PNG's IFP Implementation Experience and Lessons Learned.

- GNSS Design Phase I 2017 - 2019 31 Airports includes Jax SIDs/STARs
- GNSS Design Phase II 2020 - 2023 7 Airports
- GNSS Design Phase III 2025 - 2027 9 Airports, RNP AR & SID

29/10/2024

IFP Implementation Experience and Lessons Learned.

Contents

Organization Overview

Introduction to NiuSky Pacific Limited (NSPL)

- NiuSky Pacific Limited (NSPL) is the new Corporate Identity of the former PNG Air Services Limited (PNGASL), the sole provider of Air Navigation Services for Papua New Guinea.
- NSPL is a State Aviation Entity (SAE) registered as an independent company in July, 2007. However, its official operations commenced in January, 2008. The Company evolved from a government agency, formally known as the PNG Civil Aviation Authority (CAA), into a self-sustaining commercialised entity as intended by the Government who remains the sole shareholder through the Minister for Finance and the Minister for Civil Aviation.

Key Statistics

- NSPL has a gender diverse workforce of approximately 270 employees, with women making up 42% of the team.
- NSPL holds certifications under CASA PNG Civil Aviation Rules Parts 171, 172 and 175.
- NSPL employs 4 personnel trained in Pans-Ops and Cartography.
- NSPL Pans-Ops personnel frequently participate in ICAO APAC FPP online courses and workshops.
- CASA PNG submitted ICAO APAC FPP Phase V proposal extending PNG's participation as a User State

GNSS Design Project Overview

Project Purpose

Why GNSS? And Importance of satellite-based navigation in aviation.

1) **Aging NavAids**
   - 11 NDBs
   - 11 DMEs,
   - 4 DVOR;

   Challenges: These NavAids were aging, requiring frequent repairs and upgrades to meet operational standards.

2) **Costly Maintenance**
   - High Maintenance Requirements, the upkeep of traditional NavAids demanded significant resources, both financially and in terms of labor.11 DMEs,
   - Rising costs, Routine maintenance, parts replacement, and personnel training made these systems increasingly expensive to sustain.

3) **Cost of New NavAid Infrastructure**
   - Investment Needed for Replacement, the cost of replacing outdated NavAids with modern equipment was considerable.
   - Benefit of GNSS: GNSS significantly reduced the dependency on ground-based infrastructure, thus minimizing ongoing investment in physical NavAids.

GNSS Design Project Overview

Project Purpose

Why GNSS?

4) **Reduced Infrastructure Costs:**
   - Satellite-based navigation reduced the need for extensive ground equipment.
5) **Enhanced Reliability and Precision:**
   - GNSS offered higher accuracy and was/is less susceptible to environmental factors affecting ground-based NavAids.
6) **Future-Proofing Airspace Operations:**
   - GNSS aligned with global aviation standards, preparing the PNG airspace for increased traffic and more complex routing.
7) **Environment:**
   - Reduced fuel consumption Efficient Flight Paths: GNSS enables more direct routes and optimized Standard Instrument Departures (SIDs) and Arrivals (STARs).
   - Lower Fuel Use: Reduced flight times and optimized routes result in lower fuel consumption, directly decreasing greenhouse gas emissions.
   - Less ground infrastructure with Lower Environmental Footprint: Fewer installations mean reduced energy and resources required for maintenance and operations, which benefits local environments.

GNSS Design Phase I (2017 -2019)

Scope: 31 Airports

All major Airports including Port Moresby International Airport, Nadzab, Mt Hagen, Madang, Tokua, Goroka.

	AIRPORT NAME	ICAO CODE	STATUS
1.	AROPA/KIETA[7]	AYIQ	**Completed.** Awaiting CASA to clear 22FT coordinates before IFP can be published.
2.	BUKA	AYBK	**Completed.**
3.	BULOLO	AYBU	Owned by mining company that did not want an approach designed
4.	DARU*	AYDU	**Completed.** Being redesigned due NAC runway works rendering previous design invalid, received OLS reports from NAC May 21 less vital THR coordinates.
5.	GIRUA/POPENDETTA*	AYGR	**Completed.** Being part redesigned due NAC runway works rendering previous design invalid, awaiting OLS reports from NAC.
6.	GOROKA[7]	AYGA	**Completed.**
7.	GURNEY/ALOTAU* [8r]	AYGN	**Completed.** Being part redesigned due NAC runway works rendering previous design invalid, awaiting OLS reports from NAC.
8.	HOSKINS/KIMBE	AYHK	**Completed.**
9.	KAVIENG*	AYKV	**Completed.** Being part redesigned due NAC runway works rendering previous design invalid, awaiting OLS reports from NAC.
10.	KEREMA	AYKM	**Completed.**
11.	KIRIWINA/LOSUIA	AYKA	**Completed.**

Features:

- CASA PNG approved Civil Aviation Rule Part 173 IFP Service Certificate
- IFP designed in accordance with CASA PNG IFP Design Manual
- Introduction of LNAV, LNAV/VNAV, Standard Instrument Departures (SIDs) and Standard Terminal Arrival Routes (STARs) for Port Moresby.

