



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

Agenda Item 4: Other Air Navigation Issues

4.4 Initiatives by States and Industry and other Air Navigation Issues

AFI SEAMLESS OPERATION CONCEPT

(Presented by South Africa.)

SUMMARY	
<p>APIRG 21 Conclusion 21/08 called for all Regional Economic Communities and ANSP's to develop a clear and agreed roadmap, in consultation with users for the implementation of seamless, harmonized, interoperable Air Traffic Management Systems and Procedures with clear benefits to the aviation stakeholders.</p> <p>This paper, whilst addressing the requirement of the APIRG conclusion aims at defining seamless operations, highlighting the enablers and challenges for Seamless Operations, and addressing the possible benefits for the ATM Community.</p> <p>Action by the Meeting:</p> <ul style="list-style-type: none"> a) Endorse the Seamless Operations concept as discussed. b) Conduct a GAP analysis to establish regional infrastructures through the ICAO regional offices. c) Develop an AFI Monitoring and Implementation Dashboard (AMID) to monitor the infrastructure implementation in the region. d) Appoint implementation champions. e) States/ANSP's to develop their own implementation and monitoring dashboards. 	
<i>Strategic Objectives</i>	Safety, Air Navigation Capacity and Efficiency, Security and Facilitation, Economic Development of Air Transport and Environmental Protection.

1. INTRODUCTION

1.1 The ICAO Global ATM Operational Concept, Doc 9854, defined ICAO's vision of an integrated, harmonised and globally interoperable ATM system. This requires States and service providers to leverage on innovative technologies to transition from the historical "cross-border-focused traffic management mindset" to a more "global network orientated mindset" by providing seamless ATM service delivery. This will enable the "most ideal flight" by allowing for user preferred flight trajectories whilst improving capacity within airspace between gate to gate operations, which is optimal, efficient, safe and environmentally sustainable, without imposing undue restriction or delay on other airspace users.

1.2 The anticipated traffic growth and the challenges posed by the 4th Industrial Revolution together with new airspace entrances, Remotely Piloted Aircraft Systems, requires that the AFI region fast track the implementation of seamless operations. New tools and technologies

are one of the fastest drivers of change in ATM, from automation and artificial intelligence, to blockchain security, digital and remote towers and space-based surveillance. These offers opportunities to improve the safety and efficiency of air navigation services and improve performance. These initiatives must be implemented across borders for the ATM Community to realize the efficiencies associated with them.

1.3 In an increasingly complex operating environment and with a growing demand for cohesive operations and integrated services, the ATM industry must find ways to remove barriers and create harmonised airspace to realise seamless operations.

2. DISCUSSION

2.1. CAN SEAMLESS AIRSPACE BE ACHIEVED?

2.1.1 Seamless Airspace is defined as a contiguous airspace that is technically and procedurally interoperable, universally safe, and in which all categories of airspace users transition between Flight Information Regions, or other vertical or horizontal boundaries, without requiring a considered action to facilitate that transition and without any noticeable change in type or quality of service received, Air Navigation and communications performance standards and/or Standard practices to be followed. This translates to Airspace users flying from point A to B safely, efficiently, consistently predictably, cost effectively and using the optimal route and altitude without any delays.

2.1.2 No one company, organization, or State can make it happen. Industry partners, international organisations, regulators and States have important roles to fulfill. They can help harmonise standards, regulations and procedures. Collaborative Decision Making (CDM) and Air Traffic flow management (ATFM) are key to smooth and seamless flow and improving capacity.

2.1.3 At the heart of seamless operations is humans and we must recruit personnel for what we need for the future. This will need us to carefully determine what caliber of employees we will require for the future taking cognizant of 4th Industrial Revolution and the anticipated traffic growth across the region

2.1.4 Airport operators and related services have a huge role to play for seamless operations to be achieved. Their role in A-CDM is vital, as how passengers are processed will make seamless operations a reality.

2.2 PILLARS TO ACHIEVE SEAMLESS OPERATIONS

2.2.1 Making seamless operations a reality' is a huge and continuing task for the ATM industry and is central to our efforts to transforming global ATM performance. Achieving seamless operations is the cultural shift towards developing a mutual understanding among all partners of the aviation system in analyzing a situation and then coming to a jointly supported solution, which is then implemented in a synchronized way.

2.2.2 Growing traffic leading to capacity constraints, and fragmented airspace are due to restrictions, including those for military and conflict reasons; differences in ATM maturity, culture, business models, regulatory frameworks, standards, procedures, technologies across regions and across ANSPs; and differences between flight information regions or FIRs in terms of transition levels, language and procedure presents a challenge for seamless operations

2.2.3 **Interoperability of systems** is a critical challenge and States/ANSP will need to

collaborate with their neighbors when procuring new systems through a CDM to ensure that the systems are interoperable.

2.2.4 **Civil/military coordination** will have to be at a mature level.

2.2.5 **Sovereignty** is mostly a cultural acceptance, which says that States own the airspace above their territory, this means that a particular State controls that airspace and that another State cannot control that airspace. This acceptance will have to be adjusted to achieve seamless operations

2.2.6 **Technology** helps harmonize systems, processes and traffic flows without reference to land-based equipment. Digitization of air traffic control towers is improving safety and efficiency. Automation in ATM can reduce separation minima thus safely improving capacity. The timely exchange of information between aviation stakeholders, planes, airports and ATM systems is vital and system wide information management or SWIM will enable the provision of the right information at the right time, anywhere to the user or system that needs it. Air Traffic Services Inter-Facility Data Communication (AIDC) will enable automation of information across FIRs. Aeronautical Message Handling system (AMHS) in conjunction with the Aeronautical Telecommunications Network be the backbone and play a vital role in allowing efficient exchange of information and supporting ATS Interfacility Data Communications (AIDC).

2.2.7 **Airport infrastructure and passenger handling** will play a critical role in seamless operations. Rapid Exit Taxiways (RET) and Low Visibility Operations (LVO) including seamless security check points, boarding gateways, bag drops, and face biometrics passenger identification will greatly enhance capacity both at airports and surrounding airspaces. Air Traffic Flow Management (ATFM) which is already established through the **MOMBASA ATFM Plan** will fast track the seamless operations

2.2.8 Establishment of a **single AFI Billing systems and AFI overflights permission centre** will ensure seamless operations.

2.3 BENEFITS

2.3.1 Seamless operation will enable the concept of the most ideal flight that is safe, efficient, consistent, predictable, cost effective that uses the optimal route, same separation standard and altitude without any unreasonable delays.

2.3.2 Reduction of coordination failures through AIDC.

2.3.3 Meeting the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) targets.

2.3.4 Cheaper air travel.

2.3.5 Ensuring coordinated RPAS integration into segregated airspaces.

3 ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Endorse the seamless operations concept as discussed.
- b) Conduct a GAP ANALYSIS to establish regional infrastructure through the ICAO regional offices.
- c) Develop an AFI Monitoring and Implementation Dashboard (AMID) to monitor the infrastructure implementation in the region.
- d) Appoint implementation champions.
- e) States/ANSP's to develop their own implementation and monitoring dashboards.

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