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International Civil Aviation Organization
African Flight Procedure Programme

Eleventh Meeting of the African Flight Procedure Programme Steering Committee
Lusaka, Zambia, 21 - 23 May 2025

AGENDA ITEM 5: PRESENTATIONS BY STAKEHOLDERS
INSTRUMENT FLIGHT PROCEDURE DESIGN (IFPD) IN NIGERIA,
ACHIEVEMENTS, CHALLENGES AND PROSPECTS

(Presented by Nigeria)

Summary
This paper provides an overview of the status of Instrument Flight Procedure Design (IFPD) in Nigeria, highlighting the significant progress made, existing challenges, and ongoing initiatives aimed at strengthening national capabilities. The paper discusses the evolution of IFPD, the shift to internal capacity development, Nigeria's role in PBN implementation and AFPP participation, and outlines the strategic efforts being made to ensure regulatory oversight and full PBN implementation.
Action by the meeting is provided in section 3
Related ICAO Strategic Objective(s). <ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency

1.0 Introduction

1.1 The airspace over Nigeria, known as the Kano Flight Information Region (FIR), covers a territorial area of 988,885 km². This area includes the Nigerian landmass (923,763 km²) and the surrounding territorial waters up to 250 nautical miles off the coastline.

1.2 With a population of 220 million people and a GDP of over 440 billion USD, Nigeria's economy ranks amongst the first 3 in Africa. With a growing middle class, air travel, both domestic and international, continues to increase

1.3 Nigeria's aviation sector is substantial, featuring a mix of domestic and international airlines, as well as numerous airports and airstrips. In 2023, Nigeria recorded 15.89 million air journeys. There are five designated international airports and twenty-nine domestic airports.

1.4 The combination of factors, such as the number of airports, volume of air traffic, terrain diversity, and environmental considerations, presents challenges in Instrument Flight Procedure and Airspace design. This paper, therefore, presents the achievements, challenges, and prospects of IFPD in Nigeria.

2.0 Discussion

2.0.1 The trajectory of a flight through all phases (departure, en-route, approach, and missed approach) is governed by the principle of obstacle avoidance and creating a protective envelope around an aircraft. The IFPD ensures that the flight path to be followed through all the phases



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is conducted within acceptable obstacle clearance appropriate to the type of approaches (Precision and Non-Precision).

2.1 IFPD in Nigeria

2.1.2 IFPD for Nigerian Aerodromes was contracted out until 2002, when the Air Navigation Service Provider, Nigerian Airspace Management Agency (NAMA), decided to look inwards to develop capacity. A specific department (Department of Airspace Planning) was created to provide Instrument Flight Procedure Design Services, and some Air Traffic Controllers were trained to become Instrument Flight Procedure Designers. From thereon, all procedures are being designed by the department.

2.2 Performance-Based Navigation (PBN) Design

2.2.1 The introduction of the PBN concept by ICAO in 2008 presented a new paradigm, which Nigeria complied with by redesigning the airspace structure, especially at the international aerodromes. IATA helped in providing technical expertise in the design of the airspace structure, especially at the terminal level, where the PBN designs were implemented for the runways for four of the five International Airports, incorporating Standard Instrument Departure Routes (SIDs) and Standard Arrival Routes (STARs). Currently, PBN approaches have been designed for all runways in Nigeria.

2.3 AFPP AFFILIATION

2.3.1 Nigeria was a pioneer member State of the AFPP in 2014 and greatly contributed to the development of the framework for the successful implementation of the stated objectives. However, changes in management and policies brought a setback in Nigeria's active participation in AFPP activities.

2.3.2 With the coming on board of the present DGCA-Nigeria, there has been a renewed approach to exploring opportunities geared towards capacity enhancement of Inspectors through collaboration and partnership with relevant organisations. It is to this end that Nigeria has fulfilled its commitment to the AFPP and will continue to do so in the future.

2.4 Instrument Flight Procedure Inspectorate

2.4.1 The IFPD Inspectorate of the Nigerian Civil Aviation Authority (NCAA) is responsible for the oversight of the Instrument Flight Procedure Design Service Provider. To ensure effective safety oversight, Inspectors are being trained by the CAA to develop the required competencies.

