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African Flight Procedure Programme

12th Meeting of the African Flight Procedure Programme Steering Committee

Ouagadougou, Burkina Faso, 15 - 17 July 2026

Agenda Item 3: Review of the Programme implementation status

Working Paper 3.3: PBN implementation status in Africa and challenges

(Presented by the Secretariat)

EXECUTIVE SUMMARY

This paper presents the status of Performance-Based Navigation (PBN) implementation across Africa based on information reported by ICAO Regional Offices and the renown data bases. It reviews the implementation of National PBN Implementation Plans, PBN approach procedures, Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs), while highlighting the differences between ICAO regions serving Africa.

The paper also identifies key challenges affecting sustainable PBN implementation and the root causes of Significant Safety Concerns (SSCs) related to the PANS-OPS domain. It concludes with proposed actions aimed at accelerating implementation and strengthening States' oversight capabilities.

Action by the meeting is indicated in section 3.

REFERENCES

- Phase IV project document
- Project quarterly reports
- Foreflight data base

1. INTRODUCTION

- 1.1 ICAO Assembly Resolution A37-11 urges States to implement Performance-Based Navigation (PBN) in accordance with the ICAO Global Air Navigation Plan (GANP) and Doc 9613 - Performance-Based Navigation (PBN) Manual.
- 1.2 The implementation of PBN remains one of the principal enablers for improving aviation safety, operational efficiency, airport accessibility, environmental sustainability and airspace capacity.



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- 1.3 The African Flight Procedure Programme (AFPP) continuously monitors the maturity of PBN implementation throughout the Africa to identify implementation gaps and prioritize capacity-building activities.

2. DISCUSSION

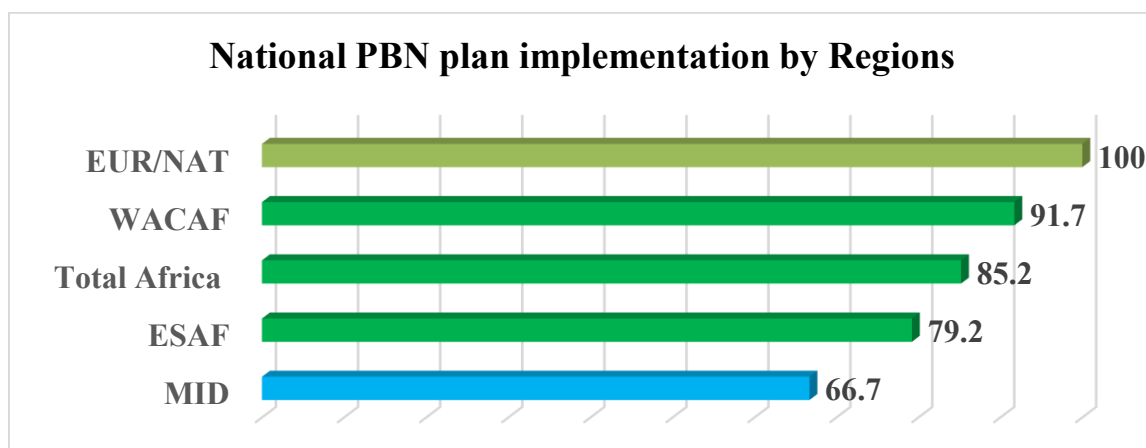
- 2.1 The review of the PBN implementation status focusses on the National PBN Implementation Plans, PBN approach procedures, Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs), while highlighting the differences between ICAO Regions serving Africa.

2.2 National PBN Implementation Plans

- 2.2.1 A National PBN Implementation Plan constitutes the strategic framework guiding States in the systematic deployment of PBN procedures.
- 2.2.2 Based on information available to ICAO, implementation has reached encouraging levels across Africa.
- 2.2.3 It should nevertheless be noted that figures presented below reflect only information officially communicated to ICAO. Some States may already have developed or updated their implementation plans without formally notifying ICAO Regional Offices.

Table 1: National PBN plan implementation by Region

ICAO Region	Value (%)
ESAF	79.2%
EUR/NAT	100.0%
MID	66.7%
WACAF	91.7%
Total Africa	85.2%





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2.2.4 States yet to communicate a National PBN Plan:

- a) ESAF:
 - 1) Burundi;
 - 2) Djibouti;
 - 3) Eritrea;
 - 4) Lesotho; and
 - 5) South Sudan.
- b) MID:
 - 1) Libya.
- c) WACAF:
 - 1) Central African Republic; and
 - 2) Guinea Bissau.

