

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**
**Fourth Meeting of the APIRG Airspace and Aerodrome Operations Sub-Group  
(AAO SG/4), Virtual Meeting, 16 to 18 August 2021**
**Agenda Item 3: Planning and Implementation**
**3.1 Airspace (Safety, Capacity and Efficiency) Projects**
**OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN EN-ROUTE AIRSPACE**

*(Presented by Secretariat)*

<b>SUMMARY</b>
<p>This paper presents status of PBN RNAV and RNP route implementation in the AFI region and initiates the process for optimization of the ATS route structure in en-route airspace.</p> <p><b>Action required is at paragraph 3.</b></p>
<p><b>REFERENCE(S):</b></p> <ul style="list-style-type: none"> <li>• APIRG/19 Report</li> <li>• AFI Air Navigation System Implementation Action Plan</li> <li>• SAT/17, SAT/18, SAT/22 and SAT/23 Reports</li> </ul>
<p><b>Related ICAO Strategic Objective(s):</b>  <b>Related ICAO Strategic Objective(s):</b> <b>A</b>-Safety, <b>B</b>-Air Navigation Capacity and Efficiency, <b>D</b>-Economic Development of Air Transport and <b>E</b>- Environmental Protection</p>

**1. INTRODUCTION**

1.1 The Nineteenth Meeting of the Africa-Indian Ocean (AFI) Planning and Implementation Regional Group (APIRG/19) was held in Dakar, Senegal, from 28 to 31 October 2013 adopted the Aviation Systems Block Upgrade (ASBU).

1.2 The Group reviewed adopted an AFI Air Navigation System Implementation Action Plan prepared by the ASBU Workshop, and agreed on the priorities, targets and metrics/indicators to measure implementation progress and operational improvements for all the 18 ASBU Block 0 Modules applicable to the AFI Region.

1.3 The Group adopted CONCLUSION 19/06 that states *inter alia*, that:

- a) *AFI States adopt the Regional Air Navigation System Implementation Plan aligned with the 18 Block 0 Modules of the ICAO Aviation System Block Upgrades (ASBU) Methodology, as provided at Appendix 3.0A to this report;*

- b) *That AFI States implement the adopted modules based on their operational needs, the categorization and the prioritization defined in the Action Plan;*
- c) *The Secretariat finalize the implementation targets set for the adopted ASBU Block 0 Modules, and ensure that these targets are aligned with existing regional programmes aimed at enhancing air navigation capacity and efficiency and aviation safety;*
- d) *The APIRG and the ICAO Regional Offices coordinate the implementation of the ASBU Block 0 Modules related to Safety Key Performance Area with regional aviation safety mechanisms (RASG-AFI, AFI Plan) and other relevant safety initiatives for the AFI Region;*
- e) *ICAO continually provide capacity building through workshops and seminars to AFI States and regional stakeholders as the needs arise in the different levels of ASBUs*

1.4 To optimize the ATS route structure in en-route airspace, APIRG/19 urged for the development of airspace concept based on AFI PBN regional implementation plan, in order to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN RNAV 5 implementation, and taking into account interregional harmonization. The target date for PBN RNAV 5 implementation was December 2017.

## **2. DISCUSSION**

2.1 Through the AFI PBN Route Network Development Working Group, AFI Region has implemented a considerable number of PBN RNAV 10 routes in Oceanic airspaces as well as some continental airspace. The most recent was the Accra Route Lab concept that planned and coordinated the RNAV 10 or RNP 10 routes in July 2020.

2.2 It has been noticed that some States have implemented RNAV 5 routes in some continental airspace in line with APIRG Conclusion 19/06 and in the spirit of the AFI systems implementation plan. The efforts made by the States concerned are commendable. However, in most cases, the implementation process lacked the required prior-coordination with adjacent States and the ICAO regional offices to achieve an interregional harmonization.

2.3 It is important to note that the aircraft that operate along RNAV 5 routes are the same that operate on RNAV 10 routes in the region.

2.4 Following the implementation of AORRA phases I, II and III, Transition Routes and Gates in Oceanic airspace over the South Atlantic were based on RNAV 10, the implementation of RNP 4 has been agreed as the appropriate concept to provide further improvements in Oceanic airspace.

2.5 The FIRs that constitute the EUR/SAM Corridor Airspace have adopted RNP 4 as part of their airspace concept to enable them to address capacity constraints and optimal Flight Level allocation challenges in the airspace.

2.6 The AFI systems implementation plan provides for the development of airspace concept based on the AFI PBN roadmap, in order to design and implement optimized standard instrument departures (SIDs), standard terminal arrival routings (STARs), holding and associated instrument flight procedures on the basis of PBN and, in particular RNAV 1 and RNP 1.

2.7 The following table indicates the Nav Specs as well as ground and airborne requirements for the implementation of RNA 5, RNP 4, RNP 2 and RNP 1.

<b>Airspace</b>	<b>Nav. Specifications</b>
En-Route Oceanic	RNAV 10 / RNP 4
En-Route Remote Continental	RNAV 10 / RNP 4
En-Route Continental	RNAV 2, RNP 2, RNAV 5
TMA Arrival/Departure	RNAV 1, or RNP 1

2.8 The AAO SG is urged to note the elapsed timelines for the implementation of RNAV 5, RNP 4, RNP 2 and RNP 1 in the AFI region and propose a roadmap for optimization of the ATS route structure in en-route airspace considering benefits afforded by RNAV 5, RNP 4, RNP 2 and RNP 1.

2.9 The AAO SG may consider the need for a survey to be conducted with IATA support to determine the level of equipage and capability of fleets as part of the implementation prerequisites.

### **3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) Note the information in the paper;
- b) Review the provisions and timelines in the AFI systems implementation plan relating to RNAV 5 in addition to requirements for RNP 4 and RNP 2 in the AFI region and decide on a revised implementation roadmap.
- c) Urge States and IATA to conduct equipage survey relating to RNAV 5, RNP 4 and RNP 2 implementation for optimization of the ATS route structure in en-route airspace; and
- d) Decide on further actions required or necessary for the optimization of the ATS route structure in the AFI en-route airspace.

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