CIVIL AVIATION AUTHORITY OF FIJI
CERTIFIED ISO 9001

# AVIATION SAFETY BULLETIN

ISSUE 4 | 2024

An official publication of the Civil Aviation Authority of Fiji


## Honouring Our Past

## Launching Our Future

Safe Skies, Secure Fiji


CAAF'S REBRANDING


AUTONOMOUS DISTRESS TRACKING


THE ADVENT OF ADVANCED AIR MOBILITY (AAM)


PIONEERING WOMEN IN AVIATION ENGINEERING

*Cover Pic: Designed by Editor*

# In this issue...



## AVIATION SAFETY BULLETIN


***PUBLISHED BY THE*** *:*

Aviation Safety Bulletin (ASB) Committee
Civil Aviation Authority of Fiji (CAAF)
Fiji Airport Estate, Ottawa Road, Namaka, Nadi
Private Mail Bag, NAP 0354,
Nadi International Airport, **Fiji**.
Tel: (679) 8923 155
*Email:* info@caaf.org.fj

*Editor - Roshni Deo*

*Committee - Makiti Raratabu and Edward Dass*

Design : *ASB Committee*


**PUBLICATION CONTENT** Unless expressly stated as CAAF policy, the views expressed in this *Aviation Safety Bulletin* do not necessarily reflect the policy of the Civil Aviation Authority of Fiji. Articles are intended to stimulate discussion, and nothing in this *Aviation Safety Bulletin* is to be taken as overriding any Fiji Civil Aviation Legislation, or any statements issued by the Chief Executive or the Civil Aviation Authority of Fiji.

Reader comments and contributions are welcome and may be published, but the Editor reserves the right to edit or abridge them, and not to publish those that are judged not to contribute constructively towards safer aviation. Reader contributions and correspondence regarding the content of *Aviation Safety Bulletin* should be addressed to:

*Aviation Safety Bulletin* Editor, CAA Fiji, Private Mail Bag
NAP 0354, Nadi International Airport, Fiji *or*
email: info@caaf.org.fj

**DISTRIBUTION**

*Aviation Safety Bulletin* can be downloaded from CAAF's website, **www.caaf.org.fj .**

## Message from the desk of
# Chief Executive

**Bula Vinaka Fellow Aviation Stakeholders!**

As we conclude 2024, it is with gratitude that I reflect on a transformative year for the Civil Aviation Authority of Fiji (CAAF). This year has been defined by forward momentum, landmark achievements, and a renewed focus on excellence in aviation safety, security, and service delivery.

One of the most significant highlights was the official opening of the International Civil Aviation Organization's Pacific Small Island Development States Liaison Office in Nadi, a testament to Fiji's leadership in aviation in the Pacific region. This milestone reinforces our commitment to fostering regional collaboration and advancing global aviation standards.

We also celebrated CAAF's 45th Anniversary, marking over four decades of safeguarding Fiji's skies. This milestone was accompanied by our rebranding initiative, which introduced our new motto: ***Safe Skies, Secure Fiji.***

This motto encapsulates our unwavering dedication to protecting Fiji's aviation sector and ensuring its continued growth and prosperity which in turn contributes to Fiji's thriving economy. Alongside this, we unveiled a renewed Vision and Mission, which will guide us into the future:

**Vision:** *To be a leader in aviation safety and security oversight in the Pacific, recognised for excellence in regulation, partnership, and service delivery.*

**Mission:** *To collaborate with stakeholders to achieve the highest standards of safety, security, and efficiency in civil aviation, contributing to the growth and prosperity of Fiji.*

In alignment with these guiding principles, we also launched our Corporate Plan 2024–2029, providing a strategic roadmap for the next five years.

The plan is driven by four key strategic objectives; *Regulatory Excellence, Safety and Security Enhancement, Enhancing Operational Efficiency and Stakeholder Engagement.* These objectives reflect our commitment to advancing safety, security, regulatory excellence, and sustainability for the benefit of Fiji and its people.

This edition of the Aviation Safety Bulletin captures the vibrancy and progress shaping our sector. Highlights include; a celebration of CAAF's 45th Anniversary and the launch of our rebranding initiative, insights into the advent of Advanced Air Mobility and its implications for air transportation, information on the Autonomous Distress Tracking System effective 1 January 2025, a discussion on wildlife hazards to aircraft safety and mitigation strategies, updates on SELCAL 32 critical to effective communication in aviation, reflections on the 59th DGCA Conference and a spotlight on Air Terminal Services (Fiji) Pte Ltd, including the inspiring story of Fiji's first female licensed aircraft maintenance engineer at ATS Fiji.

As we celebrate our achievements this year, I extend my heartfelt thanks to our stakeholders, industry partners, the CAAF Board of Directors and the dedicated team at CAAF. Your unwavering support has been instrumental in making 2024 an exceptional year. As we look ahead to 2025, I am confident that we will continue to soar to new heights, guided by our renewed Vision, Mission, and Motto.

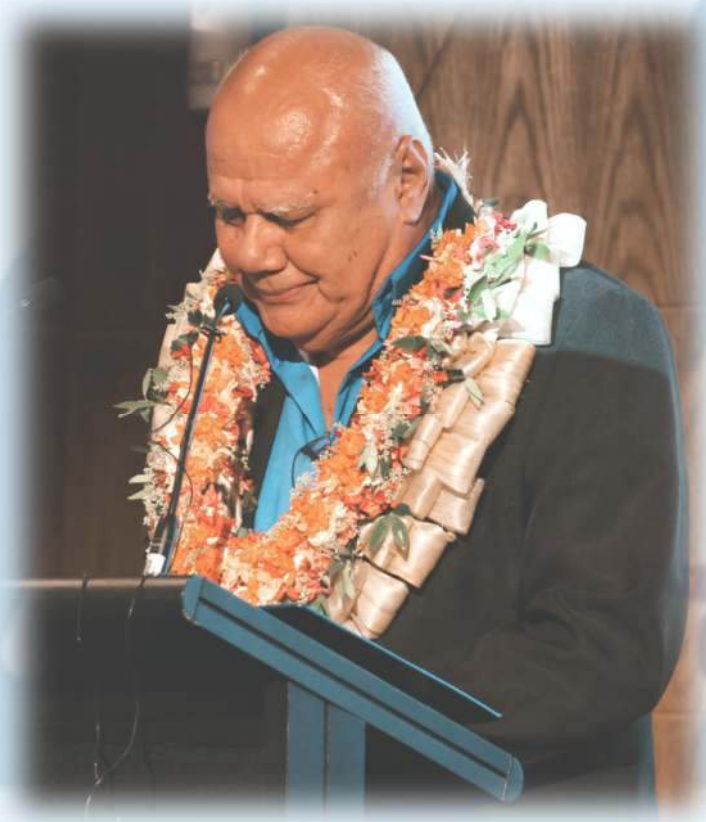
Vinaka vakalevu,

Ms Theresa O'Boyle-Levestam
Chief Executive

# CAAF's Rebranding

## Honouring Our Past, Shaping the Future of Aviation

In a grand event that beautifully blended history with innovation, the Civil Aviation Authority of Fiji (CAAF) unveiled its bold new rebranding, themed "Honouring Our Past, Launching Our Future." This milestone event emphasized CAAF's deep-rooted commitment to aviation safety, regulatory excellence, and a forward-thinking approach to the future of aviation.



The Honourable Viliame Gavoka, Deputy Prime Minister and Minister for Tourism & Civil Aviation, graced the occasion as the chief guest, highlighting CAAF's pivotal role in both Fiji's aviation sector and its regional leadership. He commended CAAF for its vital contributions to Fiji's aviation industry and expressed confidence that the rebranding would significantly enhance Fiji's global standing in aviation and tourism.

Hon. Gavoka remarked, "This rebranding will position Fiji very strongly for the future of aviation and tourism, as people around the world are seeking security, safety, and efficiency. CAAF will ensure that what we offer in the aviation industry is on par with the highest global standards."

A key highlight of the rebranding was the introduction of CAAF's new strapline, "Safe Skies, Secure Fiji," a powerful phrase that captures the Authority's unwavering dedication to safety, trust, and innovation in aviation regulation. This slogan encapsulates CAAF's dual mission: ensuring secure skies for Fiji while fostering economic and social connectivity, both domestically and internationally.

