



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWENTY FIFTH MEETING OF THE
ASIA/PACIFIC AIR NAVIGATION PLANNING AND
IMPLEMENTATION REGIONAL GROUP (APANPIRG/25)**

Kuala Lumpur, Malaysia, 8 – 11 September 2014

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation
3.0: Regional and National Performance Framework
**ANRF, SEAMLESS REPORTING AND
MONITORING OF REGIONAL PROGRESS**

(Presented by the Secretariat)

SUMMARY

This paper presents an overview of the Seamless ATM planning and reporting required by States, and provides an update on the progress towards the performance-based monitoring regime being implemented during 2014.

This paper relates to –

Strategic Objectives:

A: Safety – Enhance global civil aviation safety

B: Air Navigation Capacity and Efficiency – Increase Capacity and improve efficiency of the global civil aviation system

E: Environmental Protection – Minimize the adverse environmental effects of civil aviation activities

1. INTRODUCTION

1.1 APANPIRG/24 noted that although the GANP has a global perspective, all ASBU modules may not be applicable to all States or Regions. Some of the modules are specialized packages that should be applied where specific operational requirements or corresponding benefits exist. Implementation priorities for Air Traffic Management enhancements vary between regions as each has different operational environments, traffic volumes etc. Prioritization exercise could be done by individual states and regionally by APANPIRG. Guided by the Global Air Navigation Plan (GANP), APANPIRG/24 acknowledged that the regional planning process requires full involvement of States, service providers, airspace users and other stakeholders, thus ensuring commitment by all for implementation.

1.2 APANPIRG/24 further noted that the PIRG–RASG Global Coordination Meeting held on 19 March 2013 requested PIRGs to establish regional priorities and set targets and report to ICAO by May 2014. APANPIRG/24 noted that the APAC Seamless ATM Plan spelt out the 6 regional ASBU priorities which are aligned to GANP (ASBU modules) and adopted Conclusion 24/2:

Conclusion 24/2 — Establishing Regional Priorities and Targets

That, following the PIRG - RASG Global Coordination meeting held in March 2013 APANPIRG/24 invited the 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 in order to facilitate submission to ICAO by May 2014.

1.3 In accordance with APANPIRG Conclusion 24/2, the Chairpersons of the Sub Groups agreed on the regional priorities and targets for the APAC Region which was based on the highest priority elements. In addition, all 42 Seamless ATM elements were assigned priorities.

1.4 Regional priorities and targets, along with the supporting Air Navigation Reporting Forms, are now proposed for endorsement at the APANPIRG/25. In order to plan improvements to the Air Navigation system, ANRF act as high level regional planning documents for the 18 Block 0 ASBU modules, while the seamless plan details the objectives for the 42 seamless items. Air Navigation Reporting Forms, are now proposed for endorsement at the APANPIRG/25.

1.5 Once the regional priorities and targets are endorsed by APANPIRG/25, the APAC Region will have to progress the implementation of the 42 seamless ATM plan items. APANPIRG/24 adopted the following conclusion in this connection:

Conclusion 24/3 - Regional and Global Air Navigation Reporting

That States:

a. support the plan for an online Regional Performance Dashboard in March 2014 and annual Global Air Navigation Report in April 2014;

b. provide requisite information to the ICAO Regional Office, Bangkok to demonstrate operational improvements; and

c. establish, if not yet done so, a performance measurement strategy that comprises of data compilation, processing, storage and reporting for the identified regional performance metrics for the air navigation systems.

1.6 In line with this conclusion, a web-based reporting process for data collection, and a regional performance dashboard will allow to track the progress done in APAC Region.

2. DISCUSSION**AIR NAVIGATION REPORTING FORMS (ANRF)**

2.1 APANPIRG/23 noted the developments in revising the Global Air Navigation Plan and agreed to take the revised edition of the Global Plan into account in planning and implementation of regional and national air navigation systems. APANPIRG/23 also noted that as ICAO will be migrating to the ASBU framework, consequently the Performance Framework Form will be modified to the Air Navigation Report Form (ANRF) effective from 2013.

2.2 The Air Navigation Report Forms (ANRFs) have replaced the earlier Performance Framework Forms (PFF) that were maintained by the various APANPIRG sub groups. The ANRF is intended to be a tool to set milestones, targets, and metrics for each of the key planning elements (at

first, the seven priority elements). The ANRF also identifies the implementation challenges. A total of 18 ANRF corresponding to the 18 ASBU elements was developed at the regional level and presented to APANPIRG and its Sub-Groups as appropriate for review, with the exception of B0-OPFL and B0-WAKE that were not reviewed by any sub group and are provided for information only at this stage. It should be noted that States are not expected to fill ANRF for global or regional purposes; however they are a practical solution for planning the ANS improvements at the national level.

2.3 All ANRF are attached (**Appendices A to P**). Appendix P is a draft Search and Rescue (SAR) ANRF, which is provided only for information as there was no current ASBU module for SAR, and the Asia/Pacific SAR Task Force (APSAR/TF) was expected to review this draft at its next meeting.

2.4 During the planning process which took place in 2012 and 2013 in the APAC Region and led to the adoption by APANPIRG/24 of the Seamless ATM Plan v1.0, all objectives and targets pertaining to ATM performance were discussed and planned accordingly.

2.5 The meeting is invited to review and adopt the ANRF that were reviewed by the corresponding APANPIRG Sub Groups, recognizing that the main objectives and targets to meet for these two modules had been already discussed and planned by the APAC States in the Seamless Plan V1.0.

ANRF endorsing bodies

2.6 Placed at **Appendix Q**, a draft matrix of responsibilities for APANPIRG bodies has been developed by the ICAO Regional Office to allocate the ASBU modules and corresponding seamless ATM elements to the different subgroups of APANPIRG for review by the meeting. The role of those bodies is to endorse the amendments to the ANRF, and review and discuss the progress of their implementation, using the monitoring tools for this purpose.

2.7 While the table presents the endorsing body, it is understood that other sub-groups would be consulted as necessary.

2.8 The matrix was reviewed and amended by CNS SG/18 with consideration of 2 scenarios, depending on whether the decision to create the PBNICG would be made or not by APANPIRG/25.

2.9 The CNS SG/18 meeting recommended the adoption of the draft ANRF related to CNS and of the ASBU responsibility matrix to APANPIRG/25 through the following Draft Conclusion which was endorsed by ATM SG/2 meeting :

Draft Conclusion 18/20 - ANRFs and Responsibility Matrix

That, the ANRF on B0-ASUR, B0-FICE, B0-TBO, B0-APTA, B0-CCO, B0-CDO, B0-SNET, B0-ACAS, B0-ASEP and B0-SURF together with the matrix of responsibilities as provided in **Appendix X** be adopted.

2.10 Since then, after discussions at ATM SG/2 and a request from some States, this matrix has been extended to all Seamless items and is presented at **Appendix R**. This matrix includes the ASBU responsibility matrix. Furthermore, the ASBU modules B0-ASEP, B0-WAKE, and B0-OPFL have been given a Seamless reference, respectively 430, 440 and 450, and endorsing body in the scenario 2 (case where the PBNICG would not be created) for seamless elements 90, 100, 110, 120, 140 and 250 were changed from APANPIRG to ATM SG.

Seamless ATM Planning and seminars

2.11 APANPIRG/24 had also adopted the following Conclusion and Decision:

Conclusion 24/55: State Seamless ATM Planning

That, given the urgency and priority of Seamless ATM planning for the Asia/Pacific as acknowledged by the 46th Conference of Directors General of Civil Aviation (DGCA, Osaka, Japan, 12-16 October 2009) and APANPIRG/22 (05-09 September 2011), States should be urged to:

- a) review Version 1.0 of the Asia/Pacific Seamless ATM Plan and utilise the Plan to develop planning for State implementation of applicable Seamless ATM elements;*
- b) ensure relevant decision-makers are briefed on the Seamless ATM Plan;*
- c) submit the first Regional Seamless ATM Reporting Form to the ICAO Regional Office by 01 March 2014; and*
- d) where possible, participate and contribute to Seamless ATM system collaborative training and research initiatives.*

Decision 24/56: Seamless ATM Seminars/Workshops

That, ICAO be urged to facilitate Asia/Pacific Seamless ATM Planning and Implementation Seminars/ Workshops for Asia/Pacific and trans-regional States.

Seminars

2.12 In accordance with APANPIRG Decision 24/56, the Asia/Pacific Regional Office had conducted a number of Seminars or presentations to States and organisations on Seamless ATM:

- 10 September 2013: Bangkok, Thailand (ASEAN Air Transport Working Group - (ATWG));
- 23 – 25 September 2013, Beijing, China (Europe – Asia Trans-regional Special Coordination Meeting);
- 21 October 2013: Hyderabad, India (Bay of Bengal, Arabian Sea and Indian Ocean Region - BOBASIO);
- 26 November 2013, Bangkok, Thailand (Collaborative Development of Operational Safety and Continuing Airworthiness Programme-Southeast Asia - COSCAP-SEA);
- 27 November 2013, Bangkok, Thailand Meteorological Requirements Task Force (MET-R/TF); and
- 28 November 2013: Bangkok, Thailand (Civil Air Navigation Services Organisation - CANSO).
- 24 March 2014: Singapore (Inaugural ATM Research Institute Seminar).