Achievements:

- Successful deployment of GNSS design at 24 of 31 airports
- Improvements in navigation precision and airport accessibility
- NSPL Pans-Ops personnel capacity building during ground & flight validation flights.

GNSS Design Phase II (2020 -2023)

Scope: 7 Airports

- All major domestic Airports including Goroka, Kokoda, Aropa/Kieta, Jacquinot Bay, Telefomin, Kawito and Kandrian.
- Focus on airports targeted for advanced GNSS solutions.

Features:

- CASA PNG approved Civil Aviation Rule Part 173 IFP Service Certificate
- IFP designed in accordance with CASA PNG IFP Design Manual
- Aerodromes redesigned new PBN approaches and 2 SIDs at Goroka and Aropa/Kieta.
- Integration of Instrument Flight Procedures (IFP) software for improved route design

Achievements:

- Successful deployment of GNSS design at 6 of 7 airports
- Improvements in navigation precision and airport accessibility
- NSPL expanded capacity with the use of IFP software, enhancing operational efficiency
- NSPL Pans-Ops personnel Improved data analysis capabilities for ongoing airport operations
- NSPL Pans-Ops personnel capacity building completing ground & flight validation flights.

Lessons Learned

Challenges Faced:

- 200 plus aerodromes needing PBN approaches
- Papua New Guinea's rugged terrain, with high mountains and deep valleys, makes traditional navigation challenging.
- 9 aerodromes underwent runway resurfacing after IFP published
- CAR 173 IFP Service Certificate contract review, Contract Change Proposals

Key Takeaways:

- Collaboration with CASA on delegation of function for Phase II flight validation
- NSPL Pans-ops team exposure to advanced flight validation equipment (GPS, IPAD)
- ATC training to Goroka ATS personnel

Future Recommendations:

- Improved ICAO criteria to assist GNSS design and deployment for future projects

Air Traffic Services

KOKODA(AYKO),
TELEFOMIN(AYTE),
KAWITO(AYKW),
KANDRIAN(AYKC) &
JACQUINOT BAY(AYJB).

NEW GNSS APP

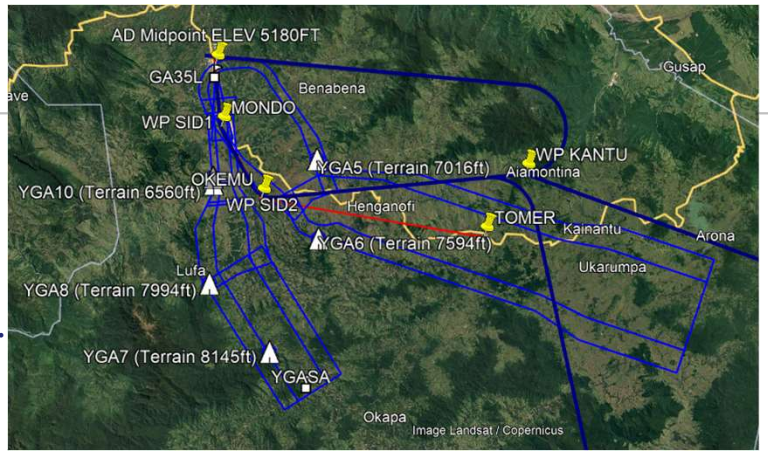
Safety Case

	Name/Position	Signature	Date
Prepared By	Nolisa Katsin Manager AIS Ilaitia M. Tabakaucoro Manager SMS/QA/RC		17/04/24 17/04/24

Conclusion and Next Steps

Summary of GNSS Progress:

- Recap achievements of Phases I and II objective
- Focus on airports targeted for advanced GNSS solutions.



Looking Ahead:

- Regional solution for PIS's IFP initiatives through close collaboration with CASA PNG and ICAO APAC PSIDs.

Q&A