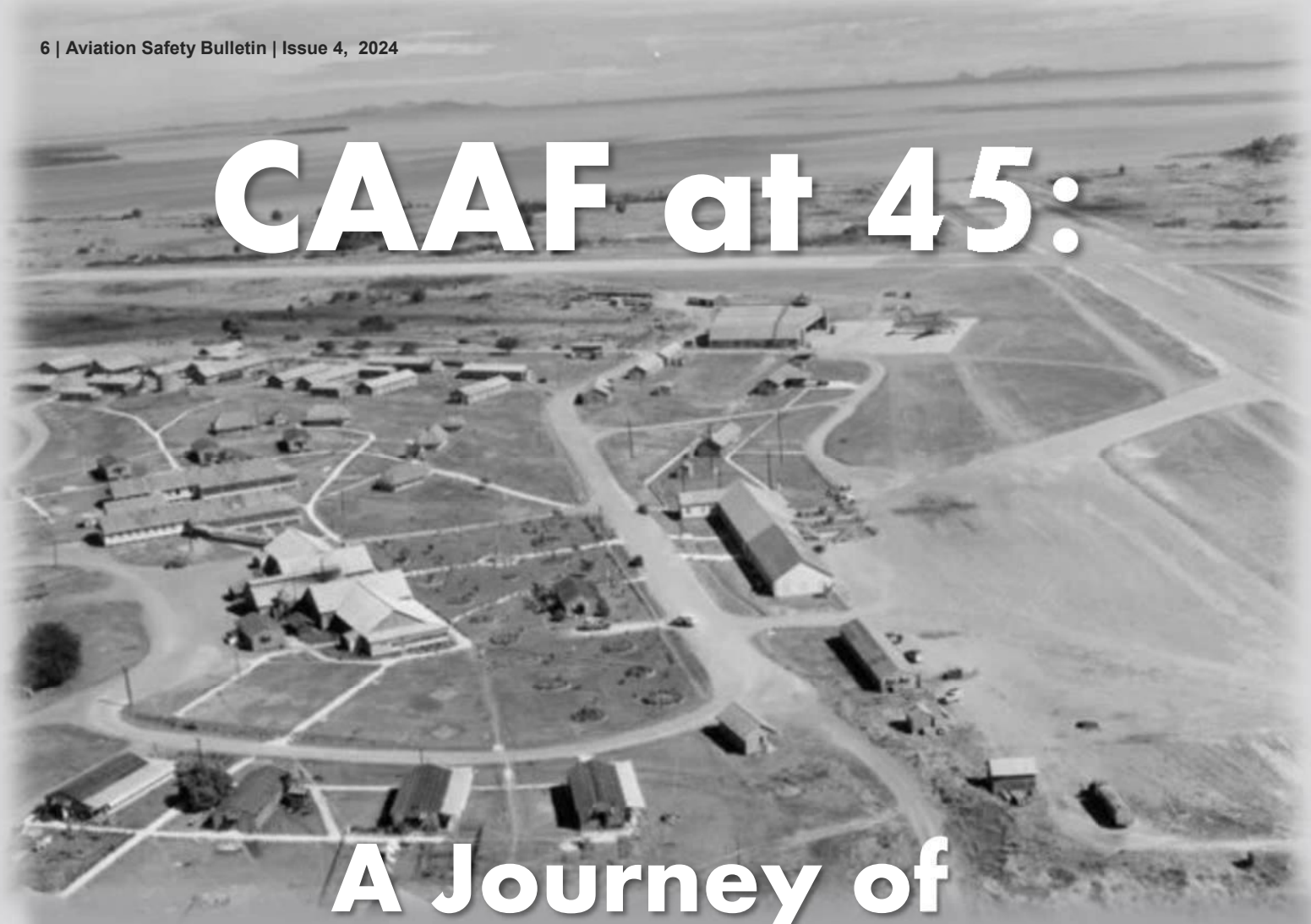
The event also marked the official launch of CAAF's revamped website. Designed with user accessibility in mind, the new site promises a streamlined and more efficient navigation experience for stakeholders. This digital transformation is part of CAAF's broader strategy to embrace innovation, modernize operations, and improve engagement with its partners and the public.

Adding to the sense of renewal was the unveiling of CAAF's fresh logo and renewed promise to the industry, which blends the distinctive symbols of Fiji's geography with elements representing trust and safety. The updated visual identity reflects the Authority's professionalism and commitment to regulatory excellence.

Ms. Theresa Levestam, CAAF's Chief Executive, expressed her enthusiasm for the rebranding, saying, "This rebranding represents a new chapter for CAAF, one that reflects our ongoing mission to uphold safety, trust, and regulatory standards that meet international benchmarks while honoring Fiji's unique identity."

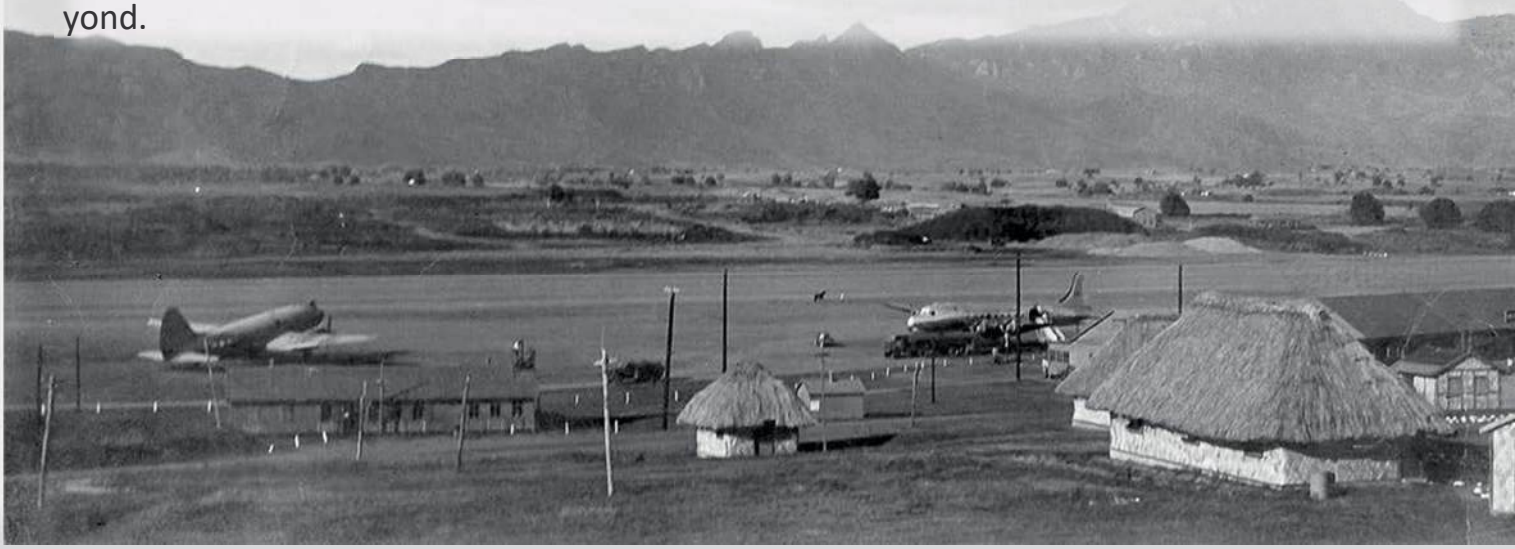
The event brought together key stakeholders from across the aviation sector, including government officials, industry partners, and international regulators. CAAF's rebranding is aligned with its strategy to modernize operations, enhance stakeholder engagement, and solidify its leadership role in the Pacific. With a strengthened identity, CAAF is now even better positioned to meet global aviation standards and serve both local and international stakeholders. For more details and to explore the newly launched website, visit: https://caaf.org.fj/ ■

# CAAF at 45:



# A Journey of Growth And Innovation

The Civil Aviation Authority of Fiji (CAAF) celebrated a significant milestone in 2024: its 45th anniversary. Established in 1979 under the Civil Aviation Authority of Fiji Act, CAAF's primary mission was to oversee and regulate civil aviation activities in Fiji. Over the years, the organization has grown, evolved, and played a pivotal role in shaping the aviation industry in Fiji and the Pacific region. Today, CAAF stands as a modern, forward-thinking regulator committed to ensuring the safety, security, and efficiency of aviation in Fiji and beyond.



## Early days: Laying the Foundation

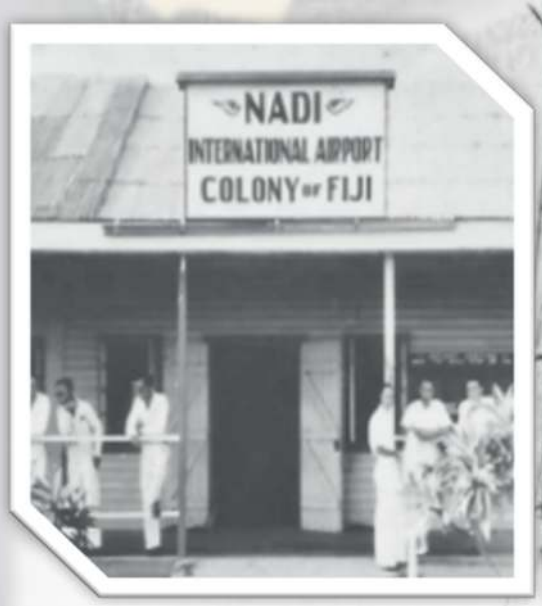
In the early years, CAAF focused on establishing critical frameworks and regulations for the country's aviation sector. In 1981, the Air Navigation Regulations were promulgated, setting the groundwork for the safe and efficient operation of air services in Fiji. The same year, Fiji hosted the 16th Director General of Civil Aviation (DGCA) Conference in Nadi, a sign of the nation's growing influence in regional aviation.


*Attending DGCA Conference*
*Pic: former Chief Executives; Mr Norman Yee and Mr Netava Waqa*

## The 1990s: Modernizing Aviation Safety

The 1990s marked a period of substantial growth for CAAF. In 1991, the 28th DGCA Conference was again held in Fiji, underscoring the country's increasing role in international aviation affairs. Around this time, the introduction of Global Positioning System (GPS) technology revolutionized navigation practices in Fiji, improving both safety and efficiency.

In 1994, the Civil Aviation (Security) Act and Regulations were established, marking a critical step in strengthening aviation security for the country.




