



International Civil Aviation Organization

WORKING PAPER

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ASSEMBLY — 42ND SESSION

LEGAL COMMISSION

Agenda Item 29 : Other issues to be considered by the Legal Commission

STUDY OF INTERNATIONAL LEGAL ISSUES RELATING TO GLOBAL SATELLITE SYSTEMS AND SERVICES SUPPORTING INTERNATIONAL AIR NAVIGATION SERVICES

(Presented by South Africa)

EXECUTIVE SUMMARY

The increased use of space-based technology to support global industry is ever increasing. Various papers have been developed by States and presented for consideration by the ICAO Air Navigation Conference and ICAO Assembly.

Many of the resolutions developed pursuant to these papers have common elements relating to legal consideration, such as safety, access, reliability, sovereignty, and the obligations placed on States and Service providers of these Satellite Technologies.

This paper presents some of these past and current legal considerations which require review and consolidation to guide and support global aviation industry.

Action: The Assembly is invited to:

- a) Review the content of the paper;
- b) Assign key work packages to the relevant ICAO Panels, Committees, and Working Groups relating to continuous monitoring of the aviation operating landscape to identify potential risks including supporting mitigation measures relating to ATM/CNS implementation, as well as the potential impacts posed by the increase of re-entry of space objects affecting International Air Navigation, and Higher Altitude Operations (HAO); and
- c) Task the ICAO Legal Committee to create a risk matrix on aspects considered and deemed addressed under the Chicago Convention and related SARPS/PANS for consideration by States.

<i>Strategic Goals:</i>	This working paper relates to Strategic Goals - Aviation Delivers Seamless, Accessible, and Reliable Mobility for All; International Civil Aviation Convention and Other Treaties, Laws and Regulations Address all Challenges.
<i>Financial implications:</i>	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.

<i>References:</i>	<i>A32-19: Charter on the Rights and Obligations of States Relating to GNSS Services</i> <i>A32-20: Development and elaboration of an appropriate long term legal framework to govern the implementation of GNSS</i> <i>Doc 9849, ICAO Global Navigation Satellite System (GNSS) Manual</i>
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1. INTRODUCTION

1.1 Satellite-based technology has significantly contributed to aviation through enhanced navigation, communication, and data transmission, ultimately leading to increased safety, efficiency, and operational capabilities. This technology enables precise positioning, weather monitoring, and real-time communication, even in remote areas, benefiting all stakeholders.

1.2 With the evolution of the Air Traffic Management (ATM) System, utilizing the Global Navigation Satellite Systems (GNSS) plays a crucial role in modern aviation, providing precise positioning, timing, and navigation data for various flight phases. It enhances safety, efficiency, and capacity in air traffic management. ICAO identified the need to develop a legal framework to support the implementation of GNSS and further define the Charter on the Rights and Obligations of States Relating to GNSS Services.

1.3 The 32nd session of the ICAO Assembly in 1998 developed two resolutions in this regard, namely:

1.3.1 A32-19: Charter on the Rights and Obligations of States Relating to GNSS Services; and

1.3.2 A32-20: Development and elaboration of an appropriate long term legal framework to govern the implementation of GNSS.

1.4 Since the development of these resolutions, other aspects which require legal consideration include re-entry of space objects affecting International Air Navigation including higher altitude operations.

2. DISCUSSION

2.1 Various papers have been developed by ICAO, States, and Industry and presented at multilateral platforms such as the Air Navigation Conference and the ICAO Assembly with resolutions developed to address the aspects raised in these papers through the ICAO working groups like Panels, Committees, and Commissions.

2.2 One of the aspects which is common to these various papers is the legal requirements relating to global satellite systems and services supporting international air navigation services. This is because the services provided through satellite technology to the aviation industry are not necessarily operated or owned by the individual States.

2.3 The Chicago Convention recognizes that each State has complete and exclusive sovereignty over the airspace above its territory, Furthermore, the Convention recognizes the contracting States' responsibilities to provide air navigation facilities and standard systems. The Chicago Convention is supported by its Annexes that contain Standards and Recommended Practices (SARPs) for international civil aviation, ensuring safety, efficiency, and consistency in aviation operations worldwide.

2.4 Assembly Resolution *A32-19 – Charter on the Rights and Obligations of States Relating to the GNSS Services* highlights the principles that shall apply in the implementation and operation of GNSS, including: the primacy of safety; nondiscriminatory access to GNSS services; State sovereignty; the obligation of provider States to ensure reliability of services; and cooperation and mutual assistance in global planning.

2.5 Assembly Resolution *A32-20 Development and Elaboration of an Appropriate Long-term Legal Framework to Govern the Implementation of GNSS* further highlighted the complexity of legal aspects required to be considered with the implementation of CNS/ATM, including GNSS and the importance of developing guidance for the development and implementation of a global legal framework for CNS/ATM, and particularly GNSS.

2.6 This was to build mutual confidence among States regarding CNS/ATM systems and to support the implementation of CNS/ATM systems by Contracting States.

2.7 As the ATM system evolves, it requires continuous monitoring of the aviation operating landscape to identify potential risks including supporting mitigation measures relating to ATM/CNS implementation, and particularly GNSS. This is one of the reasons why a constant review of the legal framework is required to address any potential risks during the evolution of the ATM system. The consideration of risk and potential impacts relating to ATM/CNS implementation in 1998 might have significantly changed and require additional review to ensure that it is adequately addressed through the related ICAO SARPs and related procedures for air navigation services (PANS).

2.8 These potential impacts included the increase of re-entry of space objects affecting International Air Navigation as presented by South Africa through AN-Conf/14-WP/204 at the 14th Air Navigation Conference. With the anticipated increase in satellite infrastructure in space to maintain the service provision networks, which is expected to increase from 10,000 to 100,000 over the next couple of years, the management of conjunctions between active orbiting satellites and other space objects including its conjunctions with aviation will pose a significant challenge and become much more complicated to manage. This would require adequate regulatory and legal frameworks to ensure the interests of States are protected in line with Articles 1 and 28 of the Chicago Convention.

2.9 Additionally, Higher Altitude Operations (HAO) present unique legal challenges that require careful consideration. These challenges include determining the applicable law for operations that cross into or spend significant time in space, defining the legal status of vehicles that transition between aircraft and space objects, and establishing third-party liability and insurance for the potentially higher risks associated with HAO. Additionally, the need for a coordinated approach between aviation and space institutions, research bodies, and industry is crucial for navigating these complex legal issues.

3. CONCLUSION

3.1 The legal aspects relating to ATM/CNS and GNSS implementation for consideration by ICAO and Member States is vast and will remain an activity for consideration by the Legal Committee as the ATM systems evolve.

3.2 It is required that a risk matrix of legal aspects be considered by the Legal Committee and the relevant SARPs/PANS be developed to guide the activities for a coordinated approach between aviation and space institutions, research bodies, and industry in line with Assembly Resolutions A32-19 and A32-20.