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Asia Pacific Seamless ATM Plan and Implementation of ATFM in Asia Pacific

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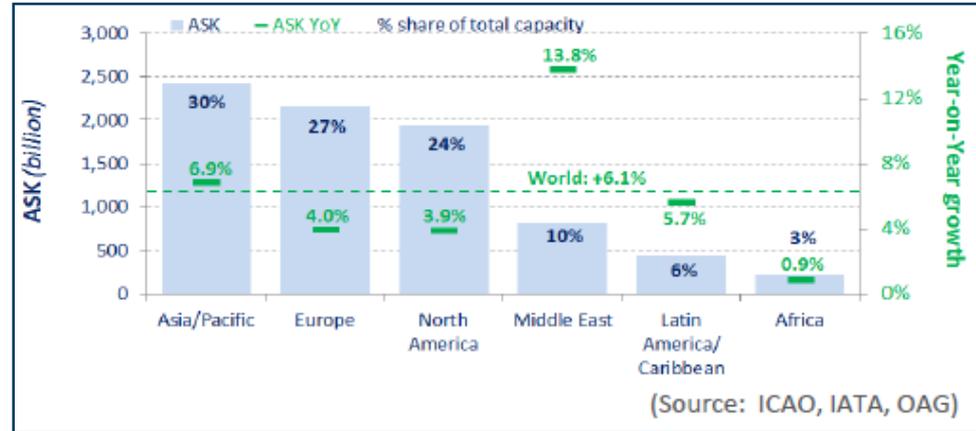
Deputy Regional Director - ICAO Asia and Pacific Office

Global Ministerial Conference
Riyadh, Saudi Arabia, 29 – 31 August 2016



APAC Region

- Growth in air traffic
- Different level of aviation activities
 - 38 States, 40 CAAs, 42 ANSPs, 50 FIRs
- Diversified air navigation infrastructure
- Vast oceanic airspace
- Civil / Military

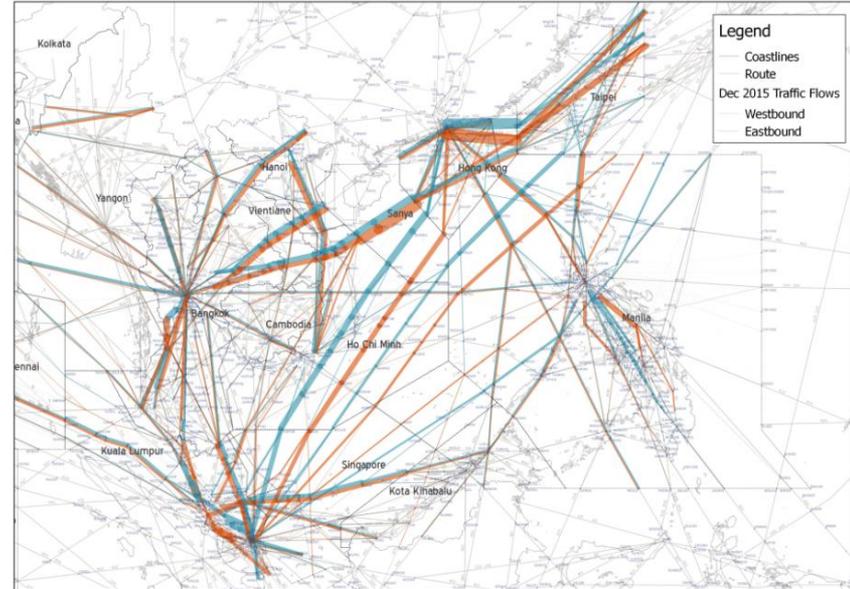


- States / ANSPs have developed their own infrastructure tailored to suite their own national needs.
- No means of coordinated / harmonized ATM modernization plans applicable to APAC region.



Seamless ATM Plan

- DGCA Conference committed to a future ATM system for Asia/Pacific
- DGCA agreed APANPIRG be a platform to discuss a future ATM system for the Asia Pacific Region.
- APANPIRG formed the APAC Seamless ATM Planning Group to develop a Seamless ATM Plan.
- Asia/Pacific Seamless ATM Plan, developed by APSAPG was endorsed by APANPIRG/24 (June 2013).





