International Civil Aviation Organization

The First Meeting of the ICAO Asia/Pacific Seamless ATM Planning Group (APSAPG/1)

Bangkok, Thailand, 31 January – 03 February 2012

Agenda Item 3: Drivers for a Seamless ATM Environment
Agenda Item 4: Asia/Pacific Seamless ATM Status and Strategies

Singapore's Views on Seamless Air Traffic Management

(Presented by Singapore)

SUMMARY

This paper presents Singapore's views on how Seamless ATM can be mapped out clearly to guide the evolution towards a globally harmonized interoperable ATM and the evolution of requirement for this transition.

Strategic Objectives:

A: ***Safety*** *– Enhance global civil aviation safety*

C: ***Environmental Protection and Sustainable Development of Air Transport*** *– Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:

GPI-1 Flexible use of airspace
GPI-5 RNAV and RNP (Performance-based navigation)
GPI-6 Air traffic flow management
GPI-7 Dynamic and flexible ATS route management
GPI-8 Collaborative airspace design and management
GPI-9 Situational awareness
GPI-10 Terminal area design and management
GPI-11 RNP and RNAV SIDs and STARs
GPI-12 Functional integration of ground systems with airborne systems
GPI-14 Runway operations
GPI-16 Decision support systems and alerting systems
GPI-17 Data link applications
GPI-18 Aeronautical information
GPI-21 Navigation systems
GPI-22 Communication infrastructure

1. INTRODUCTION

1.1 There are different interpretations of what 'seamlessness' in Air Traffic Management (ATM) mean. One such interpretation could be: a desired state of air traffic operations where flights operate at close to or optimum conditions throughout all phases in densely packed airspaces while keeping safety at its highest level. To achieve all that, one must not forget the critical components when we develop the Seamless ATM Plan and without a holistic review, they may be overlooked. In addition,

having a good understanding and agreement on a common end-state helps us visualise the objectives clearer so as to make the best out of the Seamless ATM Plan later on.

1.2 With the strong traffic growth in Asia/Pacific expected, there will be further squeeze on capacity and air traffic operations will get more complex. Singapore supports the formation of a Planning Group to guide this region towards 'Seamless ATM'. The planning and implementation of Seamless ATM should be carried out in a progressive and evolutionary manner so as to enable thorough participation by all stakeholders for maximum effects and to enable all to keep pace with the progression. At the same time, we should look for low hanging fruits along the way so as to keep up the momentum. In view of this, the Seamless ATM Plan should be mapped out clearly to guide the evolution towards a globally harmonised interoperable ATM system. This paper discusses the evolution of requirements for this transition.

2. DISCUSSION

2.1 The ICAO Global ATM Operational Concept Document contains key concept components that act as good pointers for planning. For example, Airspace Organization and Management (AOM) is quint-essential to facilitate seamless handling of flights along optimum flight trajectories from gate to gate without undue restriction or delay. In this regard, there are several key areas in which we should focus on when considering the building blocks for the Seamless ATM Plan.

a) Cross-border coordination and joint activities

ACC-to-ACC exchange of essential traffic information and harmonisation of operational procedures is applicable to all ANSPs. A shared situational awareness and knowledge among all parties is vital to a Seamless ATM environment.

States should work to improve cross-border coordination by harmonizing the necessary technological standards for ensuring smooth ATM service delivery, thereby increasing air traffic safety and efficiency. However, we need not reinvent the wheel. Many of the ongoing APANPIRG Sub-Groups, ATS coordination groups and Task Forces serve as the appropriate platforms for us to pursue specific ATM initiatives implementation. States/ANSPs should continue with such close cooperation while keeping in view the regional vision when the Seamless ATM Plan is developed.

b) Civil-military operations / integration

To achieve seamlessness in civil-military operations, there has to be greater cooperation between civil and military operating entities going forward. Reservation of airspace for specific use limits operational flexibility and can stiffle growth. We should work towards greater integration of civil and military operations in order to fully optimise airspace use. Current airspace usage can be improved if the military is viewed as a customer of air traffic management. States are encouraged to work together to promote improved civil-military cooperation.

c) Reduction in operational complexity

With high traffic growth expected, the major objective of ANSPs in this region is to enhance the existing ATM system capacity and operational efficiency while ensuring that this goes hand-in-hand with commensurate safety improvements. Seamless ATM will require performance-based, future procedures to be developed and employed in a standard and consistent way in order to harmonize the various concepts of operations in the airspace.

The stepping stones to a Seamless ATM environment are slowly being put in place. Example initiatives include Aeronautical Inter-facility Data Communications (AIDC) and Automatic Dependent Surveillance-Broadcast (ADS-B). The former will see about reduction in coordinating activities between ACCs while the latter will enhance situational awareness significantly and enables ACCs to handle increased traffic. But we should not forget the human-in-the-loop. With improvements in capability, we should always remember that the operator forms part of the solution. We could yield maximum benefits only if operator competency commensurate with technological capabilities. States/ANSPs should constantly aim to improve air traffic management through reduction of operational complexity either internally or between Flight Information Regions (FIRs).

d) Air Traffic Flow Management (ATFM)

An effective ATFM mechanism will form a good facility to balance demand and capacity, resulting in traffic flowing in a safe, orderly and efficient manner. ATFM can improve airspace efficiency today. As a key ingredient, collaboration decision making (CDM) processes seems indispensable to the stakeholders involved. As a start, this Planning Group could stress the importance of information sharing between relevant ATM stakeholders of identified critical traffic bulging points.

2.2 As we focus on the present technologies and procedures, we must not overlook the need to include development of new-generation ATM capabilities that will be capable of ensuring the safety and fluidity of air transport over the next 30 years. As such, the Seamless Plan should also embrace new technologies. One such example is the System Wide Information Management (SWIM) development. With increased traffic volume and operational complexity, it would be a matter of time when the current infrastructural support for ATM-related information sharing reaches its limit. The SWIM concept holds new operating paradigm that includes ideas such as management of flight trajectories, timely and rich exchanges of weather information and aeronautical information between air-air, air-ground and ground-ground systems. Though very much under development, we should still include future plans for such SWIM idea as it will take some years before actual deployment.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss the critical components and to consider key points as raised in this paper to be included in the Seamless ATM planning for this region;

c) consider use of APANPIRG fora as the platforms to continue pursuing key cross-border ATM initiatives and implementations;

d) explore and discuss other focal areas which might be of importance to the critical needs of the traffic flows unique in this part of the world.

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