2.3 Implementation of RNP APCH Procedures

2.3.1 The deployment of RNP APCH procedures has considerably improved accessibility to airports while reducing dependence on conventional navigation infrastructure.

2.3.2 The following States have not yet implemented PBN flight procedures:

- Burundi;
- Eswatini;
- Tunisia; and
- Libya.

2.3.3 Given the low rate of PBN implementation, the following States need to make efforts to implement ICAO Assembly Resolution A37-11 on performance-based navigation.:

- Algeria (6.5%);
- Morocco (44.4%);
- Zimbabwe (40%).

Table 2. RNP APCH Implementation Status

ICAO region (in Africa)	Value (%)
ESAF	80.3
EUR/NAT	18.9
MID	70.6
WACAF	89.9
Total Africa	69.6

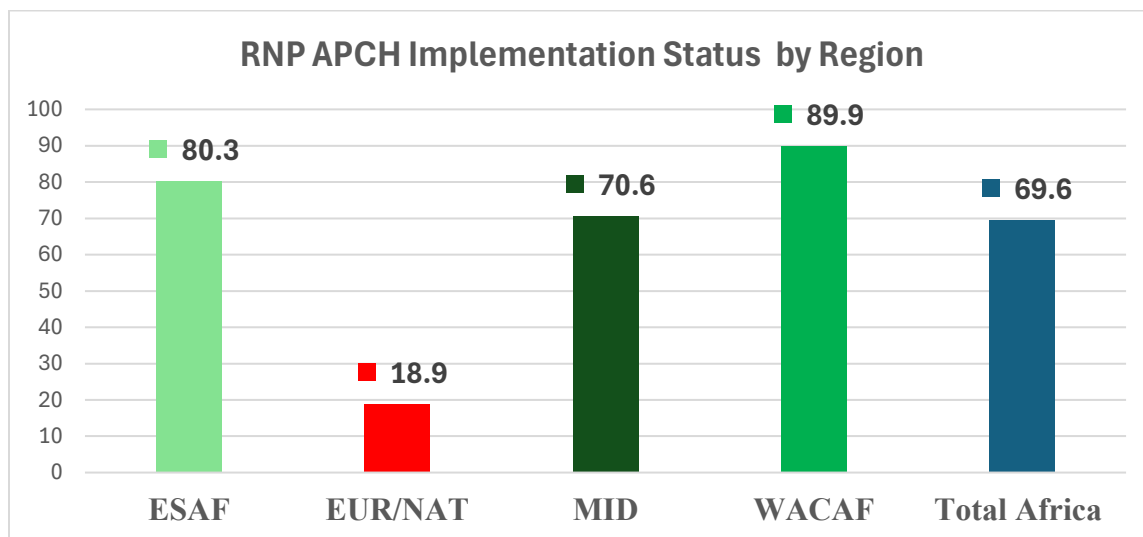


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Note 1.— The low percentage in EUR/NAT reflects the extensive use of conventional precision approaches and should not be interpreted as poor navigation capability.



2.4 APV Baro-VNAV Procedures

2.4.1 APV Baro-VNAV procedures significantly enhance operational safety by providing stabilized vertical guidance without requiring ground-based precision approach systems.