State Seamless ATM Plans

2.13 The State Seamless ATM Plans were intended to be high-level and concise, so that each of the Seamless ATM elements that were applicable to the State could be elucidated in a brief paragraph, explaining the basic benefits and costs, barriers and steps to implementation, and an outline of the expected result. A template of a State Seamless ATM Plan is available on the same web page that the Seamless ATM Plan is located. It was not necessary to submit the State Seamless ATM Plan to the Regional Office at this juncture, although this may become necessary in the future.

Seamless ATM Implementation Guidance

2.14 The Seamless ATM plan version 1.0 was endorsed by APANPIRG/24 (June 2013) in conclusion 24/54.

2.15 A Seamless ATM Implementation Guidance was developed from April to June 2013 and received different comments from States and ICAO since then. The latest version (version 4.3, May 2014) of seamless implementation guidance is placed at Appendix 11. It is also available here: <http://www.icao.int/APAC/Documents/edocs/Seamless%20ATM%20Implementation%20Guidance%20v4-3.pdf>

2.16 A comprehensive history of changes is available here: <http://www.icao.int/APAC/Documents/edocs/Seamless%20ATM%20Implementation%20Guidance%20-%20History%20of%20changes.pdf>.

2.17 The Seamless ATM Implementation Guidance provides a valuable guidance on expected impacts and on documents to be used when implementing any of the ASBU/Seamless elements.

2.18 The CNS SG/18 meeting also reviewed the Seamless ATM Implementation Guidance v4.3 and recommended its adoption by APANPIRG/25 through the following Draft Conclusion which was endorsed by ATM SG/2:

Draft Conclusion 18/21 - Seamless ATM Implementation Guidance

That, the Seamless ATM Implementation Guidance Version 4.3, provided in **Appendix Y** be adopted by APAC States/Administrations and maintained by the ICAO Regional Office.

Reporting Process (from an offline to a web-based data collection)

2.19 Whilst guidance is provided for each and every action of the Seamless ATM Plan, only a very limited subset of actions needs a periodic implementation report from Asia/Pacific States at the regional level to keep all stakeholders coordinated. Through the Seamless ATM Reporting Form, available as a spreadsheet in Excel format (<http://www.icao.int/APAC/Documents/edocs/Regional%20Seamless%20ATM%20Reporting%20Form%20-%20v4.xlsx>) and soon as a web-based reporting form, States are invited to report their progress on implementation and issues encountered. In this way, potential delays may be anticipated and managed.

2.20 The Seamless ATM Reporting Form enables a formalised process for regional planning that can identify areas where greater support for States is required. In this regard, the scope of support and desired timeframe should be specified in the column “Remarks” of the Seamless ATM Reporting Form.

2.21 The Regional Seamless ATM Reporting Form is used for collecting and analysing data from States from a global perspective. This allows planning that supports the Global Air Navigation Plan, and reporting of the overall progress of Asia/Pacific Seamless ATM implementation to appropriate bodies.

2.22 Since Conclusion 24/55 on State Seamless ATM Planning was adopted in June 2013, **16 States have submitted their first Seamless ATM reporting form.** The remaining States/Administrations that had not reported were reminded to submit a Seamless ATM reporting form as soon as possible, using the attached reporting form, through ICAO State letter T 8/5.1 & T 3/10.1.2- AP101114 dated 1 July 2014.

2.23 The form may include more items in the future. For example, if the ANRF on B0-FICE is approved with its revision concerning AMHS and the migration of communications between States on the regional network, those two items would be added to the Reporting Form if necessary for progress tracking.

2.24 The ICAO APAC Regional Office has developed a web-based tool in an effort to ease the submission of such reports in the future for States, and reap the benefits of data analysis for ICAO. This tool will be available on the ICAO APAC website using a secure webpage dedicated to the States/Administrations, and will provide the ability to submit up to four reports times a year, as well as exporting and archiving functions. It will be possible for users to prepare a report based on the previous submissions, which should minimize the input workload.

2.25 The testing process is currently ongoing, and showcasing was proposed at different ICAO Sub Groups meetings. Additionally, Snapshots of the application are placed at **Appendix 1**. A “How To” will be available online to describe how to use the tool.

2.26 The same ICAO State letter requested to nominate a point of contact and a substitute before 31 August 14 that will be in charge of preparing and submitting the form online at least once per year on behalf of their State/Administration. As of 25 August 2014, **7 States have nominated their points of contact.**

2.27 Once the tool is online, States/Administrations will submit their Seamless ATM reporting forms through the web-based tool. The estimated date for the cut-over is September 2014. Registered points of contact will be informed by email.

2.28 The CNS SG/18 meeting noted the information showcasing the web-based on-line Reporting process and recommended to APANPIRG/25 the adoption of the following Draft Conclusion which was endorsed by ATM SG/2:

Draft Conclusion 18/22 - Web-based reporting process

That, States/Administrations start reporting through the ICAO online process on their Seamless ATM implementation progress at least once a year, starting from October 2014 onwards.

Two levels of monitoring

2.29 Two levels of monitoring are desirable:

- monitoring of the regional performance gains, through the regional performance dashboard, allowing global correlation of status and expectations and “customer oriented”; and
- monitoring of regional implementation progress through a regional picture, one level below, allowing corrective actions by APANPIRG on the implementation : “process oriented”. The monitoring would be done for the 42 seamless items.

2.30 In the discussions of the Chairpersons meetings, the added value of having two levels of monitoring (the high level regional performance dashboard and the process-orientated regional picture, focusing on the 42 Seamless ATM elements) to steer the air navigation improvements was shared and acknowledged. It was envisaged that the monitoring tools (regional picture and regional performance dashboard) could serve a more streamlined project-oriented process for the Asia/Pacific Region by identifying issues, challenges or risks and speeding up the decision-making process to take corrective actions and adapt plans.

Regional picture (project)

2.31 Export functions including calculation are provided to the ICAO Regional Office staff members to analyse the inputs from States/Administrations and later on, feed a GIS (Geographical Information System)-based regional picture that would present a regional picture, i.e. a regional map with the progress on each item for all States/Administrations. However this project is still in progress and the feasibility not fully guaranteed.

Regional performance dashboard

2.32 The Performance Dashboards present up-to-date regional implementation results, highlighting what States and groups of States are achieving in collaboration with their respective Planning and Implementation Regional Groups (PIRGs) and Regional Aviation Safety Groups (RASGs). Their ultimate intention, besides ICAO’s basic measurement, accountability and transparency goals, is to help motivate aviation groups and stakeholders to continue to participate in and improve upon the applicable cooperative programmes being implemented at the regional level.

2.33 The dashboards are available at the link below:
<http://www.icao.int/safety/Pages/Regional-Targets.aspx>. This link will be provided in the dedicated State/Administration Web-based Reporting Process Home page as well.

2.34 The targets and metrics as per WP20 will be recommended to ICAO/HQ for inclusion and use in the public ICAO APAC Performance Regional Dashboard until further update if such draft conclusion is endorsed. Some of the indicators will be calculated thanks to the data collection through the web-based Reporting Process.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;

- b) adopt the ANRF and responsibility matrix through the following Draft Conclusion:

Draft Conclusion 25/X - ANRFs and responsibility matrix

That, the ANRF regarding the Block 0 ASBU (except B0-OPFL and B0-WAKE) together with the matrix of responsibilities be adopted for the APAC Region.

- c) review the Seamless ATM Implementation Guidance v4.3 and recommend its adoption to APANPIRG/25 through the following Draft Conclusion:

Draft Conclusion 25/X - Seamless ATM implementation guidance

That, the Seamless ATM implementation guidance version 4.3, May 2014 be adopted by APAC States/Administrations and maintained by the ICAO Regional Office.

- d) note the information on the web-based Reporting process and urge the nomination of points of contact as requested by ICAO State letter;
- e) recommend to APANPIRG/25 the adoption of the following Draft Conclusion

Draft Conclusion 25/X - Web-based reporting process

That, States/Administrations start reporting on their Seamless ATM implementation progress at least once a year through the ICAO online reporting process from October 2014 onwards.

- f) Note that the targets and metrics will be recommended to ICAO/HQ for inclusion and used in the public ICAO APAC Regional Performance Dashboard until further update if such draft conclusion is endorsed; and
- g) discuss any relevant matters as appropriate.

