55th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS

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AGENDA ITEM 1:   THEME TOPIC

SWIM IN ASEAN DEMONSTRATION

Presented by Singapore, Thailand, and the United States of America

SUMMARY

This paper discusses one of the tangible ways to advance SWIM development through a demonstration in ASEAN, aiming at showcasing the operational benefits of implementing SWIM in ASEAN and the Asia/Pacific region, and getting the buy-in from States/Administrations to accelerate the implementation.

SWIM IN ASEAN DEMONSTRATION

1.   INTRODUCTION

1.1   System-Wide Information Management (SWIM) is considered as a key driver for the next bound of Air Traffic Management (ATM) capability development. SWIM is an integral part of ICAO's Global Air Navigation Plan (GANP), particularly the Aviation System Block Upgrades (ASBUs), which was first adopted at the ICAO Twelfth Air Navigation Conference (AN-Conf/12) in 2012. Subsequently, SWIM was highlighted as one of the regional strategic initiatives to be included in Phase III of the Asia/Pacific Seamless ATM Plan. Considered as the intranet for aviation, enabling the management of ATM information and its exchange between qualified parties, SWIM is thus an important building block of the Seamless ASEAN (Association of Southeast Asian Nations) Sky and will be one of the key initiatives in the ASEAN ATM Master Plan to be adopted and implemented under ASEAN Transport Strategic Plan 2016-2025.

1.2   In support of ATM modernization in ASEAN, the United States proposed at the Thirty-Fourth ASEAN Air Transport Working Group Meeting (ATWG/34) in October 2016 to work with ASEAN Member States (AMSs) in SWIM development by providing assistance in conducting a demonstration involving all AMSs.

1.3   Following this proposal, Singapore and Thailand have been working with the United States to develop a SWIM in ASEAN demonstration aimed at showcasing the operational benefits enabled by SWIM, with the target to conduct the demonstration in mid-2019.

2.   DISCUSSION

2.1   Keeping in mind the ultimate objective to achieve the seamless ATM connectivity for not only ASEAN but also the Asia/Pacific region, the SWIM in ASEAN Demonstration is aimed at the following:

- Promoting cross-border information exchange, facilitating ATM information flow among aviation stakeholders, and reinforcing the value of information sharing;
- Demonstrating the principles of SWIM, which will in turn lead to a better understanding of SWIM and help accelerate the implementation;
- Showing the potential operational benefits of SWIM; and
- Substantiating the vision of the ICAO Information Management Panel (IMP) and the Seamless ASEAN Sky.

2.2   The lessons learnt from the demonstration will present valuable takeaways for ASEAN and the Asia-Pacific region, and give ASEAN the opportunity to contribute effectively to the ICAO Asia/Pacific SWIM Task Force (SWIM TF) and the IMP through the experiences gained from the demonstration.

WHAT IS SWIM?

2.3   SWIM is an information-sharing infrastructure which facilitates the exchange of ATM system information, e.g. airport operational status, weather information, flight data, the Flexible Use of Airspace (FUA) information, etc., to a wide range of ATM stakeholders in real time.

Real-time information sharing enabled by SWIM

2.4   As SWIM leverages the globally-standardized information exchange models, information from various disparate systems within the Asia-Pacific region can be shared efficiently and on-demand. It connects different producers of the data (e.g. flight data information from the ANSP) to the users (e.g. the airlines) through an interface developed using the information exchange service standards also currently utilized in other information-critical businesses such as finance.

OPERATIONAL BENEFITS OF IMPLEMENTING SWIM

2.5   SWIM is not developed and implemented for its own sake. Benefits of SWIM thus lie in improved performance of operational ATM services requiring timely and quality information conveyed using SWIM. In view of the expected growth in air traffic which will be brought about by the ASEAN Single Aviation Market (ASAM), the timely and seamless exchange of ATM information enabled by SWIM will help ASEAN achieve the following.

ICAO Key Performance Area	Benefit of SWIM
Safety	With real-time data exchange enabled by SWIM, all aviation stakeholders have access to the most up-to-date and reliable information of the current ATM environment, increasing the situational awareness as well as augmenting the decision making process. Moreover, greater automation of ATM information exchange reduces data entry errors and allows air traffic controllers to shift their focus to higher value tasks, e.g. monitoring and contingency planning.
Cost Effectiveness	Interoperable infrastructure and standardized data exchange formats, brought about by SWIM through harmonized implementation, reduce duplication in the management of the same information in multiple systems. Moreover, with data mediation able to support adaption of current data format, e.g. Air Traffic Services (ATS) message, to XML-based format, migration to SWIM environment can be done evolutionarily, no big-bang change is required. In the long run, cost saving can be expected from utilizing a streamlined system to grow as the SWIM concept matures.

