FOURTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 26 August to 6 September 2024

Agenda Item 3: **Air Navigation System Performance Improvement**
3.2: **Phasing out legacy systems**

PHASING OUT LEGACY AIR TRAFFIC MANAGEMENT SYSTEMS FOR ENHANCED EFFICIENCY AND SAFETY

(Presented by the United Arab Emirates)

EXECUTIVE SUMMARY

This paper presents the necessary phasing out of legacy air traffic management (ATM) systems to enhance efficiency, safety, and interoperability in global air navigation. It highlights the limitations of existing legacy systems and proposes strategies for transitioning to modern, performance-based systems. The paper underscores the benefits of modernizing ATM systems, including improved operational efficiency, enhanced safety, and better environmental performance. It calls for a global framework to guide the transition and the establishment of a knowledge-sharing platform to facilitate the exchange of best practices.

Action: The Conference is invited to:
   a)   encourage Member States to adopt a phased implementation plan for transitioning to modern ATM systems;
   b)   recommend the development of an ICAO-led global framework to guide Member States in phasing out legacy systems, ensuring consistency and interoperability; and
   c)   establish a knowledge sharing platform for Member States to share experiences, challenges, and best practices related to the transition from legacy systems to modern ATM technologies.

1.   INTRODUCTION

1.1   The rapid evolution of air traffic management (ATM) technologies necessitates the phasing out of outdated legacy systems to enhance efficiency, safety, interoperability in global air navigation. This paper discusses the limitations of existing legacy systems and presents strategies for transitioning to modern, performance-based systems, aligning with ICAO's Long-term Aspirational Goal (LTAG) of net-zero carbon emissions by 2050.
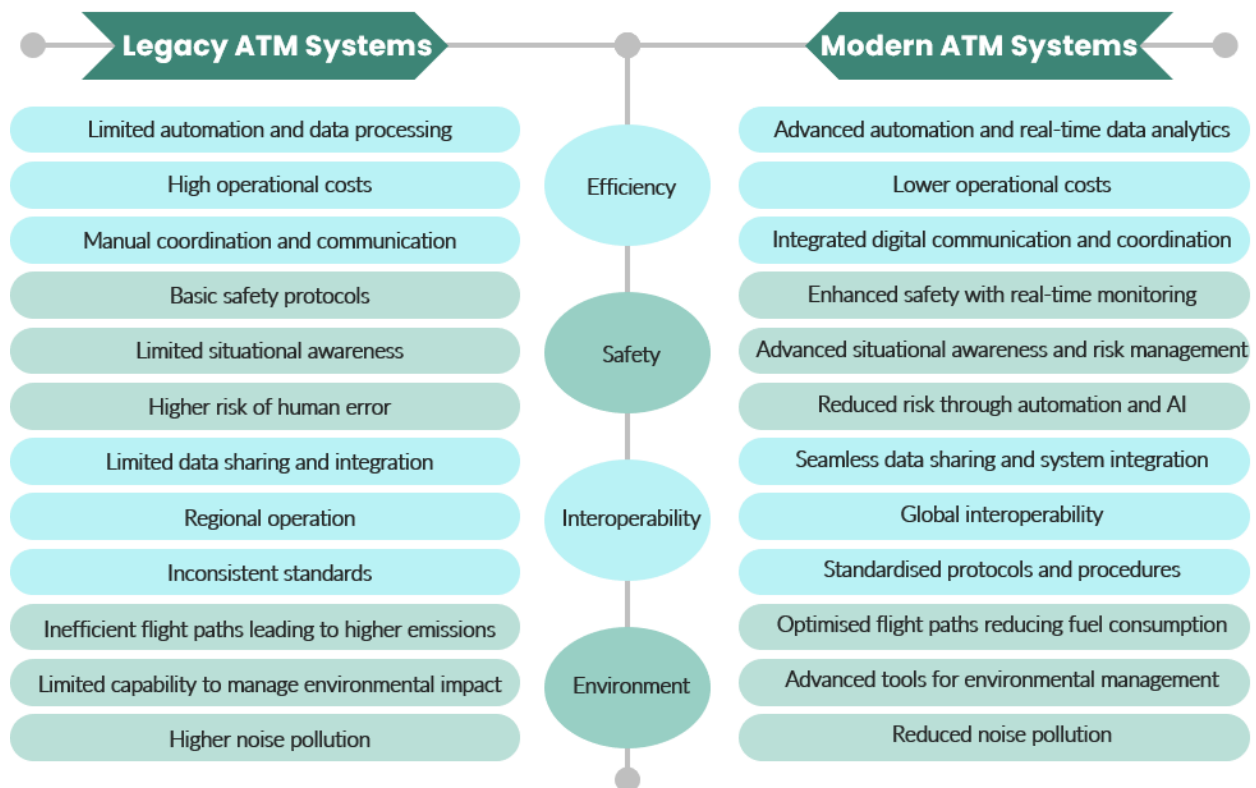
1.2   The transition to modern ATM systems aligns with ICAO's LTAG of net-zero carbon emissions by 2050. By optimizing flight paths and reducing fuel consumption, modern systems contribute to the aviation sector's sustainability efforts. Additionally, the implementation of advanced technologies supports the broader goals of ICAO's Global Aviation Safety Plan (GASP) and Global Air Navigation Plan (GANP), ensuring the continued safety and efficiency of global air navigation.