Appendix I: Web-based Seamless ATM Reporting Process

The screenshot shows the home page of a State/Administration user. At the top, it says 'Home > RO_APAC'. The main heading is 'APAC Regional Seamless ATM Reporting Process'. Below this is a section titled 'My State/Administration' which contains a table with the following data:

Title	Number of FIR	Number of high density FIR	High Density International Aerodromes
Japan	1	1	2

Below the table is a large box with the text 'To report from a blank form, start here'. Underneath is a 'How to' section with links for 'URL', 'Seamless ATM plan', 'Seamless ATM guidance material', 'Monitoring the APAC implementation progress with the APAC Regional Picture', and 'Monitoring the performance with the Regional Performance Dashboard'. The 'My reporting forms' section displays a table of reporting forms:

Type	Name	Modified	Status	Edit	Modified By
State : Japan (4)					
ReportYear : 2014 (3)					
	Japan-2014-1	11/06/2014 1:28 AM	Submitted		asisuser, oTest
	Japan-2014-2	10/06/2014 10:03 PM	in preparation		asisuser, oTest
	Japan-2014-4	10/06/2014 10:19 PM	in preparation		asisuser, oTest
ReportYear : 2013 (1)					
	Japan-2013-2	08/06/2014 5:36 PM	Submitted		asisuser, oTest

At the bottom, there is a link: '+ Add a State seamless implementation plan you want to share with ICAO'.

Home page of a State/Administration user showing number of FIR/aerodromes, the starting point for reporting (“To report from a blank form”), useful links (“How to”) and archived reporting forms
Note: content displayed is fictive

Regional Seamless Reporting Form

State/Administration:	Japan	Number of FIR:	1	General Comment (Optional): <div style="border: 1px solid black; height: 50px;"></div>
		Number of high density FIR:	1	
Date of Report:	11/06/2014			

Priority	Seamless Plan Reference	Applicable or not	Reaching the Objective Phase I		Reaching the Objective Phase II		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		70%				
3	ATM-Aerodrome Coordination	Applicable	26/06/2014	80%			test	
3	Aerodrome capacity	Applicable		60%		60%		
3	Safety and Efficiency of Surface Operations	Not yet analysed		Select...				

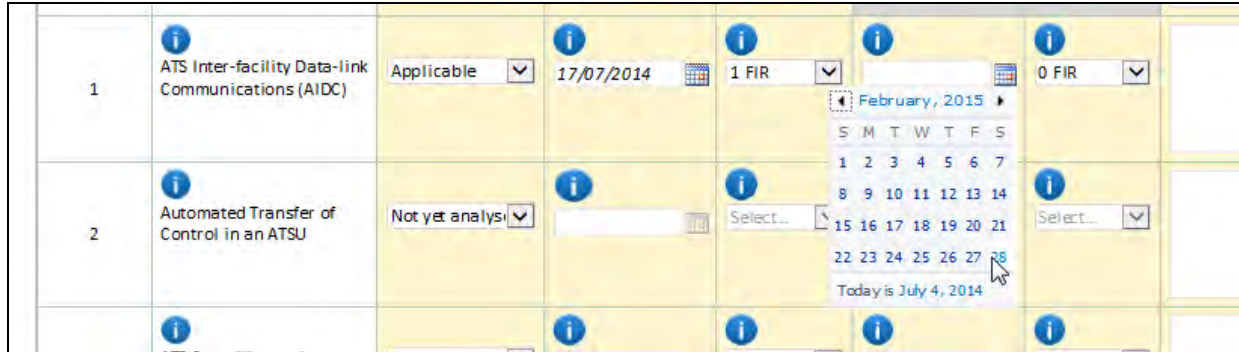
Online Reporting form (partial view) showing metadata, and the first 4 seamless items

1	ATS Inter-facility Data-link Communications (AIDC)	Not yet analysed Not applicable Applicable	17/07/2014	1 FIR		0 FIR	

Different status shown for the column “Applicable or not”

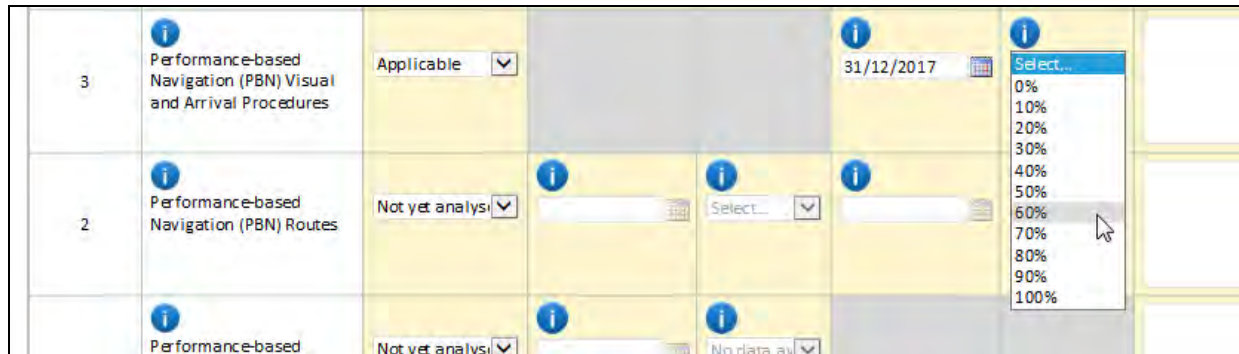
3	Safety and Efficiency of Surface Operations	Applicable					
2	Arrival Manager/Departure Management (AMAN/DMAN)	Not yet analysed		Select...		Select...	
2	ATC Sector Capacity	Applicable				Select...	

Information tips by overflying a “i” with the mouse



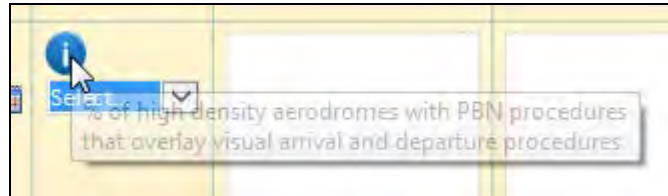
A screenshot of a data table with three rows. The first row is for 'ATS Inter-facility Data-link Communications (AIDC)' with a value of 'Applicable' and a date of '17/07/2014'. The second row is for 'Automated Transfer of Control in an ATSU' with a value of 'Not yet analysed'. A calendar pop-up is open over the second row, showing the month of February 2015. The calendar grid shows days 1 through 28. The date 'Today is July 4, 2014' is visible at the bottom of the calendar. The table has a yellow background and blue information icons in the first column of each row.

Example of selection of a date in the calendar



A screenshot of a data table with three rows. The first row is for 'Performance-based Navigation (PBN) Visual and Arrival Procedures' with a value of 'Applicable' and a date of '31/12/2017'. The second row is for 'Performance-based Navigation (PBN) Routes' with a value of 'Not yet analysed'. A dropdown menu is open over the second row, showing a list of percentages from 0% to 100% in 10% increments. The table has a yellow background and blue information icons in the first column of each row.

**Example of selection of a percentage of implementation for PBN visual/arrival procedures
The indicator can be overflowed to recall what is measured:**



2	Civil Military common training	Applicable		Yes				
2	Civil Military common procedures	Applicable		Yes				
2	Air traffic Situational awareness	Applicable			Yes			
3	Optimized wake turbulence separation	Applicable			80%			
3	In-trail procedures	Applicable			1 FIR			

Save Submit Exit without saving

**Choice of actions to perform after filling in the form
(Save/Submit/Exit without saving)**

APPENDIX A

**AIR NAVIGATION REPORT FORM (ANRF)
APAC Regional Planning for ASBU Modules**

<p>REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS)</p> <p>Performance Improvement Area 1: Airport Operations</p>					
<p>ASBU B0-SURF: Impact on Main Key Performance Areas (KPA)</p>					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y
<p>ASBU B0-SURF: Planning Targets and Implementation Progress</p>					
Elements			Targets and Implementation Progress (Ground and Air)		
Safety and Efficiency of Surface Operations			November 2015 (Seamless ATM Phase I): All high density international aerodromes (100,000 scheduled movements per annum or more) should have provided electronic surface movement guidance and control.		
<p>ASBU B0-SURF: Implementation Challenges</p>					
Elements	Implementation Area				
	Ground system Implementation	Avionics Implementation	Procedures Availability	Operational Approvals	
Safety and Efficiency of Surface Operations	A-SMGCS system integrating sensors. Vehicles properly equipped (cooperative transponder systems)	Nil	Nil	Nil	

APPENDIX A

ASBU B0-SURF: Performance Monitoring and Measurement (Implementation)	
Elements	Performance Indicators/Supporting Metrics
Surveillance system for ground surface movement(PSR,SSR, ADS-B or Multilateration (aircraft vehicles)	Percentage of applicable international aerodromes having implemented A-SMGCS
ASBU B0-SURF: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	Performance Metrics
Access & Equity	Improves portions of the Manoeuvring area obscured from view of the control tower for vehicles and aircraft. Ensures equity in ATC handling of surface traffic regardless of the traffic's position on the international aerodrome
Capacity	Sustained level of aerodrome capacity during periods of reduced visibility
Efficiency	Reduced taxi times through diminished requirements for intermediate holdings based on reliance on visual surveillance only. Reduced fuel burn
Environment	Reduced emissions due to reduced fuel burn
Safety	Reduced runway incursions. Improved response to unsafe situations. Improved situational awareness leading to reduced ATC workload