ICAO Key Performance Area	Benefit of SWIM
Efficiency	Timely information sharing enabled by SWIM allows increased flight predictability and improved resource management among related stakeholders, e.g. better gate management by airport operators, enhanced fleet optimization by airlines.
Predictability	
Flexibility	
Environment	Availability of more robust data on traffic movement and infrastructure utilization rates within the airspace and at the airports help optimize resource usage, thereby reducing fuel burn and emission.

SCOPE OF THE DEMONSTRATION

2.6   The demonstration was originally scoped to include only AMSs and the United States. However, at the First Meeting of SWIM TF, other Asia/Pacific States/Administrations outside of ASEAN, e.g. Australia, Hong Kong China, Japan, New Zealand, expressed their keen interest to participate in the demonstration as well. Considering significant advantages gained by including other Asia/Pacific States/Administrations in the demonstration, i.e. (*i*) the higher number of scenario types which can be exhibited, (*ii*) more opportunities for AMSs to learn from such States/Administrations, and (*iii*) promoting ASEAN regional leadership, the demonstration's scope was extended to also include non-ASEAN States/Administrations.

2.7   To enable the participants to experience and observe the benefits of leveraging on seamless data exchange to deliver efficient operations across Flight Information Regions, participants will exchange data with one another through a Global Enterprise Management Service (GEMS) which consists of several Enterprise Management Services (EMSs) interconnected within a secured IP (Internet Protocol) network. The architecture is illustrated in the figure below.
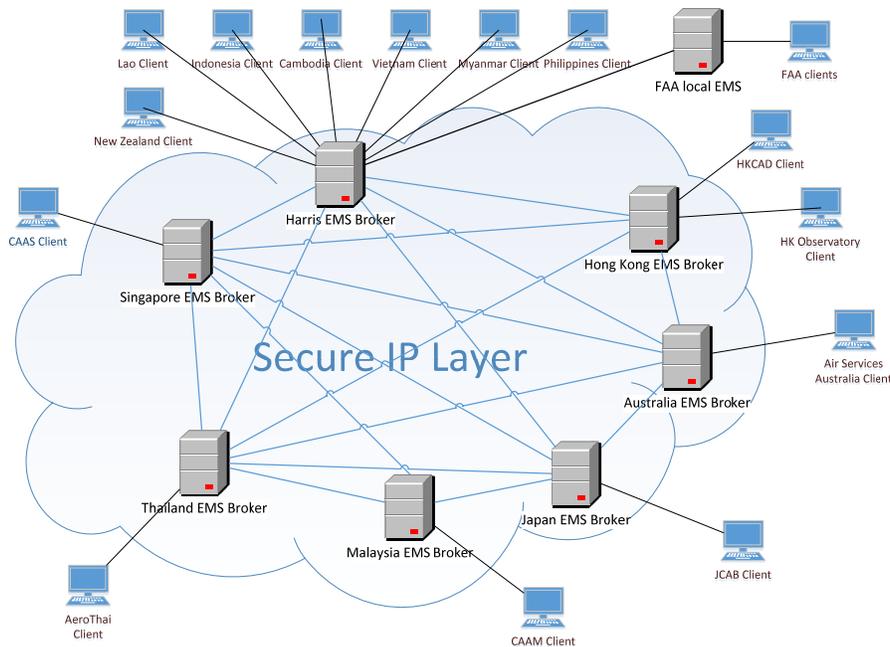
2.8   This architecture allows States/Administrations that have the capability of implementing an EMS the option to do so if they so choose, but yet still caters to States/Administrations that do not wish to or have no capability of implementing an EMS to participate in the SWIM in ASEAN Demonstration.

2.9   For the purpose of this demonstration, participants can use pre-recorded or simulated data for the information exchange.

2.10   In order to showcase the operational benefits of SWIM, several operational scenarios, involving the exchange of aeronautical information, flight information, and weather information, are being developed with the focus on the ATFM (Air Traffic Flow Management) operation based on the Distributed Multi-Nodal ATFM Network concept.

3.   ACTION BY THE CONFERENCE

3.1   The Conference is invited to:

a)   note information contained in this paper;

b)   discuss the use of demonstrations as a tangible way to advance SWIM development;

c)   encourage States/Administrations to support the ICAO Asia/Pacific SWIM Task Force; and

d)   discuss any relevant matter as appropriate.

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