
- collaboration

- electronic user helpdesk
- crisis management

Tactical ATFM Capability

- Agreed acceptance rates could be changed to *Dynamic Capacity Declaration* to emphasize that acceptance rates and capacity should be dynamically updated according to information received/changing circumstances
- Agreed flow gates at uniform distances (nominally 40 to 50NM from the aerodrome), with published holding patterns
- Prioritization of landing aircraft;
- Industry notification of additional ~~fuel for~~ *expected-duration* of traffic delays;
- Prioritization of compliant flights and de-prioritization of non-complaint flights

ATFM Execution Tools

- Slot Allocation
- Route and Fix Balancing
- Collaborative Trajectory Options (*Are these a measure?*)

ATFM Measures

- Miles in Trail
- Minutes in trail
- fix balancing
- rerouting
(*could be both strategic and tactical*)
- mandatory rerouting
- Level capping
- alternative or advisory routing
- minimum departure intervals
- slot swapping (*not easy without ATFM automation*)
- ground delay programme
- ground stop
- airborne holding

Analysis Tools

- data analysis and reporting

APPENDIX X: AIRPORT AND AIRSPACE CAPACITY ASSESSMENT

The following pages of this draft appendix include capacity assessment excerpts from ICAO Doc 9971.

The group should decide whether these should be included in an appendix to the framework Framework, or merely referenced in the text.

Annex 11 requires ATFM on the basis of common procedures and methods of capacity assessment. Needs common methodology.

Capacity should not be taken as a static figure. Whenever circumstances change it should be revised accordingly. Words to this effect should go into the main document.

Dynamic Capacity Declaration should be done by suitably qualified, experienced people

APPENDIX X: AIRPORT AND AIRSPACE CAPACITY IMPROVEMENT

Note: Include consideration of Principles for the Regional Framework

The group should consider what can be included in the framework to achieve improvements in airport and airspace capacity in the short term.

CANSO to supply a list of airport and airspace capacity improvements

FOR EXAMPLE:

Airport Capacity:

- Optimized separation between arriving aircraft
- Improved pilot behaviours (runway occupancy)

Airspace Capacity:

- PANS/ATM Surveillance-based separation standards.
- ATS route re-design, including
 - segregated SIDs, and STARs
 - STARs terminating at the instrument approach
 - Performance-based ATS route structure (RNP2)
- AIDC, preceded by other reductions to ATC coordination workload including ATS route re-alignment and implementation of non-coordination routes.
- Retirement of paper flight progress strips in automated ATM System environments.
- Dispensing with voice position reports for radar/ADS-B identified aircraft.

APPENDIX X: PLANNING FOR INTERIM TACTICAL ATFM

The group should identify what steps are required in planning for basic tactical ATFM for both arrivals and departure management, and for basic tactical ATFM in the en-route environment.

Much of the information below is ATM planning, and may not have a place in an ATFM document. (Secretariat comment: Several States that do not have any ATFM experience or processes in place. In some cases their only solution during busy periods at airports is to put all aircraft into holding pattern at the primary approach navaid and progressively clear them out of the stack, often resulting in substantial gaps between landing aircraft.

EXAMPLE:

1. Determine airport arrival rate for all runway configurations, considering approach conditions:
 - a. VMC
 - b. IMC (e.g. cloud ceiling/visibility less than alternate minima but above circling minima)
 - c. ILS (e.g. cloud ceiling/visibility less than circling minima)
 - d. Low visibility operations.
2. Identify inbound arrival 'gates', nominally 40 – 50 NM from aerodrome, normally the "4 gatepost" concept.
3. Gather data: Aircraft times from each gate to each runway. (use consistent speeds for jets, e.g. 250 knots IAS below A100/FL100).
4. Develop practices for determining the sequence, e.g.:
 - a. all aircraft "raw" estimate for arrival
 - b. determine landing order
 - c. determine landing time (CTA) based on minim
 - d. determine time at "gate" (CTO) based on landing time minus time interval from gate to threshold (CTO)
5. Develop practices for achieving the sequence, e.g.:
 - a. Pilot adjusted speed cruise and/or descent to meet gate time (CTO)
 - b. ATC radar vectors
 - c. Holding (ATC to closely manage to ensure CTO are met)
6. Develop and deliver training for ATC.

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7. Speed control, radar vectors and management of holding patterns to achieve the sequence.

8. Aircraft capability data (min speeds within 30/15/5 NM of aerodrome).

APPENDIX X: AIR TRAFFIC FLOW MANAGEMENT COMPETENCIES FOR ATFM Staff

The group should list the required competencies and skillsets for operational ATFM staff.

CANSO: this is a very important part of the document. Flow Managers in particular must have deep understanding of and experience in all ATC operations. They must have credibility, the respect of the units they interact with, knowledge of airline operations, etc. CANSO to provide a list.. There was some discussion on this topic, including the situation of highly automated ATFM systems where the human becomes the constraint in the system. There was further commentary that this may be the case in some single-ANSP ATFM environments, but the multi-state, multi ANSP scenario with differing levels of automation should be considered.

See also report item on Thailand IP on this topic for further discussion

USA: “aptitudes and skills”

EXAMPLES:

1. Lines of Authority
2. Qualifications and experience
 - a. Flow Managers
 - b. ATFM operators
3. Daily airport and airspace capacity determination
4. Monitoring MET and other factors affecting capacity
5. Dynamic capacity adjustment
6. Monitoring demand
7. Knowledge of available ATFM measures
8. Knowledge of aircraft performance
9. Initiation of ATFM measures
10. ATFM coordination methods
11. Monitoring ATFM outcomes and adjusting measures
12. Responding to unexpected events (runway or airspace closures, short notice SUA)
13. Collection of ATFM data for analysis
14. ATFM qualifications and competency assessment

Note: ICAO Annex 1 does not specify licensing requirements for ATFM functions. Many States with functional ATFM programs do not require ATFM staff to be licensed. In all cases competency criteria and perform competency assessments must be developed and implemented

APPENDIX X: AIR TRAFFIC FLOW MANAGEMENT COMPETENCIES FOR ATC

The group should list the required ATC competencies for operational ATC staff. These include Flow Management skills where a separate FMU is not provided, and must include the operational capability for using a variable mix of tactical skills to achieve the sequence.

Any ATFM competencies for ATC should be included in the overall ATFM competencies appendix. This separate appendix not required.

EXAMPLES:

Dedicated FLOW Control Positions, or ATC Traffic-Separating Positions with FLOW Control Functions:

1. Tactical ATFM competencies as defined for FMU personnel.

ATC Sectors Executing ATFM Measures:

1. Assignment of ATFM measure to pilot (e.g. pilot adjusted speed/profile to meet CTO);
2. Speed Control instructions for cruise and descent;
3. Radar vectors for sequencing to meet CTO and/or MIT
 - a. When to use
 - b. Turn rate and radius
 - c. Wind effect
 - d. pilot response factors
 - i. Information for pilot SA
 - ii. vectors towards gate before resuming pilot navigation
4. Holding pattern management
 - a. Estimating time of entry to the hold
 - b. Time taken to execute a holding pattern
 - c. Calculating number of holding patterns
 - d. Extending outbound legs to meet CTO
 - e. Techniques to ensure immediate pilot execution.
 - i. Turn inbound instruction before resuming pilot navigation

ATC Sectors Managing the Approach Phase

5. Speed Control in the approach phase (requires availability of speed control data)
6. Separation near the minimum
7. Use of visual separation
8. Assigning visual separation to the tower
9. Missed approaches
10. Sending aircraft around.

Appendix X: ATS Route Design Considerations for ATFM

Discussion of this should be included in the main document, and limited to stating that ATS route design should take into account (or re-design undertaken to achieve) ATFM outcomes, in first cast being capacity increase.