Asia/Pacific Seamless ATM Plan

- ATM operations
 - Harmonization, Interoperability
 - Efficiency focus for aircraft operations
 - Preferred Aerodrome/Airspace and Route Specifications (PARS)
 - Performance Improvement Plans for aerodrome, terminal areas, en-route and oceanic.
 - Preferred ATM Service Levels (PASL)
 - ATM service level at busy airports, terminal areas, en-route
- Two Phases
 - Phase 1 November 2015
 - Phase 2 November ~~2018~~ 2019 (Plan update during 2016)
 - Aligned with ASBU timeframe
 - Not binding on States, but harmonization and interoperability

INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC SEAMLESS ATM PLAN

Version 1.0, June 2013

This Plan was developed by the Asia/Pacific Seamless ATM Planning Group (APSAPG)

Approved by APANPIRG/24 and published by the ICAO Asia and Pacific Office, Bangkok



Seamless ATM Implementation Elements – priority 1

Specification title	Module
Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	B0-NOPS
Performance-based Navigation (PBN) Approach	B0-APTA
Ground-based surveillance	B0-ASUR
ATS Inter-facility Data-link Communications (AIDC)	B0-FICE
ATS surveillance with data integrated	B0-ASUR
ADS-C, CPDLC	B0-TBO
Aeronautical Information Management (AIM)	B0-DATM
Civil Military use of Special Use of Airspace (SUA)	B0-FRTO
Strategic Civil Military coordination	Regional
Tactical Civil Military coordination	Regional



Seamless ATM Implementation Elements – priority 2

Specification title	Module
ATC Sector Capacity	Regional
Airport Collaborative Decision-Making (ACDM)	B0-ACDM
Continuous Descent Operations (CDO)	B0-CDO
Continuous Climb Operations (CCO)	B0-CCO
Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	B0-CCO B0-CDO
Arrival Manager/Departure Management (AMAN/DMAN)	B0-RSEQ
Performance-based Navigation (PBN) Routes	B0-FRTO
Performance-based Navigation (PBN) Airspace	Regional



Seamless ATM Implementation Elements – priority 2

Specification title	Module
Safety Nets	B0-SNET
Airborne Safety Systems	B0-ACAS
Airspace classification	Regional
Flight Level Orientation Scheme (FLOS)	Regional
Flight Level Allocation Schemes (FLAS)	Regional
Automated Transfer of Control	Regional
ATS Surveillance data sharing	Regional
ATM systems enabling optimal PBN/ATC operations	B0-APTA
ATC Horizontal separation	Regional



Seamless ATM Implementation Elements – priority 2

Specification title	Module
Meteorological Information	BO-AMET
ATM Managers' Performance	Regional
ATC simulators performance	Regional
Safety assessment of changes	Regional
ATM Operators' performance	Regional
Civil Military system integration	Regional
Civil Military Nav aids joint provision	Regional
Civil Military common training	Regional
Civil Military common procedures	Regional



Seamless ATM Implementation Elements – priority 3

Specification title	Module
Apron Management	Regional
ATM-Aerodrome Coordination	Regional
Aerodrome capacity	Regional
Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	B0-SURF
Performance-based Navigation (PBN) Visual Departure and Arrival Procedures	Regional
UPR and DARP	B0-FRTO
Air traffic situational awareness	B0-ASEP
Optimized wake turbulence separation	B0-WAKE
In-trail procedures	B0-OPFL



Reporting / monitoring

- Seamless ATM Online Reporting System
- Internet-based reporting tool in an effort to ease the submission of the Seamless ATM reports for States

