



| ICAO

CAPACITY & EFFICIENCY

The AFI Inter-Regional ATM Coordination Meeting

Free Route Air Space—UPDATE

Presented by: Louis Mancienne

Virtual / 28 June – 2 July 2021





GLOBAL AIR NAVIGATION PLAN (DOC 9750)



2016–2030
Global Air Navigation Plan



Performance Improvement Area 3:
Optimum capacity and flexible flights – through global collaborative ATM



Performance Improvement Area 3: Optimum capacity and flexible flights – through global collaborative ATM

BLOCK 0

B0-FRTO

Improved operations through enhanced en-route trajectories

To 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 length and fuel burn.

BLOCK 1

B1-FRTO

Improved operations through optimized ATS routing

Introduction of free routing in defined airspace, where the flight plan is not defined as segments of a published route network or track system to facilitate adherence to the user-preferred profile.



APIRG CONCLUSION

APIRG/22 Conclusion 22/36: Free Routing Airspace

That, in order to foster the concept of free routing in the AFI continental airspace in preparation for the ASBU BI module,

a) States consider incorporating Free Route Airspace concept into their national airspace concept and ATM Master Plan in line with the BI-FRTO ASBU module and AAO Sub-Group project plans; and

b) East African States including, Seychelles, Mauritius, Kenya, Ethiopia, Tanzania and Uganda develop and implement Free Route Airspace as a case study for implementation of Free Routing Airspace in AFI Region as part of BI-FRTO ASBU module.



International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Eastern and Southern

Ref.: ES AN 1/6 - 0239

Chief Executive Officer
Seychelles Civil Aviation Auth
Victoria, Mahe, Seychelles
E-mail: galbert@scaa.sc [secret](#)

International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Eastern and Southern African Regional Office/Bureau régional Afrique orientale et australe

Ref.: ES AN 1/6 – 0395

28 August 2020

Subject: AFI Region I
Management T

Subject: **First Meeting of the AFI Region Free Routing Airspace (FRA), East African States Project Management Team (PMT) - ESAF FRA PMT/1 (Virtual 16 September 2020).**

Action required: *Nominate Pr*

Requirement: *Confirmation of participation by 4 September 2020*

Dear Sir,

Dear Sir / Madam,

I wish to refer to
APIRG/22 Concl

I wish to refer to my letter Ref: ES AN 1/6 - 0239 that required your Administration to nominate a Free Routing Airspace (FRA) Project Manager (PM) in preparation for the implementation of APIRG/22 **Conclusion 22/36**, quoted here below:

That, in order to,
preparation for it

APIRG/22 Conclusion 22/36: Free Routing Airspace

a) *States consid*
airspace con
and AAO Su

That, in order to foster the concept of free routing in the AFI continental airspace in preparation for the ASBU B1 module,

b) *East African*
and Uganda
implementat
ASBU modu

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Reference is m
Organizations are to nominat
State/Organisation level, for tl
implementation of the free rout

Following the nomination of the Project Managers by states concerned, the Project Management Team (PMT) is ready to commence the implementation process. In this regard, the first meeting (virtual) of the PMT is organized to take place on **16 September 2020**.

This first meeting will establish the work modalities and the Terms of Reference for the PMT.

United Nations Office at Nairobi Complex, Gigiri
P.O. Box 46294-00100 GPO
Nairobi, Kenya

- State Letter Ref: ES AN 1/6 - 0239, dated 15th April 2020

- Nomination of Project Manager by 31st May 2020

- State Letter Ref.: ES AN 1/6-0395, dated 28th August 2020

- Confirmation of participation in 1st meeting



SUB-COMMITTIES FORMED

- To further review the Terms of Reference (TOR)
- Review the Draft Concept of Operation (CONOPS)
- To develop the Gap analysis questionnaire



TERMS OF REFERENCE (TOR)

- The review of the ToR has been completed and distributed to all members of the PMT



AFI FRA CONOPS: Achievements to date

ATTACHMENT 2

1st Edition: AFI FRA CONOPS

CONOPS for Free Route Airspace (FRA) implementation in AFI region-1st Edition

The Free Route operational concept AFI

0-Background

Navigation Evolution

At the earlier stages of flying, pilots used visual markers to navigate from one point to another e.g. landmarks, rivers, mountains and cities etc. Later, as a result of invention of navigational aids e.g. Non-Directional Beacon (NDB), VHF Omnidirectional Range (VOR) and Distance Measuring Equipment (DME) traditional navigation was improved. In modern times, a more accurate navigation systems have been made available to pilots e.g. satellite-based navigation systems such as Global Position Systems (GPS), with far much better accuracy. Equipped with both Flight Management System (FMS) on-board aircraft and satellite-based navigation system, pilots can now navigate through a user preferred route trajectory (UPR) without reference to ground systems under the performance-based navigation (PBN) criteria and within a level of precision that was not available before.

Fuel and Flight Efficiency

Based on the above, is there a need to continue to confine flights to published routes? The answer is not so simple. Depending on the complexity of the airspace and the existing air traffic management (ATM) infrastructure, aircraft can be flown directly from one waypoint to the next without reference to ground equipment. This, therefore, can provide opportunities for efficiency improvements in terms of reduced track miles, time and fuel, which can be further translated into reduced maintenance costs.

How can we then achieve direct-direct routing operations (**DRO-Direct Routing Operation**) which can be transitioned into **Free Routing Airspace-FRA**? Working with strategic aviation stakeholders, including ICAO, IATA, AFRAA, CANSO, IFALPA, IFATCA, EAC, ECOWAS etc.; a project management approach to implement DRO towards FRA is necessary in order to enable Africa to transit from fixed routes to free routing airspace without compromising safety of the provision of ATS and flight operations.

