

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG)



AFI REGIONAL AIR NAVIGATION PLAN

VOLUME III

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REVISION INDEX

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ABBREVIATIONS

ACRONYM/ABBREVIATION	DESCRIPTION
ACAS	Airborne Collision Avoidance System
ACDM	Airport Collaborative Decision Making
ACIS	Airport CDM Information Sharing
ADS-B	Automatic Dependant Surveillance Broadcast
AIRB	Basic airborne situational awareness during flight operations
AMAN	Arrivals Manager
ANSP	Air Navigation Service Provider
AO	Aircraft Operator
AOP	Airport Operations
A-SMGCS	Advanced-Surface Movement Guidance and Control System
ATCO	Air Traffic Control Officer
ATFM	Air Traffic Flow Management
APM	Approach Path Monitoring
APTA	Improve arrival and departure operations
APW	Area Proximity Warning
ASM	Airspace management
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
AU	Airport Users
CAA	Civil Aviation Authority
CAT I	Category I
CCO	Continuous Climb Operations
CDM	Collaborative Decision Making
CDO	Continuous Descent Operations
CDP	Climb and Descend Procedure
CDT	Conflict Detection Tools
CDTI	Cockpit Display Traffic Information
CSEP	Cooperative Separation
CSFP	Compact Small Form-factor Pluggable
CTOP	Collaborative Option Programs
CTOT	Computed Time of Take-Off
DATS	Digital Aerodrome Air Traffic Services
DCB	Demand Capacity Balancing
DCT	Direct
ESAF	Eastern and Southern Africa
FI	Fully Implemented
FOC	Flight Operations Centre
FRA	Free Routing Airspace
FRT0	Improved operations through enhanced en-route trajectories
FUA	Flexible Use of Airspace
GADS	Global Aeronautical Distress and Safety System
GBAS	Ground Based Augmentation System
HMI	Human Machine Interface
ICAO	International Civil Aviation Authority
LoA	Letter of Agreement
MONA	Monitoring Aids
MSAW	Minimum Sector Altitude Warning
MSP	Multi-Sector Planning
MTCD	Medium Term Conflict Detection Tool
N/A	Not Applicable

NAVAIDS	Navigation Aids
NI	Not Implemented
NOPS	Network Operations
OPFL	Improved access to optimum flight levels in oceanic and remote airspace
PBN	Performance Based Navigation
PBLoSM	Performance Based Longitudinal Separation Minima
PI	Partially Implemented
PoC	Point of Contact
PinS	Point in Space Operations
RATS	Digital Aerodrome Air Traffic Services
RCC	Rescue Co-ordination Centre
RNP	Required Navigation Performance
RSEQ	Improved traffic flow through runway sequencing
RTC	Remote Tower Centre
SAR	Search and Rescue
SBAS	Satellite Based Augmentation System
SID	Standard Instrument Departure
SNET	Safety Net
SOP	Standard Operating Procedure
STAM	Short Term ATFM Measures
STAR	Standard Arrival
STCA	Short Term Conflict Alert
SWIM	System Wide Information Management
TBO	Trajectory-based operations
TCAS	Traffic Collision and Avoidance System
TMA	Terminal Area
TOS	Trajectory Options Set
VSA	Visual Separation on Approach
WACAF	Western and Central Africa

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PART 0 INTRODUCTION

0.1 Introduction

- 0.1.1 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).
- 0.1.2 The information contained in Volume III is related mainly to:
- a) Planning: objectives set, priorities and targets planned at regional or sub-regional levels;
 - b) 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
 - c) Guidance: providing regional guidance material for the implementation of specific system/procedures in a harmonized manner.
- 0.1.3 The management of Volume III is the responsibility of the APIRG. 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 APIRG. The status of implementation is updated on a regular basis as endorsed by APIRG.

0.2 Aviation System Block Updates (ASBUs), Elements and Roadmaps

- 0.2.1. The ASBU Elements 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.
- 0.2.2. Although the GANP has a worldwide perspective, it is not intended that all Block Upgrade Elements are required to be applied in every State, sub-region and/or region. Many of the Block Upgrade Elements 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 Elements depending on a region, sub-region and/or State's specific operational requirements. Guided by the GANP, ICAO AFI regional, sub-regional and State planning should identify Elements which best provide the needed operational improvements.

PART 1 GENERAL PLANNING ASPECTS (GEN)

1.1 Planning Methodology

- 1.1.1 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. Elements from the Aviation System Block Upgrades (ASBUs) are evaluated to identify which of those Elements best provide the needed operational improvements. Depending on the complexity of the element, additional planning steps may need to be undertaken including financing and training needs. Finally, regional plans would be developed for the deployment of elements 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.
- 1.1.2 Block 0 features Elements 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), as of 2013, based on regional, sub-regional and State operational needs. Blocks 1 through 4 are characterized by both existing and projected performance area solutions, with availability milestones beginning in 2019, 2025, 2031 and 2037 respectively.

1.2 Review and Evaluation of Air Navigation Planning

- 1.2.1 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.
- 1.2.2 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.
- 1.2.3 The air navigation planning and implementation performance framework prescribes reporting, monitoring, analysis and review activities being conducted on a cyclical, annual basis. The tables AOP III-2, ATM III-2, SAR III-2, CNS III-2, AIM III-2 and MET III-2 provided in Part II are intended to be used by States for reporting on their planning and implementation of ASBU elements.

1.3 Reporting to APIRG

- 1.3.1 Reporting and monitoring results will be analyzed by APIRG, 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.
- 1.3.2 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 Elements.

PART 2 AIR NAVIGATION SYSTEM / ASBU APPLICABLE ELEMENTS

2.1 Introduction

- 2.1.1 The planning and implementation of the ICAO Aviation System Block Upgrades (ASBUs) should be undertaken within the framework of the APIRG with the participation and support of all stakeholders, including regulatory personnel.
- 2.1.2 The ASBU Threads/Elements adopted by the AFI Region should be followed in accordance with the specific ASBU requirements to ensure global interoperability and harmonization of air traffic management. APIRG determines the ASBU Threads/Elements, which best provide the needed operational improvements in the AFI Region.

2.2 ICAO AFI Region Air Navigation Objectives, Priorities, KPIs and Targets

- 2.2.1 PIRGs are requested to establish priorities and targets for air navigation, in line with the ASBU methodology.
- 2.2.2 Considering that some of the ASBU threads and elements 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 thread/element would fit into the national and regional plans.
- 2.2.3 In establishing and updating the AFI Air Navigation Plan, the APIRG and States should give due consideration to the safety priorities set out in the Global Aviation Safety Plan (GASP) and the AFI Region Safety Strategy attached to the AFI Regional Aviation Safety Plan (AFI RASP).
- 2.2.4 The AFI Region air navigation priorities and targets are reflected in the AFI Region Air Navigation Strategy, which is being reviewed on regular basis to ensure that is aligned with the GANP (latest edition) and also reflecting the regional priorities
- 2.2.5 States contribute to the implementation of the GANP by developing national air navigation plans to ensure the provision of essential air navigation services for international civil aviation and the modernization of their air navigation system based on local performance and operational needs, taking into consideration regional requirements. In addition, States contribute to the implementation of the GANP by sharing best practices and lessons learned from implementation challenges, performing cost-benefit analyses and assessing environmental impact, human performance and safety

2.3 Identification of ASBU elements applicable to the AFI Region

2.3.1 Description of the methodology

The AFI Regional air navigation system implementation plan was aligned with the fifth edition of the GANP. Based on operational requirements and considering the benefits associated, the former 18 Block 0 modules were all chosen for implementation in the AFI region, with the categories as follows:

- a) Essential (E): These are the ASBU modules that provide substantial contribution towards global interoperability, safety, or regularity. The five (5) Modules for all States of AFI region are FICE, DATM; ACAS, FRTO and APTA.
- b) Desirable (D): These are the ASBU modules that, because of their strong business and/or safety case, are recommended for implementation almost everywhere. The eight (8) Modules for all States of AFI region are ACDM, NOPS, ASUR, SNET, AMET, TBO, CDO, and CCO.

- c) Specific (S): These are the ASBU modules that are recommended for implementation to address a particular operational environment in specific countries of AFI region (for example South Africa). The (3) Modules are OPFL, ASEP and WAKE.
 - d) Optional (O): These are the ASBU modules that address operational requirements in specific countries of AFI region and provide additional benefits that may not be common everywhere. The two (2) Modules are SURF and RSEQ.
- 2.3.2 The ASBU framework has been updated in the 6th edition of the GANP with better clarification of its concepts. Thus, the ASBU Element have become the core concept. It is a specific change in operations designed to improve the performance of the air navigation system under specified operational conditions.
- 2.3.3 While the first version of the AFI Regional air navigation system implementation plan was Module-oriented, the focus is now made on the applicability of the ASBU elements in the AFI region. The assessment of this applicability was conducted, considering the performance-based approach. Moreover, some ASBU Elements are made mandatory pursuant to the ICAO Standards and Recommended Practices (SARPs).
- 2.3.4 The identification of applicable ASBU Elements was conducted in the areas of AOP, ATM, SAR, AIM, CNS and MET based on the maturity level and the rational of applicability of the elements. The following tables provide details on the applicable elements as approved by APIRG at its twenty-fifth meeting.

Table AOP III-1: ASBU applicable elements in AOP area

ASBU Modules	ASBU Elements	Purpose of elements	Maturity Level	Applicable (Yes or No)	Rationale for applicability	Enablers	Stakeholders
ACDM-B0	ACDM-B0/1 Airport CDM Information Sharing	To generate common situational awareness by sharing relevant surface operations data among the local stakeholders involved in aerodrome operations.	Ready for Implementation	Yes	The element forms the first step for Airport Stakeholder collaboration in Aerodrome Operations. It generates situational awareness for effective decision making and does not need automation.	Surface operation milestones procedures	<ul style="list-style-type: none"> • Airport operator • ANSP • Aircraft operator • Ground handling agent
						ACIS system	<ul style="list-style-type: none"> • Airport operator • ANSP • Aircraft operator • Ground handling agent
						Training requirements for ACIS	<ul style="list-style-type: none"> • Airport operator • ANSP • ATM network function • Aircraft operator • Ground handling agent
						ACIS Phraseology	<ul style="list-style-type: none"> • ANSP • Aircraft operator
	ACDM-B0/2 integration with ATM Network function	Airport CDM operations will be enriched by enhanced arrival information from the ATM network and, at the same time, network operations will benefit from more accurate departure information from CDM airports	Ready for Implementation	Yes		Procedures for turnaround integration	<ul style="list-style-type: none"> • Airport operator • ANSP • ATM network function • Aircraft operator
						Phraseology for turnaround integration	<ul style="list-style-type: none"> • Airport operator • ANSP
						A-CDM system/platform- ATFM system interconnectivity	<ul style="list-style-type: none"> • Airport operator • ANSP • ATM network function • Aircraft operator
						Training requirements for the integration of the turnaround	<ul style="list-style-type: none"> • Airport operator • ANSP • ATM network function • Aircraft operator • Ground handling agent

Medium traffic density. Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typically between 20 to 35 total aerodrome movements.

Table ATM III-1: ASBU applicable elements in ATM area

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
APTA-B0	APTA-B0/1 PBN Approaches (with basic capabilities)	This element represents the use of PBN in design of approach procedures to provide more flexibility to airspace planners to manage the use of airspace, and to facilitate access to airports. It includes the provision of instrument approach procedures with vertical guidance in support of stabilized approaches	Ready for implementation	Yes	Any runway ends with or without existing procedures. Can be used to facilitate access at aerodromes where conventional procedures are not implementable, or in support of existing procedures for contingency use	<ul style="list-style-type: none"> - PBN approach - PBN approach validation, approval and publication - SOPs - Contingency procedures - Aircraft capability - Training requirements - Operational Authorization 	<p>Airport operator ANSP Aircraft operator CAA Aircraft Manufacturer</p>
APTA-B0	APTA-B0/2 PBN SID and STAR procedures (with basic capabilities)	Use of PBN capabilities allows more flexible placement of arrival and departure routing without the need for Ground-based infrastructure to support these routes	Ready for implementation	Yes	Applicable in all terminal areas. Arrivals facilitates descent and connects to the approach phase. Departures facilitates climb and provides lateral path top exit terminal area. The use of PBN procedures supports flexible airspace planning and development	<ul style="list-style-type: none"> - PBN approach - PBN SID and STAR - SOPs - Contingencies - Aircraft capability - Operational Authorization - NAVAIDS - Training requirements 	<p>Airport operator ANSP Airspace user CAA Aircraft manufacturer</p>

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
APTA-B0	APTA-B0/3 - SBAS/GBAS CAT I precision approach procedures	Introduction of SBAS and GBAS CAT I procedures allow for reduced minima at aerodromes situated in areas of significant terrain, where ILS is not possible.	Ready for implementation	Yes	Runway ends where precision approach guidance is considered a requirement.	<ul style="list-style-type: none"> - CAT I Precision Approach Procedure design and use - CAT I Precision Approach procedure validation, approval and publication - SOPs for CAT I Precision Approaches - Training requirements for CAT I Precision Approach Procedures - Contingencies for CAT I Precision Approaches - Aircraft capability for CAT I Precision Approaches - Ground based system for CAT I Precision Approach 	CAA ANSP Aircraft operator Aircraft manufacturer Airport operator
APTA-B0	APTA-B0/4 CDO (Basic)	Reduce fuel burn by not requiring application or power during descent	Ready for implementation	Yes	Non-congested terminal airspace with PBN STAR routings where greater efficiency is required. Noise sensitive areas requiring reduced noise footprint	<ul style="list-style-type: none"> - CDO procedures - Procedures validation, approval and publication - SOPs - Contingencies - Aircraft Capability - NAVAIDS - Training requirements 	ANSP Aircraft operator CAA Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
APTA-B0	APTA-B0/5 CCO (Basic)	Reduce fuel burn by not requiring level-offs during climb	Ready for implementation	Yes	Non-congested terminal airspace with PBN SID routings where greater efficiency is required. Noise sensitive areas requiring noise abatement procedures	<ul style="list-style-type: none"> - CCO procedures - Procedures validation, approval and publication - SOPs - Contingencies - Aircraft Capability - NAVAIDS - Training requirements 	ANSP CAA Aircraft operator Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
APTA-B0	APTA-B0/6 - PBN Helicopter Point in Space (PinS) Operations	Helicopter unique capabilities allow IFR operations that start or terminate from any suitable point in space (PinS), if visual conditions support take-off/landing capability from that point	Ready for implementation	Yes	Facilitating arrivals and departures to landing locations which do not otherwise support such operations.	<ul style="list-style-type: none"> - Helicopter PBN Point in Space (PinS) procedure design - Helicopter PBN Point in Space (PinS) procedure validation, approval and publication - SOPs for Helicopter PBN Point in Space (PinS) operations - Contingencies for Helicopter PBN Point in Space (PinS) operations - Aircraft capability for PBN Helicopter Point in Space (PinS) operations - Operational Authorization PBN Helicopter Point in Space (PinS) operations - Training requirements for Helicopter PBN Point in Space (PinS) 	ANSP CAA Aircraft operator Aircraft manufacturer
APTA-B0	APTA-B0/7 - Performance based aerodrome operating minima – Advanced aircraft	Standard Aerodrome operating minima are predicated upon aircraft equipped with the minimum required equipment (the basic aircraft) for that approach. These aerodrome	Ready for implementation	Yes	Approach operations in adverse weather conditions to lower than standard minima for operators of advanced aircraft.	<ul style="list-style-type: none"> - Operational credits - SOPs for Performance-based Aerodrome Operating Minima (Advanced aircraft) 	CAA Aircraft operator ANSP Aircraft manufacturer Airport operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
		operating minima relate directly to the established types and categories of operations and the associated infrastructure requirements (e.g. runway lights, approach lights). Aircraft with more advanced equipment can take advantage of existing infrastructure to obtain special authorizations for enhanced approach operations to lower minimums than basic aircraft can use.				<ul style="list-style-type: none"> - Contingency procedures for Performance-based Aerodrome Operating Minima (Advanced aircraft) - ATC procedures for Performance-based Aerodrome Operating Minima (Advanced aircraft) - Aerodrome procedures for Performance-based Aerodrome Operating Minima (Advanced aircraft) - Advanced aircraft capability - Operational Authorization for Performance-based Aerodrome Operating Minima (Advanced aircraft) - NAVAIDS to support the intended operation - Training requirements for Performance-based Aerodrome Operating Minima (Advanced aircraft) 	
APTA-B0	APTA-B0/8 Performance based aerodrome operating minima – Basic aircraft	For Basic aircraft, improvements include: Instrument approaches to non-instrument runways, improving airport access.	Ready for implementation	Yes	Airports with limited infrastructure wanting to implement or improve instrument approach procedures	<ul style="list-style-type: none"> - Design procedures - Validation, approval and publication of approach procedures - SOPs - Contingencies 	ANSP CAA Aircraft operator Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
		Flexibility to gradually improve the ground infrastructure with consequent improvements in operating minima				<ul style="list-style-type: none"> - Aircraft capability - Ground based infrastructure to support the desired operating minima 	
FRTO-B0	FRTO-B0/1 Direct routing (DCT)	Direct routings are established with the aim of providing airspace users with additional flight planning route options on a larger scale across FIRs such that overall planned leg distances are reduced in comparison with the fixed route network	Ready for implementation	Yes	This element will bring benefits in en-route airspace with low, medium and high complexity traffic	<ul style="list-style-type: none"> - DCT Procedures - ATC system upgrades - Upgrade of AOs Flight Planning Systems - Training requirements - ATFM system for FUA 	ANSP ATM network function Aircraft operator
FRTO-B0	FRTO-B0/2 Airspace planning and Flexible Use of Airspace (FUA)	Establish the Flexible Use of Airspace (FUA) process and improve data exchange between civil and military stakeholders by automation to enable a more efficient use of airspace based on transparency and due regard to national security needs	Ready for implementation	Yes	This element will bring benefits in en-route airspace with low, medium and high complexity traffic	<ul style="list-style-type: none"> - Operational approval - FUA Procedures - Tools and System to support FUA - Training requirements - ATFM system for FUA 	CAA ICAO ANSP Aircraft operator ATM network function
FRTO-B0	FRTO-B0/3 Pre-validated and coordinated ATS routes to support flight and flow	A collection of routes that have been pre-validated and coordinated with impacted air route traffic control centers and airspace users	Ready for implementation	Yes	This element will bring benefits in en-route airspace with low, medium and high complexity traffic	<ul style="list-style-type: none"> - Procedures on flexible routing tools - Tools and system - Upgrade of AOs Flight Planning Systems 	ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						- Training requirements	
FRTO-B0	FRTO-B0/4 Basic conflict detection and conformance monitoring	Reduction of ATCO's workload via early and systematic conflict detection and conformance monitoring	Ready for implementation	Yes	This element will bring benefits in en-route airspace with low, medium and high complexity traffic	- ATC Procedures for MTCDD and MONA - ATM system Upgrades - Training requirements	ANSP
NOPS-B0	NOPS-B0/1 Initial integration of collaborative airspace management with air traffic flow management	Introduce ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process applicable to the strategic through to the tactical phases of operations	Ready for implementation	Yes	This element should be undertaken by all ANSPs, AUs and the ATM Network function affecting both en-route and TMA operations	- Procedures for dynamic co-operative management of the airspace - Procedures for improved notification process - Procedures for released of reserved airspace - Procedures for promulgation and notification of receipt - Distribution of planned airspace usage information - Integrated airspace planning process - Pre-tactical scenario management - Airspace status information - ATFM systems interoperability with ASM system - Reception of planned and actual airspace status	ANSP ATM network function

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						- Training requirements	
NOPS-B0	NOPS-B0/2 Collaborative Network Flight Updates	Improve ATFM situation awareness in order to facilitate re-routings and coordinated application of ATFM measures	Ready for implementation	Yes	This element will involve all ANSPs, AUs and the ATM Network Function for the collaborative updates of the flight status within an ATFM area. This will enhance predictability and better utilisation of available capacity	- Network Planning procedures - Procedures for updated flight plan information - Correlated Position Reports - ATFM message exchanges - Flight activation messages - Updated flight plan info	ANSP ATM network function
NOPS-B0	NOPS-B0/3 Network Operation Planning basic features	The Network Operation Planning provides an overview of the situation from strategic planning through real time operations with ever increasing accuracy up to and including the day of operations by a common situational awareness for all ATFM actors within and adjacent to the ATFM area and allowing network wide demand and capacity balancing	Ready for implementation	Yes	The Network Operation Planning will involve all the operational stakeholders providing an overview of the situation from strategic planning to real time operations with ever increasing accuracy optimising the efficiency of the ATM system while balancing demand with capacity	- Tactical changes procedures - Capacity balancing procedures - Coordination procedures - Network Operation Planning procedures - Predefined scenario management - Dynamic sectorization procedures - Exchange of ATFM related data - Capacity planning - Training requirements	Airport operator ANSP ATM network function Aircraft operator
NOPS-B0	NOPS-B0/4 Initial Airport/ATFM slots and A-	Initial integration of airports into the ATM network function	Ready for implementation	Yes	It concerns airports which have implemented A-CDM. The integration of airport planning with ATFM will	- Airport slot procedure - ATFM A-CDM procedure	Airport operator ANSP ATM network function

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
	CDM Network Interface				involve all respective stakeholders in a collaborative decision facilitating slot adherence and some AUs preferences (limited slot swapping)	<ul style="list-style-type: none"> - Airport Slot Monitoring Tool - Departure planning estimate - Flight data for airborne flights 	Aircraft operator
NOPS-B0	NOPS-B0/5 - Dynamic ATFM slot allocation	Provision of dynamic departure ATFM slot allocation including Calculated Take-off Time (CTOT) for regulated flights to avoid ATFM congestions.	Ready for implementation	Yes	It concerns airports integrated in ATFM. All operational stakeholders participate in smoothing traffic flows facilitating ATFM slot adherence.	<ul style="list-style-type: none"> - Slot revision procedures - CTOT - 	Airport operator Aircraft operator ANSP ATM network function
OPFL-B0	OPFL-B0/1 - In Trail Procedure (ITP)	To enable aircraft to reach a more satisfactory flight level for flight efficiency or to avoid turbulence for safety	Ready for implementation	Yes	Improve situational awareness of flight crew and ATCO	There are currently no enablers.	ANSP Aircraft operator
RSEQ-B0	RSEQ-B0/1 - Arrival Management	To optimize sequencing for arrivals	Ready for implementation	Yes	- Runways and terminal manoeuvring area in major hubs and metropolitan areas.	<ul style="list-style-type: none"> - Arrival Sequencing Procedure - Arrival Sequencing ATC Automation system - Training requirements for arrival management - Arrival Sequencing Safety Assessment 	ANSP Aircraft operator
	RSEQ-B0/2 - Departure Management	To optimize departure operations	Ready for implementation	Yes	Runways and terminal manoeuvring area in major hubs and metropolitan areas. It will streamline departure traffic flow and smooth transition into en-route airspace. Automated dissemination of departure information and clearances.	<ul style="list-style-type: none"> - Departure Sequencing Procedure - Departure Sequencing ATC Automation system - Training requirements for departure management 	ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						- Departure Sequencing Safety Assessment	
	RSEQ-B0/3 - Point merge	To allow merging of arrival flows	Ready for implementation	Yes	Runways and terminal manoeuvring area in major hubs and metropolitan areas.	- Arrival Traffic Merging Procedure - Training requirements for point merge - Pilot Point Merge Briefing - Point Merge Safety Assessment	ANSP Aircraft operator
SNET-B0	SNET-B0/1 Short Term Conflict Alert (STCA)	To assist the air traffic controller in preventing collision between aircraft, using position data from ground surveillance	Ready for implementation	Yes	STCA systems are applicable in all controlled airspace for all aircraft for which a controller has responsibility for separation or traffic information. Before operational use, the system must have been configured for the target airspace, to maximize the number of relevant alerts while keeping the number of unnecessary alerts to an acceptable level	- Controller reaction - Surveillance system capabilities - Surveillance ground capabilities - Display for STCA - Training requirements	ANSP Airspace user Aircraft manufacturer Ground systems supplier
SNET-B0	SNET-B0/2 Minimum Safe Altitude Warning (MSAW)	To assist the air traffic controller in preventing controlled flight into terrain accidents by generating, in a timely manner, an alert of aircraft proximity to terrain or obstacles	Ready for implementation	Yes	All controlled airspace for all aircraft	- Controller reaction - Surveillance system capabilities - Surveillance ground capabilities for MSAW - Display for MSAW - Training requirements	ANSP Airspace user Aircraft manufacturer Ground systems supplier
SNET-B0	SNET-B0/3 Area Proximity Warning (APW)	APW is designed, configured and used to make a significant positive contribution to the prevention of accidents arising from	Ready for implementation	Yes	All controlled airspace for all aircraft	- Controller reaction - Surveillance system capabilities - Surveillance ground capabilities	ANSP Aircraft manufacturer Aircraft operator Ground systems supplier

