



**ASSEMBLY — 39TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 36: Aviation safety and air navigation implementation support**

**STATUS OF IMPLEMENTATION OF THE  
ICAO AVIATION SYSTEM BLOCK UPGRADE (ASBU)**

Presented by the Agency for Air Navigation Safety in Africa and Madagascar (ASECNA)

**EXECUTIVE SUMMARY**

At its 37th session, the Assembly instructed ICAO to intensify efforts to meet global needs for interoperability of airspace while maintaining the focus on safety.

To this end, a planning framework has been implemented for global harmonization and interoperability, called "aviation system block upgrades" incorporated into the fourth edition of the Global Air Navigation Plan.

This information paper aims to inform of the current status of implementation of the ICAO Aviation System Block Upgrades (ASBU) for ASECNA member states as adopted in accordance with the Global Air Navigation Plan (GANP) and regional performance objectives.

<i>Strategic Objectives:</i>	This information paper relates to the Safety, Air Navigation Capacity and Efficiency, and Environmental Protection Strategic Objectives
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<i>Financial implications:</i>	N/A
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<i>References:</i>	Doc 9750, <i>Global Air Navigation Plan</i> A-38 Resolution relating to ASBU APIRG 19 and 20 relating to adoption of AFI Regional Air Navigation System implementation plan aligned with the ICAO Aviation System Block Upgrade (ASBU).
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<sup>1</sup> English and French versions provided by ASECNA

## 1. INTRODUCTION

1.1 The Global Air Navigation Plan (GANP) and the Aviation System Block Upgrade (ASBU) which is integrated in the GANP, provide a framework where future improvements on technologies and air navigation procedure are structured in a strategic consultative approach that coordinates specific global performance capabilities and the flexible upgrade timelines associated with each component.

1.2 The ASBU Modules are structured into blocks and their implementation must be in accordance with operational requirements of the area. ASBU framework and technologic roadmap are set in order to be sure all conditions of the planning activities at the national and the regional levels are met.

1.3 The AFI Region has adopted the classifications of the 18 Modules of the Block 0 into 4 categories which are: Essentials (E), the Desirables (D), Specifics (S) and Optional (O). With regards to the implementation two levels of priorities have been assigned: Priority 1 (Immediate Implementation) and Priority 2 (Recommended implementation).

1.4 ASECNA, as a the ANSP for 17 Western, Central and Indian Ocean African States, has aligned its Strategic Orientation Plan with the prescribed regional schedule for the implementation of the Block 0 modules in the AFI region with. The existing regional programme is intended for the enhancement of air navigation capacity and efficiency and the aviation safety, on behalf of the member states. As consequence of the adoption of the Block 0 modules by ICAO and therefore at the Regional level; ASECNA has updated its Investment Plan for Facilities and Services which implementation is described in the Appendix A attached to this information paper.

## 2. STATUS OF IMPLEMENTATION

2.1 ASECNA, as part of AFI Region, has participated in the 2 workshops relating to the implementation of the ASBU concept that was organised by ICAO, including the discussions relating to the Safety Key Performance Areas.

2.2 For ASECNA Area 12 modules of the Block 0 have been retained: 9 Modules of the priority 1 and 3 Modules of the priority 2.

## 3. ACTIONS BY THE MEETING

3.1 The meeting is invited to note the contents of this information paper including the **attached** implementation plan in Appendix A.