- 1st edition -AFI FRA Concept of Operation (CONOPS) completed.



AFI FRA CONOPS : 2021

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- The 2nd Edition of the AFI FRA CONOPS is expected to be released by end 2021-this amendment will focus mainly on :

- FRA - AIP Publication – in progress

As there are many AFI States candidates which are ready to implement FRA in 2021.



AFI FRA CONOPS : 2022 Projects

ATTACHMENT 2

1st Edition: AFI FRA CONOPS

CONOPS for Free Route Airspace (FRA) implementation in AFI region-1st Edition

The Free Route operational concept AFI

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- The next amendments will provide more information on the following topics :
 1. Steps to consider when removing some fixed ATS routes
 2. Connection between FRA upper airspace and SIDs and STARs (COO, CDO)



Gap analysis

The objective of the gap analysis is to carry out a State-by-State evaluation of the current status of implementation of infrastructure necessary for FRA.



THE APPROACH TO GAP ANALYSIS

- Develop a gap analysis checklist
- Conduct the assessment for each states score and report on agreed scorecard
- Develop regional (sub-regional) and national action plans using an impact effort matrix



AREAS OF FOCUS

Airspace organization

Traffic Characteristics

Airspace Characteristics

OPERATIONAL NEEDS

- Operational procedures and technologies
- Aircraft capabilities
- ATS capabilities



FRA Gap Analysis Tool

Theme	Query	Remarks
Airspace Structure	<p>Which practices are currently in place within your FIR?</p> <p><input type="checkbox"/> Fixed ATS Route Network (ARN)</p> <p><input type="checkbox"/> Published Direct Routing Operations (DRO)</p> <p><input type="checkbox"/> Unpublished Direct Routing Operations (UDRO)</p> <p><input type="checkbox"/> Free flight</p>	
Communication capabilities	<p>Which communication capabilities do you have? Please specify the capabilities you have:</p> <p><input type="checkbox"/> VHF Transaction time in sec: Availability in %: Continuity in %: Integrity in %:</p> <p><input type="checkbox"/> CPD Transaction time in sec: Availability in %: Continuity in %: Integrity in %:</p> <p><input type="checkbox"/> HF Transaction time in sec: Availability in %: Continuity in %: Integrity in %:</p> <p>Others.....</p>	
Surveillance capabilities	<p>Do you have surveillance capabilities? If Yes, please specify the surveillance capabilities you have based on the specific parameters below;</p>	Surveillance capabilities

There is a Survey Monkey Tool available for this on the following link - <https://www.surveymonkey.com/r/8DJPK8S>

Theme	Query	Remarks
	<p>If No, please specify alternative/equivalent measures you have in place and the estimated period to deploy surveillance if planned.....</p> <p><input checked="" type="checkbox"/> ADS B (ground/space) Surveillance data delivery time in seconds: Availability in %:</p> <p>Availability in %: Continuity in %: Integrity in %</p> <p>• Does your SSR have MODE-S capability? YES.....NO.....</p> <p><input type="checkbox"/> MLAT Surveillance data delivery time in seconds: Availability in %: Continuity in %: Integrity in %</p> <p>Others.....</p> <p>Is total surveillance coverage achieved throughout your Airspace? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	



International Civil Aviation Organization Organisation de l'aviation civile internationale Organización de Aviación Civil Internacional Международная организация гражданской авиации منظمة الطيران المدني الدولي 国际民用航空组织

Eastern and Southern African Regional Office/Bureau régional Afrique orientale et australe

Ref: ES AN 1/6 – 0100

8 April 2021

Subject: The Free Routing Airspace (FRA) Gap Analysis

Requirement: Provide feedback by 31 May 2021

Dear Sir / Madam,

I wish to refer to my letter **Ref: ES AN 1/6 - 0395** requesting your State Project Manager (PM) to attend a virtual meeting to develop the implementation road map for the AFI Free Routing Airspace (FRA) in line with APIRG/22 **Conclusion 22/36, Free Routing Airspace**.

The Project Management Team (PMT) that met on 16 September 2020 commenced the work of developing the road map and subsequently the team has generated a **Gap Analysis Tool** to help collect data on States' preparedness to implement FRA (see attachment).

I therefore request your Administration to fill the attached tool, which will be used to complete the analysis and propose the best way forward in achieving the APIRG Conclusion. It would be appreciated if as much details as possible are provided in the tool. The tool is also available on this survey monkey link: https://www.surveymonkey.com/r/Preview/?sm=3CzP166ETNuFuWD9Ord2CNEEJetf9yXi_2FWdFyCzfsWZO7XUx_2B_2BWJ6iyGBKFFJKJ. You are free to use your most preferred method in providing the data to ICAO.

The Feedback is to be forwarded to the ICAO ES/AF or WACAF Regional Offices by the following email addresses: icaoesaf@icao.int or icao-wacaf@icao.int and copies to kogutu@icao.int; ataylor@icao.int and manyango@icao.int preferably not later than **31 May 2021**.

Yours sincerely,

Barry Kashambo
Regional Director

Attachment:
FRA Gap Analysis Tool

Completed and circulated to states

States are urged to complete the checklist without further delay to allow timely completion of the assessment



STATUS REPORT

ESAF	Tool	WACAF	Tool
Angola	Form	Benin	Form
Madagascar	Form	Ghana	Form
Mauritius	Form	Senegal	Form
Namibia	Form	DRC	Form
South Africa	Form		
Uganda	Form		



Coordination

If everyone is moving forward together then the success takes care of itself.



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CAPACITY & EFFICIENCY



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(NACC) Office
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(SAM) Office
Lima

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Dakar

European and
North Atlantic
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Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU