

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG)



INFRASTRUCTURE & INFORMATION (IIM) SUB-GROUP

NAVIGATION PROJECT

RADIO NAVIGATION AIDS & GNSS:

IMPLEMENTATION OF CONVENTIONAL NAV'AIDS AND GNSS (CORE AND AUGMENTED) AIMED AT ENABLING THE IMPLEMENTATION OF PBN.

QUESTIONNAIRE

Version 2.0

STATE CONTACT NAME	
CONTACT DETAILS (Name and email)	

1. PURPOSE

The target of this questionnaire is to collect data to determine the implementation status of conventional Nav'Aids and GNSS-core and augmented by member States of the AFI region. The goal being the assessment of the implementation and operational status of these systems which are aimed at enabling the implementation of Performance based Navigation within the region, in line with the regional air navigation plan.

The survey is expected to assemble ample data for the following metric as a minimum:

a) Conventional Nav'Aids:

- Number of En-Route conventional radio navigation station (VOR, DME) implemented : X
- Average availability of VOR and DME station : **X%**
- Number of approach and landing radio navigation station (LOC/Glide/DMEs) implemented: **X**
- Average availability of LOC/Glide/DME stations : **X%**
- Number of runway ends equipped with LOC/GLIDE on both ends: X

b) GNSS:

- Number of FIRs with National Regulation on GNSS promulgated: **X**
- Number of GBAS stations deployed: **X**
- Number of SBAS deployed: **X**
- Number of Aerodromes with Augmented GNSS Systems (ABAS/GBAS/SBAS) implemented , **X**
- Percentage of fleet operating Augmented GNSS in Approach and landing phases: **X%**
- Percentage of fleet operating GNSS En-Route : **X%**
- Number of published PBN of procedures based on GNSS: **X**
- Number of GNSS interferences: **X**

2. PROJECT OBJECTIVE

Assist/accompany States in the implementation of:

- a) Conventional navigation aids (VOR/DME, NDB, ILS)
- b) Global Navigation Satellite System (GNSS Core and Augmented);

in accordance with the operational requirements of relevant ICAO SARPs as well as ISO/OSI standards and protocols.

3. PROJECT SCOPE

The project covers all phases of flight and relies on the implementation scheme which is in accordance with the provisions of Aeronautical Radionavigation Services as defined in the AFI Air Navigation Plan (AFI/RAN Abuja 1997).

4. PROJECT STRATEGY

Led by Cameroon, APIRG IIM/SG Nav project team coordinator, delegates designated by team member states carry out the activities of the project under the supervision of the ICAO WACAF and ESAF Regional Offices (RO/CNS). The team reports the work done in a project report to the APIRG facilitators. The facilitators submit the final project document to the APIRG Project Coordination Committee for approval if need be.

5. RATIONALE / JUSTIFICATION

- a) Ensure that the radionavigation aids and GNSS are installed in the region in accordance with the AFI Air Navigation Plan.
- b) Follow up the operational status of GNSS En-route in continental remote and oceanic air spaces to enable the implementation of RNAV and RNP so as to take full advantage of the benefits of PBN/

SECTION A: Implementation of conventional navigation aids

1. En-route Conventional Radio Navigation Stations

a. Has your State implemented En-route conventional radio navigation stations (NDB, VOR, DMEs)?

Yes

No

b. If yes, how many?

NAVAID	Implemented	Required
VOR		
NDB		
VOR/DME (Co-located)		
DME/DME		

c. What are the coordinates (Location) of your NDB/VOR/DME Stations?

Facility	Latitude	Longitude	Antenna height (m)	Location (City or Airport)/ ICAO Code
Facility 1				
Facility 2				
...				
...				
Facility 2				

d. On a scale of 0 – 100%, how would you rate the average availability of your NDB/VOR/DME Stations in the last one year?

Facility	Availability (In %)
Facility 1	
Facility 2	
...	
...	
Facility 2	

e. Do you have additional comments regarding the availability of your radio navigation Stations (NDB/VOR/DME)?

2. Approach and Landing Radio Navigation stations

a. Has your State implemented Approach and landing radio navigation stations (LOC/Glide/DMEs)?