The Third Meeting of ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/3)

Singapore, 10 – 14 March 2014

PROPOSED DRAFT TRAINING CURRICULUM TOPICS

To be further developed by ATFM/SG

Level 1 ATFMU Personnel – ATC background

- ICAO Manual on Collaborative ATFM (Doc 9971)
- Airspace Organization & Management (EUROCONTROL ASM-ASM)
- Slot Coordination
- MET for ATM Operations
- CNS/ATM Training
- ATFM Automation System

Level 1 ATFMU Personnel – Non-ATC background

The above topics, and:

- Aviation English
- Air Traffic Services (Annex 11)
- Basic Aerodrome Control Service (Simulation)
- Basic Approach Control Service (Simulation)
- Basic Area Control Service (Simulation)
- Intro to Network Operations
- Aeronautical Information Services (Annex 15)
- Flight Plan
- Aeronautical Telecommunications (Annex 10 Volume II)
- Rule of the Air (Annex 2)

Level 2 ATFMU Personnel – Recruited from Level 1 ATFMU Personnel

- Introduction to ATFCM (EUROCONTROL ASM-ATFCM)
- Airspace Organization & Management (EUROCONTROL ASM-ASM)
- Civil / Military ATM Coordination (EUROCONTROL GEN-CIV/MIL)
- Intro to Airline Operations: Flight Planning and Flight Operations
- Flight Efficiency : Re-routing and Fuel Costs
- Slot Coordination
- MET for ATM Operations
- Basic PANS/OPS
- ATFM Automation Systems – Level 2 Functions

Level 3 – ATFMU Manager – Recruited from Level 2 ATFMU Personnel

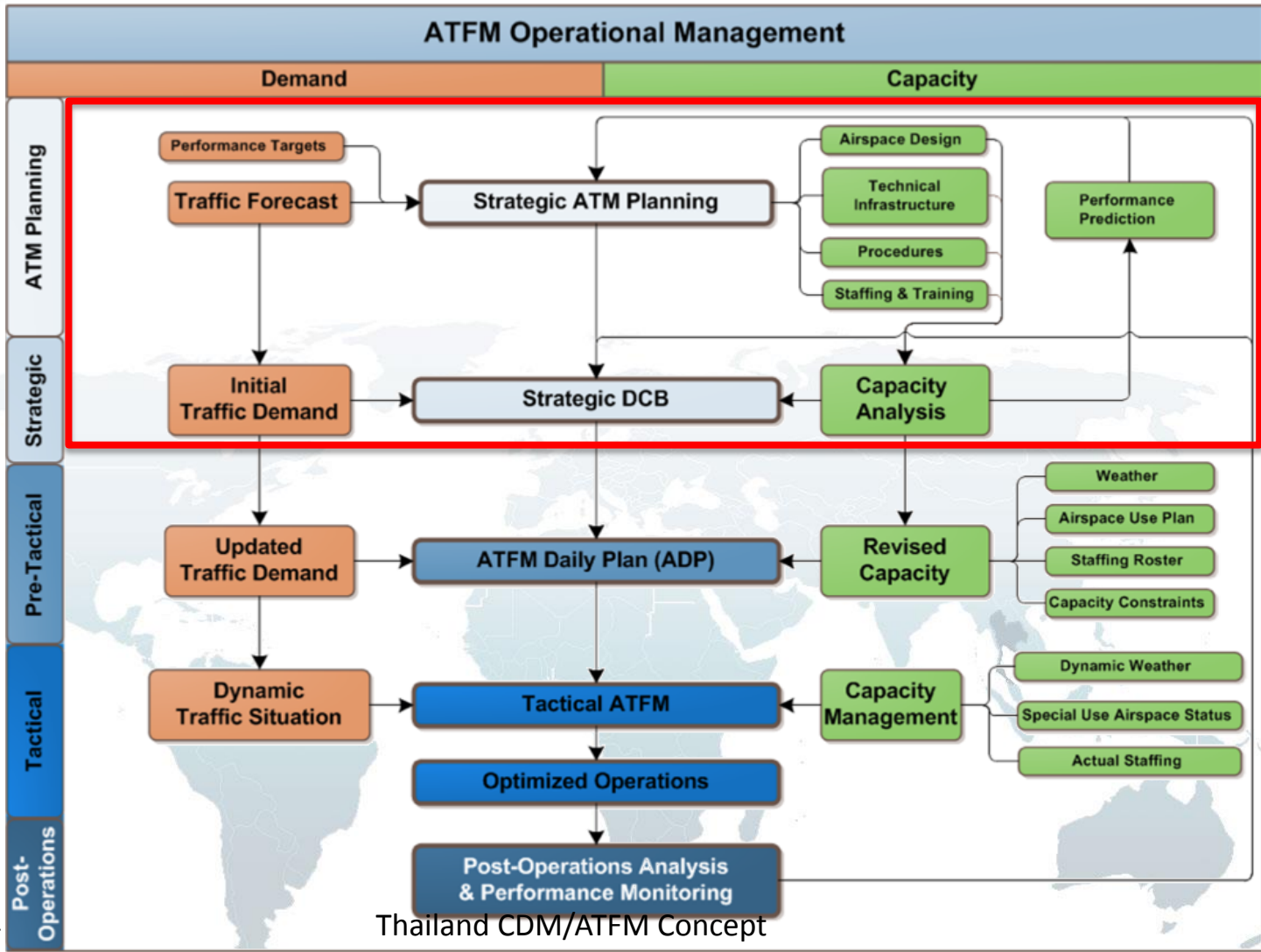
- Flow Management Position – Module 2 (EUROCONTROL)
- Network Capacity Planning (EUROCONTROL ASM-CAP)
- Enhanced Civil/Military Coordination (EUROCONTROL ASM-FUA)
- Airport Collaborative Decision Making (EUROCONTROL APT-ACDM)
- PBN Airspace Design
- ATFM Automation System – Manager Functions

Level 4 – ATFM Network Manager – Recruited from Level 3 ATFMU Manager Personnel

- Flow Management Position – Module 3 (EUROCONTROL)
- Advanced Airline Operations
- Advanced Airport Operations
- AIS / AIM Operations

