

APAC AIR NAVIGATION PLAN

VOLUME III

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PART 0 – INTRODUCTION

1. INTRODUCTION

1.1 The background to the publication of ANPs in three volumes is explained in the Introduction in Volume I. The procedure for amendment of Volume III is also described in Volume I. Volume III contains dynamic/flexible plan elements related to the implementation of the air navigation system and its modernization in line with the ICAO Aviation System Block Upgrades (ASBUs) and associated technology roadmaps described in the Global Air Navigation Plan (GANP).

1.2 The information contained in Volume III is related mainly to:

- Planning: objectives set, priorities and targets planned at regional or sub-regional levels;
- Implementation monitoring and reporting: monitoring of the progress of implementation towards targets planned. This information should be used as the basis for reporting purposes (i.e.: global and regional air navigation reports and performance dashboards); and/or
- Guidance: providing regional guidance material for the implementation of specific system/procedures in a harmonized manner.

1.3 The management of Volume III is the responsibility of the APANPIRG.

1.4 Volume III should be used as a tool for monitoring and reporting the status of implementation of the elements planned here above, through the use of tables/databases and/or references to online monitoring tools, as endorsed by APANPIRG. The status of implementation is updated on a regular basis as endorsed by APANPIRG.

2. AVIATION SYSTEM BLOCK UPGRADES (ASBUs), MODULES AND ROADMAPS

2.1. The ASBU Modules and Roadmaps form a key component to the GANP, noting that they will continue to evolve as more work is done on refining and updating their content and in subsequent development of related provisions, support material and training.

2.2. Although the GANP has a worldwide perspective, it is not intended that all Block Upgrade Modules are required to be applied in every State, sub-region and/or region. Many of the Block Upgrade Modules contained in the GANP are specialized packages that should be applied only where the specific operational requirement exists or corresponding benefits can be realistically projected. Accordingly, the Block Upgrade methodology establishes an important flexibility in the implementation of its various Modules depending on a region, sub-region and/or State's specific operational requirements. Guided by the GANP, ICAO APAC regional, sub-regional and State planning should identify Modules which best provide the needed operational improvements.

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PART I - GENERAL PLANNING ASPECTS (GEN)

1. PLANNING METHODOLOGY

1.1 Guided by the GANP, the regional planning process starts by identifying the homogeneous ATM areas, major traffic flows and international aerodromes. An analysis of this data leads to the identification of opportunities for performance improvement. Modules from the Aviation System Block Upgrades (ASBUs) are evaluated to identify which of those modules best provide the needed operational improvements. Depending on the complexity of the module, additional planning steps may need to be undertaken including financing and training needs. Finally, regional plans would be developed for the deployment of modules by drawing on supporting technology requirements. This is an iterative planning process which may require repeating several steps until a final plan with specific regional targets is in place. This planning methodology requires full involvement of States, service providers, airspace users and other stakeholders, thus ensuring commitment by all for implementation.

1.2 Block 0 features Modules characterized by technologies and capabilities which have already been developed and implemented in many parts of the world today. It therefore features a near-term availability milestone, or Initial Operating Capability (IOC), of 2013 for high density based on regional, sub-regional and State operational need. Blocks 1 through 3 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2018, 2023 and 2028 respectively.

2. REVIEW AND EVALUATION OF AIR NAVIGATION PLANNING

2.1. The progress and effectiveness against the priorities set out in the regional air navigation plans should be annually reported, using a consistent reporting format, to ICAO.

2.2. Performance monitoring requires a measurement strategy. Data collection, processing, storage and reporting activities supporting the identified global/regional performance metrics are fundamental to the success of performance-based approaches.

2.3. The air navigation planning and implementation performance framework prescribes reporting, monitoring, analysis and review activities being conducted on a cyclical, annual basis. An Air Navigation Reporting Form (ANRF) reflecting selected key performance areas as defined in the Manual on Global Performance of the Air Navigation System (ICAO Doc 9883) has been developed for each ASBU Module. The ANRF is a customized tool which is recommended for the application of setting planning targets, monitoring implementation, and identifying challenges, measuring implementation/performance and reporting. If necessary, other reporting formats that provide more details may be used but should contain as a minimum the elements described in the ANRF template. A sample of the ANRF is provided in **Appendix A**. A sample Template of a planning table which may be used to show the elements planned in an ICAO region is provided in **Appendix B**.

3. REPORTING AND MONITORING RESULTS

3.1 Reporting and monitoring results will be analyzed by the PIRGs, States and ICAO Secretariat to steer the air navigation improvements, take corrective actions and review the allocated objectives, priorities and targets if needed. The results will also be used by ICAO and aviation partner stakeholders to develop the annual Global Air Navigation Report. The report results will provide an opportunity for the international civil aviation community to compare progress across different ICAO regions in the establishment of air navigation infrastructure and performance-based procedures.

3.2 The reports will also provide the ICAO Council with detailed annual results on the basis of which tactical adjustments will be made to the performance framework work programme, as well as triennial policy adjustments to the GANP and the Block Upgrade Modules.

3.3 **Table GEN III-1** contains a minimum set of Implementation Indicator(s) for each of the eighteen ASBU Block 0 Modules necessary for the monitoring of these Modules (if identified as a priority for implementation at regional or sub-regional level). These indicators are intended to enable comparison between ICAO Regions with respect to ASBU Block 0 Modules and will apply only to commonly selected ASBU Modules. All regions/PIRGs reserve the right to select the ASBU Modules relevant to their needs and to endorse additional indicators, as deemed necessary. No reporting is required for ASBU Block 0 Modules that have not been selected.

Note: The priority for implementation as well as the applicability area of each selected ASBU Block 0 Module is to be defined by APANPIRG. This should be reflected in Part II – Air Navigation System Implementation.

TABLE GEN III-1 – IMPLEMENTATION INDICATOR(S) FOR EACH ASBU BLOCK 0 MODULE**Explanation of the Table**

- 1 Block 0 Module Code
 2 Block 0 Module Title
 3 High level Implementation Indicator
 4 Remarks *Additional information as deemed necessary.*

Module Code	Module Title	Implementation Indicator	Remarks
1	2	3	4
B0-APTA	Optimization of Approach Procedures including vertical guidance	% of international aerodromes having at least one runway end provided with APV Baro-VNAV or LPV procedures	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	% of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation	1. Not to be considered for the first reporting cycles due to lack of maturity. 2. List of ADs to be established through regional air navigation agreement.
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	% of applicable international aerodromes having implemented AMAN / DMAN	1. Not to be considered for the first reporting cycles due to lack of maturity. 2. List of ADs to be established through regional air navigation agreement.
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	% of applicable international aerodromes having implemented A-SMGCS Level 2	List of ADs to be established through regional air navigation agreement.
B0-ACDM	Improved Airport Operations through Airport-CDM	% of applicable international aerodromes having implemented improved airport operations through airport-CDM	List of ADs to be established through regional air navigation agreement.
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	- % of States having implemented an AIXM based AIS database - % of States having implemented QMS	
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	- % of States having implemented SADIS / WIFS - % of States having implemented QMS	

Module Code	Module Title	Implementation Indicator	Remarks
1	2	3	4
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	% of FIRs in which FUA is implemented	
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	% of FIRs within which all ACCs utilize ATFM systems	
B0-ASUR	Initial capability for ground surveillance	% of FIRs where ADS-B OUT and/or MLAT are implemented for the provision of surveillance services in identified areas.	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-ASEP	Air Traffic Situational Awareness (ATSA)	% of States having implemented air traffic situational awareness	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	% of FIRs having implemented in-trail procedures	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-ACAS	ACAS Improvements	% of States requiring carriage of ACAS (with TCAS 7.1 evolution)	
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	% of States having implemented ground-based safety-nets (STCA, APW, MSAW, etc.)	
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	- % of international aerodromes / TMAs with PBN STAR implemented - % of international aerodromes/TMA where CDO is implemented	
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	% of FIRs utilising data link en-route in applicable airspace	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	- % of international aerodromes / TMAs with PBN SID implemented - % of international aerodromes/TMA where CCO is implemented	

Appendix A

SAMPLE TEMPLATE

1. AIR NAVIGATION REPORT FORM (ANRF)

(This template demonstrates how ANRF to be used.

