International Civil Aviation Organization

The First Meeting of the Asia/Pacific Air Traffic Flow Management Steering Group (ATFMSG/1)

Tokyo, Japan, 08 – 10 December 2010

Agenda Item 4: Development of ATFM Task List

DRAFT APAC ATFM CONCEPT OF OPERATIONS

(Presented by the Secretariat)

SUMMARY

This paper presents a draft APAC (Asia and Pacific) Region Air Traffic Flow Management (ATFM) Concept of Operations.

1. INTRODUCTION

1.1 The need for Air Traffic Flow Management as a means of balancing demand and capacity has long been recognized, and has already been implemented in a number of States. The current ICAO provisions and guidance for ATFM can be found in Section 3.7.5 of *Annex 11 — Air Traffic Services*, Section 3.2 of the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), and Part II Chapter 1 of the *Air Traffic Services Planning Manual* (Doc 9426).

1.2 As a result of discussion at the ATFM Steering Group (ATFMSG/1) held at Tokyo, Japan, 8-10 December 2010, an APAC (Asia and Pacific) Region Air Traffic Flow Management (ATFM) Concept of Operations was drafted for discussion at that meeting. A copy of the draft is attached as **Appendix A**.

Appendix A

Asia and Pacific Regional ATFM Concept of Operations

1. BACKGROUND

1.1 As a result of increasing regional Air Traffic Flow Management (ATFM) activities and the provisions of GPI- 6 (ATFM), the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/18, September 2007) adopted Conclusion 18/7 for the conduct of a regional ATFM Seminar. The ICAO Asia/Pacific ATFM Seminar/Workshop was hosted at Fukuoka, Japan by the Japan Civil Aviation Bureau (JCAB), Ministry of Land, Infrastructure, Transport and Tourism from 7 to 9 October 2008.

1.2 As a result of the ATFM Seminar and Workshop, APANPIRG/20 (Bangkok, September 2009) made the decision to constitute an ATFM Steering Group (ATFMSG/1), which was also held in Japan at Tokyo, from 8 to 10 December 2010. One of the key deliverables from the ATFMSG/1 was expected to be a Regional ATFM Concept of Operations.

1.3 It was considered inappropriate at the ATFMSG/1 for the Regional ATFM Concept of Operations to closely analyse specific Major Traffic Flows (MTF) or to determine actual ATFM systems to be used on these flows, as this would impinge upon the individual State responsibilities to determine the type and level of air traffic service (ATS). Moreover, States have a greater knowledge of the operational requirements, limitations and safety risks of any given airspace that they provide ATS within. In addition, Air Traffic Management Coordination Groups (ATMACG) are better placed to closely monitor and assess the need for ATFM measures within sub-regions (such as the NOPAC - North Pacific), recognising that these are more likely to be implemented on MTFs and not on a regional basis.

1.4 For these reasons, the ATFMSG/1 developed this Regional ATFM Concept of Operations based on broad principles and recommended practises that are intended to provide a framework for desired regional outcomes. Moreover, it was considered that optimal ATFM is a subset of a seamless Air Traffic Management (ATM) system, so further development of the Regional ATFM Operational Concept should be considered within the context of the Seamless ATM Concept.

2. ATFM CHARACTERISTICS

2.1 The ATFMSG/1 recognized that ATFM had a number of important characteristics, which are detailed as follows.

a. ATFM is intended as a win-win enabler, to ensure the ATM system is compatible, balances capacity, and is responsive to user needs. ATFM supports the introduction of new technologies (such as probabilistic meteorological forecasting and ATS sector capacity assessment tools) and procedures that enhance airspace capacity.

b. ATFM is evolutionary in nature, in order to manage a changing aeronautical environment. Thus the nature of ATFM is one of a system that is constantly reviewed in terms of the airspace, ATS routes and aerodromes, and the ATFM system effectiveness itself.

c. ATFM is integral to world economies, as it maximises aviation economic efficiencies and returns, in turn supporting many other economic sectors such as tourism and freight carriage. ATFM supports predictability in terms of inventories, and the efficient carriage of passengers and freight.

