International Civil Aviation Organization

Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG

Singapore, 25 – 29 August 2025

Agenda Item 6: ATM Coordination (Meetings, Route Development, Contingency Planning)

ROCKET LAUNCH DANGER AREA COORDINATES MISMATCH

(Presented by IATA)

SUMMARY

This paper presents the issue of mismatched rocket launch danger area coordinates between adjacent Flight Information Regions (FIRs), leading to operational confusion. It highlights the need for improved coordination and harmonization to ensure safe and efficient airspace management during launch activities.

1. INTRODUCTION

1.1 Over the past year, IATA received several reports from airlines regarding the mismatch of danger area coordinates for rocket launches between adjacent FIRs.

1.2 These discrepancies may arise during the coordination of airspace closures and the dissemination of NOTAMs, particularly in regions where multiple FIRs are responsible for managing the affected airspace.

1.3 These mismatches have caused operational confusion and ambiguity in the interpretation of restricted airspace, resulting in increased workload for pilots and dispatchers. It may also contribute to a higher operational risk due to potential misinterpretation across FIR boundaries.

2. DISCUSSION

Asia/Pacific Regional Guidance[1]:

2.1 The ICAO Asia/Pacific Regional Guidance for Space Object Launch and Re-entry Activities Coordination emphasizes the importance of cross-border collaboration and information harmonization for space object launch activities.

2.2 However, practical challenges persist in the implementation phase, where adjacent FIRs publish different coordinates for the same rocket launch danger area.

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1 https://www2023.icao.int/APAC/Documents/Asia%20Pacific%20Regional%20Guidance%20for%20Space%20Object%20Launch%20and%20Re-entry%20V.1.pdf

2.3 The following examples illustrate instances of mismatched coordinates. In the **Figure *1***, the red outlines represent the danger zones based on NOTAM-published coordinates, while the white outlines reflect the danger zones as defined/coordinated by the Launch State.

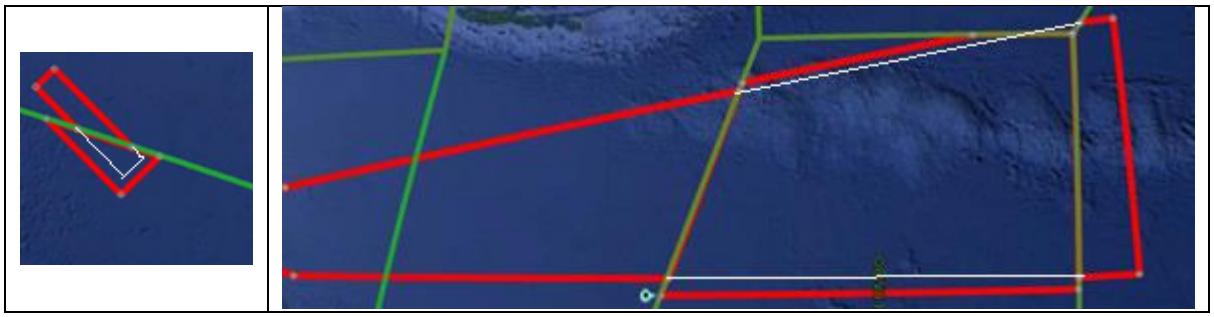

Figure 1: Examples of Mismatching Coordinates

2.4 One contributing factor to the observed mismatches could be the addition of supplementary buffer areas (approximately 10 NM) by the adjacent Affected Appropriate ATS Authority/ANSP, possibly as a precautionary measure.

2.5 While the intent to enhance safety is understood, however, it is also important to recognize that the Launching State, in accordance with established international practices, is responsible for ensuring the adequacy of the defined danger areas. These zones are required to be very carefully determined based on comprehensive risk assessments that already include appropriate safety margins.

2.6 Such unilateral modifications by the ANSP *(Affected Appropriate ATS Authority*[1]*)* can lead to unnecessary operational confusion, increased pilot and dispatcher workload and invite associated operational risk due to possible misinterpretation.

2.7 These instances highlight the need for strengthened pre-launch coordination mechanisms to ensure that danger areas are consistently defined and published in a harmonised manner through respective NOTAMs by the Appropriate ATS Authorities.

2.8 Refer to Annexure A – *Space Debris Safety Risk Assessment* by IATA[2]. Clear, unambiguous communication that avoids misinterpretation is an essential “Preventive Control” measure in risk assessment.

2.9 Regional collaboration, including simulation exercises and workshops, can support the identification and resolution of such inconsistencies. Airlines' involvement in these activities would add significant value by ensuring that operational perspectives are considered and practical challenges are adequately addressed.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) consider conducting space object launch and re-entry activities coordination simulation exercises/workshop to help identify and rectify inconsistencies; and

c) discuss any relevant matters as appropriate.