The data inserted here refers to ASBU B0-05/CDO as an example only)

Regional and National planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-05/CDO: Improved Flexibility and Efficiency in Descent Profiles

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

3. ASBU B0-05/CDO: Impact on Main Key Performance Areas (KPA)

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

4. ASBU B0-05/CDO: Planning Targets and Implementation Progress

5. Elements	6. Targets and implementation progress (Ground and Air)
1. CDO	
2. PBN STARs	

7. ASBU B0-05/CDO: Implementation Challenges

Elements	Implementation Area			
	Ground system Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. CDO				
2. PBN STARs				

8. Performance Monitoring and Measurement 8A. ASBU B0-05/CDO: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
1. CDO	Indicator: Percentage of international aerodromes/TMAs with CDO implemented Supporting metric: Number of international aerodromes/TMAs with CDO implemented
2. PBN STARs	Indicator: Percentage of international aerodromes/TMAs with PBN STARs implemented Supporting metric: Number of international aerodromes/TMAs with PBN STARs implemented

8. Performance Monitoring and Measurement 8 B. ASBU B0-05/CDO: Performance Monitoring	
Key Performance Areas (Out of eleven KPAs, for the present until experienced gained, only five have been selected for reporting through ANRF)	Where applicable, indicate qualitative Benefits,
Access & Equity	Not applicable
Capacity	Not applicable
Efficiency	Cost savings through reduced fuel burn. Reduction in the number of required radio transmissions.
Environment	Reduced emissions as a result of reduced fuel burn
Safety	More consistent flight paths and stabilized approach paths. Reduction in the incidence of controlled flight into terrain (CFIT).
9. Identification of performance metrics: It is not necessary that every module contributes to all of the five KPAs. Consequently, a limited number of metrics per type of KPA, serving as an example to measure the module(s)' implementation benefits, without trying to apportion these benefits between module, have been identified on page 5. For the family of ASBU modules selected for air navigation implementation, States/Region to choose the applicable performance (benefit) metrics from the list available on page 5. This approach would facilitate States in collecting data for the chosen performance metrics. States/Region, however, could add new metrics for different KPAs based on maturity of the system and ability to collect relevant data.	

**AIR NAVIGATION REPORT FORM
HOW TO USE - EXPLANATORY NOTES**

1. **Air Navigation Report Form (ANRF):** This form is nothing but the revised version of Performance Framework Form that was being used by Planning and Implementation Regional Groups (PIRGs)/States until now. The ANRF is a customized tool for Aviation System Block Upgrades (ASBU) Modules which is recommended for application for setting planning targets, monitoring implementation, identifying challenges, measuring implementation/performance and reporting. Also, the PIRGs and States could use this report format for any other air navigation improvement programmes such as Search and Rescue. If necessary, other reporting formats that provide more details may be used but should contain as a minimum the elements described in this ANRF template. The results will be analysed by ICAO and aviation partners and utilized in the Regional Performance Dashboards and the Annual Air Navigation Report. The conclusions from the Air Navigation Report will serve as the basis for future policy adjustments, aiding safety practicality, affordability and global harmonization, amongst other concerns.
2. **Regional/National Performance objective:** In the ASBU methodology, the performance objective will be the title of the ASBU module itself. Furthermore, indicate alongside corresponding Performance Improvement area (PIA).
3. **Impact on Main Key Performance Areas:** Key to the achievement of a globally interoperable ATM system is a clear statement of the expectations/benefits to the ATM community. The expectations/benefits are referred to eleven Key Performance Areas (KPA) and are interrelated and cannot be considered in isolation since all are necessary for the achievement of the objectives established for the system as a whole. It should be noted that while safety is the highest priority, the eleven KPAs shown below are in alphabetical order as they would appear in English. They are access/equity; capacity; cost effectiveness; efficiency; environment; flexibility; global interoperability; participation of ATM community; predictability; safety; and security. However, out of these eleven KPAs, for the present, only five have been selected for reporting through ANRF, which are Access & Equity, Capacity, Efficiency, Environment and Safety. The KPAs applicable to respective ASBU module are to be identified by marking Y (Yes) or N (No). The impact assessment could be extended to more than five KPAs mentioned above if maturity of the national system allows and the process is available within the State to collect the data.
4. **Planning Targets and Implementation Progress:** This section indicates planning targets and status of progress in the implementation of different elements of the ASBU Module for both air and ground segments.
5. **Elements related to ASBU module:** Under this section list elements that are needed to implement the respective ASBU Module. Furthermore, should there be elements that are not reflected in the ASBU Module (example: In ASBU B0-80/ACDM, Aerodrome certification and data link applications D-VOLMET, D-ATIS, D-FIS are not included; Similarly in ASBU B0-30/DAIM, note that WGS-84 and eTOD are not included) but at the same time if they are closely linked to the module, ANRF should specify those elements. As a part of guidance to PIRGs/States, every Regional ANP will have the complete list of all 18 Modules of ASBU Block 0 along with corresponding elements, equipage required on the ground and in the air as well as metrics specific to both implementation and performance (benefits).
6. **Targets and implementation progress (Ground and Air):** Planned implementation date (month/year) and the current status/responsibility for each element are to be reported in this section. Please provide as much details as possible and should cover both avionics and ground systems. This ANRF being high level document, develop necessary detailed action plan separately for each element/equipage.

7. **Implementation challenges:** Any challenges/problems that are foreseen for the implementation of elements of the Module are to be reported in this section. The purpose of the section is to identify in advance any issues that will delay the implementation and if so, corrective action is to be initiated by the concerned person/entity. The four areas, under which implementation issues, if any, for the ASBU Module to be identified, are as follows:

- Ground System Implementation:
- Avionics Implementation:
- Procedures Availability:
- Operational Approvals:

Should be there no challenges to be resolved for the implementation of ASBU Module, indicate as “NIL”.

8. **Performance Monitoring and Measurement:** Performance monitoring and measurement is done through the collection of data for the supporting metrics. In other words, metrics are quantitative measure of system performance – how well the system is functioning. The metrics fulfil three functions. They form a basis for assessing and monitoring the provision of ATM services, they define what ATM services user value and they can provide common criteria for cost benefit analysis for air navigation systems development. The Metrics are of two types:

- A. **Implementation Monitoring:** Under this section, the indicator supported by the data collected for the metric reflects the status of implementation of elements of the Module. For example- Percentage of international aerodromes with CDO implemented. This indicator requires data for the metric “number of international aerodromes with CDO”.
- B. **Performance Monitoring:** The metric in this section allows to assess benefits accrued as a result of implementation of the module. The benefits or expectations, also known as Key Performance Areas (KPA), are interrelated and cannot be considered in isolation since all are necessary for the achievement of the objectives established for the system as a whole. It should be noted that while safety is the highest priority, the eleven KPAs shown below are in alphabetical order as they would appear in English. They are access/equity; capacity; cost effectiveness; efficiency; environment; flexibility; global interoperability; participation of ATM community; predictability; safety; and security. However, out of these eleven KPAs, for the present until experienced gained, only five have been selected for reporting through ANRF, which are Access & Equity, Capacity, Efficiency, Environment and Safety. Where applicable, mention qualitative benefits under this section.

