



International Civil Aviation Organization

Implementing the changes – Seamless ATM Seminar/workshop

Session 2: Seamless ATM Implementation

Implementation Guidance Material

Hyderabad, 21 Oct. 2013

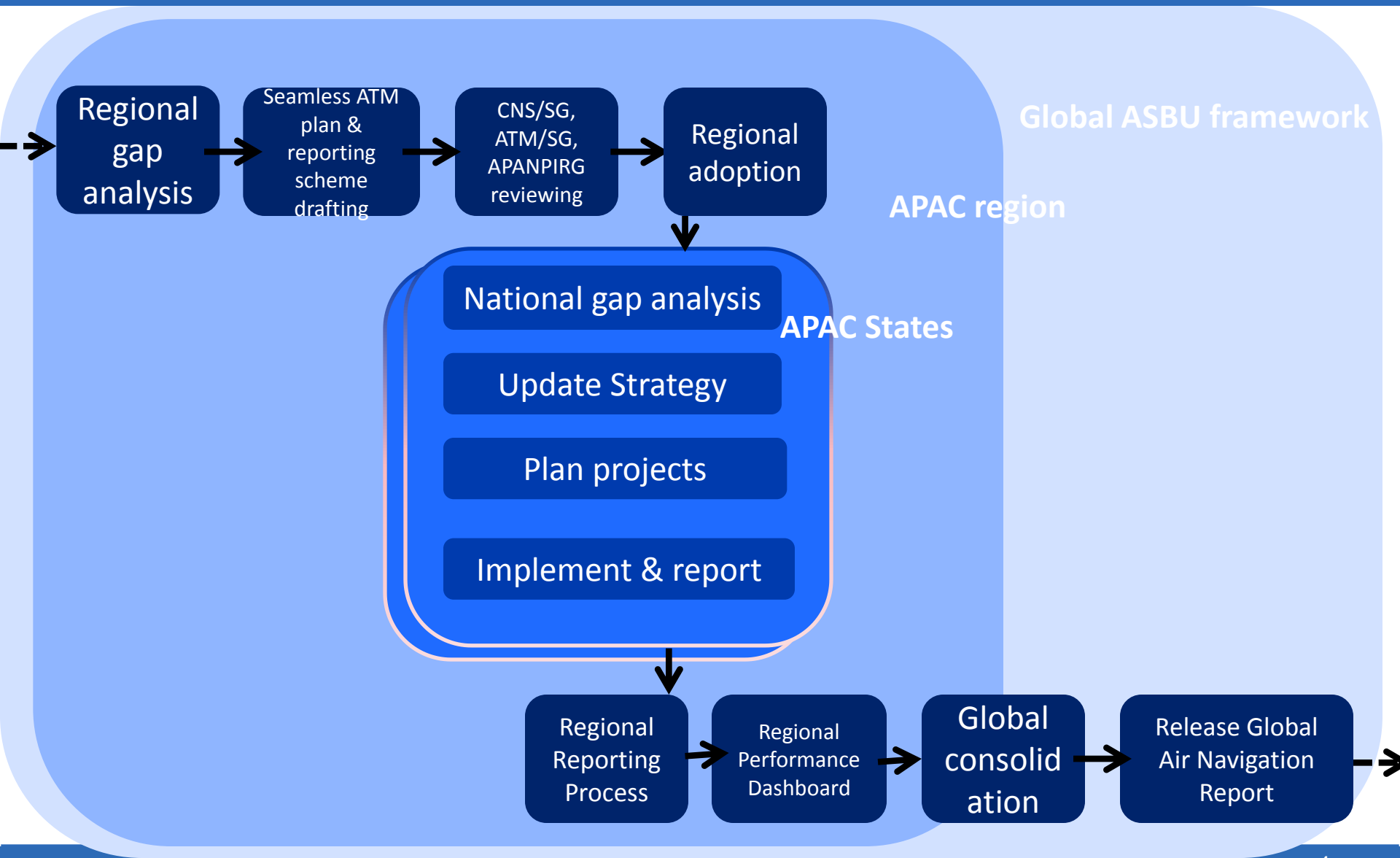
Improving the Air Navigation System

- Global level
 - 4th edition of *Global Air Navigation Plan* (GANP, Doc 9750) released in 2013
 - Includes the new Aviation Systems Block Upgrades (ASBU) framework.
- Regional and national levels
 - States and PIRGs are transitioning to a performance-oriented approach to support their air navigation infrastructure planning
 - In APAC region: the Seamless ATM plan v1.0 was endorsed by APANPIRG/24 for planning (Conclusion 24/54)
- Establishing Regional Priorities and Targets
 - APANPIRG/24 noted that Seamless ATM Plan spelt out the 6 regional ASBU priorities which are aligned to GANP (ASBU Modules)
 - Chairpersons of ATM, RASMAG, CNS, and MET sub groups to establish regional priorities and targets for the APAC Region in alignment with the GANP and APAC Seamless ATM Plan by December 2013 (Conclusion 24/2)

6 priorities in Seamless ATM plan v1.0

- B0-FICE Increased Interoperability, Efficiency And Capacity Through Ground-Ground Integration (AIDC)
- B0-DATM Service Improvement Through Digital Aeronautical Information Management
- B0-FRTO Improved Operations Through Enhanced En-Route Trajectories (CDM, FUA)
