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EXTENDED IMPLEMENTATION AND APPLICATION OF FLIGHT AND FLOW INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) IN THE STRATEGIC PHASE OF GLOBAL PRE-FLIGHT PLAN

REVISION NO. 1

(Presented by China)

EXECUTIVE SUMMARY

This working paper focuses on the extended implementation and application of flight and flow information for a collaborative environment (FF-ICE) in the strategic phase of a global pre-flight plan. It elaborates on China's practical achievements in the strategic phase of a pre-flight plan under the global FF-ICE-based transition program. Aligning with the development plan of China civil aviation, it proposes recommendations for FF-ICE application in the strategic phase of a pre-flight plan and these recommendations will integrate into global FF-ICE transition in the future, providing reference for the high-quality development of the global aviation industry.

Strategic Goals:	This working paper relates to Strategic Goals of *Every Flight is Safe and Secure.*
Financial implications:	The activities referred to in this paper are expected to be undertaken with the resources available in the 2026-2028 Regular Budget and/or from extra-budgetary contributions as guided by the ICAO Business Plan 2026-2028.
References:	Doc 9750, *Global Air Navigation Plan* Doc 9854, *Global Air Traffic Management Operational Concept* Doc 9965, *Manual on Flight and Flow Information for a Collaborative Environment* Doc 9750, *Global Air Navigation Plan 2013-2028*

[1] English and Chinese versions provided by China.

1. INTRODUCTION

1.1 The *Global Air Navigation Plan* (GANP, Doc 9750) serves as the core strategic framework for the evolution of the global air navigation system. By establishing an interactive collaboration platform, it integrates global resources across regions and States within the multi-layer structure and accurately coordinates responsibilities and operational processes among different parties, thus providing strategic guidance for the continuous improvement and innovative development of the global air navigation system. ICAO has clearly identified the development of system-wide information management (SWIM)-based flight and flow information for a collaborative environment (FF-ICE) as one of the key performance improvement areas for the air navigation system. The ICAO plans to globally promote FF-ICE-based pre-flight plan services, laying the foundation for collaborative decision-making (CDM) among different operating entities such as air traffic control (ATC) units, airlines and airports.

1.2 States in the Asia-Pacific region are at different stages in terms of FF-ICE application and promotion. China has made progress in FF-ICE technological development, developing a model platform featuring complete planning and a submission and dissemination process for FF-ICE/R1 based on the ATOM system. Additionally, China has collaborated with various ATC units and airlines in 4D trajectory test flight and dual-aircraft trajectory-based operation (TBO) flight test validation. Other Asian-Pacific States are also actively engaged in related research and tests to align with ICAO's development pace, so as to enhance regional air traffic management efficiency and coordination. The Asian-Pacific region is expected to continue adhering to ICAO Standards and Recommended Practices (SARPs), strengthen FF-ICE exchanges and cooperation, and advance SWIM building and broad FF-ICE adoption in the region. States may introduce policies to encourage research institutions and enterprises to engage in the development and application of FF-ICE technologies and improve accuracy and real-time nature of flight plans for more efficient air traffic flow management.

1.3 Europe has preliminarily set a target, requiring all operators with flights operating in the airspace of EU, Norway and Switzerland to ensure submission of their flight plans must comply with FF-ICE/Release 1 requirements as of 31 December 2025. This indicates that Europe has established a clear timeline and mandatory requirements for FF-ICE implementation and has made positive progress in technology research and development and application, laying the groundwork for full FF-ICE adoption. Although lacking a unified timeline as explicit as Europe, US Next Generation Air Transportation System (NextGen) plan also prioritizes associated information management and collaborative operational technologies, including automatic dependent surveillance-broadcast (ADS-B), data communications, automation systems, and SWIM.

1.4 To advance the building of China's civil aviation FF-ICE system and integrate it into the global aviation digitalization process, the Civil Aviation Administration of China (CAAC) has formulated an FF-ICE implementation road map. This road map outlines the phased approaches to FF-ICE/R1 adoption. China is expected to participate in international standard development, establish a SWIM data platform, realize GUFI distribution, make system upgrades and technical breakthroughs, conduct TBO validation training, and deepen cooperation in the Asian-Pacific region. China's civil aviation sector plans to create a hybrid operating environment for FF-ICE/R1 and FPL2012, complete system upgrades, establish a performance evaluation platform, promote data interoperability, and promote TBO model projects. It is envisaged to see full FF-ICE/R1 capabilities, enhanced data security, comprehensively upgraded ATC systems, 4D trajectory coordination and performance optimization, and a TBO operational environment for global interoperability and Asian-Pacific collaboration.

2. DISCUSSION

2.1 China attaches high importance to planning in the strategic phase of a pre-flight plan. It has mobilized relevant authorities to integrate systems, built a collaborative and efficient management system, and developed an automated approval system featuring “one-stop” on-line services. After a decade of efforts, significant outcomes have been made. FF-ICE can be extended to the strategic phase of a pre-flight plan, with innovative applications. Its interactive content fully satisfies the operational demands in this phase and can ensure long-term effectiveness through functional iterations.

2.2 China has collated information in the strategic phase of a pre-flight plan, and has been, based on FF-ICE information requirements, conducting research on standardization and making comprehensive transportation research in line with FF-ICE requirements simultaneously.

2.3 Regarding the FF-ICE application in the tactical phase of a pre-flight plan, Member States show significant difference in development of frameworks, guidelines, programs and implementation processes. Those who have completed system framework building and implementation are now advancing FF-ICE application and implementation in the strategic phase, while some others remain in the conceptual planning. For those Member States lagging behind, a unified approach integrating both strategic and tactical phases should be adopted to accelerate planning, reducing transition periods caused by various implementation timelines.

3. CONCLUSION

3.1 It is recommended that airlines study and develop implementation guidelines for extending FF-ICE to the strategic phase of a pre-flight plan, providing guidance for its effective application.

3.2 It is recommended to conduct special research on the allocation rules and full process management mechanism of the GUFI in the strategic phase under the FF-ICE framework. Focuses should be on establishing a GUFI generation logic that covers the entire flight life cycle including flight planning, filing and implementation. By formulating unified coding rules that span from the strategic phase to the tactical phase, the uniqueness of GUFI in the whole life cycle of each flight can be ensured. This will effectively mitigate identifier conflicts caused by different standards in cross-border operations and enable seamless coordination of trans-regional flight plans in terms of resource allocation and operational monitoring.

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