9. **Identification of performance metrics:** It is not necessary that every module contributes to all of the five KPAs. Consequently, a limited number of metrics per type of KPA, serving as an example to measure the module(s)’ implementation benefits, without trying to apportion these benefits between module, have been identified on page 6. For the family of ASBU modules selected for air navigation implementation, States/Region to choose the applicable performance (benefit) metrics from the list available on page 6. This approach would facilitate States in collecting data for the chosen performance metrics. States/Region, however, could add new metrics for different KPAs based on maturity of the system and ability to collect relevant data.
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PART II – AIR NAVIGATION SYSTEM IMPLEMENTATION

1. INTRODUCTION

1.1 The planning and implementation of the ICAO Aviation System Block Upgrades (ASBUs) should be undertaken within the framework of the APANPIRG with the participation and support of all stakeholders, including regulatory personnel.

1.2 The ASBU Blocks and Modules adopted by the Asia and Pacific Regions should be followed in accordance with the specific ASBU requirements to ensure global interoperability and harmonization of air traffic management. The APANPIRG should determine the ASBU Block Upgrade Modules, which best proved the needed operational improvements in the ICAO Asia and Pacific Regions.

2. ICAO APAC AIR NAVIGATION OBJECTIVES, PRIORITIES AND TARGETS

2.1 In accordance with Recommendation 6/1 of the Twelfth Air Navigation Conference (AN-Conf/12), PIRGs are requested to establish priorities and targets for air navigation, in line with the ASBU methodology.

2.2 The achievement of the intended benefits along such routing or within each affinity is entirely dependent on the coordinated implementation of the required elements by all provider and user stakeholders concerned.

2.3 Considering that some of the Block Upgrade Modules contained in the GANP are specialized packages that may be applied where specific operational requirements or corresponding benefits exist, States and PIRGs should clarify how each Block Upgrade Module would fit into the national and regional plans.

2.4 As Block 0 Modules in many cases provide the foundation for future development, all Block 0 modules should be assessed, as appropriate, for early implementation by States in accordance with their operational needs.

2.5 In establishing and updating the APAC Air Navigation Plan, the APAC States should give due consideration to the safety priorities set out in the Global Aviation Safety Plan (GASP) and RASG.

2.6 States in the Asia and Pacific Regions through the APANPIRG should establish their own air navigation objectives, priorities and targets to meet their individual needs and circumstance in line with the global and regional air navigation objectives, priorities and targets.

2.7 In 2014, APANPIRG/25 adopted the following regional priorities and targets (APANPIRG/25 Conc. 25/2). The main planning table is listed below.

Priority	ASBU module or Seamless Element	Targets	Target date (Seamless ATM Phase 1 Plan)	Metric
PBN	B0-APTA	1. <u>Approach</u> : Where practicable, all high- density aerodromes with instrument runways serving aeroplanes should have precision approaches or APV or LNAV. <i>Note: High density aerodrome is defined by Asia-Pacific Seamless ATM Plan as aerodromes with scheduled operations in excess of 100,000/year.</i>	12 November 2015	% of high density aerodromes with precision approaches or APV or LNAV.
Network Operations	B0-NOPS	2. 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. <i>Note: High Density FIRs are defined in the Seamless ATM plan</i>	12 November 2015	% of High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes using operational ATFM platforms incorporating CDM
Aeronautical Information Management	B0-DATM	3. ATM systems should be supported by digitally-based AIM systems through implementation of Phase 1 and 2 of the AIS-AIM Roadmap	12 November 2015	% of Phase 1 and 2 AIS-AIM elements completed
Flight and Flow Information for a Collaborative Environment (FF-ICE)	B0-FICE	4. All States between ATC units where transfers of control are conducted have implemented the messages ABI, EST, ACP, TOC, AOC as far as practicable.	12 November 2015	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs
Civil/Military	B0-FRTO	5. Enhanced En-Route Trajectories: 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.	12 November 2015	% of States in which FUA is implemented

Priority	ASBU module or Seamless Element	Targets	Target date (Seamless ATM Phase 1 Plan)	Metric
Civil/Military	Strategic Civil Military coordination (Regional)	6. Enhanced En-Route Trajectories: All States should ensure that a national civil/military body coordinating strategic civil-military activities is established.	12 November 2015	% of States which have established a national civil/military body that performs strategic civil-military coordination
Civil/Military	Tactical Civil Military coordination (Regional)	7. Enhanced En-Route Trajectories: All States should ensure that formal civil military liaison for tactical response is established.	12 November 2015	% of States which have established a formal civil military liaison for tactical response
ADS-B airspace	B0-ASUR	8. 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.	12 November 2015	% of FIRs where Category S airspace and Category T airspace supporting high density aerodromes are designated as ADS-B airspace
ATS Surveillance	B0-ASUR	9. 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.	12 November 2015	% of ACCs with ATS Surveillance using ADS-B, MLAT or radar in Category S airspace, and having data integrated into the ATC system situation display
Trajectory-Based Operations-Data Link En-Route	B0-TBO	10. Within Category R airspace, ADS-C surveillance and CPDLC should be enabled to support PBN-based separations.	12 November 2015	% of FIRs using data link applications to support PBN-based separations in Category R airspace

2.8 All ASIA/PAC objectives, priorities and targets for November 2015 (paragraph 2.8.1), November 2019 (paragraph 2.8.2) and November 2022 (paragraph 2.8.3) are documented in the following ASIA/PAC Main Planning Tables. The ASIA/PAC Main Planning Table is built upon the versions of the Seamless ATM plans as adopted by APANPIRG.