2.   DISCUSSION

2.1   Legacy ATM systems, while having served the aviation industry for decades, are increasingly becoming insufficient to meet modern demands. These systems often suffer from limited interoperability, high maintenance costs, and reduced operational efficiency. The continued reliance on outdated technologies poses significant challenges, including vulnerability to cyber threats and system failures.

2.2   Modern ATM systems offer many benefits over legacy systems. These include improved operational efficiency through advanced automation and data analytics, enhanced safety with better situational awareness and real-time monitoring, and superior environmental performance by optimizing flight paths to reduce fuel consumption and emissions. Additionally, modern systems enhance interoperability and data sharing between international air navigation services providers (ANSPs), ensuring a more cohesive global air traffic network.

2.3   High level advantages of modern ATM systems over existing legacy systems:

Legacy ATM Systems		Modern ATM Systems
Limited automation and data processing	Efficiency	Advanced automation and real-time data analytics
High operational costs		Lower operational costs
Manual coordination and communication		Integrated digital communication and coordination
Basic safety protocols	Safety	Enhanced safety with real-time monitoring
Limited situational awareness		Advanced situational awareness and risk management
Higher risk of human error		Reduced risk through automation and AI
Limited data sharing and integration	Interoperability	Seamless data sharing and system integration
Regional operation		Global interoperability
Inconsistent standards		Standardised protocols and procedures
Inefficient flight paths leading to higher emissions	Environment	Optimised flight paths reducing fuel consumption
Limited capability to manage environmental impact		Advanced tools for environmental management
Higher noise pollution		Reduced noise pollution

2.4   Phasing out legacy systems requires a well-planned and phased implementation strategy. Key strategies include:

   a)   creating detailed, phased plans for transitioning from legacy to modern ATM systems, ensuring minimal disruption to ongoing operations;

   b)   investing in training and upskilling personnel to manage and operate new ATM technologies effectively; and

c) working closely with international bodies and ANSPs to harmonize the implementation of new systems, ensuring global interoperability.

2.5   Examining successful transitions from legacy to modern ATM systems can provide valuable insights. Case studies from various regions highlight the importance of robust planning, stakeholder engagement, and iterative testing. Best practices include phased rollouts, comprehensive training programs, and continuous monitoring and evaluation.

2.6   To facilitate the transition, ICAO and Member States should:

a) encourage the adoption of modern, performance-based ATM systems to replace outdated technologies;

b) propose funding mechanisms and incentives to support the transition, ensuring that financial barriers do not hinder progress; and

c) promote international cooperation and standardization to ensure seamless global implementation and interoperability.

3.   **CONCLUSION**

3.1   Phasing out legacy air traffic management systems is crucial for enhancing the efficiency, safety, and sustainability of global air navigation.

3.2   This paper advocates for a global framework to guide the transition from legacy systems, providing Member States with guidelines and best practices for implementing modern technologies. A standardized approach will enhance consistency and interoperability, streamlining the transition process.

3.3   Additionally, creating a knowledge-sharing platform is vital to facilitate the exchange of best practices and lessons learned. This platform will enable Member States, ANSPs, and industry stakeholders to share experiences and develop innovative solutions, accelerating the transition to modern ATM systems.

3.4   In conclusion, phasing out legacy ATM systems is necessary for modernizing global air navigation. This paper outlines the strategic importance of this transition and provides recommendations to guide Member States and stakeholders. Embracing modern technologies and fostering collaboration will ensure a safer, more efficient, and sustainable future for aviation.

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