Manned and Unmanned Space Vehicles:
Air Traffic Insertion & SESAR Requirements


Deutsches Zentrum für Luft- und Raumfahrt e. V., Institut für Flugführung

**Motivation**
- Commercialization of Space Transportation
  - More launch/reentry activities and sites
  - Needed minimum segregation of airspaces in time & size (efficient, economic joint ops)
  - **Goal**: Seamless, efficient, and safe integration of air traffic and spaceflight

**Challenges**
- Launch & Reentry Operations
  - Restricted Airspace for launch/reentry window
  - Airspace in risk of falling debris

**SESAR Requirements**
- Improvements on safety & environmental impact
- System Wide Information Management (SWIM):
  - Business to Performance based trajectory Air Traffic Operations
  - Availability of information throughout ATM system

**Approach**
- Spaceport/Launch & Landing site evaluation
  - Risk Analysis
  - Impact on aircraft
  - Public Acceptance

- Efficiency of Spaceport Operation
  - International operations and landing
  - Remote Tower Control of Launch/Landing sites
  - Contingency and Continuity Operations

**Future Outlook**
- Development of a Spacecraft Emergency Information Provider prototype for SWIM integration
- Flight planning/execution testing through simulation
- Flight testing in a human-in-the-loop ATM simulation
- Integration of Spaceflight Operations into ATM
- International participation increase and input from emerging economies