2.8.1 Objectives for Phase 1 (November 2015)

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)		Regional planning elements	Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	Regional	1- Airport Operations	Yes	10	Apron Management	3	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;	% of high density international aerodromes (100,000 scheduled movements per annum or more) providing an appropriate apron management service	Seamless Plan V2R0
0	Regional	1- Airport Operations	Yes	20	ATM-Aerodrome Coordination	3	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	% of high density international aerodromes having appropriate ATM coordination in accordance with the Seamless ATM Plan	Seamless Plan V2R0
0	Regional	1- Airport Operations	Yes	30	Aerodrome capacity	3	All high density international aerodromes (100,000 scheduled movements per annum or more) should have a declared airport terminal and runway capacity	% of high density international aerodromes having declared capacity in accordance with the Seamless ATM Plan Phase 1	Seamless Plan V2R0
0	B0-SURF	1- Airport Operations	Yes	40	Safety and Efficiency of Surface Operations	3	All high density international aerodromes (100,000 scheduled movements per annum or more) should have provide electronic surface movement guidance and control.	% of applicable international aerodromes having implemented A-SMGCS Level 2	ANRF B0-SURF
0	B0-RSEQ	1- Airport Operations	Yes	50	Arrival Manager/Departure Management (AMAN/DMAN)	2	All high density aerodromes should have AMAN/DMAN facilities	% of applicable international aerodromes having implemented AMAN / DMAN (applicable = high density)	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-ACDM	1- Airport Operations	Yes	70	Airport Collaborative Decision-Making (ACDM)	2	All high density aerodromes should operate an A-CDM system serving the MTF and busiest city pairs	% of applicable international aerodromes having implemented improved airport operations through airport-CDM (applicable=high density)	ANRF B0-CDM
0	B0-NOPS	3- Optimum Capacity and Flexible Flights	Yes	80	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	1	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.	% of High Density FIRs supporting the busiest Asia/Pacific traffic flows and high density aerodromes using operational ATFM platforms incorporating CDM	ATFM Framework - ANRF B0-NOPS
0	B0-CDO	4- Efficient Flight Path	Yes	90	Continuous Descent Operations (CDO)	2	All high density international aerodromes implement CCO and CDO operations where States have assessed it applicable	% of international aerodromes/TMA where CDO is implemented	ANRF B0-APTA - CCO - CDO
0	B0-CCO	4- Efficient Flight Path	Yes	100	Continuous Climb Operations (CCO)	2	All high density international aerodromes implement CCO and CDO operations where States have assessed it applicable	% of international aerodromes where CCO is implemented	ANRF B0-APTA - CCO - CDO
0	B0-APTA	1- Airport Operations	Yes	110	Guided approach	1	Where practicable, all high density aerodromes with instrument runways serving aeroplanes should have precision approaches (GBAS or ILS/MLS) or APV or LNAV	% of high density aerodromes with precision approaches (GBAS or ILS/MLS) or APV or LNAV (High density aerodrome is defined by Asia-Pacific Seamless ATM Plan as aerodromes with scheduled operations in excess of 100,000/year)	ANRF B0-APTA - CCO - CDO
0	B0-CCO B0-CDO	1- Airport Operations	Yes	120	Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	2	All international high density aerodromes should have RNAV 1 (ATS surveillance environment) or RNP 1 (ATS surveillance and non-ATS surveillance environments) STAR	% of international aerodromes / TMAs with PBN STAR implemented	ANRF B0-APTA - CCO - CDO
0	B0-CCO B0-CDO	1- Airport Operations	Yes	120	Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)	2	All international high density aerodromes should have RNAV 1 (ATS surveillance environment) or RNP 1 (ATS surveillance and non-ATS surveillance environments) SID	% of international aerodromes / TMAs with PBN SID implemented	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-FRTO	4- Efficient Flight Path	Yes	140	Performance-based Navigation (PBN) Routes	2	All ATS routes should be designated with a navigation performance specification for category R airspace RNP 4 or RNP 10 (RNAV 10) or RNP 2 oceanic; and for Category S airspace RNAV 2 or RNP 2	% of ATS routes designated as PBN routes in accordance with Seamless ATM Phase 1	ANRF to be developed
0	Regional	4- Efficient Flight Path	Yes	150	Performance-based Navigation (PBN) Airspace	2	All Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes should be designated as non-exclusive or exclusive PBN airspace as appropriate.	Are all your Category R and S upper controlled airspace, and Category T airspace supporting high density aerodromes designated as non-exclusive or exclusive PBN airspace as appropriate.? (1- yes, 0-no)	Seamless Plan V2R0
0	B0-ACAS	3- Optimum Capacity and Flexible Flights	Yes	170	Airborne Safety Systems	2	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	% of States/Administrations requiring the carriage of ACAS (with TCAS 7.1 evolution)	ANRF B0-ACAS
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	180	ADS-B airspace	1	Unless supported by alternative means of ATS surveillance (such as radar, where there are no plans for ADS-B), 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	% of FIRs where Category S airspace and Category T airspace supporting high density aerodromes are designated as ADS-B airspace and require operation of ADS-B using 1090ES with DO-260/260A or 260B	ANRF B0-ASUR

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)		Regional planning elements	Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	181	Downlinked Aircraft Parameters (DAPS)	1	Mode S surveillance and the use of Mode S Downlinked Aircraft Parameters (DAPS) should be enabled in all upper level Category S airspace and all Category T airspace servicing high density city pairs. ATM automation system specifications should include the processing and presentation in ATC human-machine interfaces and decision support and alerting tools, the communications, navigation and approach aid indicators received in items 10 and 18 of FPL and ATS messages, where applicable, and the following Mode S or ADS-B downlinked aircraft parameters as a minimum: <ul style="list-style-type: none"> • Aircraft Identification; • Aircraft magnetic heading; • Aircraft indicated airspeed or Mach Number; and • Pilot selected altitude. 	% of FIRs with Category S airspace and Category T airspace supporting high density city pairs where the ATM automation system presents to the controller at least the following DAPS: <ul style="list-style-type: none"> • Aircraft Identification; • Aircraft magnetic heading; • Aircraft indicated airspeed or Mach Number; and • Pilot selected altitude. 	Seamless plan V2RO
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	182	Use of standard non-discrete Mode A codes	1	All Category S upper controlled airspace, and Category T airspace supporting high density city pairs and wholly served by Mode S SSR and/or ADS-B surveillance should implement the use of a standard non-discrete Mode A code XXXX for Mode S transponder equipped aircraft to reduce the reliance on assignment of discrete Mode A SSR codes and hence reduce the incidences of code bin exhaustion and duplication of code assignment.	% of FIRs with Category S airspace and Category T airspace supporting high density city pairs where the use of a standard non-discrete Mode A code XXXX for Mode S transponder equipped aircraft is implemented	Seamless plan V2RO

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	190	Airspace classification	2	Harmonization of upper airspace classification should be as follows: a) Category R controlled airspace– Class A; and b) Category S controlled airspace– Class A, or if there are high level general aviation or military VFR operations: Class B or C.	% of States/Administrations having harmonized the upper airspace classification as follows: a) Category R controlled airspace– Class A; and b) Category S controlled airspace– Class A, or if there are high level general aviation or military VFR operations: Class B or C.? (1- yes, 0-no)	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	200	Flight Level Orientation Schemes (FLOS)	2	The ICAO Table of Cruising Levels based on feet as contained in Appendix 3a to Annex 2 should be used.	% of States/Administrations using the ICAO Table of Cruising Levels based on feet as contained in Appendix 3a to Annex 2	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	210	Flight Level Allocation Schemes (FLAS)	2	Priority for FLAS level allocations should be given to higher density ATS routes over lower density ATS routes. Any aircraft that does not meet specified equipage requirements should receive a lower priority.	% of States/Administrations having their Operations Manual give priority for FLAS level allocations to higher density ATS routes over lower density ATS routes, and a lower priority to any aircraft that does not meet specified equipage	Seamless Plan V2R0
0	B0-FICE	2- Globally Interoperable Systems & Data	Yes	220	ATS Inter-facility Data Communications (AIDC)	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.	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs	ANRF B0-FICE
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	230	Automated Transfer of Control	2	Where practicable, all ATC Sectors within the same ATC unit with ATS surveillance capability should have automated hand-off procedures that allow the TOC of aircraft without the necessity for voice communications, unless an aircraft requires special handling	% of ATC sectors with automated hand-off procedures in accordance with Seamless ATM Plan Phase 1	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	240	ATS Surveillance data sharing	2	Subject to appropriate filtering, ATS surveillance data, particularly from ADS-B, should be shared with neighbouring ATC units within high density FIRs	% of ACCs within high density FIRs (as per the Seamless ATM Plan) sharing ATS surveillance data	Seamless Plan V2R0
0	B0-APTA	3- Optimum Capacity and Flexible Flights	Yes	250	ATM systems enabling optimal PBN/ATC operations	2	ATM systems, including communication and ATS surveillance systems and the performance of those systems, should support the capabilities of PBN navigation specifications and ATC separation standards applicable within the airspace concerned	% of ATC units with ATM systems enabling optimal PBN operations	ANRF B0-APTA - CCO - CDO
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	260	ATC Horizontal separation	2	All ATC units should authorise the use of the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable,	% of States/Administrations having their AIP authorising the use of the horizontal separation minima stated in ICAO Doc 4444 (PANS ATM), or as close to the separation minima as practicable	Seamless Plan V2R0
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	270	ATS surveillance with data integrated	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	% of ACCs with ATS Surveillance using ADS-B, MLAT or radar in Category S airspace, and having data integrated into the ATC system situation display	ANRF B0-ASUR