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**APPENDIX A**

**ASBU BLOCK 0 IMPLEMENTATION PLAN FOR ASECNA AREA**

PIA	Module	Module Title	Module description	Implementation Elements and Dates	Priority
Airport Operations	B0-65 APTA	Optimisation of Approach Procedures including vertical guidance	The use of performance-based navigation (PBN) to enhance the reliability and predictability of approaches to runways, thus increasing safety, accessibility, efficiency and capacity. This is possible through the application of basic global navigation satellite system (GNSS), Baro-vertical navigation (VNAV), satellite-based augmentation system (SBAS) and GBAS/GLS.	80% of ASECNA member states major airports with SID/STAR PBN RNP1 All ASECNA member states major airports' instrument runways with APV (Baro VNAV) except Bangui (Republic of Central Africa) and N'Djamena (Chad) airports waiting for safety validation GBAS is on-going Project with an inception phase at Dakar Airport SBAS is on-going Project organised with an implementation strategy	1
	B0-75 SURF	Safety and efficiency of Surface Operations (A-SMGCS Level 1-2)	Basic advanced-surface movement guidance and control systems (A-SMGCS) provides surveillance and alerting of movements of both aircraft and vehicles at the aerodrome, thus improving runway/aerodrome safety.	A-SMGCS already installed in Dakar and Nouakchott Oumtounsy new airports Extension on other airports planned on 2018	2
Globally Interoperable Systems and Data	B0-25 FICE	Increased Interoperability, efficiency and Capacity through Ground-Ground Integration	Improves coordination between air traffic service units (ATSUs) by using ATS interfacility data communication (AIDC) defined by ICAO's Manual of Air Traffic Services Data Link Applications (Doc 9694). The transfer of communication in a data link environment improves the efficiency of this process, particularly for oceanic ATSUs	Implementation includes activation of AIDC functionality on ATM Systems for 100% coordination between ACCs. Following links are already implemented: Antananarivo/Plaisance (Mauritius), Dakar/Abidjan, Niamey/ N'Djamena, N'Djamena /Brazzaville The links N'Djamena/Khartoum, Ouagadougou/Niamey will be implemented shortly. Full AIDC on December 2016 on ASECNA member States. AMHS already implemented at Lome, Cotonou, Nouakchott and Ouagadougou. For Ndjamen, Bamako Dakar, Brazzaville, Antananarivo, Niamey and EAMAC equipment have been installed, Configuration and SAT are planned for next step. Full AMHS to be completed on 2017.	1
	B0-30 DAIM	Service Improvement through Digital Aeronautical Information Management	The initial introduction of digital processing and management of information through, aeronautical information service (AIS)/aeronautical information management (AIM) implementation, use of aeronautical exchange model (AIXM), migration to electronic aeronautical information publication (AIP and better quality and availability of data.	Implementation elements include AFTN/AMHS, Migration of AIS to AIM (AIMANT Project) QMS for AIM implemented. ISO 9001 V2008 certified in all ASECNA member states WGS-84 campaign performed in 2015 e-TOD, AIXM and e-AIP Projects planned for 2017 Data Exchanges between systems in AIXM planned for 2018	1
	B0-105 AMET	Meteorological information supporting enhanced operational efficiency and safety	Global, regional and local meteorological information: a) Forecasts provided by world area forecast centres (WAFCs), volcanic ash advisory centres (VAACs) and tropical cyclone advisory centres (TCAC); b) Aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome, including wind shear; c) SIGMETs to provide information on occurrence or expected occurrence of specific en-route weather phenomena which may affect the safety of aircraft operations. This information supports flexible airspace management, improved situational awareness and collaborative decision-making, and dynamically-optimized flight trajectory planning. This Module includes elements which should be viewed as a subset of all available meteorological information that can be used to support enhanced operational efficiency and safety	Implementation elements include: QMS for MET implemented, ISO 9001 V 2008 certified in 2014 in all ASECNA member states WAFS (use of new products: Turbulence, icing, CB) Surveillance of tropical cyclones planned for 2017/2018 Wind shear detection project planned for 2017/2018 Thunderstorms warning and alert systems project planned for 2017/2018	1
Optimum Capacity and Flexible Flights	B0-10 FRTO	Improved Operations through enhanced en-route trajectories	Allow the use of airspace which would otherwise be segregated (i.e. Special Use Airspace) along with flexible routing adjusted for specific traffic patterns. This will allow greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight lengths and fuel burn	Implementation elements include SSR and ADS-B Replacement and densification of NAVAIDS 2014 to 2018 FUA, Indian Ocean Strategic Partnership to Reduce Emissions (INSPIRE) implemented in Antananarivo FIR through ASIO Project and User Preferred Routes (UPR) in Dakar oceanic implemented through AORRA. UPR routes implemented in continental parts of Dakar FIR, Niamey FIR, Brazzaville FIR, Ndjamen FIR which includes airspace for all member states except Comoros and Madagascar PBN implementation strategy in coordination with PBN national strategy	1

Optimum Capacity and Flexible Flights	B0-35 NOPS	Improved Flow Performance through planning based on a Network-wide view	Air traffic flow management (ATFM) is used to manage the flow of traffic in a way that minimizes delays and maximizes the use of the entire airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or flight information region (FIR)/sector boundaries and reroute traffic to avoid saturated areas. ATFM may also be used to address system disruptions including crisis caused by human or natural phenomena.	Implementation elements include reorganisation in the provision of navigation services, including ATFM planned for 2017	2
	B0-84 ASUR	Initial capability for ground surveillance	Provides initial capability for lower cost ground surveillance supported by new technologies such as ADS-B OUT systems. This capability will be expressed in various ATM services, e.g. traffic information, search and rescue and separation provision.	Implementation elements include: SSR and ATM systems densification on 2016 Total airspace surveillance coverage with ADS-B ground based to complete actual Radar coverage, will be completed on 2017. Study case and CBA for ADS-B space based for oceanic airspace and remote airspace planned after 2018 initial tests planned in 2016).	1
	B0-86 SNET	Increased Effectiveness of Ground based Safety nets	Monitors the operational environment during airborne phases of flight to provide timely alerts on the ground of an increased risk to flight safety. In this case, short-term conflict alert, area proximity warnings and minimum safe altitude warnings are proposed. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centred.	Implementation elements include: Ground-based safety nets implemented Short Term Conflict Alert, Area Proximity Warnings and Minimum Safe Altitude Warnings have been implemented. All CCR are equipped with automation systems (TOPSKY) with ADS-C/CPDLC, FDPS, FPASD, RDP, SDP functions	1
Efficient Flight Paths	B0-05 CDO	Improved flexibility and efficiency in descent profiles (CDO)	Performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas	Dakar and Abidjan airports as Pilots sites in 2014 Ongoing projects at Libreville, Brazzaville, Bamako airports to be completed on 2017 and other ASECNA airports to be completed in 2018	1
	B0-40 TBO	Improved safety and efficiency through the initial application of Data link en-route	Implements an initial set of data link applications for surveillance and communications in air traffic control (ATC), supporting flexible routing, reduced separation and improved safety.	ADS-C/CPDLC and Mode S Radar systems implemented in all ASECNA FIRs already implemented FUA, Indian Ocean Strategic Partnership to Reduce Emissions (INSPIRE) and User Preferred Routes (UPR) in oceanic airspace implemented HFDL and VDL Projects planned for 2017 D-ATIS and D-VOLMET Projects implementation on 2016	2
	B0-20 CCO	Improved flexibility and efficiency Departure profiles (CCO)	Implements continuous climb operations (CCO) in conjunction with performance-based navigation (PBN) to provide opportunities to optimize throughput, improve flexibility, enable fuel-efficient climb profiles, and increase capacity at congested terminal areas	Implementation elements include: Dakar and Abidjan airports as Pilots sites in 2014 Ongoing projects at Libreville, Brazzaville, Bamako airports to be completed on 2017 and other ASECNA airports to be completed in 2018 GNSS ongoing Implementation, Terminal NAVAID consolidation on airports. Completed in 2017/2018	1