



International Civil Aviation Organization

**Third Meeting of the ICAO Asia/Pacific Seamless ATM Planning Group  
(APSAPG/3)**

Chennai, India, 21-25 January 2013

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**Agenda Item 4: Asia/Pacific Seamless ATM Status and Strategies**

**A SYSTEM-WIDE APPROACH TO SEAMLESS ATM IMPLEMENTATION  
IN THE REGION**

(Presented by CANSO)

**SUMMARY**

Under its Terms of Reference the APSAPG is required to determine priorities, programmes, and mechanisms for implementation of Seamless ATM taking into account traffic forecasts of major airports and major traffic flows. This paper highlights the need for a system-wide approach to implementation based on the ICAO ASBUs that will address both capacity creation and the balancing of capacity and demand. It illustrates this approach with the example of capacity creation through ADS-B/en-route PBN implementation complemented by CDM/ATFM.

**1. INTRODUCTION**

1.1 The objective of the Asia/Pacific Seamless ATM Planning Group (APSAPG) as stated in its Terms of Reference (TOR) is to determine the means for Seamless ATM development in the Asia Pacific Region. In this regard, the APSAPG has, over two meetings, deliberated on various aspects of seamless airspace, the enablers and barriers to seamlessness, the building blocks and requirements of seamless operations as well as commenced an analysis of the region's performance.

1.2 The TOR however goes on to add that in defining the Concept Plan the APSAPG shall (among other things listed in the TOR):

- *conceptualise future Seamless APAC air traffic operations, paying due regard to traffic forecasts for major airports and major traffic flows;*
- *determine priorities, programmes, and mechanisms for implementation of Seamless ATM, including phases with broad timelines and projected deliverables*

1.3 This part of the TOR spelling out the need for the APSAPG to address the implementation issues cannot be over-emphasised because ultimately the Seamless ATM Concept Plan developed by the APSAPG has to be translated into actual implementation on the ground and in the air.

1.4 The APSAPG has made good progress since its inception and in the process has started looking at the major traffic flows in the region to identify the gaps that needed attention. While this requires the identification of specific areas that require improvements in harmonisation and interoperability implicit in such efforts is the over-arching goal of safety, capacity and efficiency enhancement.

## 2. DISCUSSION

### ASBU implementation

2.1 The ICAO Aviation System Block Upgrades (ASBUs) concept which was recently endorsed by the 12<sup>th</sup> Air Navigation Conference in Montreal has provided a solid foundation for the region to pursue its vision of a seamless sky. Several States in the region have started aligning their national ATM plans to the ASBUs while others are implementing various components of ASBU Block 0.

2.2 Some examples where CANSO itself has been intimately involved in include ADS-B and CDM. This paper discusses how ASBU initiatives such as these can provide a sound basis for the implementation of seamless ATM through the creation of capacity and the balancing of demand and capacity, provided they are properly harnessed and coordinated at a regional level.

### Capacity creation

2.3 To illustrate, ADS-B implementation over the South China Sea has been making good progress and similar projects are taking hold over the Bay of Bengal (At APSAPG/2, CANSO reported that it hosted a meeting in Singapore in July 2012 where the ANSPs of India and Myanmar agreed to exchange ADS-B data that would provide end-to-end surveillance for air routes between Calcutta in India and Myeik in Myanmar). This holds great promise for significant improvements in safety, capacity and efficiency as ADS-B surveillance coupled with DCPC would enable radar-like separation on routes with end-to end surveillance coverage.

2.4 But ADS-B by itself would not be able to provide the full benefits of increased capacity and efficiency unless PBN is also implemented. With PBN, the airspace can be restructured and air routes spaced closer together (for example from the current 50nm to 20nm lateral spacing) thus allowing for shorter flying distances and more optimum flight level allocations. This means greater flight efficiency, reduced fuel burn and lower carbon emissions.

2.5 From the seamless ATM perspective, it is imperative that we look beyond the implementation of the ADS-B ground systems to the full realisation of operational benefits in the airspace concerned. And as with all cross-boundary initiatives, the success of en-route PBN implementation depends on close cooperation among neighbouring States in the region to coordinate and harmonise efforts. Therefore even as the ADS-B ground systems are being installed, the States involved should start looking at the implementation of en-route PBN in the airspace concerned.

### Balancing Demand and Capacity

2.6 At the same time, we also need to recognise that while air traffic capacity can be enhanced with the implementation of ASBU elements such as ADS-B and PBN, air traffic demand will continue to rise in tandem with the region's rapidly growing economies and there will still be peaks, choke points and abnormal situations en-route and at airports where demand can exceed capacity.

2.7 Therefore some mechanism would be needed to balance traffic demand with the available capacity. Conceptually, this could be realised through the application of CDM and ATFM, both of which are part of the ICAO ASBUs aimed at optimising the flow of air traffic. CDM is a key enabler of ATFM as it allows the continuous sharing of real-time information among the parties involved in the decision making process of a flight. It is therefore conceivable that the successful implementation of CDM on major city pairs could be coupled with ATFM to eventually provide the mechanism needed to balance traffic demand with the available capacity of a network of airports.

2.8 As reported in the last two APSAPG meetings, the Bangkok-Singapore CDM city pair project is a CANSO initiative to improve flight efficiency and predictability through the timely exchange of information among all stakeholders (ANSPs, airports and airlines) for flights between the city pair. The project has been making good progress and in a live trial involving over 100 flights in July and August 2012 the data collected showed marked improvements in the predictability of the CDM flights.

2.9 CDM coupled with ATFM provides the basis for a system that could help balance demand with capacity in a network of airports. Even today, major airports need to deal with sudden traffic increases and/or capacity reduction arising from weather or abnormal operations. The pilot CDM city pair project between Bangkok and Singapore can be a trail-blazer for more CDM city pairs and act as a catalyst for the establishment of sub-regional CDM/ATFM networks capable of balancing capacity and demand at the region's major airports during normal and abnormal circumstances.

### Conclusion

2.10 The ICAO ASBU provides the full menu of technology that would be available at specific time-frames. As APSAPG/2 had noted not every item is of equal importance to the region and with limited resources choices have to be made in selecting what would work best in helping the region achieve its vision of a seamless sky. This paper highlights the need for an implementation strategy and suggests a system-wide approach that combines capacity creation with demand and capacity balancing measures using the examples of ADS-B/PBN and CDM/ATFM.

2.11 While the ASBUs and individual national ATM plans are important inputs for the APSAPG's Seamless ATM Concept Plan, the APSAPG's TORs remind us that the Plan should contain a coherent implementation strategy that takes into account current and forecasted traffic levels for major airports and major traffic flows and spells out the regional priorities and mechanisms so that ATM planning and implementation efforts by individual States can be harmonised and coordinated in a timely manner at the regional level.

## **3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) note the need for a Seamless ATM strategy with a strong focus on implementation;
- c) discuss a system-wide approach to implementation that integrates capacity creation and demand/capacity balancing measures such as ADS-B/PBN and CDM/ATFM at major traffic flows and airports; and
- d) discuss any relevant matters as appropriate.

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