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
		unauthorized penetration of an airspace volume				- Display for area proximity warning - Training requirements	
SNET-B0	SNET-B0/4 Approach Path Monitoring (APM)	APM is a Ground-based safety net intended to warn the controller about increased risk of controlled flight into terrain accidents by generating, in a timely manner, an alert of aircraft proximity to terrain or obstacles during final approach	Ready for implementation	Yes	All controlled airspace for all aircraft in final approach	- Controller reaction - Surveillance system capabilities - Surveillance ground capabilities - Display for approach path monitoring alerts - Training requirements	ANSP Aircraft manufacturer Aircraft operator Ground systems supplier
SURF-B0	SURF-B0/1 Basic ATCO tools to manage traffic during ground operations	To improve safety and efficiency during ground operations by providing proper indications to pilots and vehicle drivers	Ready for implementation	Yes	Runway incursion is traditionally prevented using lighting systems on the Airport. Stop bars and other systems are highly contributing to the fluidity and safety of taxi operations	To improve safety and efficiency during ground operations by providing proper indications to pilots and vehicle drivers	ANSP Aircraft operator
SURF-B0	SURF-B0/2 - Comprehensive situational awareness of surface operations	To better maintain ATCO awareness of ground operations.	Ready for implementation	Yes:	On complex Airports, the introduction of SMGCS functions is highly contributing to the safety and efficiency of surface operations by providing to the ATCO the necessary situation awareness to control operations.	There are currently no enablers.	Airport operator Aircraft operator ANSP
SURF-B0	SURF-B0/3 - Initial ATCO alerting service for surface operations	Detection by the ATCO of potentially unsafe situations with regard to runway operations.	Ready for implementation	Yes	On complex airports, the complexity of the infrastructure and the traffic can induce possibility of errors in the management of taxi operations.	There are currently no enablers.	Airport operator Aircraft operator ANSP
TBO-B0	TBO-B0/1	Provides for more efficient flight	Ready for implementation	Yes	Benefitting stakeholder(s)	Provides for more efficient flight	ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
	Introduction of time-based management within a flow centric approach	operation by using time-based scheduling versus more tactical measures such as holding to manage tactical synchronization				operation by using time-based scheduling versus more tactical measures such as holding to manage tactical synchronization using strategic and tactical time-based management	
ACAS-B1	ACAS-B1/1 ACAS Improvements	To provide airborne collision avoidance as a last resort safety net for pilots	Ready for implementation	Yes	Improve situational awareness of flight crew	<ul style="list-style-type: none"> - TCAS version 7.1 certification - Procedures for the operation of ACAS including phraseology - TCAS II version 7.1 avionics - TCAS II version 7.1 operational approval - Avionics for extended hybrid surveillance (optional) - Training requirements for TCAS version 7.1 operations 	CAA Aircraft manufacturer ANSP Aircraft operator
APTA-B1	APTA-B1/1-PBN Approaches (with advanced capabilities)	PBN approaches with advanced functionality allow for the introduction of more flexible approaches including the use of RF legs within the Final Approach Segment (FAS) and RNP	Standardization	Yes	Any runway ends with or without existing procedures. Particularly relevant for airports situated in congested or challenging operating environments.	<ul style="list-style-type: none"> - PBN approach (with advanced capabilities) procedures design and use - PBN approach (with advanced capabilities) validation, approval, and publication 	CAA ANSP Aircraft operator Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						<ul style="list-style-type: none"> - SOPs for PBN approaches (with advanced capabilities) - Contingency procedures for PBN approaches (with advanced capabilities) - Aircraft capability for PBN approach (with advanced capabilities) - Operational Authorization for PBN approaches (with advanced capabilities) - Training requirements for PBN Approaches (with advanced capabilities) 	
APTA-B1/2	APTA-B1/2 - PBN SID and STAR procedures (with advanced capabilities)	Advanced PBN functionality further supports flexibility of route placements in airspace design.	Standardization	Yes	Applicable in all terminal areas. Particularly suited to airports situated in congested or challenging operating environments.	<ul style="list-style-type: none"> - PBN SID and STAR Procedures (with advanced capabilities) procedure design and use - PBN SID and STAR Procedures (with advanced capabilities) validation, approval, and publication - SOPs for PBN SID/STAR (with advanced capabilities) - Contingencies for PBN SID/STAR 	CAA ANSP Aircraft operator Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						(with advanced capabilities) - Aircraft capability for PBN SID/STAR (with advanced capabilities) - Operational Authorization for PBN SID/STAR (with advanced capabilities) - NAVAIDS to support the applicable navigation specification used for SID/STAR (with advanced capabilities) - Training requirements for PBN SID/STAR (with advanced capabilities)	
APTA-B1/4	APTA-B1/4 - CDO (Advanced)	Increase the ability CDO operations to contribute to terminal airspace efficiency	Standardization	Yes	Congested terminal airspace with existing PBN STAR routings already utilizing CDO operations.	- Development of CDO (advanced) procedures - CDO (advanced) procedures validation, approval and publication - SOPs for CDO (advanced) operations - Contingencies for CDO (advanced) - Aircraft Capability for CDO (advanced) - NAVAIDS to support the applicable	CAA ANSP Aircraft operator Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						navigation specification used for CDO (advanced) - Training requirements for CDOs (advanced)	
APTA-B1	APTA-B1/5 - CCO (Advanced)	Increase the ability CCO operations to contribute to terminal airspace efficiency	Ready for implementation	Yes:	Congested terminal airspace with existing PBN SID routings already utilizing CCO operations.	- Development of CCO (advanced) procedures - CCO (advanced) procedures validation, approval and publication - SOPs for CCO (advanced) operations - Contingencies for CCO (advanced) - Aircraft Capability for CCO (advanced) - NAVAIDS to support the applicable navigation specification used for CCO (advanced) - Training requirements for CCOs (advanced)	CAA Aircraft manufacturer Aircraft operator ANSP
CSEP-B1	CSEP-B1/1 Basic airborne situational awareness during flight operations (AIRB)	To improve traffic situational awareness in all phases of flight	Ready for implementation	Yes Essential Expedite implementation	AIRB may be introduced in a partial equipage of ADS-B OUT, in which only some aircraft are equipped with ADS-B OUT	- Certification of CDTI (Cockpit Display Traffic Information) - SOPs - ADS-B IN equipment/function - CDTI – Cockpit display - Training requirements	CAA Aircraft manufacturer Aircraft operator Airspace user

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
CSEP-B1	CSEP-B1/2 - Visual Separation on Approach (VSA)	To assist pilots in maintaining own separation during successive visual approach procedures. VSA is defined to support aircraft performing successive visual approach and landing operations	Ready for implementation	Yes	The application can be used by all suitably equipped aircraft during approach to any airports where own separation is used. VSA may be introduced in a partial equipage of ADS-B OUT environment, in which only some aircraft are equipped with ADS-B OUT. VSA is applicable for all types of runway configurations where successive visual approaches are in use (PANS-ATM 6.5.3).	<ul style="list-style-type: none"> - Certification of CDTI for airborne situational awareness - ADS-B IN equipment/function - CDTI - Training requirements for VSA - SOPs for the use of CDTI for VSA - ADS-B OUT equipment/function 	CAA Aircraft manufacturer Aircraft operator Airspace user

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
CSEP-B1	CSEP-B1/3 - Performance Based Longitudinal Separation Minima	Reduced separation allowing more flights to operate in their optimum flight levels	Standardization	Yes	Applicable to oceanic airspace and/or remote areas.	<ul style="list-style-type: none"> - Operational Approval for performance-based longitudinal separation - Procedures for PBLoS M - Surveillance systems for PBLoS M - Navigation systems for PBLoS M - Communication systems for PBLoS M - Training requirements for PBLoS M - Communication capabilities for PBLoS M - Navigation capabilities for PBLoS M - Surveillance capabilities for PBLoS M 	CAA Aircraft manufacturer Aircraft operator ANSP
CSEP-B1	CSEP-B1/4 - Performance Based Lateral Separation Minima	To increase airspace capacity and allow optimum utilization of available airspace	Standardization	Yes		<ul style="list-style-type: none"> - Operational Approval for performance-based lateral separation - Procedures for PBLaSM - Training requirements for PBLaSM - Communication capabilities for PBLaSM 	CAA ANSP Aircraft operator Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						<ul style="list-style-type: none"> - Navigation capabilities for PBLaSM - Surveillance capabilities for PBLaSM - Communication systems for PBLaSM - Navigation systems for PBLaSM - Surveillance systems for PBLaSM 	
DATS-B1 Digital Aerodrome Air Traffic Services	RATS B1/1 – Remotely Operated Aerodrome Air Traffic Services	To provide ATS at aerodromes not from a traditional on-site tower, but remotely from either a local or a distant location. The service provided may be a control service or flight information service as appropriate	Standardization	Yes	Provide ATS for an aerodrome which due to its location has limited support living facilities for staff and results in increased overall operational costs to build and maintain a conventional on-site tower. Provide a contingency ATC Tower Facility from a remote tower in the event the regular on-site tower is unavailable. A remote facility may be sited at a location which is ideally located to provide better living conditions for operational staff. Providing a remote facility may enable substantial cost savings in construction. The deployment may enable provision of ATS at aerodromes where it would otherwise be uneconomical or unsustainable. Provide an ATC Tower Facility	<ul style="list-style-type: none"> - Amendment of the national regulatory framework for the provision of remote ATS at aerodromes - Procedures for the provision of remote ATS at aerodromes - Procedures for the provision of remote ATS at aerodromes in contingency situations. - Training requirements for the provision of remote ATS at aerodromes - Surveillance means at the remote tower centre - Surveillance means at the aerodrome where remote ATS are provided - Operational approval required 	CAA ANSP

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
					from a remote tower located on the aerodrome or within close proximity to the aerodrome as the main facility which may enable a more cost effective and efficient service compared to that of a conventional tower.	for remote tower centre - ATS Unit Certification to include level of service to be provided by the RTC.	
FRTO-B1	FRTO-B1/1 Free Route Airspace (FRA)	The Free Route Airspace (FRA) concept brings significant flight efficiency benefits and a choice of user preferred routes to airspace users	Standardization	Yes	This element will bring benefits in en-route airspace with low, medium and high complexity traffic	- Procedures for FRA Airspace Design - ATC System Upgrade for FRA - Upgrade of AOs flight planning systems for FRA - Training requirements - ATFM system for FRA	ANSP ATM network function Aircraft operator
FRTO-B1	FRTO-B1/2 Required Navigation Performance (RNP) routes	RNP routes should be deployed within en-route airspace where Free Route Airspace (FRA) is not planned or if FRA is deployed the RNP routes should ensure the connectivity between FRA and TMAs	Standardization	Yes	The element will bring benefit in an en-route medium to high complexity traffic environment	- Operational approval to provide RNP Routes - Procedures to design the RNP routes - Install appropriate RNP equipment - Adapt ATC ground system HMI for RNP routes - Training requirements for RNP routes	CAA ICAO ANSP Aircraft manufacturer Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
FRTO-B1	FRTO-B1/3 Advanced Flexible Use of Airspace (FUA) and management of real time airspace data	FUA and airspace management (ASM) need to be enhanced with collaborative airspace data sharing between all ATM actors, negotiation procedures, system support and real time ASM data integration	Standardization	Yes	The element will bring benefit in an en-route medium to high complexity traffic environment	<ul style="list-style-type: none"> - Operational approval to provide Advanced FUA - Procedures for Exchange of Real Time Airspace Data - System Upgrades for Exchange of Real Time Airspace Data - Integration and Management of ASM real-time Data - Training requirements for Advanced FUA - Upgrade of AOs flight planning systems for FUA 	CAA ICAO ANSP ATM network function Aircraft operator
FRTO-B1	FRTO-B1/4 Dynamic sectorization	Dynamically adapt ATC sectorization to respond to traffic demand without increasing the number of controllers working position in use.	Standardization	Yes	This tool will provide real-time support to the operations room supervisor to select the most appropriate sector configuration according to the traffic demand and complexity, taking into account predefined sector configuration as well as the change of the ATC sector shapes by adding/removing the elementary sectors.	<ul style="list-style-type: none"> - ATC Operational Supervisor Procedures for Dynamic Sectorization - ATC System Tools for Support of Dynamic Sectorization - Training requirements for dynamic sectorization 	ANSP
FRTO-B1	FRTO-B1/5 Enhanced Conflict Detection Tools and Conformance Monitoring	Enhancements of basic mid-term conflict detection (MTCD)/ monitoring alert (MONA) functions and thus further improving the ATCO productivity	Standardization	Yes	The element will bring benefit in an en-route medium to high complexity traffic environment	<ul style="list-style-type: none"> - ATC procedures for enhanced CDT and MONA - ATC system upgrades for enhanced CDT and MONA functions 	ANSP

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
		and reducing the workload				- Training requirements for enhanced CDT and MONA	
FRTO-B1	FRTO-B1/6 - Multi-Sector Planning	This element is applicable only to en-route sectors that are currently staffed by two ATCOs (planning and tactical). The multi-sector planning (MSP) function defines a new organization of controller team(s) and new operating procedures to enable the planning controller to provide support to several tactical controllers operating in different adjacent sectors. This function might reduce the ATCO workload related to intra/inter centre coordination. The workload conversion to potential capacity gains might vary considerably depending on the sector configurations	Standardization	Yes	The element will bring benefit in an en-route medium to high complexity traffic environment.	- ATC procedures for MSP - ATC system Upgrade for Support of MSP Role - Training requirements for MSP	ANSP
FRTO-B1	FRTO-B1/7 - Trajectory Options Set (TOS)	To give airspace users greater flexibility and control over their trajectory with respect to airspace constraints	Standardization	Yes	The element will bring benefit in an en-route medium to high complexity traffic environment.	- CTOP advisory circular - Operational procedures for the use of CTOP - Tools and system to support CTOP	CAA ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						<ul style="list-style-type: none"> - CSFP to support CTOP - Training requirements for CTOP 	
NOPS-B1	NOPS B1/1 - Short Term ATFM measures	Short Term ATFM Measures (STAM) intends to smooth sector workloads by reducing traffic peaks through short-term applications of minor ground delays, appropriate flight level capping, timing and modalities of ATC re-sectorisation These measures can reduce the traffic complexity for ATC with minimum curtailing impact on the airspace users	Standardization	Yes	Stakeholders can optimize capacity throughput by adopting and improving the tactical capacity management procedures with the use of STAM.	<ul style="list-style-type: none"> - DCB change procedure - DCB optimisation procedure - STAM procedures - Strategic DCB tools - Routings and Flow changes - Basic STAM tool - Sector configuration integration - Enhanced STAM tool - Local STAM tool - Training requirements for STAM 	ANSP ATM network function Aircraft operator Local tool and interface with ATFM tools
NOPS-B1	NOPS B1/2 - Enhanced Network Operations Planning	The Network Operations Planning needs to be enhanced to achieve collaborative planning with the support of services which can be automated (B2B interfaces/SWIM services)	Standardization	Yes	An enhanced common platform is available to all Stakeholders needs enabling the collaborative decision-making processes used to maintain and execute the Network Operations Planning.	<ul style="list-style-type: none"> - Enhanced NOP dissemination procedure - Enhanced NOP notification procedure - Critical event procedure - Airspace availability procedure - B2B/SWIM services procedure - Enhanced NOP platform 	Airport operator ANSP ATM network function Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						<ul style="list-style-type: none"> - Enhanced NOP functions - Enhanced NOP interfaces - Training requirements for enhanced network operations planning 	
NOPS-B1	NOPS B1/3 - Enhanced integration of Airport operations planning with network operations planning	Integrate the airport operations planning (AOP) into the network operations planning (NOP)	Standardization	Yes	It concerns airports which have already implemented AOP. This element will involve Airports and the ATM Network function. Airport planning will be integrated in the Network operations planning. The integration of Airport operations planning within the Network operations planning.	<ul style="list-style-type: none"> - AOP/NOP procedure - Airport Operations Plan - Airport Operations/ /Network Operations Planning interface 	Airport operator ATM network function
NOPS-B1	NOPS B1/4 - Dynamic Traffic Complexity Management	Enhanced traffic complexity assessment by automation	Standardization	Yes	It is applicable only in areas with dense and complex traffic. This element needs to be addressed by the ANSPs and the ATM Network function in their endeavour to find optimum solutions to accommodate the traffic demand.	<ul style="list-style-type: none"> - Complexity management procedure - Local Traffic Load Management tool. - Local Traffic Complexity tools - Provision and integration of ATFM Planned Trajectory - Enhancements related to ATFM Traffic complexity assessment - Upgrade the ATFM systems with the Planned Trajectory improvements 	ANSP ATM network function

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
NOPS-B1	NOPS B1/5 - Full integration of airspace management with air traffic flow management	Ensure a continuous, seamless and iterative airspace management and air traffic flow management approach	Standardization	Yes	This element is an evolution of element NOPS-B0/1 and should be undertaken by all ANSPs, AUs and the ATM Network function affecting both en-route and TMA operations.	<ul style="list-style-type: none"> - Rolling ASM/ATFM procedure - ASM data sharing procedure - ASM real time exchanges procedure - Advanced FUA procedure - Airspace changes procedure - Rolling ASM/ATFM - ASM notification process - ASM real time exchanges-ATC part - ASM real time exchanges-ASM and ATFM part - Training requirements for full integration of ASM with ATFM 	ANSP ATM network function Aircraft operator
NOPS-B1	NOPS-B1/6 Initial Dynamic Airspace configurations	ASM solutions and initial dynamic airspace configurations for ATFM planning, synchronization of traffic flows and demand/capacity balancing	Standardization	Yes	This element will be addressed by ANSPs and the ATM Network function as required ensuring a synchronized availability of optimized airspace structures supported by dynamic sectors management to better address traffic demand	<ul style="list-style-type: none"> - Airspace solution procedure - Predefined airspace configuration procedure - Constrain management procedure - Airspace solution - Predefined airspace configuration - Dynamic sectorization - Airspace configuration data 	ANSP ATM network function

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						exchanges (basic feature)	
NOPS-B1	NOPS-B1/7 Enhanced ATFM slot swapping	Improve the Airspace Users driven ATFM slot swapping process	Standardization	Yes	This element will support AUs businesses by reprioritizing their flights during the pre-tactical part of operations if and as requested by them. The ATM Network function will keep all impacted stakeholders in the loop in the context of the Collaborative Decision Making processes.	<ul style="list-style-type: none"> - Slot swapping procedure - FOC interface to slot swapping module - ATFM slot swapping module - Training requirements for slot swapping 	ATM network function Aircraft operator
NOPS-B1	NOPS-B1/8 Extended Arrival Management supported by the ATM Network function	ATM Network function contributions to extended Arrival Management	Standardization	Yes	It is applicable in areas where extended AMAN tools and procedures are implemented. This element will be addressed by the ANSPs at high density TMAs, if and as required, in improving arrival management. The ATM Network function will ensure that all impacted stakeholders (different ATC units also maybe in different countries) are properly involved and appropriate ATFM actions are undertaken.	<ul style="list-style-type: none"> - Extended AMAN LoA - ATFM procedure for Extended AMAN - ATFM extended AMAN module 	ANSP ATM network function
NOPS-B1	NOPS-B1/9 Target Times for ATFM purposes	Use of Target Times for ATFM purposes including an initial level of arrival sequencing in case of an arrival ATFM measure	Standardization	Yes	This element will involve ANSPs, Airspace Users and the ATM Network function in their endeavour to improve predictability of operations through the sharing and use of Target Times (Target Times	<ul style="list-style-type: none"> - Target Time procedure - Target time module - Training requirements for Target Times 	ANSP ATM function Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
					Over/Target Times of Arrival).		
NOPS-B1	NOPS-B1/10 Collaborative Trajectory Options Program (CTOP)	Collaborative Trajectory Options Programs are Traffic Management Initiatives (TMI) that allow ATFM to choose the best possible balance between ATFM delay and rerouting by using airspace user provided Trajectory Option Sets (TOS) to mitigate the operational impact of weather or traffic demand airspace constraints.	Standardization	Yes		<ul style="list-style-type: none"> - CTOP advisory circular - Operational procedures for the use of CTOP - Tools and system to support CTOP - CSFP to support CTOP - Training requirements for CTOP 	CAA ANSP Aircraft operator
OPFL-B1	OPFL B1/1- Climb and Descend Procedure (CDP)	The CDP was designed to improve service to appropriately equipped aircraft by providing an air traffic controller with another option for initiating an altitude change when existing separation minima do not allow an aircraft to climb or descend through the altitude of a blocking aircraft	Standardization	Yes	The capability for the controller to request current position and intent from pair(s) (ADS-C capability) aircraft provides the situational awareness to allow the controller to use the simultaneous reporting of position to support the procedure at less than the nominal separation.	There are currently no enablers.	ANSP Aircraft operator
RSEQ-B1	RSEQ-B1/1 Extended arrival metering	To enhance predictability and ATM decision compliance	Standardization	Yes	Synchronization between adjacent FIRs, arrival management taking into account extended metering requirements.	<ul style="list-style-type: none"> - Extended Arrival Metering Procedure - Extended Arrival Metering Letter of Agreement - Procedure to Reconcile ATFM Constraint with 	ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
						Extended Metering Requirements - Extended Arrival Metering Local ATM Automation systems - Training requirements for extended arrival management - Extended Arrival Metering Safety Assessment	
SNET-B1	SNET-B1/1 Enhanced STCA with aircraft parameters	Assist the air traffic controller in preventing collision between aircraft, using position data from ground surveillance and flight intent reported by aircraft	Ready for implementation	Yes	Enhanced STCA systems with aircraft parameters are applicable in all controlled airspace for all aircraft for which a controller has responsibility for separation or traffic information	- Controller reaction to short term conflict alerts - Surveillance system capabilities required for enhanced short term conflict alerts - Surveillance ground capabilities required for enhanced short term conflict alerts - Display for enhanced short term conflict alerts - Training requirements for enhanced short term conflict alerts	Aircraft manufacturer Aircraft operator ANSP Ground systems supplier
SNET-B1	SNET B1/2 - Enhanced STCA in complex TMAs	Assist the air traffic controller in preventing collision between aircraft, using position data from ground surveillance, and considering possible	Ready for implementation	Yes:	Enhanced STCA systems in complex TMAs are applicable in all controlled complex TMAs for all aircraft for which a controller has responsibility for separation or traffic	- Controller reaction to short term conflict alerts - Surveillance system capabilities required for enhanced short term	ANSP Aircraft manufacturer Aircraft operator Ground systems supplier

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
		crew intents linked to traffic patterns and ATC practices in complex TMAs			information. The deployment of such an enhanced STCA is necessary in TMAs where the basic STCA would produce an unacceptable level of unnecessary alerts or would fail to produce timely alerts for traffic with frequent trajectory changes. Before operational use, the system must have been configured for the target airspace, to maximize the number of relevant alerts while keeping the number of unnecessary alerts to an acceptable level.	conflict alerts in complex TMAs - Surveillance ground capabilities required for enhanced short term conflict alerts in complex TMAs - Display for enhanced short term conflict alerts in complex TMAs - Training requirements for enhanced short term conflict alerts in complex TMAs	
SURF-B1	SURF B1/1 - Advanced features using visual aids to support traffic management during ground operations	To improve surface operations with the aim to reduce taxi time and fuel burn, potential mistakes	Standardization	Yes	On complex airports, the management of the platform is introducing numerous changes and an increased complexity in managing maintenance or construction together with ensuring safety and efficiency of operations. The introduction of dynamic aids is highly improving accuracy of the navigation on the surface and as such safety and efficiency.	There are currently no enablers.	Airport operator ANSP Aircraft operator Aircraft manufacturer Ground handling agent
SURF-B1	SURF B1/2 - Comprehensive pilot situational awareness on the airport surface	To improve ground operations based on increasing pilot's situational awareness and safety especially at taxiway and runway intersections, as well as	Ready for implementation	Yes	On complex airports, the complexity of the infrastructure and the traffic can induce possibility of errors in the management of taxi operations. Full pilot situational awareness will first compensate possible	There are currently no enablers.	Airport operator ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
		for aircraft landing and taking off			mistakes from the controllers but also assist in improving the efficient management of taxi operations.		
SURF-B1	SURF B1/3 - Enhanced ATCO alerting service for surface operations	The enhanced A-SMGCS alerting service anticipates potential runway conflicts, runway incursion and other hazardous situations on the aerodrome surface	Standardization	Yes	On complex airports, the complexity of the infrastructure and the traffic can induce possibility of errors in the management of taxi operations.	There are currently no enablers.	Airport operator ANSP Aircraft operator
SURF-B1	SURF B1/4 - Routing service to support ATCO surface operations management	To improve pre-departure and departure sequencing by provision of accurate taxi times and efficient routing service	Standardization	Yes	On complex airports, the management of the platform is introducing numerous changes and an increased complexity in managing maintenance or construction together with ensuring safety and efficiency of operations. Appropriate and potentially tailored routing services can highly improve safety and efficiency of airport surface management. When fully consistent with ACDM and Runway sequencing strategies, it clearly contributes to the performance of the airport and surrounding airspace management.	There are currently no enablers.	Airport operator ANSP Aircraft operator
SURF-B1	SURF B1/5 - Enhanced vision systems for taxi operations	Allow for improved navigation by visual reference, even during conditions of low-light or weather obscuration such as fog	Standardization	Yes	On complex airports, the capacity of the airport may decrease a lot in LVC due to surface operations. The introduction of enhance vision systems on board aircraft able to recognize	There are currently no enablers.	Airport operator ANSP Aircraft operator

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Enablers	Stakeholders
					lightings and ground indications can highly improve accuracy of the navigation on the surface and as such safety and efficiency and limit negative impact.		
TBO-B1	TBO B1/1 - Initial Integration of time-based decision-making processes	Provides initial support to network operations by integrating network applied constraints into local arrival and departure management. Overall operations are still locally conducted with time-based decision-making tools	Standardization	Yes		There are currently no enablers.	ANSP Airport operator Aircraft operator

Table SAR III-1: ASBU applicable elements in SAR area

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
GADS-B1	GADS-B1/1 Aircraft Tracking	To provide support to the ATSU Alerting Service in areas without ATS surveillance with an update rate of the aircraft position of at least once per 15 mins.	Ready for implementation	Yes	This element is only applicable in oceanic airspace lacking ATS surveillance with a position update rate of at least once per 15 mins	<ul style="list-style-type: none"> - Procedures for aircraft tracking - Airborne aircraft tracking system - Data link for aircraft tracking - Ground aircraft tracking system - Aircraft tracking training 	Aircraft operator
GADS-B1	GADS-B1/2 Contact directory service	To ensure that Point of Contact (PoC) information is available and can be accessed by Rescue Coordination Centres (RCCs), ATSUs and aircraft operators in support of emergency situations	Ready for implementation	Yes	This element is applicable in emergency situations	<ul style="list-style-type: none"> - Procedures for Operational Control Directory 	ANSP Aircraft operator RCC SAR authority

