



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 3: Drivers for a Seamless ATM Environment**

**WHY SEAMLESS ATM NEEDS EVERYONE'S SUPPORT**

(Presented by the Secretariat)

**SUMMARY**

This paper introduces a presentation of the drivers that are behind the Seamless ATM development, and why everyone, from political bodies to on the job controllers, needs to support this initiative.

This paper relates to –

**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-2 Reduced vertical separation minima
- GPI-3 Harmonization of level systems
- GPI-4 Alignment of upper airspace classifications
- 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-13 Aerodrome design and management
- GPI-14 Runway operations
- GPI-15 Match IMC and VMC operating capacity
- GPI-16 Decision support systems and alerting systems
- GPI-17 Data link applications
- GPI-18 Aeronautical information
- GPI-19 Meteorological Systems
- GPI-20 WGS-84
- GPI-21 Navigation systems
- GPI-22 Communication infrastructure
- GPI-23 Aeronautical radio spectrum

**1. INTRODUCTION**

1.1 On 17 October 2012 the Asia Pacific Economic Cooperation body (APEC) was provided a briefing by ICAO in accordance with the APSAPG Terms of Reference.

**2. DISCUSSION**

Heading

2.1 While most of the discussions regarding Seamless ATM have involved ATM experts, the scale of the initiative and need for close collaboration between States, as well as the need for significant changes in the way States provide services, required input from political and economic bodies. In addition to APEC, the following entities were invited to APSAPG to facilitate political feedback and buy-in:

- Association of Southeast Asian Nations (ASEAN); and
- South Asian Association for Regional Cooperation (SAARC).

2.2 A presentation is provided at **Attachment 1**.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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# Why Seamless ATM Needs Everyone's Support

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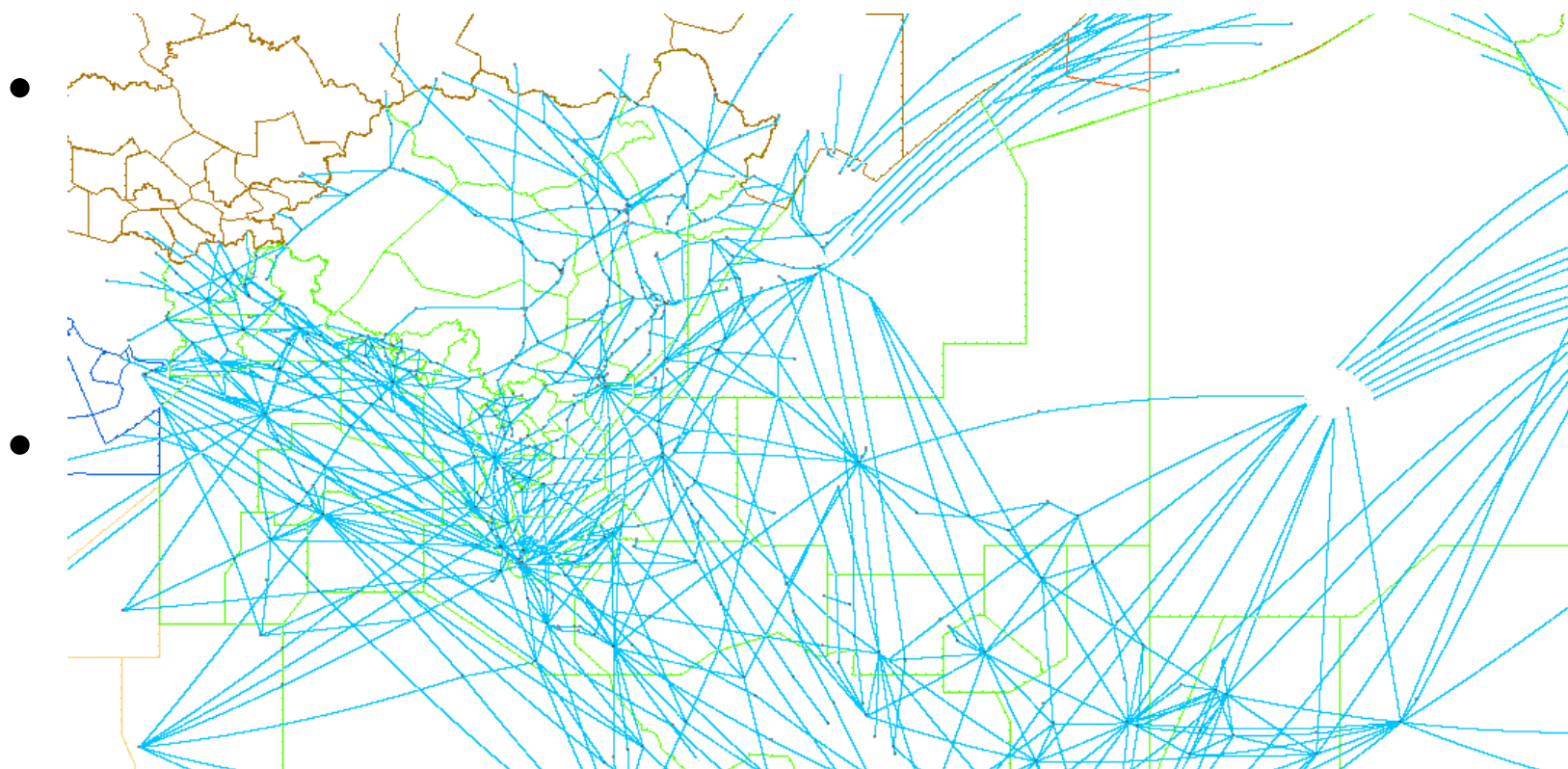