Table 3. APV Baro-VNAV Implementation

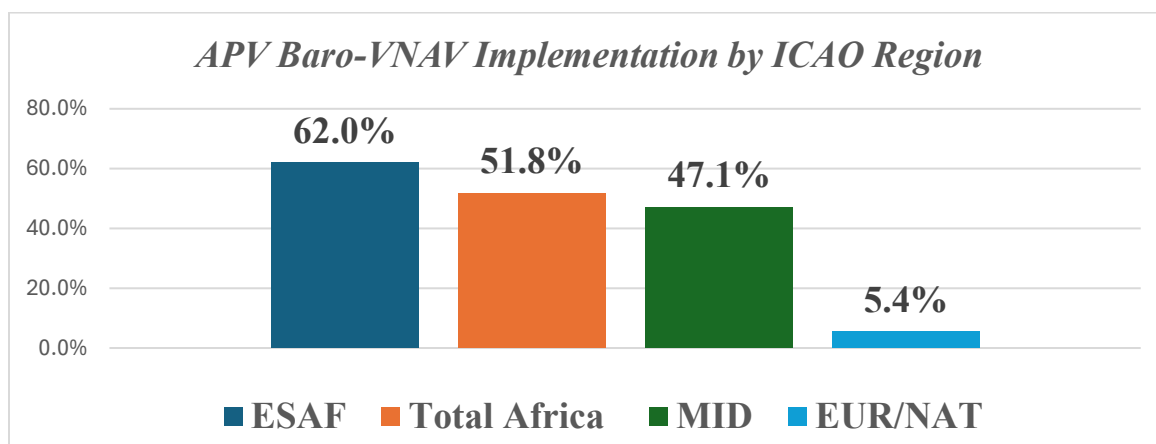
ICAO Region	Value (%)
ESAF	62.0
EUR/NAT	5.4
MID	47.1
WACAF	71.6
Total Africa	51.8



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2.5 Standard Instrument Departures (SIDs)

2.5.1 Although steady progress continues, the implementation of PBN departure procedures remains below expectations in several African States.

Table 4. PBN SID Implementation

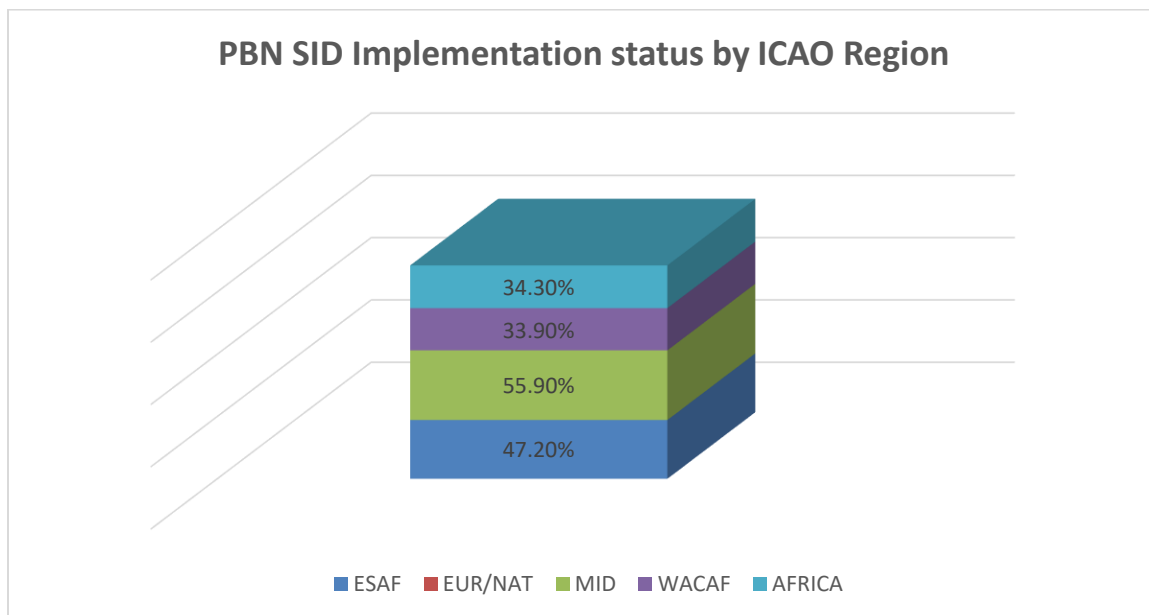
ICAO Region	Value (%)
ESAF	47.2
EUR/NAT	0.0
MID	55.9
WACAF	33.9
Total Africa	34.3



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2.6 Standard Arrival Routes (STARs)

2.6.1 The implementation of PBN STARs continues to improve, although further efforts remain necessary to fully optimize terminal airspace operations.