Table CNS III-1: ASBU applicable elements in CNS area

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
COMI-B0	COMI-B0/1 - Aircraft Communication Addressing Reporting System (ACARS)	<ul style="list-style-type: none"> ▪ To enable the data exchanges through Controller/Pilot Data Link Communication (CPDLC); ▪ To enable the data exchanges through Automatic Dependant Surveillance-Contract (ADS-C) Communication ▪ To enable Airlines Operations Communication 	Ready for implementation	Yes	<p>Introduction of a datalink to support domestic data communications operations.</p> <p>Exchanges aviation data (AOC, CPDLC and ADS)</p>	<ul style="list-style-type: none"> • ACARS ground network and avionics • ACARS Space Radio Transceiver 	<ul style="list-style-type: none"> • ANSPs • Airlines • Aircraft manufacturer • Ground systems supplier • Satellite provider
	COMI-B0/2 - Aeronautical Telecommunication Network/Open System Interconnection (ATN/OSI)	To support Operational Data Exchange (Flight Plans, NOTAMs and OPMET)	Ready for implementation	No	ATN/OSI is not selected for implementation in the AFI Region in consideration of Cost constraints	NA	NA
	COMI-B0/3 - VHF Data Link (VDL) Mode 0/A	To support Air /Ground Data Link Communication	Ready for implementation	Yes	<p>Introduction of a datalink to support domestic data communications operations. a supplement to voice communications</p> <p>Exchanges aviation data (AOC, CPDLC and ADS)</p>	<ul style="list-style-type: none"> • Narrow-band transceiver operating in the VHF aviation protected spectrum band • System is based on double side band AM multi-shift eyeing modulation to transfer 2400 bps. 	<ul style="list-style-type: none"> • CAA • ANSPs • Airlines • CSPs • Aircraft manufacturer
	COMI-B0/4 - VHF Data Link (VDL) Mode 2 Basic	To support Air /Ground Data Link Communication with higher performance than VDLM0/A	Ready for implementation Standardized (Annex 10 Vol. III Chap 6)	Yes	<ul style="list-style-type: none"> • Provides an Increase in data capacity over VDL Mode 0/A • Exchanges aviation data (AOC, CPDLC and ADS) 	VHF narrow-band transceiver operating in the protected spectrum band, under a set of air-ground protocols that	<ul style="list-style-type: none"> • CAA • ANSPs • Airlines • CSPs

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
					<ul style="list-style-type: none"> More efficient use of spectrum 	increase the data rate to 31.5 kbits - VDL-M2 ground network and avionics	<ul style="list-style-type: none"> Aircraft manufacturer
COMI-B0	COMI-B0/5-Satellite Communication (SATCOM) Class C Data	<ul style="list-style-type: none"> To provide surveillance and communications in Continental Remote and Oceanic airspaces, where VHF usage is not possible or practical. Satellite-based, narrow-band communication provided by multiple service providers that can be used for safety and routing communications 	Ready for implementation Standardized (Annex 10 Vol. III Chap 6), Doc 9925 AMS(R) S Manual	Yes	<ul style="list-style-type: none"> Supports improvement of surveillance and communication in airspace where procedural separation is being applied 	<ul style="list-style-type: none"> Class C capable Satellite and ground infrastructures 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer
	COMI-B0/6-High Frequency Data Link (HFDL)	To exchange data messages between aircraft end-systems and corresponding ground based HFDL ground stations	Ready for implementation Standardized (Annex 10 Vol. III Chap 11)	Yes	<ul style="list-style-type: none"> To communicate in areas where SATCOM and VHF are not available 	<ul style="list-style-type: none"> HFDL network and avionics 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer
	COMI-B0/7-ATS Message Handling System (AMHS)	To supports improved communication over AFTN To provide flight information coordination between ANSPs at adjacent FIRs, and with relevant military units, support separation assurance, potentially providing, when used in conjunction with other	Ready for implementation Standardized (ICAO Annex 10 Vol. II & Vol. III and Doc. 9880)	Yes	<ul style="list-style-type: none"> To carry traffic for AIDC/Flight Plan/MET until SWIM is ready in Block 2 and accommodate SWIM compliance data message (IWXXM) until ANSPs readiness for SWIM 	<ul style="list-style-type: none"> ATN infrastructure 	<ul style="list-style-type: none"> CAA ANSPs CSPs

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
		enablers (e.g. navigation capabilities), reduced separation. 1. Flight Plan/Clearance 2. AIDC: Flight transfer 3. MET data					
COMI-B1	COMI-B1/1- Ground-Ground Aeronautical Telecommunication Network/Internet Protocol suite (ATN/IPS)	To support Air Traffic Service Communication (ATSC) as well as Aeronautical Industry Service Communication (AINSC), such as Aeronautical Administrative Communications (AAC) and Aeronautical Operational Communications	Standardization ICAO Annex 10 Vol. II & Vol. III and Doc. 9896	Yes	. To enable the efficient integration of technologies with improved integrity to support air to ground aeronautical safety services and regularity of flight communications.	<ul style="list-style-type: none"> Modern robust, efficient and cost-effective data communications network infrastructure IPS nodes and networks operating in a multinational environment 	<ul style="list-style-type: none"> CAA ANSPs CSPs
	COMI-B1/2- VHF Data Link (VDL) Mode 2 Multi-Frequency	<ul style="list-style-type: none"> To supports transmission of data link message sets to supplement current voice operations, thus reducing voice channel congestion, while increasing productivity and capacity. Support increased subnetwork capacity and reduces interference over the standard VDL Mode 2 system. 	Ready for implementation Standardized (Annex 10 Vol. III Chap 6)	Yes	<ul style="list-style-type: none"> Provides an Increase in data capacity over VDL Mode 2 Basic Exchanges aviation data (AOC, CPDLC and ADS) More efficient use of spectrum 	<ul style="list-style-type: none"> VHF narrow-band transceiver operating in the protected spectrum band, under a set of air-ground protocols that increase the data rate to 31.5 kbits 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer
	COMI-B1/3- SATCOM Class B Voice and Data	<ul style="list-style-type: none"> To supports introduction of SATVOICE and SATDATA as a complement to HF voice communications. To provide for oceanic and domestic broadband IPS based safety critical data link operations. 	Ready for implementation (Annex 10 Vol. III Chap 6), Doc 9925 AMS(R) S Manual	Yes	<ul style="list-style-type: none"> Use of SATCOM voice for all types of ATS communications (routine and emergency/urgency communications). Provide high-speed IP based broadband networks. Improved security 	<ul style="list-style-type: none"> Inmarsat 4 and Iridium satellite constellations, global coverage for SATCOM Class B (SB-S): Avionics, satellite modem Aircraft antenna capable of receiving 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
		<ul style="list-style-type: none"> To support safety critical, safety and regularity of flight operations. 			<ul style="list-style-type: none"> Lower cost than the traditional circuit switched services (Classic Aero). 	Swift Broadband and <ul style="list-style-type: none"> Related equipment (diplexer, LNA, HPA & cabling) 	
	COMI-B1/4- Aeronautical Mobile Airport Communication System (AeroMACS)	To reduce Separation & Efficiency To improve situational awareness To reduced Cost	Ready for implementation (Annex 10 Vol. III Chap 7), Doc 10044 AeroMACS Manual	Yes	<ul style="list-style-type: none"> To support Safety communications To ensure network connectivity on the airport surface for the safety critical and regularity of flight. 	<ul style="list-style-type: none"> IPS Based wireless communications infrastructure and system Multilateration sensors, weather sensors, surface radar and fixed navigation aids. 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Airport operator
COMS-B0	COMS-B0/1- CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace	To supports : <ul style="list-style-type: none"> reduction of voice channel congestion and increase of capacity in domestic airspace, improvement of communication and surveillance in airspace where procedural separation is being applied. 	Ready for implementation (Standardized in Annex 10 Vol. I, Annex 10 Vol. II Chap. 8.2)	Yes	Complement to voice communications, controller–pilot data link communications (CPDLC) provide the controller and the pilot with the ability to communicate through exchange of data link messages.	<ul style="list-style-type: none"> Aircraft ATN B1 CPDLC data link infrastructure ATSU CPDLC systems Training requirements for CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace CPDLC Requirements and/or mandates CPDLC Safety Management System 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer
	COMS-B0/2- ADS-C (FANS 1/A) for procedural airspace	To support improvement of surveillance in airspace where procedural separation is being applied	Ready for implementation (Standardized in Annex 10 Vol. I, Annex 10 Vol. II Chap. 8.2)	Yes	<ul style="list-style-type: none"> ADS-C capability to provide ATSUs with aircraft position and projected profile for the flight at time intervals, events or on demand dictated by the ground need 	<ul style="list-style-type: none"> FANS aircraft Flight Management System ATSU ADS-C systems Training requirements for ADS-C (FANS 1/A) 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
						for procedural airspace <ul style="list-style-type: none"> • ADS-C Requirements and/or mandates • ADS-C Safety Management System 	
COMS=B1	COMS-B1/1 -PBCS approved CPDLC (FANS 1/A +) for domestic and procedural airspace	To support: <ul style="list-style-type: none"> • reduction of voice channel congestion and increase of capacity in domestic airspace, • introduction of performance-based reduced separation minima in procedural airspace 	Ready for implementation (Standardized in Annex 10 Vol. I, Annex 10 Vol. II Chap. 8.2)	Yes	<ul style="list-style-type: none"> • RCP240 in procedural airspace, for CPDLC (FANS 1/A+) to provides ATCs with intervention capability, allowing when used in conjunction with other enablers (e.g., ADS-C and navigation capabilities), reduced separation minima and thus capacity increase • RCP 130 in domestic airspace, compliant CPDLC (FANS 1/A+) provides a complementary means of communications for en-route routine communications and the extension of CPDLC for ground operations (e.g. departure clearance) 	<ul style="list-style-type: none"> • FANS 1/A+ CPDLC systems compliant with RCP240 (procedural) and RCP130 (domestic). • Training requirements for PBCS approved CPDLC (FANS 1/A+) for domestic and procedural airspace • CPDLC PBCS Requirements and/or mandates • CPDLC PBCS Safety Management System • PBCS Approval (RCP240 and RCP130) 	<ul style="list-style-type: none"> • CAA • ANSPs • Airlines • CSPs • Aircraft manufacturer
	COMS-B1/2 PBCS-approved ADS-C (FANS 1/A +) for procedural airspace	To support introduction of performance-based reduced separation minima in procedural airspace	Ready for implementation (Standardized in Annex 10 Vol. III, Annex 10 Vol. II Chap. 8.2)	Yes	<ul style="list-style-type: none"> • FANS 1/A+ ADS-C systems (along with associated air-ground network and physical layers) are demonstrated 	<ul style="list-style-type: none"> • FANS aircraft Flight Management System • ATSU ADS-C systems • Compliance with RSP180 	<ul style="list-style-type: none"> • CAA • ANSPs • Airlines • CSPs • Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
						<ul style="list-style-type: none"> • Training requirements for PBCS approved ADS-C (FANS 1/A+) for procedural airspace • ADS-C Safety Management System • ADS-C PBCS Requirements and/or mandates • Datalink performance requirements and monitoring (ADS-C) • PBCS Approval (RSP 180) 	
	COMS-B1/3-SATVOICE (incl. routine communication) for procedural airspace	To increase quality of voice communications in procedural airspace without VHF coverage	Ready for implementation (Annex 10 Vol. III Chap 6)	Yes	GANP Portal: https://www4.icao.int/ganpportal/ASBU	<ul style="list-style-type: none"> • Dedicated networks and aircraft system • Requirements for the use of SATVOICE • SATVOICE Safety Management System • SATVOICE procedures (Doc 10038 SATVOICE operational Manual) • SATVOICE performance monitoring • Training requirements for SATVOICE (Doc 10038) 	<ul style="list-style-type: none"> • CAA • ANSPs • Airlines • CSPs • Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
NAVS-B0	NAVS-B0/1- Ground Based Augmentation System (GBAS)	To support Precision Approach and landing operations (CAT I) at a specific airport (one system may support all runway ends). As an option, may support arrival and departure phases of flight	Ready for implementation (Annex 10 Vol. I Attachment D Chap7)	Yes	To introduce improved accuracy, integrity and availability through a local airport based differential satellite navigation and monitoring system	<ul style="list-style-type: none"> Airport local network of reference receivers corrections computing and integrity monitoring systems VHF Data Broadcast link to users (operating in the 108 to 118 MHz band) GBAS Cat I Instrument flight procedures GBAS airborne and ground GAST C equipment Training requirements for GBAS for CAT I GNSS core constellation 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer GNSS Satellite provider
	NAVS-B0/2- Satellite Based Augmentation System (SBAS)	To support PBN in all phases of flight with an increased accuracy, integrity and availability compared to ABAS. Increases accuracy and integrity for the vertical guidance	Ready for implementation (Annex 10 Vol. I Attachment D Chap 6)	Yes	To introduce improvements in the availability, accuracy and integrity of satellite navigation through a wide area differential satellite navigation position and integrity monitoring system	<ul style="list-style-type: none"> Network of ground reference systems in a region and connected via a data-network Satellite signals Reference monitoring systems Geostationary satellite broadcast to aircraft link correction 	<ul style="list-style-type: none"> CAA ANSPs Airlines CSPs Aircraft manufacturer

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
	NAVS-B0/3- Aircraft Based Augmentation system (ABAS)	To support all PBN navigation specifications with the exception of RNP APCH down to LPV/LP minima.	Ready for implementation (Annex 10 Vol. I Attachment D Chap 5)	Yes	To support non-precision (LNAV) and vertically guided (LNAV/VNAV) approaches with Baro VNAV and other terminal and enroute navigations	<ul style="list-style-type: none"> • ABAS Avionics. 	<ul style="list-style-type: none"> • CAA • Airlines
	NAVS-B0/4- Navigation Minimal Operating Networks (Nav. MON)	<ul style="list-style-type: none"> • To adjust conventional nav aids networks through the increased deployment of satellite-based navigation systems and procedures to ensure the necessary levels of resilience for navigation. • To provide a minimum level of capabilities to accommodate State aircraft operations where there is a mismatch in terms of aircraft equipment. • To make a more efficient use of the frequency spectrum 	Ready for implementation	Yes	To rationalize the ground based conventional infrastructure through the definition of minimal networks of ground nav aids.	<ul style="list-style-type: none"> • Conventional nav aids networks • Satellite based navigation systems • Aircraft equipment. • Frequency spectrum 	<ul style="list-style-type: none"> • CAA • ANSP • Airlines
NAVS-B1	NAVS-B1/1- Extended GBAS	To improve accuracy, integrity and availability through a local airport network of reference receivers	Standardization	Yes	To support precision approach and landing operations at a specific airport (one system may support all runway ends). As an option, may support arrival and departure phases of flight	<ul style="list-style-type: none"> • GNSS core constellation • GBAS receiver GAST D • GBAS ground stations GAST D • GBAS Cat II/III Instrument flight procedures • Training requirements for GBAS for CAT II/III 	<ul style="list-style-type: none"> • CAA • ANSP • Airlines

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
ASUR-B0	ASUR-B0/1- Automatic Dependent Surveillance - Broadcast (ADS-B)	To support the provision of Air Traffic Services and operational applications at reduced cost and increased surveillance coverage.	Ready for implementation (Annex 10 Vol. III §6.9.8 ; Vol. IV, Chap. 5 and 7)	Yes	To provides precise position/velocity information in all airspace (accuracy not range-dependent as with radar) To provide aircraft call sign and precise position/velocity information to nearby aircraft with ADS-B-In receivers.	<ul style="list-style-type: none"> • ADS-B Transmitter on board aircraft • ADS-B Receiver and processing system in ATU • 	<ul style="list-style-type: none"> • CAA • Airlines • ANSPs
	ASUR-B0/2-Multi-lateration cooperative surveillance systems (MLAT)	To provide an alternative to radar surveillance by using available aircraft transponders	Ready for implementation (ICAO Annex 10 Vol. IV and Doc 9924 Aeronautical Surveillance Manual, Appendix L)	Yes	To provide a new independent cooperative surveillance	<ul style="list-style-type: none"> • Ground MLAT Transmitters/Receivers stations • Processing system. 	<ul style="list-style-type: none"> • CAA • Airlines • ANSPs
	ASUR-B0/3-Cooperative Surveillance Radar Downlink of aircraft Parameters (SSR-DAPS)	To obtain additional information from an aircraft transponder in support of the provision of Air Traffic Services	Ready for implementation (ICAO Annex 10 Vol. IV and Doc 9924 Aeronautical Surveillance Manual)	Yes	To increase ATCOs awareness and reduce the volume of air-ground voice communications, To improve the performance of tracking systems or safety net systems such as STCA and MSAW	<ul style="list-style-type: none"> • To obtain additional information from an aircraft transponder in support of the provision of Air Traffic Services. 	<ul style="list-style-type: none"> • CAA • Airlines • ANSPs
ASUR-B1	ASUR-B1/1-Reception of aircraft ADS-B signals from space (SB ADS-B)	To provide surveillance coverage in locations where ground stations siting is not possible or not currently provided	Ready for implementation (see GANP website)	Yes	<ul style="list-style-type: none"> • <i>To provide surveillance coverage in locations where ground stations siting is not possible or not currently provided.</i> 	<ul style="list-style-type: none"> • HMI that supports controller awareness • SSR Mode S transponder with extended squitter version 0, version 1 and version 2 	<ul style="list-style-type: none"> • CAA • ANSP • Service providers

ASBU Modules	ASBU Elements	Purpose of Elements	Maturity level	Applicable (Yes or No)	Rationale of Applicability	Element Enablers	Stakeholders
						<ul style="list-style-type: none"> • ADS-B receivers on orbiting satellites • Service Delivery Point(s) for satellite ADS-B • Training requirements SB ADS-B • Basic Aviation GNSS receiver with RAIM 	
<p>ACAS-B1</p> <p>ACAS is listed twice, in ATM and here in CNS.</p>	ACAS-B1/1-ACAS Improvement	To provide airborne collision avoidance as a last resort safety net for pilots	Ready for implementation (ICAO Annex 10 Vol. IV and Doc 9924 Aeronautical Surveillance Manual)	Yes	To ensure airborne collision avoidance	<ul style="list-style-type: none"> • Avionics TCAS 	<ul style="list-style-type: none"> • CAAs • Airlines
FICE-B0	FICE-B0/1- Automated basic facility data exchange (AIDC)	To improve the efficiency of coordination and transfer of control between ATSU's	Ready for implementation (ICAO Annex 10 Vol II and Vol. III & Doc.9694)	Yes	To implement the first automation step in the evolution of the coordination and transfer of control between neighbouring ATSU's units to guarantee that all related and necessary flight information will be available to the other unit as per agreement.	<ul style="list-style-type: none"> • Compatible AIDC facilities and systems 	<ul style="list-style-type: none"> • CAAs • ANSPs

Table AIM III-1: ASBU applicable elements in AIM area

ASBU modules	ASBU elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Element enablers	Stakeholders
DAIM-B1	DAIM-B1/1 - Provision of quality-assured aeronautical data and information	The main purpose of this element is to ensure that aeronautical data and information comply with quality standards to meet the needs of airspace users and support the safety of flight operations.	<i>Standardization</i>	Yes	Although this element is at the standardization level of maturity, its following components are mandatory under SARPs: <ul style="list-style-type: none"> ✓ Quality management system, <i>Annex 15 §3.6</i> ✓ Use of common references WGS84 and AIRAC, <i>Annex 15 §1.2 and §6.2</i> Use of automated data-centric environment, <i>Annex 15 § 3.5</i>	○ National regulatory framework for the provision of quality assured aeronautical data and information	○ CAA
						○ Operational procedures for the provision of aeronautical information services in an AIM environment	○ ANSP
						○ Operational procedures for the application of a quality management system to the AIM processes.	○ ANSP
						○ Automated aeronautical information management systems and infrastructure	○ ANSP
						○ Training requirements for the provision of quality-assured aeronautical data and information	○ ANSP
						○ Formal arrangements for data quality assurance	○ ANSP ○ CAA
	DAIM-B1/2 - Provision of digital Aeronautical Information Publication (AIP) data sets	To make available digital AIP data and information in an interoperable and mutually understood manner.	<i>Ready for implementation</i>	Yes	This element is Ready for implementation and the provision of AIP data sets is made mandatory under SARPs, <i>Annex 15 §5.3</i>	○ National regulatory framework for the provision of digital Aeronautical Information Publication (AIP) data sets	○ CAA
						○ Procedures for the provision of digital AIP data sets	○ ANSP
						○ Aeronautical Information Exchange Model (AIXM) v 5.1+	○ ANSP
						○ Automated systems and infrastructure to support the provision of digital AIP data sets using AIXM	○ ANSP
					○ Training requirements for the provision of digital AIP data sets	○ ANSP	

ASBU modules	ASBU elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Element enablers	Stakeholders
	DAIM-B1/3 - Provision of digital terrain data sets	To make available digital terrain data and information in an interoperable and mutually understood manner.	<i>Ready for implementation</i>	Yes	This element is Ready for implementation and the provision of Terrain data sets is made mandatory under SARPs, <i>Annex 15 §5.3</i>	○ National regulatory framework for the provision of digital terrain data sets	○ CAA
						○ Operational procedures for the provision of digital terrain data sets	○ ANSP
						○ Automated systems and infrastructure to support the provision of digital terrain data sets using AIXM	○ ANSP
						○ Training requirements for the provision of digital terrain data sets	○ ANSP
DAIM-B1	DAIM-B1/4 - Provision of digital obstacle data sets	To make available digital obstacle data in an interoperable and mutually understood manner.	<i>Ready for implementation</i>	Yes	This element is Ready for implementation and the provision of obstacle data sets is made mandatory under SARPs, <i>Annex 15 §5.3</i> .	○ National regulatory framework for the provision of digital obstacle data sets	○ CAA
						○ Operational procedures for the provision of digital obstacle data sets	○ ANSP
						○ Aeronautical Information Exchange Model (AIXM) v 5.1+	○ ANSP
						○ Automated systems and infrastructure to support the provision of digital obstacle data sets using AIXM	○ ANSP
						○ Training requirements for the provision of digital obstacle data sets	○ ANSP

ASBU modules	ASBU elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Element enablers	Stakeholders
DAIM-B1	DAIM-B1/5 - Provision of digital aerodrome mapping data sets	To make available digital aerodrome mapping data and information in an interoperable and mutually understood manner.	<i>Ready for implementation</i>	Yes	This element is Ready for implementation and the provision of aerodrome mapping data sets is made mandatory under SARPs, <i>Annex 15 §5.3.</i>	○ National regulatory framework for the provision of digital aerodrome mapping data sets	○ CAA
						○ Operational procedures for the provision of digital aerodrome mapping data set	○ ANSP
						○ Aeronautical Information Exchange Model (AIXM) v 5.1+	○ ANSP
						○ Automated systems and infrastructure to support the provision of digital aerodrome mapping data sets using AIXM	○ ANSP
						○ Training requirements for the provision of digital aerodrome mapping data sets	○ ANSP
	DAIM-B1/6 - Provision of digital instrument flight procedure data sets	To make available digital instrument flight procedure data in an interoperable and mutually understood manner.	<i>Ready for implementation</i>	Yes	This element is Ready for implementation and the provision of instrument flight procedure data sets is made mandatory under SARPs, <i>Annex 15 §5.3.</i>	○ National regulatory framework for the provision of digital instrument flight procedures sets	○ CAA
						○ Operational procedures for the provision of digital instrument flight procedures data set	○ ANSP
						○ Aeronautical Information Exchange Model (AIXM) v 5.1+	○ ANSP
						○ Automated systems and infrastructure to support the provision of digital instrument flight procedures data sets using AIXM	○ ANSP
						○ Training requirements for the provision of digital instrument flight procedure data sets	○ ANSP

ASBU modules	ASBU elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Element enablers	Stakeholders
DAIM-B1	DAIM-B1/7 - NOTAM improvements	To provide timely and relevant information about status and condition of the ANS infrastructure to the next intended users via NOTAM.	<i>Ready for implementation</i>	Yes	This element addresses the identification of clear operational conditions under which a NOTAM shall or shall not be originated. It also prepares for the replacement of the paper-based NOTAM by a digital version using information exchange models. It is mandatory under SARPs, <i>Annex 15 §6.3.2.</i>	○ National regulatory framework for the provision of NOTAM	○ CAA
						○ Operational procedures for the provision of an enhanced NOTAM service	○ ANSP
						○ Aeronautical Information Exchange Model (AIXM) v 5.1+	○ ANSP
						○ Automated systems and infrastructure to support the provision of NOTAM using AIXM	○ ANSP
						○ Training requirements for the provision of enhanced NOTAM	○ ANSP

Table MET III-1: ASBU applicable elements in MET area

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
AMET-B0 Global, regional, and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.	AMET-B0/1 Meteorological observations products	Provides Meteorological observations in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning	Ready for implementation	Yes	<ul style="list-style-type: none"> A3 Chap. 4: §4.1.5 requires that at aerodromes with runways intended for Category II and III instrument approach and landing operations, automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure shall be installed to support approach and landing and take-off operations. Annex 3 Appx. 6: §6.2.5 requires that the wind shear alerts shall be disseminated from automated, ground-based, wind shear remote-sensing or detection equipment in accordance with local arrangements to those concerned. 	<ul style="list-style-type: none"> National framework amendment for the provision of meteorological observations products 	<ul style="list-style-type: none"> CAA
						<ul style="list-style-type: none"> Procedures for the provision of meteorological observations products 	<ul style="list-style-type: none"> ANSP MET Service Provider
						<ul style="list-style-type: none"> Transmission of meteorological observations data from aircraft 	<ul style="list-style-type: none"> Aircraft Manufacturer
						<ul style="list-style-type: none"> Automated systems and infrastructure to support the provision of meteorological observations products 	<ul style="list-style-type: none"> Airport Operator ANPS MET Service Provider
						<ul style="list-style-type: none"> Training requirements for the provision of meteorological observations products 	<ul style="list-style-type: none"> CAA ANSP MET Service Provider Airport Operator