d. ATFM assists international cooperation, leading to an optimal seamless ATM environment.

e. Even relatively simple ATFM systems such as slot management can be as effective as complex systems, to enable systems to cope with unexpected capacity deficiencies.

f. ATFM traffic data analysis can yield significant strategic benefits, especially when used in conjunction with airspace and ATS route planning, in terms of future ATM systems and procedure improvements. This is part of a continuous safety and service improvement loop (Figure 1).

g. Collaborative Decision-Making (CDM), as part of ATFM, ideally involves people skilled in facilitation.

h. CDM is about sharing knowledge, which allows an understanding of user and ATM requirements, in order to achieve buy-in, cooperation, and predictability. In effect, CDM allows the system to work smarter, not harder.

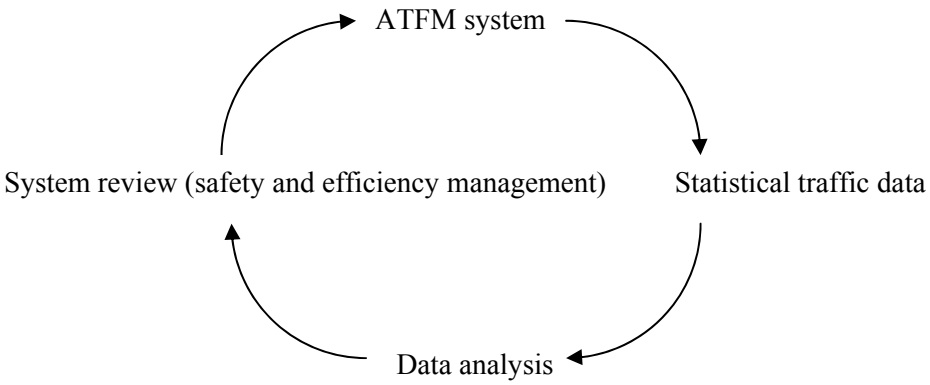

Figure 1: ATFM Cycle of Review and Improvement

3. REGIONAL ATFM OBJECTIVES

3.1 Asia and Pacific Regional ATFM has the following objectives:

a. without compromising safety, to ensure an optimum flow of air traffic during times when demand exceeds, or is expected to exceed, available capacity of the air traffic control (ATC) system (Doc 9426*);

b. to ensure the maximum utilisation of airspace, and balance the legitimate, but sometimes conflicting, requirements of all users (Doc 9426);

c. to develop a seamless and harmonised ATM system and ensure compatibility with international developments (CAR/SAM ATFM Project, Doc 9426);

d. to ensure that optimum capacity is provided in a flexible and timely manner (CAR/SAM ATFM Project); and

e. to minimise inefficiencies that affect ATM capacity (ATFMSG/1).

*Note: references in this document are not necessarily copied verbatim from the source, but have been amended in a minor manner from the original to ensure it is up-to-date, readable and in the correct context.

4 REGIONAL ATFM PRINCIPLES

4.1 ATFM in the Asia and Pacific Regions is expected to be implemented in accordance with the following principles:

a. ATFM must seek to optimise available aerodrome and airspace capacity without compromising safety (CAR/SAM ATFM Project);

b. ATFM must seek to balance the financial impact on stakeholders with safety, and operational and technical benefits, taking into account global interoperability (CAR/SAM ATFM Project);

c. ATFM applications must be consistent with the ICAO Regional Air Navigation Plan (CAR/SAM ATFM Project);

d. ATFM must entail timely and effective co-ordination with affected parties, including ATC units, aircraft operators, military authorities and aerodrome operators as appropriate. Civil/military co-ordination ideally results in airspace being shared, either simultaneously or on a time-share basis. ATFM must take into consideration the requirements of the military, law enforcement, and search and rescue (Doc 9426).

e. Military aircraft operating as general air traffic should be subject to ATFM (CAR/SAM ATFM Project).

f. ATFM recognises that airspace is a common resource for all users, ensuring fairness and transparency, while taking into account security and defence needs (CAR/SAM ATFM Project).

