



ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

RISK CONTROL UNDER RAPID ADVANCEMENT OF SUSTAINABLE AVIATION FUEL: DEVELOPING GLOBAL STANDARDIZED MEASURES FOR AVIATION FUEL QUALITY MANAGEMENT

(Presented by China and co-sponsored by Egypt)

EXECUTIVE SUMMARY

To promote the sustainable development of the global aviation industry and the green transformation, civil aviation authorities of Member States are committed to seeking more economical and environmentally friendly ways to reduce carbon emissions in civil aviation. Sustainable aviation fuel (SAF), as the better effective way for emissions reduction, has become an important tool for States to achieve energy conservation, carbon reduction, and green development of civil aviation. With the rapid development of SAF and its growing application around the world, SAF produced from various raw materials and technological ways is being rapidly introduced into the civil aviation fuel market. States, however, may have different airworthiness requirements for aviation fuel. And in terms of quality management, there lacks a unified quality management system and standardized specifications, which increases operational risks for civil aviation. To ensure global aviation safety and harmonize airworthiness standards among States, it is recommended that ICAO draw upon the quality management practices of Member States, consider the application risks of SAF, and develop appropriate and unified Standards and Recommended Practices (SARPs) for aviation fuel management.

Action: The Assembly is invited to:

- recommend that the ICAO draw upon the experience of Member States in SAF quality management to enhance the fuel quality assurance system. This shall include revising the *Manual on Civil Aviation Jet Fuel Supply* (Doc 9977) to incorporate SAF quality control requirements into its guidance materials; and
- recommend that an item for developing SARPs to be added to agenda of the Air Navigation Commission. These SARPs shall be based on the *Manual on Civil Aviation Jet Fuel Supply* (Doc 9977), and shall contain requirements for ensuring jet fuel quality, covering the entire aviation fuel production, supply, and distribution system.

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure</i> and <i>Aviation is Environmentally Sustainable</i> .
<i>Financial implications:</i>	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.
<i>References:</i>	Doc 9977, <i>Manual on Civil Aviation Jet Fuel Supply</i>

¹ English and Chinese versions provided by China.

1. INTRODUCTION

1.1 Aviation fuel is the lifeblood of aircraft engines, and its quality is paramount to aviation safety. In recent years, the frequency of unsafe events caused by fuel quality issues has risen globally. The aviation fuel supply chain spans multiple stages - from refinery production to aircraft refuel - including refineries, transportation, storage, refuel, and airports. Given the varying quality management requirements among States, developing standardized processes and procedures for the entire supply chain is essential to ensuring global aviation safety.

1.2 In 2012, ICAO published the *Manual on Civil Aviation Jet Fuel Supply* (Doc 9977), which was drafted by the Technical Fuel Group of the International Air Transport Association (IATA), in coordination with ICAO, Airlines for America (A4A), the Joint Inspection Group (JIG), suppliers, and Airports Council International (ACI). The manual outlines the requirements related to fuel quality control, operations, and training within the jet fuel supply and distribution system. However, as a guidance document, its provisions were not incorporated into ICAO Annexes.

1.3 With the growing global emphasis on reducing carbon emissions, SAF has become a pivotal tool for achieving carbon reduction. However, the diverse feed stock, processes, and chemical properties of SAF differ significantly from conventional jet fuel, necessitating ongoing refinement of its quality control standards and testing methods. The *Manual on Civil Aviation Jet Fuel Supply* (Doc 9977) can no longer fully accommodate the quality control requirements for SAF.

1.4 To enhance global aviation fuel safety and harmonize airworthiness standards, the practical experience from various States in fuel quality management shall be leveraged. Building on the manual's foundational principles, new SARPs could be developed. This proposal has been formally raised by the International Air Transport Association (A39-WP/167-TE/61 refers), Bangladesh (A40-WP/504-TE/206 refers), and the Russian Federation (A41-WP/319-TE/127 refers).

2. DISCUSSION

2.1 ICAO has established a structured procedure for developing and amending SARPs in the *Convention on International Civil Aviation*, typically requiring one to five years from initial proposal to publication. Given this consideration, the existing provisions in the *Manual on Civil Aviation Jet Fuel Supply* (Doc 9977) can serve as a foundational reference, enabling that the necessary provisions be developed within an optimal time-frame. By developing Doc 9977 and SARPs, a global legal framework will be established to ensure consistent quality control across the entire civil aviation jet fuel supply chain.

2.2 SAF is undergoing rapid global development, with civil aviation authorities and trade organizations in multiple countries and regions making significant progress in SAF airworthiness certification. ASTM International has issued product standards for SAF under ASTM D7566, specifying SAF specifications from various production pathways. The UK Energy Institute (EI) has issued EI 1533, providing guidelines for SAF quality control in production, storage, transportation, and refuelling. Civil Aviation Administration of China (CAAC) has actively engaged in SAF certification and established a certification system covering regulations, procedures, manuals, and technical standards.

2.3 To address aviation safety risks and enhance safety oversight capabilities, harmonizing certification requirements for jet fuel - particularly for SAF - is critical.

2.4 Studying the certification requirements for jet fuel and establishing unified and coordinated quality management standards in the Annex to the Convention as guidance materials will better guide Member States in developing jet fuel airworthiness requirements, enhance fuel quality and safety oversight capabilities, and reduce operational risks caused by fuel quality inconsistencies.

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