International Civil Aviation Organization

WORKING PAPER

ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

STRENGTHENING THE SAFE INTEGRATION OF SPACE LAUNCHES AND RE-ENTRIES IN GLOBAL AIRSPACE MANAGEMENT

(Presented by Denmark on behalf of the European Union and its Member States[1], the other Member States[2] of the European Civil Aviation Conference, and by EUROCONTROL)

EXECUTIVE SUMMARY
The European Union (EU), ECAC and EUROCONTROL commend ICAO's leadership through Resolutions A40-26: Commercial space transport (CST) and the Fourteenth Air Navigation Conference (AN-Conf/14), Recommendation 3.1/6 — Addressing the safe integration of space transport operations into the airspace system, which mandate the development of comprehensive space transport operations (STOs) guidance material covering inter-alia NOTAM dissemination, stakeholder communication associated with specific operations, air traffic flow management, and data-sharing, and contingency procedures. Commercial launch and re-entry activities continue to increase and STOs are becoming routine users of the airspace. Collaborative work between space transport and aviation is therefore needed in order to better understand needs and constraints for the optimized use of the airspace. There is an urgent need for the delivery of the requested guidance material by States, and the activity must be afforded greater priority in the allocation of resources by ICAO. The paper furthermore stresses the need for collaborative work with the United Nations Office for Outer Space Affairs (UNOOSA).
Action: The Assembly is invited to:
a) support the implementation of the recommendations agreed at the Fourteenth Air Navigation Conference (AN-Conf/14) on the safe integration of space transport operations (STOs) into air traffic management;
b) reaffirm its strong support for integrating STOs into air traffic management in accordance with Resolutions A40-26 and AN-Conf/14, Recommendation 3.1/6; and
c) request ICAO to prioritise the development of harmonized STOs guidance material on air traffic management for space launch and re-entry activities, by allocating dedicated expertise and resources within the ICAO Secretariat and working collaboratively with the United Nations Office for Outer Space Affairs (UNOOSA).
Strategic Goals:	This working paper relates to Strategic Goals *Every Flight is Safe and Secure; and Aviation Delivers Seamless, Accessible and Reliable Mobility for all*.

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[1] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden

[2] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Iceland, Republic of Moldova, Monaco, Montenegro, North Macedonia, Norway, San Marino, Serbia, Switzerland, Türkiye, Ukraine and the United Kingdom

Financial implications:	N/A
References:	Resolution A40-26: Commercial space transport (CST) Doc 10209, *Report of the Report of the Fourteenth Air Navigation Conference*, Recommendation 3.1/6 - Addressing the safe integration of space transport operations into the airspace system NAT Doc 013 Operational Guidance Material for Commercial Space Operations (CSO) North Atlantic Region, First Edition July 2024 NACCDCA12WP06 - Asia Pacific Regional Guidance for Space Object Launch and Re-entry

1. **INTRODUCTION**

1.1   The European Union (EU), ECAC and EUROCONTROL commend ICAO's sustained leadership in improving the accommodation of space transport operations (STO) into the existing air traffic management (ATM) system.

1.2   Assembly Resolution A40-26 Commercial Space Transport (2019) reaffirmed the role of ICAO in developing policy guidance in the areas where international commercial space transport (CST) operations intersect with international civil aviation. More recently, during the Fourteenth Air Navigation Conference (AN-Conf/14), Recommendation 3.1/6 (2024), Member States have collectively requested the development of "*guidance material for air navigation services providers related to the integration of space transport operations, including NOTAM dissemination, stakeholder communication associated with specific operations, air traffic flow management, and data-sharing for real-time updates on the status of the airspace, excluding telemetry data of launch vehicles*".

1.3   Space operations boost economic growth and improve everyday life through innovation and technology. As growth in the commercial launch and re-entry industry accelerates rapidly, the necessity for this foundational work is essential for maintaining the efficiency of the ATM system and for supporting the growth of the STO industry. There is an urgent need for the delivery of the requested guidance material by States, and the activity must be afforded greater priority in the allocation of resources.