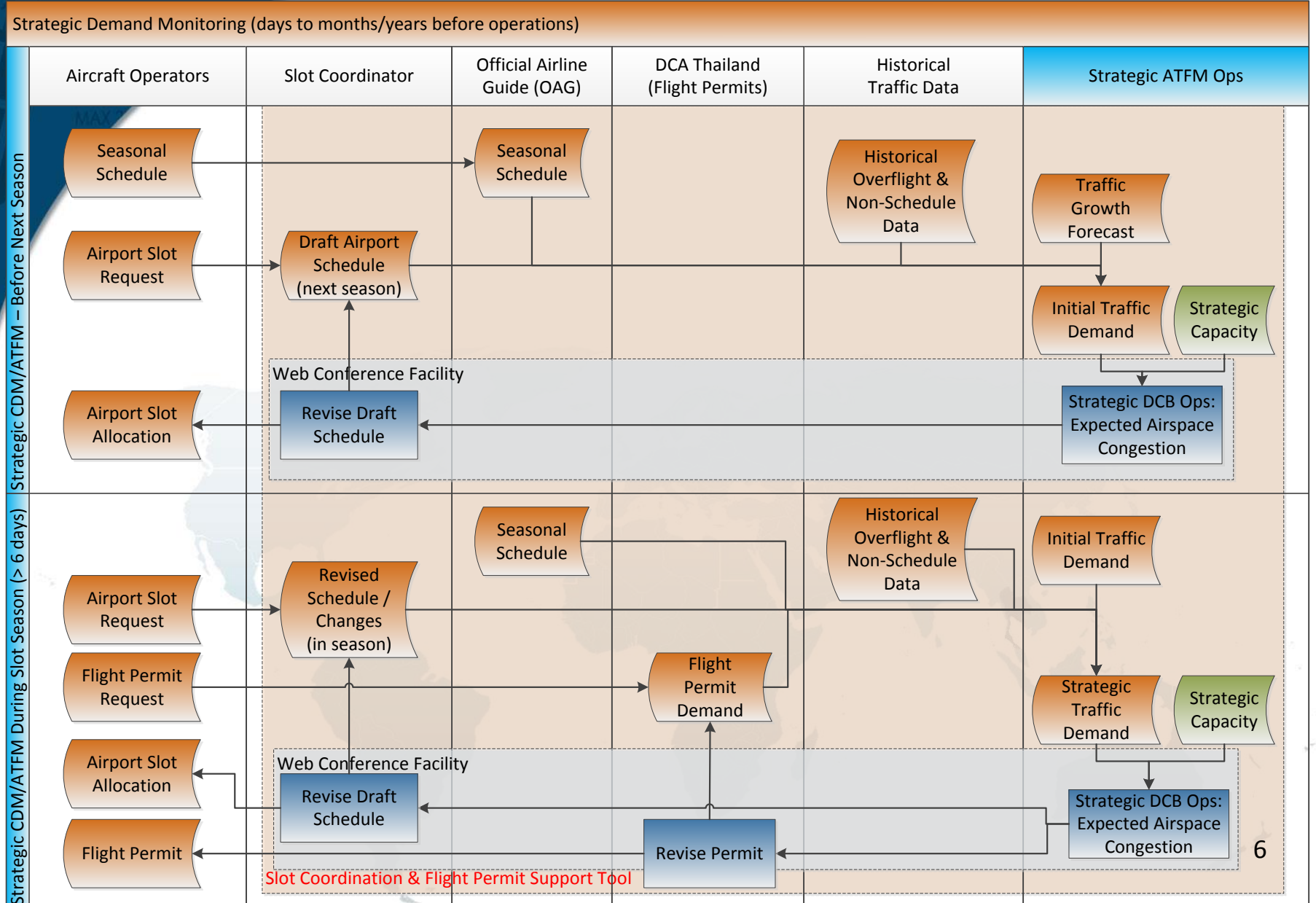


ATFM Operations Management



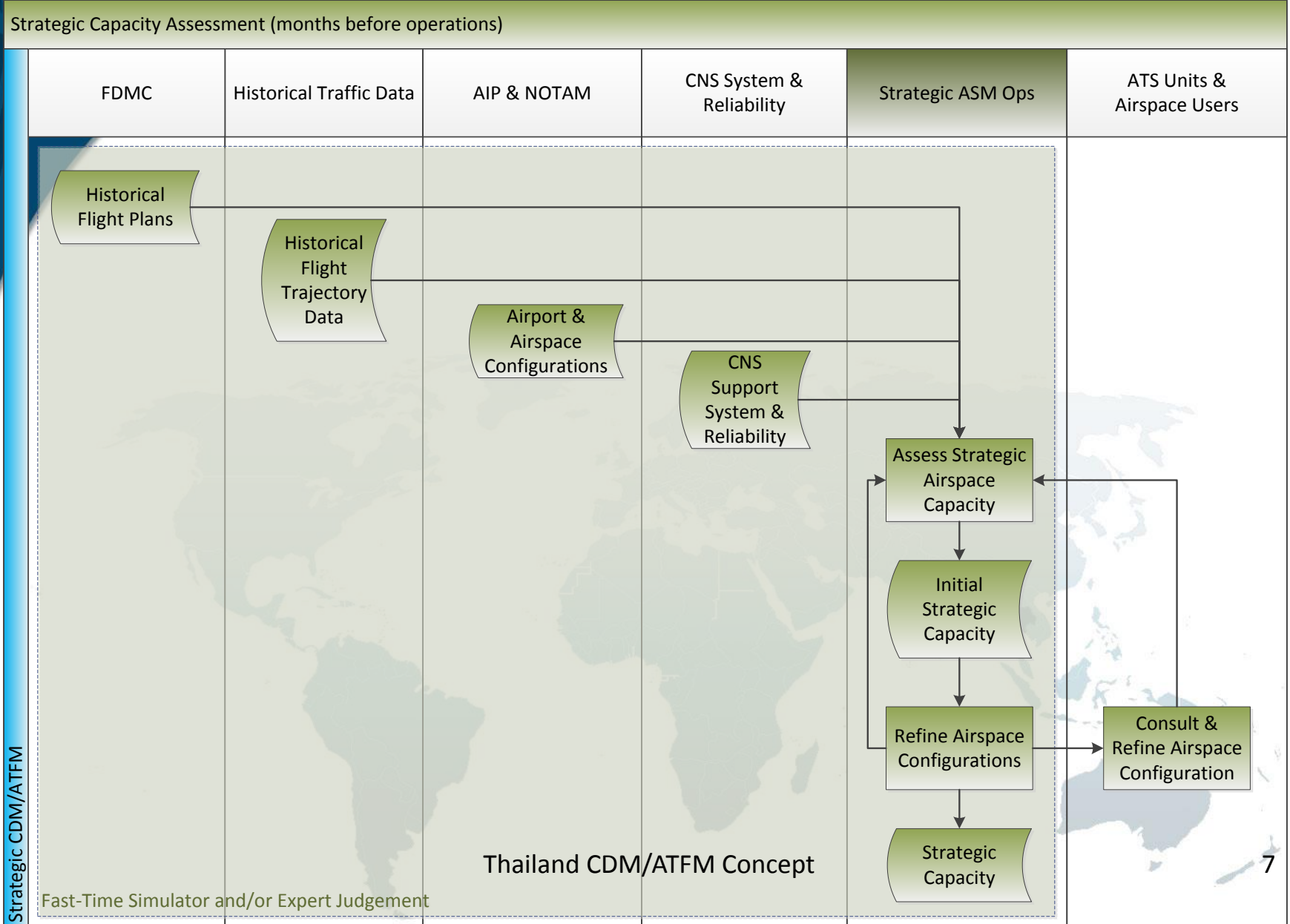


Strategic CDM/ATFM : Traffic Demand & Ops

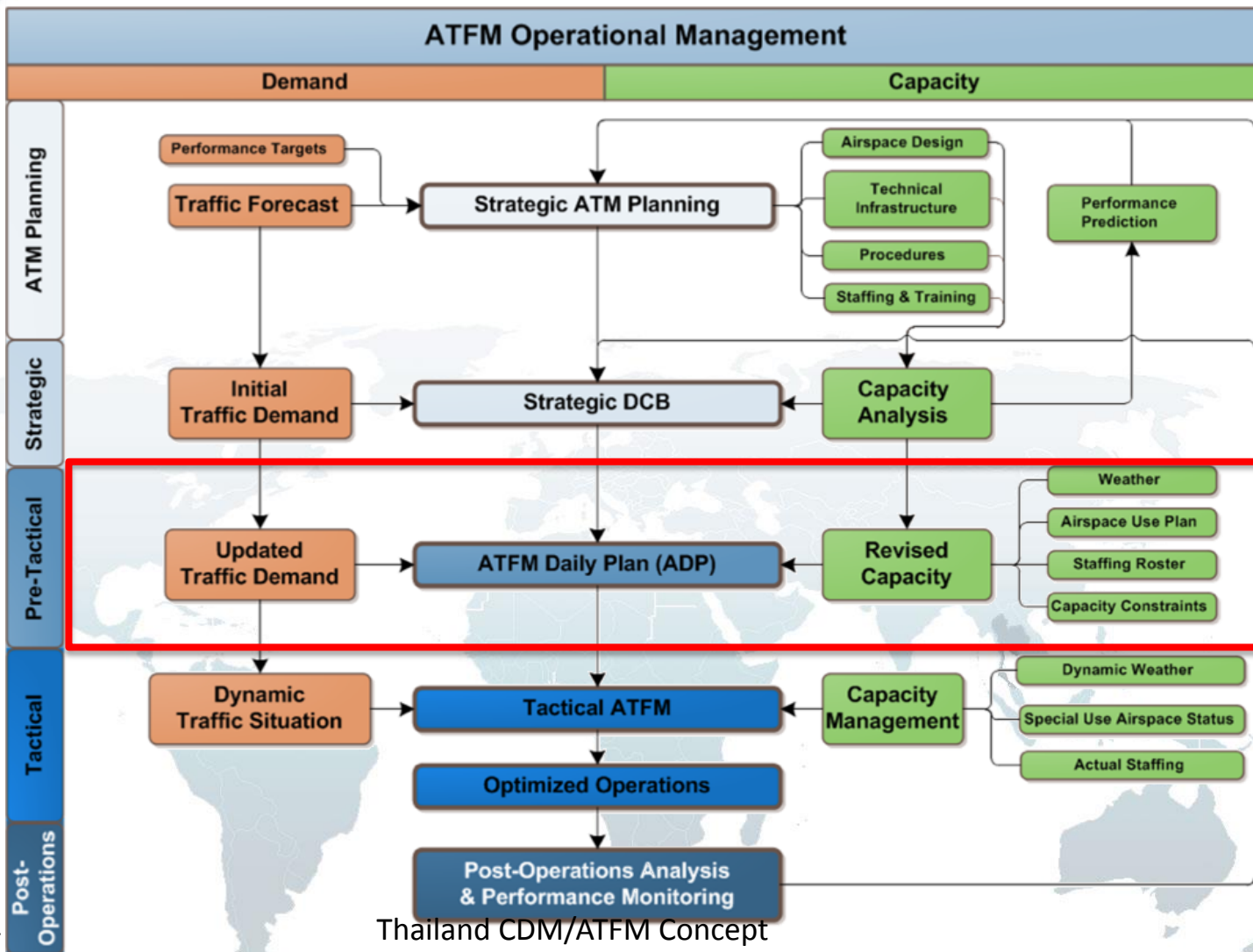




Strategic CDM/ATFM: Initial Capacity Analysis



