



International Civil Aviation Organization

WORKING PAPER

A42-WP/594

TE/222

12/9/25

(Information paper)

English and Chinese only¹

ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 23: Global Aviation Safety and Air Navigation Plans

ENHANCING THE IMPLEMENTATION OF FF-ICE IN THE GLOBAL STRATEGIC PRE-FLIGHT PLANNING PHASE

(Presented by China)

EXECUTIVE SUMMARY

This paper presents China's experience in the implementation and application of flight and flow information for a collaborative environment (FF-ICE) during the global strategic pre-flight planning phase. Within the framework of the global transition plan, it outlines key outcomes from China's practical applications and, aligned with the Civil Aviation Development Plan of China, offers recommendations to support worldwide adoption. The paper seeks to contribute to the high-quality development of the global aviation industry

<i>Strategic Goals:</i>	This working paper relates to <i>every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	
<i>References:</i>	Doc 9750, <i>Global Air Navigation Plan</i> Doc 9854, <i>Global Air Traffic Management Operational Concept</i> Doc 9965, <i>Manual on Flight and Flow Information for a Collaborative Environment</i>

¹ English and Chinese versions provided by China.

1. INTRODUCTION

1.1 The *Global Air Navigation Plan* (Doc 9750) provides the strategic framework for the evolution of the global air navigation system. Through an interactive and collaborative platform, it supports the integration of regional and national resources and the coordination of stakeholder roles and processes. ICAO identifies the development of the system-wide information management (SWIM)-based flight and flow information for collaborative environment (FF-ICE) as a key area for system performance improvement. It aims to promote FF-ICE-based pre-departure flight planning services worldwide to enable collaborative decision-making among air traffic control (ATC) units, airlines, airports, and other stakeholders.

1.2 Asia-Pacific States are at different stages in the implementation of FF-ICE. China has made progress by developing a demonstration platform based on the ATOM system to support the full FF-ICE/R1 planning and filing process. Trial initiatives, such as four-dimensional trajectory flights and dual-aircraft TBO validation, have been conducted in collaboration with air navigation services providers (ANSPs) and airlines. Other States in the region are also advancing research and trials to align with ICAO's guidance and enhance regional air traffic management (ATM) performance. It is expected that the region will continue to follow ICAO's Standards and Recommended Practices (SARPs), strengthening cooperation and knowledge sharing on FF-ICE, while promoting broader SWIM and FF-ICE implementation. States may also introduce policies to support research and industry participation, aiming to improve flight plan accuracy, timeliness, and overall air traffic flow management efficiency.

1.3 Europe has set a clear implementation timeline requiring all air operators flying within the airspace of the European Union, Norway, and Switzerland to submit flight plans in accordance with FF-ICE/Release 1 by 31 December 2025. This demonstrates that Europe has established a clear timeline and mandatory requirements for FF-ICE implementation, supported by significant progress in technological development and application, laying the groundwork for full-scale deployment. The United States has not set a specific deadline, but its NextGen programme prioritizes technologies such as automatic dependent surveillance — broadcast (ADS-B), data communications, automation systems, and SWIM, recognizing their role in enhancing information management and collaborative operations.

1.4 To advance FF-ICE development and support global aviation digitalization, the Civil Aviation Administration of China (CAAC) has developed an implementation roadmap. It sets out a phased path for FF-ICE/R1. From 2025 to 2027, China will participate in international standards development, establish a SWIM data platform, implement GUF1 distribution mechanisms, upgrade related systems, advance technical solutions, conduct trajectory-based operations (TBO) validation and training, and strengthen cooperation within the Asia-Pacific Region. Between 2028 and 2032, efforts will focus on building a hybrid operating environment for FF-ICE/R1 and FPL2012, completing system modernization, establishing a performance evaluation platform, and promoting data interoperability and TBO demonstration activities. After 2032, full FF-ICE capability will be achieved, with enhanced data security, upgraded ATM systems, four-dimensional trajectory collaboration, and a TBO environment to support global and regional harmonization.

2. DISCUSSION

2.1 China places high priority on strategic-phase pre-flight planning and has promoted system integration and collaborative management. An automated approval system under a unified platform has achieved notable progress over the past decade. FF-ICE can be extended to support strategic

pre-flight planning, offering comprehensive coverage of operational requirements at this phase. With iterative enhancements, it holds strong potential for sustained and innovative application.

2.2 China has initiated the consolidation of strategic phase pre-flight planning information and is conducting standardization studies in line with FF-ICE information requirements. In parallel, integrated transport research consistent with FF-ICE standards is also being pursued.

2.3 In the tactical phase application of FF-ICE, notable disparities exist among States in terms of framework development, guidance material, and implementation progress. While some States have advanced to strategic phase applications after completing system architecture and initial deployment, others remain at the conceptual planning stage. To minimize the implementation gap, it is recommended that States adopt an integrated planning approach for both the strategic and tactical phases, accelerate development efforts, and reduce the duration of transitional periods resulting from varied implementation timelines.

2.4 During the strategic phase of pre-flight planning, when expanding the application of FF-ICE, it is necessary to develop a systematic, comprehensive, and operationally feasible implementation guide. This guide should closely align with the business characteristics and practical needs of the strategic phase of pre-flight planning, clearly defining key elements such as the application process, standards, and responsible entities for FF-ICE in this phase. It aims to provide clear and precise guidance for relevant regulatory authorities and practitioners, ensuring the scientific, orderly, and efficient application of FF-ICE during the strategic phase of pre-flight planning.

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