2. **DISCUSSION**

2.1   Both STO and ATM have their own constraints, and both require the use of the airspace. It is urgent that the two communities work together, under the leadership of the International Civil Aviation Organization and of the United Nations Office for Outer Space Affairs, to facilitate the safe integration of the rapidly increasing space launches and re-entries into the current use of airspace while recognizing air law and space law are subject to different legal regimes.

2.2   Airspace in many regions can be complex, spanning many States and stakeholders, and some of these depend on a layered planning cycle - seasonal, pre-tactical and tactical - to safeguard network performance and meet environmental goals. The introduction of launch notifications late into the necessary planning process has a significant impact on the integrity and efficiency of the entire ATM cycle. By agreeing on capacity targets and route structures up to nine months in advance, refining flow constraints and slot allocations one to three months before operations, and finalizing NOTAMs and sector configurations several days out, air navigation service providers (ANSPs) can minimize delays, smooth cross-border traffic flows and optimize fuel-efficient routings. This disciplined approach transforms

complexity into predictability, ensuring resilient, on-time service while upholding the region's emissions and sustainability commitments.

2.3　　　　There is general recognition that unplanned adjustments also affect airline operations by requiring last-minute reroutes and additional schedule updates. Dispatch teams need extra time to revise flight plans, and ATCOs may need to allocate part of their shift to managing these changes rather than their routine duties. Therefore, to align the different operating procedures between aviation and space a balanced approach is needed.

2.4　　　　Unscheduled reroutes around temporary airspace restrictions may add extra track miles per flight, and when dozens of flights are affected in a single launch window, the cumulative fuel burn quickly reaches thousands of kilograms per flight and hundreds of tonnes of CO_2 overall. These additional emissions, repeating with each clustered launch period, represent a significant drag on ICAO environmental targets.

2.5　　　　The absence of a taxonomy common to space-related and aviation activities presents immediate barriers to efficient and seamless, cross-border or inter-region coordination. CAAs/ANSPs must translate between disparate terminologies and manually reconcile differing terms or definitions. This inconsistency slows down processes, complicates the exchange of machine-readable data and increases the risk of misinterpretation during time-critical events.

2.6　　　　Similarly, without reasonable notification timelines, neighbouring FIRs cannot align their planning activities. Such misaligned lead times force ANSPs to choose between overriding established seasonal or pre-tactical constraints or operating with insufficient information neither of which supports effective, multi-region traffic-flow management.

2.7　　　　Contingency management also suffers in the absence of standardized protocols. Divergent practices around activating and releasing emergency airspace - in terms of criteria, communication channels and "all-clear" signals - mean that adjacent States cannot automatically recognize each other's hazard-area declarations. The result is repeated bilateral negotiations, delayed hazard-area activations and uneven flight-path restrictions that undermine both safety assurance and network predictability across borders.

2.8　　　　Various ICAO regions (e.g. Latin America) have commenced development and promulgation of airspace management procedures for accommodating STO because of necessity. ICAO can use these experiences to coordinate global guidance material and reduce the risk of divergence and loss of the harmonisation in aspects that are essential to efficient inter-regional coordination.

2.9　　　　By developing guidance material to support structured, inter-regional coordination ICAO can help states and regions beyond the current patchwork of ad-hoc measures to a unified, efficient model. This evolution will not only enhance safety and network resilience but also deliver measurable environmental benefits and reinforce aviation's efforts in the global, sustainable integration of air and space operations.

3.　　**CONCLUSION**

3.1　　　　Building on ICAO's excellent policy groundwork, we call upon the Assembly to request that the Council and Secretariat re-prioritize the already agreed work on STO integration and allocate dedicated resources to achieve these goals in collaboration with the United Nations Office for Outer Space Affairs (UNOOSA).

3.2　　　　By providing the global guidance material necessary to enhance cross border and inter-region coordination, ICAO will enable the safe integration of STO into the airspace system by considering the constraints of both kinds of operations. By moving from reactive, region-specific workarounds to a

coordinated, predictable and flexible global model, and with ICAO and UNOOSA collaboration, we will have better means of assuring an optimised use of the airspace by both aviation and space actors.

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