Table 5. PBN STAR Implementation

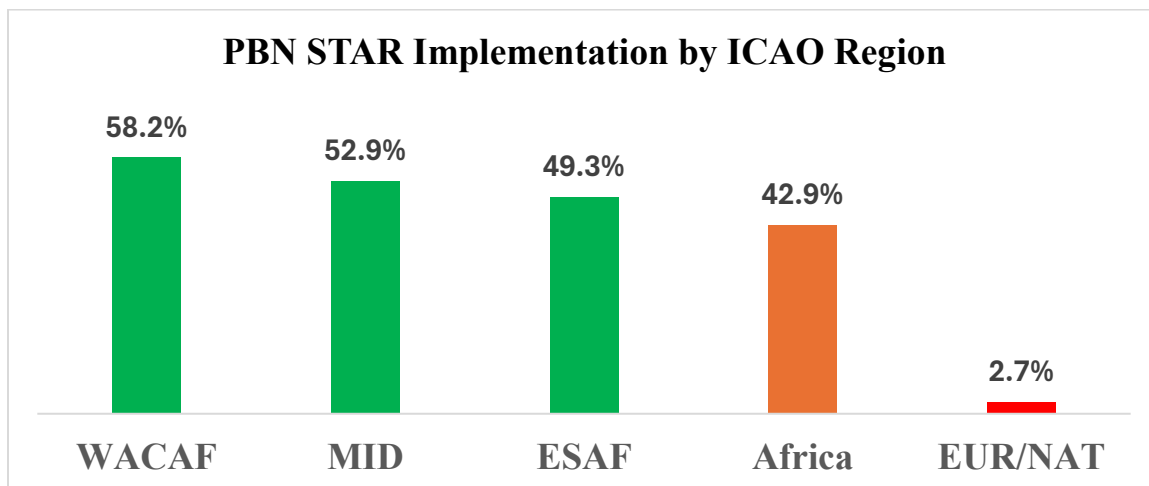
ICAO Region	Value (%)
ESAF	49.3
EUR/NAT	2.7
MID	52.9
WACAF	58.7
Total Africa	42.9



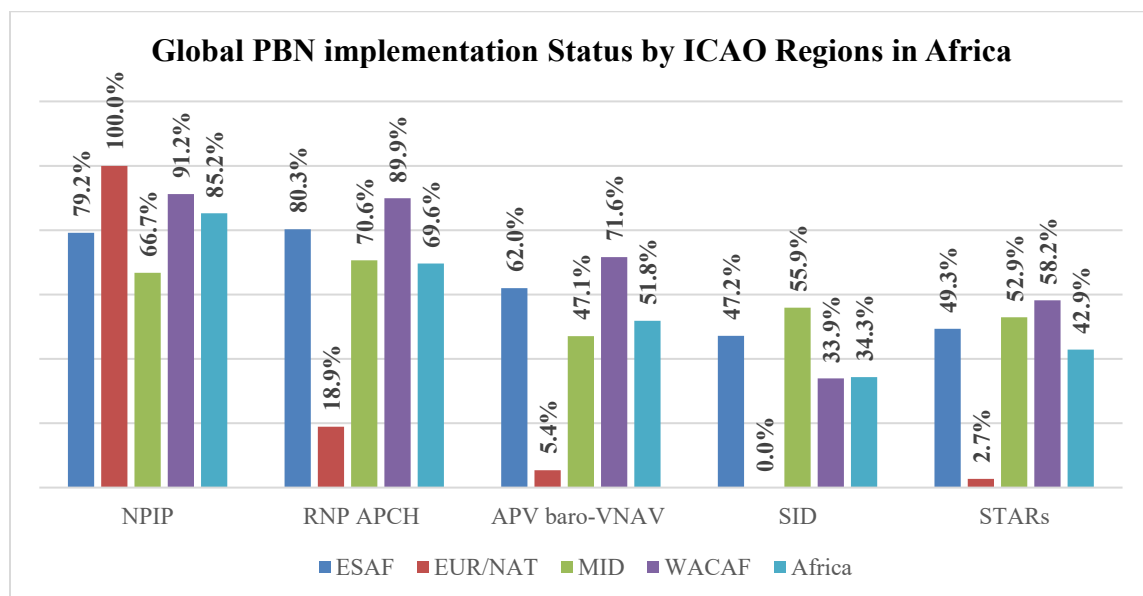
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2.7 A summary of PBN implementation status by ICAO regions in Africa is given in the chart below:



2.8 Challenges Affecting Sustainable PBN Implementation

- 2.8.1 Notwithstanding the progress achieved, the sustainable implementation of PBN in the continent continues to face several challenges, including the continuous maintenance of instrument flight procedures and various technical and institutional constraints.
- 2.8.2 The implementation of instrument flight procedures does not constitute the end of the process.
- 2.8.3 In accordance with ICAO provisions, instrument flight procedures and the associated aeronautical charts should be reviewed at intervals not exceeding five years, or earlier whenever significant operational changes occur.
- 2.8.4 These changes may include:



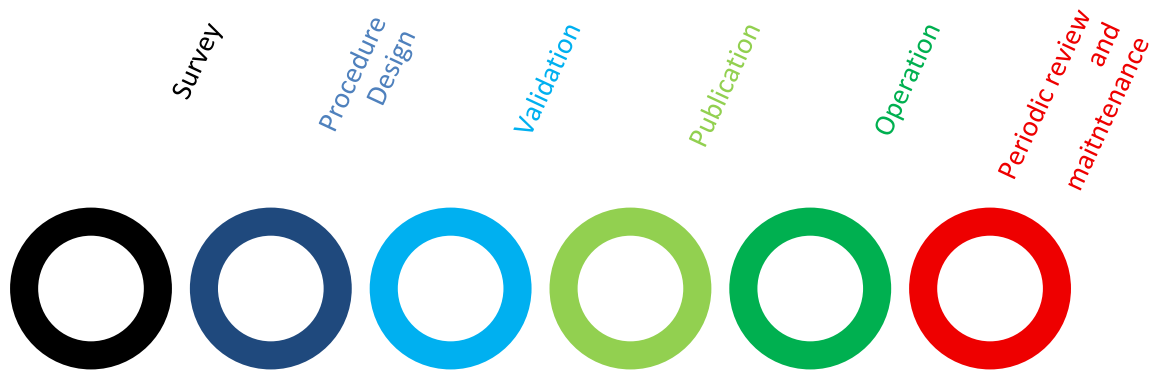
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- aerodrome infrastructure modifications;
- installation or relocation of CNS facilities;
- changes to the obstacle environment;
- updates to magnetic variation; and
- changes in airspace design.

2.8.5 Most of these changes require the conduct of accurate WGS-84 aeronautical surveys before revision of procedures.



2.8.6 The AFPP has identified recurring technical and institutional challenges that continue to hinder sustainable implementation.

a) Technical Challenges

- Limited availability of qualified WGS-84 survey companies;
- High cost of aeronautical surveys;
- Insufficient funding;
- Limited availability of qualified flight procedure designers; and
- Incomplete qualification of designers who did not complete the full ICAO competency-based training curriculum.

b) Institutional Challenges

- Limited awareness among senior decision-makers regarding the importance of continuous procedure maintenance;
- Weak national governance arrangements;
- Lack of sustainable maintenance programmes; and
- Insufficient allocation of resources.



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Recommended Graphic: Fishbone (Cause-and-Effect) Diagram.

2.9 Root causes of PANS-OPS related Significant Safety Concerns (SSCs)

2.9.1 Most of PANS-OPS-related Significant Safety Concerns identified within the AFI region are related to deficiencies that go far beyond procedure design.

2.9.2 Key root causes include:

a) PANS-OPS Oversight

- lack or insufficient PANS-OPS regulations;
- insufficient number of qualified inspectors;
- inadequate inspection programmes; and
- inadequate regulatory approval process for instrument flight procedures.

b) Flight Procedure Design

- shortage of qualified designers;
- inadequate recurrent training; and
- incomplete competency development.

c) WGS-84 Surveys

- lack of qualified survey organizations; and
- absence of updated aeronautical surveys.

d) Flight Validation

- inadequate operational validation before implementation.