# Introduction

- The main objective of this presentation is to provide an insight into the important Seamless ATM development, which could be the largest Asia/Pacific aviation infrastructure and operational efficiency project in history.
- However the level of support from this project will be entirely dependent on whether States understood and agreed with its messages and then inspired necessary change – in other words, how much political support the objectives had.
- The other aim of the presentation is to encourage State thinking beyond individual programmes like Airport Collaborative Decision-Making (A-CDM), to system-wide improvement, as small steps would not be enough.

# Problem Statement

- Asia Pacific has a very fragmented airspace (38 States and 2 Special Administrative Regions), some of which have multiple FIRs.





# Problem Statement

- Capital expenditure for Asia/Pacific airport infrastructure was expected to top USD60B in the next 10 years, from a total global projected airport capital expenditure of USD150B – where was the equivalent for Air Navigation Service Provider (ANSP) infrastructure?
- It would be inconceivable that traffic increases of this magnitude could be handled effectively and efficiently without significant enhancement of the ATM processes.
- In Asia/Pacific, even aircraft flying short-haul intra-regional routes were affected by different procedures and inconsistent infrastructure, which were neither standardized nor harmonized.



# Problem Statement

- Historically, States and ANSPs have developed their own infrastructure tailored only to suit their own national needs, and some ANSPs did not operate within a business-like environment.
- There was no means of practically undertaking a European or North American type of Air Traffic Management (ATM) modernisation programme, even if Japan had an equivalent for its own airspace (CARATS).
- However, the Asia/Pacific could still make huge strides in safety and efficiency simply by addressing the **organisational** and **human performance** issues that prevent optimal ATM, even with the current systems.



# Seamless ATM

- The 46th DGCA conference (Japan, 2009) committed to a Seamless ATM Asia/Pacific by issuing the KANSAI statement.
- APANPIRG formed the Asia/Pacific Seamless ATM Planning Group (APSAPG), which was tasked with developing an Asia/Pacific Seamless ATM Plan.
- The Seamless ATM Plan was intended to conceptualise future operations, and determine the key and minimum requirements for seamless **gate-to-gate** ATM operations – an efficiency focus for both passenger and aircraft movements.
- The facility-orientated Aviation System Block Upgrade (ASBUs) were only **part** of the overall solution.





# Seamless ATM

- One of the potentially sensitive tasks was to compare different State operating capabilities and practices, so the current status of ATM could be verified.
- Recommendations to improve would include collaboration between States so that resources, research and communication were improved for everyone.
- The Plan had to determine priorities, programmes, and mechanisms for implementation of Seamless ATM, including phases with broad timelines and projected deliverables.
- Technology and automation could greatly enhance efficiency, especially in the terminal area where all that is gained en-route could be easily lost.



## Supporting Change

- Some States had a very positive view of regional standards, while others do not always see harmonisation as positive for their own reasons - these could include civil/military cooperation issues, or simply because of high-level politics.
- Thus an important part of the process was to brief and consult with regional bodies to solicit their views and support, such as (these bodies are invited to the APSAPG/3 and 4 meetings):
  - ASEAN (Association of Southeast Asian Nations);
  - APEC (Asia-Pacific Economic Cooperation); and
  - SAARC (South Asian Association for Regional Cooperation).



## Supporting Change

- ASEAN recently announced an Open Sky policy for airlines, to be implemented in 2015, clearly promoting greater efficiency and economic growth within Southeast Asia.
- However, there was no parallel ASEAN agreement to improve aviation infrastructure needed for the Open Sky initiative.
- ASEAN Open Sky was likely to result in a steep increase in airlines and aircraft within congested SE Asian airspace.
- APEC has been actively involved in aviation infrastructural improvements, but what is needed now is support for the more holistic Seamless ATM project, which includes human performance, procedural changes, and was all-encompassing.