*Nadi International Airport*
*Colony of Fiji*

## A New Era: Separation of Regulatory and Commercial Functions

The late 1990s brought about a major reform in CAAF's operations. In 1999, the regulatory functions of CAAF were separated from its commercial operations. This shift resulted in the creation of Airports Fiji Ltd (AFL) to manage airport operations and air navigation services (which was outsourced to Strategic Air Services Limited), allowing CAAF to focus entirely on regulatory oversight. This was a pivotal moment in CAAF's evolution, positioning the authority as a dedicated aviation regulator.

# CAAF at 45:

## A Journey of Growth And Innovation - cont...

### 2000s: Adapting to Global Changes

The turn of the century brought significant changes to the global aviation landscape. The aftermath of the September 11 attacks in 2001 reshaped aviation security worldwide. CAAF responded by establishing robust security protocols, including the introduction of the Aviation Security & Facilitation Department and a series of regulatory amendments to align with international standards. In 2006, CAAF underwent a Safety Oversight Audit by the International Civil Aviation Organization (ICAO), further cementing its commitment to global aviation standards.

Around the same time, CAAF began integrating GPS-based navigation and Performance-Based Navigation (PBN) standards into Fiji's air traffic systems, improving flight efficiency and safety. The adoption of GPS technology in air traffic management systems marked a key step in modernizing airspace operations in Fiji.

### 2010s: Strengthening Identity and Global Engagement

The 2010s were a period of reflection and transformation for CAAF, as it continued to grow into its role as a regional leader in aviation regulation. In 2011, the Aviation Security & Facilitation Department began certifying screeners and cargo officers to ensure rigorous security standards. This decade also saw the launch of numerous programmes aimed at improving aviation safety and security, including the State Safety Programme (SSP) and the National Civil Aviation Security Programme (NCASP).

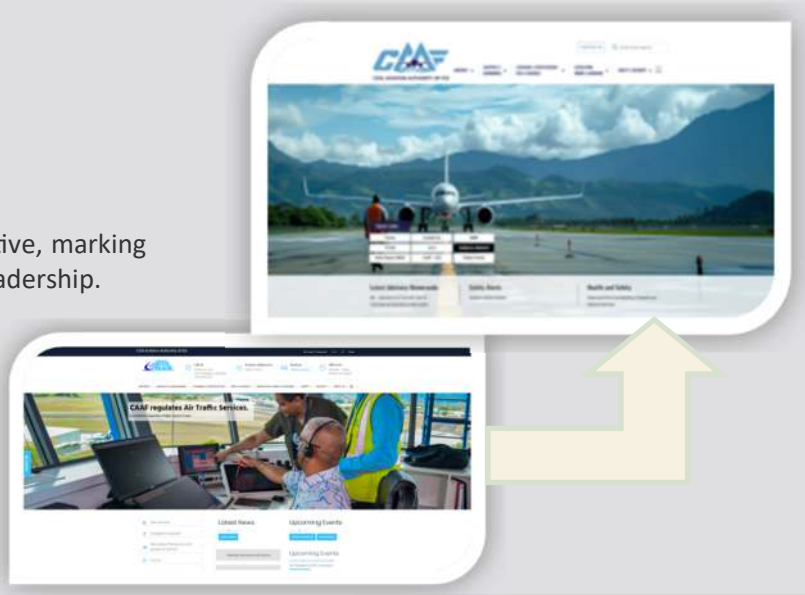
Another one of the standout moments of the decade was in 2017, when CAAF facilitated the journey of Shaesta Waiz, a female Afghan pilot who completed a solo flight around the world. Her visit to Fiji symbolized the growing role of women in aviation and further highlighted CAAF's global outreach.


*29-year-old Afghan pilot Shaesta Waiz, flying solo around the world in a Beechcraft Bonanza A36 single-engine aircraft, arrived in Nadi, Fiji, marking her 19th stop. Here she is pictured with Roshni.*

In 2018, CAAF articulated its vision to become a model aviation regulator, emphasizing professionalism, accountability, commitment and integrity. Later that same year, Fiji hosted the 55th DGCA Conference, a significant international event that further cemented CAAF's position as a regional leader.


*Fiji hosted the 55th DGCA Conference in 2018. Pic: Sharvada Sharma, the former Permanent Secretary; Dr. Fang Liu, former Secretary General of the ICAO; Mr. Arun Mishra, former ICAO's Regional Director for Asia and Pacific; and Mr. Ajai Kumar, former Acting Chief Executive of CAAF.*

## Recent Achievements: Modernization and Innovation



In 2023, CAAF appointed its first female Chief Executive, marking a significant step toward inclusivity and diversity in leadership.

The recent past has seen CAAF embrace new technologies and innovations. The organization launched a new, user-friendly website to enhance accessibility and streamline stakeholder engagement and successfully migrated to cloud in 2024, ensuring greater efficiency and data security.

## Celebrating Leadership: Pioneers of the Civil Aviation Authority of Fiji

The journey over the past 45 years has been marked by significant advancements in aviation. These developments were shaped by visionary leadership, guiding the organization through its transformative phases. The foundation was laid by Varley RMG, who served as Director of Civil Aviation from 1974 to 1979 and as Chief Executive until 1981. His strategic foresight set the stage for future growth. After Varley, Mr. Jone Koroitama took over as the first Fijian Chief Executive. He led the authority from 1982 to 1998, solidifying CAAF's reputation for safety and operational excellence. The turn of the millennium brought Norman Yee into the role. He served from 1998 to 2005, leading the organization into modernization and efficiency. Netava Waqa took charge from 2006 to 2018, guiding CAAF through a rapidly evolving global aviation landscape. After a brief leadership period by Ajai Kumar as Acting Chief Executive from 2018 to 2020, Ms. Theresa Levestam was appointed as the first female Chief Executive in 2023. This appointment marks a milestone towards inclusivity and diversity in leadership, promising a new era of innovation, safety, and global engagement. Each leader has played an essential role in shaping CAAF into a forward-thinking organization.


## Looking Ahead: A Future Built on Safety, Trust, and Innovation

As CAAF celebrates 45 years of championing aviation safety and security, it looks ahead to the future with confidence. With a newly appointed board of directors steering the organization, CAAF is poised to achieve its strategic goals, enhance its operations, and continue its commitment to ensuring safe skies and a secure Fiji.

From its humble beginnings in 1979 to its current status as a globally respected aviation regulator, CAAF's journey is a testament to the dedication and resilience of the team and stakeholders who have worked tirelessly to shape the aviation landscape of Fiji.

As CAAF celebrates this momentous anniversary, it remains steadfast in its mission: to honor its past while launching a bright future for aviation in Fiji and beyond. Here's to the next 45 years of growth, innovation, and ensuring secure and safe skies! ■

# Autonomous Distress Tracking System in Aviation Enhancing

***By sharing this information with the public domain, aviation stakeholders can better understand the benefits and importance of Autonomous Distress Tracking Systems in improving aviation safety for future generations.***

## Introduction

In the dynamic world of aviation, ensuring the safety of passengers and crew remains the top priority. The rapid evolution of technology has introduced various tools to improve safety, one of the most important being the **Autonomous Distress Tracking System (ADTS)**. This system provides a crucial mechanism for real-time monitoring and alerting during emergency situations, enabling rapid responses that can save lives. This paper delves into the key concepts, technology, and implementation of the ADTS in aviation, illustrating its vital role in modern air travel.

## 1. The Role of Autonomous Distress Tracking Systems (ADTS)

Autonomous Distress Tracking Systems are designed to automatically detect distress signals from aircraft in distress and transmit critical information to relevant authorities. The system plays a significant role in:

- **Real-time detection**: Detecting distress conditions such as mechanical failure, emergency landings, or lost communication.
- **Tracking and alerting**: Sending location data and emergency messages automatically to rescue teams.
- **Reducing response time**: By eliminating human delay in identifying the emergency.

### Key Benefits of ADTS:

- **Improved Safety**: Automatic detection of distress signals minimizes the time taken to initiate a rescue operation.
- **Reduced Human Error**: Reduces reliance on manual reporting and decision-making.
- **Enhanced Situational Awareness**: Provides continuous updates on aircraft status, location, and condition.

## 2. How Autonomous Distress Tracking Systems Work

ADTS operates through a combination of advanced sensors, satellite communication, and artificial intelligence algorithms. Here is a breakdown of the system's working components:

### Components of ADTS:

- **Flight Data Monitoring**: Real-time collection of flight data through onboard sensors (e.g., altitude, speed, fuel levels, engine status).
- **Automatic Distress Signal Activation**: When certain predefined thresholds (such as altitude loss or a sudden speed drop) are crossed, the system automatically triggers a distress signal.
- **Global Communication System**: The distress signal is sent via satellite to air traffic control and emergency response teams, providing exact location data.
- **Autonomous Navigation and Tracking**: The system continuously updates the aircraft's position, ensuring rescuers can locate it swiftly.

### Process Flow:

1. **Normal Flight Conditions**: The system monitors all parameters.
2. **Anomaly Detection**: If a parameter deviates beyond the predefined threshold, the system detects potential distress.
3. **Signal Transmission**: The distress signal is automatically activated and sent via satellite communication to emergency responders.
4. **Rescue Coordination**: Emergency teams receive real-time location and status data for rapid intervention.