Priority	Seamless Plan Item/ASBU Reference	Applicable or not	Seamless ATM plan phase I (Nov. 15)		Seamless ATM plan phase II (Nov. 18)		Remarks (e.g. project scope, FIRs or routes concerned by implementation, etc.)	Issues Encountered/ Expected
			Date of Complete Implementation (Planned or Actual)	Progress	Date of Complete Implementation (Planned or Actual)	Progress		
3	Apron Management	Applicable <input type="text" value="v"/>	01/01/2010	100% <input type="text" value="v"/>			Pre-existing and has been in place for many years.	
3	ATM-Aerodrome Coordination	Applicable <input type="text" value="v"/>	01/01/2010	100% <input type="text" value="v"/>			Pre-existing and has been in place for many years.	
3	Aerodrome capacity	Applicable <input type="text" value="v"/>	01/01/2010	100% <input type="text" value="v"/>		Select... <input type="text" value="v"/>	Pre-existing and has been in place for many years. Brisbane, Sydney, Melbourne and Perth (4 of the 5)	Aerodrome movements are monitored monthly at all Major Aerodromes. Any trends are <input type="text" value="v"/>
3	Safety and Efficiency of Surface Operations	Applicable <input type="text" value="v"/>	30/06/2015	100% <input type="text" value="v"/>			Sydney, Melbourne and Brisbane all have electronic surface movement guidance (known as ASMSI). Perth will	There are no plans to provide Adelaide with an ASMGCS in the near future. 100% was achieved in mid April 2015 <input type="text" value="v"/>
2	Arrival Manager/Departure Management	Applicable <input type="text" value="v"/>		0% <input type="text" value="v"/>	29/01/2021	20% <input type="text" value="v"/>	An arrival management system (known as	An integrated AMAN/DMAN is not expected until post 2020 with the <input type="text" value="v"/>



Seamless Item	Air Traffic Flow Management/ Collaborative Decision-Making (ATFM/CDM)	Performance-based Navigation (PBN) Approach	Civil Military use of SUA	Strategic Civil Military coordination	Tactical Civil Military coordination	ATS Inter-facility Data-link Communications (AIDC)	ADS-C and CPDLC	Aeronautical Information Management	ADS-B airspace	ATS surveillance with data integrated
ASBU	80 B0-NOPS	110 B0-APTA	360 B0-FRTO	370 Regional	380 Regional	220 B0-FICE	280 B0-TBO	300 B0-DATM	180 B0-ASUR	270 B0-ASUR

PRIORITY

THE 10 ASIA-PACIFIC REGIONAL PRIORITIES (APANPIRG/25, 2014)

Country	Year	ATFM/CDM	PBN	Civil Military use of SUA	Strategic Civil Military coordination	Tactical Civil Military coordination	AIDC	ADS-C and CPDLC	Aeronautical Information Management	ADS-B airspace	ATS surveillance with data integrated
Australia	2016 - 3	100%	100%	100%	100%	100%	100%	100%	76.90%	100%	100%
Bangladesh	2015 - 2	N/A	30%	No data	No data	100%	Not yet analysed	N/A	61.50%	N/A	Not yet analysed
Bhutan	2015 - 3	N/A	10%	N/A	No data	No data	No data	N/A	23%	N/A	Not yet analysed
China	2015 - 3	77.70%	100%	N/A	100%	100%	100%	N/A	38.50%	11.10%	100%
Democratic People's Republic of Korea	2016 - 2	100%	N/A	100%	100%	100%	100%	N/A	No data	100%	100%
Fiji	2015 - 3	100%	70%	N/A	N/A	N/A	100%	100%	7.70%	100%	100%
French Polynesia, France	2015 - 3	N/A	100%	N/A	No data	N/A	100%	100%	7.70%	100%	100%
Hong Kong, China	2016 - 3	100%	100%	100%	100%	100%	100%	N/A	69%	100%	94%
India	2015 - 4	0%	100%	100%	100%	100%	100%	100%	100%	0%	100%
Indonesia	2015 - 4	100%	40%	0%	0%	0%	50%	100%	No data	No data	Not yet analysed
Japan	2014 - 4	100%	0%	100%	100%	100%	100%	100%	No data	0%	100%
Macao, China	2014 - 4	N/A	No data	N/A	N/A	N/A	N/A	N/A	38.50%	N/A	N/A
Malaysia	2015 - 4	50%	0%	100%	100%	100%	100%	50%	76.90%	0%	100%
Maldives	2016 - 1	Not yet analysed	100%	N/A	N/A	N/A	0%	0%	0%	0%	100%
Mongolia	2016 - 1	100%	N/A	Not yet analysed	Not yet analysed	Not yet analysed	100%	No data	No data	100%	40%
Nepal	2016 - 1	Not yet analysed	No data	N/A	N/A	N/A	100%	N/A	Not yet analysed	100%	No data
New Caledonia, France	2015 - 2	N/A	0%	N/A	N/A	N/A	N/A	N/A	Not yet analysed	N/A	N/A
New Zealand	2015 - 2	50%	100%	100%	100%	100%	100%	50%	No data	No data	100%
Philippines	2016 - 1	100%	100%	100%	100%	0%	0%	100%	46.20%	0%	50%
Republic of Korea	2015 - 3	100%	No data	100%	100%	100%	No data	N/A	84.60%	No data	100%
Singapore	2015 - 3	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sri Lanka	2015 - 4	N/A	50%	0%	100%	100%	100%	100%	46.20%	100%	100%
Thailand	2015 - 4	0%	80%	100%	100%	100%	0%	N/A	15.40%	0%	100%
United States	2015 - 1	50%	N/A	100%	100%	100%	50%	50%	No data	50%	N/A

