



International Civil Aviation Organization

**The Third Meeting of the APANPIRG ATM Sub-Group
(ATM /SG/3)**

Bangkok, Thailand, 03-07 August 2015

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

**HARNESSING THE POWER OF DATA SHARING FOR AIR TRAFFIC MANAGEMENT
ENHANCEMENT**

(Presented by Singapore)

SUMMARY

As aviation is cross-border in nature, harnessing the power of data-sharing on a multi-national basis is important to ensure sustainable ATM for the future. This paper calls for States and Administrations to consider the sharing of information, such as historical and forecasted traffic data, which will enable analyses of current stress points as well as future traffic demands in the region.

1. INTRODUCTION

1.1 Data analytics and big data are key elements of many businesses in this modern world. Data analytics provides information and insights for decision making and performance enhancement. Likewise, States and Air Navigation Services Providers (ANSPs) can harness the power of data sharing for air traffic management (ATM) enhancement.

1.2 Unlike other industries, ATM is far from harnessing the full potential of data sharing to bring about a revolutionary change in its applications. Given the cross-boundary nature of aviation, data sharing therefore requires a multi-national effort in the Asia Pacific (APAC) region.

2. DISCUSSION

2.1 ICAO has laid a foundational step to move global ATM developments towards a more proactive, pre-emptive form of traffic management through the revised Global Air Navigation Plan (GANP) and introduction of the Aviation System Block Upgrades (ASBU). Future ATM concepts as described in the ASBU, such as Flight and Flow Information in a Collaborative Environment (FF-ICE), System Wide Information Management (SWIM) and Trajectory-Based Operations (TBO), hinge on the free and frequent exchange of data between ATM nodes and actors and across all phases of flight. From planning, to operations, to post-operational analysis, the use of data will revolutionalise the ATM business.

2.2 Data sharing will be difficult without a common platform. In Europe, the Eurocontrol Demand Data Repository (DDR) provides open data sharing platform for all European historical en-route flight data used for analysing performance of current operations and for future operations planning by extrapolation. This enables the relevant stakeholders, such as airport planners, to harness the ability to look and plan ahead, making sure that the airports are well prepared for future growth. Likewise for this region, in order for the sharing to be possible, a data sharing platform will be necessary. This can be in the form of a web depository only accessible by the participating States.

2.3 In a way, data sharing by some of the States in the region has enabled post-operations analysis of traffic flows in Southeast Asia. Under the auspices of the European Union – ASEAN Air Transport Integration Programme (EU-AATIP), the Air Traffic Management Research Institute (ATMRI), a research entity jointly set up by Civil Aviation Authority of Singapore and the Nanyang Technological University (NTU) of Singapore, undertook a project to establish an ATM modelling and simulation (M&S) function to assess the major traffic flows in Southeast Asia. At an EU-AATIP Modelling & Simulation Workshop in Bangkok, 26th – 27th Nov 2014, ASEAN Member States agreed to share their air traffic data to support this work. Traffic data collected is used to determine the current traffic demand baseline for ASEAN. Interested ASEAN Member States (AMS) could leverage on this project to build up traffic analysis capabilities and expertise in modelling and simulation. It was envisaged that the establishment of this ASEAN ATM M&S function will encourage a regional approach to developing, evaluating and planning the implementation of improvements in the domains of airspace design and procedures, cross-border air traffic flow management (ATFM), operational deployment of technologies and airport performance enhancements.

2.4 Small steps can be taken to materialise data sharing. For example, APAC states are currently submitting traffic sample data (TSD) for the first week of December to the Regional Monitoring Agencies (RMA, e.g. MAAR) and the En-route Monitoring Agencies (EMA, e.g. SEASMA) annually for vertical and horizontal safety monitoring activities respectively. As a start, States could agree that the TSD collected by each RMA/EMA be consolidated together to form a regional traffic sample database and shared among all Asia Pacific stakeholders to support regional ATM planning and research. For example, the TSD can be combined with traffic forecasts to perform a holistic analysis of future traffic demand under various scenarios of traffic growth to derive an accurate assessment of future loading on the regional network of air traffic services ATS routes and early identification of potential bottlenecks. In addition, if States can contribute comprehensive information on past weather and forecasts, which can then be used for research purposes, such as to match weather patterns and observed traffic flows. This information can serve as a starting point for further operational research to predict future demand/capacity on major traffic flows to support regional ATFM implementation.

2.5 Just like in other sectors, the on-going data revolution offers promising potential for ATM and aviation. If ATM were to play a strategic role in aviation development, ATM stakeholders need to make the smart choice of harnessing the power of this data revolution and put in place the necessary building blocks. The following draft Conclusion is proposed for the meeting's consideration:

Draft Conclusion

That, Asia Pacific States recognise the usefulness and importance of data sharing on a regional basis. To support future ATM planning and implementation, States and Administrations could consider the setting up of a regional traffic database, which would enable analyses of current stress points and future traffic demands.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information in this paper;
- b) Discuss the need for a common platform for data sharing, such as to facilitate exchange of traffic data as mentioned in paragraph 2.4, and to consider creating a depository for the submission, management and sharing of such data;
- c) Consider supporting the draft conclusion in paragraph 2.5; and
- d) Discuss any other matters related to this paper.