APPENDIX A

**AIR NAVIGATION REPORT FORM (ANRF)
APAC Regional Planning for ASBU Modules**

<p>REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-ACDM: Improved Airport Operations through Airport-CDM</p> <p>Performance Improvement Area 1: Airport Operations</p>					
<p>ASBU B0-ACDM: Impact on Main Key Performance Areas (KPA)</p>					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	
<p>ASBU B0-ACDM: Implementation Progress</p>					
Elements			Target and Implementation Status (Ground and Air)		
Airport CDM at all high density aerodromes			November 2015 (Seamless ATM Phase I): - Airport CDM at all high density aerodromes.		
Apron Management			November 2015- (Seamless ATM Phase I) All high density international aerodromes (100,000 scheduled movements per annum or more) should provide an appropriate apron management service in order to regulate entry of aircraft into and coordinate exit of aircraft from the apron;		
ATM- Aerodrome coordination			November 2015- (Seamless ATM Phase I) All high density international aerodromes (100,000 scheduled movements per annum or more) should have appropriate ATM coordination on airport development and maintenance planning; coordination with local authorities regarding environmental, noise abatement, and obstacles; and ATM/PBN procedures for the aerodrome		
Aerodrome Capacity - assessment of passenger, airport gate, apron, taxiway and runway capacity;			November 2015- (Seamless ATM Phase I) All high density international aerodromes (100,000 scheduled movements per annum or more) should have a declared airport terminal and runway capacity November 2018- (Seamless ATM Phase II) All high density aerodromes should have a declared airport terminal and runway capacity		

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APPENDIX A

ASBU B0-ACDM: Implementation Challenges				
Elements	Implementation Area			
	Ground system Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
Airport CDM at all high density aerodromes	Inter connection of ground systems of all stakeholders	Nil	Lack of guidance material and Coordination procedures	Lack of Agreements (MOU) among stake holders, and procedures
Apron Management	communication facilities	Nil	Lack of Coordination procedures between a provider of ATS Services and the aerodrome operator.	Lac k of Agreements, (MOU) and procedures
ATM coordination	Nil	Nil	Lack of Coordination procedures	Lack of Agreements (MOU),and procedures
Aerodrome Capacity	Availability of space	Nil	Lack of guidance material to assess airport capacity	Nil

ASBU B0-ACDM: Performance Monitoring and Measurement (Implementation)	
Elements	Performance Indicators/Supporting Metrics
Airport CDM at all high density aerodromes.	% of applicable international aerodromes having implemented improved airport operations through airport-CDM (applicable=high density)
Apron Management	% of high density international aerodromes (100,000 scheduled movements per annum or more) providing an appropriate apron management service
ATM – Aerodrome coordination	% of high density international aerodromes having appropriate ATM coordination in accordance with the Seamless ATM Plan
Aerodrome Capacity –Phase 1	% of high density international aerodromes having declared capacity in accordance with the Seamless ATM Plan Phase 1

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APPENDIX A

Aerodrome Capacity- Phase 2	% of high density aerodromes having declared capacity in accordance with the Seamless ATM Plan Phase 2
ASBU B0-ACDM: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	Performance Metrics
Access & Equity	Enhanced equity on the use of aerodrome facilities.
Capacity	Enhanced use of existing of gate and stands (unlock latent capacity). Reduced workload, better organization of the activities to manage flights. Enhanced aerodrome capacity
Efficiency	Improved operational efficiency (fleet management); and reduced delay. Reduced fuel burn due to reduced taxi time and lower aircraft engine run time. Improved aerodrome expansion in accordance with Master Plan
Environment	Reduced emissions due to reduced fuel burn
Safety	Not applicable

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APPENDIX B

AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-ACAS: ACAS Improvements Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
ASBU B0-102: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	N	Y	N	Y

ASBU B0-101: Planning Targets and Implementation Progress	
5. Elements	6. Targets and Implementation Progress (Air Ground)
1. ACAS II (TCAS Version 7.1)	<p>Nov. 15 (phase 1): All Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes should require the carriage of ACAS and Terrain Awareness Warning Systems (TAWS), unless approved by ATC</p> <p>Nov. 18 (phase 2): All Category R and S upper controlled airspace, and Category T airspace should, unless approved by the State, require the carriage of an operable ACAS and TAWS</p>

ASBU B0-101: Implementation Roadblocks/Issues				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. ACAS II (TCAS Version 7.1)	NIL	Lack of funding	NIL	NIL

ASBU B0-101: Performance Monitoring and Measurement (Implementation)	
Elements	Performance Indicators/Supporting Metrics
1. ACAS II (TCAS Version 7.1)	<p>Percentage of States/Administrations requiring the carriage of ACAS (with TCAS 7.1 evolution) and TAWS for all Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes</p> <p>Percentage of States/Administrations requiring the carriage of ACAS and TAWS for all Category T airspace</p>

APPENDIX B

ASBU B0-101: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	Benefits
Access & Equity	NA
Capacity	NA
Efficiency	ACAS improvement will reduce unnecessary resolution advisory (RA) and then reduce trajectory deviations
Environment	NA
Safety	ACAS increases safety in the case of loss of separation

1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-AMET: Meteorological Information Supporting Enhanced Operational Efficiency and Safety					
Performance Improvement Area 2: Globally Interoperable Systems and Data					
3. ASBU B0-AMET: Impact on Main Key Performance Areas					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

4. ASBU B0-AMET: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
1. WAFS	Systems implemented to receive WAFS information and to make this available to users to support flight planning, dynamic and flexible management of airspace, improved situational awareness, collaborative decision making and flight trajectory planning.
2. IAVW	Implementation of VAACs to support IAVW. Agreements in place between Volcano Observatories and VAACs.
3. Tropical cyclone watch	Implementation of TCACs to support tropical cyclone watch.
4. Aerodrome warnings	Aerodromes identified that require Aerodrome Warnings.
5. Wind shear warnings and alerts	Aerodromes identified that require wind shear warnings and/or alerts.
6. OPMET	OPMET data available as per the requirements in the Regional Air Navigation Plan.

7. ASBU B0-AMET: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. WAFS	WAFS data reception system, either via satellite or internet	Nil	Operations manuals. Contingency plans.	N/A
2. IAVW	AFTN/AMHS	Nil	Operations manuals. Contingency plans.	N/A
3. Tropical cyclone watch	AFTN/AMHS	Nil	Operations manuals. Contingency plans.	N/A
4. Aerodrome warnings	AFTN/AMHS	Nil	Operations manuals. Contingency plans.	N/A
5. Wind shear warnings and alerts	AFTN/AMHS	Nil	Operations manuals. Contingency plans.	N/A

7. ASBU B0-AMET: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
6. OPMET	AFTN/AMHS	Nil	Operations manuals. Contingency plans.	N/A

8. ASBU B0-AMET Performance Monitoring and Measurement	
8A. ASBU B0-AMET: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
1. WAFS	% of required States receiving WAFS and making this available to users.
2. IAVW	% of designated VAACs implemented.
3. Tropical cyclone watch	% of designated TCACs implemented.
4. Aerodrome warnings	% of the required aerodromes providing Aerodrome Warnings.
5. Wind shear warnings and alerts	% of the required aerodromes providing Wind Shear Warnings and/or Alerts.
6. OPMET	% availability, reliability and compliance of METAR/SPECI and TAF. Number of FIRs covered by SIGMET.

8. ASBU B0-AMET. Performance Monitoring and Measurement	
8 B. ASBU B0-AMET: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Not applicable
Capacity	Optimized usage of airspace and aerodrome capacity due to MET support
Efficiency	Reduced arrival/departure holding time, thus reduced fuel burn due to MET support
Environment	Reduced emissions due to reduced fuel burn due to MET support
Safety	Reduced incidents/accidents in-flight and at aerodromes due to MET support.



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module PBN Terminal					
Performance Improvement Area 4: Efficient Flight Path – Through Trajectory-based Operations					
3. ASBU B0-TBO: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	N	Y	Y	Y

4. PBN Terminal: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
CCO implementation ¹	November 2015 (Phase I): all high density international aerodromes implement CCO and CDO operations where States have assessed it applicable ²
CDO implementation	
PBN SIDs implementation	November 2015 (Phase I): all international high density aerodromes should have RNAV 1 (ATS surveillance environment) or RNP 1 (ATS surveillance and non-ATS surveillance environments) SID/STAR
PBN STARs	

7. PBN Terminal: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
CCO implementation	NIL	NIL	Airspace and procedure design enable optimized climb profile until cruising level	NIL
CDO implementation	NIL	NIL	Airspace and procedure design enable optimized profile descents (avoid stepped arrivals)	NIL

¹ CCO and CDO are flight operations procedures and only indirectly related to PBN procedures - SID/STAR, and APV. Whether this stays in this ANRF or not will depend entirely on finding a performance measurement that has some meaning. If we do not, then these items should be removed.