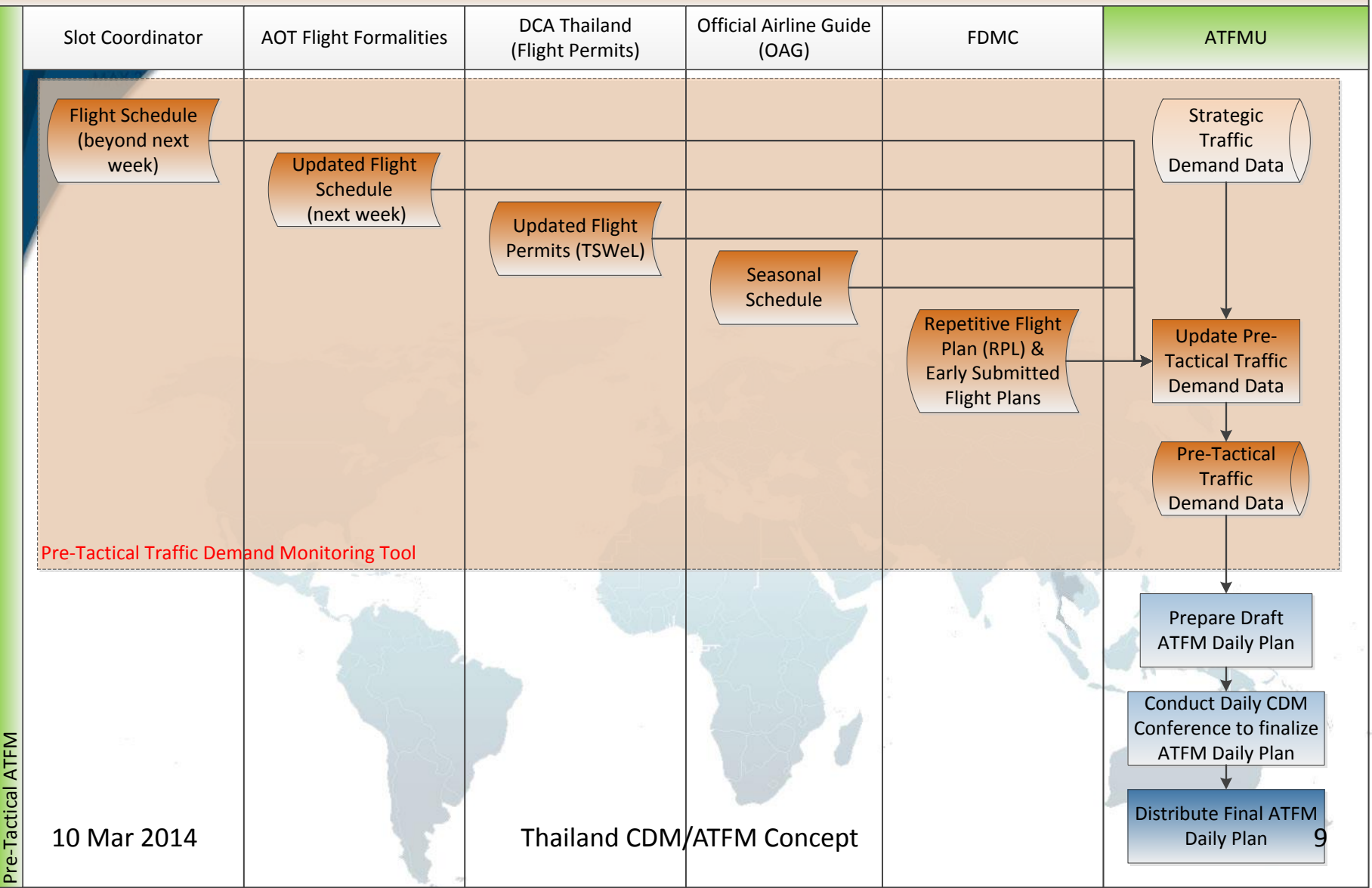
ATFM Operations Management





Pre-Tactical CDM/ATFM: Updated Traffic Demand

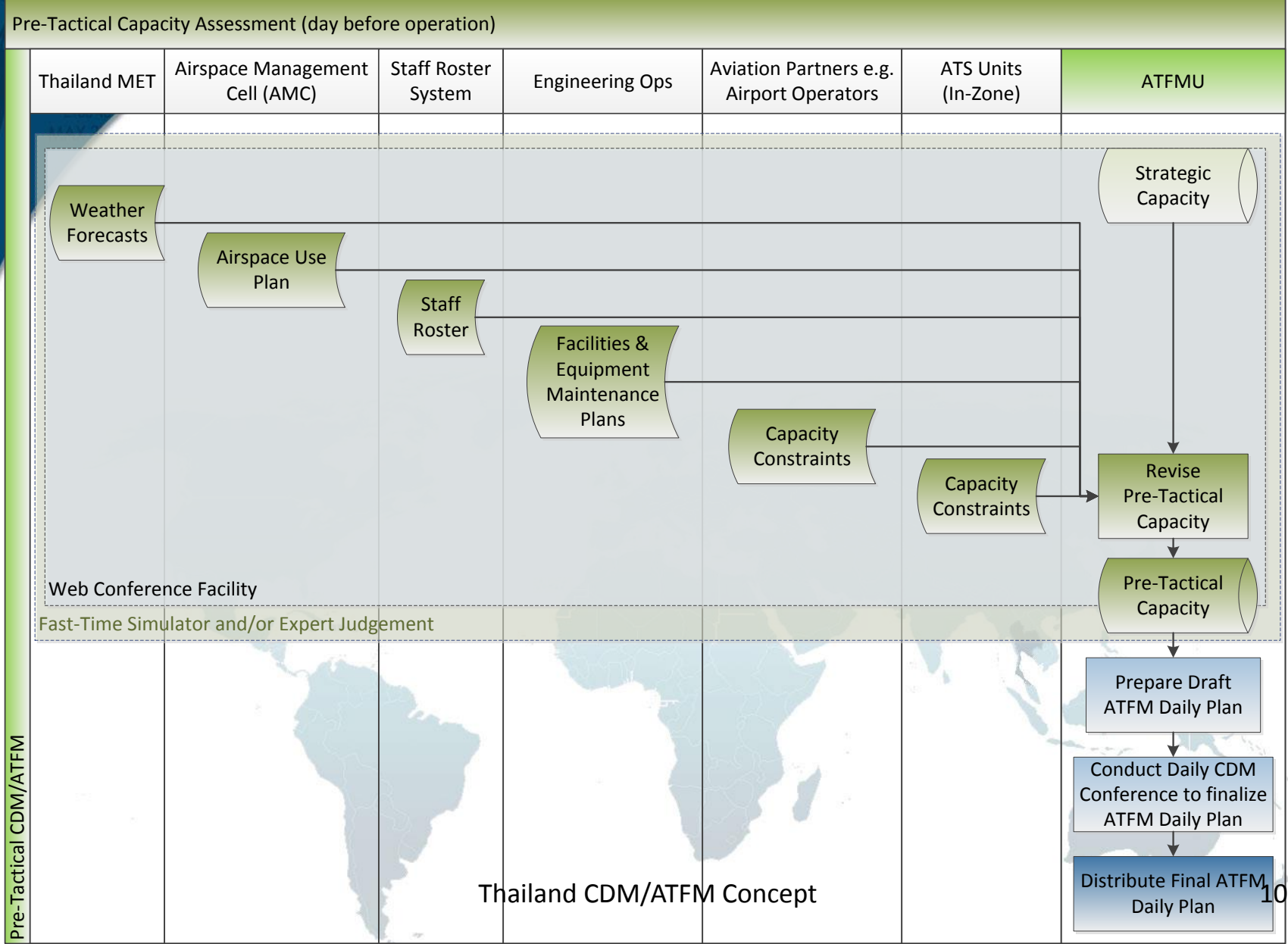
Pre-Tactical Demand Monitoring (hours – 1 day before operations)