## 3. Technological Components of ADTS

The effectiveness of an Autonomous Distress Tracking System hinges on its technological components. Some of the advanced technologies used in ADTS include:

- **Global Navigation Satellite Systems (GNSS)**: For accurate, real-time location tracking of the aircraft.
- **Automatic Dependent Surveillance-Broadcast (ADS-B)**: For broadcasting the aircraft's location, velocity, and other flight data to air traffic control and surrounding aircraft.
- **Satellite Communication (SATCOM)**: For communication between the aircraft and ground-based stations, especially in remote regions.
- **Aircraft Health Monitoring Systems (AHMS)**: For continuous monitoring of the aircraft's mechanical health, providing early warning of potential failures.
- **Artificial Intelligence (AI)**: For analysing data patterns and detecting anomalies faster than traditional systems.


*Figure 1*

# Autonomous Distress Tracking System in Aviation Enhancing Safety And Efficiency

cont....

## 4. Case Studies and Applications of ADTS

### Case Study 1: The MH370 Occurrence

One of the most notable occurrence where distress tracking systems could have been beneficial is the disappearance of Malaysia Airlines Flight MH370. With no automated distress signals transmitted, the search for the aircraft took an extended period. Had an Autonomous Distress Tracking System been in place, the aircraft's last known location and condition could have been relayed to search teams in real time, greatly reducing search efforts.

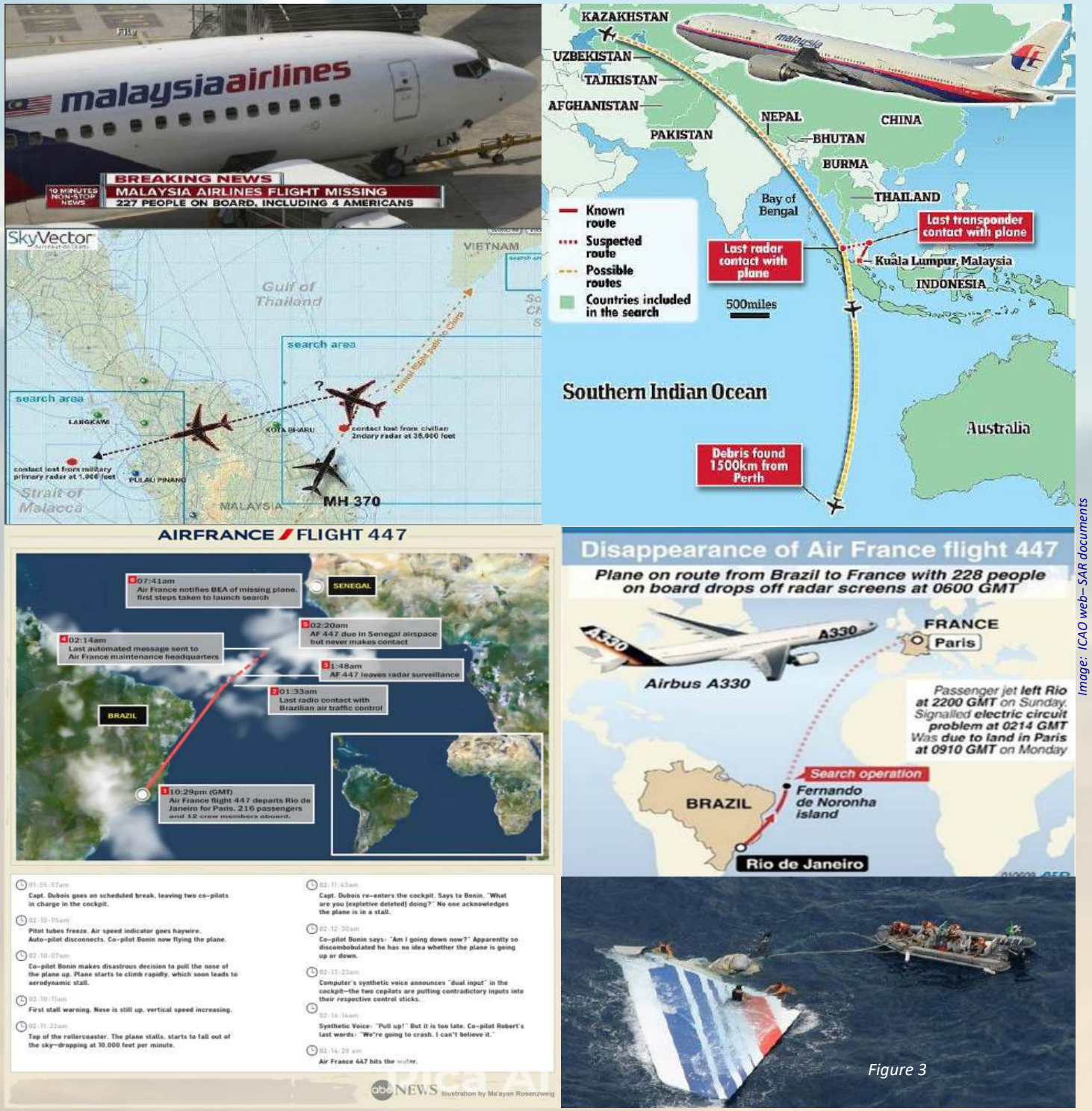



Figure 3

Image: ICAO web– SAR documents

## Case Study 2: Real-time Tracking in Remote Areas

In remote and oceanic regions, such as the North Atlantic, traditional air traffic radar often loses tracking ability due to vast distances and terrain limitations. ADTS can function in these areas by using satellite-based communications, ensuring that distress signals and location data can be sent even when there is no radar coverage.

## 5. ADTS Implementation Challenges

While the implementation of ADTS offers significant advantages, there are several challenges to overcome:

- **Infrastructure Costs**: Installing advanced systems on aircraft, such as satellite communication and global tracking, requires substantial investment.
- **Data Privacy and Security**: Protecting flight data from potential breaches or unauthorized access is critical, as it contains sensitive information.
- **Global Standardization**: Establishing a global standard for distress tracking across all airlines and countries can be complex due to varying regulations and technological compatibility.

## Solutions to Challenges:

- **Collaborative Industry Efforts**: Collaboration between airlines, regulators, and manufacturers to create unified ADTS standards.
- **Advances in Low-Cost Technology**: As technology advances, the cost of implementing ADTS systems is expected to decrease, making it more feasible for smaller carriers.
- **Enhanced Cybersecurity**: Developing robust security protocols to safeguard the transmitted distress data.

## 6. Future of ADTs in Aviation

The future of Autonomous Distress Tracking Systems in aviation looks promising. With the continued development of satellite technology, artificial intelligence, and cloud-based systems, the capability of ADTS is expected to expand.

Some of the potential future enhancements include:

- **Integration with Air Traffic Management Systems**: ADTS could evolve to interact directly with air traffic control systems, providing real-time updates and allowing for faster response times.
- **Improved Predictive Analytics**: The use of AI to predict potential mechanical failures before they happen, allowing for preventative measures to be taken.
- **Global Coverage**: Future systems may provide 100% global coverage, ensuring that aircraft can be tracked and assisted no matter their location on the planet.

## Conclusion

The **Autonomous Distress Tracking System (ADTS)** represents a significant leap forward in aviation safety, offering automated, real-time distress detection, tracking, and communication. By reducing human error, accelerating rescue times, and providing greater situational awareness, ADTS has the potential to save countless lives. However, the widespread implementation of such systems will require overcoming technological, regulatory, and financial challenges. With ongoing advancements in technology, the future of ADTS holds promise for safer skies for all.

*Note: ICAO Annex 6P1: **Standard 6.18.1** As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of **over 27 000 kg** for which the individual certificate of airworthiness is **first issued on or after 1 January 2024**, **shall** autonomously transmit information from which a position can be determined by the operator at least **once every minute**, when **in distress**, in accordance with Appendix 9*

**Abbreviation** ***Figure 1***

*MCC: Mission Control Center. It serves as the central hub for processing distress signals and coordinating search and rescue operations.*
*RCC: Rescue Coordination Center. This is responsible for coordinating the response to distress signals and managing search and rescue operations.*
*RLSP: Return Link Service Provider. This entity provides the return link service, which allows for communication back to the distress beacon*
*LUTs: Local User Terminals. These are ground stations that receive distress signals from satellites and forward them to the MCC*
*EPIRB: Emergency Position Indicating Radio Beacon. This is a device used to alert search and rescue services in the event of an emergency*
*AHMS: Autonomous Health Monitoring System. This system monitors the health and status of the distress tracking equipment.*
*ELT-DT: ELT stands for Emergency Locator Transmitter.*
*DT refers to Distress Tracking, implying a system that uses the ELT to detect and track distress signals autonomously. ELT-DT is typically used in aviation to send out distress signals during an emergency.*
*PLB stands for Personal Locator Beacon.It is a small, portable distress beacon that is used by individuals in emergency situations to alert search and rescue services to their location. PLBs typically send signals to satellites, which then relay the distress signal to ground stations.*
*LEO stands for Low Earth Orbit.*
*This refers to a satellite orbiting close to Earth, typically between 160 and 2,000 kilometres above the Earth's surface. LEO satellites are commonly used in communication, navigation, and distress tracking systems, like those used in ELT-DT or PLB systems.*
*GEO stands for Geostationary Orbit.*
*This is an orbit approximately 35,786 kilometres above the Earth's equator where a satellite appears to remain in a fixed position relative to the Earth's surface. GEO satellites are often used for communication and weather monitoring, as well as in distress tracking systems.*
*SAR stands for Search and Rescue.*
*It refers to operations, typically coordinated by government agencies or military forces, aimed at locating and helping people in distress. SAR systems often rely on technologies like GPS, satellite communication, and distress beacon systems to locate those in need of help.*
*GPS stands for Global Positioning System.*
*It is a satellite-based navigation system that provides location data. It is widely used in many distress tracking systems (e.g., in ELTs, PLBs) to determine the precise location of a person or object in distress.*
*Galileo is the European Union's Global Navigation Satellite System (GNSS).*
*It is similar to GPS but is operated by the European Union. It provides positioning, navigation, and timing services to users worldwide, and it is often integrated into distress tracking systems alongside GPS*
*GLONASS stands for Global Navigation Satellite System.*
*It is Russia's counterpart to GPS and Galileo, providing global positioning and navigation services. Like GPS and Galileo, GLONASS is used in distress tracking systems to assist in locating distress signals.*
*These systems and technologies play vital roles in ensuring rapid response to emergencies and are often integrated in autonomous distress tracking systems for accurate, real-time location data and efficient rescue operations.*
*Homepage.aspx , accident information web sites and self-study research.*

