



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 4: Asia/Pacific Seamless ATM Status and Strategies

Proposed Work Items for the Asia-Pacific Seamless ATM Planning Group

(Presented by Hong Kong, China)

SUMMARY

The objective of the Asia Pacific Seamless ATM Planning Group (APSAPG) is to determine the means for Seamless ATM development in the APAC Regions. The concept to be developed by APSAPG should be in line with the ICAO Global ATM Operational Concept and take into account the unique ATM environment of the APAC Regions and the latest ICAO Aviation System Block Upgrades (ASBU) initiative. This Paper presents a preliminary assessment and identifies the critical minimum operational and system needs across the APAC Regions for further discussions by the APSAPG.

1. INTRODUCTION

- 1.1. APANPIRG/22 tasked the Asia Pacific Seamless ATM Planning Group (APSAPG) to determine the means for Seamless ATM development for the APAC Regions. DGCA/48 subsequently tasked the APSAPG to identify the critical minimum operational and system needs and ensure that they are in line with the ICAO ASBU framework for global harmonization and implementation (DGCA Action Item 48/3).
- 1.2 This Paper made an assessment on the latest 15 modules for ASBU Block 0 and attempts to identify some priority, short to medium term work items for the consideration of the Meeting. Individual items are tagged with the ASBU Block 0 reference number for easy reference.

2. DISCUSSION

- 2.1 APSAPG has to take into account the regional characteristics and uniqueness in defining the future Seamless ATM concept for the APAC Regions.
- 2.2 The APAC Regions has 38 member States and 2 Special Administrative Regions, with a large differential in ATM capabilities as well as air traffic operating environment. It would be unrealistic to expect all states in the regions are managing or will be managing the same type and level of air traffic operations. It is therefore highly desirable for the APSAPG to conduct a gap analysis in order to ascertain the current ATM capability and type of operations of individual state so as to gauge an appropriate starting level for defining the Seamless ATM Concept Plan.

2.3 The following major areas should be covered in the gap analysis:

2.3.1 Ground-Ground and Air-Ground Communications Capability (AIDC B0-25), (ADS-C/CPDLC/FANS-1A B0-40)

It is envisaged that controller-to-controller and controller-to-pilot will communicate through ground-to-ground and air-to-ground data link communications rather than through voice, with great reduction in human error in the future ATM operational environment, APAC States/Administrations would need to decide on the timeframe when they are ready to transition to the digital environment to form an integral communications network.

2.3.2 Navigation Capability (PBN B0-65)

A high percentage of aircraft operating in the APAC Regions is PBN capable, though many of which would probably need the proper operational approval to be issued by their respective State Regulatory Authorities. A mechanism need to be put in place to facilitate mutual recognition of RNAV/RNP operational approval of APAC member States, thereby promoting regional implementation of PBN. With PBN, aircraft navigation will be less reliance on expensive ground-based navigation aids, which in turn would enable greatly reduced aircraft separation, resulting in increased airspace capacity and more direct/efficient air routes.

2.3.3 ATC Surveillance Capability (ADS-B IN B0-85), (ADS-B IN/OUT B0-86)

APAC airspace is characterized by a combination of oceanic and continental FIRs, with the majority of the South China Sea being covered by surveillance radar. As tasked by DGCA/48, a combination of ADS-B OUT integrated with primary and secondary surveillance technologies appears to be the most appropriate means of ATC surveillance for the Regions. In this regard, the APSAPG needs to identify the areas/ sub-regions that warrant priority attention and expedite ADS-B implementation in accordance with DGCA Action Item 48/4.

2.4 An preliminary assessment of the applicability of Block 0 modules in the APAC Regions is described in the ensuing paragraphs:

2.4.1 Airspace Management (Airspace Planning/ FUA/ City-pair CDM/ Flexible Routing B0-10)

The APAC airspace is fragmented and lacks transparency in many areas. The South East Asia Route Review Task Force (SEA-RR/TF) has only been able to achieve slow progress in the past few years. The conventional 'airspace border' concept is probably too rigid to allow for the efficient use of airspace resources. In order to satisfy the projected air traffic growth demand, a more collaborative airspace planning and implementation mechanism is necessary. Functional Airspace Blocks (FAB) capitalizing on the efficiency offered by PBN air route design and aircraft capabilities, where airspace/ air routes are interoperable and designed in such a way to facilitate major traffic flow should be promoted. In this regard, the APSAPG needs to identify areas/sub-regions that need priority attention and mobilize resources (e.g. SEA-RR/TF) to work out a pragmatic roadmap for progressive regional airspace enhancement programme.

2.4.2 Enroute Separation Minima (ADS-B IN/OUT B0-86), (AIDC B0-25)

The progressive application of RNAV/RNP as well as ADS-B across the region would enable higher levels of airspace capacity and ATM efficiency, with reduced traffic congestion. The more widespread use of digital data communications between flight crews and controllers as well as between ground controllers would also drastically reduce the potential for human induced errors, and enable reduced enroute separation. Taking into account the current traffic level, projected traffic growth, ATC surveillance as well as aircraft capabilities, etc., the APSAPG should identify areas/sub-regions that warrant priority attention and work out a roadmap for progressive reduction of enroute separation.

2.4.3 PBN Operations in Terminal Area (PBN/CDO/GLS/GNSS Cat I B0-65)

In line with the ICAO PBN implementation roadmap, the APSAPG should collaborate with the PBN/TF and the ICAO APAC FPP to identify areas/ sub-regions that warrant urgent ICAO attention and deploy regional resources to assist/facilitate implementation of RNAV/RNP approach and departure procedures as well as RNP/RNAV SIDs and STARs.