5. RECOMMENDED PRACTICES

a. ATFM planning should be prioritised for appropriate major sub-regional traffic flows, instead of a focus on regional ATFM. ATFM WS and ATFMSG

b. December traffic sample data used by all States to satisfy airspace safety monitoring analysis may be utilised for airspace planning and implementation purposes. APANPIRG 20

c. Recognising that the most efficient utilization of available airspace and airport capacity can be achieved only if all relevant elements of the air traffic system had been considered during the planning stage, applying a systems approach (Doc 9426). Quantitative data should be moderated by qualitative assessment using subject matter experts to ensure the following factors, inter alia, are taken into account:

- airspace and airway complexity, structure and volume;
- adjoining ATC sectors;
- amount of climbing/descending traffic;
- terrain;
- military operations; and
- special use airspace. ATFM Survey/ATFMSG

d. When flow management measures are necessary for certain areas, they should be applied in a timely manner only for the period when expected air traffic demand will exceed the capacity in those areas. ATFM measures

should be kept to the minimum and, whenever possible, be applied selectively only to that part of the system that is constrained (Doc 9426).

e. Advance information on overload situations should be provided to ATC and aircraft/aerodrome operators (Doc 9426).

f. Relevant air traffic statistics should be generated in order to promptly identify bottlenecks in the system (Doc 9426). Accurate and timely data should be continuously available to support implementation and ongoing ATFM operations in the form of:

- Static data identifying historical traffic loadings, for use as strategic planning and trend analysis, and
- Dynamic real-time data used for the tactical management of traffic in terms of commencement of ATFM measures (ATFM Workshop/Seminar);

g. Flow control measures should be established and coordinated in such a way that they will not cumulatively interact with each other on the same flights (Doc 9426);

h. The following types of flights should be granted exemption from flow control measures:

- emergency flights, including aircraft subjected to unlawful interference;
- flights operating for humanitarian reasons;
- medical flights specifically declared by medical authorities;
- flights on search and rescue missions;
- flights with “Head of State” status; and
- other flights as specifically required by State authorities (Doc 9426).

i. The use of appropriate automated tools should allow effective application of ATFM (ATFM Workshop/Seminar);

j. Formalised CDM should be utilised to promote increased information sharing, awareness and acceptance (ATFMSG/1);

k. States should ensure the use of the English language in a concise, non-verbose manner in ATFM operations, utilising the *Air Traffic Flow Management Communications Handbook for the Asia/Pacific Region* (ATFMSG/1)*;*

l. Whenever measures to control the flow of air traffic have to be applied in the form of delays, they should, if possible, be applied by ATC to aircraft on the ground rather than to aircraft in flight (Doc 9426).

m. Whenever application of ATFM in the form of delays to airborne aircraft becomes unavoidable, the flights concerned should be informed as soon as possible (Doc 9426).

n. The ATFM service should have the following basic strategic and tactical functions:

- collection, collation and analysis of data on air traffic, the air navigation infrastructure and on the capacities of the ATS system and selected aerodromes (Doc 9246);
- determination of available airspace, ATS and aerodrome capacity (ATFMSG/1);

- determination of a coherent picture of expected traffic demand (Doc 9426);
- identification of areas and time periods of expected critical traffic loadings (Doc 9426); and
- in order to accommodate the growth of air traffic, an appropriate ATFM plan should be established, aimed at optimising the airspace utilisation (Doc 9426).

6. GUIDANCE MATERIAL

6.1 Additional ATFM Guidance Material may be derived from the following sources:

a. ICAO Annex 11 (Section 3.7.5)

b. ICAO Doc 4444 (Section 3.2);

c. ICAO Doc 9426 (Part II, Chapter 1);

d. ATFM Communications Handbook for the Asia/Pacific Region (*http://www.bangkok.icao.int/edocs/ATFMComms_Handbook.pdf*); and

e. FAA ATFM web site (http://www.fly.faa.gov).