*Source: ICAO Web sites. https://www.icao.int/safety/globaltracking/pages/*

# SELCAL and SELCAL 32

# Enhancing Aviation Safety

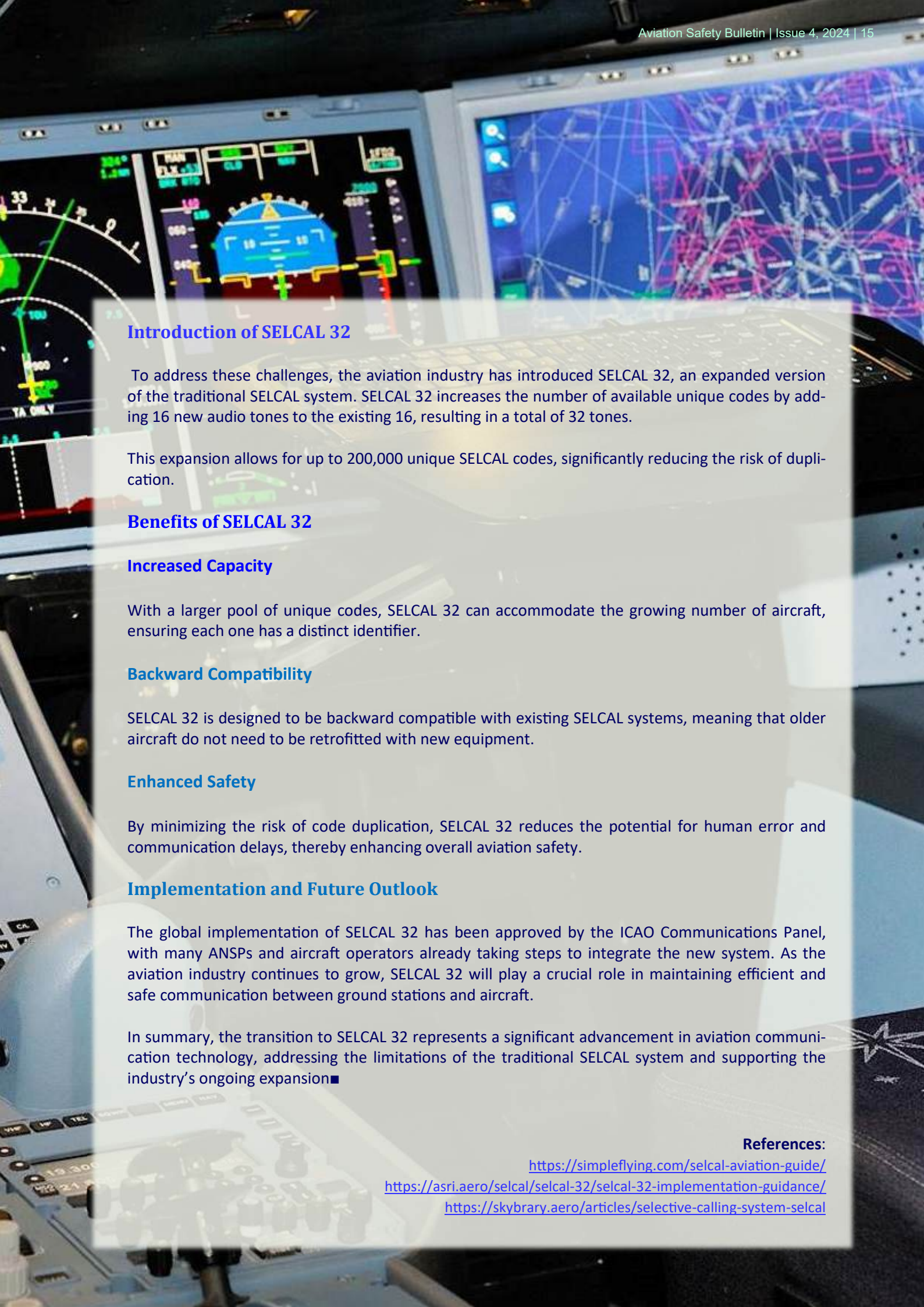
Selective Calling (SELCAL) is a communication system used in aviation to selectively alert an aircraft's crew that a ground station wishes to communicate with them. This system allows flight crews to be relieved from continuously monitoring their HF or VHF radio frequencies, thus reducing fatigue and enhancing safety. Each aircraft is assigned a unique SELCAL code, which, when transmitted by a ground station, triggers an alert in the cockpit.

## Challenges with Traditional SELCAL:

### Code Duplication:

The traditional SELCAL system uses 16 audio tones to create unique codes. However, with the growing number of aircraft, the pool of available codes (10,920 unique combinations) has become insufficient1. This has led to instances where multiple aircraft respond to the same SELCAL code, creating potential safety risks and increasing the workload for air traffic controllers.

Operational Impact: Duplicate SELCAL codes can cause confusion and delays in communication, which are critical in maintaining efficient and safe flight operations



## Introduction of SELCAL 32

To address these challenges, the aviation industry has introduced SELCAL 32, an expanded version of the traditional SELCAL system. SELCAL 32 increases the number of available unique codes by adding 16 new audio tones to the existing 16, resulting in a total of 32 tones.

This expansion allows for up to 200,000 unique SELCAL codes, significantly reducing the risk of duplication.

## Benefits of SELCAL 32

### Increased Capacity

With a larger pool of unique codes, SELCAL 32 can accommodate the growing number of aircraft, ensuring each one has a distinct identifier.

### Backward Compatibility

SELCAL 32 is designed to be backward compatible with existing SELCAL systems, meaning that older aircraft do not need to be retrofitted with new equipment.

### Enhanced Safety

By minimizing the risk of code duplication, SELCAL 32 reduces the potential for human error and communication delays, thereby enhancing overall aviation safety.

## Implementation and Future Outlook

The global implementation of SELCAL 32 has been approved by the ICAO Communications Panel, with many ANSPs and aircraft operators already taking steps to integrate the new system. As the aviation industry continues to grow, SELCAL 32 will play a crucial role in maintaining efficient and safe communication between ground stations and aircraft.

In summary, the transition to SELCAL 32 represents a significant advancement in aviation communication technology, addressing the limitations of the traditional SELCAL system and supporting the industry's ongoing expansion■

**References**:
https://simpleflying.com/selcal-aviation-guide/
https://asri.aero/selcal/selcal-32/selcal-32-implementation-guidance/
https://skybrary.aero/articles/selective-calling-system-selcal

# Wildlife

# Hazard to Aircraft Safety

Birds and other wildlife on, and in the vicinity of any airport presents a threat to aircraft safety. Reducing the presence of wildlife in aircraft flight paths can be achieved through ecological means such as habitat management or the dispersal or removal of hazardous wildlife.

Site inspections have shown that food and beverage packages, including food waste, are littered across areas near the airport and the lids of garbage containers are left open. Garbage containers left open and wastes not disposed of properly but littered around containers provide ready food opportunities for birds and wildlife passing through these areas, thereby attracting birds and other wildlife to these areas, thus these areas being made usable continuously by wildlife.

**WARNING**

Wildlife tend to be present on aerodromes because they offer a favorable habitat and resting and feeding areas.

## Major Wildlife Attractions

- Food
- Water
- Shelter
- Perching sites
- nesting site
- resting place
- safe assembly point

## Threats to Aircraft Safety

Bird Strikes can have a range of effects on aircraft safety, some of which are listed as follows:

### 1. Loss of Life

While bird strikes are usually not fatal, there have been instances where they have led to tragic accidents. When a bird strike causes severe damage to an aircraft, such as engine failure or structural compromise, it can result in catastrophic events during critical phases of flight, like takeoff or landing. For example, the 1960 crash of Eastern Air Lines Flight 375 in Boston, which resulted in 62 fatalities, was attributed to bird ingestion into multiple engines. Such incidents underscore the potential threat bird strikes pose to the lives of passengers and crew.

### 2. Structural Damage

The high-speed impact of a bird on an aircraft can cause significant damage to its structure. This includes shattered windshields, dented radomes (the nose of the aircraft housing radar systems), and compromised wing or tail surfaces. In severe cases, the damage can affect the aerodynamic performance of the aircraft, leading to control difficulties. For instance, if a bird strike damages the leading edge of a wing or horizontal stabilizer, it can alter the lift and balance of the aircraft, making it difficult to control.