2.4.4 Airport Operations (A-CDM B0-80), (A-SMGCS B0-75), (Wake Vortex B0-70)

To cope with the projected traffic growth in the region, it is essential to ensure uninterrupted, safe and efficient airport operations under all weather situations, through implementing various enhancement measures. The APSAPG could identify airports in the Regions that would most likely be benefited by these items and facilitate their implementation through ICAO.

2.4.5 Air Traffic Flow Management (TBFM/AMAN/DMAN B0-15), (Collaborative ATFM/ CFMU B0-35)

To ensure the APAC States can reap the economic benefits brought about by the projected traffic growth, DGCA Action 48/8 urge the ICAO Regional Office to coordinate an APAC regional ATFM Strategy. The ATM Operational Concept envisages a more strategic approach to ATM, and through collaborative decision-making, a reduction in the reliance on tactical flow management. It is inevitable that tactical flow intervention will continue to be required; however closer coordination between airspace users and ATM service providers can reduce the need for routine tactical intervention which is often disruptive to aircraft operations. In this regard, the Region currently lacks a centralized ATFM body and may not need one for the time being, however, the APSAPG may need to guide the Regional Office in devising a pragmatic cooperative ATFM mechanism applicable for this Region.

2.4.6 Aeronautical Information Management (AIXM/eAIP B0-30)

A common digital aeronautical data information exchange model for the region is essential for disseminating the right information to the right user at the right time. In this regard, the APSAPG should set up a roadmap to progressively realize improvement in delivering Aeronautical Information Management Service through AIXM.

2.4.7 Avionics Improvement (ACAS_B0-101)

Improvement on ACAS brings along significant safety and operational benefits for flight operations especially in busy airspace. It offers a potent last-ditch defence for pilots as well as ATC in recovering from undesirable flight safety incidents. EuroControl has already promulgated the requirements for all relevant avionics installations no later than December 2015. APSAPG should consider its applicability and implementation in the APAC Regions.

2.4.8 Air Traffic Operations (CDOs B0-05), (CCOs B0-20)

While improvement in air traffic operations could generally be expected by wider applications of CDOs and CCOs. Individual Authorities would have specific and unique considerations in terms of its local airspace and air traffic management. A broad brush application throughout the Regions may not be appropriate. In this regard, individual States could engage the operators and work out a mutually acceptable solution for local application.

2.5 While there are 4 Blocks in the ICAO ASBU (Block 0-3), it is considered that Block 0 carrying the most significance at this stage and laid down the foundation for progressive implementation of other Blocks. An assessment of the critical minimum operational and system items pertaining to the latest 15 modules of Block 0 is given in the **Attachment**. It is suggested that the APSAPG to focus more on those modules that involve “Regional” implementation across multiple FIRs, which requires joint efforts from parties concerned. Modules for “Local” implementation will be under the discretion of local ANSP subject to their own needs. Out of the 15 Block 0 modules, 8 are categorized as requiring ‘Regional’ attention and 4 of these ‘Regional’ items are considered as critical minimum.

2.6 To reap early benefits of the readily available ASBU Block 0 technologies, it is recommended that States should consider forming city-pair or sub-regions to facilitate coordinated implementation of ADS-B, AIDC, CDM, ATFM as well as ADS/CPDLC.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) take note of the information and preliminary assessment results in this working paper; and,
- b) deliberate and formulate a list of critical minimum operational and system needs for use in the APAC Regions; and,
- c) discuss and adopt other measures that the meeting may deem necessary.

Aviation System Block Upgrades
Critical Minimum Operational and System Items
(15 modules for Block 0)

Block 0		Type	APAC Regional Critical Minimum
PIA 1	B0-65 Optimisation of approach procedures including vertical guidance (PBN/CDO/GLS/GNSS (Cat I)) (name changed)	Local	N/A
	B0-70 Increased Runway Throughput through Wake Vortex Separation	Local	N/A
	B0-75 Improved Runway Safety (A-SMGCS Level 1-2 and Cockpit Moving Map) (name changed)	Local	N/A
	B0-80 Improved Airport Operations through A-CDM	Local	N/A
	B0-15 Improved Runway Traffic Flow through Sequencing (TBFM/AMAN/DMAN) (name changed)	Local	N/A
PIA 2	B0-25 Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration (AIDC)	Regional	Yes
	B0-30 Service Improvement through Digital Aeronautical Information Management (AIXM/eAIP)	Regional	No
PIA 3	B0-10 Improved Operations through Enhanced En- Route Trajectories (Airspace Planning/FUA/City-pair CDM/Flexible Routing)	Regional	Partial
	B0-35 Improved Flow Performance through Planning based on a Network-Wide view (Collaborative ATFM/CFMU)	Regional	Yes
	B0-85 (original B0-100) Air Traffic Situational Awareness (ATSA) (ADS-B IN/Cockpit Traffic Display)	Regional	No
	B0-86 (note) Improved Access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B (ADS-B IN/OUT)	Regional	No
	B0-101 (note) ACAS Improvements	Regional	No
PIA 4	B0-05 Improved Flexibility and Efficiency in Descent Profiles (CDOs)	Local	N/A
	B0-40 Improved Safety and Efficiency through the initial application of Data Link En-Route (ADS-C/CPDLC/FANS-1A)	Regional	Yes
	B0-20 Improved Flexibility and Efficiency in Departure Profiles (CCOs)	Local	N/A

Note : Newly added by the ICAO to the GANIS document in Septemebr 2011.