- B0-NOPS Improved Flow Performance Through Planning Based On A Network-Wide View
- B0-ASUR Initial Capability For Ground Surveillance
- B0-TBO Improved Safety And Efficiency Through The Initial Application Of Data Link En-Route

Process overview



Documents overview

Seamless ATM Plan

[Asia/Pacific Seamless ATM Plan](#)

[Seamless ATM Implementation Guidance Draft](#)

- [Implementation Guidance – comments from China 8-8-13](#)

[State Seamless ATM Implementation Plan Template](#) - (MS Word)

[Regional Seamless ATM Reporting Form Version 2](#) - (MS Excel)

[Template for comments – Implementation Guidance](#) - (MS Excel)

<http://www.icao.int/APAC/Pages/edocs.aspx>

National gap analysis

APAC States

- ASBU framework - GANP 4th Edition
- Seamless plan v1.0
- Seamless ATM implementation guidance (table 3)
- Current national plans (PBN, surveillance strategy, ...)
- Seamless ATM reporting form



- Seamless Items selected
- Seamless ATM reporting form updated with Items selected and Items already completed

	National gap analysis	cu
ce	Selected or not (in the national plan)	
	Selected	
	Not selected	

Reaching the objective Phase I		
Date of full implementation		Current progress (in %)
February	2012	100%

ASBU and regional frameworks

260	7.3	ATC Horizontal separation	Region
270	7.32	Multi-sensor integrated surveillance (ADS-B, MLAT, radar)	B0-AS
280	7.33	ADS-C, CPDLC	B0-TE