### 3. Engine Failure

Bird strikes often involve birds being ingested into jet engines. Depending on the size and number of birds, this can result in complete engine failure due to fan blade damage, compressor stalls, or turbine damage. The 2009 emergency landing of US Airways Flight 1549 in the Hudson River, often referred to as the "Miracle on the Hudson," is a notable example. The Airbus A320 struck a flock of geese, causing both engines to fail. Fortunately, the skilled actions of the crew prevented loss of life, but the event demonstrated the severe consequences of engine failure caused by bird strikes.

### 4. Loss of Control

Bird strikes can lead to a sudden and unexpected loss of control, especially during critical phases of flight. For example, if a bird strike damages the flight control surfaces (e.g., ailerons, elevators, or rudders), it can reduce or eliminate the pilot's ability to maintain stable flight. In some cases, bird strikes may also cause pilot disorientation or distraction, particularly if a bird breaches the cockpit through the windshield or severely damages instruments critical for navigation and control.

## Roles of Airport Operators

- Establish, implement and evaluate the Wildlife Hazard Management Plan (WHMP)
- Provide sufficient resources (human and financial) for implementation of WHMP.
- Control wildlife and analyze the risk of wildlife hazards.
- Organize and host the Bird Strike Committee.

## How Can You Help?

- The general public and all airport staff and stakeholders working or living near the airport must pay attention to issues set above.
- Food waste must NOT be thrown away randomly or littered around the garbage containers.
- Lids of garbage containers must be kept closed at all times.
- For Flight safety, cats, dogs and bird species must not be fed at or near the airport vicinity.
- Reduce, Reuse and Recycle.
- Building managers must pay attention to bird movements and take precautions against nests that birds can build on roofs and hangars.
- Educate children, neighbors, friends and family on proper waste disposal


*Reference: https://www.istairport.com/media/oe4g0wi2/safety-bulletin-2019-08-rev01.pdf*

# Reflection on the 59th Director General's Conference

The Civil Aviation Authority of Fiji (CAAF) was represented at the 59th Director Generals' Conference in Cebu, Philippines from 13th – 18th October 2024 by the Chief Executive, Ms Theresa Levestam, Executive Manager Air Safety, Captain Tom Waqa and the Executive Manager Aviation Security and Facilitation, Mr Rigamoto Aisake. The Fiji delegation was headed by the Permanent Secretary for the Ministry of Tourism and Civil Aviation, Ms Salaseini Daunabuna and included Director Civil Aviation, Ms Alumita Lagicere. The theme for the conference was, 'Shaping the Future of Aviation: Sustainable, Resilient and Inclusive'.

About 45 different countries in the Asia Pacific Region attended the Conference. In attendance also were the President of the ICAO Council, the Secretary General to ICAO, Regional Director for ICAO and other senior officers of ICAO. Apart from the participants, other global partners and sponsors were on hand to advertise and sell their products and services.

The Annual Director Generals' Conference is a technical aviation forum which discusses aviation; progress, trends, challenges, successes, innovation, technology and future plans covering safety, security, facilitation, economy and the environment. The scope of the discussions covered the 19 different ICAO Annexes, including the different conventions.

The Fiji delegation participated in the discussions and also had separate meetings with global aviation partners along the margins of the conference on matters of mutual interest.

CAAF Chief Executive, Ms Theresa Levestam facilitated one of the discussion sessions in her area of expertise and also contributed to the safety related discussion papers that were presented. CAAF's Executive Manager Aviation Security and Facilitation, Mr Rigamoto Aisake responded to some of the aviation security and facilitation discussion papers and provided a brief update on Fiji's status of implementation in those specific areas.

In total, there were about 68 Discussion Papers that were tabled at the meeting. Out of these, there were 6 Aviation Security and Facilitation Papers that were tabled for discussion and included topics on:

1) One Stop Security;
2) Recognition of the 10th Anniversary of the United Nations Security Council Resolution (UNSCR) 2178 and the Continued Progression in Passenger Name Record (PNR) Implementation to Counter Terrorist Travel;
3) Privatisation of Airports and the Need for Guidance on Security By Design;
4) Research on Application of an Advanced Technological Means to Reduce the Impact of Human Factors on Operations;
5) Importance of Strengthening the State's Preparation for Universal Security Audit Programme Continuous Monitoring Approach (USAP-CMA); and
6) Strengthening Management of Airport Security Facilities.

Recurring themes throughout the conference included the use of innovation, artificial intelligence and advanced technology to complement and; or, improve aviation and enhance collaboration across national boundaries, strengthen inclusiveness, whilst developing resilience. The emphasis on gender parity in aviation is a positive step in the right direction and demonstrates a change in attitude that is welcomed and embraced.

The Conference provided meaningful opportunities to forge new partnerships, expand global networking and learn from the experiences of other more developed countries. It was equally important that Fiji shared its aviation story. Fiji used the opportunity to also acknowledge and thank its aviation partners who are instrumental in supporting the development of aviation in the country through the provision of scholarships, training.

ICAO updated the forum on its new strategic plan for 2026-2050. The strategic plan is aligned with similar ICAO global plans like the Global Aviation Security Plan (GASeP) and focusses on ensuring safety and security across the aviation spectrum. Central to the plan is the notion that aviation delivers reliable, accessible, seamless mobility for all, including cargo, that no country is left behind, emphasis on the ratification of air law instruments to address challenges to aviation and encourage economic development of air transport. In addition, the conference encouraged States to strengthen regional priorities, including capacity building and gender equality. There was discussion on the need to use gender neutral terms for air crew and women in aviation, whilst promoting zero tolerance for sexual harassment.

Singapore shared its experience in preparing for the ICAO USAP-CMA audit where its project team conducted a mock audit of their aviation security system using the ICAO Protocol Questions. Gaps identified during the mock audit were appropriately addressed as part of its corrective action plan, before the real audit. As a result, Singapore performed extremely well during their USAP-CMA audit.

The 59th Director General's Conference has successfully concluded. It has provided us with new found knowledge on aviation which we can share and implement where appropriate, to help broaden our horizons and further develop and protect this critical sector of Fiji's economy■

**CAA Fiji is keen to hear from you regarding our levels of service. If you believe you have constructive ideas on how we can improve our services, or would like to report instances where we have failed to meet your expectations, please send your feedback to CAAF, preferably using the QA 108 form that can be accessed from our website. This can be sent to CAAF via email or dropping it in the feedback box in the foyer of CAAF HQ, or emailing to : *info@caaf.org.fj***

## FCAIR

**FIJI CONFIDENTIAL AVIATION INCIDENT REPORTING FORMS AVAILABLE ON WEBSITE www.caaf.org.fj *OR* FRONT DESK, CAAF HQ.**

# The Advent of Advanced Air Mobility (AAM) and Its Potential Effects on Air Transportation

## Introduction

The aviation industry stands on the brink of a transformative era with the advent of Advanced Air Mobility (AAM). This innovative concept encompasses a range of new aircraft technologies, including electric vertical takeoff and landing (eVTOL) vehicles, drones, and autonomous flight systems. AAM promises to revolutionise air transportation by enhancing connectivity, reducing congestion, and providing sustainable solutions to urban mobility challenges. This article explores the implications of AAM for the future of air transportation, focusing on its potential benefits, challenges, and safety considerations.

### Understanding Advanced Air Mobility

AAM refers to a new air transport system that integrates advanced aircraft designs and flight technologies into existing transportation frameworks. It includes various applications, such as urban air taxis, cargo delivery drones, and emergency medical services. The primary goal of AAM is to create a more efficient, accessible, and environmentally friendly mode of transport, particularly in urban and suburban areas.

# The Advent of Advanced Air Mobility (AAM) and Its Potential Effects on Air Transportation cont...

## Key Technologies Driving AAM

1. **Electric Propulsion**: AAM vehicles often utilise electric or hybrid-electric propulsion systems, which significantly reduce emissions compared to traditional aircraft. This shift aligns with global sustainability goals and addresses growing concerns about air quality and climate change.
2. **Autonomous Flight**: Many AAM concepts incorporate autonomous flight capabilities, which can enhance safety and operational efficiency. By reducing the need for human pilots, these systems can lower operational costs and expand the potential for air transport in underserved regions.
3. **Integration with Existing Infrastructure**: AAM aims to seamlessly integrate with current transportation systems, including airports, heliports, and urban transport networks. This integration is crucial for ensuring that AAM can effectively complement existing modes of transport rather than replace them.

## Potential Effects on Air Transportation

### Enhanced Connectivity

One of the most significant impacts of AAM is the potential for enhanced connectivity. By providing rapid transport options in urban areas, AAM can alleviate congestion on roads and improve access to remote locations. This is particularly beneficial for emergency services, allowing for quicker response times in critical situations.

### Economic Opportunities

The introduction of AAM is expected to create new economic opportunities within the aviation sector. This includes job creation in manufacturing, maintenance, and operations of AAM vehicles. Furthermore, the development of vertiports and related infrastructure will stimulate local economies and attract investment.

### Environmental Benefits

AAM technologies are designed with sustainability in mind. The shift to electric propulsion and the potential for reduced noise pollution can significantly lessen the environmental impact of air travel. This aligns with global efforts to reduce carbon emissions and promote greener transportation solutions.