Pre-Tactical ATFM



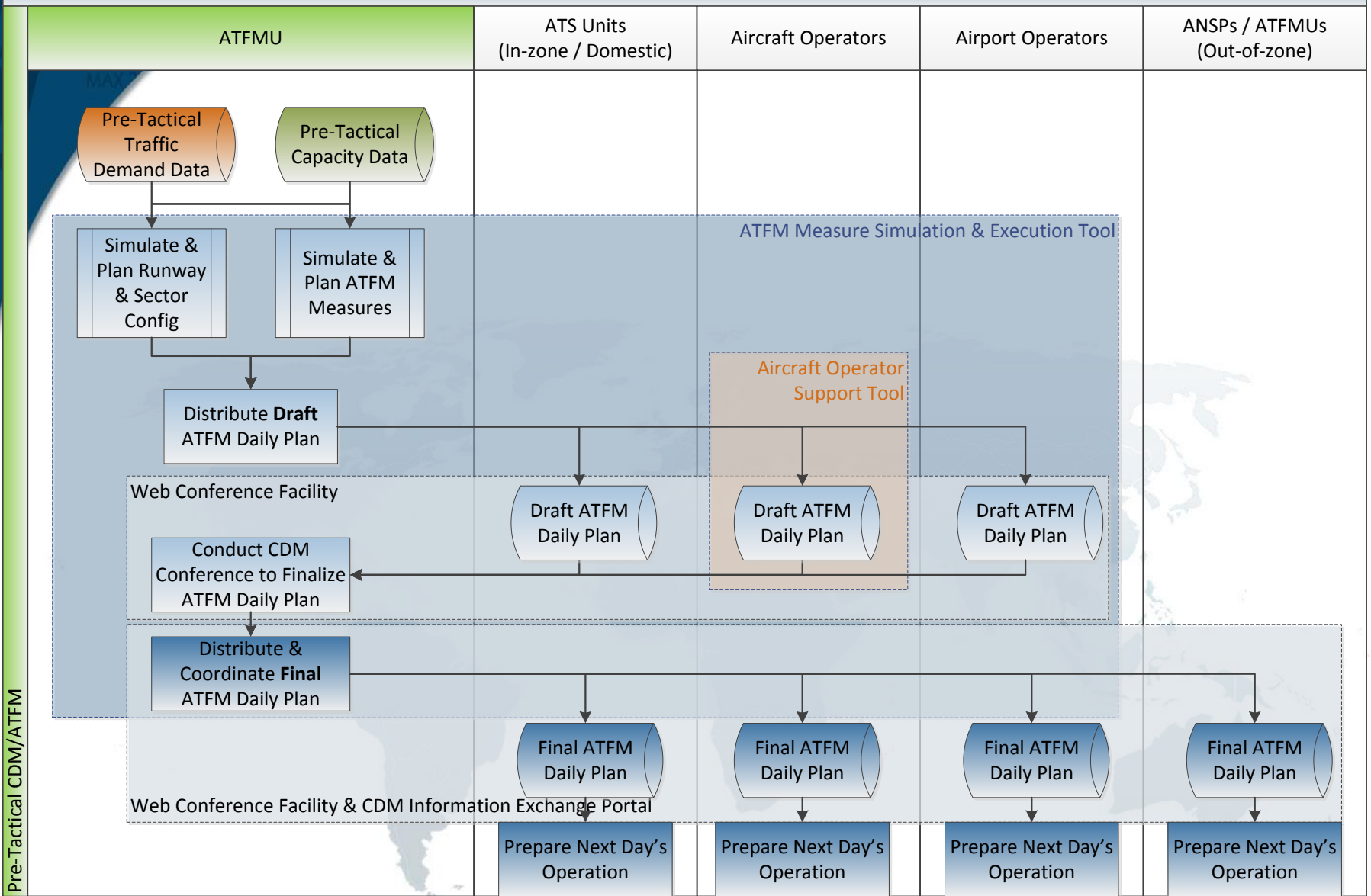
Pre-Tactical CDM/ATFM: Revised Capacity





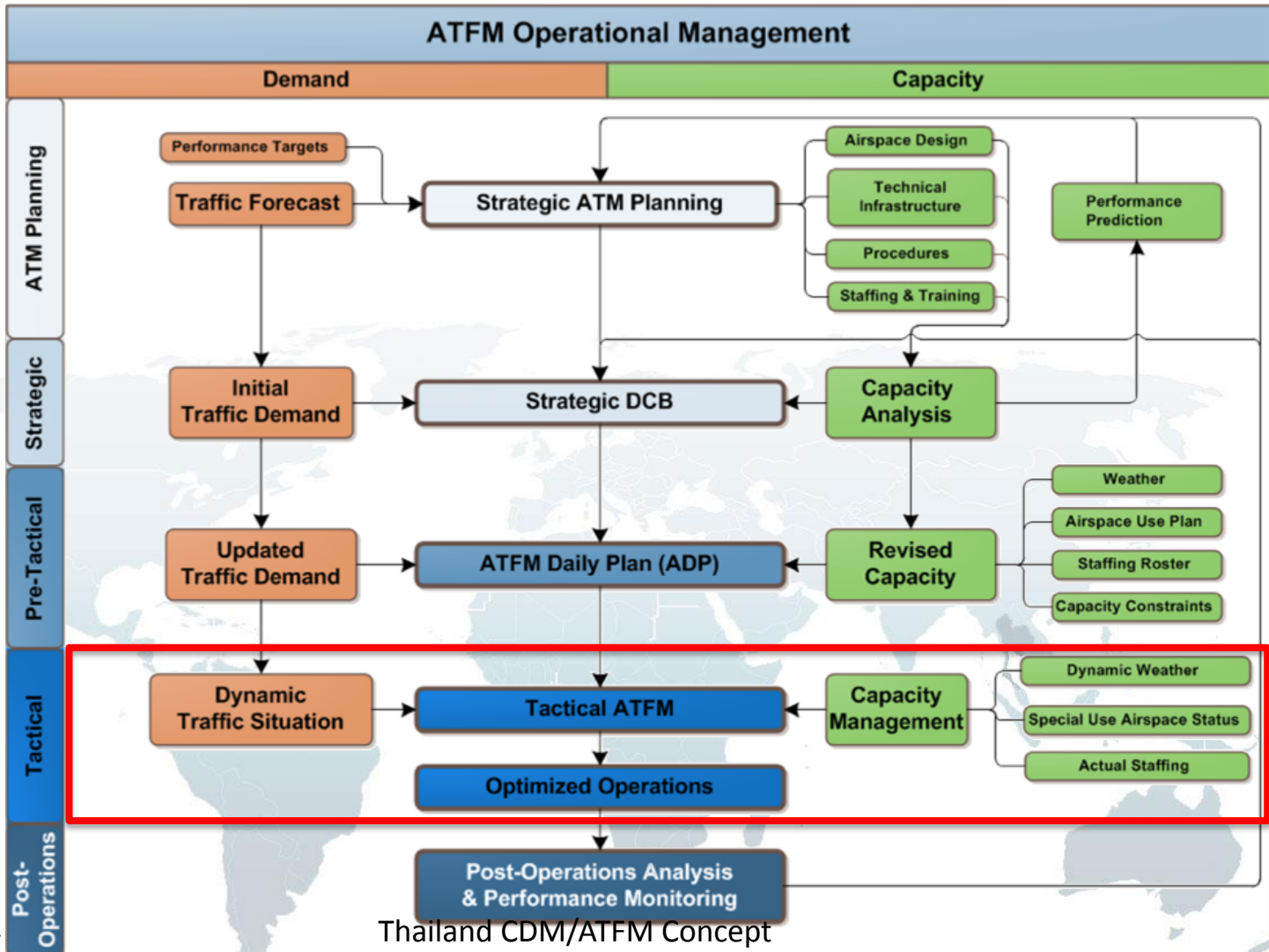
Pre-Tactical CDM/ATFM: ATFM Daily Plan

Pre-Tactical CDM/ATFM (day before operation)