² The Seamless ATM Plan does not state that CCO/CDO is expected to be implemented in all high density aerodromes. It says that States should consider implementation. The target is to implement 100% of procedures that have been assessed as beneficial (i.e.: according to the States plan)



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7. PBN Terminal: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
PBN SIDs implementation	ATM systems enable PBN spec. and ATC separation standards (as per Seamless item 250)	NIL	NIL	NIL
PBN STARs	ATM systems enable PBN spec. and ATC separation standards (as per Seamless item 250)	NIL	NIL	NIL

8. PBN Terminal: Performance Monitoring and Measurement	
8A. PBN Terminal: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
CCO implementation	Indicators: Percentage of high density international aerodromes implementing CCO and CDO operations Supporting metric: Number of high density international aerodromes implementing CCO and CDO operations
CDO implementation	
PBN SIDs implementation	Indicators: percentage of international high density aerodromes implementing Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR) Supporting metric: Number of international high density aerodromes implementing Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)
PBN STARs	
	Indicators: percentage of high density international aerodromes implementing ATM systems enabling optimal PBN operations Supporting metric: Number of high density international aerodromes implementing ATM systems enabling optimal PBN operations

8. PBN Terminal: Performance Monitoring and Measurement	
8 B. PBN Terminal: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	NA
Capacity	NA
Efficiency	Benefit: Cost savings for aircraft operators through reduced fuel burn and efficient aircraft operating profiles.
Environment	Benefit: Environmental benefits through reduced emissions and noise reduction Authorization of operations where noise limitations would otherwise result in operations being curtailed or restricted.
Safety	Benefit: More consistent flight paths. Lower pilot and air traffic control workload



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APAC Regional planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-ASEP: Air Traffic Situational Awareness					
Performance Improvement Area 3: Optimum Capacity and Flexible Flights					
3. ASBU B0-ASEP: Impact on Main Key Performance Areas					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	Y	N	N	Y
4. ASBU B0-ASEP: Planning Targets and Implementation Progress					
5. Elements			6. Targets and implementation progress (Ground and Air)		
Air Traffic Situational Awareness (ATSA)			Nil		
7. ASBU B0-ASEP: Implementation Challenges					
Elements	Implementation Area				
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals	
Air Traffic Situational Awareness (ATSA)	NIL	Upgrade of avionics	NIL	NIL	
8. ASBU B0-ASEP Performance Monitoring and Measurement					
8A. ASBU B0-ASEP: Implementation Monitoring					
Elements	Performance Indicators/Supporting Metrics				
Air Traffic Situational Awareness (ATSA)	Indicator: Percentage of States/Administrations implementing air traffic situational awareness Supporting metric: Number of States/Administrations implementing air traffic situational awareness				
8. ASBU B0-ASEP. Performance Monitoring and Measurement					
8 B. ASBU B0-ASEP: Performance Monitoring					
Key Performance Areas		Metrics (if not indicate qualitative Benefits)			
Access & Equity		-			
Capacity		Provides crews with the means to achieve quicker visual acquisition of targets			
Efficiency		-			
Environment		-			
Safety		Crew awareness is improved			



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-ASUR: Initial capability for ground surveillance					
Performance Improvement Area 1: Airport Operations					
3. ASBU B0-ASUR: Impact on Main Key Performance Areas					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

4. ASBU B0-ASUR: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
Item 180- ATS surveillance	<p>November 2015 (Seamless ATM Plan Phase 1): All Category S upper controlled airspace and Category T airspace supporting high density aerodromes should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B</p> <p>November 2018 (Seamless ATM Plan Phase 2): All Category S upper controlled airspace and Category T airspace should be designated as non-exclusive or exclusive as appropriate ADS-B airspace requiring operation of ADS-B using 1090ES with DO-260/260A and 260B capability. In areas where ADS-B based separation service is provided, the mandatory carriage of ADS-B OUT using 1090ES with DO260/60A and 260B should be prescribed</p>
Item 270- ATS surveillance with data integrated	November 2015 (Seamless ATM Plan Phase 1): ADS-B or MLAT or radar surveillance systems should be used to provide coverage of all Category S-capable airspace as far as practicable, with data integrated into operational ATC aircraft situation displays

7. ASBU B0-ASUR: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
Item 180- ATS surveillance	Long transition time to ADS-B systems for SSR equipped providers Misuse of ADS-B messages of insufficient integrity	Ratio of fleet ADS-B equipped and approved, particularly in general aviation, and ageing commercial fleet	NIL	Dependent on States' development of approval standards.



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7. ASBU B0-ASUR: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
	Sharing of data surveillance	Faulty/ageing avionics		
Item 270- ATS surveillance with data integrated	Lack of any automation functionality. Quality control of integration of data into ATM automation systems.	NIL	NIL	NIL

8. ASBU B0-ASUR Performance Monitoring and Measurement	
8A. ASBU B0-ASUR: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
Item 180- ATS surveillance	Indicator: Percentage of FIRs with ATS surveillance using ADS-B or SSR or MLAT where ATS surveillance is possible Supporting metric: Number of FIRs with ATS surveillance using ADS-B or SSR or MLAT where ATS surveillance is possible
Item 270- ATS surveillance with data integrated	Indicator: Percentage of ACCs with ATS Surveillance using ADS-B, MLAT or radar where ATS surveillance is possible and having data integrated into the ATC system situation display Supporting metric: Number of ACCs with ATS Surveillance using ADS-B, MLAT or radar where ATS surveillance is possible and having data integrated into the ATC system situation display

8. ASBU B0-ASUR. Performance Monitoring and Measurement	
8 B. ASBU B0-ASUR: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Improved airspace capacity, separation standards and ATC situational awareness permit better opportunity for access to airspace by all users.
Capacity	Benefits: Typical surveillance-based horizontal separation minima are 3 NM or 5 NM enabling a significant increase in airspace capacity compared to procedural minima.
Efficiency	Benefits: Optimized air traffic flow sequencing and runway throughput rates enabled by typical surveillance separation minima. Reduced ATC workload with implementation of surveillance separation minima and significantly reduced radiotelephony traffic required for managing identified aircraft.



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8. ASBU B0-ASUR. Performance Monitoring and Measurement	
8 B. ASBU B0-ASUR: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Environment	Benefits: Reduced carbon emissions resulting from increased airspace capacity and efficiency, which lead to greater opportunity for flight at optimal flight levels and reduction in airborne holding.
Safety	Benefits: Less likelihood of airspace and ATC overload due to increased airspace capacity and reduced controller workload. Reduced likelihood of breakdown-of-separation incidents. Support for search and rescue alerting response.



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – B0-DATM: Service Improvement through Digital Aeronautical Information Management					
Performance Improvement Area 2: Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management					
3. ASBU B0-DATM: Impact on Main Key Performance Areas					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

4. ASBU DATM: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
Item 300 - Aeronautical Information Management	November 2015 (Seamless ATM Phase I): ATM systems should be supported by digitally-based AIM systems through implementation of Phase 1 and 2 of the AIS-AIM Roadmap
	November 2018 (Seamless ATM Phase II): ATM systems should be supported by digitally-based AIM systems through implementation of Phase 3 of the AIS-AIM Roadmap

7. ASBU B0-DATM: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
AIM Phase 1 and Phase 2	<ul style="list-style-type: none"> • Current AIS systems may be too segmented. • Slow implementation of electronic databases. • AIS/AIM departments of State Regulators and/or ANSPs not being accorded appropriate priority within their organizations • Late updating of AIM guidance material (ICAO Doc 8126 – <i>AIS Manual</i>) and delayed publication of new PANS/AIM may delay State progress. 	NIL	Lack of procedures to allow airlines to provide digital AIS data to on-board devices, in particular electronic flight bags (EFBs). Lack of training for AIS/AIM personnel.	Operational approvals of EFB.



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7. ASBU B0-DATM: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
AIM Phase 3	<ul style="list-style-type: none"> Lack of IP-based infrastructure for data integration and user access. System configuration (populating of data models) may require time 	NIL	NIL	NIL

8. ASBU B0-DATM: Performance Monitoring and Measurement	
8A. ASBU B0-DATM: Implementation	
Elements	Performance Indicators/Supporting Metrics
AIM Phase 1 and Phase 2	Indicator: Percentage of States which implement the total number of Phase 1 and 2 AIS-AIM elements Supporting Metric: Number of States which implement the total number of Phase 1 and 2 AIS-AIM elements
AIM Phase 3	Indicator: Percentage of States which implement the total number of Phase 3 AIS-AIM elements Supporting Metric: Number of States which implement the total number of Phase 3 AIS-AIM elements

8A. ASBU B0-DATM: Performance Monitoring and Measurement	
8 B. ASBU B0-DATM: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Benefit: Improved access to aeronautical information through dynamically updated web-based applications
Capacity	Benefit: Improved capacity resulting from higher quality data and its application to improvements in airspace and ATS route and flight procedure design.
Efficiency	Benefit: Improved flight efficiency facilitated by better quality data and consequent improvements in airspace and airport capacity.
Environment	Benefit: Reduced amount of paper for promulgation of information. Reduced carbon emissions as a consequence of improved flight efficiency.
Safety	Benefit: Improved quality management, accessibility, usability and dynamic update of aeronautical information.