## Challenges to Overcome

Despite its promising potential, AAM faces several challenges that must be addressed for successful implementation:

1. **Regulatory Frameworks**: The integration of AAM into existing airspace requires comprehensive regulatory frameworks to ensure safety and efficiency. Governments and aviation authorities must collaborate to establish guidelines that facilitate the safe operation of AAM vehicles.
2. **Public Acceptance**: Gaining public trust in AAM technologies is crucial. Concerns about safety, noise, and privacy must be addressed through transparent communication and community engagement.
3. **Infrastructure Development**: The successful deployment of AAM will necessitate significant investment in infrastructure, including vertiports and charging stations. This requires collaboration between public and private sectors to ensure adequate support for AAM operations.

# The Advent of Advanced Air Mobility (AAM) and Its Potential Effects on Air Transportation cont...

## Safety Considerations for AAM

The safety considerations for AAM are crucial as this innovative sector develops. Here are some key aspects to consider:

### 1. Aircraft Design and Technology

AAM vehicles will incorporate advanced technologies, including automation and electric propulsion. The design must ensure reliability and safety, with systems capable of making critical decisions, such as hazard detection and avoidance. This is particularly important for both piloted and autonomous operations.

### 2. Certification Processes

The certification of AAM aircraft is essential to ensure they meet safety standards. This involves rigorous testing and evaluation of the aircraft's performance, operational capabilities, and compliance with regulatory requirements.

### 3. Operational Safety

AAM operations will require comprehensive safety protocols, including pilot training and operational guidelines. The integration of AAM into existing airspace must consider the interaction with traditional aircraft, necessitating clear communication and coordination among all airspace users.

### 4. Air Traffic Management

Effective air traffic management systems will be vital for AAM to operate safely, especially in urban environments. This includes the development of dedicated airspace corridors and traffic management solutions to prevent collisions and ensure smooth operations.

### 5. Infrastructure Development

The establishment of vertiports and charging stations must adhere to safety standards. These facilities should be designed to accommodate the unique requirements of AAM vehicles, including emergency protocols and maintenance considerations.

### 6. Community Engagement

Public acceptance is a significant factor in the successful implementation of AAM. Engaging with communities to address concerns about noise, safety, and privacy will be essential for fostering trust and support.

### 7. Environmental Considerations

While AAM aims to reduce emissions, the environmental impact of operations must be continuously assessed. This includes evaluating noise pollution and ensuring that AAM contributes positively to urban environments.

## Conclusion

The advent of Advanced Air Mobility represents a significant leap forward in the evolution of air transportation. With its potential to enhance connectivity, create economic opportunities, and promote environmental sustainability, AAM could reshape the way we think about travel in urban environments. However, addressing the associated challenges and safety considerations will be essential to realise its full potential. As the aviation industry embraces this new frontier, ongoing collaboration among stakeholders will be crucial to ensure a safe, efficient, and widely accepted AAM ecosystem■

**References :** [1] Advanced Air Mobility (AAM) and Safety Management Systems (SMS);
[2] Defining Services, Functions, and Capabilities for an Advanced Air ...; [3] Aviation Safety Protocols: Evolution from Past to Future ;
[4] Advanced Air Mobility (AAM) Implementation Plan

Images: https://www.nasa.gov/directorates/armd/aosp/amp/; https://nbaa.org/aircraft-operations/emerging-technologies/advanced-air-mobility-aam/nbaa-advanced-air-mobility-aam-roundtable/

# SPOTLIGHT On Air Terminal Services Fiji

## Breaking Barriers, Inspiring Change: Celebrating Women in Aviation

Air Terminal Services (Fiji) Limited (ATS Fiji) is a leading provider of ground handling and aviation support services in Fiji, dedicated to excellence in airport operations. Established in 1981, ATS Fiji serves major airlines with a wide range of services, including passenger and cargo handling, aircraft maintenance, and catering. With a strong commitment to innovation, sustainability, and empowering its workforce, ATS Fiji plays a vital role in ensuring the seamless operation of Fiji's aviation industry.

This year, ATS Fiji celebrated three inspiring women who are breaking barriers and driving change in the aviation industry.

### Shradha Sharma: Transformative Leadership at the Helm

In 2023, ATS Fiji appointed Ms. Shradha Sharma as its first female Chair of the Board of Directors—a historic milestone in the company's journey. With over 20 years of experience in finance, governance, and capacity building, Ms. Sharma has steered ATS Fiji toward record achievements, including the reinstatement of 500 workers post-COVID and the company's highest-ever profits. A passionate advocate for women's empowerment, she continues to inspire future leaders with her innovative and inclusive vision.

### Camilla Simpson-Rigamoto: Pioneering Engineering Excellence

As the first female Licensed Aircraft Maintenance Engineer (LAME) at ATS Fiji and Nadi International Airport, Camilla Simpson-Rigamoto is a trailblazer in a traditionally male-dominated field. Certified for the Boeing 737 Next Generation and 737 MAX, Camilla's journey from tradesperson to LAME involved rigorous training and determination. Despite the challenges of balancing long shifts with family responsibilities, she remains passionate about her work. "If you love what you do, you'll keep going back despite the challenges," she says. As the only female engineer on her 26-member team, Camilla's success is a beacon for aspiring women in aviation engineering.

ATS Fiji's celebration of these remarkable women highlights the company's dedication to fostering a culture of inclusivity and empowerment, inspiring aviation personnel across the industry to dream big and break new ground.

### May Panapasa: A Legacy of Dedication and Service

Recognized with the 40 Years' Long Service Award, Julia May Panapasa exemplifies commitment and resilience. Joining ATS Fiji in 1984 as a Switchboard Operator, May rose through the ranks to serve as Personal Assistant in the Administration Department for 34 years, supporting eight different Chief Executive Officers. Her unwavering dedication has been instrumental in ATS Fiji's operations, making her a true role model for future generations■

# Camilla Simpson-Rigamoto Pioneering Women In Aviation Engineering

## An Inspirational Journey

Camilla Simpson-Rigamoto is a trailblazer in the male-dominated field of aviation engineering. From her early fascination with aircraft to earning her certifications, Camilla's journey is a testament to resilience, adaptability, and dedication. Her personal life also serves as a significant source of motivation. As a wife and mother of two, she draws inspiration from her family to continually strive for excellence in her professional endeavors.

With a career spanning more than a decade, Camilla exemplifies how passion and perseverance can overcome challenges in a demanding industry. Her story highlights the strength and determination needed to break barriers, serving as an inspiration for others to follow.

Born and raised in Taveuni, Fiji, Camilla's fascination with aviation was ignited during a childhood trip accompanying her mother, Lorraine Simpson, a flight attendant with Air Pacific. Witnessing the intricacies of an aircraft engine and the excitement of the flight deck, she was inspired to explore the world of aircraft engineering. Moving to the west to complete her final three years of high school at Natabua High School, played a significant role, as it positioned her closer to educational opportunities in aviation.

Camilla pursued her passion by earning a Trade Certificate in Aircraft Engineering (Avionics) from the Fiji National University in 2009. Joining Fiji Airways (formerly known as Air Pacific) as a trainee in 2010, she steadily progressed, earning her first basic license from the Civil Aviation Authority of Fiji (CAAF) in 2016. Despite the pandemic disrupting her career in 2020, Camilla returned to aviation in 2023 with Air Terminal Services (ATS), achieving a significant milestone by obtaining her first Aircraft Type rating for the Boeing 737 NG.

## Navigating Challenges

As a woman in aviation engineering, Camilla has faced her share of obstacles. Reflecting on her experiences, she shared "I have always been fortunate enough to work alongside gentlemen, and they have always been very supportive".

Despite the supportive environment, Camilla acknowledges the physical demands of the job, which often required creative problem-solving. "As a female, our bodies aren't as strong as males, especially when it comes to heavy lifting. So, it's always about working smarter, not harder," she explained. Her pragmatic approach underscores her ability to adapt and excel in a field where physical demands can sometimes be a challenge.

"The best way to manage is to make the most of the time you do have," Camilla advises. For her, days off are spent reconnecting with family and recharging emotionally, an approach that reflects her resourcefulness and commitment.

Balancing work and family life presented another significant challenge. Shift work and irregular hours often meant missing out on important family moments. "The best way around that is to manage your free time well," Camilla advises. For her, days off are spent reconnecting with loved ones and recharging emotionally, an approach that reflects her resourcefulness and commitment.

## Thriving at ATS

Since joining ATS in January 2023, Camilla has thrived as a Licensed Aircraft Engineer certified on the Boeing 737NG and 737Max aircraft. Her role involves critical maintenance and inspections, ensuring the safety and reliability of air travel. One of the most fulfilling aspects of her job is knowing that her work directly contributes to the safety of Fiji's air transport industry. The satisfaction of seeing an aircraft take off safely after meticulous servicing is unparalleled. It's a testament to her dedication and skill as an engineer. Each successful departure reflects not only her technical expertise but also her ability to adapt to challenges and maintain high standards under pressure.

Challenges like working in extreme weather conditions - scorching sun or heavy rain – test her resilience. Yet, she remains steadfast in her commitment to safety and operational excellence.