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-TBO	4- Efficient Flight Path	Yes	280	ADS-C and CPDLC	1	Within Category R airspace (remote en-route airspace within ATS communications and surveillance coverage dependent on a third-party CSP), ADS-C surveillance and CPDLC should be enabled to support PBN-based separations	% of FIRs utilising data link en-route in applicable airspace	ANRF B0-TBO
0	B0-FRTO	4- Efficient Flight Path	Yes	290	UPR and DARP	3	Within Category R airspace, UPR and DARP should be enabled to support PBN-based separations	% of FIRs using UPR and DARP within R airspace	ANRF B0-FRTO
0	B0-DATM	2- Globally Interoperable Systems & Data	Yes	300	Aeronautical Information Management	1	ATM systems should be supported by digitally-based AIM systems through implementation of Phase 1 and 2 of the AIS-AIM Roadmap	% of Phase 1 and 2 AIS-AIM elements completed (0-13)	ANRF B0-DATM
0	B0-AMET	2- Globally Interoperable Systems & Data	Yes	310	Meteorological Information	2	All high density aerodromes should have meteorological information provided by aerodrome meteorological offices (e.g., aerodrome meteorological forecasts and reports, aerodrome warnings and wind shear warnings) and automated equipment (e.g., wind shear alerts) as necessary supporting enhanced efficiency and safety of efficient terminal operations.	% of high density aerodromes providing meteorological forecasts and reports, aerodrome and wind shear warnings and alerts	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	320	ATM Managers' Performance	2	Human performance training for all managers of operational air navigation services (such as aerodrome operators, ATC organisations and aeronautical telecommunications) including a proactive organisational culture, assessment and management of risks, human factors, effective safety reporting systems	% of States/Administrations having their Operations Manual require the human performance training for all ANSP managers	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	330	ATC simulators performance	2	Enhancement and improved application of ATC simulators should be established to support human performance in the delivery of a Seamless ATM service	% of States/Administrations having a programme for enhancement and improved application of ATC simulators	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	340	Safety assessment of changes	2	Safety teams comprising multidisciplinary operational staff and managers which review safety performance and assess significant proposals for change to ATM systems should be established to support human performance in the delivery of a Seamless ATM service	% of States/Administrations having safety teams comprising multidisciplinary operational staff and managers which review safety performance and assess significant proposals for change to ATM systems	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	350	Human performance-based training and procedures for provision of Air Navigation Services	2	Human performance-based training and procedures for operational staff providing ATS (ATC separation, ATM contingency operations, irregular/abnormal operations and safety net alerts), human performance-based training and procedures for staff providing operational air navigation services (effective safety reporting culture, 'just culture')	% of States/Administrations having human performance-based training and procedures for staff providing Air Navigation Services	Seamless Plan V2R0
0	B0-FRTO	3- Optimum Capacity and Flexible Flights	Yes	360	Civil Military use of SUA	1	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	% of FIRs in which FUA is implemented	ANRF B0-FRTO
0	B0-FRTO	3- Optimum Capacity and Flexible Flights	Yes	370	Strategic Civil Military coordination	1	All States should ensure that a national civil/military body coordinating strategic civil-military activities is established	% of States/Administrations having established a national civil/military body that performs strategic civil-military coordination	Seamless Plan V2 R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-FRTO	3- Optimum Capacity and Flexible Flights	Yes	380	Tactical Civil Military coordination	1	All States should ensure that formal civil-military liaison for tactical responses is established	% of States/Administrations having you established a formal civil military liaison for tactical response	Seamless Plan V2 R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	390	Civil Military system integration	2	Civil and military ATM systems integrated using joint procurement, and sharing of ATS surveillance data (especially from ADS-B systems) should be provided as far as practicable	% of States/Administrations having their civil ATS and military systems integrated	Seamless Plan V2 R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	400	Civil Military navaids joint provision	2	Joint provision of civil/military navigation aids should be encouraged;	% of States/Administrations having their joint civil and military navigation aids	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	410	Civil Military common training	2	Common training should be conducted between civil and military ATM units in areas of common interest;	% of States/Administrations having Civil Military common training conducted in areas of common interest	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	420	Civil Military common procedures	2	Civil and military ATM units should utilize common procedures as far as practicable	% of States/Administrations having common procedures for Civil Military operations where appropriate	Seamless Plan V2R0

2.8.2 Objectives for Phase 2 (November 2019)

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)		Regional planning elements	Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	Regional	1- Airport Operations	Yes	30	Aerodrome capacity	3	All high density aerodromes should have a declared airport terminal and runway capacity	% of high density aerodromes having declared capacity in accordance with the Seamless ATM Plan Phase 2	Seamless Plan V2R0
0	Regional	1- Airport Operations	Yes	31	Airport Master plan	3	All high density aerodromes should develop and regularly update the Airport Master Plan to align the airport infrastructure future planning with the Seamless ATM needs	% of high density aerodromes having an Airport Master Plan regularly updated to align the airport infrastructure future planning with the Seamless ATM needs	Seamless Plan V2R0
1	B1-SURF	1- Airport Operations	Yes	41	Enhanced vision system (EVS) and runway safety alerting logic	2	All high density international (ICAO codes 3 and 4) aerodromes and aircraft operators operating from these aerodromes should implement EVS and runway safety alerting logic (SURF-1A) in accordance with EUROCAE/RTCA documents ED-159/DO-312/ ED-165	% of ICAO codes 3 and 4 aerodromes having aerodromes and aircraft operators operating from these aerodromes which implement EVS and runway safety alerting logic (SURF-1A) in accordance with EUROCAE/RTCA documents ED-159/DO-312/ ED-165	Seamless Plan V2R0
0	B0-RSEQ	1- Airport Operations	Yes	50	Arrival Manager/Departure Management (AMAN/DMAN)	2	All AMAN systems should take into account airport gates for runway selection and other aircraft departures from adjacent gates that may affect arriving aircraft	% of applicable international aerodromes having implemented AMAN / DMAN (applicable = high density)	Seamless Plan V2R0
1	B1-RSEQ	1- Airport Operations	Yes	51	Integrated Surface Management (A-SMGCS with SMAN or ASDE-X)	2	All high density international aerodromes should integrate arrival/departure management (AMAN/DMAN) with the surface management systems: A-SMGCS with SMAN or ASDE-X	% of high density aerodromes having integrated arrival/departure management (AMAN/DMAN) with the surface management systems	Seamless Plan V2R0