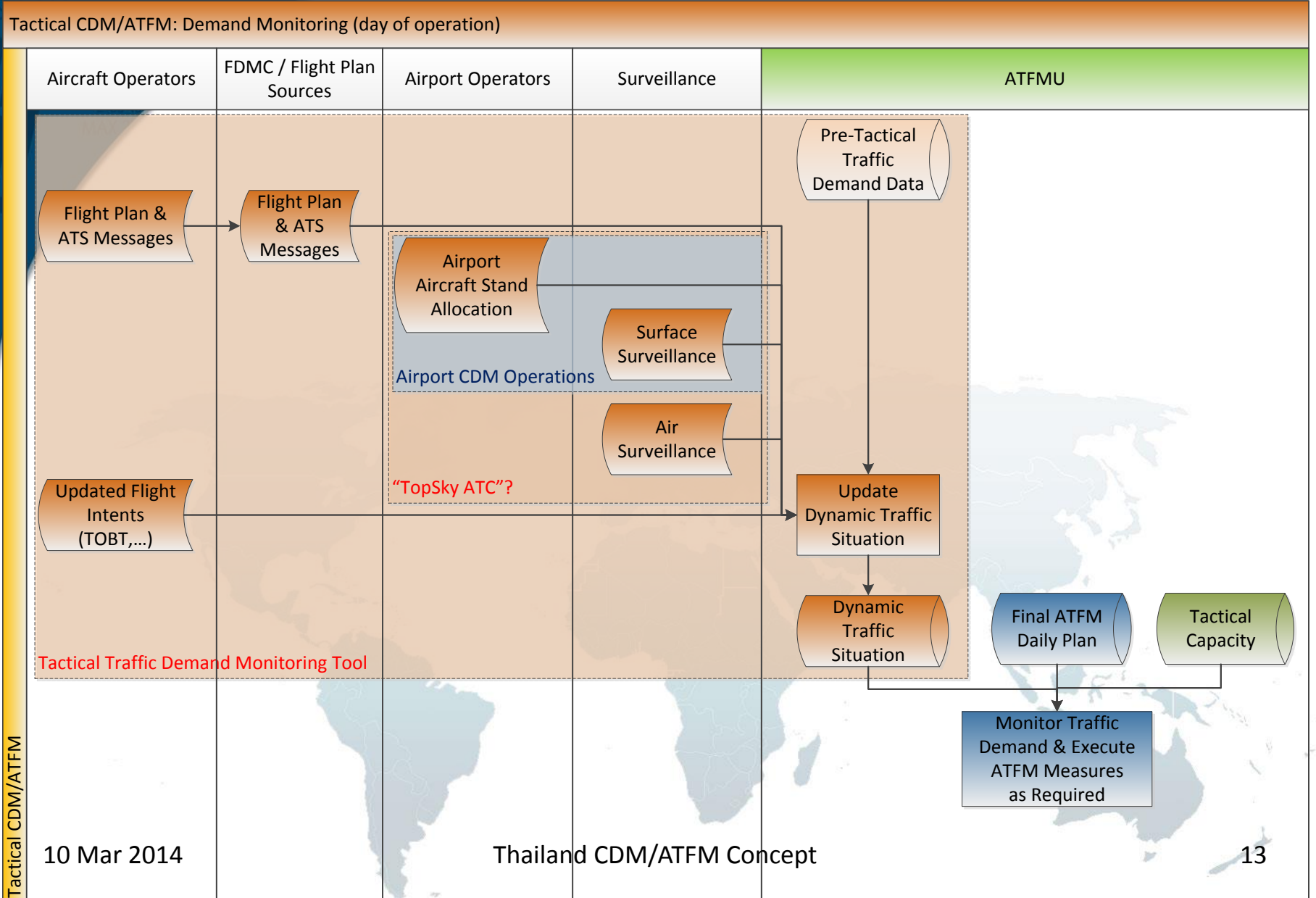
Pre-Tactical CDM/ATFM

ATFM Operations Management





Tactical CDM/ATFM: Dynamic Traffic Situation

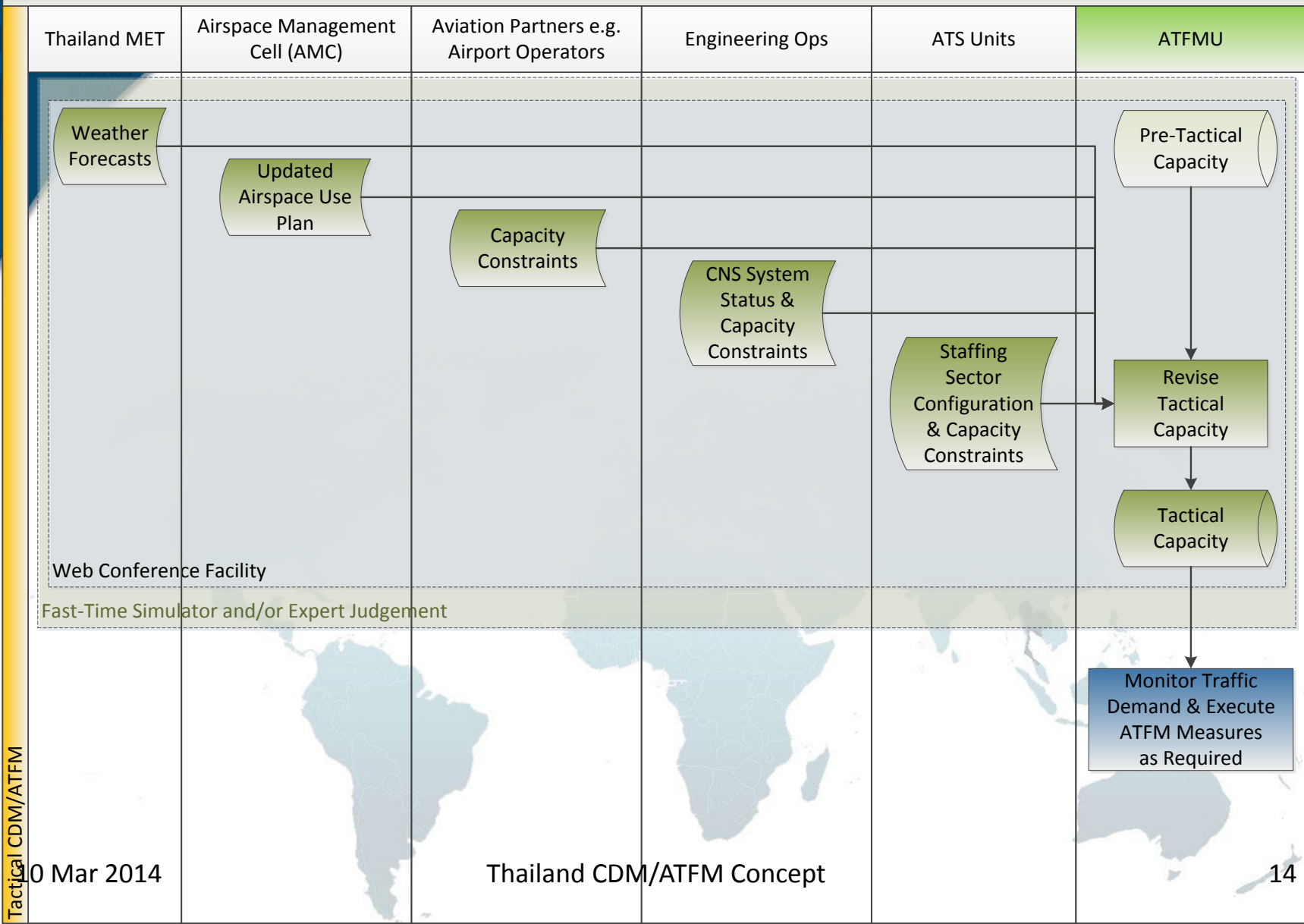


Tactical CDM/ATFM



Tactical CDM/ATFM: Capacity Management

Tactical Capacity Assessment (day of operation)



