

SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)

Enabling safe commercial spaceflight: vehicles and spaceports (3)

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DECONFLICTING AVIATION AND COMMERCIAL SPACEFLIGHT

Abstract

This paper examines the physical and technical aspects of deconflicting aviation and spaceflight. Calling on the author's decades of experience with North American airspace management and satellite operations, the paper will consider factors such as air and spacecraft observability, maneuverability, guidance, and control. The paper will examine the ability to track spacecraft and aircraft simultaneously, the ability of spacecraft to maneuver, and the requirements of airspace sharing.

Anticipating commercial opportunities, several nations have conceived spaceports. Some anticipate horizontal takeoff and landing or closely related air launch and horizontal landing. Some recognize the heritage of vertical launch with horizontal landing or vertical landing. Most are remote from population. Others share air and space ports. All must share airspace. Spaceports must also recognize satellite presence at altitudes that even suborbital trajectories must traverse. The paper will categorize diverse national and industrial spaceport concepts according to their demands on shared airspace and near Earth environments.

The paper demonstrates the international scope of commercial spaceflight and the differences between reusable, expendable and partially reusable operations. The principles guiding regulation, most relevant regulations and laws are permissive and emphasize compliance with procedures and authorities rather than specific measures. We enumerate issues with most spaceport initiatives. Finally, we suggest criteria for regulation and safe deconfliction,