Objectives					Priorities and targets				
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)		Regional planning elements	Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	60	ATC Sector Capacity	2	All all enroute ATC sectors and terminal ATC Sectors should have a nominal aircraft capacity figure based on a scientific capacity study and safety assessment, to ensure safe and efficient aircraft operations.	% of ATC sectors with capacity figures capacity figure based on a scientific capacity study and safety assessment, to ensure safe and efficient aircraft operations	Seamless Plan V2R0
1	B1-ACDM	1- Airport Operations	Yes	71	Airport Operations management	2	All high density international aerodromes should implement collaborative Airport Operations Planning (AOP) and where practicable an Airport Operations Centre (APOC).	% of high density aerodromes having implemented collaborative Airport Operations Planning (AOP) and where practicable an Airport Operations Centre (APOC).	Seamless Plan V2R0
0	B0-NOPS	3- Optimum Capacity and Flexible Flights	Yes	80	Air Traffic Flow Management/Collaborative Decision-Making (ATFM/CDM)	1	All FIRs supporting Major Traffic Flows should implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements	% of FIRs supporting Major Traffic Flows which implement ATFM incorporating CDM to enhance capacity, using bi-lateral and multi-lateral agreements	ATFM Framework - ANRF B0-NOPS
1	B1-NOPS elements 1 and 2	3- Optimum Capacity and Flexible Flights	Yes	81	Collaborative ATFM enhancing airspace capacity	1	All high density FIRs (detailed in the Asia/Pacific eANP) should enhance the ATFM and CDM in accordance with the ATFM Framework in order to enhance and monitor the airspace capacity (refer to the Asia/Pacific ATFM Framework for Collaborative ATFM para.7.6, 7.7,7.8, 7.11, 7.18, 7.19, 7.21, 7.23, 7.26, 7.27,7.28, 7.30, 7.31, and 8.9	% of high density FIRs implementing para.7.6, 7.7,7.8, 7.11, 7.18, 7.19, 7.21, 7.23, 7.26, 7.27,7.28, 7.30, 7.31,and 8.9 of the ATFM Framework	ATFM Framework- Seamless Plan V2R0
1	B1-CDO	4- Efficient Flight Path	Yes	91	Continuous Descent Operations (CDO) with vertical guidance	2	All high density international aerodromes should implement approaches with the Continuous Descent Operations (CDOs) using VNAV as far as practicable (RTCA DO-236CB refers)	% of high density international aerodromes with Continuous Descent Operations (CDOs) using VNAV	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-APTA	1- Airport Operations	Yes	110	Guided approach	1	Where practicable, all aerodromes with instrument runways serving aeroplanes should have precision approaches (GBAS or ILS/MLS) or APV or LNAV	% of aerodromes with precision approaches (GBAS or ILS/MLS) or APV or LNAV	ANRF B0-APTA - CCO - CDO
0	Regional	4- Efficient Flight Path	Yes	130	Performance-based Navigation (PBN) Visual Departure and Arrival Procedures	3	PBN procedures that overlay visual arrival and departure procedures should be established where this provided an operational advantage	% of high density aerodromes with PBN procedures that overlay visual arrival and departure procedures	Seamless Plan V2R0
0	B0-FRTO	4- Efficient Flight Path	Yes	140	Performance-based Navigation (PBN) Routes	2	All ATS routes should be designated with a navigation performance specification RNP 2	% of ATS routes designated as PBN routes in accordance with Seamless ATM Phase 2	ANRF to be developed
0	B0-SNET	3- Optimum Capacity and Flexible Flights	Yes	160	Safety Nets	2	ATM systems providing services within Category R airspace should enable appropriate ATC capabilities including CPAR, which is a key enabler for UPR and DARP operations	% of ACCs using CPAR in R airspace in accordance with Seamless ATM Phase 2	ANRF B0-SNET
0	B0-SNET	3- Optimum Capacity and Flexible Flights	Yes	160	Safety Nets		ATS surveillance systems should enable STCA, APW and MSAW. Route Adherence Monitoring (RAM) should be utilised when monitoring PBN route separations. Cleared Level Adherence Monitoring (CLAM) should be utilised to monitor RVSM airspace.	Does your State implement ground-based safety-nets (STCA, APW, MSAW, etc.)? (1- yes, 0-no)	ANRF B0-SNET
0	B0-ACAS	3- Optimum Capacity and Flexible Flights	Yes	170	Airborne Safety Systems	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	% of States/Administrations requiring the carriage of TAWS?	ANRF B0-ACAS

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-ASUR	3- Optimum Capacity and Flexible Flights	Yes	180	ADS-B airspace	1	Unless supported by alternative means of ATS surveillance (such as radar, where there are no plans for ADS-B), 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 or 260B capability. In areas where ADS-B based separation service is provided, the mandatory carriage of ADS-B OUT using 1090ES with DO260/260A or 260B should be prescribed	% of of FIRs where Category S airspace and Category T airspace supporting high density aerodromes are designated as ADS-B airspace and require operation of ADS-B using 1090ES with DO-260/260A or 260B	ANRF B0-ASUR
0	B0-FICE	2- Globally Interoperable Systems & Data	Yes	220	ATS Inter-facility Data Communications (AIDC)	1	Implement full AIDC messaging, or alternate communication standard.	% of FIRs within which all applicable ACCs have implemented full AIDC messaging, or alternate communication standard	ANRF B0-FICE
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	230	Automated Transfer of Control	2	Where practicable, all ATC Sectors with adjacent ATC Centres using ATS surveillance capability should have automated hand-off procedures that allow the TOC of aircraft without the necessity for voice communications, unless an aircraft requires special handling	% of ATC sectors with automated hand-off procedures in accordance with Seamless ATM Plan Phase 2	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	240	ATS Surveillance data sharing	2	Subject to appropriate filtering, ATS surveillance data, particularly from ADS-B, should be shared with all neighbouring ATC units	% of ACCs sharing ATS surveillance data	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)		Regional planning elements	Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-APTA	3- Optimum Capacity and Flexible Flights	Yes	250	ATM systems enabling optimal PBN/ATC operations	2	ATM system design should be planned and implemented to support optimal aerodrome capacity expectations for the runway(s) concerned. Electronic flight progress strips should be utilised wherever automation systems allow the capability	% of ATC units with ATM systems supporting optimal aerodrome capacity and using electronic flight progress strips	ANRF B0-APTA - CCO - CDO
1	B1-TBO, element 3	4- Efficient Flight Path	Yes	281	Departure clearance (DCL)	1	All high density FIRs should implement data-link Departure Clearance (DCL) compliant with EUROCAE WG78/RTCA SC 214 standards	% of high density FIRs which implement data-link Departure Clearance (DCL) compliant with EUROCAE WG78/RTCA SC 214 standards	Seamless Plan V2R0
0	B0-DATM	2- Globally Interoperable Systems & Data	Yes	300	Aeronautical Information Management	1	ATM systems should be supported by complete implementation of AIM Phase 3 (using at a minimum, version AIXM 5.1).	% of Phase 3 AIS-AIM elements completed (0-8)	ANRF B0-DATM
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	320	ATM Managers' Performance	2	Prevention of fatigue systems should be established to support human performance in the delivery of a Seamless ATM service	% of States/Administrations having a prevention of fatigue systems established to support human performance in the delivery of your ATM services	Seamless Plan V2R0
0	B0-ASEP	3- Optimum Capacity and Flexible Flights	No	430	Air traffic situational awareness	2	Nil	% of States/Administrations implementing air traffic situational awareness?	Nil
0	B0-WAKE	1- Airport Operations	No	440	Optimized wake turbulence separation	3	Nil	% of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation	Nil

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
0	B0-OPFL	3- Optimum Capacity and Flexible Flights	No	450	In-trail procedures	3	Nil	% of FIRs having implemented in-trail procedures	Nil
1	B1-SWIM	2- Globally Interoperable Systems & Data	Yes	460	Common network services	1	All ANSPs serving high density FIR should connect to CRV (Common aeRonautical Virtual private network).	% of States/ANSP having an operational connection to CRV (Common aeRonautical Virtual private network)	Seamless Plan V2R0
1	Regional	3- Optimum Capacity and Flexible Flights	Yes	470	Performance-based voice communications between ATS units	2	Direct speech circuits or digital voice communications, meeting pre-established safety and performance requirements, and appropriate handoff procedures should be implemented between controllers providing ATS surveillance in adjacent airspace	% of States/ANSP having pre-established safety and performance requirements and monitoring for voice coordinations between ATS units	Seamless Plan V2R0
1	Regional	3- Optimum Capacity and Flexible Flights	Yes	471	Voice communications over IP between ATS units	2	All States should upgrade their ATM voice communication systems or implement analog/digital VoIP converters in compliance with the EUROCAE ED-137 standards (interoperability standards for VOIP ATM components).	% of States/ANSP implementing ATM voice communication systems in compliance with the EUROCAE ED-137 standards	Seamless Plan V2R0
0	Regional	3- Optimum Capacity and Flexible Flights	Yes	480	Search and Rescue (SAR) capability	1	All States should ensure appropriate SAR capability by complying with the provisions of the Asia/Pacific SAR Plan	% of implementation of Preferred SAR Capability Specifications (i.e. progress averaged over the 41 SAR PERFORMANCE INDICATORS)	Seamless Plan V2R0 - SAR plan V2

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
1	Regional	3- Optimum Capacity and Flexible Flights	Yes	490	Ballistic launch and space re-entry activities	1	All States with Agencies that conduct ballistic launch or space re-entry activities should ensure: a) the development of written coordination agreements between the State civil aviation authority and the launch/re-entry agency concerned; b) that strategic coordination is conducted between the State civil aviation authority and any States affected by the launch/re-entry activity at least 14 days prior to the proposed activity, providing notice of at least: a. three days for the defined launch window; and b. 24 hours for the actual planned launch timing; c) that consideration of affected airspace users and ANSPs is made after consultation, so that the size of the airspace affected is minimized and the launch window is optimized for the least possible disruption to other users ; and d) that communication is established with affected ANSPs to provide accurate and timely information on the launch/re-entry activity to manage tactical responses (for example, emergencies and activity completion).	% of States/Administrations concerned with ballistic launch or space re-entry activities that implement the four Seamless ATM plan expectations	Seamless Plan V2R0

2.8.3 Objectives for Phase 3 (November 2022)

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
1	B1-NOPS elements 3, 4 and 5	3- Optimum Capacity and Flexible Flights	Yes	82	Enhanced flow performance through network operational planning	1	All high density FIRs (detailed in the Asia/Pacific eANP) should enhance the ATFM and CDM in accordance with the ATFM Framework	% of high density FIRs implementing the entire ATFM Framework	ATFM Framework-Seamless Plan V2R0
1	B1-FICE	2- Globally Interoperable Systems & Data	Yes	221	Ground-ground trajectory negotiation through a common flight object before departure	1	FF-ICE, Step 1 for ground-ground application will facilitate collaborative decision-making (CDM), the implementation or the systems interconnection for information sharing, trajectory or slot negotiation before departure providing better use of capacity and better flight efficiency	% of States/Administrations implementing a FF-ICE negotiation process before departure, including GUF1 allocation	Seamless Plan V2R0
1	B1-TBO, element 3	4- Efficient Flight Path	Yes	281	Departure clearance (DCL)	1	Digital Clearance Delivery should be implemented for flights departing high density airports or operating on routes between the busiest Asia/Pacific city pairs	Number of busiest Asia/Pacific city pairs using Digital Clearance	Seamless Plan V2R0
1	B1-FRTO	4- Efficient Flight Path	Yes	291	Free routes	3	Where practicable, free routes can be introduced in Category S controlled upper airspace, where the flight plan is not defined as segments of a published route network or track system, to facilitate user-preferred profiles	% of States having introduced free routes in Category S controlled upper airspace to facilitate user-preferred profiles	Seamless Plan V2R0
1	B1-DATM	2- Globally Interoperable Systems & Data	Yes	301	Semantic interoperability of Aeronautical information services (AIRM)	1	Aim of AIRM (ATM Information Reference Model) introduction is to provide greater and timelier access to up-to-date information by a wider set of users	% of States publishing at least one service AIRM-compliant service and using at least one AIRM-compliant service as defined in the common SWIM registry	Seamless Plan V2R0

Objectives						Priorities and targets			
Block	ASBU modules and elements and enablers	Performance Improvement Area	Applicable or not in APAC (yes/no)	Regional planning elements		Priority in APAC	Target(s) in APAC	Indicator(s) / Metric(s)	Reference
1	B1-AMET	2- Globally Interoperable Systems & Data	Yes	311	Integrated meteorological information for planning and near-term service	2	Improvements in the content, format, quantity, quality, timeliness and availability of meteorological information (observations and forecasts) will lead to enhanced situational awareness of meteorological conditions, and in particular the location, extent, duration and severity of hazardous meteorological conditions, as well as space weather, and their impacts on airspace	% of States utilizing integrated ATS-MET data to determine optimum flight profile planning and execution, and support tactical in-flight avoidance of hazardous meteorological conditions	Seamless Plan V2R0
1	B1-SWIM	2- Globally Interoperable Systems & Data	Yes	461	Ground-ground SWIM	1	Implementation of system-wide information management (SWIM) services (applications and infrastructure) to create an aviation intranet based on standard data models, and internet-based protocols to maximize interoperability	% of States/ANSP having an operational connection to the ground SWIM intranet	Seamless Plan V2R0

3. Monitoring of ASBU IMPLEMENTATION

3.1 The monitoring of air navigation and its enhancement should be carried out through identification of relevant air navigation Metrics and Indicators as well as the adoption and attainment of air navigation system Targets.

3.2 The monitoring of the regional progress and performance metrics/indicators should be done for all elements by APANPIRG. The monitoring should allow global correlation of status and expectations, appreciation of benefits achieved for the airspace users, as well as corrective actions to be taken by the PIRG on implementation plans.

3.3 The APANPIRG should determine appropriate mechanisms and tools for the monitoring and the collection data at national and regional levels.

Data collection

3.4 ASIA/PAC States/Administrations are urged to report on their Seamless ATM implementation progress at least once a year through the ICAO online reporting process from November 2014 onwards (Conclusion APANPIRG 25/5). The Web-based Seamless ATM Implementation Progress Reporting Process is available here (secured access): https://portal.icao.int/RO_APAC/Reporting/Pages/default.aspx

3.5 The list of Points of Contact for the Reporting Process is available here (secured access): https://portal.icao.int/RO_APAC/Reporting/Lists/Point%20of%20Contact/AllItems.aspx

Monitoring through the regional picture and Regional Performance Dashboards

3.6 The process of ANS implementation against the objectives and targets as set forth in the ASIA/PAC Main Planning Table above is tracked through a regional picture that is periodically updated. The latest version is available here: <http://www.icao.int/APAC/Pages/ATMReport.aspx>.

3.7 The Regional Performance Dashboards aim at providing a glance of both Safety and Air Navigation Capacity and Efficiency strategic objectives, using a set of indicators and targets based on the regional implementation of the Global Aviation Safety Plan (GASP) and the Global Air Navigation Plan (GANP). The progress can be checked here: <http://www.icao.int/safety/Pages/Regional-Targets.aspx#tabs-2>.