## Supporting Change

- Engagement by the military was necessary to understand that supporting the civil aviation air navigation structure was consistent with a mission to protect the nation, by also **protecting the vital economies** of the region.
- Military needs must be integrated within a predominantly civil system, to achieve the necessary **balance** of the civil and the military missions, which were not inconsistent.
- The message for change in the relationship had to emanate from the **highest levels**.
- Political policies that supported economic development with a balancing of civil/military needs were very important



# Civil/Military Engagement

- In many places the military did not engage well with civilian entities and even 'owned' the airspace.
- Predominant in any State's consideration was to enhance civil/military cooperation if the economy was to benefit.
- Airspace/ATM procedures should be predominantly managed by a **civil system**, with the military's needs taken into account.
- Sharing civil surveillance data allowed more effective military monitoring, while adjacent States could share publically broadcast ADS-B signals without security implications.
- Supporting the civil air navigation infrastructure, and thus the economy, were consistent with actions to protect the State.



# Air Traffic Control

- Seamless ATM should improve ATC tools and systems; with harmonised procedures there should be less bottlenecks and a reduction of ATC workload.
- There was no immediate plan to amalgamate ATC Centres and airspace, but the concept of sub-regional collaboration in the long term for ATFM and eventually, ATC may provide many advantages in terms of unified organisational systems, service levels, training regimes and personnel licences.
- ATS surveillance data would be expected to be shared and safety nets would assist controllers, where there were no such systems today.



# Air Traffic Control

- The use of procedural separation standards, even with tactical capability using ATS surveillance being available, created workload trying to manage so many aircraft procedurally with conflicts due to large, conservative separation standards.
- ANSPs also needed to train controllers to use the ATS surveillance and systems in an optimal manner, such as the application of positive control techniques when the spacing between aircraft reduced towards minimum separation.
- One factor that should be considered was the application of 'Just Culture' and an open ('no blame') reporting culture, so that human error was managed in a modern context.



# Air Traffic Control

- None of the procedures being recommended were unsafe or difficult as they had been used for decades, but they sometimes ran counter to cultural norms.
- ATM in the Asian Region was characterised by long shift lengths and compressed schedules, which may not be best practice in protecting the controller's human performance.
- The experience of International Organizations such as CANSO, IFATCA, IFALPA and IATA , as well as ICAO was crucial in up-skilling senior managers and operational decision-makers regarding international best practice.





## Possible Future Concept

- There was a need to develop Sub-Regional or Regional ATM Improvement Research and Development (AIRD) Institutes.
- Inter-linked (data-sharing) Sub-Regional Air Traffic Flow Management (ATFM) units should be developed:
  - South Asia;
  - Southeast Asia;
  - China; and
  - East Asia/North Pacific (excluding mainland China); and
  - Australasia.
- The ATFM units could be a single unit at one physical location, or they could be a virtual unit, composed of a number of operational positions and automated systems located in several different physical locations, including different States.



## Possible Future Concept

- While virtual units could be a solution to overcome political barriers in terms of all involved States having a role, the concept would need to be supported by robust communications and contingency arrangements.
- The location of any non- virtual ATFM Centres and Area Control Centres (or headquarters of such entities) could be considered at smaller States to reduce potential barriers.
- There is a need for a collaborative approach in ATM service provision that provides unified management, training, and staffing. ANS staff could move from one State to another under the umbrella of a single ANSP and common licenses, and also provide contingency services.