Yes

No

b. If yes, how many?

NAVAID	Number implemented	Number required
LOC		
GLIDE/DME		

c. What are the coordinates (Location) of your Approach and landing radio navigation stations (LOC/Glide/DMEs)?

Facility	Latitude	Longitude	Antenna height (m)	Location (City or airport)/ICAO CODE
Facility 1				
Facility 2				
...				
...				
Facility 2				

d. On a scale of 0 – 100%, how would you rate the average availability of your Approach and landing radio navigation stations (LOC/Glide/DMEs) in the last one year?

Facility	Availability (In %)
Facility 1	
Facility 2	
...	
...	
Facility 2	

e. Do you have additional comments regarding the availability of your Approach and landing radio navigation stations (LOC/Glide/DMEs)?

3. Replenishing of NAVAIDS (replacement plan of NAVAIDS)

a. Are there any plans of NOT replacing the current NAVAIDS in questions 1c and 2c once their end of life reaches?

Yes

No

b. If YES, how many of the following will be affected?

NDB:.....

DME:

DVOR:

LOC/GP (ILS):

Do you plan to have any new NAVAIDS installed?

Yes

No

c. If YES, which type of NAVAIDS do you intend to install

DVOR

NDBs

DME

LOC/GP (ILS)

d. And when shall the installation be undertaken

in the next 0-5 years

in the next 5- 10 years

in the next 10- 15 years

e. Are there any Aerodromes that the state would like to have NAVAIDS installed at but are unable to due to GEOGRAPHICAL or FINANCIAL constraints?

Yes

No

f. If YES, please list the FIRs/Aerodrome

	Location (City or airport)
Facility 1	
Facility 2	
...	
...	
Facility 2	

SECTION B: Implementation of Augmented GNSS

1. AUGMENTED GNSS

a. Has your State/FIR promulgated National Regulations related to Global Navigation Satellite System (GNSS)?

Yes

No

b. Are there Aerodromes in your State with implemented GNSS Augmentation Systems (GBAS/SBAS)?

Yes

No

c. If yes, how many?

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f. What are the Aerodromes with implemented GNSS Augmentation Systems (GBAS/SBAS)?

	SBAS	GBAS
Aerodrome 1		
Aerodrome 2		
...		
...		
Aerodrome n		

d. Has your State developed and implemented Global Navigation Satellite system (GNSS) procedures for the existing aerodromes?

Yes

No

e. If yes, how many?

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g. What are the developed and implemented Global Navigation Satellite system (GNSS) procedures for the existing aerodromes?

	Procedure 1	Procedure 2	---	Procedure n
Aerodrome 1				
Aerodrome 2				
...				
...				
Aerodrome n				

f. Has your State promulgated National regulations related to PBN operations?

Yes

No

g. Has your State developed and published a Performance Based Navigation (PBN) implementation Plan?

Yes

No

h. If yes, on a scale of 0 – 100%, how would you rate the average implementation level of the published Performance Based Navigation (PBN) implementation Plan?

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i. How many aircraft operating GNSS En-Route are registered in your State?

Number of aircraft with GNSS	
Total number of registered aircraft	

- j. How many aircraft operating Augmented GNSS in Approach and landing phases are registered in your State?

Number of Aircraft with augmented GNSS	
Total number of registered aircraft	

- k. List the different aircraft which are augmented GNSS equipped

Type of Aircraft	Number	GBAS	SBAS	GBAS/SBAS	ABAS/GBAS/SBAS
Aircraft 1					
Aircraft 2					
...					
...					
Aircraft					

- l. Do you have additional comments regarding the implementation of the GNSS and PBN in your State? *(Attach additional sheets for details if need be.)*

2. Mitigation of GNSS interference

- a. Have you recorded any complaints on GNSS interference?

Yes

No

- b. If YES (you recorded any complaints on GNSS interference), how many of such complaints have been recorded?

.....

- c. And which phases of flight have been affected?

En-route

Approach

Landing

d. Do you have measures put in place to mitigate the occurrence of such interferences?

Yes

No

e. If YES, What Measures are in place?

.....
.....
.....

f. If NO, do you plan to install any GNSS monitoring systems?

Yes

No