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
	AMET-B0/2 Meteorological forecast and warning products	Provides Meteorological forecasts, advisories and warnings in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.	Ready for implementation	Yes	<ul style="list-style-type: none"> Annex Chap. 3: §3.2 & Appendix 2: §1.2 require for the provision of the new gridded WAFS information (e.g. Wind, Temperature, Icing, Turbulence, CB clouds). 	<ul style="list-style-type: none"> National framework amendment for the provision of meteorological forecast products and warnings 	<ul style="list-style-type: none"> CAA
						<ul style="list-style-type: none"> Procedures for the provision of Meteorological forecast products and warnings 	<ul style="list-style-type: none"> ANSP MET Service Provider
						<ul style="list-style-type: none"> Training requirements for the provision of meteorological forecast products and warnings 	<ul style="list-style-type: none"> CAA ANSP MET Service Provider Airport Operator
						<ul style="list-style-type: none"> Systems and infrastructure to support the provision of meteorological forecast and warning products 	<ul style="list-style-type: none"> MET Service Provider
	AMET-B0/3 Climatological and historical meteorological products	Climatological products in support of the design and planning of infrastructure, flight routes and airspace	Ready for implementation	Yes	<ul style="list-style-type: none"> Annex 3 Chap 8: §8.1.1 requiring for the provision of Aerodrome climatological information and historical meteorological products in support of the design 	<ul style="list-style-type: none"> National framework amendment for the provision of climatological meteorological information products 	<ul style="list-style-type: none"> CAA

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
		management. Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigations			and planning of infrastructure, flight routes and airspace management.	<ul style="list-style-type: none"> Procedures for the provision of climatological meteorological information products 	<ul style="list-style-type: none"> ANSP MET Service Provider
						<ul style="list-style-type: none"> Training requirements for the provision of climatological meteorological information products 	<ul style="list-style-type: none"> CAA ANSP MET Service Provider Airport Operator
						<ul style="list-style-type: none"> Systems and infrastructure to support the provision of climatological meteorological products 	<ul style="list-style-type: none"> MET Service Provider
	AMET-B0/4 Dissemination of meteorological products	Dissemination of meteorological products in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning	Ready for implementation	Yes	<ul style="list-style-type: none"> The requirements for the dissemination of OPMET messages in both TAC and digital formats as of November 2020 prescribed by Annex 3 provisions (A3 App. 3: §2.1.3; App. 6: §1.1.6 & §1.2) 	<ul style="list-style-type: none"> National framework amendment for meteorological information exchange 	<ul style="list-style-type: none"> CAA
						<ul style="list-style-type: none"> Procedures for meteorological information exchange 	<ul style="list-style-type: none"> ANSP MET Service Provider
						<ul style="list-style-type: none"> Communications infrastructure for meteorological information exchange 	<ul style="list-style-type: none"> ANSP MET Service Provider

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
						<ul style="list-style-type: none"> • Training for meteorological information exchange 	<ul style="list-style-type: none"> • ANSP • MET Service Provider
						<ul style="list-style-type: none"> • ICAO Meteorological Information Exchange Model (IWXXM) V1-V2 	<ul style="list-style-type: none"> • ANSP • MET Service Provider
AMET-B1 Meteorological information supporting automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support	AMET-B1/1 Meteorological observations information	Provides Meteorological observations information in support of automated decision processes or aids and performance based requirements, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.	Standardization	Yes	<ul style="list-style-type: none"> • IWXXM format became a Standard for dissemination on 5 November 2020 with the applicability of Amendment 79 to Annex 3 for the following TAC products: SIGMET, AIRMET, METAR, SPECI, TREND, TAF, VAA, TCA and SWXA. • Significant weather (SIGWX) forecasts, is recommended for dissemination in IWXXM as of 4 November 2021 • Furthermore, the Conclusion 23/29 of APRG/23 Established a Regional Space Weather Project to assist States with the implementation of Space Weather 	<ul style="list-style-type: none"> • National framework amendment for the provision of meteorological observations information 	<ul style="list-style-type: none"> • CAA
						<ul style="list-style-type: none"> • Procedures for the provision of meteorological observations information 	<ul style="list-style-type: none"> • ANSP • MET Service Provider
						<ul style="list-style-type: none"> • Transmission of meteorological observations information from aircraft 	<ul style="list-style-type: none"> • Aircraft Manufacturer
						<ul style="list-style-type: none"> • Automated systems and infrastructure to support the provision of meteorological observations information 	<ul style="list-style-type: none"> • Airport Operator • ANSP • MET Service Provider

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
					requirements as per the provisions of Annex 3 to Chicago Convention.	<ul style="list-style-type: none"> • Training requirements for meteorological observations information 	<ul style="list-style-type: none"> • CAA • ANSP • MET Service Provider • Airport Operator
	AMET-B1/2 Meteorological forecast and warning information	Meteorological forecast and warning information for automated support for decision processes or aids and performance based requirements, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision processes	Standardization	Yes	<ul style="list-style-type: none"> • The above is applied 	<ul style="list-style-type: none"> • National framework amendment for the provision of meteorological forecast and warnings information 	<ul style="list-style-type: none"> • CAA
<ul style="list-style-type: none"> • Procedures for the provision of meteorological forecast and warnings information 						<ul style="list-style-type: none"> • ANSP • MET Service Provider 	
<ul style="list-style-type: none"> • Training requirements for Meteorological forecast and warning information 						<ul style="list-style-type: none"> • CAA • ANSP • MET Service Provider • Airport Operator 	
<ul style="list-style-type: none"> • Systems and infrastructure to support the provision of meteorological forecast and warning information 						<ul style="list-style-type: none"> • MET Service Provider 	

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
	AMET-B1/3 Climatological and historical meteorological information	Climatological information in support of the design and planning of infrastructure, flight routes and airspace management. Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigations.	Standardization	Yes	<ul style="list-style-type: none"> Enhanced climatological data/Information with their associated characteristics such as metadata; required to support the design and planning of infrastructure, flight routes and airspace management. 	<ul style="list-style-type: none"> National framework amendment for the provision of climatological meteorological information 	<ul style="list-style-type: none"> CAA
						<ul style="list-style-type: none"> Procedures for the provision of climatological meteorological information 	<ul style="list-style-type: none"> ANSP MET Service Provider
						<ul style="list-style-type: none"> Training requirements for climatological meteorological information 	<ul style="list-style-type: none"> CAA ANSP MET Service Provider Airport Operator
						<ul style="list-style-type: none"> Systems and infrastructure to support the provision of climatological meteorological information 	<ul style="list-style-type: none"> MET Service Provider
	AMET-B1/4 Dissemination of meteorological information	Dissemination of meteorological information in support of automated decision process or aids, involving meteorological information, meteorological information	Standardization	Yes	<ul style="list-style-type: none"> As of 5 November 2020, States were required by Annex 3 to the Convention to implement IWXXM format for the international exchange of MET information. States, ROCs and RODBs in a position to do so will begin to disseminate 	<ul style="list-style-type: none"> National framework amendment for the dissemination of meteorological information 	<ul style="list-style-type: none"> CAA
						<ul style="list-style-type: none"> Procedures for the dissemination of meteorological information 	<ul style="list-style-type: none"> ANSP MET Service Provider

ASBU Modules	ASBU Elements	Purpose of elements	Maturity level	Applicable (Yes or No)	Rationale of applicability	Enablers	Stakeholders
		translation, ATM impact conversion and ATM decision support.			gridded and imagery products throughout Block 1. <ul style="list-style-type: none"> RODBs to implement TAC Request/Reply and IWXXM Request/Reply Procedures. 	<ul style="list-style-type: none"> Communication infrastructure for meteorological information exchange 	<ul style="list-style-type: none"> ANSP MET Service Provider
						<ul style="list-style-type: none"> Training for the dissemination of meteorological information 	<ul style="list-style-type: none"> CAA ANSP MET Service Provider Airport Operator
						<ul style="list-style-type: none"> ICAO Meteorological Information Exchange Model (IWXXM) V3 	<ul style="list-style-type: none"> ANSP MET Service Provider

2.4 Reporting on the Status of Implementation of the ASBU Threads /Elements

Data collection

2.4.1. The process of data collection is one of the most critical processes at national and regional levels to support the monitoring and reporting of the status of implementation of the applicable ASBU Threads/Elements. APIRG urged AFI States to provide the ICAO AFI Regional Offices, with necessary data on implementation progress at least once a year (by 1st December every year) for the development of the AFI Region Air Navigation Reports, on annual basis.

2.4.2. The following Tables are used for the collection of detailed information related to the implementation of associated applicable ASBU Threads/Elements, which are also used for the determination of the performance indicators included in the AFI Region Air Navigation Strategy. Other Tables might be developed for other Threads/Elements.

Table AOP III-2: Collection of ASBU implementation data in AOP

ASBU Module	ASBU Element	Required Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments	
ACDM-B0	ACDM-B0/1 Airport CDM Information Sharing	ACIS Platform						
		A-CDM Procedures						
		Apron Management						
	ACDM-B0/2 Integration with ATM Network function	ATM- Aerodrome Coordination						
		Aerodrome Capacity Information						
FUM- Flight Status Update Messages								

Table ATM III-2: Collection of ASBU implementation data in ATM

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
ACAS B1	ACAS –B1/1 ACAS Improvements	TCAS version 7.1 certification					
		Procedures for the operation of ACAS including phraseology					
		TCAS II version 7.1 avionics					
		TCAS II version 7.1 operational approval					
		Avionics for extended hybrid surveillance (optional)					
		Training requirements for TCAS version 7.1 operations					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
APTA – B0 Improve arrival and departure operations	APTA – B0/1 PBN Approaches (with basic capabilities)	PBN approach procedures design and use						
		PBN approach validation, approval and publication						
		SOPs for PBN approaches						
		Contingency procedures						
		Aircraft capability for PBN approach						
		Training requirements						
		Operational Authorization						
	APTA-B0/2 PBN SID and STAR procedures (with basic capabilities)	PBN approach procedures design and use						
		PBN SID and STAR Procedures validation, approval and publication						
		SOPs						
		Contingencies						
		Aircraft capability						
		Operational Authorization						
		NAVAIDS to support the applicable navigation specification						
		Training requirements						
	APTA-B0/3 SBAS/GBAS CAT I precision approach procedures	CAT I Precision Approach Procedure design and use						
		CAT I Precision Approach procedure validation, approval and publication						
		SOPs						
		Contingencies						
Aircraft capability								

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
		Ground based system						
		Training requirements						
	APTA-B0/4 CDO (Basic)	Development of CDO procedures						
		CDO procedures validation, approval and publication						
		SOPs						
		Contingencies						
		Aircraft Capability						
		NAVAIDS to support the applicable navigation specification used for CDO						
		Training requirements						
	APTA-B0/5 CCO (Basic)	Development of CCO procedures						
		CCO procedures validation, approval and publication						
		SOPs						
		Contingencies						
		Aircraft Capability						
		NAVAIDS to support the applicable navigation specification used for CCO						
		Training requirements						
	APTA-B0/6 PBN Helicopter Point in Space (PinS) Operations	(PinS) procedure design						
		(PinS) procedure validation, approval and publication						
		SOPs						
		Contingencies						
		Aircraft capability						
		Operational Authorization						
		Training requirements						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
	APTA-B0/7 Performance based aerodrome operating minima – Advanced aircraft	Operational credits						
		SOPs						
		Contingency procedures						
		ATC procedures						
		Aerodrome procedures						
		Advanced aircraft capability						
		Operational Authorization						
		NAVAIDS to support the intended operation						
		Training requirements						
	APTA-B0/8 Performance based aerodrome operating minima – Basic aircraft	Design of approach procedures						
		Validation, approval and publication of approach procedures to non-instrument runways						
		SOPs						
		Contingencies						
		Aircraft capability						
Ground based infrastructure to support the desired operating minima								

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
	APTA-B1/1 PBN Approaches (With advanced capabilities)	PBN approach (with advanced capabilities) procedures design and use					
		PBN approach (with advanced capabilities) validation, approval, and publication					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments		
		SOPs for PBN approaches (with advanced capabilities)							
		Contingency							
		Aircraft capability							
		Operational Authorization							
		Training requirements							
	APTA-B1/2 PBN SID and STAR procedures (with advanced capabilities)	PBN SID and STAR Procedures (with advanced capabilities) procedure design and use							
		PBN SID and STAR Procedures (with advanced capabilities) validation, approval, and publication							
		SOPs							
		Contingencies							
		Aircraft capability							
		Operational Authorization							
		NAVAIDS to support the applicable navigation specification							
		Training requirements							
		APTA-B1/4 CDO (Advanced)	Development of CDO (advanced) procedures						
			CDO (advanced) procedures validation, approval and publication						
	SOPs								
	Contingencies								
	Aircraft Capability								
	NAVAIDS to support the applicable navigation specification								

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		Training requirements					
	APTA-B1/5 CCO (Advanced)	Development of CCO (advanced) procedures					
		CCO (advanced) procedures validation, approval and publication					
		SOPs					
		Contingencies					
		Aircraft Capability					
		NAVAIDS to support the applicable navigation specification					
		Training requirements					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
CSEP B1 Cooperative Separation	CSEP-B1/1 Basic airborne situational awareness during flight operations (AIRB)	Certification of CDTI (Cockpit Display Traffic Information)					
		SOPs					
		ADS-B IN equipment/function					
		CDTI – Cockpit display					
		Training requirements					
	CSEP-B1/2 Visual Separation on Approach (VSA)	Certification of CDTI					
		ADS-B IN equipment/function					
		CDTI – Cockpit display					
		Training requirements					
		SOPs for the use of CDTI for VSA					
		ADS-B OUT equipment/function					
	CSEP-B1/3 Performance Based Longitudinal	Operational Approval					
Procedures for PBLoSM							

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
	Separation Minima	Surveillance systems for PBLoS						
		Navigation systems for PBLoS						
		Communication systems for PBLoS						
		Training requirements						
		Communication capabilities						
		Navigation capabilities						
		Surveillance capabilities						
	CSEP-B1/4 Performance Based Lateral Separation Minima	Operational Approval						
		Procedures						
		Training requirements						
		Communication capabilities						
		Navigation capabilities						
		Surveillance capabilities						
		Communication systems						
Navigation systems								
	Surveillance systems							

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
DATS-B1 Digital Aerodrome Air Traffic Services	RATS-B1/1 Remotely operated Aerodrome Air Traffic Services	Amendment of the national regulatory framework for the provision of remote ATS at aerodromes					
		Procedures for the provision of remote ATS at aerodromes					
		Procedures for the provision of remote ATS at aerodromes in contingency situations					
		Training requirements					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		Surveillance means at the remote tower centre					
		Surveillance means at the aerodrome where remote ATS are provided					
		Communication means between the remote tower centre and the aerodrome where remote ATS are provided					
		Operational approval					
		ATS Unit Certification to include level of service to be provided by the RTC.					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
FRTO B0/1 Improved operations through enhanced en-route trajectories	FRTO-B0/1 Direct routing (DCT)	DCT Procedures						
		ATC system upgrades for monitoring aids functions						
		Upgrade of AOs Flight Planning Systems for DCTs						
		Training requirements						
		ATFM system for FUA						
	FRTO-B0/2 Airspace planning and Flexible Use of Airspace (FUA)	Operational approval to provide FUA						
		FUA Procedures for Dynamic Airspace Management						
		Tools and System to support FUA						
		Training requirements						
ATFM system for FUA								

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
	FRTO-B0/3 Pre-validated and coordinated ATS routes to support flight and flow	Procedures on flexible routing tools					
		Tools and system to support Flexible routing					
		Upgrade of AOs Flight Planning Systems for Flexible routings (optional)					
		Training requirements					
	FRTO-B0/4 Basic conflict detection and conformance monitoring	ATC Procedures for Medium Term Conflict Detection (MTCD) and Monitoring Aids (MONA)					
		ATM system Upgrades for MTCD and MONA functions					
		Training requirements for MTCD and MONA					
	FRTO-B1/1 Free Route Airspace (FRA)	Procedures for FRA Airspace Design					
		ATC System Upgrade for FRA					
		Upgrade of AOs flight planning systems for FRA					
		Training requirements					
		ATFM system for FRA					
	FRTO-B1/2 Required Navigation Performance (RNP) routes	Operational approval to provide RNP Routes					
		Procedures to design the RNP routes					
		Install appropriate RNP equipment					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
		Adapt ATC ground system HMI for RNP routes						
		Training requirements for RNP routes						
	FRTO-B1/3 Advanced Flexible Use of Airspace (FUA) and management of real time airspace data	Operational approval to provide Advanced FUA						
		Procedures for Exchange of Real Time Airspace Data						
		System Upgrades for Exchange of Real Time Airspace Data						
		Integration and Management of ASM real-time Data						
		Training requirements for Advanced FUA						
		Upgrade of AOs flight planning systems for FUA						
	FRTO-B1/4 Dynamic sectorization	ATC Operational Supervisor Procedures						
		ATC System Tools for Support of Dynamic Sectorization						
		Training requirements						
	FRTO-B1/5 Enhanced Conflict Detection Tools and Conformance Monitoring	ATC procedures for enhanced CDT and MONA						
		ATC system upgrades for enhanced CDT and MONA functions						
		Training requirements for enhanced CDT and MONA						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
	FRTO-B1/6 Multi-Sector Planning	ATC procedures for MSP						
		ATC system Upgrade for Support of MSP Role						
		Training requirements for MSP						
	FRTO-B1/7 Trajectory Options Set (TOS)	CTOP (Collaborative Option Programs) advisory circular						
		Operational procedures for the use of CTOP						
		Tools and system to support CTOP						
		CSFP to support CTOP						
		Training requirements for CTOP						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
NOPS Network Operations B0/1	NOPS-B0/1 Initial integration of collaborative airspace management with air traffic flow management	Procedures for dynamic co-operative management of the airspace					
		Procedures for improved notification process					
		Procedures for released of reserved airspace					
		Procedures for promulgation and notification of receipt					
		Distribution of planned airspace usage information					
		Integrated airspace planning process					
		Pre-tactical scenario management					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
		Airspace status information						
		ATFM systems interoperability with ASM system						
		Reception of planned and actual airspace status						
		Training requirements for initial integration of collaborative ASM with ATFM						
	NOPS-B0/2 Collaborative Network Flight Updates	Network Planning procedures						
		Procedures for updated flight plan information						
		Correlated Position Reports						
		ATFM message exchanges						
		Flight activation messages						
		Updated flight plan info						
	NOPS-B0/3 Network Operation Planning basic features	Tactical changes procedures						
		Capacity balancing procedures						
		Coordination procedures						
		Network Operation Planning procedures						
		Predefined scenario management						
		Dynamic sectorization procedures						
		Exchange of ATFM related data						
		Capacity planning						
Training requirements								

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
	NOPS-B0/4 Initial Airport/ATFM slots and A-CDM Network Interface	Airport slot procedure						
		ATFM A-CDM procedure						
		Airport Slot Monitoring Tool						
		Departure planning estimate						
		Flight data for airborne flights						
	NOPS-B0/5 Dynamic ATFM slot allocation	Slot revision procedures						
		CTOT						
	NOPS-B1/1 Short Term ATFM measures	DCB (Demand Capacity Balancing) change procedure						
		DCB optimisation procedure						
		STAM (Short term ATFM Measures) procedures						
		Strategic DCB tools						
		Routings and Flow changes						
		Basic STAM tool						
		Sector configuration integration						
		Enhanced STAM tool						
		Local STAM tool						
		Training requirements for STAM						
NOPS-B1/2 Enhanced Network Operations Planning	Enhanced NOP dissemination procedure							
	Enhanced NOP notification procedure							
	Critical event procedure							
	Airspace availability procedure							

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
		B2B/SWIM services procedure						
		Enhanced NOP platform						
		Enhanced NOP functions						
		Enhanced NOP interfaces						
		Training requirements						
	NOPS-B1/3 Enhanced integration of Airport operations planning with network operations planning	AOP/NOP procedure						
		AOP						
		AOP/NOP interface						
	NOPS-B1/4 Dynamic Traffic Complexity Management	Complexity management procedure						
		Local Traffic load						
		Local Traffic complexity						
		ATFM Planned Trajectory (basic feature)						
		ATFM Planned Trajectory (enhanced feature)						
		Network traffic complexity						
	NOPS-B1/5 Full integration of airspace management with air traffic flow management	Rolling ASM/ATFM procedure						
		ASM data sharing procedure						
		ASM real time exchanges procedure						
		Advanced FUA procedure						
		Airspace changes procedure						
		Rolling ASM/ATFM						
		ASM notification process						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
		ASM real time exchanges-ATC part						
		ASM real time exchanges-ASM and ATFM part						
		Training requirements for full integration of ASM with ATFM						
	NOPS-B1/6 Initial Dynamic Airspace configurations	Airspace solution procedure						
		Predefined airspace configuration procedure						
		Constrain management procedure						
		Airspace solution						
		Predefined airspace configuration						
		Dynamic sectorization						
		Airspace configuration data exchanges (basic feature)						
	NOPS-B1/7 Enhanced ATFM slot swapping	Slot swapping procedure						
		FOC interface to slot swapping module						
		ATFM slot swapping module						
		Training requirements for slot swapping						
	NOPS-B1/8 Extended Arrival Management supported by the ATM Network function	Extended AMAN LoA						
		ATFM procedure for Extended AMAN						
		ATFM extended AMAN module						
NOPS-B1/9	Target Time procedure							

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
	Target Times for ATFM purposes	Target time module						
		Target time interface						
		Training requirements for Target Times						
	NOPS-B1/10 Collaborative Trajectory Options Program (CTOP)	CTOP advisory circular						
		Operational procedures for the use of CTOP						
		Tools and system to support CTOP						
		CSFP to support CTOP						
		Training requirements for CTOP						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
OPFL B0/1 Improved access to optimum flight levels in oceanic and remote airspace	OPFL-B0/1 In Trail Procedure (ITP)	Improve situational awareness of flight crew and ATCO					
	OPFL-B1/1 Climb and Descend Procedure (CDP)	Another option for initiating an altitude change when existing separation minima do not allow an aircraft to climb or descend through the altitude of a blocking aircraft					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
RSEQ B0/1 Improved traffic flow through runway sequencing	RSEQ-B0/1 Arrival Management	Arrival Sequencing Procedure					
		Arrival Sequencing ATC Automation system					
		Training requirements for					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		arrival management					
		Arrival Sequencing Safety Assessment					
	RSEQ-B0/2 Departure Management	Departure Sequencing Procedure					
		Departure Sequencing ATC Automation system					
		Training requirements for departure management					
		Departure Sequencing Safety Assessment					
	RSEQ-B0/3 Point merge	Arrival Traffic Merging Procedure					
		Training requirements for point merge					
		Pilot Point Merge Briefing					
		Point Merge Safety Assessment					
	RSEQ-B1/1 Extended arrival metering	Extended Arrival Metering Procedure					
		Extended Arrival Metering Letter of Agreement					
		Procedure to Reconcile ATFM Constraint with Extended Metering Requirements					
		Extended Arrival Metering Local ATM Automation systems					
		Training requirements for extended arrival management					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		Extended Arrival Metering Safety Assessment					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
SNET B0/1 Ground-based Safety Nets	SNET-B0/1 Short Term Conflict Alert (STCA)	Controller reaction to short term conflict alerts						
		Surveillance system capabilities required for short term conflict alerts						
		Surveillance ground capabilities required for short term conflict alerts						
		Display for short term conflict alerts						
		Training requirements for short term conflict alerts						
	SNET-B0/2 Minimum Safe Altitude Warning (MSAW)	Controller reaction to minimum safe altitude warning						
		Surveillance system capabilities required for minimum safe altitude warning						
		Surveillance ground capabilities required for minimum safe altitude warning						
		Display for minimum safe altitude warnings						
		Training requirements for minimum safe altitude warnings						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments	
	SNET-B0/3 Area Proximity Warning (APW)	Controller reaction to area proximity warning						
		Surveillance system capabilities required for area proximity warning						
		Surveillance ground capabilities required for area proximity warning						
		Display for area proximity warning						
		Training requirements for area proximity warnings						
	SNET-B0/4 Approach Path Monitoring (APM)	Controller reaction to approach path monitoring alerts						
		Surveillance system capabilities required for approach path monitoring alerts						
		Surveillance ground capabilities required for approach path monitoring alerts						
		Display for approach path monitoring alerts						
		Training requirements for approach path monitoring alerts						
	SNET-B1/1 Enhanced STCA with aircraft parameters	Controller reaction to short term conflict alerts						
		Surveillance system capabilities required for enhanced short						

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		term conflict alerts					
		Surveillance ground capabilities required for enhanced short term conflict alerts					
		Display for enhanced short term conflict alerts					
		Training requirements for enhanced short term conflict alerts					
	SNET-B1/2 Enhanced STCA in complex TMAs	Controller reaction to short term conflict alerts					
		Surveillance system capabilities required for enhanced short term conflict alerts					
		Surveillance ground capabilities required for enhanced short term conflict alerts					
		Display for enhanced short term conflict alerts					
		Training requirements for enhanced short term conflict alerts					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
SURF B0/1 Surface operations	SURF-B0/1 Basic ATCO tools to manage traffic during ground operations	To improve safety and efficiency during ground operations by providing proper					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		indications to pilots and vehicle drivers					
	SURF-B0/2 Comprehensive situational awareness of surface operations	To better maintain ATCO awareness of ground operations using A-SMGCS					
	SURF-B0/3 Initial ATCO alerting service for surface operations	Detection by the ATCO of potentially unsafe situations with regard to runway operations using A-SMGCS					
	SURF-B1/1 Advanced features using visual aids to support traffic management during ground operations	To improve surface operations with the aim to reduce taxi time and fuel burn, potential mistakes using advanced features such as FTG and Variable Message Panels					
	SURF-B1/2 Comprehensive pilot situational awareness on the airport surface	To improve ground operations based on increasing pilot's situational awareness and safety especially at taxiway and runway intersections, as well as for aircraft landing and taking off. One technology used is ADS-B OUT/ADS-B IN					
	SURF-B1/3 Enhanced ATCO alerting service for surface operations	The enhanced A-SMGCS alerting service anticipates potential runway conflicts,					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
		runway incursion and other hazardous situations on the aerodrome surface					
	SURF-B1/4 Routing service to support ATCO surface operations management	To improve pre-departure and departure sequencing by provision of accurate taxi times and efficient routing service using A-SMGCS routing service					
	SURF-B1/5 Enhanced vision systems for taxi operations	Allow for improved navigation by visual reference, even during conditions of low-light or weather obscuration such as fog using cockpit enhanced vision capabilities					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
TBO B0/! Trajectory-based operations	TBO-B0/1 Introduction of time-based management within a flow centric approach	Provides for more efficient flight operation by using time-based scheduling versus more tactical measures such as holding to manage tactical synchronization using strategic and tactical time-based management					
	TBO-B1/1 Initial Integration of time-based	Provides initial support to network operations by integrating					

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
	decision-making processes	network applied constraints into local arrival and departure management					

Table SAR III-2: Collection of ASBU implementation data in SAR

ASBU Module	ASBU Element	Required Services/Facility	Implementation Status	Data Planned	Date Completed	Evidence of Implementation Status	Comments
GADS B1 Global Aeronautical Distress and Safety System (GADSS)	GADS- B1/1 Aircraft Tracking	Procedures for aircraft tracking					
		Airborne aircraft tracking system					
		Data link for aircraft tracking					
		Ground aircraft tracking system					
		Aircraft tracking training					
	GADS- B1/2 Contact directory service	Procedures for Operational Control Directory					

Table CNS III-2: Collection of ASBU implementation data in CNS

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
COMI-B0	COMI-B0/1 Aircraft Communication Addressing Reporting System (ACARS)	ACARS-VDL					
	COMI-B0/3 VHF Data Link (VDL) Mode O/A	VDL Mode 0/A					
	COMI-B0/4 VHF Data Link (VDL) Mode 2 Basic	VDL Mode 2					
	COMI-B0/5 Satellite Communication (SATCOM) Class C Data	SATCOM Class C Data					
	COMI-B0/6 High Frequency Data Link (HFDL)	HFDL					
	COMI-B0/7 ATS Message Handling System (AMHS)	AMHS					
	COMI-B1	COMI B1/1 Ground-Ground Aeronautical Telecommunication Network/Internet Protocol suite (ATN/IPS)	ATN/IPS				
		COMI-B1/2 VHF Data Link (VDL) Mode 2 Multi-Frequency	VDL Mode 2				
	COMI-B1/3 SATCOM Class B Voice and Data	SATCOM Class B Voice and Data					

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
	COMI-B1/4 Aeronautical Mobile Airport Communication System (AeroMACS)	AEROMACS (AMC)					
COMS-B0	COMS-B0/1- CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace	CPDLC					
	COMS-B0/2 ADS-C (FANS 1/A) for procedural airspace	ADS-C					
COMS-B1	COMS-B1/1 PBCS approved CPDLC (FANS 1/A +) for domestic and procedural airspace	ADS-C/CPDLC					
	COMS-B1/2 PBCS approved ADS-C (FANS 1/A +) for procedural airspace	ADS-C FANS1/A CPDLC					
	COMS-B1/3 SATVOICE (incl. routine communication) for procedural airspace	SATVOICE					
NAVS-B0	NAVS-B0/1 Ground Based Augmentation System (GBAS)	GNSS/GBAS					
	NAVS-B0/2 Satellite Based Augmentation System (SBAS)	GNSS/SBAS					
	NAVS-B0/3 Aircraft Based Augmentation system (ABAS)	GNSS/ABAS					

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
	NAVS-B0/4 Navigation Minimal Operating Networks (Nav. MON)	Rationalization of the ground based conventional navigation infrastructure					
NAVS-B1	NAVS-B1/1- Extended GBAS	GNSS/GBAS					
ASUR-B0	ASUR-B0/1 Automatic Dependent Surveillance - Broadcast (ADS-B)	ADS-B, GNSS					
	ASUR-B0/2 Multilateration cooperative surveillance systems (MLAT)	MLAT, GNSS and ADS-B					
	ASUR-B0/3 Cooperative Surveillance Radar Downlink of aircraft Parameters (SSR-DAPS)	SSR-DAPS					
ASUR-B1	ASUR-B1/1- Reception of aircraft ADS-B signals from space (SB ADS-B)	SB ADS-B					
ACAS	ACAS-B1/1- ACAS Improvement	TCAS Version 7.1					
FICE	FICE-B0/1 - Automated basic facility data exchange (AIDC)	AMHS					

Table AIM III-2: Collection of ASBU implementation data in AIM

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments	
DAIM-B1 <i>Digital Aeronautical Information Management</i>	DAIM-B1/1 - Provision of quality-assured aeronautical data and information	QMS						
		SLA						
		AIRAC						
		WGS-84						
	<hr/>							
	DAIM-B1/2 - Provision of digital Aeronautical Information Publication (AIP) data sets	AIXM Database						
		Electronic AIP						
		AIP data sets						
	<hr/>							
	DAIM-B1/3 - Provision of digital terrain data sets	Digital Terrain data sets – Area 1						
		Digital Terrain data sets – Area 2						
		Digital Terrain data sets – Area 3						
		Digital Terrain data sets – Area 4						
	<hr/>							
	DAIM-B1/4 - Provision of digital obstacle data sets	Digital Obstacle data sets – Area 1						
		Digital Obstacle data sets – Area 2						
		Digital Obstacle data sets – Area 3						
		Digital Obstacle data sets – Area 4						
	<hr/>							
	DAIM-B1/5 - Provision of aerodrome mapping data sets	Aerodrome mapping data sets						

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
	DAIM-B1/6 - Provision of digital instrument flight procedure data sets	Digital instrument flight procedure data sets					
	DAIM-B1/7 NOTAM improvements	NOTAM of required quality					

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments	
AMET-B0 Global, regional and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.	AMET-B0/1 Meteorological observations products	AWOS						
		Local Report						
		Aerodrome report						
		Lighting information						
		Ground based weather radar information						
		MET SAT imagery						
		A/C MET report (AIREPs, AMDAR)						
		Vertical wind & Temp profile						
		Volcano Observatory Notice for Aviation (VONA)						
	Wind shear alert							
	AMET-B0/2 Meteorological forecast and warning products	WAFS						
		SIGWX						
		TAF						
		Trend						
		Take-off forecast						
		Volcanic Ash Advisory (VAA)						
		Tropical Cyclone Advisory (TCA)						
		SIGMET						
AD WRNG								

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
		Wind shear warning					
	AMET-B0/3	Climatological and historical meteorological products	Aerodrome climatological tables and Aerodrome climatological summaries				
				Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigations.			
	AMET-B0/4	Dissemination of meteorological products	TAC format				
			Gridded data				
			Graphical format				
			BUFR Code				
			IWXXM (in XML/GML)				
AMET-B1	AMET-B1/1	Wind speed and direction (Aerodrome) including gusts					
Meteorological information supporting automated decision process or	Meteorological observations information						

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support		Wind speed and direction from Departure to Top of Climb & Top of Descent (TOD) to landing					
		Wind speed and direction en-route					
		Air temperature and dew point temperature (aerodrome)					
		Air temperature and dew point temperature from departure to TOC and then TOD to landing					
		Air temperature and dew point temperature (or equivalent) en-route					
		Pressure (aerodrome) (i.e. QNH/QFE)					

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
		Visibility (aerodrome) (horizontal, slant, vertical), Runway visual range (RVR)					
		Cloud type (of operational significance)					
		Cloud coverage, bases, tops and layers					
		Thunderstorms, Lightning, Convection (TCU & CB)					
		Precipitation (ie. drizzle, rain, freezing rain, snow, hail)					
		Weather (dust storm, sandstorm, funnel cloud, squall, smoke, haze, mist, fog)					
		Icing, including airframe and engine					
		Liquid Water Content, Iced Water Content					

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
		Turbulence, Mountain waves, Wind shear					
		Fronts					
		Radioactive clouds, Toxic chemicals					
		Tropical cyclones					
		Volcanic ash					
		Sulphur dioxide (SO2) and other hazardous gases					
		Aerodrome surface (runway) temperature, state					
		Sea temperature, state and wave height (seaports)					
		Space weather events					
		Tsunami, Flood					
	AMET-B1/2 Meteorological forecast and warning information	Wind speed and direction (aerodrome) including gusts and operationally significant wind shifts					
		Air temperature and dew point temperature (aerodrome)					
		Upper-level wind (speed and direction), including departure to Top of Climb (TOC) and					

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
		then Top of Descent (TOD) to landing					
		Upper-level air temperature and dew point temperature or equivalent (i.e. humidity), including height of freezing level and lower tropospheric temperature inversions					
		Flight level and temperature of tropopause					
		Geopotential altitude for flight levels					
		Pressure (aerodrome) (i.e. QNH, QFE)					
		Visibility (aerodrome), Runway visual range (RVR)					
		Cloud type (of operational significance)					
		Cloud coverage, bases, tops and layers					
		Thunderstorms, Lightning, Convection (TCU & CB)					
		Precipitation (ie. drizzle, rain, freezing rain, snow, hail)					
		Weather (ie. dust storm, sandstorm, funnel cloud, squall, smoke, haze, mist, fog)					
		Icing (airframe and engine),					

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
		Liquid Water Content, Iced Water Content					
		Turbulence, Mountain waves, Wind shear					
		Fronts					
		Radioactive clouds, Toxic chemicals					
		Tropical cyclones					
		Volcanic ash					
		Sulphur dioxide (SO ₂) and other hazardous gases					
		Aerodrome surface (runway) temperature, state					
		Sea temperature, state and wave height (seaports)					
		Space weather events					
	AMET-B1/3 Climatological and historical meteorological information	Historical information including meteorological observations and forecasts and their associated characteristics (metadata)					

Table MET III-2: Collection of ASBU implementation data in MET

ASBU Module	ASBU Element	Required Procedures/ Systems/ Services/ Facilities	Implementation Status	Date planned	Date completed	Evidence of implementation Status	Comments
		Climatological information for the range of meteorological parameters and phenomena and their associated characteristics (metadata)					
	AMET-B1/4 Dissemination of meteorological information	ICAO Meteorological Information Exchange Model (IWXXM) format					
		AFS/AMHS Secure Internet services (WIFS/SADIS)					

2.5 Performance Monitoring of AFI Region Air Navigation System

- 2.5.1. The monitoring of air navigation performance 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.
- 2.5.2. The monitoring of the regional implementation progress and performance Metrics/Indicators should be done for all Elements planned by APIRG. 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 APIRG on implementation plans.
- 2.5.3. Based on operational requirements and taking into consideration the associated benefits, the AFI Region has focused on the implementation of ASBU Thread/Element applicable for the region from Block 0 and Block 1 and agreed on the subsidiary bodies that will be monitoring and supporting the implementation of the ASBU Threads/Elements.
- 2.5.4. In addition to the monitoring of the AFI Region applicable ASBU Threads/Elements (Block 0 and 1) and as part of the performance-based approach, an initial set of KPIs has been identified to be used for monitoring the performance of the Air Navigation System at National and Regional Levels, and has been addressed in the AFI Region Air Navigation Strategy.
- 2.5.5. Reporting and monitoring results of these KPIs will be analyzed by the APIRG, States and ICAO Secretariat to steer the air navigation improvements, take corrective actions and review the allocated objectives, priorities and targets, as appropriate.

AERODROME OPERATIONS (AOP)

Table AOP III-3: Implementation Status of ASBU applicable elements in AOP

Explanation of the Table

Fill in the information as provided for using the Column number

Column number	Description
1	Name of the State
2 to 7	Status of availability of Enablers FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
8	Remarks

ESAF STATES

	ACDM-B0/1 Airport CDM Information Sharing			ACDM-B0/2 Integration with ATM Network function			
ESAF States	ACIS System/Platform	ACDM Procedures	Apron Management	ATM-Aerodrome Coordination	Aerodrome Capacity	FUM-Flight Update Messages	Remarks
1	2	3	4	5	6	7	8
Angola							
Botswana							
Burundi							
Comoros							
Djibouti							
Eritrea							
Eswatini							
Ethiopia							
Kenya							
Lesotho							
Madagascar							
Malawi							
Mauritius							
Mozambique							
Namibia							
Rwanda							
Seychelles							
Somalia							
South Africa							
South Sudan							
Uganda							
United Republic of Tanzania							
Zambia							
Zimbabwe							

WACAF STATES

	ACDM-B0/1 Airport CDM Information Sharing			ACDM-B0/2 Integration with ATM Network function			
WACAF States	ACIS System/Platform	ACDM Procedures	Apron Management	ATM-Aerodrome Coordination	Aerodrome Capacity	FUM-Flight Update Messages	Remarks
1	2	3	4	5	6	7	8
Benin							
Burkina Faso							
Cameroon							
Cabo Verde							
Central African Republic							
Chad							
Congo							
Cote d'Ivoire							
Democratic Republic of Congo							
Equatorial Guinea							
Gabon							
Gambia							
Ghana							
Guinea Bissau							
Guinea							
Liberia							
Mali							
Mauritania							
Niger							
Nigeria							
Sao Tome & Principe							
Senegal							
Sierra Leone							
Togo	NI	NI	NI	NI	NI	NI	
Saint Helena & Asuncion Islands							

AIR TRAFFIC MANAGEMENT /SEARCH AND RESCUE /SAR)

APTA : Improve arrival and departure operations

Table ATM -III-3: ACAS-B1/1: Airborne Collision Avoidance System (ACAS)

Column number	Description
1	Name of the State

2	Status of implementation of ACAS Improvements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
3	Remarks

Table ATM -III-3A: **Implementation status of applicable ASBU elements of ACAS - ESAF**

ESAF States	ACAS Improvement	Remarks
1	2	3
Angola		
Botswana		
Burundi		
Comoros		
Djibouti		
Eritrea		
Eswatini		
Ethiopia		
Kenya		
Lesotho		
Madagascar		
Malawi		
Mauritius		
Mozambique		
Namibia		
Rwanda		
Seychelles		
Somalia		
South Africa		
South Sudan		
Uganda		
United Republic of Tanzania		
Zambia		
Zimbabwe		

Table ATM -III-3B: Implementation status of applicable ASBU elements of ACAS - WACAF

WACAF States	ACAS Improvement	Remarks
1	2	3
Benin		
Burkina Faso		
Cameroon		
Cabo Verde		
Central African Republic		
Chad		
Congo		
Cote d'Ivoire		
Democratic Republic of Congo		
Equatorial Guinea		
Gabon		
Gambia		
Ghana		
Guinea Bissau		
Guinea		
Liberia		
Mali		
Mauritania		
Niger		
Nigeria		
Sao Tome & Principe		
Senegal		
Sierra Leone		
Togo	FI	
Saint Helena & Asuncion Islands		

Table III 4: APTA-B0/1; B0/2; B0/3; B0/4; B0/5; B0/6; B0/7; B0/8: Improve arrival and departure operations

Column number	Description
1	Name of the State
2 to 10	Status of implementation of APTA – B0 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
11	Remarks

Table III 4A: APTA-B0/1; B0/2; B0/3; B0/4; B0/5; B0/6; B0/7; B0/8: Improve arrival and departure operations - ESAF

ESAF States	PBN Approaches (with basic capabilities)	PBN SID and STAR procedures (with basic capabilities)	SBAS GBAS CAT I precision approach procedures	CD O (Basic)	CD O (Basic)	PBN Helicopter Point in Space (PinS) Operations	Performance based aerodrome operating minima – Advanced aircraft	Performance based aerodrome operating minima – Basic aircraft	Performance based aerodrome operating minima – Basic aircraft	Remarks
1	2	3	4	5	6	7	8	9	10	11
Angola										
Botswana										
Burundi										
Comoros										
Djibouti										
Eritrea										
Eswatini										
Ethiopia										
Kenya										
Lesotho										
Madagascar										
Malawi										
Mauritius										
Mozambique										
Namibia										
Rwanda										
Seychelles										
Somalia										
South Africa										
South Sudan										
Uganda										
United Republic of Tanzania										
Zambia										
Zimbabwe										

Table III 4B: APTA-B0/1; B0/2; B0/3; B0/4; B0/5; B0/6; B0/7; B0/8: Improve arrival and departure operations - WACAF

WACAF States	PBN Approaches (with basic capabilities)	PBN SID and STAR procedures (with basic capabilities)	SBAS GBAS CAT I precision approach procedures	CD O (Basic)	CD O (Basic)	PBN Helicopter Point in Space (PinS) Operations	Performance based aerodrome operating minima – Advanced aircraft	Performance based aerodrome operating minima – Basic aircraft	Performance based aerodrome operating minima – Basic aircraft	Remarks
1	2	3	4	5	6	7	8	9	10	11
Benin										
Burkina Faso										
Cameroon										
Cabo Verde										
Central African Republic										
Chad										
Congo										
Cote d'Ivoire										
Democratic Republic of Congo										
Equatorial Guinea										
Gabon										
Gambia										
Ghana										
Guinea Bissau										
Guinea										
Liberia										
Mali										
Mauritania										
Niger										
Nigeria										
Sao Tome & Principe										
Senegal										
Sierra Leone										
Togo	FI	FI	NI	NI	N/A	FI	FI	FI		
Saint Helena & Asuncion Islands										

Table III 5: APTA-B1/1; B1/2; B1/4; B1/5: Improve arrival and departure operations

Column number	Description
---------------	-------------

1	Name of the State
2 to 5	Status of implementation of APTA-B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
6	Remarks

Table III 5A: APTA-B1/1; B1/2; B1/4; B1/5: Improve arrival and departure operations - ESAF

ESAF States	PBN Approaches (with advanced capabilities)	PBN SID and STAR procedures (with advanced capabilities)	CDO Bas(e)	CCO (Advanced)	Remarks
1	2	3	4	5	6
Angola					
Botswana					
Burundi					
Comoros					
Djibouti					
Eritrea					
Eswatini					
Ethiopia					
Kenya					
Lesotho					
Madagascar					
Malawi					
Mauritius					
Mozambique					
Namibia					
Rwanda					
Seychelles					
Somalia					
South Africa					
South Sudan					
Uganda					
United Republic of Tanzania					
Zambia					
Zimbabwe					

Table III 5B: APTA-B1/1; B1/2; B1/4; B1/5: Improve arrival and departure operations - WACAF

WACAF States	PBN Approaches (with advanced capabilities)	PBN SID and STAR procedures (with advanced capabilities)	CDO (Basic)	CCO (Advanced)	Remarks
1	2	3	4	5	
Benin					
Burkina Faso					
Cameroon					
Cabo Verde					
Central African Republic					
Chad					
Congo					
Cote d'Ivoire					
Democratic Republic of Congo					
Equatorial Guinea					
Gabon					
Gambia					
Ghana					
Guinea Bissau					
Guinea					
Liberia					
Mali					
Mauritania					
Niger					
Nigeria					
Sao Tome & Principe					
Senegal					
Sierra Leone					
Togo	FI	FI	NI	NI	
Togo					
Saint Helena & Asuncion Islands					

Table III 6: CSEP-B1/1; B1/2; B1/3; B1/4: Cooperative Separation

Column number	Description
1	Name of the State
2 to 5	Status of implementation of CSEP-B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
6	Remarks

Table III 6A: CSEP-B1/1; B1/2; B1/3; B1/4: Cooperative Separation - ESAF

ESAF States	Basic airborne situational awareness during flight operations (AIRB)	Visual Separation on Approach (VSA)	Performance Based Longitudinal Separation Minima	Performance Based Lateral Separation Minima	Remarks
1	2	3	4	5	6
Angola					
Botswana					
Burundi					
Comoros					
Djibouti					
Eritrea					
Eswatini					
Ethiopia					
Kenya					
Lesotho					
Madagascar					
Malawi					
Mauritius					
Mozambique					
Namibia					
Rwanda					
Seychelles					
Somalia					
South Africa					
South Sudan					
Uganda					
United Republic of Tanzania					
Zambia					
Zimbabwe					

Table III 6B: CSEP-B1/1; B1/2; B1/3; B1/4: Cooperative Separation - WACAF

WACAF States	Basic airborne situational awareness during flight operations (AIRB)	Visual Separation on Approach (VSA)	Performance Based Longitudinal Separation Minima	Performance Based Lateral Separation Minima	Remarks
1	2	3	4	5	6
Benin					
Burkina Faso					
Cameroon					
Cabo Verde					
Central African Republic					
Chad					
Congo					
Cote d'Ivoire					
Democratic Republic of Congo					
Equatorial Guinea					
Gabon					
Gambia					
Ghana					
Guinea Bissau					
Guinea					
Liberia					
Mali					
Mauritania					
Niger					
Nigeria					
Sao Tome & Principe					
Senegal					
Sierra Leone					
Togo	PI	PI	N/A	N/A	
Saint Helena & Asuncion Islands					

Table III 7: RATS-B1/1: Digital Aerodrome Air Traffic Services

Column number	Description
1	Name of the State
2	Status of implementation of Digital Aerodrome Air Traffic Services FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
3	Remarks

Table III 7A: RATS-B1/1: Digital Aerodrome Air Traffic Services - ESAF

ESAF States	Digital Aerodrome Air Traffic Services	Remarks
1	2	3
Angola		
Botswana		
Burundi		
Comoros		
Djibouti		
Eritrea		
Eswatini		
Ethiopia		
Kenya		
Lesotho		
Madagascar		
Malawi		
Mauritius		
Mozambique		
Namibia		
Rwanda		
Seychelles		
Somalia		
South Africa		
South Sudan		
Uganda		
United Republic of Tanzania		
Zambia		
Zimbabwe		

Table III 7B: RATS-B1/1: Digital Aerodrome Air Traffic Services - WACAF

WACAF States	Digital Aerodrome Air Traffic Services	Remarks
1	2	3
Benin		
Burkina Faso		
Cameroon		
Cabo Verde		
Central African Republic		
Chad		
Congo		
Cote d'Ivoire		
Democratic Republic of Congo		
Equatorial Guinea		
Gabon		
Gambia		
Ghana		
Guinea Bissau		
Guinea		
Liberia		
Mali		
Mauritania		
Niger		
Nigeria		
Sao Tome & Principe		
Senegal		
Sierra Leone		
Togo	N/A	
Saint Helena & Asuncion Islands		

Table III 8: FRTO-B0/1; B0/2; B0/3; B0/4: Improved operations through enhanced en-route trajectories

Column number	Description
1	Name of the State
2 to 5	Status of implementation of FRTO-B0 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
6	Remarks

Table III 8A: FRTO-B0/1; B0/2; B0/3; B0/4: Improved operations through enhanced en-route trajectories - ESAF

ESAF States	Direct routing (DCT)	Airspace planning and Flexible Use of Airspace (FUA)	Pre-validated and coordinated ATS routes to support flight and flow	Basic conflict detection and conformance monitoring	Remarks
1	2	3	4	5	6
Angola					
Botswana					
Burundi					
Comoros					
Djibouti					
Eritrea					
Eswatini					
Ethiopia					
Kenya					
Lesotho					
Madagascar					
Malawi					
Mauritius					
Mozambique					
Namibia					
Rwanda					
Seychelles					
Somalia					
South Africa					
South Sudan					
Uganda					
United Republic of Tanzania					
Zambia					
Zimbabwe					

Table III 8B: FRTO-B0/1; B0/2; B0/3; B0/4: Improved operations through enhanced en-route trajectories - WACAF

WACAF States	Direct routing (DCT)	Airspace planning and Flexible Use of Airspace (FUA)	Pre-validated and coordinated ATS routes to support flight and flow	Basic conflict detection and conformance monitoring	Remarks
1	2	3	4	5	6
Benin					
Burkina Faso					
Cameroon					
Cabo Verde					
Central African Republic					
Chad					
Congo					
Cote d'Ivoire					
Democratic Republic of Congo					
Equatorial Guinea					
Gabon					
Gambia					
Ghana					
Guinea Bissau					
Guinea					
Liberia					
Mali					
Mauritania					
Niger					
Nigeria					
Sao Tome & Principe					
Senegal					
Sierra Leone					
Togo	FI	PI	FI	FI	
Saint Helena & Asuncion Islands					

Table III 9: FRTO-B1/1; B1/2; B1/3; B1/4; B1/5; B1/6; B1/7: Improved operations through enhanced en-route trajectories

Column number	Description
1	Name of the State

2 to 8	Status of implementation of FRTO-B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
9	Remarks

Table III 9A: FRTO-B1/1; B1/2; B1/3; B1/4; B1/5; B1/6; B1/7: Improved operations through enhanced en-route trajectories - ESAF

ESAF States	Free Route Airspace (FRA)	Required Navigation Performance (RNP) routes	Advanced Flexible Use of Airspace (FUA) and management of real time airspace data	Dynamic sectorization	Enhanced Conflict Detection Tools and Conformance Monitoring	Multi-Sector Planning	Trajectory Options Set (TOS)	Remarks
1	2	3	4	5	6	7	8	9
Angola								
Botswana								
Burundi								
Comoros								
Djibouti								
Eritrea								
Eswatini								
Ethiopia								
Kenya								
Lesotho								
Madagascar								
Malawi								
Mauritius								
Mozambique								
Namibia								
Rwanda								
Seychelles								
Somalia								
South Africa								
South Sudan								
Uganda								
United Republic of Tanzania								
Zambia								
Zimbabwe								

Table III 9B: FRTO-B1/1; B1/2; B1/3; B1/4; B1/5; B1/6; B1/7: Improved operations through enhanced en-route trajectories - WACAF

WACAF States	Free Route Airspace (FRA)	Required Navigation Performance (RNP) routes	Advanced Flexible Use of Airspace (FUA) and management of real time airspace data	Dynamic sectorization	Enhanced Conflict Detection Tools and Conformance Monitoring	Multi-Sector Planning	Trajectory Options Set (TOS)	Remarks
1	2	3	4	5	6	7	8	9
Benin								
Burkina Faso								
Cameroon								
Cabo Verde								
Central African Republic								
Chad								
Congo								
Cote d'Ivoire								
Democratic Republic of Congo								
Equatorial Guinea								
Gabon								
Gambia								
Ghana								
Guinea Bissau								
Guinea								
Liberia								
Mali								
Mauritania								
Niger								
Nigeria								
Sao Tome & Principe								
Senegal								
Sierra Leone								
Togo	PI	FI	PI	FI	FI	FI	FI	NI
Saint Helena & Asuncion Islands								

SAR

Table SAR-III-10: GADS-B1/1; B1/2: Global Aeronautical Distress and Safety System (GADSS)

Column number	Description
1	Name of the State
2 to 3	Status of implementation of GADS-B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
4	Remarks

Table SAR-III-10A: GADS-B1/1; B1/2: Global Aeronautical Distress and Safety System (GADSS) - ESAF

ESAF States	Aircraft Tracking	Contact directory service	Remarks
1	2	3	4
Angola			
Botswana			
Burundi			
Comoros			
Djibouti			
Eritrea			
Eswatini			
Ethiopia			
Kenya			
Lesotho			
Madagascar			
Malawi			
Mauritius			
Mozambique			
Namibia			
Rwanda			
Seychelles			
Somalia			
South Africa			
South Sudan			
Uganda			
United Republic of Tanzania			
Zambia			
Zimbabwe			

Table SAR-III-10B: GADS-B1/1; B1/2: Global Aeronautical Distress and Safety System (GADSS) - WACAF

WACAF States	Aircraft Tracking	Contact directory service	Remarks
1	2	3	4
Benin			
Burkina Faso			
Cameroon			
Cabo Verde			
Central African Republic			
Chad			
Congo			
Cote d'Ivoire			
Democratic Republic of Congo			
Equatorial Guinea			
Gabon			
Gambia			
Ghana			
Guinea Bissau			
Guinea			
Liberia			
Mali			
Mauritania			
Niger			
Nigeria			
Sao Tome & Principe			
Senegal			
Sierra Leone			
Togo	FI	FI	
Saint Helena & Asuncion Islands			

Table III 11: NOPS-B0/1; B0/2; B0/3; B0/4; B0/5: Network Operations

Explanation of the Table

Fill in the information as provided for using the Column number

Column number	Description
1	Name of the State
2 to 6	Status of implementation of NOPS-B0 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
7	Remarks

Table III 11A: NOPS-B0/1; B0/2; B0/3; B0/4; B0/5: Network Operations - ESAF

ESAF States	Initial integration of collaborative airspace management with air traffic flow management	Collaborative Network Flight Updates	Network Operation Planning basic features	Initial Airport/ATFM slots and A-CDM Network Interface	Dynamic ATFM slot allocation	Remarks
1	2	3	4	5	6	7
Angola						
Botswana						
Burundi						
Comoros						
Djibouti						
Eritrea						
Eswatini						
Ethiopia						
Kenya						
Lesotho						
Madagascar						
Malawi						
Mauritius						
Mozambique						
Namibia						
Rwanda						
Seychelles						
Somalia						
South Africa						
South Sudan						
Uganda						
United Republic of Tanzania						
Zambia						
Zimbabwe						

Table III 11B: NOPS-B0/1; B0/2; B0/3; B0/4; B0/5: Network Operations - WACAF

WACAF States	Initial integration of collaborative airspace management with air traffic flow management	Collaborative Network Flight Updates	Network Operation Planning basic features	Initial Airport/ATFM slots and A-CDM Network Interface	Dynamic ATFM slot allocation	Remarks
1	2	3	4	5	6	7
Benin						
Burkina Faso						
Cameroon						
Cabo Verde						
Central African Republic						
Chad						
Congo						
Cote d'Ivoire						
Democratic Republic of Congo						
Equatorial Guinea						
Gabon						
Gambia						
Ghana						
Guinea Bissau						
Guinea						
Liberia						
Mali						
Mauritania						
Niger						
Nigeria						
Sao Tome & Principe						
Senegal						
Sierra Leone						
Togo	N/A	N/A	N/A	N/A	N/A	
Saint Helena & Asuncion Islands						

Table III 12: NOPS-B1/1; B1/2; B1/3; B1/4; B1/5; B1/6; B1/7; B1/8; B1/9; B1/10: Network Operations

ESAF States	Short Term ATFM measures	Enhanced Network Operations Planning	Enhanced integration of Airport operations planning with network operations planning	Dynami c Traffic Comple xity Management	Full integrat ion of airspace management with air traffic flow management	Initial Dynami c Airspace configur ations	Enha nced ATFM slot swap ping	Extend ed Arrival Manage ment support ed by the ATM Networ k functio n	Targ et Time s for ATFM purposes	Collabo rative Traject ory Options Progra m (CTOP)	Rem arks
1	2	3	4	5	6	7	8	9	10	11	12
Angola											
Botswana											
Burundi											
Comoros											
Djibouti											
Eritrea											
Eswatini											
Ethiopia											
Kenya											
Lesotho											
Madagasca r											
Malawi											
Mauritius											
Mozambiq ue											
Namibia											
Rwanda											
Seychelles											
Somalia											
South Africa											
South Sudan											
Uganda											
United Republic of Tanzania											
Zambia											
Zimbabwe											

Column number	Description
1	Name of the State
2 to 11	Status of implementation of NOPS-B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
12	Remarks

**Table III 12A: NOPS-B1/1; B1/2; B1/3; B1/4; B1/5; B1/6; B1/7; B1/8; B1/9; B1/10:
Network Operations - ESAF**

**Table III 12B: NOPS-B1/1; B1/2; B1/3; B1/4; B1/5; B1/6; B1/7; B1/8; B1/9; B1/10:
Network Operations - WACAF**

WACAF States	Short Term ATFM measures	Enhanced Network Operations Planning	Enhanced integration of Airport operations planning with network operations planning	Dynamic Traffic Complexity Management	Full integration of airspace management with air traffic flow management	Initial Dynamic Airspace configurations	Enhanced ATFM slot swapping	Extended Arrival Management supported by the ATM Network function	Target Times for ATFM purposes	Collaborative Trajectory Options Program (CTOP)	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
Benin											
Burkina Faso											
Cameroon											
Cabo Verde											
Central African Republic											
Chad											
Congo											
Cote d'Ivoire											

WACAF States	Short Term ATFM measures	Enhanced Network Operations Planning	Enhanced integration of Airport operations planning with network operations planning	Dynamic Traffic Complexity Management	Full integration of airspace management with air traffic flow management	Initial Dynamic Airspace configurations	Enhanced ATFM slot swapping	Extended Arrival Management supported by the ATM Network function	Target Times for ATFM purposes	Collaborative Trajectory Options Program (CTOP)	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
Democratic Republic of Congo											
Equatorial Guinea											
Gabon											
Gambia											
Ghana											
Guinea Bissau											
Guinea											
Liberia											
Mali											
Mauritania											
Niger											
Nigeria											
Sao Tome & Principe											
Senegal											
Sierra Leone											
Togo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Saint Helena & Asuncion Islands											

Table III 13: OPFL-B0/1; B1/1: Improved access to optimum flight levels in oceanic and remote airspace

Column number	Description
1	Name of the State
2 to 3	Status of implementation of OPFL-B1/B2 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
4	Remarks

Table III 13A: OPFL-B0/1; B1/1: Improved access to optimum flight levels in oceanic and remote airspace - ESAF

ESAF States	In Trail Procedure (ITP)	Climb and Descend Procedure (CDP)	Remarks
1	2	3	4
Angola			
Botswana			
Burundi			
Comoros			
Djibouti			
Eritrea			
Eswatini			
Ethiopia			
Kenya			
Lesotho			
Madagascar			
Malawi			
Mauritius			
Mozambique			
Namibia			
Rwanda			
Seychelles			
Somalia			
South Africa			
South Sudan			
Uganda			
United Republic of Tanzania			
Zambia			
Zimbabwe			

Table III 13B: OPFL-B0/1; B1/1: Improved access to optimum flight levels in oceanic and remote airspace - WACAF

WACAF States	In Trail Procedure (ITP)	Climb and Descend Procedure (CDP)	Remarks
1	2	3	4
Benin			
Burkina Faso			
Cameroon			
Cabo Verde			
Central African Republic			
Chad			
Congo			
Cote d'Ivoire			
Democratic Republic of Congo			
Equatorial Guinea			
Gabon			
Gambia			
Ghana			
Guinea Bissau			
Guinea			
Liberia			
Mali			
Mauritania			
Niger			
Nigeria			
Sao Tome & Principe			
Senegal			
Sierra Leone			
Togo	N/A	N/A	
Saint Helena & Asuncion Islands			

Table III 14: RSEQ-B0/1; B0/2; B0/3 and B1/1: Improved traffic flow through runway sequencing

Column number	Description
1	Name of the State
2 to 5	Status of implementation of RSEQ-B0/B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
6	Remarks

Table III 14A: RSEQ-B0/1; B0/2; B0/3 and B1/1: Improved traffic flow through runway sequencing - ESAF

ESAF States	Arrival Management	Departure Management	Point merge	Extended arrival metering	Remarks
1	2	3	4	5	6
Angola					
Botswana					
Burundi					
Comoros					
Djibouti					
Eritrea					
Eswatini					
Ethiopia					
Kenya					
Lesotho					
Madagascar					
Malawi					
Mauritius					
Mozambique					
Namibia					
Rwanda					
Seychelles					
Somalia					
South Africa					
South Sudan					
Uganda					
United Republic of Tanzania					
Zambia					
Zimbabwe					

Table III 14B: RSEQ-B0/1; B0/2; B0/3 and B1/1: Improved traffic flow through runway sequencing - WACAF

WACAF States	Arrival Management	Departure Management	Point merge	Extended arrival metering	Remarks
1	2	3	4	5	6
Benin					
Burkina Faso					
Cameroon					
Cabo Verde					
Central African Republic					
Chad					
Congo					
Cote d'Ivoire					
Democratic Republic of Congo					
Equatorial Guinea					
Gabon					
Gambia					
Ghana					
Guinea Bissau					
Guinea					
Liberia					
Mali					
Mauritania					
Niger					
Nigeria					
Sao Tome & Principe					
Senegal					
Sierra Leone					
Togo	Togo	PI	PI	NI	PI
Saint Helena & Asuncion Islands					

Table III 15: SNET-B0/1; B0/2; B0/3; B0/4 and B1/1; B1/2: Ground-based Safety Nets

Column number	Description
1	Name of the State
2 to 7	Status of implementation of SNET-B0/B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
8	Remarks

Table III 15A: SNET-B0/1; B0/2;B0/3; B0/4 and B1/1; B1/2: Ground-based Safety Nets - ESAF

ESAF States	Short-Term Conflict Alert (STCA)	Minimum Safe Altitude Warning (MSAW)	Area Proximity Warning (APW)	Approach Path Monitoring (APM)	Enhanced STCA with aircraft parameters	Enhanced STCA in complex TMAs	Remarks
1	2	3	4	5	6	7	8
Angola							
Botswana							
Burundi							
Comoros							
Djibouti							
Eritrea							
Eswatini							
Ethiopia							
Kenya							
Lesotho							
Madagascar							
Malawi							
Mauritius							
Mozambique							
Namibia							
Rwanda							
Seychelles							
Somalia							
South Africa							
South Sudan							
Uganda							
United Republic of Tanzania							
Zambia							
Zimbabwe							

Table III 15B: SNET-B0/1; B0/2; B0/3; B0/4 and B1/1; B1/2: Ground-based Safety Nets - WACAF

WACAF States	Short-Term Conflict Alert (STCA)	Minimum Safe Altitude Warning (MSAW)	Area Proximity Warning (APW)	Approach Path Monitoring (APM)	Enhanced STCA with aircraft parameters	Enhanced STCA in complex TMAs	Remarks
1	2	3	4	5	6	7	8
Benin							
Burkina Faso							
Cameroon							
Cabo Verde							
Central African Republic							
Chad							
Congo							
Cote d'Ivoire							
Democratic Republic of Congo							
Equatorial Guinea							
Gabon							
Gambia							
Ghana							
Guinea Bissau							
Guinea							
Liberia							
Mali							
Mauritania							
Niger							
Nigeria							
Sao Tome & Principe							
Senegal							
Sierra Leone							
Togo	FI	FI	FI	FI	FI	FI	
Saint Helena & Asuncion Islands							

Table III 16: SURF-B0/1; B0/2; B0/3 and B1/1; B1/2; B1/3; B1/4; B1/5: Surface operations

Column number	Description
1	Name of the State

2 to 9	Status of implementation of SURF-B0/B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
10	Remarks

Table III 16A: SURF-B0/1; B0/2; B0/3 and B1/1; B1/2; B1/3; B1/4; B1/5: Surface operations - ESAF

ESAF States	Basic ATCO tools to manage traffic during ground operations	Comprehensive situational awareness of surface operations	Initial ATCO alerting service for surface operations	Advanced features using visual aids to support traffic management during ground operations	Comprehensive pilot situational awareness on the airport surface	Enhanced ATCO alerting service for surface operations	Routing service to support ATCO surface operations management	Enhanced vision systems for taxi operations	Remarks
1	2	3	4	5	6	7	8	9	10
Angola									
Botswana									
Burundi									
Comoros									
Djibouti									
Eritrea									
Eswatini									
Ethiopia									
Kenya									
Lesotho									
Madagascar									
Malawi									
Mauritius									
Mozambique									
Namibia									
Rwanda									
Seychelles									
Somalia									
South Africa									
South Sudan									
Uganda									
United Republic of Tanzania									
Zambia									
Zimbabwe									

Table III 16B: SURF-B0/1; B0/2; B0/3 and B1/1; B1/2; B1/3; B1/4; B1/5: Surface operations - WACAF

WACA F States	Basic ATCO tools to manage traffic during ground operati ons	Comprehen sive situational awareness of surface operations	Initial ATCO alerting service for surface operati ons	Advance d features using visual aids to support traffic managem ent during ground operati ons	Comprehen sive pilot situational awareness on the airport surface	Enhanc ed ATCO alerting service for surface operati ons	Routing service to support ATCO surface operati ons managem ent	Enhanc ed vision systems for taxi operati ons	Remar ks
1	2	3	4	5	6	7	8	9	10
Benin									
Burkina Faso									
Camero on									
Cabo Verde									
Central African Republi c									
Chad									
Congo									
Cote d'Ivoire									
Democr atic Republi c of Congo									
Equatori al Guinea									
Gabon									
Gambia									
Ghana									
Guinea Bissau									
Guinea									
Liberia									
Mali									
Maurita nia									
Niger									

WACA F States	Basic ATCO tools to manage traffic during ground operati ons	Comprehen sive situational awareness of surface operations	Initial ATCO alerting service for surface operati ons	Advance d features using visual aids to support traffic managem ent during ground operati ons	Comprehen sive pilot situational awareness on the airport surface	Enhanc ed ATCO alerting service for surface operati ons	Routing service to support ATCO surface operati ons managem ent	Enhanc ed vision systems for taxi operati ons	Remar ks
1	2	3	4	5	6	7	8	9	10
Nigeria									
Sao Tome & Principe									
Senegal									
Sierra Leone									
Togo	FI	PI	PI	NI	PI	NI	NI	NI	
Saint Helena & Asuncio n Islands									

Table III 17: TBO-B0/1; B1/1: Trajectory-based operations

Column number	Description
1	Name of the State
2 to 3	Status of implementation of TBO-B0/B1 Elements

	FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
4	Remarks

Table III 17A: TBO-B0/1; B1/1: Trajectory-based operations - ESAF

ESAF States	Introduction of time-based management within a flow centric approach	Initial Integration of time-based decision-making processes	Remarks
1	2	3	4
Angola			
Botswana			
Burundi			
Comoros			
Djibouti			
Eritrea			
Eswatini			
Ethiopia			
Kenya			
Lesotho			
Madagascar			
Malawi			
Mauritius			
Mozambique			
Namibia			
Rwanda			
Seychelles			
Somalia			
South Africa			
South Sudan			
Uganda			
United Republic of Tanzania			
Zambia			
Zimbabwe			

Table III 17B: TBO-B0/1; B1/1: Trajectory-based operations - WACAF

WACAF States	Introduction of time-based management within a flow centric approach	Initial Integration of time-based decision-making processes	Remarks
1	2	3	4
Benin			
Burkina Faso			
Cameroon			
Cabo Verde			

WACAF States	Introduction of time-based management within a flow centric approach	Initial Integration of time-based decision-making processes	Remarks
1	2	3	4
Central African Republic			
Chad			
Congo			
Cote d'Ivoire			
Democratic Republic of Congo			
Equatorial Guinea			
Gabon			
Gambia			
Ghana			
Guinea Bissau			
Guinea			
Liberia			
Mali			
Mauritania			
Niger			
Nigeria			
Sao Tome & Principe			
Senegal			
Sierra Leone			
Togo	FI	FI	
Saint Helena & Asuncion Islands			

**COMMUNICATION,
NAVIGATION AND
SURVEILLANCE
(CNS)**

**Table CNS III-3: Implementation status of applicable ASBU elements of
COM I-B0 and COMI-B1, Aeronautical Mobile Service (AMS) - Air/Ground Communication**

Explanation of the Table

Column number	Description
1	Name of the State
2 to 8	Status of implementation of COMI-B0/B1 Elements: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
9	Remarks

Table CNS III-3A: Implementation status of applicable ASBU elements of COMI-B0 and COMI-B1 - ESAF

ESAF States	ACARS VHF Datalink (ACARS VDL)	VHF Datalink Mode 0/A	VHF Data Link Mode 2 (VDL Mode 2)	SATCOM Class C	HF Data Link (HL DL)	VHF Data Link Mode 2 Multifrequency (VDL Mode 2 Multi frequency)	SATCOM Class B	Remarks
1	2	3	4	5	6	7	8	9
Angola		NI	NI	NI	NI	NI	NI	
Botswana	FI	NI	NI	NI	NI	NI	NI	
Burundi	FI	NI	NI	NI	NI	NI	NI	
Comoros	FI	NI	NI	NI	NI	NI	NI	
Djibouti	FI	NI	NI	NI	NI	NI	NI	
Eritrea	FI	NI	NI	NI	NI	NI	NI	
Eswatini	FI	NI	NI	NI	NI	NI	NI	
Ethiopia	FI	NI	NI	NI	NI	NI	NI	
Kenya	FI	NI	NI	NI	NI	NI	NI	
Lesotho	FI	NI	NI	NI	NI	NI	NI	
Madagascar	FI	NI	NI	NI	NI	NI	NI	
Malawi	FI	NI	NI	NI	NI	NI	NI	
Mauritius	FI	NI	NI	NI	NI	NI	NI	
Mozambique	FI	NI	NI	NI	NI	NI	NI	
Namibia	FI	NI	NI	NI	NI	NI	NI	
Rwanda	FI	NI	NI	NI	NI	NI	NI	
Seychelles	FI	NI	NI	NI	NI	NI	NI	
Somalia	FI	NI	NI	NI	NI	NI	NI	
South Africa	FI	NI	NI	NI	NI	NI	NI	
South Sudan	FI	NI	NI	NI	NI	NI	NI	
Uganda	FI	NI	NI	NI	NI	NI	NI	
United Republic of Tanzania	FI	NI	NI	NI	NI	NI	NI	
Zambia	FI	NI	NI	NI	NI	NI	NI	
Zimbabwe	FI	NI	NI	NI	NI	NI	NI	

Table CNS III-3B: Implementation status of applicable ASBU elements of COMI-B0 and COMI-B1 - WACAF

WACAF States	ACARS VHF Datalink (ACARS VDL)	VHF Datalink Mode 0/A	VHF Data Link Mode 2 (VDL Mode 2)	SATCOM Classe C	HF Data Link (HL DL)	VHF Data Link Mode 2 Multifrequency (VDL Mode 2 Multi frequency)	SATCOM Classe B	Remarks
1	2	3	4	5	6	7	8	9
Benin	FI	NI	NI	NI	NI	NI	NI	
Burkina Faso	FI	NI	NI	NI	NI	NI	NI	
Cameroon	FI	NI	NI	NI	NI	NI	NI	
Cabo Verde	FI	NI	NI	NI	NI	NI	NI	
Central African Republic	FI	NI	NI	NI	NI	NI	NI	
Chad	FI	NI	NI	NI	NI	NI	NI	
Congo	FI	NI	NI	NI	NI	NI	NI	
Cote d'Ivoire	FI	NI	NI	NI	NI	NI	NI	
Democratic Republic of Congo	FI	NI	NI	NI	NI	NI	NI	
Equatorial Guinea	FI	NI	NI	NI	NI	NI	NI	
Gabon	FI	NI	NI	NI	NI	NI	NI	
Gambia	FI	NI	NI	NI	NI	NI	NI	
Ghana	FI	NI	NI	NI	NI	NI	NI	
Guinea Bissau	FI	NI	NI	NI	NI	NI	NI	
Guinea	FI	NI	NI	NI	NI	NI	NI	
Liberia	FI	NI	NI	NI	NI	NI	NI	
Mali	FI	NI	NI	NI	NI	NI	NI	
Mauritania	FI	NI	NI	NI	NI	NI	NI	
Niger	FI	NI	NI	NI	NI	NI	NI	
Nigeria	FI	NI	NI	NI	NI	NI	NI	
Sao Tome & Principe	FI	NI	NI	NI	NI	NI	NI	
Senegal	FI	NI	NI	NI	NI	NI	NI	
Sierra Leone	FI	NI	NI	NI	NI	NI	NI	
Togo	FI	NI	NI	NI	NI	NI	NI	
Saint Helena & Asuncion Islands	FI	NI	NI	NI	NI	NI	NI	

**Table CNS III-4: Implementation status of applicable ASBU elements of COMS-B0 and COMS-B1:
Aeronautical Mobile Service (AMS) - Air/Ground Communication**

Explanation of the Table

Column number	Description
1	Name of the State
2 to 7	Status of implementation of COMS-B0/B1 Elements FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
8	Remarks

Table CNS III-4A: Implementation status of applicable ASBU elements of COMS-B0 and COMS-B1 - ESAF

ESAF States	ADS-C (FANS 1/A) for procedural airspace)	PBCS approved CPDLC (FANS 1/A+) for domestic & procedural airspace	PBCS approved ADS-C (FANS 1/A+) for procedural airspace	SATVOICE (incl. routine communications) for procedural airspace	PBCS approved CPDLC (B2) for domestic and procedural airspace	PBCS approved SATVOICE (incl. routine communications) for procedural airspace	Remarks
1	2	3	4	5	6	7	8
Angola	FI	FI	PI	NI	NI	NI	
Botswana	NI	NI	PI	NI	NI	NI	
Burundi	NI	NI	PI	NI	NI	NI	
Comoros	FI	FI	PI	NI	NI	NI	
Djibouti	NI	NI	PI	NI	NI	NI	
Eritrea	NI	NI	PI	NI	NI	NI	
Eswatini	NI	NI	PI	NI	NI	NI	
Ethiopia	NI	NI	PI	NI	NI	NI	
Kenya	FI	NI	PI	NI	NI	NI	
Lesotho	NI	NI	PI	NI	NI	NI	
Madagascar	FI	FI	PI	NI	NI	NI	
Malawi	NI	NI	PI	NI	NI	NI	
Mauritius	FI	FI	PI	NI	NI	NI	
Mozambique	NI	NI	PI	NI	NI	NI	
Namibia	NI	NI	PI	NI	NI	NI	
Rwanda	NI	NI	PI	NI	NI	NI	
Seychelles	NI	NI	PI	NI	NI	NI	
Somalia	FI	FI	PI	NI	NI	NI	
South Africa	FI	FI	PI	NI	NI	NI	
South Sudan	NI	NI	PI	NI	NI	NI	
Uganda	NI	NI	PI	NI	NI	NI	
United Republic of Tanzania	NI	NI	PI	NI	NI	NI	
Zambia	NI	NI	PI	NI	NI	NI	
Zimbabwe	NI	NI	PI	NI	NI	NI	

Table CNS III-4B: Implementation status of applicable ASBU elements of COMS-B0 and COMS-B1 - WACAF

WACAF States	ADS-C (FANS 1/A) for procedural airspace)	PBCS approved CPDLC (FANS 1/A+) for domestic & procedural airspace	PBCS approved ADS-C (FANS 1/A+) for procedural airspace	SATVOICE (incl. routine communications) for procedural airspace	PBCS approved CPDLC (B2) for domestic and procedural airspace	PBCS approved SATVOICE (incl. routine communications) for procedural airspace	Remarks
1	2	3	4	5	6	7	8
Benin	FI	FI	PI	NI	NI	NI	
Burkina Faso	FI	FI	PI	NI	NI	NI	
Cameroon	FI	FI	PI	NI	NI	NI	
Cabo Verde	FI	FI	PI	NI	NI	NI	
Central African Republic	FI	FI	PI	NI	NI	NI	
Chad	FI	FI	PI	NI	NI	NI	
Congo	FI	FI	PI	NI	NI	NI	
Cote d'Ivoire	FI	FI	PI	NI	NI	NI	
Democratic Republic of Congo	FI	FI	PI	NI	NI	NI	
Equatorial Guinea	FI	FI	PI	NI	NI	NI	
Gabon	FI	FI	PI	NI	NI	NI	
Gambia	FI	FI	PI	NI	NI	NI	
Ghana	FI	FI	PI	NI	NI	NI	
Guinea Bissau	FI	FI	PI	NI	NI	NI	
Guinea	FI	FI	PI	NI	NI	NI	
Liberia	FI	FI	PI	NI	NI	NI	
Mali	FI	FI	PI	NI	NI	NI	
Mauritania	FI	FI	PI	NI	NI	NI	
Niger	FI	FI	PI	NI	NI	NI	
Nigeria	FI	FI	PI	NI	NI	NI	
Sao Tome & Principe	FI	FI	PI	NI	NI	NI	
Senegal	FI	FI	PI	NI	NI	NI	
Sierra Leone	FI	FI	PI	NI	NI	NI	
Togo	NI	NI	NI	NI	NI	NI	
Saint Helena & Asuncion Islands	FI	FI	PI	NI	NI	NI	

**Table CNS III-5: Implementation status of applicable ASBU elements COMI-B0/7, B1/1 and FICE-B0/1:
Aeronautical Fixed Service (AFS) - Ground/Ground Communication**

Explanation of the Table

Column number	Description
1	Name of the State
2 to 6	Status of implementation of COM-B0 Elements: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
7	Remarks

Table CNS III-5A: Implementation status of applicable ASBU elements COMI-B0/7, B1/1 and FICE-B0/1 - ESAF

ESAF States	Aeronautical Fixed Telecommunication Network (AFTN)	ATS Message Handling Services (AMHS)	Air Traffic Service Direct Speech (ATS-DS)	ATS Interfacility Data Communication (AIDC)	Voice over Internet Protocol (VoIP)	Remarks
1	2	3	4	5	6	7
Angola	FI	PI	FI	NI	NI	
Botswana	FI	PI	FI	NI	NI	
Burundi	FI	NI	FI	NI	NI	
Comoros	FI	PI	FI	PI	NI	
Djibouti	FI	NI	FI	NI	NI	
Eritrea	FI	NI	FI	NI	NI	
Eswatini	FI	NI	FI	NI	NI	
Ethiopia		PI	FI	NI	NI	
Kenya	FI	PI	FI	NI	NI	
Lesotho	FI	NI	FI	NI	NI	
Madagascar	FI	PI	FI	PI	NI	
Malawi	FI	NI	FI	NI	NI	
Mauritius	FI	PI	FI	FI	NI	
Mozambique	FI	PI	FI	NI	NI	
Namibia	FI	NI	FI	NI	NI	
Rwanda	FI	PI	FI	NI	NI	
Seychelles	FI	PI	FI	NI	NI	
Somalia	FI	PI	FI	NI	NI	
South Africa	FI	PI	FI	NI	NI	
South Sudan	FI	NI	FI	FI	NI	
Uganda	FI	PI	FI	NI	NI	
United Republic of Tanzania	FI		FI	NI	NI	
Zambia	FI	PI	FI	NI	NI	
Zimbabwe	FI	PI	FI	NI	NI	

Table CNS III-5B: Implementation status of applicable ASBU elements COMI-B0/7, B1/1 and FICE-B0/1 - WACAF

WACAF States	Aeronautical Fixed Telecommunication Network (AFTN)	ATS Message Handling Services (AMHS)	Air Traffic Service Direct Speech (ATS-DS)	ATS Interfacility Data Communication (AIDC)	Voice over Internet Protocol (VoIP)	Remarks
1	2	3	4	5	6	7
Benin	FI	PI	FI	PI	NI	
Burkina Faso	FI	PI	FI	PI	NI	
Cameroon	FI	PI	FI	PI	NI	
Cabo Verde	FI	PI	FI	PI	NI	
Central African Republic	FI	PI	FI	PI	NI	
Chad	FI	PI	FI	PI	NI	
Congo	FI	PI	FI	PI	NI	
Cote d'Ivoire	FI	PI	FI	PI	NI	
Democratic Republic of Congo	FI	PI	FI	PI	NI	
Equatorial Guinea	FI	PI	FI	PI	NI	
Gabon	FI	PI	FI	PI	NI	
Gambia	FI	PI	FI	PI	NI	
Ghana	FI	PI	FI	PI	NI	
Guinea Bissau	FI	PI	FI	PI	NI	
Guinea	FI	PI	FI	PI	NI	
Liberia	FI	PI	FI	PI	NI	
Mali	FI	PI	FI	PI	NI	
Mauritania	FI	PI	FI	PI	NI	
Niger	FI	PI	FI	PI	NI	
Nigeria	FI	PI	FI	PI	NI	
Sao Tome & Principe	FI	PI	FI	PI	NI	
Senegal	FI	PI	FI	PI	NI	
Sierra Leone	FI	PI	FI	PI	NI	
Togo	FI	PI	FI	PI	NI	
Saint Helena & Asuncion Islands	FI	PI	FI	PI	NI	

**Table CNS III-6: Implementation status of applicable ASBU elements of NAVS-B0 and NAVS-B1:
Aeronautical Radionavigation Service (ARNS) Conventional and GNSS Nav aids**

Explanation of the Table

Column number	Description
1	Name of the State
2 to 10	Status of implementation of NAVS-B0/B1 Elements: FI – Fully Implemented, PI – Partially Implemented NI – Not Implemented, N/A – Not applicable
11	Remarks

Table CNS III-6A: Implementation status of applicable ASBU elements of NAVS-B0 and NAVS-B1 – ESAF

ESAF States	VHF Omni Range (VOR)	Distance measurement Equipment (DME)	Instrument Landing System (ILS)	Core GNSS	Ground Based Augmentation Systems (GBAS)	Satellite Based Augmentation Systems (SBAS)	Aircraft Based Augmentation Systems (ABAS)	Navigation Minimal Operating Networks (Nav. MON)	Extended GBAS	Remarks
1	2	3	4	5	6	7	8	9	10	
Angola	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Botswana	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Burundi	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Comoros	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Djibouti	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Eritrea	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Eswatini	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Ethiopia	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Kenya	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Lesotho	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Madagascar	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Malawi	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Mauritius	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Mozambique	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Namibia	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Rwanda	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Seychelles	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Somalia	FI	FI	FI	FI	NI	NI	PI	NI	NI	
South Africa	FI	FI	FI	FI	NI	NI	PI	NI	NI	
South Sudan	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Uganda	FI	FI	FI	FI	NI	NI	PI	NI	NI	
United Republic of Tanzania	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Zambia	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Zimbabwe	FI	FI	FI	FI	NI	NI	PI	NI	NI	

Table CNS III-6B: Implementation status of applicable ASBU elements of NAVS-B0 and NAVS-B1 – WACAF

WACAF States	VHF Omni Range (VOR)	Distance measurement Equipment (DME)	Instrument Landing System (ILS)	Core GNSS	Ground Based Augmentation Systems (GBAS)	Satellite Based Augmentation Systems (SBAS)	Aircraft Based Augmentation Systems (ABAS)	Navigation Minimal Operating Networks (Nav. MON)	Extended GBAS	Remarks
1	2	3	4	5	6	7	8	9	10	11
Benin	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Burkina Faso	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Cameroon	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Cape Verde	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Central African Republic	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Chad	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Congo	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Cote d'Ivoire	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Democratic Republic of Congo	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Equatorial Guinea	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Gabon	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Gambia	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Ghana	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Guinea Bissau	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Guinea	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Liberia	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Mali	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Mauritania	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Niger	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Nigeria	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Sao Tome & Principe	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Senegal	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Sierra Leone	FI	FI	FI	FI	NI	NI	PI	NI	NI	
Togo	FI	FI	FI	FI	N/A	PI	PI	NI	NI	
Saint Helena & Asuncion Islands	FI	FI	FI	FI	NI	NI	PI	NI	NI	

**Table CNS III-7: Implementation status of applicable ASBU elements of ASUR-B0, ASUR-B1 and ACAS-B1:
Aeronautical Surveillance Service (ASUR & ACAS)**

Explanation of the Table

Column number	Description
1	Name of the State
2 to 8	Status of availability of ASUR-B0/B1 and ACAS-B1 Elements: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
9	Remarks

Table CNS III-7A: Implementation status of applicable ASBU elements of ASUR-B0, ASUR-B1 and ACAS-B1 - ESAF

ESAF States	Secondary Surveillance Radar Mode A/C (SSR Mode A/C)	Secondary Surveillance Radar Mode S (SSR Mode S)	Automatic Dependent Surveillance – Broadcast (ADS-B)	Multilateration cooperative surveillance systems (MLAT)	Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)	Reception of aircraft ADS-B signals from space (SB ADS-B)	ACAS Improvemnts	Remarks
1	2	3	4	5	6	7	8	9
Angola	FI	PI	NI	NI	NI	NI	NI	
Botswana	NI	FI	NI	NI	NI	NI	NI	
Burundi	NI	NI	NI	NI	NI	NI	NI	
Comoros	FI	FI	FI	NI	NI	PI	NI	
Djibouti	NI	NI	NI	NI	NI	NI	NI	
Eritrea	NI	NI	NI	NI	NI	NI	NI	
Eswatini	NI	NI	NI	NI	NI	NI	NI	
Ethiopia	FI	PI	FI	FI	NI	PI	NI	
Kenya	FI	FI	NI	NI	NI	NI	NI	
Lesotho	NI	NI	NI	NI	NI	NI	NI	
Madagascar	FI	FI	FI	NI	NI	PI	NI	
Malawi	NI	NI	NI	NI	NI	NI	NI	
Mauritius	NI	NI	NI	NI	NI	NI	NI	
Mozambique	NI	NI	NI	NI	NI	NI	NI	
Namibia	NI	NI	NI	NI	NI	NI	NI	
Rwanda	NI	NI	NI	NI	NI	NI	NI	
Seychelles	NI	NI	PI	NI	NI	PI	NI	
Somalia	NI	NI	NI	NI		NI	NI	
South Africa	FI	FI	PI	NI		NI	NI	
South Sudan	NI	NI	NI	NI		NI	NI	
Uganda	NI	FI	NI	NI		NI	NI	
United Republic of Tanzania	NI	FI	NI	NI		NI	NI	
Zambia	NI	FI	NI	NI		NI	NI	
Zimbabwe	NI	NI	NI	NI		NI	NI	

Table CNS III-7B: Implementation status of applicable ASBU elements of ASUR-B0, ASUR-B1 and ACAS-B1 - WACAF

WACAF States	Secondary Surveillance Radar Mode A/C (SSR Mode A/C)	Secondary Surveillance Radar Mode S (SSR Mode S)	Automatic Dependent Surveillance – Broadcast (ADS-B)	Multilateration cooperative surveillance systems (MLAT)	Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)	Reception of aircraft ADS-B signals from space (SB ADS-B)	ACAS Improvemnts	Remarks
1	2	3	4	5	6	7	8	9
Benin	FI	FI	FI	NI	NI	PI	NI	
Burkina Faso	FI	FI	FI	NI	NI	PI	NI	
Cameroon	FI	FI	FI	NI	NI	PI	NI	
Cape Verde	FI	FI	NI	NI	NI	NI	NI	
Central African Republic	FI	FI	FI	NI	NI	PI	NI	
Chad	FI	FI	FI	NI	NI	PI	NI	
Congo	FI	FI	FI	NI	NI	PI	NI	
Cote d'Ivoire	FI	FI	FI	NI	NI	PI	NI	
Democratic Republic of Congo	NI	NI	FI	NI	NI	NI	NI	
Equatorial Guinea	FI	FI	FI	NI	NI	PI	NI	
Gabon	FI	FI	FI	NI	NI	PI	NI	
Gambia	N/A	N/A	NI	NI	NI	NI	NI	
Ghana	FI	FI	FI	NI	NI	PI	NI	
Guinea Bissau	FI	FI	FI	NI	NI	PI	NI	
Guinea	N/A	N/A	FI	NI	NI	NI	NI	
Liberia	NI	NI	NI	NI	NI	NI	NI	
Mali	FI	FI	FI	NI	NI	PI	NI	
Mauritania	FI	FI	FI	NI	NI	PI	NI	
Niger	FI	FI	FI	NI	NI	PI	NI	
Nigeria	FI	FI	FI	NI	NI	PI	NI	
Sao Tome & Principe	NI	NI	FI	NI	NI	NI	NI	
Senegal	FI	FI	FI	NI	NI	PI	NI	
Sierra Leone	N/A	N/A	NI	FI	NI	NI	NI	
Togo	FI	FI	FI	N/A	NI	PI	NI	
Saint Helena & Asuncion Islands	FI	FI	FI	NI	NI	PI	NI	

Note: The implementation of Automatic Dependent Surveillance Contract (ADS-C) is addressed in the ASBU COMS Modules elements (Table CNS III-2B) as part of the Data Link

AERONAUTICAL INFORMATION MANAGEMENT (AIM)

DAIM Digital Aeronautical Information Management

Table AIM III-3 - Provision of AIM products and services of ASBU elements DAIM-B1/1 and DAIM-B1/2

Explanation of the table

Column number	Description
1	Name of the State
2 to 8	Status of implementation of DAIM-B1 Elements, where: FI – Fully Implemented, PI – Partially Implemented NI – Not Implemented, N/A – Not Applicable
9	Remarks — additional information, including detail of “FI”, “PI”, “NI” and “N/A”, as appropriate.

Table AIM III-3A: Provision of AIM products and services of ASBU elements DAIM-B1/1 and DAIM-B1/2 - ESAF

ESAF States	<i>DAIM-B1/1 - Provision of quality-assured aeronautical data and information</i>				<i>DAIM-B1/2 - Provision of digital Aeronautical Information Publication (AIP) data sets</i>			Remarks
	QMS	SLA	AIRAC	WGS-84	AIXM DB	eAIP	AIP Data sets	
1	2	3	4	5	6	7	8	9
Angola	NI	NI	PI	PI	NI	NI	NI	
Botswana	PI	PI	PI	PI	NI	NI	NI	
Burundi	NI	NI	PI	PI	NI	NI	NI	
Comoros	FI	PI	PI	PI	FI	FI	NI	
Djibouti	NI	NI	PI	PI	NI	NI	NI	
Eritrea	NI	NI	PI	PI	NI	NI	NI	
Eswatini	NI	NI	PI	PI	NI	NI	NI	
Ethiopia	FI	PI	PI	PI	NI	NI	NI	
Kenya	FI	PI	PI	PI	FI	FI	NI	
Lesotho	NI	NI	PI	PI	NI	NI	NI	
Madagascar	FI	PI	PI	PI	FI	FI	NI	
Malawi	NI	NI	PI	PI	NI	NI	NI	
Mauritius	NI	NI	PI	PI	NI	NI	NI	
Mozambique	FI	PI	PI	PI	NI	NI	NI	
Namibia	PI	PI	PI	PI	NI	NI	NI	
Rwanda	FI	PI	PI	PI	NI	NI	NI	
Seychelles	PI	PI	PI	PI	NI	NI	NI	
Somalia	NI	NI	PI	PI	NI	NI	NI	
South Africa	FI	PI	PI	PI	FI	PI	NI	
South Sudan	NI	NI	PI	PI	NI	NI	NI	
Uganda	FI	PI	PI	PI	NI	NI	NI	
United Republic of Tanzania	FI	PI	PI	PI	NI	NI	NI	
Zambia	FI	PI	PI	PI	NI	NI	NI	
Zimbabwe	NI	NI	PI	PI	NI	NI	NI	

Table AIM III-3B: Provision of AIM products and services of ASBU elements DAIM-B1/1 and DAIM-B1/2 - WACAF

WACAF States	<i>DAIM-B1/1 - Provision of quality-assured aeronautical data and information</i>				<i>DAIM-B1/2 - Provision of digital Aeronautical Information Publication (AIP) data sets</i>			Remarks
	QMS	SLA	AIRAC	WGS-84	AIXM DB	eAIP	AIP Data sets	
1	2	3	4	5	6	7	8	9
Benin	FI	PI	PI	PI	FI	FI	NI	
Burkina Faso	FI	PI	PI	PI	FI	FI	NI	
Cameroon	FI	PI	PI	PI	FI	FI	NI	
Cabo Verde	FI	PI	PI	PI	FI	FI	NI	
Central African Republic	FI	PI	PI	PI	FI	FI	NI	
Chad	FI	PI	PI	PI	FI	FI	NI	
Congo	FI	PI	PI	PI	FI	FI	NI	
Cote d'Ivoire	FI	PI	PI	PI	FI	FI	NI	
Democratic Republic of Congo	NI	NI	PI	PI	NI	NI	NI	
Equatorial Guinea	FI	PI	PI	PI	FI	FI	NI	
Gabon	FI	PI	PI	PI	FI	FI	NI	
Gambia	NI	NI	PI	PI	NI	NI	NI	
Ghana	FI	PI	PI	PI	NI	NI	NI	
Guinea Bissau	FI	PI	PI	PI	FI	FI	NI	
Guinea	NI	NI	PI	PI	NI	NI	NI	
Liberia	NI	NI	PI	PI	NI	NI	NI	
Mali	FI	PI	PI	PI	FI	FI	NI	
Mauritania	FI	PI	PI	PI	FI	FI	NI	
Niger	FI	PI	PI	PI	FI	FI	NI	
Nigeria	NI	NI	PI	PI	NI	NI	NI	
Sao Tome & Principe	NI	NI	PI	PI	NI	NI	NI	
Senegal	FI	PI	PI	PI	FI	FI	NI	
Sierra Leone	NI	NI	PI	PI	NI	NI	NI	
Togo	FI	FI	FI	FI	FI	FI	PI	

Table AIM III-4 - Provision of AIM products and services of ASBU elements DAIM-B1/3 and DAIM-B1/4

Explanation of the table

Column number	Description
1	Name of the State
2 to 9	Status of implementation of DAIM-B1/3 and DAIM-B1/4 Elements for Areas 1 to 4, where: FI – Fully Implemented, PI – Partially Implemented NI – Not Implemented, N/A – Not Applicable
10	Remarks — additional information, including detail of “FI”, “PI”, “NI” and “N/A”, as appropriate.

Table AIM III-4A: Provision of AIM products and services of ASBU elements DAIM-B1/3 and DAIM-B1/4 – ESAF

ESAF States	<i>DAIM-B1/3 – Provision of digital terrain data sets</i>				<i>DAIM-B1/4 – Provision of digital obstacle data sets</i>				Remarks
	Area 1	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 4	
1	2	3	4	5	6	7	8	9	10
Angola	NI	NI	NI	NI	NI	NI	NI	NI	
Botswana	NI	NI	NI	NI	NI	NI	NI	NI	
Burundi	NI	NI	NI	NI	NI	NI	NI	NI	
Comoros	NI	NI	NI	NI	NI	NI	NI	NI	
Djibouti	NI	NI	NI	NI	NI	NI	NI	NI	
Eritrea	NI	NI	NI	NI	NI	NI	NI	NI	
Eswatini	NI	NI	NI	NI	NI	NI	NI	NI	
Ethiopia	NI	NI	NI	NI	NI	NI	NI	NI	
Kenya	PI	PI	NI	NI	NI	NI	NI	NI	
Lesotho	NI	NI	NI	NI	NI	NI	NI	NI	
Madagascar	NI	NI	NI	NI	NI	NI	NI	NI	
Malawi	NI	NI	NI	NI	NI	NI	NI	NI	
Mauritius	NI	NI	NI	NI	NI	NI	NI	NI	
Mozambique	NI	NI	NI	NI	NI	NI	NI	NI	
Namibia	NI	NI	NI	NI	NI	NI	NI	NI	
Rwanda	NI	NI	NI	NI	NI	NI	NI	NI	
Seychelles	NI	NI	NI	NI	NI	NI	NI	NI	
Somalia	NI	NI	NI	NI	NI	NI	NI	NI	
South Africa	NI	NI	NI	NI	NI	NI	NI	NI	
South Sudan	NI	NI	NI	NI	NI	NI	NI	NI	
Uganda	NI	NI	NI	NI	NI	NI	NI	NI	
United Republic of Tanzania	NI	NI	NI	NI	NI	NI	NI	NI	
Zambia	NI	NI	NI	NI	NI	NI	NI	NI	
Zimbabwe	NI	NI	NI	NI	NI	NI	NI	NI	

Table AIM III-4B: Provision of AIM products and services of ASBU elements DAIM-B1/3 and DAIM-B1/4 – WACAF

WACAF States	<i>DAIM-B1/3 – Provision of digital terrain data sets</i>				<i>DAIM-B1/4 – Provision of digital obstacle data sets</i>				Remarks
	Area 1	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 4	
1	2	3	4	5	6	7	8	9	10
Benin	NI	NI	NI	NI	NI	NI	NI	NI	
Burkina Faso	NI	NI	NI	NI	NI	NI	NI	NI	
Cameroon	NI	NI	NI	NI	NI	NI	NI	NI	
Cabo Verde	NI	NI	NI	NI	NI	NI	NI	NI	
Central African Republic	NI	NI	NI	NI	NI	NI	NI	NI	
Chad	NI	NI	NI	NI	NI	NI	NI	NI	
Congo	NI	NI	NI	NI	NI	NI	NI	NI	
Cote d'Ivoire	NI	NI	NI	NI	NI	NI	NI	NI	
Democratic Republic of Congo	NI	NI	NI	NI	NI	NI	NI	NI	
Equatorial Guinea	NI	NI	NI	NI	NI	NI	NI	NI	
Gabon	NI	NI	NI	NI	NI	NI	NI	NI	
Gambia	NI	NI	NI	NI	NI	NI	NI	NI	
Ghana	NI	NI	NI	NI	NI	NI	NI	NI	
Guinea Bissau	NI	NI	NI	NI	NI	NI	NI	NI	
Guinea	NI	NI	NI	NI	NI	NI	NI	NI	
Liberia	NI	NI	NI	NI	NI	NI	NI	NI	
Mali	NI	NI	NI	NI	NI	NI	NI	NI	
Mauritania	NI	NI	NI	NI	NI	NI	NI	NI	
Niger	NI	NI	NI	NI	NI	NI	NI	NI	
Nigeria	NI	NI	NI	NI	NI	NI	NI	NI	
Sao Tome & Principe	NI	NI	NI	NI	NI	NI	NI	NI	
Senegal	NI	NI	NI	NI	NI	NI	NI	NI	
Sierra Leone	NI	NI	NI	NI	NI	NI	NI	NI	
Togo	PI	PI	PI	PI	PI	PI	PI	PI	

Table AIM III-5 – Provision of AIM products and services of ASBU elements DAIM-B1/5, DAIM-B1/6 and DAIM-B1/7

Explanation of the table

Column number	Description
1	Name of the State
2 to 4	Status of implementation of DAIM-B1/5 and DAIM-1/6 Elements where: FI – Fully Implemented, PI – Partially Implemented NI – Not Implemented, N/A – Not Applicable
5	Remarks — additional information, including detail of “FI”, “PI”, “NI” and “N/A”, as appropriate.