Nov - 2015

Indicator

% of High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes using operational ATFM platforms incorporating CDM

% of high density aerodromes with precision approaches or APV or LNAV (High density aerodrome is defined by Asia-Pacific Seamless ATM Plan as aerodromes with scheduled operations in excess of 100,000/year)

% of FIRs in which FUA is implemented

Have you established a national civil/military body that performs strategic civil-military coordination?

Have you established a formal civil military liaison for tactical response?

% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs

% of FIRs utilising data link en-route in applicable airspace

% of Phase 1 and 2 AIS-AM elements completed (0-13)

% of FIRs where Category 5 airspace and Category 1 airspace supporting high density aerodromes are designated as ADS-B airspace?

% of ACCs with ATS Surveillance using ADS-B, MLAT or radar in Category 5 airspace, and having data integrated into the ATC system situation display



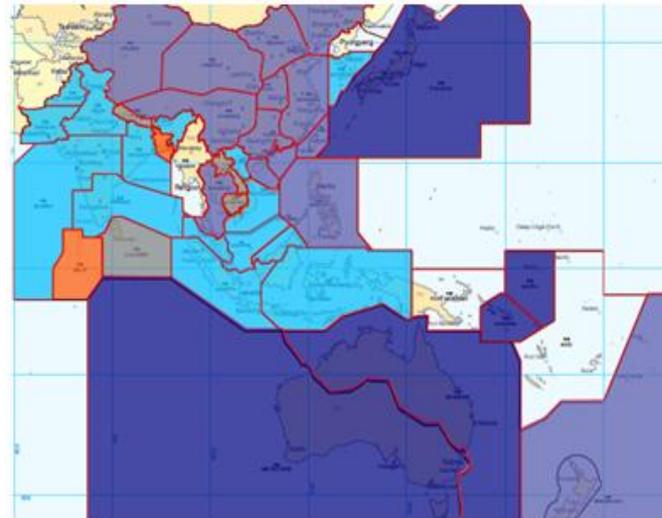
Implementation of ATFM in the Asia Pacific Region



Need for ATFM

- First response to increased traffic is Increase Capacity
- Growing demand and capacity imbalance resulted in congestion, delays, costs, potential safety risk.
- Capacity
 - Typhoon, cyclone, weather, military activities
- Demands
 - Increase during holiday season
- Established Asia/Pacific ATFM Steering Group to develop a common regional ATFM framework (2013)

ATFM Infrastructure



Australia
Japan
China
Hong Kong
New Zealand
Philippines
Thailand
India
Indonesia
Rep of Korea
Malaysia
Pakistan
Singapore
Viet Nam
Bangladesh
Maldives

