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PNG ATS infrastructure, constraints/issues, and desired enhancements

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PRESENTATION OVERVIEW

01. Introduction
02. ATS Infrastructure
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01

Introduction

- The Air Traffic Services (ATS) infrastructure in PNG plays a vital role in ensuring safe and efficient aircraft operations within the PNG Flight Information Region (FIR).
- This presentation provides an overview of PNG's current ATS infrastructure, the challenges faced, and potential improvements to align with regional and global standards

02

ATS infrastructure

PNG's ATS infrastructure consists of the follwing key components

- **Communication Infrastructure**
- **Navigation Infrastructure**
- **Surveillance Infrastructure**
- **Meteorological (MET) Services Infrastructure**
- **Air Traffic Management (ATM) Systems**

Communication Infrastructure

- Aeronautical Fixed Services (AFTN, AMHS)
- Aeronautical Mobile Services (VHF/HF, CPDLC)
- VSAT & MPLS networks for regional and domestic communication
- CRV network for voice and data exchange

Navigation Infrastructure

- **Ground-based Navigation Aids:** VOR, DME, ILS
  - PNG operates Doppler VHF Omni-directional Range (DVOR) and Distance Measuring Equipment (DME) systems at key airports. I
    - Indra DVOR VRB-52D is used to provide precise bearing information for aircraft navigation.
    - Indra DME LDB-102 is used to provide High Accuracy Distance Measurement
  - A CAT I ILS is installed at Port Moresby International Airport, with considerations for upgrading to CAT II and adding installations at Nadzab International Airport
- **Satellite-based Navigation:** GNSS
  - PNG uses Global Navigation Satellite System (GNSS), which is a satellite-based navigation system .This system is used for a variety of applications, including en-route navigation, approach, and landing procedures, enhancing safety and efficiency in air traffic management.

Surveillance Infrastructure

- **Radar Surveillance:** SSR (Mode S)
  - PNG uses the Indra MSSR IRS-20MP/S system, installed in 2018, enhances aircraft tracking and identification.
- **Automatic Dependent Surveillance (ADS):** ADS-B, ADS-C, SB ADS-B
  - **Ground based Automatic Dependent Surveillance-Broadcast (GB ADS-B):** Installed at multiple sites, including manned airports, providing real-time aircraft position updates.
  - **Space-Based ADS-B:** PNG began operational use of Aireon space-based Automatic Dependent Surveillance-Broadcast (ADS-B) in 2021, initially covering upper-level airspace. In 2022, the coverage expanded to include lower-level airspace, encompassing the entire Port Moresby Flight Information Region (FIR).

Meteorological (MET) Services Infrastructure

PNG's MET services play a crucial role in supporting air navigation by providing real-time weather data for flight operations. Key infrastructure elements include:

- **Automatic Weather Observation System (AWOS):**
  - PNG use the Vaisala AWOS which provides real-time, automated meteorological data essential for pilots and air traffic controllers
- **Weather Radar System**
  - PNG is considering the procurement of a dual-polarization S-band weather radar system for Port Moresby to improve meteorological forecasting and weather monitoring capabilities in the near future

Air Traffic Management (ATM) Systems

- PNG has NO ATC automation platforms- such as Arrival (AMAN) or Departure Management (DMAN) systems
- PNG has No System-Wide Information Management (SWIM) capability
- PNG is working on Flow Control Software which is planned for STARs implementation in mid-2025

03

Constraints/Issues

➢ Aging Infrastructure

- Many Navaids and surveillance systems are outdated, leading to increased maintenance costs and reliability issues.
- Limited spare parts availability for older equipment such as the DVOR VRB-52D and DME LDB-102.

➢ Limited Data Sharing and SWIM Capabilities

- PNG does not employ SWIM, leading to inefficient information sharing with local partners(NAC, NWS), and neighbouring ANSPs.

➢ Ground based ADSB and Radar Coverage Gaps

- Ground based ADS-B and radar surveillance gaps require additional infrastructure improvements to ensure complete coverage of the PNG FIR.

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Desired Enhancements

➢ Modernization of ATS Infrastructure

- Upgrade outdated Navaids (DVOR, DME) with newer, more reliable systems.
- Expand Ground based ADS-B coverage to eliminate surveillance gaps.
- Implement a new CAT II ILS at Jackson International airport in Port Moresby and additional installations at Nadzab.
- Upgrade to PSR radar systems

➢ Enhanced ATM Systems

- Implement System-Wide Information Management (SWIM) for improved data sharing.

➢ Strategic Investment and Policy Development

- Establish SLAs for critical systems to ensure reliability and sustainability.
- Align with ICAO's APAC Seamless ATM Plan and Global Air Navigation Plan (GANP).

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Conclusion

- PNG’s ATS infrastructure is vital for safe and efficient air navigation but faces significant challenges due to aging systems, and limited data-sharing capabilities.
- The proposed enhancements focus on modernizing infrastructure, improving surveillance and communication capabilities, and aligning with international standards.
- Continued investment and strategic planning will be essential for ensuring sustainable and efficient air traffic management in PNG.

Thank You

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