## Breaking Barriers Through Mentorship

Camilla shares that *"Women have always been seen as the caretakers in the household, and this societal expectation often places significant pressure on them."* She goes on to explain "*They're expected to attend to the sick, manage children if they have any, and maintain a balance between their personal lives and demanding work schedules. In aviation, where shifts can range from 10 to 12 hours or more, this expectation becomes even more challenging.*"

She explains that these pressures frequently lead women to sacrifice their careers for household responsibilities. Camilla emphasises that strong support systems; whether from family members, partners, or spouses, is important for women pursuing long-term goals in aviation. "I was very fortunate to have a strong support system from my family and friends."

To address these challenges, Ms Simpson suggests fostering environments where women feel supported both at work and at home. This includes encouraging open conversations about shared responsibilities within households and workplaces offering flexible policies that accommodate family needs without penalising career progression.

Camilla recognises that her journey holds the power to inspire others, particularly women considering careers in aviation. Thus, opportunities to share experiences are important, believing that real-world examples of success can help dismantle stereotypes about women in technical fields. Through outreach events and mentorship programs, Camilla hopes to show aspiring engineers that determination and a supportive environment can help them thrive in any industry.

## Empowering Women in Aviation

Camilla is passionate about inspiring more women to join aviation, particularly in technical fields. She emphasises the importance of outreach programs and representation. "*When young girls see women who are thriving in traditionally male-dominated careers, it helps them realize that anything is possible*," she shares.

Camilla highlights the need for strong support systems at home and work, enabling women to balance career aspirations with personal responsibilities. She hopes to mentor and inspire the next generation, potentially through social media platforms that showcase her experiences as a female engineer.

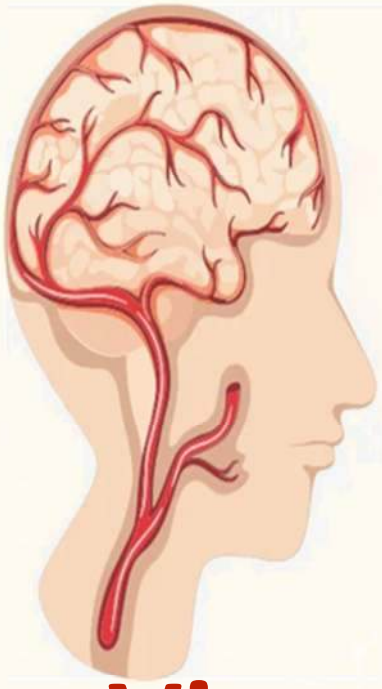
Her vision is clear; by being visible and approachable, whether through direct mentorship or digital storytelling, she aims to break down barriers and encourage more women to step confidently into aviation roles.

## Words of Wisdom

Reflecting on her journey, she could have chosen an easier career path, but aviation has been incredibly rewarding. Her resilience and gratitude for her family's support have driven her success, and she remains ambitious about acquiring additional aircraft ratings to expand her expertise.

Beyond her professional achievements, Camilla finds balance through sports, enjoying hockey, squash, and jogging to maintain her well-being. Her story is a testament to the possibilities that arise from passion, hard work, and unwavering determination.

Camilla Simpson-Rigamoto's trailblazing journey continues to inspire women to break barriers and pursue careers in aviation engineering, proving that no dream is too ambitious■




# Vitamin B12 Deficiency

Nutritional deficiency is common in this modern era yet its often difficult to detect and diagnose. It's ironic in some way, that as modern civilization has brought forth wealth, prosperity and plentiful supply of food, many are getting afflicted by nutritional deficiencies stemming from a poor diet.

Modern agricultural practices of using pesticides and chemical fertilizers coupled with a round the clock all year round utilization of soil without any period of rest, has resulted in plants and animals that we source our foods from, deficient in key nutrients.

The common nutritional deficiencies that we see today, apart from Vitamin B12 include Iron, Folate, Magnesium, Iodine, Zinc and many others.

## What is Vitamin B12

Vitamin B12 is a water-soluble vitamin, also known as Cobalamin. It is an **Essential Vitamin** acquired from dietary consumption. An Essential Vitamin or nutrient is one that cannot be naturally produced by our body and has to be eaten. Animal products are rich in Vitamin B12 eg. Meat, poultry, fish, eggs and dairy products.

## How Is Vitamin B12 Absorbed into our Bodies

*Stomach Processes of Vitamin B12 Absorption*

Parietal Cells in the stomach secrete two important chemicals.

a) *Hydrochloric Acid.*
Hydrochloric acid breaks down the meat in our food and cleaves the Vitamin B12 off the meat cells. Once the Vitamin B12 is freed other enzymes originating in the salivary glands (mouth) grab hold of the Vitamin B12 moiety acting as a shuttle to transport this nutrient to the cells that absorb it, in the distal small intestine or ileum. Majority of the absorption of Vitamin B12 occur in the ileum.

b) *Intrinsic Factor*.
Once the Vitamin B12 has reached the small intestine it is then grabbed by the chemical *Intrinsic Factor* which is the final shuttle that takes Vitamin B12 into the intestinal cells for absorption. It is the intrinsic factor that runs the gantlet of the entire small intestine to deliver the Vitamin B12 to the distal ileum for absorption.

## Body Stores of Vitamin B12

The liver stores Vitamin B12 and releases to the blood stream what the body requires. This stock of Vitamin B12 can take 6 months to a couple of years to be depleted. So, if a person suddenly goes vegan, they will still feel better until time has depleted Vitamin B12 storage and the symptoms start.

In the same token, once treatment for Vitamin B12 is instituted, it may take 6 months or more for body stores to be restored.

## What causes Vitamin B12 Deficiency

There are 2 main causes of Vit B12 deficiency.

1) A Poor Diet – a diet devoid of animal products eg. Veganism Diet
2) Poor Absorption from the Ileum

## What does Vitamin B12 do?

Vitamin B12 is necessary for certain enzymatic reactions that is responsible for;

1) Central Nervous System Function
2) Red Blood Cell Function
3) Chemical processes in cells for Energy production.

## Medical Conditions that Cause Vitamin B12 Deficiency

1) **Helicobacter Pylori (H. pylori)** is a bacteria that can infect and populate the stomach causing inflammation and symptoms of **Gastritis or Peptic Ulcer disease**. H. pylori is often treated with Tripple Therapy containing 2 antibiotics and an antacid H. pylori infection can damage the cells secreting hydrochloric acid and intrinsic factor .
2) Other causes of inflammation of the stomach or Gastritis have the potential to reduce the absorption of Vitamin B12.
3) **Sjogren's Disease** is an autoimmune disease affecting the Salivary Glands thus reducing saliva and salivary enzymes secretion. This could lead to poor absorption of Vitamin B12.
4) **Gastric Bypass Surgery**. These surgeries resect portions of the stomach containing parietal cells that are necessary for production of intrinsic factor and hydrochloric acid.
5) **Inflammatory Bowel Disease**. (IBD) This includes Chron's Disease and Ulcerative Colitis. This condition affects the large intestine and can extend to the distal ileum, affecting absorption of Vitamin B12. Surgical treatment of IBD involving ileal resection can reduce the absorption surfaces for Vitamin B12.
6) **Celiac Disease / Gluten Sensitivity.** This allergic condition to Gluten containing foods (wheat) results in inflammation and villi destruction in the small intestine reducing its absorptive capacity. Intestinal bacterial overgrowth as a result of celiac disease also results in reduced absorption of vitamin B12.
7) **Pernicious Anemia.** This autoimmune disease common in the Elderly population results in the production of antibodies against Parietal Cells of the stomach leading to their destruction. Pernicious Anemia can also be triggered by Gluten exposure in gluten-sensitive people.
8) **Pregnancy.** The demands of the developing fetus could cause a deficiency in a woman with minimal liver stores of Vitamin B12 from a chronically poor diet. Vitamin B12 deficiency in pregnancy could result in neurological fetal abnormalities like Neural Tube defects.
9) Many pregnant women would be routinely prescribed Folate as a supplement, however it's important to know that Vitamin B12 is required in the activation of folate.
10) **Medications.** Metformin used in the treatment of diabetes, Proton Pump Inhibitors (Omeprazole) and Antacids used in the treatment of Gastritis could result in Vitamin B12 deficiency.
11) **Chronic Alcohol Abuse.** Alcohol can directly damage stomach parietal cells.

## Laboratory Diagnosis of Vitamin B12

A simple blood test could measure the levels of Vitamin B12 and many other nutrients like folate, iron etc.

## Treatment of Vitamin B12 Deficiency

Supplements for Vitamin B12 are available in Oral, Sublingual (Under The Tongue) or Injectable forms.

Like injectables that bypass the Gastric and Ileal problems of absorption, the sublingual route offers a more painless and non-invasive method of delivery of Vitamin B12 into the body.

## Conclusion

For aviators who may be feeling chronically fatigued and unwell, brain fog, poor vision and chronic oral inflammatory lesions, a blood test for Vitamin B12 and other nutrients like Folate, Iron, Zinc should be conducted.

Vegans and those whose diet are devoid of meat, whole foods and composed mainly of ultra-processed foods should be aware of nutritional deficiencies■

*Author: Dr Isireli Biumaitotoya*

CIVIL AVIATION AUTHORITY OF FIJI
CERTIFIED ISO 9001

# CYCLONE SEASON IS HERE.


## *Are you prepared?*

- Be Prepared
- Make a plan
- Stay Weather-ready

More info @ www.caaf.org.fj