Advanced

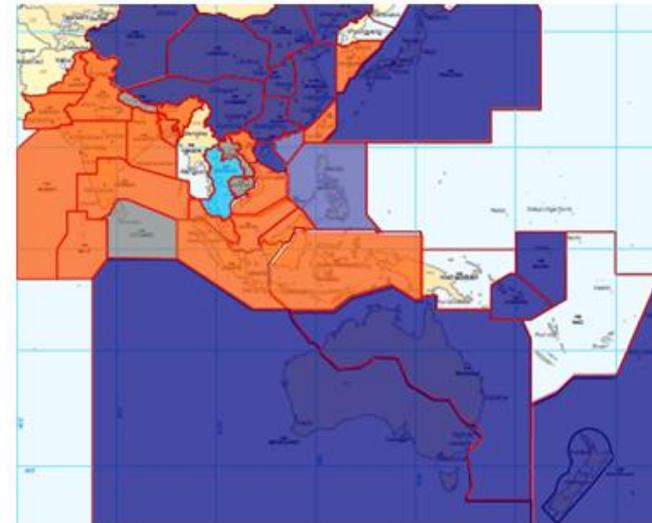




Current ATFM

- Limited ATFM and CDM to manage traffic flows within their area.
- Tool/process to monitor and predict traffic, but not accurate, not shared with others
- Strategic capacity balance – airport slot allocation system
- Tactical ATFM – reactive in nature. Traffic data not accurate, not shared
- Reactive management of demand – resulted in airborne holding, vectoring
- No wider network view

CDM Procedures and Tools



Australia
China
Japan
New Zealand
Hong Kong
Philippines
Thailand
India
Indonesia
Bangladesh
Rep of Korea
Malaysia
Maldives
Pakistan
Singapore
Viet Nam

Advanced





APANPIRG Asia Pacific Air Navigation Planning and Implementation Regional Group

- Traffic flow management collaboratively with shared information, Network-based Flow Management to be implemented
- ATFM SG developed
 - Asia/Pacific Regional Framework for Collaborative ATFM
 - Asia/Pacific Regional ATFM Concept of Operations.
- Endorsed two documents in 2015