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-FICE: Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration					
Performance Improvement Area 2: Globally Interoperable Systems and Data – Through Globally Interoperable System Wide Information Management					
3. ASBU B0-FICE: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

4. ASBU B0-FICE: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
Item 220 - ATS Inter-facility Data-link Communications (AIDC)	November 2015 (Seamless ATM Plan Phase I): ATM systems should enable AIDC between ATC units where transfers of control are conducted. As far as practicable, the AIDC messages types ABI, EST, ACP, TOC, AOC should be implemented. November 2018 (Seamless ATM Plan Phase II): Implement full AIDC messaging, or alternate communication standard.
Complete the regional ATN/AMHS network in the whole APAC region (enabler)	November 2015: all States are interconnected in AMHS
Migrate communications between States on the regional network (AIDC, ATFM, SUR data, performance monitoring, SWIM, etc) ¹ (enabler)	November 2018: all States have migrated their communications

7. ASBU B0-FICE: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementat ion	Procedures Availability	Operati onal Approva ls

¹ Valid only if the study requested by APANPIRG/24 concludes that such network should be implemented in the APAC region



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7. ASBU B0-FICE: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. ATM systems should enable AIDC between ATC units where transfers of control are conducted. As far as practicable, the AIDC messages types ABI, EST, ACP, TOC, AOC should be implemented.	ATM automation system capability and supporting data communications network.	NIL	ATC procedures for intervention and interaction with ATM automation system, and for operational improvements including reduced ATC manual coordination requirement where supported by appropriate airspace and ATS route design or redesign.	NIL
2. Implement full AIDC messaging, or alternate communication standard.	ATM automation system capability and supporting data communications network.	NIL	ATC procedures for intervention and interaction with ATM automation system, and for operational improvements including reduced ATC manual coordination requirement where supported by appropriate airspace and ATS route design or redesign.	
3. Complete the regional ATN/AMHS network in the whole APAC region	Readiness of all States for double stack	NIL	NIL	NIL
4. Migrate communications between States on the regional network	Multinational agreement and Common Procurement	NIL	NIL	NIL

8. ASBU B0-FICE: Performance Monitoring and Measurement	
8A. ASBU B0-FICE: Implementation	
Elements	Performance Indicators/Supporting Metrics
1. Implement AIDC at APAC States between ATC units where transfers of control are conducted (minimum set: ABI, EST, ACP, TOC, AOC)	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs



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8. ASBU B0-FICE: Performance Monitoring and Measurement	
8A. ASBU B0-FICE: Implementation	
Elements	Performance Indicators/Supporting Metrics
2. Implement AIDC compliant with PAN-Regional AIDC ICD, or alternate higher performance data communications between all ACCs and between ACCs and all associated terminal ATC units.	% of FIRs within which all applicable ACCs have implemented full AIDC messaging, or alternate communication standard
3. Complete the regional ATN/AMHS network in the whole APAC region (enabler)	% of States interconnected in AMHS
4. Migrate communications between States on the regional network (enabler)	% of States with migration of applications terminated

8A. ASBU B0-FICE: Performance Monitoring and Measurement	
8 B. ASBU B0-FICE: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Benefit: Greater access afforded by improvements in capacity and efficiency.
Capacity	Benefit: Increased capacity due to reduced controller workload associated with ATS coordination and transfers of control.
Efficiency	Benefit: Reduced voice coordination, improved timeliness of coordination, leading to better efficiencies in ATC workload and task prioritization
Environment	Benefit: Increased capacity due to reduction in ATC workload, leading to more aircraft operating at preferred flight levels on optimum trajectories.
Safety	Benefit: Reduction and early detection of human coordination errors, thus reducing large height deviation (LHD) events. Extension of safety net alerts to aircraft operating beyond FIR boundary when to or intending to transit the FIR.



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

<p>2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module N° B0-FRTO: Improved Operations through Enhanced En-Route Trajectories</p> <p>Performance Improvement Area 3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM</p>

3. ASBU B0-FRTO: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

4. ASBU B0-FRTO: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
Item 360 - Civil Military use of SUA	November 2015 (Phase I): All States should ensure that SUA are regularly reviewed by the appropriate Airspace Authority to assess the effect on civil air traffic and the activities affecting the airspace

7. ASBU B0-FRTO: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
Item 360 - Civil Military use of SUA	NIL	NIL	States without an independent airspace authority may have trouble achieving effective airspace management	NIL

8. ASBU B0-FRTO: Performance Monitoring and Measurement	
8A. ASBU B0-FRTO: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
Item 360 - Civil Military use of SUA	Percentage of States having made arrangements to effectively manage the designation, size, activation and operation of military/State SUA Supporting metric: number of States having made arrangements to effectively manage the designation, size, activation and operation of military/State SUA

ASBU B0-FRTO: Performance Monitoring and Measurement	
8 B. ASBU B0-FRTO: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Benefit: More flexibility in airspace management to provide different airspace users with access to airspace and optimal routes



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ASBU B0-FRTO: Performance Monitoring and Measurement	
8 B. ASBU B0-FRTO: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Capacity	Benefit: more airspace offered allowing access to optimal routes
Efficiency	Benefit: Reduced fuel burn due to better anticipation of flow issues; Reduced block times and times with engines on
Environment	Benefit: Reduced fuel burn as delays are absorbed on the ground, with shut engines; or at optimum flight levels through speed or route management
Safety	Benefit: Reduction of occurrences of sector capacity being lesser than demand



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module B0-NOPS: Improved Flow Performance through Planning based on a Network-Wide view Performance Improvement Area 3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
3. ASBU B0-NOPS: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y

4. ASBU B0-NOPS: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
Item 80: Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	November 2015: (Seamless ATM Plan Phase I) All high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes should implement ATFM incorporating CDM using operational ATFM platform/s. November 2018 (Seamless ATM Plan Phase II): All FIRs supporting Major Traffic Flows should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements

7. ASBU B0-NOPS: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals



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7. ASBU B0-NOPS: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
Item 80: Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	Procurement and commissioning of interoperable systems supporting collaborative ATFM	NIL	Development and implementation of necessary ATC, airspace user and airport operator knowledge, skills, and procedures Defined in Regional Collaborative ATFM Framework, including procedures to include relevant non-networked FIRs or ATSUs in ATFM processes	NIL
	Interoperability of intra-and inter-regional sub-Regional ATFM network communications	NIL	Interoperability of inter-Regional procedures and processes.	NIL

8. ASBU B0-NOPS: Performance Monitoring and Measurement	
8A. ASBU B0-NOPS: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
Item 80: Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	November 2015: (Seamless ATM Plan Phase I). Percentage of high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes having ATFM incorporating CDM using operational ATFM platform/s. Supporting metric: Number of high density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes having ATFM incorporating CDM using operational ATFM platform/s.
	November 2018 (Seamless ATM Plan Phase II): Percentage of FIRs supporting Major Traffic Flows that have implemented ATFM incorporating CDM Supporting metric: Number of FIRs supporting Major Traffic Flows that have implemented ATFM incorporating CDM



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ASBU B0-NOPS: Performance Monitoring and Measurement	
8 B. ASBU B0-NOPS: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	Benefits: Priorities for access determined by optimal network operations outcomes.
Capacity	Benefits: Improved airspace and airport capacity through the continuous, dynamic management of demand and the reduction of late notice ATFM measures such as holding, vectoring and ground stop.
Efficiency	Benefits: Reduced fuel burn due to better, more dynamic capacity and demand measurement, and capacity/demand balancing by collaborative planning and execution of ATFM measures
Environment	Benefits: Reduced fuel burn as delays are absorbed either on the ground, ideally with engines shut-down, or at optimum flight levels through early application of airborne ATFM measures.
Safety	Benefits: Reduced risk and incidence of ATC sector overload, and better planned, more stable aircraft trajectories through all phases of flight.

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AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-SNET: Increased Effectiveness of Ground-Based Safety Nets					
Performance Improvement Area3: Optimum Capacity and Flexible Flights – Through Global Collaborative ATM					
ASBU B0-SNET: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	N	N	N	Y

4. ASBU B0-SNET: Planning Targets and Implementation Progress	
5. Elements	6. Targets and Implementation Status (Air Ground)
1. Short Term Conflict Alert (STCA) Area Proximity Warning (APW) Minimum Safe Altitude Warning (MSAW)	Nov. 18 (Phase 2): ATS surveillance systems should enable STCA, APW and MSAW

7. ASBU B0-SNET: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. Short Term Conflict Alert (STCA) Area Proximity Warning (APW) Minimum Safe Altitude Warning (MSAW)	ATM Systems upgrade	NIL	ATC Manual update and approval	NIL

8. ASBU B0-SNET: Performance Monitoring and Measurement (Implementation)	
8A. ASBU B0-SNET: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
1. Short Term Conflict Alert (STCA) Area Proximity Warning (APW) Minimum Safe Altitude Warning (MSAW)	Indicator: Percentage of States/Administrations implementing ground-based safety-nets (STCA, APW, MSAW, etc.) Supporting Metric: Number of States/Administrations implementing ground-based safety-nets (STCA, APW, MSAW, etc.)

