



**WORKING PAPER**

**ASSEMBLY — 41ST SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 33: Other issues to be considered by the Technical Commission**

**EXPANDING THE TERMS OF REFERENCE OF THE TRUST FRAMEWORK PANEL**

(Presented by the United States)

**EXECUTIVE SUMMARY**

The global aviation community continues to make significant modernization strides, which improve the safety, security, and efficiency of air travel. Many of these modernization efforts leverage automated digital communication exchanges, as opposed to traditional voice communication. As the aviation sector continues to undergo this profound shift in its communication systems, it creates tremendous need for support services that facilitate secure and resilient digital information exchange to minimize aviation safety, security and efficiency risks. The International Aviation Trust Framework (IATF), envisioned by the ICAO Trust Framework Study Group (TFSG), offers a potential solution to provide confidence in the integrity and authenticity of aviation-related digital information—as well as its secure exchange. Additional development work is necessary to develop these foundational concepts into viable options for operationalizing the IATF, for further consideration by ICAO Member States.

The Air Navigation Bureau (ANB) is transitioning the TFSG to a panel in 2022. The United States invites ICAO to revise the Trust Framework Panel’s terms of reference to include a task focused on developing viable options to operationalize the IATF. The panel will also require input from legal experts and executive-level aviation officials to evolve the existing IATF body of work into a set of viable options for operationalizing the IATF for the further consideration by Member States

**Action:** The Assembly is invited to :

- a) Request that the Air Navigation Bureau develop terms of reference for the Trust Framework Panel that:
  - 1) include an objective to develop a set of technically and legally viable options for operationalizing the IATF, and
  - 2) encourage the participation of legal experts and executive-level aviation officials.

<i>Strategic Objectives:</i>	This working paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
<i>Financial implications:</i>	N/A
<i>References:</i>	N/A

## 1. INTRODUCTION

The civil aviation sector has continued to witness significant modernization since ICAO's 40th Assembly. Many of the technologies underpinning this modernization rely on digital communication, which is expected to grow further, with aircraft utilizing internet protocol services for Data Communications Network Service and other safety services by 2025. Secure digital information exchange is a priority, which is currently accomplished mainly on a point-to-point basis. However, since the aviation ecosystem is a complex system of systems, there are limitations to this point-to-point approach as the number of digital connection nodes increase and the stakeholders involved in these connections expand. The opportunity for cyber-attack increases as information traverses multiple point-to-point digital connections without interoperable data protection. The operational complexity for organizations to maintain a large number of secure ad-hoc point-to-point connections is not scalable and is another potential source of vulnerabilities.

1.1 Continued aviation expansion premised on digital communication without harmonized, global information security protocols presents safety and security risks, which are outlined in the discussion below.

1.2 There is an urgent need for the global aviation community to plan and develop support services infrastructure that helps enable a secure and resilient way to exchange information with multiple global aviation stakeholders in a digital manner that has information authenticity and integrity verification measures.

1.3 The ICAO Trust Framework Study Group (TFSG) has been developing and reviewing various concepts to address information security risks in an increasingly multi-dimensional aviation ecosystem. Out of this work, the TFSG developed an International Aviation Trust Framework (IATF) concept. The end goal of the IATF is to enable secure, interoperable digital information exchange.

1.4 While the IATF's objective is straightforward, the path to its accomplishment is not—transitioning from an environment where digital information protection is done on a point-to-point basis to one that is end-point to end-point is complex. The technical experts in the TFSG have developed a robust technical scope for the IATF and produced, for example, recommended information security requirements for trusted networks and identity policies.

1.5 The TFSG will transition to a panel in 2022. In order for the IATF concept to further evolve from a technical conversation toward eventual IATF implementation, it requires development of an operational and governance scope. It will be important that the Trust Framework Panel's terms of reference include an objective to focus on developing a set of viable options to operationalize the IATF. Developing these options will be best accomplished with consideration of aviation legal and executive-level perspectives, which have not been adequately represented in the TFSG's work to date. Technical experts have been the primary TFSG participants since their knowledge is critical to developing IATF concepts, now that this foundational work has advanced, the participation of legal and executive level perspectives is critical to identify IATF operationalization options.

## 2. DISCUSSION

2.1 If information security protocols for digital communication remain static, States (and all organizations across the aviation ecosystem) will be burdened to develop and support agreements with

each and every stakeholder with whom they exchange digital information. This creates not only a fragmented solution, but it also expands the cyber-attack surface. For example, a typical information exchange between one air navigation services provider and another is accomplished with multiple network devices managed by multiple organizations. In many cases, the information protection is not end-to-end or is based on weak approaches, such as shared secrets, thereby leaving these information exchanges vulnerable to attack.

2.2 Lack of information security harmonization undermines confidence in information protection and increases information security risk. Because of a lack of transparency, there is no guarantee that one party protects the information at the same level as another one. This inability to engage in end-to-end communication protection increases information security risk.

2.3 The loss of information integrity and availability (realization of information security risk) can lead to increased safety risk, and under extreme circumstances, could result in a safety hazard that may result in an accident. The existing aviation information systems and network protection approach will not scale well globally as reliance on digital communications continues to increase. Without disintermediation between service providers and users, more and more bilateral agreements will be required between countries and organizations, and technical requirements will further increase in order to achieve end-to-end security. This state of affairs will result in continually increasing connectivity costs and global complexity for interoperability.

2.4 The IATF could enable interoperable, secure information exchange between service providers (i.e., origination points) and users (i.e., endpoints) that enables authentication and message integrity. While the TFSG has achieved significant progress in developing IATF foundational concepts, there is additional development work required for the IATF to reach an implementation stage. Establishing the required support services infrastructure and the agreements that that may be necessary to operationalize the concept require not only technical expertise, but also legal and executive-level perspectives, as well as a goal for these stakeholders to collaborate in developing options to operationalize the IATF.

### 3. CONCLUSION

3.1 Aviation expansion without global information protection increases safety risk. The IATF is a potential solution to this challenge. Since the challenge is a complicated one, it requires additional work to support its successful development and implementation.