Regional Reporting Form Traceability ASBU-APAC region

Regional Seamless ATM reporting Form

Seamless ATM Plan			Performance Improvement Area							Seamless ATM plan			ASBU traceability			
Reference	Para	Regional/ASBU	1- Airport Operations	2- Globally Interoperable ATIS systems & Data	3- Dynamic Capacity and Flexible Flights	4- Efficient Flight Path	Aerodrome	Terminal	En-route	Specification title	Module	ASBU - Module title	Regional Priority	Comment		
10	7.1	Regional	✓				✓			Apron Management	-		1	Regional operational need		
20	7.1	Regional	✓				✓	✓		ATM-Aerodrome Coordination	-		1	Regional operational need		
30	7.1; 7.13	Regional	✓				✓			Aerodrome capacity	-		1	Regional operational need		
40	7.1	ASBU	✓				✓			Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	BO-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	3			
50	7.25; 7.45	ASBU	✓				✓	✓		Arrival Manager/Departure Management (AMAN/DMAN)	BO-RSEQ	Improve Traffic flow through Sequencing (AMAN/DMAN)	2			
60	7.44; 7.50	Regional			✓			✓	✓	ATC Sector Capacity	-		1	Regional operational need		
70	7.2	ASBU	✓				✓			Airport Collaborative Decision-Making (ACDM)	BO-ACDM	Improved Airport Operations through Airport-CDM	2			
-		ASBU	✓				✓	✓		-	BO-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	3	Not retained by APAC - No standard available		
80	7.27; 7.47	ASBU			✓			✓	✓	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	BO-NOPS	Improved Flow Performance through Planning based on a Network Wide view	1			
90	7.3	ASBU				✓		✓		Continuous Descent Operations (CDO)	BO-CDO	Improved Flexibility and Efficiency in Descent Profiles using Continuous Descent Operations (CDOs)	2			
100	7.3	ASBU				✓		✓		Continuous Climb Operations (CCO)	BO-CCO	Improved Flexibility and Efficiency Departure Profiles – Continuous Climb Operations (CCO)	2			
110	7.5; 7.14; 7.16	ASBU	✓					✓		Performance-based Navigation (PBN) Approach	BO-APTA	Optimization of Approach Procedures including vertical guidance	2			
120	7.4; 7.15	ASBU	✓					✓		Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	BO-CCO	Improved Flexibility and Efficiency Departure Profiles – Continuous Climb Operations (CCO)	2			
130	7.19	Regional				✓		✓		Performance-based Navigation (PBN) Visual and Arrival Procedures	-		1	Regional operational need		
140	7.9; 7.22	ASBU				✓		✓		Performance-based Navigation (PBN) Routes	BO-FRTO	Improved Operations through Enhanced En-Route Trajectories	1			
150	7.8	Regional				✓		✓		Performance-based Navigation (PBN) Airspace	-		1	Regional operational need		
160	7.52; 7.54	ASBU			✓			✓	✓	Safety Nets	BO-SNET	Increased effectiveness of ground-based safety nets	2			
170	7.7; 7.21	ASBU			✓			✓	✓	Airborne Safety Systems	BO-ACAS	Airborne Collision Avoidance Systems (ACAS) Improvements	2			
-		ASBU			✓				✓	-	BO-OPFL	Improved Access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B	3	Not retained by APAC - Limited value in airspace already using		
180	7.6; 7.23; 7.24	ASBU			✓			✓	✓	ADS-B OUT	BO-ASUR	Initial Capability for Ground Surveillance	1			

Mainly an aircraft/crew related module: cockpit-based

National planning

APAC States

- Seamless Items selected
- Seamless ATM reporting form updated
- State Seamless ATM implementation plan template



- National plans updated OR
- State Seamless ATM implementation plan created

To help national planning



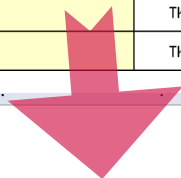
Regional Seamless Reporting Form

State/Administration:

General comment (optional)

Date of report:

Seamless Plan reference				National gap analysis	Collection of current progress	Reaching the objective Phase I		Reaching the objective Phase II		Remarks (e.g. project scope, FIRs or ro implementation, etc)
#	Para	Item	Regional/ ASBU reference	Selected or not (in the national plan)	through...	Date of full implementation	Current progress (in %)	Date of full implementation	Current progress (in %)	
10	7.1	Apron Management	Regional	Selected	This file	June	2016	0%		
20	7.1	ATM-Aerodrome Coordination	Regional	Not selected	This file					
30	7.1; 7.13	Aerodrome capacity	Regional		This file					
40	7.1	Safety and Efficiency of Surface Operations	B0-SURF		This file					
50	7.25; 7.45	Arrival Manager/Departure Management (AMAN/DMAN)	B0-RSEQ		This file					
60	7.44; 7.50	ATC Sector Capacity	Regional		This file					