Tactical CDM/ATFM

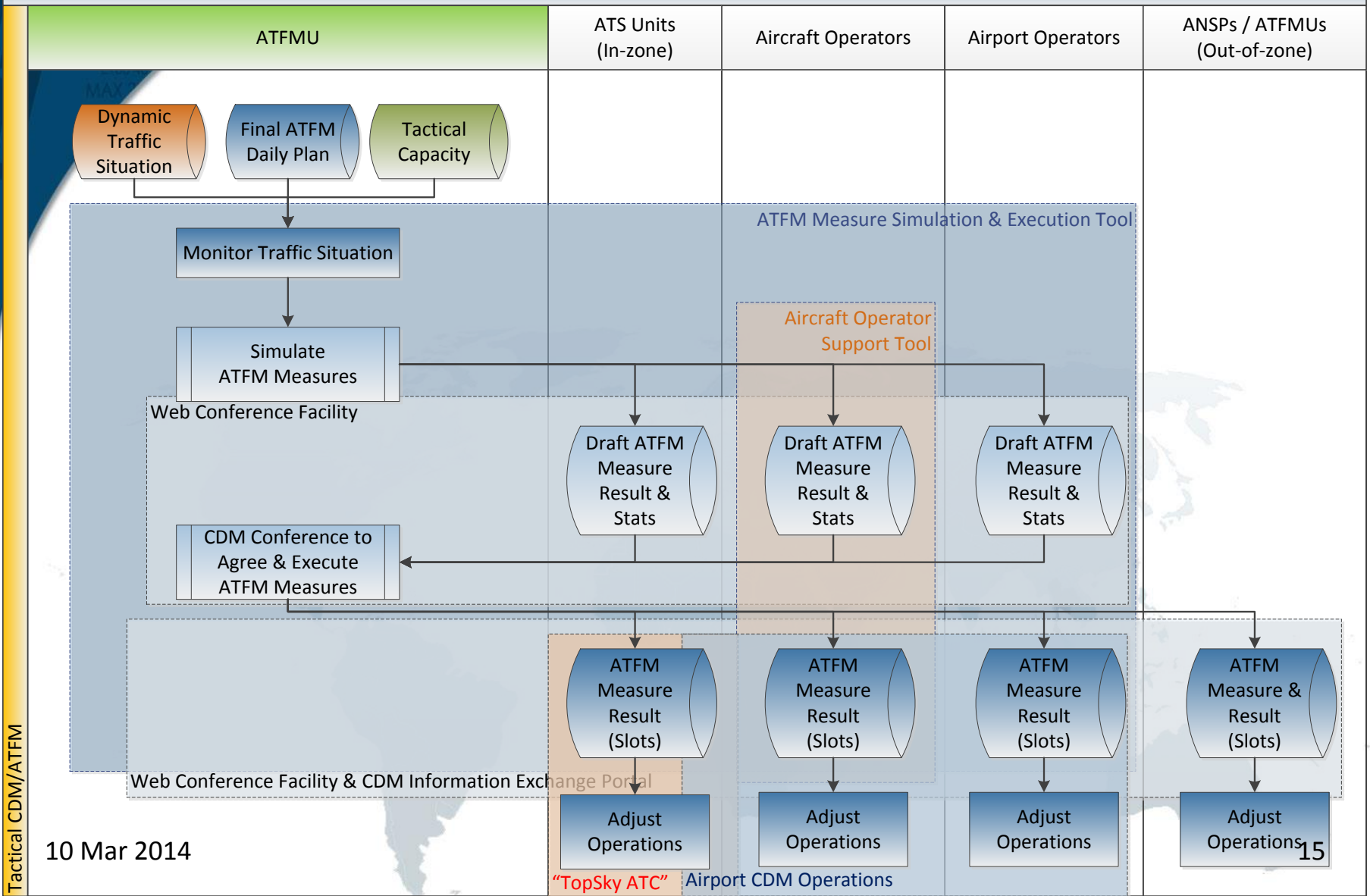
10 Mar 2014

Thailand CDM/ATFM Concept

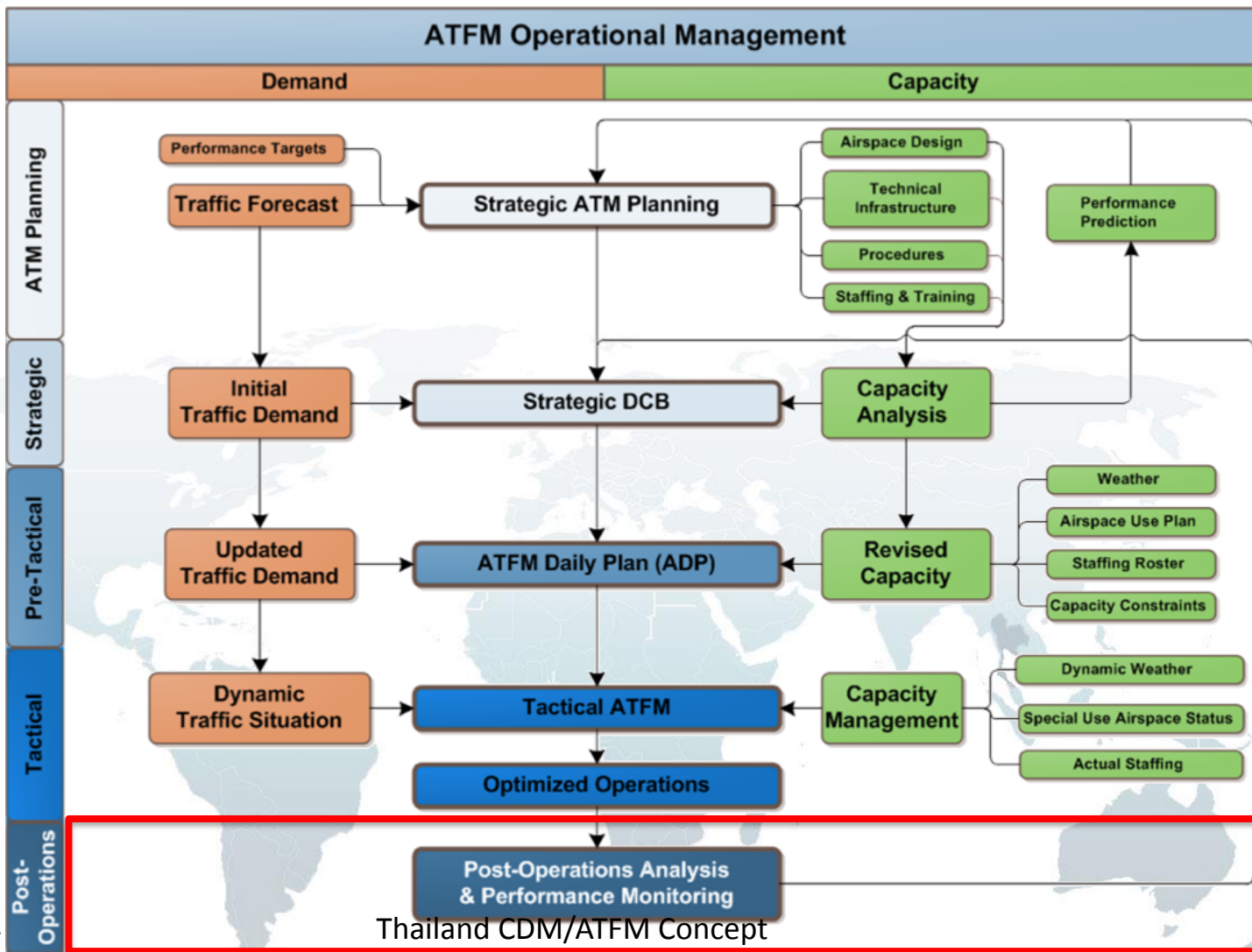


Tactical CDM/ATFM Operations

Tactical CDM/ATFM Operations (day of operation)



ATFM Operations Management





1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

<p>2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module B0-NOPS: Improved Flow Performance through Planning based on a Network-Wide view</p> <p>Performance Improvement Area 3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM</p>					
<p>3. ASBU B0-NOPS: Impact on Main Key Performance Areas (KPA)</p>					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

<p>4. ASBU B0-NOPS: Planning Targets and Implementation Progress</p>	
<p>5. Elements</p>	<p>6. Targets and implementation progress (Ground and Air)</p>
<p>Item 80: Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)</p>	<p>November 2015: (Seamless ATM Plan Phase I) All high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes should implement ATFM incorporating CDM using operational ATFM platform/s.</p> <p>November 2018 (Seamless ATM Plan Phase II): All FIRs supporting Major Traffic Flows should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements</p>

<p>7. ASBU B0-NOPS: Implementation Challenges</p>				
<p>Elements</p>	<p>Implementation Area</p>			
	<p>Ground System Implementation</p>	<p>Avionics Implementation</p>	<p>Procedures Availability</p>	<p>Operational Approvals</p>