## Possible Future Concept

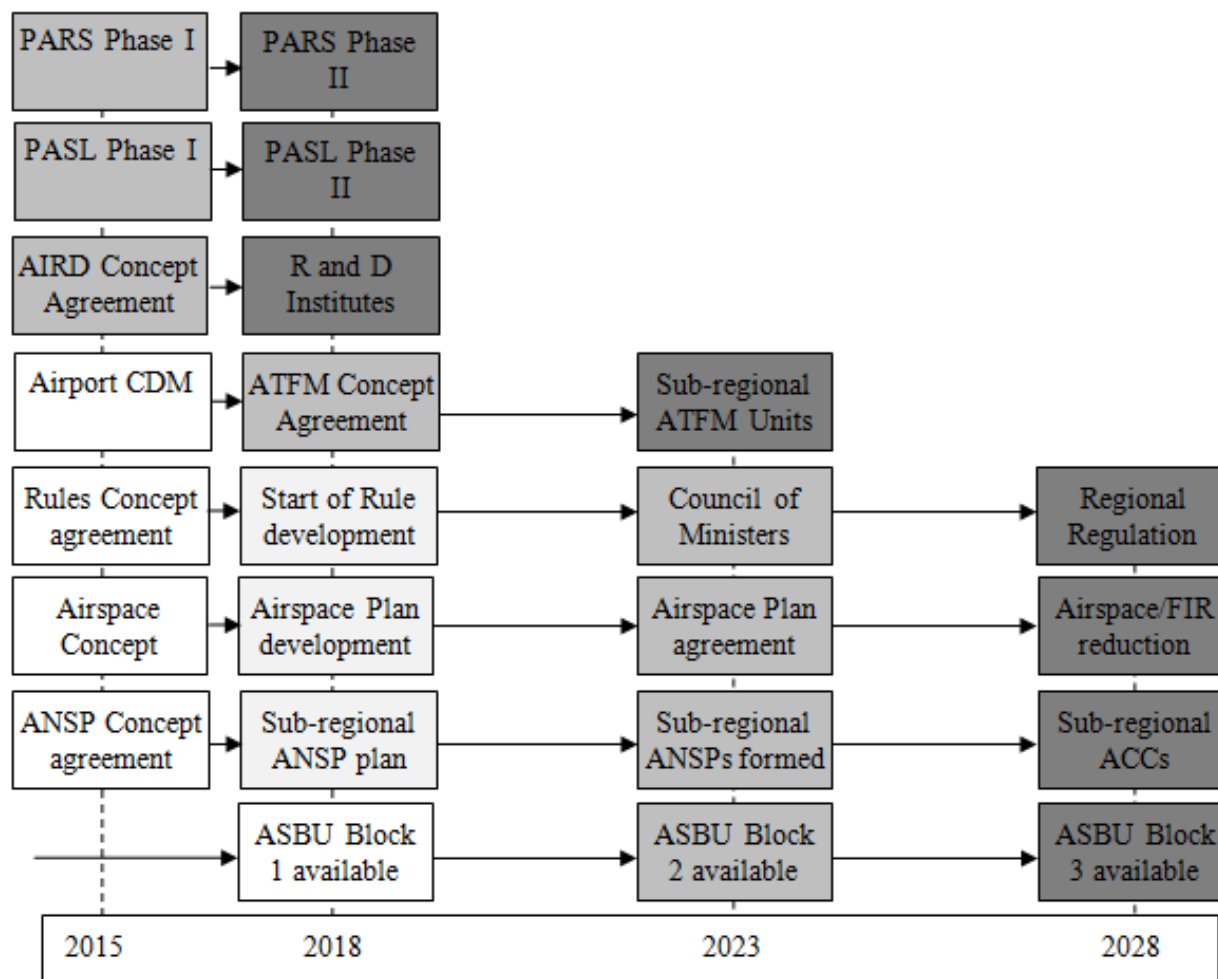
- A unified procurement programme would provide greater transparency in financial management and act as a stronger entity to improve vendor competitiveness. Airlines would receive a harmonised service and possibly a harmonised charging regime. The economies of scale would provide a much greater technical capability within a sub-regional ANSP.
- The resulting harmonisation of ATM systems from sub-regional ANSPs may allow a reduction in FIRs, airspace complexity and ANSPs from the current fragmented and multiple provider system. It should be noted that there should be no sovereignty or security issues in terms of delegated airspace or services under the terms of Annex 11.



## Possible Future Concept

- There is a need for the concept of regional regulation to be conceptualised and developed, to ensure a high level of harmonisation.
- In addition, the Asia/Pacific Region does not have a strong global voice that represents the Region like the FAA and EASA does for the USA and Europe respectively.
- Rules could be developed through an AIRD and assessed by a Council of Transport Ministers representing States involved, vetting rules and guidance that would be applied in each State represented.

# Possible Future Concept





## Conclusion

- ICAO seeks high level political support from Asia/Pacific Regional bodies that in the medium and long term may mean a much closer integration of systems where possible (regardless of political barriers) if the Seamless ATM Plan was to ultimately succeed.
- There would be little to gain from a bold and visionary plan if there was a lack of political support for collaboration in areas such as research and system design, enhancement of CNS systems, reduction of airspace and ATM complexity, and civil/military cooperation.



## Conclusion

- In discussing the early possibilities that existed for a giant stride in ATM capability, it was noticeable that some States were starting to realise that the Kansai Statement meant significant change, especially regarding the complex cultures that could act as a barrier to such improvement.
- The challenge for senior decision-makers was to consider what mechanisms and messages were necessary to support such change, focusing on the paradigm shift necessary in civil aviation regulatory and ANSP management.
- We need everyone to discuss, understand, and **support** the vital changes needed for Seamless ATM.