

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

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INTEROPERABLE DATA EXCHANGE FOR SAFE AND EFFICIENT LAUNCH AND RE-ENTRY  
OPERATIONS IN AN INTERNATIONAL ENVIRONMENT

**Abstract**

The frequency of commercial space launch and re-entry operations is increasing worldwide. Current regulations and procedures ensure safe operations by temporarily closing large volumes of airspace where risks to aircraft would otherwise exist in the case of non-nominal events during launch or re-entry operations. To maintain the safety of air traffic as the number of space operations rise, effectively providing the right information to the right stakeholders at the right time is key. Through a cooperative agreement, the FAA and DLR are sharing their unique capabilities using the Commercial Space Integration Lab and Air Traffic Validation Center, located in the USA and Germany respectively, to improve situational awareness through real-time data exchange. The project seeks to answer whether U.S. and European ANSPs can respond adequately to a non-nominal event during a launch or reentry operation that presents a hazard to the airspace system. It leverages existing international data standards and infrastructures by using a data exchange approach based on System Wide Information Management (SWIM). We have completed an initial assessment of the processes, roles and responsibilities for implementing launch and re-entry events in the air traffic systems on both sides of the Atlantic, as well as the requirements for basic functions and performance parameters of a SWIM-based integration. The key data parameters identified during the analyses shall enable information sharing among various users of the U.S. and European ANSP stakeholders in the global airspace system. Based on this, we developed a demonstration model through all system levels as far down as to the air traffic controller working position. Through a series of demonstrations, covering launch scenarios from the U.S. with possible effects on European airspace and vice versa, we will evaluate technical and operational feasibility of the concept. This should inform on means to improve the accuracy, precision and availability of flight information updates, consistency of flight planning in different Air Traffic Management (ATM) system domains, and safer transition of flights between the air traffic domains. The paper will present the concept, technical implementation and results of the performed demonstrations.