Paper ID: 54148
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IAF SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)
Commercial Spaceflight Safety and Emerging Issues (1)

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TOWARDS A NEARSPACE OPERATION MANAGEMENT

Abstract

The most important requirement for managing traffic in NearSpace or at High Altitudes above FL660 (66.000 ft.) is ensuring operational safety at all times. In essence, this means a safe separation between all participating vehicles. The variety of operating modes in this region represents a particular challenge, as it gets populated by very different kind of users who might want to persistently stay or transit vertically and horizontally through it at vastly different speeds. To meet this challenge, a concept based on so-called 4D operating zones has been suggested and defined, which enables a combination of a trajectory-based and performance-based traffic management. The operating zone is to be seen as a function of airspace planning and modeling. The size of an operating zone is initially determined by performance criteria associated with the type of vehicle and its intended mission. It takes into account the type of flight operation, the planned trajectory patterns and the uncertainty in the prediction of its position. Depending on the time, the operating zone of a vehicle may change position and size to respond to weather conditions or altered mission boundary conditions. Changes over time can be predefined as part of the flight planning process or can be customized during mission and flight execution. As part of a strategic de-conflicting, operation of vehicles in the NearSpace region shall be planned in advance and ensured through use of automated monitoring and conflict avoidance procedures. At a higher level of service, conflicts of interest in competitively claiming the same volume of operational space at the same time must also be solved through functions of the designed concept. The paper details the basic design of a concept for NearSpace Operation Management by use of a Near-Space Operation Management System (NOMS) and explains the technical and operational prerequisites for safely managing the diverse traffic population which is expected to further grow in this transition zone between air and space.