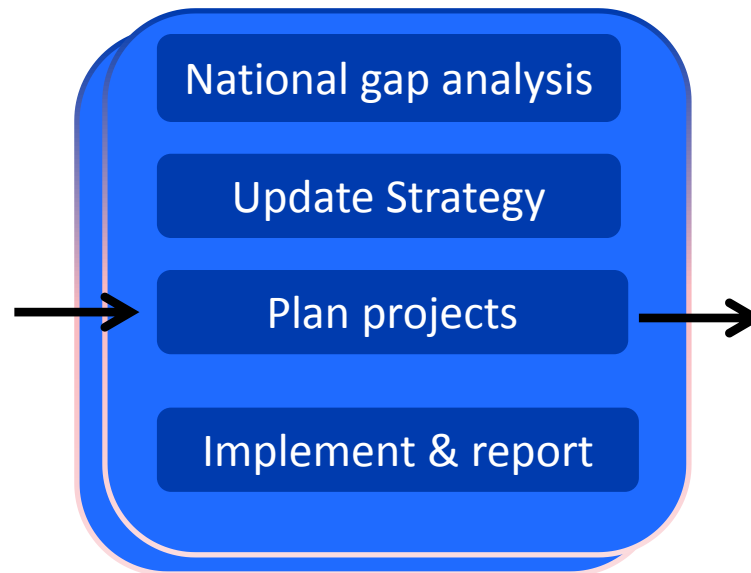


Final Priorities and targets delivered in Dec. 2013

Seamless Plan reference		Priorities and Targets					
Item	Regional/ ASBU reference	Regional Priority	Objective Nov. 2015	In...	Objective Nov. 2018	In...	Progress
Apron Management	Regional	1	Provide an appropriate apron management service	All high density international aerodromes of your State			
	Regional	1	Establish appropriate ATM coordination (airport development, maintenance planning, environmental)	All high density international aerodromes of your State			
	Regional	1	Conduct regular airport capacity analysis, declare airport terminal and runway capacity based on a capacity and efficiency analysis	All high density aerodromes of your State			
Surface Operations	B0-SURF	3	Provide electronic surface movement guidance and control	All high density international aerodromes of your State			
Arrival Management (AMAN/DMAN)	B0-RSEQ	2	Provide AMAN/DMAN facilities	All high density aerodromes of your State	All AMAN systems should take into account airport gates for runway selection and other aircraft	Terminal operations	
	Regional	1			Have a nominal aircraft capacity figure based on a scientific capacity study and safety assessment	All terminal ATC Sectors	
Decision-Making (ACDM)	B0-ACDM	2	Operate an A-CDM system serving the MTF and busiest city pairs	All high density aerodromes of your State			
Arrival Management Collaborative (FM/CDM)	B0-NOPS	1	all high density FIRs supporting the busiest Asia/Pacific traffic flows and high density		all FIRs supporting Major Traffic Flows in the Region		Percentage of your FIR ACCs utilise ATIS
Surface Operations (CCO)	B0-CDO	2					
Arrival Management (CCO)	B0-CCO	2					
Arrival Management (PBN) Approach	B0-APTA	2					Percentage of international aerodromes of your State

Plan projects

APAC States



- National plans updated OR
- State Seamless ATM implementation plan created
- **Seamless Implementation guidance**

- Projects planned for phase I and/or phase II
- Regional Seamless Reporting Form updated with planned dates and current progress for phase I and/or phase II
- **Project Management Plans, etc (as per national standards/procedures)**

Reaching the objective Phase I		
Date of full implementation		Current progress (in %)
June	2016	0%

Implement and report

Seamless Plan reference				National gap analysis	Collection of current progress	Reaching the objective Phase I		Reaching the objective Phase II		Remarks (e.g. project scope, FIRs or routes concerned implementation, etc)
#	Para	Item	Regional/ASBU reference	Selected or not (in the national plan)	through...	Date of full implementation	Current progress (in %)	Date of full implementation	Current progress (in %)	
80	7.27 : 7.47	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	B0-NOPS	Selected	This file	June 2016	40%	June 2018	0%	virtual ATFM nodes commissioned in the ATFM network
90	7.3	Continuous Descent Operations (CDO)	B0-CDO	Selected	This file	February 2015	30%	December 2017	10%	
100	7.3	Continuous Climb Operations (CCO)	B0-CCO	Selected	This file	June 2015	80%	January 2018	30%	
110	7.5 ; 7.14 ; 7.16	Performance-based Navigation (PBN) Approach	B0-APTA	Selected	This file	Not yet planned		Not yet planned		
120	7.4 ; 7.15	Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	Regional	Selected	This file	April 2008	100%			
130	7.19	Performance-based Navigation (PBN) Visual and Arrival Procedures	Regional	Selected	This file	January 2016	20%			On our international airport

APAC States



- Projects planned for phase I and/or phase II
- Regional Seamless Reporting Form updated with planned dates and current progress for phase I and/or phase II
- Project Management Plans, etc (as per national standards/procedures)
- **Seamless Implementation guidance**

- Projects planned/conducted/terminated for phase I and/or phase II
- Regional Seamless Reporting Form updated with planned dates and current progress for phase I and/or phase II