ASBU B0-SNET: Performance Monitoring and Measurement (Benefits)	
8 B. ASBU B0-SNET: Performance Monitoring	
Key Performance Areas	Benefits
Access & Equity	NA
Capacity	NA
Efficiency	NA
Environment	NA
Safety	Significant reduction of the number of major incidents

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**AIR NAVIGATION REPORT FORM (ANRF)
APAC Regional Planning for ASBU Modules**

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-SURF: Safety and Efficiency of Surface Operations (A-SMGCS)					
Performance Improvement Area 1: Airport Operations					
ASBU B0-SURF: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	Y
ASBU B0-SURF: Planning Targets and Implementation Progress					
Elements			Targets and Implementation Progress (Ground and Air)		
Safety and Efficiency of Surface Operations			November 2015 (Seamless ATM Phase I): All high density international aerodromes (100,000 scheduled movements per annum or more) should have provided electronic surface movement guidance and control.		
ASBU B0-SURF: Implementation Challenges					
Elements	Implementation Area				
	Ground system Implementation	Avionics Implementation	Procedures Availability	Operational Approvals	
Safety and Efficiency of Surface Operations	A-SMGCS system integrating sensors. Vehicles properly equipped (cooperative transponder systems)	Nil	Nil	Nil	

ASBU B0-SURF: Performance Monitoring and Measurement (Implementation)	
Elements	Performance Indicators/Supporting Metrics
ASBU B0-SURF: Performance Monitoring and Measurement (Benefits)	
Surveillance system for ground surface movement(PSR,SSR, ADS-B or Multilateration (aircraft vehicles)	Percentage of applicable international aerodromes having implemented A-SMGCS

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Key Performance Areas	Performance Metrics
Access & Equity	Improves portions of the manoeuvring area obscured from view of the control tower for vehicles and aircraft. Ensures equity in ATC handling of surface traffic regardless of the traffic's position on the international aerodrome
Capacity	Sustained level of aerodrome capacity during periods of reduced visibility
Efficiency	Reduced taxi times through diminished requirements for intermediate holdings based on reliance on visual surveillance only. Reduced fuel burn
Environment	Reduced emissions due to reduced fuel burn
Safety	Reduced runway incursions. Improved response to unsafe situations. Improved situational awareness leading to reduced ATC workload



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module B0-TBO: Improved Safety and Efficiency through the initial application of Data Link En-Route

Performance Improvement Area 4:
Efficient Flight Path – Through Trajectory-based Operations

3. ASBU B0-TBO: Impact on Main Key Performance Areas (KPA)

	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	Y	Y	Y	Y

4. ASBU B0-TBO: Planning Targets and Implementation Progress

5. Elements	6. Targets and implementation progress (Ground and Air)
ADS-C	November 2015 (Phase I): Within Category R airspace (remote en-route airspace within ATS communications and surveillance coverage dependent on a third-party CSP), ADS-C surveillance should be enabled to support PBN-based separations
CPDLC	November 2015 (Phase I): Within Category R airspace (remote en-route airspace within ATS communications and surveillance coverage dependent on a third-party CSP), CPDLC should be enabled to support PBN-based separations

7. ASBU B0-TBO: Implementation Challenges

Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
ADS-C	RCP and RSP framework should ensure that the end to end performance is reached and maintained, including CSP performance	Implementation of ADS-C for general aviation	NIL	NIL
CPDLC	RCP and RSP framework should ensure that the end to end performance is reached and maintained, including CSP performance	Implementation of CPDLC for general aviation	NIL	NIL

8. ASBU B0-TBO: Performance Monitoring and Measurement

8A. ASBU B0-TBO: Implementation Monitoring

Elements	Performance Indicators/Supporting Metrics
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8. ASBU B0-TBO: Performance Monitoring and Measurement	
8A. ASBU B0-TBO: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
ADS-C	Indicators: Percentage of FIRs utilising ADS-C to provide service within all category R airspace Supporting metric: Number of FIRs utilising ADS-C to provide service within all category R airspace
CPDLC	Indicators: Percentage of FIRs utilising CPDLC to provide service within all category R airspace Supporting metric: Number of FIRs utilising CPDLC to provide service within all category R airspace

ASBU B0-TBO: Performance Monitoring and Measurement	
8 B. ASBU B0-TBO: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	NA
Capacity	Benefit: A better localization of traffic and reduced separation allow increased capacity. Reduced communication workload and better organization of controller tasks increase sector capacity.
Efficiency	Benefit: Routes/tracks and flights can be separated by reduced minima, allowing flexible routings and vertical profiles closer to the user-preferred ones. In association with AIDC, implementation of DARP procedures.
Environment	Benefit: Reduced emissions as a result of reduced fuel burn
Safety	Benefit: ADS-C based tools support cleared level adherence monitoring, route adherence monitoring, danger area infringement warning and improved search and rescue. Reduced occurrences of misunderstandings; solution to stuck microphone situations. Quicker responses to route deviation requests and emergencies.



1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-WAKE Wake Turbulence Separation					
Performance Improvement Area 3: Optimum Capacity and Flexible Flights					
3. ASBU B0-WAKE: Impact on Main Key Performance Areas					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	Y	N	N	N
4. ASBU B0-ASEP: Planning Targets and Implementation Progress					
5. Elements			6. Targets and implementation progress (Ground and Air)		
WAKE			Nil		
7. ASBU B0-WAKE: Implementation Challenges					
Elements	Implementation Area				
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals	
Implement the 6 categories of wake vortex separation.	Ground/ automation support	NIL	NIL	NIL	
8. ASBU B0-ASEP Performance Monitoring and Measurement					
8A. ASBU B0-ASEP: Implementation Monitoring					
Elements	Performance Indicators/Supporting Metrics				
WAKE	Indicator: % of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation Supporting metric: Number of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation				
8. ASBU B0-ASEP. Performance Monitoring and Measurement					
8 B. ASBU B0-ASEP: Performance Monitoring					
Key Performance Areas		Metrics (if not indicate qualitative Benefits)			
Access & Equity		-			
Capacity		Increasing International aerodrome Arrival Operational Capacity; Increasing International aerodrome Departure Operational Capacity			
Efficiency		-			
Environment		-			
Safety		-			



1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-OPFL: Optimum Flight Levels Performance Improvement Area 3: Optimum Capacity and Flexible Flights					
3. ASBU B0-OPFL: Impact on Main Key Performance Areas					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	Y	N	Y	N

4. ASBU B0-OPFL: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
Optimum Flight Levels (OPFL)	Nil

7. ASBU B0-OPFL: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
Optimum Flight Levels (OPFL)	Availability of Conflict probing	Availability of ADS-B OUT, ADS-B IN	ITP procedure availability and training of crew	NIL

8. ASBU B0-OPFL Performance Monitoring and Measurement	
8A. ASBU B0-OPFL: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
Optimum Flight Levels (OPFL)	Indicator: Percentage of FIRs having implemented in-trail procedures Supporting metric: Number of FIRs having implemented in-trail procedures

8. ASBU B0-OPFL. Performance Monitoring and Measurement	
8 B. ASBU B0-OPFL: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
Access & Equity	-
Capacity	Improved access to optimum flight levels
Efficiency	-
Environment	Improved access to optimum flight levels
Safety	-



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1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module B0-SAR: Improved Safety and Efficiency through the initial application of Regional SAR Initiatives					
Performance Improvement Area 2: Globally Interoperable Systems and Data					

3. ASBU B0-SAR: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	N	N	Y	Y	Y

4. ASBU B0-SAR: Planning Targets and Implementation Progress	
5. Elements	6. Targets and implementation progress (Ground and Air)
SAR Regulatory and Coordination Mechanisms	November 2018: All States should develop statutes and related provisions for a SAR organization and its framework, resources, policies and procedures, including a State SAR Plan, international SAR agreements and SAR exercises (SAREX).
SAR Facilities and Assets	November 2018: All States should establish Rescue Coordination Centres (RCCs) of sufficient size with facilities, tools, and access to SAR Units (SRU) commensurate with the State’s responsibilities, or delegate the function as appropriate (all States should investigate the feasibility of establishing Joint Rescue Coordination Centres (JRCCs) and implement where beneficial).
SAR Information	November 2018: All States should establish a centralised SAR information source, which includes data supporting the Aeronautical Information Publication (AIP), SAR Library, 24 hour Contacts database of SAR facilities, assets and lists of SRUs.
SAR Improvement	November 2018: All States should implement Quality Assurance (QA) programmes that include continuous improvement and audit processes, gap and safety/quality indicator analysis, and SAR promotion activities.

7. ASBU B0-SAR: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
SAR Regulatory and Coordination Mechanisms	NA	NA	Legislative restrictions and legal problems enacting SAR agreements. Lack of political support.	NA



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7. ASBU B0-SAR: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
SAR Facilities and Assets	Lack of resources to establish appropriate facilities and SRUs . Cospas-Sarsat facilities or sharing access with other States.	Lack of appropriate communications and direction-finding equipment.	Lack of local, State and regional agreements between agencies to facilitate sharing of SAR resources, including SRUs.	Lack of Civil/Military SAR cooperation, including use of military facilities and SRUs.
SAR Information	Lack of computers and software	NA	Lack of established information support processes.	NA
SAR Improvement	NA	NA	Lack of regional and local training of RCC staff and SRUs. Lack of QA and improvement plans and procedures.	NA

8. ASBU B0-SAR: Performance Monitoring and Measurement	
8A. ASBU B0-SAR: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
SAR Regulatory and Coordination Mechanisms	Indicators: Percentage of States implementing SAR regulatory and coordination mechanisms Supporting metric: Number of States implementing SAR regulatory and coordination mechanisms
SAR Facilities and Assets	Indicators: Percentage of States establishing SAR facilities and assets Supporting metric: Number of States establishing SAR facilities and assets
SAR Information	Indicators: Percentage of States implementing SAR information systems Supporting metric: Number of States implementing SAR information systems
SAR Improvement	Indicators: Percentage of States implementing SAR improvement programmes Supporting metric: Number of States implementing SAR improvement programmes



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ASBU B0-SAR: Performance Monitoring and Measurement	
8 B. ASBU B0-SAR: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative benefits)
Access & Equity	NA
Capacity	NA
Efficiency	Benefit: enhanced sharing of SRUs and information leading to more efficient responses that involve less time searching.
Environment	Benefit: reduced emissions as a result of reduced fuel burn of airborne, maritime and land based SRUs.
Safety	Benefit: quicker response times to safety of life events, with better information providing SAR Mission Coordinators the opportunity to better match the SRU with the emergency requirement. Improved civil/military cooperation.

