ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

SYSTEM WIDE INFORMATION MANAGEMENT IMPLEMENTATION CHALLENGES

(Presented by the Civil Air Navigation Services Organisation and the
International Federation of Air Traffic Controllers' Associations)

EXECUTIVE SUMMARY

At the Fourteenth Air Navigation Conference (AN-Conf/14) meeting it was agreed that ICAO was to undertake the steps necessary to support the cessation of Flight Plan 2012 (FPL 2012). In addition, AN-Conf/14 was provided information on several technical advancements that will also impact the future aviation system. However, to advance the work of ICAO, there remain challenges that must be resolved.

To support the implementation of the new flight plan and future communication and surveillance technologies, the aviation community will need to advance the transition to a system-wide information management (SWIM) architecture. Future system concepts and new entrants will be reliant on the design, guidance and applicable provisions related to the implementation of a SWIM architecture. This paper identifies several challenges related to the implementation of SWIM that ICAO must resolve prior to 2034.

Action: The Assembly is invited to note the information contained in this working paper and consider the recommendations for assisting in the development of a global SWIM services implementation.

a) urge ICAO to develop a strategy to facilitate a harmonized approach to implementing a SWIM network infrastructure across all ICAO regions;
b) urge ICAO to advance work on the technical enablers needed for a seamless data exchange, including routing, information service definitions, registries and cybersecurity protocols in a harmonized, efficient, and manageable manner; and
c) encourage States to consider adopting the implementation of SWIM capabilities that will enable flight and flow information for a collaborative environment (FF-ICE) capabilities and other emerging services related to meteorology, aeronautical information, and communications.

Strategic Goals:	This working paper relates to *Every Flight is Safe and Secure, Aviation Delivers Seamless, Accessible, and Reliable Mobility For All* and *No Country is Left Behind*
Financial implications:	The ICAO activities referred to in this paper are expected to be undertaken within the resources available in the 2026-2028 Regular Budget and/or from extra-budgetary contributions as guided by the ICAO Business Plan 2026-2028.

[1] Arabic, Chinese, English, French, Russian and Spanish versions provided by CANSO.

References:	Doc 10039, *Manual on the System-wide Information Management (SWIM) Concept* Doc 9854, *Global Air Traffic Management Operational Concept* AN-Conf/14-WP/213, *Report of the Committee on Agenda Item Three* Recommendation 3.2/2, *Transition to flight and flow – information for a collaborative environment services and cessation of ICAO 2012 flight plan by 2034*

1. INTRODUCTION

1.1 The evolution of aviation technologies continues to drive significant advancements across the global air navigation system. However, the accelerating pace of technological change has advanced the need to modernize systems and infrastructures.

1.2 At the Fourteenth Air Navigation Conference (AN-Conf/14), ICAO presented AN-Conf/14-WP/11 on the planned cessation of the ICAO 2012 flight plan format by 2034 and its replacement by flight and flow - information for a collaborative environment (FF-ICE). While the paper outlined the benefits of FF-ICE, it did not explicitly identify system-wide information management (SWIM) as the critical enabler needed to fully facilitate this transition.

2. DISCUSSION

2.1 The initial provisions for FF-ICE (pre-departure/R1) have been developed with the expectation that the supporting infrastructure will be implemented in time to enable the transition. The *Global Air Navigation Plan* (GANP, Doc 9750) describes the new infrastructure as SWIM. While some Air Navigation Service Providers (ANSPs) have begun implementing SWIM, many have yet to begin the transition.

2.2 AN-Conf/14 Recommendations 3.2/1(e) and 3.2/2(g–j) called on ICAO to assist States in developing plans to ensure readiness for the cessation of the ICAO 2012 flight plan. FF-ICE will deliver a more comprehensive, digital flight plan in a modern data-rich format. Users will need to have transitioned to SWIM, or at a minimum, have systems capable of converting FF-ICE messages into an analogue format. air traffic management (ATM) service providers that have not transitioned to SWIM by 2034, may continue to send and receive flight plans in an analogue format, should the requirement for dual flight plan submissions remain in effect; however , such flight plans will not include the expanded fields.

2.3 In addition to FF-ICE, new message formats are under development for meteorology, aeronautical information, and communications which will similarly be dependent on a robust SWIM framework.

3. CHALLENGES

3.1 Implementing a global SWIM framework presents several technical and institutional challenges.

3.2 Connecting diverse automation systems to the global SWIM network is one such fundamental challenge. Current message routing is based on aeronautical fixed telecommunication network (AFTN) addressing. SWIM messages are designed to utilize a flexible, subscription-based mechanism. The message standards for syntax, distribution templates, and migration pathways must be developed to ensure interoperability and a safe migration pathway.

3.3 Once basic connectivity and routings are established, a consensus must be reached on Information Service Definitions (ISDs). ISDs describe the information a user will need to select the appropriate service providers. Ensuring consistency across multiple service providers will be critical.

3.4 Further, the need for a system of registries to be established listing the providers of services for specific flight information regions (FIRs), airports, or regions has been identified. The number and interoperability of registries should be optimized to avoid fragmentation and unnecessary duplication.

3.5 Successful regional cooperative networks such as CARSAM REDIG and ASIA/PAC CRV demonstrate how ICAO can play an important role in supporting the establishment of a regional implementation model.

3.6 To achieve the full benefits of a digital framework, including interoperability and seamless global data exchange, a coordinated globally harmonized approach will be required.

4. CONCLUSION

4.1 To support the planned global transition to FF-ICE by 2034 and to enable the broader use of SWIM-based applications, ICAO is encouraged to work closely with States and industry and to put in place the enabling elements of the modern information exchange, including factors such as infrastructure, routing, information service definitions, registries, security, and governance to help States and stakeholders exchange real-time, data-rich information effectively and consistently.

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