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[1] As defined in the APAC Regional Guidance, Affected Appropriate ATS Authority – the relevant authority responsible for providing air traffic services in the airspace affected by space object launch and re-entry activities conducted by the Launching State.
[2] IATA Safety Risk Assessment (SRA) on Space Debris: https://ic.iata.org/capture/safety-issue/188

Space Debris

Safety Risk Assessment - Lite

Description

With the increasing number of commercial space operators, operations that intend to flow through controlled airspace to operate at the extreme upper limits or above that airspace are growing. We are also seeing an increase in the number of uncrewed aircraft operating for days and months at and above FL600. Given these developments, it is crucial to address the safety risks associated with space debris and ensure that commercial space operations are managed with minimal disruption to aviation. This includes integrating commercial space operations into Air Traffic) Management systems to enhance coordination and safety.

There is an urgent need to globally harmonize the methods and procedures that lead to effective measures against the risks to aviation and operational impacts.

Key Risk Area	Regional Exposure	Sector Exposure	Proximity
MAC	All regions	Industry wide	Current

Main Threats

Falling Debris

As launch and recovery of spacecrafts increase, the amount of airspace that needs to be protected also increases. However, in the lack of global standards for safety requirements for launches, every State determines the safety buffers and airspace reservation differently.

Lack of Effective Communication

In some instances, communication about space launches and airspace blocks is not effective or timely.

Lack of Coordination

Effective coordination between space launch operators and aviation community is essential during all phases of launch to ensure safe operations for both spacecraft and air traffic. Current coordination procedures are not only globally unharmonized but also lack flexibility, timeliness, and efficiency necessary for safe and smooth integration of commercial space operations into ATM and minimizing disruptions to air traffic.

Lack of Harmonized Approach to Risk Management

The use of non-harmonized approach for assessing risks associated with commercial space operations and their impact on air traffic can lead to inconsistent risk management.

This inconsistency can result to inadequate mitigation measures, as States, ANSPs and commercial space operators may address the risks differently.
This inevitably leads to variations in the volume and timing of airspace reservations during launch operations, thus affecting air traffic optimal trajectories and consequently having environmental impacts.
A harmonized approach is essential to ensure effective risk management at global level and significantly minimize impacts on air traffic.

Call To Action. While regional and local initiatives aim to address the issues regarding the impact of commercial space operations on ATM, it is crucial that the aviation industry stakeholders, including states, and space launch operators, collaborate under the leadership of ICAO to develop global guidance for harmonizing procedures on coordination, communication and risk assessment methods.

Preventive controls

Local Risk Assessment

States and ANSPs should work together to conduct a thorough local risk assessment to identify potential hazards associated with commercial space operations and implementing measures to mitigate these risks.

States and ANSPs should work with industry / manufacturers to develop local guidelines and procedures to assess and mitigate the safety risks posed by space debris, including uncontrolled re-entries.

Airspace Management

To mitigate the risk of falling debris, airspace is blocked for safety of the launch and re-entry. Additional airspace is also blocked around the launch site, and buffers are added in case there is a need for interruption during the launch.

Given that some launches are state (not commercial launches) collaborative decision making between the different stakeholders is fundamental.

At a global level, there is a need to define global guidelines for safety buffers and airspace reservations to ensure consistency and predictability across different regions.

Additionally, States should create procedures for the safe and efficient transit of aerospace vehicles through controlled airspace.

Communication to other Airspace Users

States and ANSPs should improve the management and dissemination of information related to space launches and re-entries to ensure timely and effective communication about airspace reservations and closures to all users, including airlines.

While NOTAMs (Notices to Airmen) are currently used for this purpose, they often lack clarity and are confusing and inefficient for both flight crews and dispatchers.

Call to Action.

Industry stakeholders, including IATA and the International Federation of Air Traffic Controllers' Associations (IFATCA), called upon ICAO during the last Air Navigation Conference to develop global guidance to facilitate the management of controlled airspace during launch and re-entry of space operations.

Adopting a standardized and machine-readable format of the information becomes an urgent need and will not only enhance communication between stakeholders but also improve situational awareness by visually depicting the affected area and facilitate integration into flight planning systems.

Additionally, there is a need for enhanced collaborative decision-making and timely communication with all airspace users to mitigate the impact on traditional air transport and ensure equitable access to airspace.

Escalation Factors

- Other airspace uses' activities, such as military, necessitating airspace closure. This further restricts available airspace for civil air traffic.
- Geopolitical tensions resulting in avoidance of certain airspace and saturation of neighboring airspace.
- Adverse weather conditions causing in flights to deviate their planned routes leading to congestion in certain portions of airspace, increasing workload and preventing assignment of optimal flight levels.

Call to Action. With the increasing number and diversity of airspace users, it is crucial to:

- Minimize airspace closure by implementing strategies and leveraging technology to reduce the duration and volume of unavailable airspace.
- Promote and improve coordination between all stakeholders: states, ANSPs, military, commercial flights representative, and other airspace users to optimize the use of available airspace and minimize disruptions.
- Adopt flexible and dynamic airspace management by implementing ICAO concepts such as Free Route Airspace. This provides the ability to adapt to changing conditions and ensure efficient use of airspace.

For additional information visit the IATA Safety Issue Hub