Implementation project

- Each stage consists of **actions** aimed at achieving measurable results
- Implementation matrix (30 actions)

1. PROJECT PLANNING

2. DESIGN

3. SAFETY

4. COMMUNICATION

5. TRAINING

6. IMPLEMENTATION

7. POST -IMPLEMENTATION

Stage Number	Action A	Action B	Action C	Action D	Action E	Action F
1. PROJECT PLANNING	Identify the problem or improvement required	Assess applicability to operating environment and State regulations	Gather and review data related to the desired change	Assess economic feasibility and cost/benefit	Start the project, determine project budget and milestones	Plan tendering and maintenance contract process
2. DESIGN	Determine initial design of the desired change, including alternatives	Determine Key Performance Indicators and/or success criteria	Design backup and transition procedures/ steps, including reversion	Determine maintenance considerations	Refine and agree on final design	Define system validation and verification (FAT, SAT)
3. SAFETY	Form safety teams or engage relevant safety experts	Assess operational strengths and weaknesses, opportunities, and threats (SWOT)	Develop the safety case	Prepare and apply for regulatory approval or certification		
4. COMMUNICATION	Consult with key stakeholders	Coordinate Regionally and bilaterally	Conduct formal promulgation/ notification	Advertise and brief about the change		
5. TRAINING	Develop simulations and procedures	Source relevant training experts	Conduct simulation and relevant training	Assess competency and authorise		
6. IMPLEMENTATION	Conduct operational trials and testing	Assess stability and performance	Make a Go/No-Go decision	Implement and monitor		
7. POST -IMPLEMENTATION	Develop review -Lessons learnt -KPI achievement -Report	Monitor medium and long term performance and safety				

Seamless ATM plan elements

No	Element	Phase I (expected implementation by 12 November 2015)	Phase II (expected implementation by 08 November 2018)	Implementation actions (Refers to Table 2, implementation matrix)	Main impacts / Main requirements and guidance references						
10	Apron Management REGIONAL	7.1.a All high density aerodromes should provide an appropriate apron management service in order to regulate entry of aircraft into and coordinate exit of aircraft from the apron		A	B	C	D	E	F	Main impacts <ul style="list-style-type: none"> People: Airport development and maintenance planners, Airport Operators, ANSP Capacity and safety Managers and procedure designers 	
				1	√	√	√	√	√		√
				2	√	√	√	√	√		√
				3	√	√	√	√			
				4	√	√	√	√			
				5	√	√	√	√			
				6	√	√	√	√			
				7	√	√					
20	ATM (Airport) Coordination - REGIONAL	7.1.b All high density should have appropriate ATM coordination (including meetings and agreements) related to: <ul style="list-style-type: none"> airport development and maintenance planning; coordination with local authorities regarding environmental, noise abatement, and obstacles; ATM/PBN procedures affecting the aerodrome 		A	B	C	D	E	F	Main impacts <ul style="list-style-type: none"> People: Airport development and maintenance planners, Airport Operators, ANSP Capacity and safety Managers and procedure designers, Airspace users 	
				1	√	√	√	-	√		-
				2	√	√	-	-	-		-
				3	√	√	-	-			
				4	√	√	√	√			
				5	√	-	-	-			
				6	-	-	√	√			
				7	-	-					
30	Aerodrome capacity - REGIONAL	7.1.c All high density aerodromes (100,000 scheduled movements per annum or more) should conduct regular airport capacity analysis, which includes a detailed assessment of passenger, airport gate, apron, taxiway and runway capacity	7.13 All high density aerodromes should have a declared airport terminal and runway capacity based on a capacity and efficiency analysis, to ensure the maximum possible efficiency of aircraft and passenger movement.	A	B	C	D	E	F	Main impacts People: Airport development and maintenance planners, Airport Operators, ANSP Capacity and safety Managers and procedure designers, Airspace users	
				1	√	√	√	-	√		-
				2	-	-	-	-	-		-
				3	√	√	-	-			
				4	√	√	√	-			
				5	√	-	-	-			
				6	-	-	√	√			
				7	-	-					

↓
PARS or PASL element

↓
Objective for Phase I

↓
Objective for Phase II

↓
Actions to carry out (refers to Impl. Matrix)

↓
Segments impacted (people/procedures/systems) requirements and guidance

- Any questions?