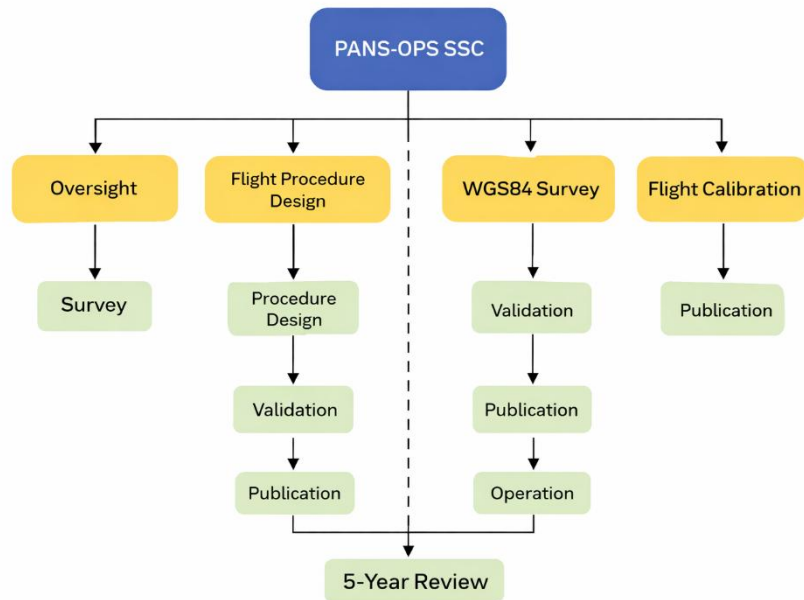
e) Flight Calibration

- absence of sustainable flight calibration programmes;
- delayed calibration of navigation aids.



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2.10 Way Forward

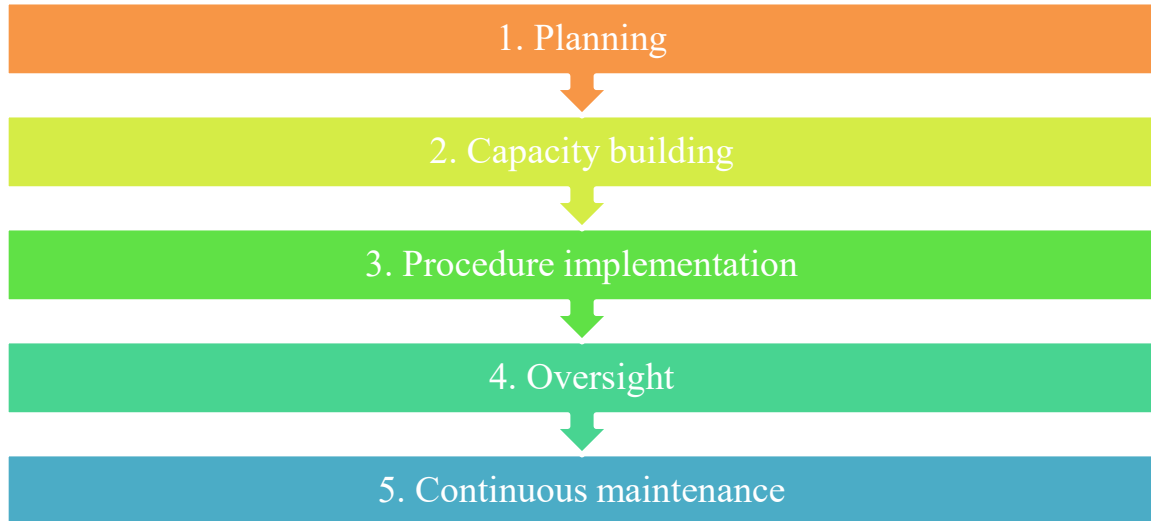
2.10.1 To accelerate implementation and improve sustainability, States are encouraged to:

- establish and regularly update National PBN Implementation Plans;
- complete implementation of PBN terminal procedures;
- establish sustainable instrument flight procedure maintenance programmes;
- conduct periodic WGS-84 surveys;
- strengthen national PANS-OPS oversight systems;
- establish a competent inspector pools;
- complete the ICAO competency-based training curriculum for designers and inspectors;
- implement sustainable flight validation and flight calibration programmes; and
- allocate adequate financial resources for continuous maintenance of instrument flight procedures.



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3. ACTION BY THE MEETING

3.1 The Steering Committee is invited to:

- a) note the status of PBN implementation presented in this paper;
- b) urge Member States to communicate updated National PBN Implementation Plans to ICAO Regional Offices;
- c) encourage States to strengthen PANS-OPS oversight capabilities, including the development of national regulations and inspector competencies;
- d) encourage States to establish sustainable programmes for WGS-84 surveys, flight validation and flight calibration; and
- e) request the Secretariat to continue supporting Member States in addressing implementation gaps and resolving PANS-OPS-related Significant Safety Concerns.

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