



ICAO

**Twenty-Second Meeting of the AFI Planning and Implementation Regional Group
(APIRG/22)
(Accra, Ghana, 29 July – 2 August 2019)**

**Implementation Of A Seamless Sky
(Presented by ASECNA)**

SUMMARY	
<p>This working paper presents a methodology for the implementation of a seamless Sky for Africa, allowing to share a common method between all States and air navigation service providers, wishing to be part of a "seamless sky" approach.</p> <p>It is built on two expectations:</p> <ul style="list-style-type: none"> - Collaboration between stakeholders, to enable coordination and planning of the various steps and actions for the achievement of a uniform continuum airspace; - Internal and external interoperability, procedures, methods, ground and space systems necessary for air traffic management. <p>It proposes a gradual approach that begins with a "cooperative" model. Its implementation aims to create a homogeneous continuum of upper airspace that promotes harmonized air traffic management with the same level of performance and significant benefits for users, States and service providers.</p> <p>Action to be taken:</p> <ul style="list-style-type: none"> - Take into account the content of this note - Recommend to ANSPs that they adopt a Uniform Sky Approach. - Support the creation within APIRG of a "seamless Sky" taskforce to coordinate initiatives. 	
<i>Strategic Objectives</i>	A B, D and E

1 INTRODUCTION

1.1 Air navigation, whether national, regional or international, is governed by safety objectives and performance criteria whose standards and best practices are applied worldwide by ICAO. The multidimensional needs for improving air navigation, combined with the increasing pressure from airspace users to have the most optimal possible routes, are motivating all air transport operators to consider and look for an optimize traffic flow conditions while improving safety.

1.2 ICAO global air traffic growth forecasts predict a doubling of traffic volume every 15 years. The working group on traffic trends set up by the AFI region, estimates, according to its evaluation model for 2032, three major flow whose Africa/Africa would represent half of the aircraft movement:

- Africa/Africa: 46.2% ;
- Africa/Europe: 28.7%;
- Africa/Middle East: 22.5%.

1.3 Issues of punctuality, efficiency, competitiveness, performance, safety and environmental protection are therefore real challenges for the future of civil aviation and recommend pro-activity, that can be solved by an approach of a “seamless Sky”

1.4 The seamless Sky for Africa seeks to minimize the current fragmentation of African airspace and air traffic management system through measures based on several axes, institutional, regulatory, operational, technological and structural matters. Its implementation will allow, in a context of continuous traffic growth, the safe and efficient use of the airspace concerned, and will provide all users with efficient routes. These users can consequently achieve substantial fuel savings, reduce greenhouse gas emissions, while preserving and improving services to remote areas of the continent.

2. DISCUSSION

2.1. The purpose of a seamless Sky is to meet the current and future needs of African airspace in terms of safety, capacity, efficiency and environmental impact, while respecting the principle of State sovereignty.

2.2 It is essential in the feasibility of the seamless Sky to distinguish "Lower" and "Upper" airspaces. This gradual approach consists of giving priority to the upper airspace and allowing each stakeholder to decline the benefits induced in the lower airspace, in order to ensure the end-to-end continuity of flights and subsequent benefits.

2.3 The realization of the seamless sky can be done according to two distinct and complementary basic modes: The "cooperative" and the "fusion». These modes can then, depending on integration capacities, and following a chronological approach, be combined to reach different scenarios.

2.4 In this first mode named "cooperative" seamless sky, the aim is to preserve the existing airspace structure (FIR/UIR) and to propose a continuum of upper airspace based, on interoperability and a similar level of performance of the services provided to users

2.5 Taking into account the major stakeholders, each ANSP concerned should first be able to carry out an assessment of his current situation, a kind of snapshot of its context. This assessment must take into account all areas such as:

- The institutional, legal and regulatory framework: How to have common regulations (RSOOs), military and civil coordination in the flexible management of airspace, exceptional situations, etc.
- The issue of interoperability: the compatibility of equipment, protocols, software and data exchanges;
- The operational aspect: classification of airspace and routes, airspace separation (longitudinal and lateral separation), balance between demand and capacity, performance-based navigation (which navigation performance specification for which area of the continent and flight mode), aeronautical and meteorological information management (integration of all digital information);
- The technical aspect: communications (Networks, AMHS, SWIM, AIDC, Air/Ground, Ground/Ground, CPDLC), Navigation (conventional method, or satellite navigation), surveillance (Radar, MLAT, ABS-B, ADS-C);
- Structural and transcendent means (cyber resilience, security supervision, cost-benefit analysis, human resources);
- The level of aircraft on-board equipment. (All COM, NAV and SUR capabilities - aircraft and crew navigation specifications are defined in field 10 and 18 of flight plans)

2.6 The value of the assessment of the current situation is to allow each actor to properly measure the distance still to be covered in order to achieve the seamless sky objective with reference to the aviation system block upgrades (ASBU) of the Global Air Navigation Plan (GANP).

2.7 In order to be in order with the seamless Sky Standard for Africa, the ANSPs concerned must first determine their operational needs. Close collaboration with adjacent ANSPs is essential to coordinate the implementation of the various induced projects. It is also necessary to prioritize the implementation of a strategy to pool resources that already exist or are being deployed by the various stakeholders. The implementation of a seamless Sky For Africa requires significant investments, so to reduce these costs, the pooling of resources is necessary and constitutes a fundamental pillar for the integration of the upper airspace.

2.8 Many African ANSPs already have operational or are deploying infrastructure in place to provide air navigation services, including

- For communication services (COM), mention can be made of the existing main ground-to-ground satellite telecommunications networks such as SADC, NAFISAT, AFISNET, etc. These satellite networks can be extended if necessary to other ANSPs for their telecom needs. The AFISNET network is in the process of being upgraded to IP for greater efficiency, economy and simplicity of management. For Air/Ground communications, more and more means and supports are available to reinforce or complete VHF coverage, such as CPDLC, VDL mod2, SATCOM
- For surveillance services (SUR) several ANSPs such as ATNS for South Africa, SCAA for Seychelles and ASECNA are building a coverage of their airspace

- based on ADS-B satellite. Taking in account the performance and radio coverage of terrestrial sensors such as radars, ADS-B or WAM widely used in Africa, data and/or resources from ADS/B space base can be shared or exchanged.
- For Navigation Services (NAV), most of the existing conventional means are land-based. However, the GPS, Glonass and Galileo constellations allow GNSS procedures to be deployed. ASECNA is currently deploying a concrete project for a spatial augmentation system (A SBAS). This A SABS will make possible to operate vertically guided procedures, thus providing the possibility of ensuring approach and landing procedures at airports without ground-based navigation infrastructure and having the full range of PBN procedures available. As part of the Performance Based Navigation Plan (PBN), ICAO recommends the deployment of vertically guided approach systems on all IFR runways. The implementation of the A SBAS will make it possible to disengage expensive conventional means in operational maintenance, such as NDB beacons, VOR, and ILS Cat1.

3 ACTION BY THE MEETING

The meeting is invited to:

- take note of the information provided in this information paper;
- Recommend to ANSPs that they adopt a Uniform Sky Approach.
- Support the creation within APIRG of a "seamless Sky" taskforce to coordinate initiatives.