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Responsibility matrix for ASBU modules and corresponding Seamless items

Seamless ATM Specification title	Seamless Reference	Regional Priority	ASBU Module	ASBU - Module title	Sc 1 Endorsing body	Sc 2 Endorsing body
Airport Collaborative Decision-Making (ACDM)	70	2	B0-ACDM	Improved Airport Operations through Airport-CDM	AOP WG	AOP WG
Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	80	1	B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	ATFM SG	ATFM SG
Arrival Manager/Departure Management (AMAN/DMAN)	50	2	B0-RSEQ	Improve Traffic flow through Sequencing (AMAN/DMAN)	ATFM SG	ATFM SG
Aeronautical Information Management	300	1	B0-DATM	Service Improvement through Digital Aeronautical Information Management	ATM SG	ATM SG
Civil Military use of SUA	360	1	B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Continuous Descent Operations (CDO)	90	2	B0-CDO	Improved Flexibility and Efficiency in Descent Profiles using Continuous Descent Operations (CDOs)	PBNICG	ATM SG
Continuous Climb Operations (CCO)	100	2	B0-CCO	Improved Flexibility and Efficiency Departure Profiles – Continuous Climb Operations (CCO)	PBNICG	ATM SG
Performance-based Navigation (PBN) Routes	140	2	B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	PBNICG	ATM SG
ATM systems enabling optimal PBN/ATC operations	250	2	B0-APTA	Optimization of Approach Procedures including vertical guidance	PBNICG	ATM SG
UPR and DARP	290	3	B0-FRTO	Improved Safety and Efficiency through the initial application of Data Link En-Route	ATM SG	ATM SG
Nil	440	3	B0-WAKE	Improved Access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B	ATM SG	ATM SG
Nil	450	3	B0-OPFL	Increased Runway Throughput through Optimized Wake Turbulence Separation	ATM SG	ATM SG
Performance-based Navigation (PBN) Approach	110	1	B0-APTA	Optimization of Approach Procedures including vertical guidance	PBNICG	ATM SG
ATS Surveillance	180	1	B0-ASUR	Initial Capability for Ground Surveillance	CNS SG	CNS SG

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ATS Inter-facility Data-link Communications (AIDC)	220	1	B0-FICE	Increased Interoperability Efficiency & Capacity through Ground-Ground Integration	CNS SG	CNS SG
ATS surveillance with data integrated	270	1	B0-ASUR	Initial Capability for Ground Surveillance	CNS SG	CNS SG
ADS-C and CPDLC	280	1	B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	CNS SG	CNS SG
Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	120	2	B0-CCO B0-CDO	Optimization of Approach Procedures including vertical guidance	PBNICG	ATM SG
Safety Nets	160	2	B0-SNET	Increased effectiveness of ground-based safety nets	CNS SG	CNS SG
Airborne Safety Systems	170	2	B0-ACAS	Airborne Collision Avoidance Systems (ACAS) Improvements	CNS SG	CNS SG
Nil	430	2	B0-ASEP	Air Traffic Situational Awareness (ATSA)	CNS SG	CNS SG
Safety and Efficiency of Surface Operations	40	3	B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	CNS SG	CNS SG
Meteorological Information	310	2	B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	MET SG	MET SG

Responsibility matrix for all Seamless items

Seamless ATM Specification title	Seamless Reference	Regional Priority	Regional/ ASBU Module	ASBU - Module title	Sc 1 Endorsing body	Sc 2 Endorsing body
Apron Management	10	3	Regional	-	AOP WG	AOP WG
ATM-Aerodrome Coordination	20	3	Regional	-	ATM SG	ATM SG
Aerodrome capacity	30	3	Regional	-	ATM SG	ATM SG
Safety and Efficiency of Surface Operations	40	3	B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	CNS SG	CNS SG
Arrival Manager/Departure Management (AMAN/DMAN)	50	2	B0-RSEQ	Improve Traffic flow through Sequencing (AMAN/DMAN)	ATFM SG	ATFM SG
ATC Sector Capacity	60	2	Regional	-	ATM SG	ATM SG
Airport Collaborative Decision-Making (ACDM)	70	2	B0-ACDM	Improved Airport Operations through Airport-CDM	AOP WG	AOP WG
Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	80	1	B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	ATFM SG	ATFM SG
Continuous Descent Operations (CDO)	90	2	B0-CDO	Improved Flexibility and Efficiency in Descent Profiles using Continuous Descent Operations (CDOs)	PBNICG	ATM SG

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Continuous Climb Operations (CCO)	100	2	B0-CCO	Improved Flexibility and Efficiency Departure Profiles – Continuous Climb Operations (CCO)	PBNICG	ATM SG
Performance-based Navigation (PBN) Approach	110	1	B0-APTA	Optimization of Approach Procedures including vertical guidance	PBNICG	ATM SG
Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	120	2	B0-CCO B0-CDO	Optimization of Approach Procedures including vertical guidance	PBNICG	ATM SG
Performance-based Navigation (PBN) Visual Departure and Arrival Procedures	130	3	Regional	-	ATM SG	ATM SG
Performance-based Navigation (PBN) Routes	140	2	B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	PBNICG	ATM SG
Performance-based Navigation (PBN) Airspace	150	2	Regional	-	ATM SG	ATM SG
Safety Nets	160	2	B0-SNET	Increased effectiveness of ground- based safety nets	CNS SG	CNS SG
Airborne Safety Systems	170	2	B0-ACAS	Airborne Collision Avoidance Systems (ACAS) Improvements	CNS SG	CNS SG
ATS Surveillance	180	1	B0-ASUR	Initial Capability for Ground Surveillance	CNS SG	CNS SG
Airspace classification	190	2	Regional	-	ATM SG	ATM SG
Flight Level Orientation Schemes (FLOS)	200	2	Regional	-	ATM SG	ATM SG

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Flight Level Allocation Schemes (FLAS)	210	2	Regional	-	ATM SG	ATM SG
ATS Inter-facility Data-link Communications (AIDC)	220	1	B0-FICE	Increased Interoperability Efficiency & Capacity through Ground-Ground Integration	CNS SG	CNS SG
Automated Transfer of Control	230	2	Regional	-	ATM SG	ATM SG
ATS Surveillance data sharing	240	2	Regional	-	CNS SG	CNS SG
ATM systems enabling optimal PBN/ATC operations	250	2	B0-APTA	Optimization of Approach Procedures including vertical guidance	PBNICG	ATM SG
ATC Horizontal separation	260	2	Regional	-	ATM SG	ATM SG
ATS surveillance with data integrated	270	1	B0-ASUR	Initial Capability for Ground Surveillance	CNS SG	CNS SG
ADS-C and CPDLC	280	1	B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	CNS SG	CNS SG
UPR and DARP	290	3	B0-FRTO	Improved Safety and Efficiency through the initial application of Data Link En-Route	ATM SG	ATM SG
Aeronautical Information Management	300	1	B0-DATM	Service Improvement through Digital Aeronautical Information Management	ATM SG	ATM SG

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Meteorological Information	310	2	B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	MET SG	MET SG
ATM Managers' Performance	320	2	Regional	-	ATM SG	ATM SG
ATC simulators performance	330	2	Regional	-	ATM SG	ATM SG
Safety assessment of changes	340	2	Regional	-	ATM SG	ATM SG
ATM Operators' performance	350	2	Regional	-	ATM SG	ATM SG
Civil Military use of SUA	360	1	B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Strategic Civil Military coordination	370	1	Regional	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Tactical Civil Military coordination	380	1	Regional	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Civil Military system integration	390	2	Regional	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Civil Military nav aids joint provision	400	2	Regional	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG

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Civil Military common training	410	2	Regional	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Civil Military common procedures	420	2	Regional	Improved Operations through Enhanced En-Route Trajectories	ATM SG	ATM SG
Nil	430	2	B0-ASEP	Air Traffic Situational Awareness (ATSA)	CNS SG	CNS SG
Nil	440	3	B0-WAKE	Improved Access to Optimum Flight Levels through Climb/Descent Procedures using ADS-B	ATM SG	ATM SG
Nil	450	3	B0-OPFL	Increased Runway Throughput through Optimized Wake Turbulence Separation	ATM SG	ATM SG