7. ASBU B0-NOPS: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
Item 80: Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	Procurement and commissioning of interoperable systems supporting collaborative ATFM	NIL	Development and implementation of necessary ATC, airspace user and airport operator knowledge, skills, and procedures Defined in Regional Collaborative ATFM Framework, including procedures to include relevant non-networked FIRs or ATSUs in ATFM processes	NIL
	Interoperability of intra-and inter-regional sub-Regional ATFM network communications	NIL	Interoperability of inter-Regional procedures and processes.	NIL

8. ASBU B0-NOPS: Performance Monitoring and Measurement	
8A. ASBU B0-NOPS: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
Item 80: Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	November 2015: (Seamless ATM Plan Phase I). Percentage of high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes having ATFM incorporating CDM using operational ATFM platform/s. Supporting metric: Number of high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes having ATFM incorporating CDM using operational ATFM platform/s.
	November 2018 (Seamless ATM Plan Phase II): Percentage of FIRs supporting Major Traffic Flows that have implemented ATFM incorporating CDM Supporting metric: Number of FIRs supporting Major Traffic Flows that have implemented ATFM incorporating CDM



ASBU B0-NOPS: Performance Monitoring and Measurement	
8 B. ASBU B0-NOPS: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Benefits: Priorities for access determined by optimal network operations outcomes.
Capacity	Benefits: Improved airspace and airport capacity through the continuous, dynamic management of demand and the reduction of late notice ATFM measures such as holding, vectoring and ground stop.
Efficiency	Benefits: Reduced fuel burn due to better, more dynamic capacity and demand measurement, and capacity/demand balancing by collaborative planning and execution of ATFM measures
Environment	Benefits: Reduced fuel burn as delays are absorbed either on the ground, ideally with engines shut-down, or at optimum flight levels through early application of airborne ATFM measures.
Safety	Benefits: Reduced risk and incidence of ATC sector overload, and better planned more stable aircraft trajectories through all phases of flight.

ATFM/SG/3
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Terms of Reference

AIR TRAFFIC FLOW MANAGEMENT STEERING GROUP (ATFMSG)

1. Having considered the ~~ATS Planning Manual (Doc 9426)~~ relevant documents such as the ~~Manual on Collaborative Air Traffic Flow Management (Doc 9971)~~, regional air traffic data and the ~~Major Traffic Flows~~ Asia/Pacific Region city pairs and associated airspace and ATS routes experiencing the most significant traffic demand, and noting that ~~recognized structural airspace capacity increasing measures have preference to use of ATFM~~ the Asia/Pacific Seamless ATM Plan provisions for structural airspace capacity increasing measures, develop an Asia/Pacific Regional ATFM Concept of Operations (including principles and objectives) Framework which addresses ATFM implementation and ATFM operational issues in the Asia/Pacific Region;

~~1. Review and update the ATFM Communications Handbook for the Asia Pacific Region until superseded by Global Material;~~

2. ~~Encourage and develop~~ Identify, research and recommend appropriate guidance regarding:

- a. capacity assessment and adjustment mechanisms;
- b. regular review for all aerodromes and ATC sectors where traffic demand is expected to reach capacity, or is resulting in traffic congestion;
- c. mechanisms for ATFM data gathering, collation and sharing between States, International Organizations and ICAO, which may include:
 - i. capacity assessments, including factors affecting capacity such as special use airspace status, runway closures and weather information;
 - ii. traffic demand information which may include flight schedules, flight plan data, repetitive flight plan data as well as associated surveillance updates of flight status; and
 - iii. ATFM Daily Plan;
- d. compliance by airspace users with ATFM measures; and
- e. any other guidance relevant to the Regional ATFM Framework.

~~3. Research suitable and regionally harmonized benchmarks for airport acceptance rates (AAR) and the throughput of airspace (sector capacity) which may vary depending on weather conditions, and associated technique, e.g. the ground delay programme and miles/minutes in trail (MIT). Maintain an overview of CDM/ATFM programs being conducted within the Region, with a view to facilitating their coordination and alignment.~~

4. Review the ~~safety and efficacy of~~ effectiveness of existing and planned ATFM systems programs in the Asia and Pacific Region, and make specific recommendations regarding ATFM, including any adjacent airspace affecting the Asia and Pacific Regions, and research and recommend appropriate mechanisms for the on-going review of such programs.

~~5. Encourage the development of an ATFM web site by Asia and Pacific Region States with significant experience in ATFM, which contains information on regional ATFM, including *inter alia*, real time flight delay data.~~

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5. The Group has linkages to the Regional ATM Contingency Plan Task Force (RACP/TF) and the Meteorological Requirements Task Force (MET/R TF).

6. The Group reports to the ATM/AIS/SAR Sub-Group.

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Air Traffic Flow Management Steering Group

Task List

(last updated ATFM/SG/3, 14 March 2014)

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
2/1	Research guidance on qualifications and competencies for ATFM operators	ATFM/SG/3 ATFM/SG/4	Specialist Team/Secretariat	Open	
2/2	Research guidance material on ATFM compliance	ATFM/SG/3 ATFM/SG/4	Specialist Team/Secretariat	Open	Can be sourced from EUROCONTROL
2/3	Further develop draft Regional Framework for Collaborative ATFM.	ATFM/SG/3 ATFM/SG/4	Specialist Team/Secretariat	Open	First draft to be presented to ATFM/SG/3 Second draft to be presented to ATFM/SG/4
2/4	Develop final draft of Produce interim regional ATFM guidance Framework for Collaborative ATFM (extracted from draft Regional Framework).	ATFM/SG/3 18 July 2014	Specialist Team/Secretariat	Open	Guidance material to be presented to APANPIRG/25 for adoption
2/5	Align Asia/Pacific BANP Volume 1 ATFM provisions with the ATFM framework and Doc 9971	ATFM/SG/5	Secretariat	Open	In consultation with ATFM/SG
2/6	Develop Regional priorities, targets and performance monitoring metrics for ASBU Module B0-NOPS	March 2014	Specialist Team/Secretariat	Open Completed	To be provided to APANPIRG Sub-Group Chairs by March 2014
2/7	Conduct study to establish regional baseline of ATFM capability and develop recommended implementation strategies.	ATFM/SG/4	IATA	Open	Decision 2/2
3/1	Provide copy of Indonesia Manual of Runway and Airspace Capacity Measurement	28 March 2014	Indonesia	Open	
	Provide information on airport and airspace capacity assessment methodology for framework development	ATFM/SG/4	China	Open	
3/2	Coordinate with MET/R TF Secretary for information on potential Annex 3 amendments including MSTA	18 July 2014	Secretariat	Open	

ATFM/SG/3
Appendix H to the Report

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS	REMARKS
3/3	Provide Points of Contact for IATA Study	21 March 2014	States/ATFM/SG Participants	Open	
3/4	Coordinate with MET/R TF to invite appropriate Aviation Meteorology experts to participate in ATFM Specialist Team activities.	28 March 2014	Secretariat	Open	
3/5	Develop a list of ATFM terminologies, definitions, their meanings and application, identifying a minimum set for interoperability	25 April 2014	CANSO, India Japan Singapore, Thailand	Open	
3/6	Provide list of airport and airspace capacity improvements Incorporate Thailand capacity improvement suggestions (ATFM/SG/3 WP14)	25 April 2014	CANSO Secretariat	Open	
3/7	Provide list of aptitudes, skills, experience recommended for Flow Managers and ATFMU operators	25 April 2014	CANSO	Open	
3/8	Research and extract appropriate information and guidance from Eurocontrol A-CDM Manual to use as guidance material in the Regional ATFM Framework	ATFM/SG/4	ICAO/Secretariat/Specialist Team	Open	
3/9	Expand and develop CDM Project assessment form to include assessment of ATFM implementation	ATFM/SG/4	Secretariat/Specialist Team	Open	
3/10	Further develop concept of ATFM Categories of Airspace	ATFM/SG/4	Secretariat/Specialist Team	Open	
3/11	Develop draft training curriculum topics based on Thailand suggested. ATFM/SG/3 IP05	ATFM/SG/4	Secretariat/Specialist Team	Open	
3/12	Commence drafting distributed multi-node CDM/ATFM ICD	ATFM/SG/4	Specialist Team	Open	
3/13	Adapt Thailand CDM/ATFM Concept of Operations for inclusion in Regional Framework (ATFM/SG/3 WP15)	ATFM/SG/4	Secretariat/Thailand/Specialist Team	Open	
3/14	Commence adapting multi-nodal distributed network concept for inclusion in Regional Framework	ATFM/SG/4	Secretariat/Specialist Team	Open	