Implementation Guidance

3.8 The Seamless ATM implementation guidance was adopted by ASIA/PAC States/Administrations and is maintained by the ICAO APAC Regional Office (Conclusion APANPIRG 25/4). Its latest version is available here: <http://www.icao.int/APAC/Pages/edocs.aspx> under the Seamless ATM Plan Section.

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

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-ACDM: Improved Airport Operations through Airport-CDM					
Performance Improvement Area 1: Airport Operations					
ASBU B0-ACDM: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	Capacity	Efficiency	Environment	Safety
Applicable	Y	Y	Y	Y	
ASBU B0-ACDM: Implementation Progress					
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 2019- (Seamless ATM Phase II) All high density aerodromes should have a declared airport terminal and runway capacity		
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 stakeholders, and procedures
Apron Management	communication facilities	Nil	Lack of Coordination procedures between a provider of ATS Services and the aerodrome operator.	Lack 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
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

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>

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
- Through Globally Interoperable System Wide Information Management**

3. ASBU B0-AMET: Impact on Main Key Performance Areas

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

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

5. Elements	6. Targets and implementation progress (Ground and Air)
1. World Area Forecast System (WAFS)	Reception of WAFS information and making 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. Volcanic Ash Advisory Centre (VAAC)	Implementation of VAACs to support International Airways Volcano Watch (IAVW). Agreements in place between Volcano Observatories and VAACs.
3. Tropical Cyclone Advisory Centre (TCAC)	Implementation of TCACs to support tropical cyclone watch.
4. Aerodrome warnings, including wind shear warnings and alerts	Identification of aerodromes that require aerodrome warnings, including wind shear warnings and alerts.
5. SIGMET	Implementation of SIGMET for all Flight Information Regions (FIR) within the APAC Region.
6. Other OPMET (ie. METAR/SPECI and TAF)	Provision of OPMET data as per the requirements in the Regional Air Navigation Plan.
7. Quality Management System	Implementation of Quality Management Systems at aviation meteorological services in accordance with ICAO and World Meteorological Organization (WMO) provisions.
8. Qualifications and Competencies	Implementation of systems along with an ongoing competency assessment and training program to ensure qualifications and competencies of aviation meteorological personnel in accordance with ICAO and WMO provisions.

7. ASBU B0-AMET: Implementation Challenges

Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. WAFS	WAFS data reception system, via public internet distribution systems	Nil	Operations manuals. Contingency plans.	N/A
2. VAAC	AFTN/AMHS AFS	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
3. TCAC	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
4. Aerodrome warnings, including wind shear warnings and alerts	AFTN/AMHS AFS ATIS Local networks	Nil	Operations manuals. Contingency plans.	N/A
5. SIGMET	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
6. Other OPMET	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
7. Quality Management	Nil	Nil	Quality Manual.	N/A
8. Qualifications and Competencies	Nil	Nil	Training program plans.	N/A

8. ASBU B0-AMET Performance Monitoring and Measurement	
8A. ASBU B0-AMET: Implementation Monitoring	
Elements	Performance Indicators/Supporting Metrics
1. WAFS	Indicator: Percentage of States receiving WAFS via Secure SADIS FTP and WIFS and making this available to users. Supporting metric: Number of States receiving WAFS via Secure SADIS FTP and WIFS and making this available to users.
2. VAAC	Indicator: Percentage of designated VAACs implemented to provide volcanic ash advice to Meteorological Watch Offices (MWO). Percentage of designated volcano observatories implemented and procedures in place to send observations to relevant VAACs and MWOs. Supporting metric: Number of VAACs implemented to provide volcanic ash advice. Number of volcano observatories implemented and procedures in place to send observations to relevant VAACs and MWOs.
3. TCAC	Indicator: Percentage of designated TCACs implemented to provide tropical cyclone advice to MWOs. Supporting metric: Number of TCACs implemented to provide tropical cyclone advice to MWOs.
4. Aerodrome warnings, wind shear warnings and wind shear alerts	Indicator: Percentage of required aerodromes providing aerodrome warnings, wind shear warnings and wind shear alerts. Supporting metric: Number of required aerodromes providing aerodrome warnings, wind shear warnings and wind shear alerts.
5. SIGMET	Indicator: Percentage of States/MWOs providing SIGMET for associated FIRs. Supporting metric: Number of States/MWOs providing SIGMET for associated FIRs.

8. ASBU B0-AMET Performance Monitoring and Measurement
8A. ASBU B0-AMET: Implementation Monitoring

Elements	Performance Indicators/Supporting Metrics
6. Other OPMET	<p>Indicator: Percentage of all required METAR/SPECI and TAF which meet message availability, reliability and compliance targets in accordance with APAC requirements aerodromes.</p> <p>Supporting metric: Number of METAR/SPECI and TAF meeting availability, reliability and compliance targets for all APAC required aerodromes.</p>
7. Quality Management	<p>Indicator: Percentage of States which have implemented a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the users. -</p> <p>Supporting metric: Number of States with a properly organized quality system comprising procedures, processes and resources necessary to provide for the quality management of the meteorological information to be supplied to the users.</p>
8. Qualifications and Competencies	<p>Indicator: Percentage of States which have ensured that the designated meteorological authority complies with the requirements of the World Meteorological Organization in respect of qualifications and training of meteorological personnel providing service for international air navigation.</p> <p>Supporting metric: Number of States where qualifications and training of meteorological personnel providing service for international air navigation complies with the requirements of the World Meteorological Organization.</p>

8. ASBU B0-AMET. Performance Monitoring and Measurement
8B. 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.

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
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

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)

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
CDO implementation	Supporting metric: Number of high density international aerodromes implementing CCO and CDO operations
PBN SIDs implementation	Indicators: percentage of international high density aerodromes implementing Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR)
PBN STARs	Supporting metric: Number of international high density aerodromes implementing Standard Instrument Departures/Standard Terminal Arrivals (SID/STAR) 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

1. AIR NAVIGATION REPORT FORM (ANRF)**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

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 2019 (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	<p>Long transition time to ADS-B systems for SSR equipped providers</p> <p>Misuse of ADS-B messages of insufficient integrity</p> <p>Sharing of data surveillance</p>	<p>Ratio of fleet ADS-B equipped and approved, particularly in general aviation, and ageing commercial fleet</p> <p>Faulty/ageing avionics</p>	NIL	Dependent on States' development of approval standards.

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

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 2019 (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.
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.

1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

1. 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 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 2019 (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) ³ (enabler)	November 2019: all States have migrated their communications

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

³ Valid only if the study requested by APANPIRG/24 concludes that such network should be implemented in the APAC region

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

8A. ASBU B0-FICE: Performance Monitoring and Measurement	
8 B. ASBU B0-FICE: Performance Monitoring	
Key Performance Areas	Metrics (if not indicate qualitative Benefits)
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.

1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional Planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – Module N° B0-FRTO: Improved Operations through Enhanced En-Route Trajectories

Performance Improvement Area 3:

Optimum Capacity and Flexible Flights – Through Global Collaborative ATM

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
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

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 2019 (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
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

7. ASBU B0-NOPS: Implementation Challenges				
Elements	Implementation Area			
	Ground System Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
	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 2019 (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

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.

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)
2. 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
2. 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
2. 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

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 (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

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

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
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	-

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 2019: 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 2019: 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 2019: 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 2019: 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
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.

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

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.