Table AIM III-5A - Provision of AIM products and services of ASBU elements DAIM-B1/5, DAIM-B1/6 and DAIM-B1/7 - ESAF

ESAF States	<i>DAIM-B1/5 - Provision of aerodrome mapping data sets</i>	<i>DAIM-B1/6 - Provision of digital instrument flight procedure data sets</i>	<i>DAIM-B1/7 - NOTAM improvements</i>	Remarks
	Aerodrome mapping data sets	Digital instrument flight procedure data sets	NOTAM of required quality	
1	2	3	4	5
Angola	NI	NI	PI	
Botswana	NI	NI	PI	
Burundi	NI	NI	PI	
Comoros	NI	NI	PI	
Djibouti	NI	NI	PI	
Eritrea	NI	NI	PI	
Eswatini	NI	NI	PI	
Ethiopia	NI	NI	PI	
Kenya	NI	NI	PI	
Lesotho	NI	NI	PI	
Madagascar	NI	NI	PI	
Malawi	NI	NI	PI	
Mauritius	NI	NI	PI	
Mozambique	NI	NI	PI	
Namibia	NI	NI	PI	
Rwanda	NI	NI	PI	
Seychelles	NI	NI	PI	
Somalia	NI	NI	PI	
South Africa	NI	NI	PI	
South Sudan	NI	NI	PI	
Uganda	NI	NI	PI	
United Republic of Tanzania	NI	NI	PI	
Zambia	NI	NI	PI	
Zimbabwe	NI	NI	PI	

Table AIM III-5B - Provision of AIM products and services of ASBU elements DAIM-B1/5, DAIM-B1/6 and DAIM-B1/7 - WACAF

WACAF States	<i>DAIM-B1/5 - Provision of aerodrome mapping data sets</i>	<i>DAIM-B1/6 - Provision of digital instrument flight procedure data sets</i>	<i>DAIM-B1/7 - NOTAM improvements</i>	Remarks
	Aerodrome mapping data sets	Digital instrument flight procedure data sets	NOTAM of required quality	
1	2	3	4	5
Benin	NI	NI	PI	
Burkina Faso	NI	NI	PI	
Cameroon	NI	NI	PI	
Cabo Verde	NI	NI	PI	
Central African Republic	NI	NI	PI	
Chad	NI	NI	PI	
Congo	NI	NI	PI	
Cote d'Ivoire	NI	NI	PI	
Democratic Republic of Congo	NI	NI	PI	
Equatorial Guinea	NI	NI	PI	
Gabon	NI	NI	PI	
Gambia	NI	NI	PI	
Ghana	NI	NI	PI	
Guinea Bissau	NI	NI	PI	
Guinea	NI	NI	PI	
Liberia	NI	NI	PI	
Mali	NI	NI	PI	
Mauritania	NI	NI	PI	
Niger	NI	NI	PI	
Nigeria	NI	NI	PI	
Sao Tome & Principe	NI	NI	PI	
Senegal	NI	NI	PI	
Sierra Leone	NI	NI	PI	
Togo	PI	PI	PI	

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Table MET III-3: AMET-B0/1 Meteorological observations products

Explanation of the Table

Column number	Description
1	Name of the State
2 to 10	Status of implementation of A MET-B0/1 MET observations products, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
11	Remarks

Table MET III-3A : AMET-B0/1 Meteorological observations products - ESAF

ESAF States	AWOS	MET REPORT /SPECIAL	METAR /SPECI	Lightning Information	Ground-based weather radar information	Meteorological satellite imagery	Aircraft meteorological report	Vertical wind and temperature profiles	VONA messages	Wind shear alerts	Remarks
1	2	3	4	5	6	7	8	9		10	11
Angola									N/A		
Botswana	FI								N/A		
Burundi									N/A		
Comoros											
Djibouti									N/A		
Eritrea											
Eswatini									N/A		
Ethiopia											
Kenya	FI								FI		
Lesotho									N/A		
Madagascar									N/A		
Malawi									N/A		
Mauritius	FI								N/A		
Mozambique									N/A		
Namibia	FI								N/A		
Rwanda	FI								N/A		
Seychelles	FI								N/A		
Somalia	FI								N/A		
South Africa	FI								N/A		
South Sudan									N/A		
Uganda	FI								N/A		
United Republic of Tanzania									N/A		
Zambia	FI								N/A		
Zimbabwe	FI								N/A		

Table MET III-3B: AMET-B0/1 Meteorological observations products - WACAF

WACAF States	AWOS	MET REPORT /SPECIAL	METAR /SPECI	Lightning Information	Ground-based weather radar information	Meteorological satellite imagery	Aircraft meteorological report	Vertical wind and temperature profiles	VONA Messages	Wind shear alerts	Remarks
1	2	3	4	5	6	7	8	9	10	11	
Benin	FI	FI	FI	FI	PI	FI	FI	FI	N/A	PI	
Burkina Faso	FI	FI	FI	FI	NI	FI	FI	FI	N/A	PI	
Cameroon	FI	FI	FI	FI	PI	FI	FI	FI	FI	PI	
Cabo Verde	FI	FI	FI	NI	NI	FI	FI	NI	FI	NI	
Central African Republic	FI	FI	FI	FI	PI	FI	FI	FI	N/A	PI	
Chad	FI	FI	FI	FI	NI	FI	FI	FI	N/A	PI	
Congo	FI	FI	FI	FI	FI	FI	PI	FI	N/A	FI	
Cote d'Ivoire	FI	FI	FI	FI	FI	FI	FI	FI	N/A	PI	
Democratic Republic of Congo	FI	FI	NI	NI	NI	NI	NI	NI	FI	NI	
Equatorial Guinea	FI	FI	FI	FI	PI	FI	PI	FI	N/A	PI	
Gabon	FI	FI	FI	FI	PI	FI	FI	FI	N/A	PI	
Gambia	FI	FI	FI	NI	NI	FI	NI	FI	N/A	NI	
Ghana	FI	FI	FI	NI	NI	FI	NI	FI	N/A	NI	
Guinea Bissau	FI	FI	FI	FI	NI	FI	PI	PI	N/A	PI	
Guinea	NI	NI	NI	NI	NI	NI	NI	FI	N/A	NI	
Liberia	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Mali	FI	FI	FI	FI	NI	FI	FI	FI	N/A	PI	
Mauritania	FI	FI	FI	FI	NI	FI	FI	FI	N/A	PI	
Niger	FI	FI	FI	FI	NI	FI	FI	FI	N/A	PI	
Nigeria	FI	FI	FI	FI	PI	FI	NI	FI	N/A	FI	
Sao Tome & Principe	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Senegal	FI	FI	FI	FI	FI	FI	FI	FI	N/A	FI	
Sierra Leone	NI	NI	NI	NI	NI	NI	NI	NI	N/A	NI	
Togo	FI	FI	FI	FI	NI	FI	FI	FI	N/A	NI	

Table MET III-4: AMET B0/2 Meteorological forecast and warning products

Explanation of the Table

Column number	Description
1	Name of the State
2 to 11	Status of implementation of AMET-B0/2 MET forecast and warning products, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
12	Remarks

Table MET III-4A: AMET-B0/2 Meteorological forecast and warning products - ESAF

ESAF States	WAFS	SIGWX	TAF	TREND	Take-off Forecast	VA Advisory	TC Advisory	SIGMET	Aerodrome Warning	Wind Shear Warning	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
Angola											
Botswana											
Burundi											
Comoros											
Djibouti											
Eritrea											
Eswatini											
Ethiopia											
Kenya											
Lesotho											
Madagascar											
Malawi											
Mauritius											
Mozambique											
Namibia											
Rwanda											
Seychelles											
Somalia											
South Africa											
South Sudan											
Uganda											
United Republic of Tanzania											
Zambia											
Zimbabwe											

Table MET III-4B: AMET-B0/2 Meteorological forecast and warning products - WACAF

WACAF States	WAFS	SIGWX	TAF	TREND	Take-off Forecast	VA Advisory	TC Advisory	SIGMET	Aerodrome Warning	Wind Shear Warning	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
Benin	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Burkina Faso	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Cameroon	FI	FI	FI	FI	FI	FI	N/A	N/A	FI	NI	
Cabo Verde	FI	FI	FI	FI	FI	FI	N/A	FI	FI	NI	
Central African Republic	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Chad	FI	FI	FI	FI	FI	N/A	N/A	FI	FI	FI	
Congo	FI	FI	FI	FI	FI	N/A	N/A	FI	FI	FI	
Cote d'Ivoire	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Democratic Republic of Congo	FI	FI	FI	FI	FI	NI	N/A	FI	FI	NI	
Equatorial Guinea	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	PI	
Gabon	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Gambia	NI	NI	NI	NI	NI	N/A	N/A	N/A	NI	NI	
Ghana	FI	FI	FI	FI	FI	N/A	N/A	FI	FI	NI	
Guinea Bissau	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Guinea	NI	NI	NI	NI	NI	N/A	N/A	NI	NI	NI	
Liberia	NI	NI	NI	NI	NI	N/A	N/A	FI	NI	NI	
Mali	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Mauritania	FI	FI	FI	FI	FI	N/A	N/A	N/A	FI	FI	
Niger	FI	FI	FI	FI	FI	N/A	N/A	FI	FI	FI	
Nigeria	FI	FI	FI	FI	FI	FI	N/A	FI	FI	FI	
Sao Tome & Principe	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Senegal	FI	FI	FI	FI	FI	FI	N/A	FI	FI	FI	
Sierra Leone	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Togo	FI	FI	FI	FI	FI	N/A	N/A	FI	FI	FI	

Table MET III-5: AMET B0/3 Climatological and historical meteorological Products

Explanation of the Table

Column number	Description
1	Name of the State
2 to 4	Status of implementation of AMET-B0/3 Climatological and historical meteorological Products, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
5	Remarks

Table MET III-5A : AMET B0/3 Climatological and historical meteorological Products - ESAF

ESAF States	Aerodrome climatological tables	Aerodrome climatological summaries	Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigations.	Remarks
1	2	3	4	5
Angola				
Botswana				
Burundi				
Comoros				
Djibouti				
Eritrea				
Eswatini				
Ethiopia				
Kenya				
Lesotho				
Madagascar				
Malawi				
Mauritius				
Mozambique				
Namibia				
Rwanda				
Seychelles				
Somalia				
South Africa				
South Sudan				
Uganda				
United Republic of Tanzania				
Zambia				
Zimbabwe				

Table MET III-5B: AMET B0/3 Climatological and historical meteorological Products - WACAF

WACAF States	Aerodrome climatological tables	Aerodrome climatological summaries	Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigations.	Remarks
1	2	3	4	5
Benin	FI	FI	FI	
Burkina Faso	FI	FI	FI	
Cameroon	FI	FI	FI	
Cabo Verde	FI	FI	FI	
Central African Republic	FI	FI	FI	
Chad	FI	FI	FI	
Congo	FI	FI	FI	
Cote d'Ivoire	FI	FI	FI	
Democratic Republic of Congo	NI	NI	NI	
Equatorial Guinea	PL	FI	FI	
Gabon	FI	FI	FI	
Gambia	NI	NI	NI	
Ghana	FI	FI	FI	
Guinea Bissau	FI	FI	FI	
Guinea	NI	NI	NI	
Liberia	NI	NI	NI	
Mali	FI	FI	FI	
Mauritania	FI	FI	FI	
Niger	FI	FI	FI	
Nigeria	FI	FI	FI	
Sao Tome & Principe	NI	NI	NI	
Senegal	FI	FI	FI	
Sierra Leone	NI	NI	NI	
Togo	FI	FI	FI	

Table MET III-6: AMET B0/4 Dissemination of meteorological products

Explanation of the Table

Column number	Description
1	Name of the State
2 to 9	Status of implementation of AMET-B0/4 Dissemination of meteorological products, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not applicable
10	Remarks

Table MET III-6A: AMET B0/4 Dissemination of meteorological products - ESAF

ESAF States	TAC	Gridded data	Graphical	BUFR	IWXXM	AFTN	AMHS	WIFS/SADIS	Remarks
1	2	3	4	5	6	7	8	9	10
Angola								FI	
Botswana								FI	
Burundi								FI	
Comoros								FI	
Djibouti								FI	
Eritrea								FI	
Eswatini									
Ethiopia								FI	
Kenya					FI			FI	
Lesotho									
Madagascar								FI	
Malawi								FI	
Mauritius								FI	
Mozambique								FI	
Namibia								FI	
Rwanda					PI			FI	
Seychelles								FI	
Somalia								FI	
South Africa					FI			FI	
South Sudan									
Uganda								FI	
United Republic of Tanzania								FI	
Zambia								FI	
Zimbabwe								FI	

Table MET III-6B: AMET B0/4 Dissemination of meteorological products - WACAF

WACAF States	TAC	Gridded data	Graphical	BUFR	IWXXM	AFTN	AMHS	WIFS/SADIS	Remarks
1	2	3	4	5	6	7	8	9	10
Benin	FI	FI	FI	FI	PI	FI	FI	FI	
Burkina Faso	FI	FI	FI	FI	PI	FI	FI	FI	
Cameroon	FI	FI	FI	FI	PI	FI	FI	FI	
Cabo Verde	FI	NI	NI	NI	NI	FI	FI	FI	
Central African Republic	FI	FI	FI	FI	PI	FI	FI	FI	
Chad	FI	FI	FI	FI	PI	FI	FI	FI	
Congo	FI	FI	FI	FI	PI	FI	FI	FI	
Cote d'Ivoire	FI	FI	FI	FI	PI	FI	FI	FI	
Democratic Republic of Congo	NI	NI	NI	NI	NI	FI	FI	FI	
Equatorial Guinea	FI	NI	NI	FI	NI	FI	FI	FI	
Gabon	FI	FI	FI	FI	PL	FI	FI	FI	
Gambia	NI	NI	NI	NI	NI	NI	NI	NI	
Ghana	FI	FI	FI	FI	NI	FI	FI	FI	
Guinea Bissau	FI	FI	FI	FI	NI	FI	FI	FI	
Guinea	NI	NI	NI	NI	NI	NI	NI	NI	
Liberia	NI	NI	NI	NI	NI	NI	NI	NI	
Mali	FI	FI	NI	FI	PL	NI	NI	NI	
Mauritania	FI	NI	NI	FI	PL	FI	FI	FI	
Niger	FI	FI	FI	FI	NI	FI	FI	FI	
Nigeria	FI	FI	PL	FI	PL	FI	FI	FI	
Sao Tome & Principe	NI	NI	NI	NI	NI	NI	NI	NI	
Senegal	FI	NI	NI	FI	PL	FI	FI	FI	
Sierra Leone	NI	NI	NI	NI	NI	NI	NI	NI	
Togo	FI	FI	FI	FI	FI	FI	FI	FI	

Table MET III-7A: AMET B1/1 Meteorological observations information - ESAF **

ESAF States	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Angola																										
Botswana																										N/A
Burundi																										N/A
Comoros																										
Djibouti																										N/A
Eritrea																										N/A
Eswatini																										N/A
Ethiopia																										N/A
Kenya																										
Lesotho																										N/A
Madagascar																										N/A
Malawi																										
Mauritius																										
Mozambique																										
Namibia																										N/A
Rwanda																										N/A
Seychelles																										
Somalia																										N/A
South Africa																										
South Sudan																										N/A
Uganda																										N/A
United Republic of Tanzania																										
Zambia																										N/A
Zimbabwe																										

Table MET III-7B: AMET B1/1 Meteorological observations information - WACAF **

ESAF States	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Benin	FI	NI	NI	FI	NI	NI	FI	FI	FI	FI	FI	FI	FI	NI	FI	NI	FI	NI	N/A	N/A	N/A	PL	NI	NI	N/A
Burkina Faso	FI	NI	NI	FI	NI	NI	FI	FI	FI	FI	FI	FI	FI	NI	FI	NI	FI	NI	N/A	N/A	N/A	PL	NI	NI	N/A
Cameroon	FI	FI	FI	FI	NI	NI	FI	FI	FI	FI	FI	FI	FI	NI	NI	NI	FI	NI	NI	FI	NI	NI	NI	NI	NI
Caboquark19 45 Verde	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A
Central African Republic	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	NI	N/A	NI	FI	NI	N/A	N/A	N/A	FI	N/A	NI	N/A
Chad	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	N/A	NI	NI	NI	N/A	N/A	N/A	N/A	FI	N/A	NI	N/A
Congo	FI	NI	NI	FI	NI	NI	FI	FI	FI	FI	FI	FI	FI	NI	NI	FI	FI	NI	N/A	N/A	N/A	FI	N/A	NI	N/A
Cote d'Ivoire	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	NI	NI	NI	FI	N/A	N/A	N/A	N/A	FI	FI	NI	NI
Democratic Republic of Congo	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Equatorial Guinea	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	N/A	N/A	N/A	N/A	NI	N/A	N/A	NI	NI	N	N	N/A
Gabon	FI	FI	FI	NI	NI	NI	NI	NI	NI	NI	FI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	NI	NI	NI	N/A	NI
Gambia	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Ghana	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Guinea Bissau	FI	FI	FI	FI	N D	FI	FI	FI	FI	FI	FI	N D	FI	FI	ND	FI	FI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Guinea	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Liberia	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mali	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	NI	NI	NI	NI	N/A
Mauritania	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	N/A	NI	NI	NI	NI

Niger	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	N/A	N/A	N/A	N/A	N/A	FI	N/A	NI	N/A
Nigeria	FI	NI	FI	FI	NI	NI	FI	FI	FI	FI	FI	FI	FI	NI	NI	FI	N/A	NI	NI	N/A	N/A	NI	NI	NI	N/A
Sao Tome & Principe	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Senegal	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	FI	NI	NI	NI	NI	NI	FI	FI	FI	N/A	N/A	N/A
Sierra Leone	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Togo	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A

****:** The following SWIM-compliant observational parameters and phenomena will begin to be made available to users and will include:

- A. Wind speed and direction (aerodrome) including gusts
- B. Wind speed and direction from departure to Top of Climb (TOC) and then Top of Descent (TOD) to landing
- C. Wind speed and direction en-route
- D. Air temperature and dew point temperature (aerodrome)
- E. Air temperature and dew point temperature (or equivalent, i.e. humidity) from departure to TOC and then TOD to landing (including the following derived outputs: freezing level, lower tropospheric temperature inversions)
- F. Air temperature and dew point temperature (or equivalent) en-route
- G. Pressure (aerodrome) (i.e. QNH/QFE)
- H. Visibility (aerodrome) (horizontal, slant, vertical), Runway visual range (RVR)
- I. Cloud type (of operational significance)
- J. Cloud coverage, bases, tops and layers
- K. Thunderstorms, Lightning, Convection (TCU & CB)
- L. Precipitation (ie. drizzle, rain, freezing rain, snow, hail)
- M. Weather (ie. dust storm, sand storm, funnel cloud, squall, smoke, haze, mist, fog)
- N. Icing, including airframe and engine
- O. Liquid Water Content, Iced Water Content
- P. Turbulence, Mountain waves, Wind shear
- Q. Fronts
- R. Radioactive clouds, Toxic chemicals
- S. Tropical cyclones
- T. Volcanic ash
- U. Sulphur dioxide (SO₂) and other hazardous gases
- V. Aerodrome surface (runway) temperature, state

- W. Sea temperature, state and wave height (seaports)
- X. Space weather events
- Y. Tsunami, Flood

Table MET III-8: AMET B1/2 Meteorological forecast and warning information **

Explanation of the Table

Column number	Description
1	Name of the State
2 to 26	Status of implementation of AMET-B1/2 Meteorological forecast and warning information, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable

Table MET III-8A: AMET B1/2 Meteorological Forecast and Warning information- ESAF **

ESAF States	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Angola																										
Botswana																										N/A
Burundi																										N/A
Comoros																										
Djibouti																										N/A
Eritrea																										N/A
Eswatini																										N/A
Ethiopia																										N/A
Kenya																										N/A
Lesotho																										N/A
Madagascar																										
Malawi																										
Mauritius																										
Mozambique																										
Namibia																										N/A
Rwanda																										N/A
Seychelles																										
Somalia																										N/A
South Africa																										
South Sudan																										N/A
Uganda																										N/A
United Republic of Tanzania																										
Zambia																										N/A
Zimbabwe																										

Table MET III-8B: AMET B1/2 Meteorological Forecast and Warning information- WACAF **

WACAF States	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Benin	FI	NI	NI	FI	NI	NI	FI	FI	FI	FI	FI	FI	FI	NI	FI	NI	NI	NI	N/A	N/A	NI	PL	NI	NI	NI	N/A
Burkina Faso	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	N/A	N/A	N/A	PL	N/A	NI	NI	N/A
Cameroon	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	FI	FI	NI	N/A	FI	NI	FI	NI	NI	NI	NI
Cabo Verde	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	FI	NI	NI	NI	NI	NI	NI
Central African Republic	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	NI	FI	NI	NI	NI	NI
Chad	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	FI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Congo	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	FI	N/A	FI	FI	FI	FI	FI	N/A	N/A	N/A	NI	NI	N/A
Cote d'Ivoire	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Democratic Republic of Congo	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	FI	FI	NI	N/A	FI	NI	NI	N/A	NI	NI	NI
Equatorial Guinea	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NI	NI	NI	NI	NI
Gabon	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Gambia	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Ghana	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Guinea Bissau	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	FI	FI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Guinea	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

WACAF States	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
I	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Liberia	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Mali	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	FI	FI	FI	FI	FI	FI	FI	NI	NI	N	NI	N/A		
Mauritania	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Niger	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	FI	FI	FI	FI	N/A	N/A	FI	N/A	FI	N/A	NI	N/A		
Nigeria	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	NI	NI	FI	N/A	NI	N/A	N/A	N/A	NI	NI	NI	NI	N/A	
Sao Tome & Principe	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Senegal	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	FI	FI	FI	FI	FI	N/A	FI	FI	FI	FI	NI	NI		
Sierra Leone	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	N I	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	
Togo	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	N/A	NI	NI	NI	NI	NI	NI	N/A	

****:** The following SWIM-compliant forecast parameters and phenomena will begin to be made available to users and will include:

- A. Wind speed and direction (aerodrome) including gusts and operationally significant wind shifts
- B. Air temperature and dew point temperature (aerodrome)
- C. Upper-level Wind (speed and direction), including departure to Top of Climb (TOC) and then Top of Descent (TOD) to landing
- D. Upper level Air temperature and dew point temperature or equivalent (i.e. humidity), including height of freezing level and lower tropospheric temperature inversions
- E. Flight level and temperature of tropopause
- F. Geopotential altitude for flight levels
- G. Pressure (aerodrome) (i.e. QNH, QFE)
- H. Visibility (aerodrome), Runway visual range (RVR)
- I. Cloud type (of operational significance)
- J. Cloud coverage, bases, tops and layers
- K. Thunderstorms, Lightning, Convection (TCU & CB)
- L. Precipitation (ie. drizzle, rain, freezing rain, snow, hail)
- M. Weather (ie. dust storm, sand storm, funnel cloud, squall, smoke, haze, mist, fog)
- N. Icing (airframe and engine),
- O. Liquid Water Content, Iced Water Content
- P. Turbulence, Mountain waves, Wind shear
- Q. Fronts
- R. Radioactive clouds, Toxic chemicals
- S. Tropical cyclones
- T. Volcanic ash
- U. Sulphur dioxide (SO₂) and other hazardous gases
- V. Aerodrome surface (runway) temperature, state
- W. Sea temperature, state and wave height (seaports)
- X. Space weather events
- Y. Tsunami, Flood

Table MET III-9: AMET B1/3 Climatological and historical meteorological information

Explanation of the Table

Column number	Description
1	Name of the State
2 to 4	Status of implementation of AMET-B1/3 Climatological and historical meteorological information, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
5	Remarks

Table MET III-9A: AMET B1/3 Climatological and historical meteorological information - ESAF

ESAF States	En-route winds**	Airport parameters (i.e., air and surface temperature, wind, precipitation, etc.)**	Historical Information on meteorological observations and forecasts and related metadata	Remarks
1	2	3	4	5
Angola				
Botswana				
Burundi				
Comoros				
Djibouti				
Eritrea				
Eswatini				
Ethiopia				
Kenya				
Lesotho				
Madagascar				
Malawi				
Mauritius				
Mozambique				
Namibia				
Rwanda				
Seychelles				
Somalia				
South Africa				
South Sudan				
Uganda				
United Republic of Tanzania				
Zambia				
Zimbabwe				

Table MET III-9B: AMET B1/3 Climatological and historical meteorological information - WACAF

WACAF States	En-route winds**	Airport parameters (i.e. air and surface temperature, wind, precipitation, etc.)**	Historical Information on meteorological observations and forecasts and related metadata	Remarks
1	2	3	4	5
Benin	PI	PI	PI	
Burkina Faso	PI	PI	FI	
Cameroon	PI	PI	PI	
Cabo Verde	NI	NI	NI	
Central African Republic	NI	NI	NI	
Chad	PI	PI	PI	
Congo	PI	PI	PI	
Cote d'Ivoire	NI	FI	FI	
Democratic Republic of Congo	NI	NI	NI	
Equatorial Guinea	NI	NI	NI	
Gabon	PI	PI	PI	
Gambia	NI	NI	NI	
Ghana	NI	NI	NI	
Guinea Bissau	NI	NI	NI	
Guinea	NI	NI	NI	
Liberia	NI	NI	NI	
Mali	PI	PI	PI	
Mauritania	PI	PI	PI	
Niger	PI	PI	PI	
Nigeria	FI	FI	FI	
Sao Tome & Principe	NI	NI	NI	
Senegal	PI	PI	PI	
Sierra Leone	NI	NI	NI	
Togo	NI	NI	NI	

****:** Characteristics of the climatological information will include:

- Averages (daily/monthly/yearly) over 10, 20, 30, 50 years
- Extremes over 1, 5, 10, 20, 30 years, since start of measurement

Table MET III-10: AMET B1/4 Dissemination of meteorological Information

Explanation of the Table

Column number	Description
1	Name of the State
2 to 6	Status of implementation of AMET-B1/4 Dissemination of meteorological information, where: FI – Fully Implemented PI – Partially Implemented NI – Not Implemented N/A – Not Applicable
7	Remarks

Table MET III-10A: AMET B1/4 Dissemination of meteorological information - ESAF

ESAF States	Gridded	Graphical	IWXXM	AMHS	WIFS/SADIS	Remarks
1	2	3	4	5	6	7
Angola						
Botswana						
Burundi						
Comoros						
Djibouti						
Eritrea						
Eswatini						
Ethiopia						
Kenya						
Lesotho						
Madagascar						
Malawi						
Mauritius						
Mozambique						
Namibia						
Rwanda						
Seychelles						
Somalia						
South Africa						
South Sudan						
Uganda						
United Republic of Tanzania						
Zambia						
Zimbabwe						

Table MET III-10B: AMET B1/4 Dissemination of meteorological information - WACAF

WACAF States	Impact-translated products	Gridded	Graphical	IWXXM	AMHS	WIFS/SADIS	Remarks
1	NI	NI	PI	FI	FI	6	7
Benin	NI	NI	PI	FI	FI	FI	
Burkina Faso	NI	NI	PI	FI	FI	FI	
Cameroon	NI	NI	NI	NI	NI	FI	
Cabo Verde	NI	NI	PI	FI	FI	FI	
Central African Republic	NI	NI	PI	FI	FI	FI	
Chad	NI	FI	PI	FI	FI	FI	
Congo	PI	FI	PI	FI	FI	FI	
Cote d'Ivoire	NI	NI	NI	NI	NI	FI	
Democratic Republic of Congo	PI	FI	PI	FI	FI	NI	
Equatorial Guinea	NI	FI	PI	FI	FI	FI	
Gabon	NI	NI	NI	NI	NI	FI	
Gambia	NI	NI	NI	NI	NI	NI	
Ghana	PI	FI	PI	FI	FI	Y	
Guinea Bissau	NI	NI	NI	NI	NI	FI	
Guinea	NI	NI	NI	NI	NI	NI	
Liberia	NI	FI	PI	FI	FI	NI	
Mali	NI	FI	PI	FI	FI	FI	
Mauritania	NI	FI	PI	FI	FI	FI	
Niger	NI	FI	PI	PI	FI	FI	
Nigeria	NI	NI	NI	NI	NI	FI	
Sao Tome & Principe	NI	FI	PI	FI	FI	NI	
Senegal	NI	NI	NI	NI	NI	FI	
Sierra Leone	NI	FI	PI	FI	FI	NI	
Togo	NI	NI	NI	NI	NI	NI	

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