2.4.2 Inspectors' guidance for the approval of IFPD has been developed. Guidance for the IFPD service provider to effectively comply with regulatory requirements is being developed. Detailed surveillance programmes and plans to ensure periodic audits and inspections have been developed.

2.4.3 The CAA is in the process of acquiring software to automate the approval process of designs forwarded by the IFPD.

2.5 Achievements



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2.5.1 Procurement of Calibration Aircraft

2.5.1.1 Nigeria, realising the enormous resources expended on calibrating all navigational equipment spread across its territory, decided to acquire a calibration aircraft. Since the acquisition, the periodicity of calibration as prescribed by the Regulation has been met. Flight validation of newly designed procedures is also carried out by the calibration aircraft

2.5.2 Free Route Airspace (FRA)

2.5.2.1 Nigeria is the first AFI Region Continental Airspace State to design and implement FRA. This effort has increased the volume of traffic utilising the airspace, thereby reducing flight time, reducing CO₂ emissions, and increasing revenue for participating airlines. It is worth noting that this was achieved through internal capacity.

2.5.3 Use of Internal Capacity for Procedure and Airspace Design

2.5.3.1 The procedures for all runways and the design of airspace are being designed by Nigerian Instrument Flight Procedure designers.

2.6 Challenges

While a lot has been achieved over the years, there have been noticeable challenges. These Include:

2.6.1 Lack of expertise in PANS-OPS Inspectorate: There is a limited number of qualified inspectors with the specialized knowledge required to effectively oversee and regulate IFPD in accordance with ICAO Doc 8168 (PANS-OPS) standards.

2.6.2 Incomplete implementation of PBN: Although PBN procedures have been designed, full implementation and seamless integration within the national airspace system remain incomplete

2.6.3 High cost of IFPD software: The acquisition of advanced procedure design software and expensive licence renewal, impose a financial burden, affecting design efficiency.

2.6.4 Lack of On-the-Job Training (OJT): Both designers and inspectors lack consistent access to hands-on experience through structured OJT programs, which hampers competency development and succession planning.

2.7 Efforts to address challenges

2.7.1 The Authority has noted the challenges and is assiduously making efforts to ensure the noted shortcomings are addressed to strengthen the safety oversight capability of the PANS-OPS Inspectorate. Some of these initiatives include:

2.7.1.1 There is a renewed commitment on the part of Nigeria to build and sustain the capacity of the PANS-OPS Inspectorate for the achievement of its safety oversight mandate. This is achieved through the provision of specialized training leading to the qualification of Inspectors. The Authority is engaging with industry experts to provide software that will



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enhance the approval process of Flight Procedure and Airspace designs submitted by IFPD Providers

2.7.1.2 NCAA, as part of its 2025 plan, will organise a *National Workshop on The Application of Global Navigation Satellite Systems (GNSS) in Aviation and Satellite-Based Augmentation System (SBAS) Implementation*. During the workshop, the National PBN Office, which will be responsible for the coordination and driving of the full implementation of PBN, will be inaugurated. Equally, the National SBAS Implementation Committee will be inaugurated. The National PBN Office membership will be drawn from stakeholders and expert areas that have various roles to play in PBN Implementation.

2.7.1.3 NCAA has noted the challenge of having very few work stations with few software licences for the IFPD Provider (NAMA) to effectively and efficiently carry out their functions. This is mainly due to stringent government procurement processes and procedure requirements. The Authority is working with relevant stakeholders to ease the process.

2.7.1.4 NCAA takes as one of its top priorities the training of qualified Inspectors. With the increase in size and complexity of aviation activities in Nigeria, the PANS-OPS Inspectorate is being strengthened by continuous training of Inspectors with a view to getting them qualified for the task of effective safety oversight. Nigeria is therefore looking forward to partnering with the AFPP in providing OJT for Inspectors and Instrument Flight Procedure Trainees to further enhance the development and sustenance of capacity.

3.0 Conclusion

3.1 Nigeria has made notable strides in developing a sustainable and effective IFPD system. While challenges persist, there is a clear roadmap and political will to address these issues. Continued collaboration with AFPP and other stakeholders remains central to enhancing Nigeria's PBN and IFPD capabilities.

4.0 Action by Meeting

4.1 The meeting is invited to note the information contained in this paper.