INTERNATIONAL CIVIL AVIATION ORGANIZATION



ASIA/PACIFIC REGIONAL

AIR TRAFFIC FLOW MANAGEMENT

CONCEPT OF OPERATIONS

Version 1.0 September 2015

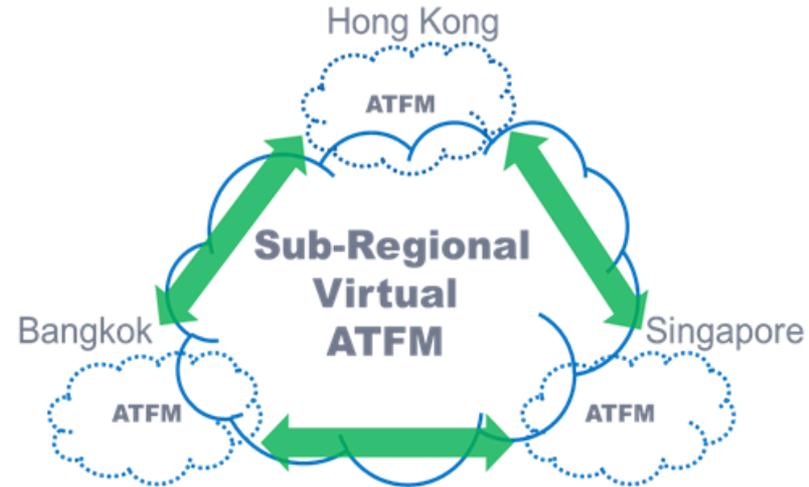
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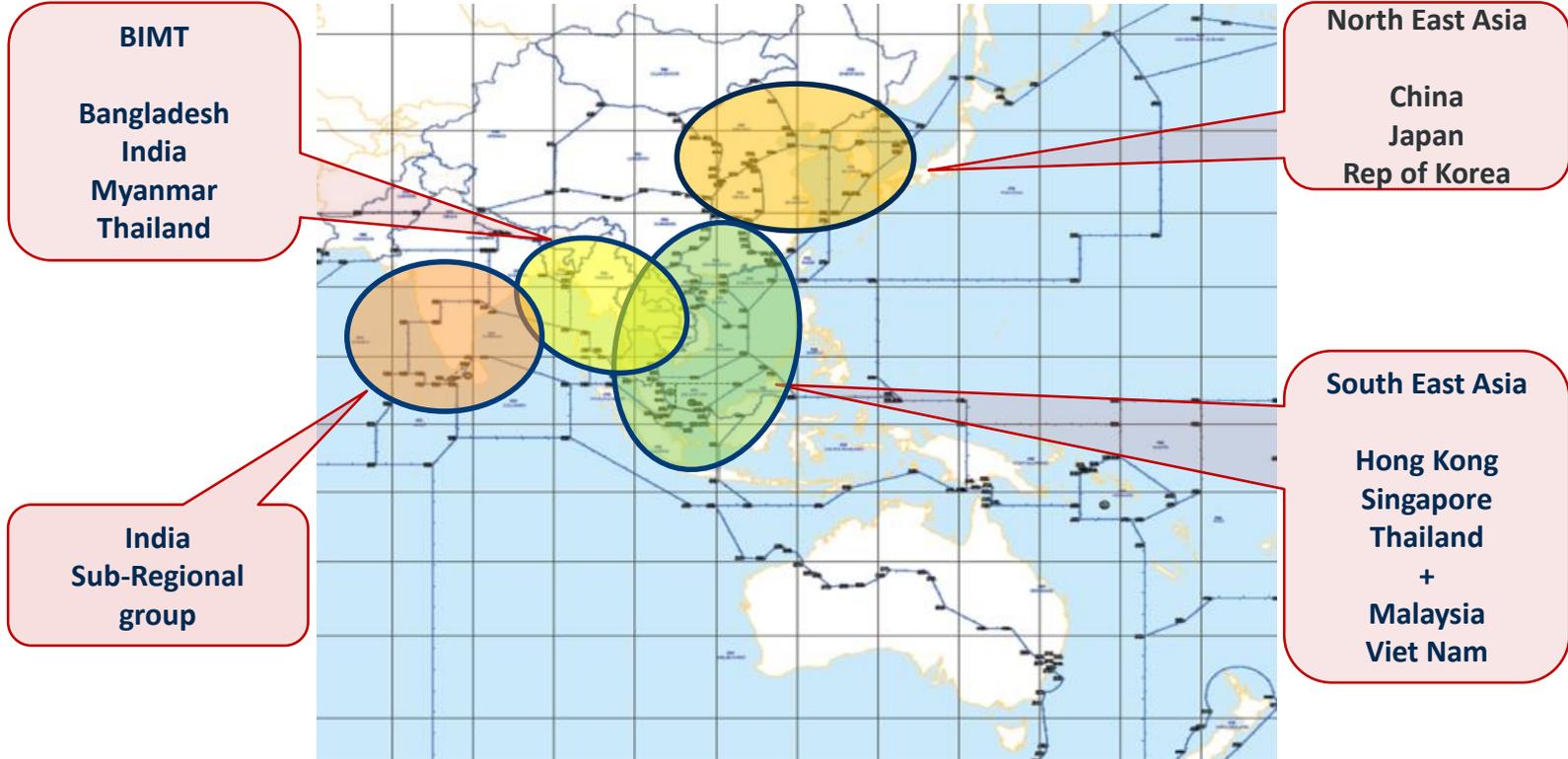
Regional Framework for Collaborative ATFM

- Key concept is a Distributed Multi-Nodal Cross-Border ATFM Network
- Virtual ATFM Platform of interconnected States in sub region operating cross-border ATFM network
- Central, physical facility providing network management is not practicable for Asia Pacific
- Multi-Nodal Cross Border ATFM
 - Allow sharing of information among all partners through common network
 - Achieve common situational awareness for all partners





Sub Regional ATFM Initiatives





ICAO

North American
Central American
and Caribbean
(NACC) Office
Mexico City

South American
(SAM) Office
Lima

ICAO
Headquarters
Montréal

Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU