

**SKYGRID**A Boeing
Company.

Operational Risk Assessment for Advanced Air Mobility Third-Party Service Providers



Traditional aviation safety assessment frameworks were built for self-contained, onboard systems rather than the distributed, cloud-connected architectures that define Advanced Air Mobility (AAM). As Third-Party Service Providers (TSPs) take on safety-critical roles by delivering off-board digital services and operational data, applying legacy development assurance methods leaves vital operational gaps. Evolving these standards to systematically evaluate TSP risks is essential to ensuring safe, scalable autonomous flight.

The Problem

Rapid advances in aviation technology are driving a new generation of aircraft designs and operational paradigms that depart significantly from conventional aviation. As the AAM ecosystem normalizes remotely piloted and increasingly autonomous flight, with essential systems hosted both on and off the aircraft, these novel architectures challenge existing methods for demonstrating regulatory safety intent.

In particular, the unique characteristics of AAM operations complicate the application of traditional development assurance and safety assessment standards like ARP4754B and ARP4761A. Evaluating whether these legacy frameworks can be applied as is, or if updated guidance is required, is critical to ensuring the safe development and deployment of these complex systems.

The Solution: Operational Risk Assessment

Safety assessments must extend beyond the traditional analyses recommended in ARP4754B and ARP4761A. To address this gap, SkyGrid proposes the adoption of an Operational Risk Assessment (ORA) method designed specifically to evaluate novel TSP products and provide additional safety assurances across the product suite. The goal is not to replace established practices, but to evolve them to safely integrate novel AAM technologies while preserving aviation's highest safety standards.

By adapting proven concepts from operational safety frameworks, the SkyGrid ORA method applies a systems-thinking approach to the entire ecosystem. This allows us to evaluate TSPs as critical safety stakeholders delivering trusted information exchange and interoperable digital services across the airspace, instead of in isolation.

SkyGrid's Safety Approach

Conceptual Safety

Collaborate with engineering early to ensure sound safety principles in the product intent and original conceptual design from the outset.

Nominal Operations

Create a model of the product within its operational ecosystem to represent intended operations.

Operational Safety

Derive safety controls to reduce the likelihood of unintended operations by safe design.

Off-Nominal Operations

Systematically iterate on the consequence of each of the intended operations becoming unintended operations.

The ORA method is intentionally modular so that it can be performed at early Technical Readiness Levels and at later engineering stages to both assist in designing safety controls into the system and assure the safety control architecture before deployment.

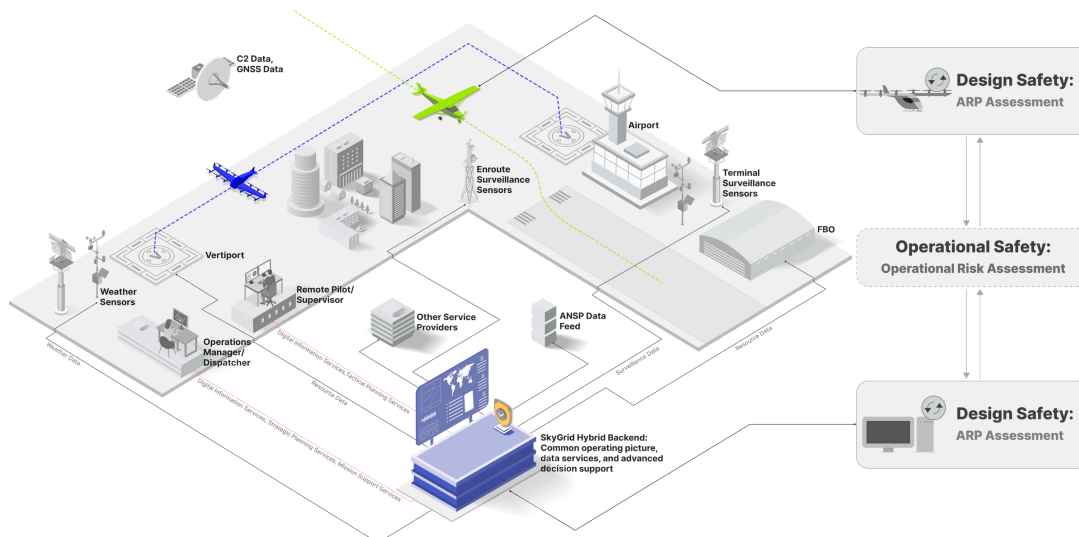
Call to Action for the Industry

The emergence of AAM and autonomous flight marks a transformative shift in global aviation. While these novel technologies challenge existing operational norms, foundational safety standards remain essential to development assurance. However, the scale and complexity of AAM, driven largely by its heavy reliance on TSPs, amplify these safety challenges and demand a more comprehensive regulatory approach.

Realizing AAM's full potential requires industry leaders, regulators, and standards bodies to integrate TSPs into the core safety paradigm collaboratively. Defining clear, robust standards for these service providers will ensure a seamless and secure transition, establishing advanced aerospace infrastructure as a safe, scalable reality for global transportation.

Read the Full White Paper

Download "[Operational Risk Assessment for Advanced Air Mobility Third-Party Service Providers](#)" at [skygrid.com](#).



Operational Risk Assessment covers an expanded safety case scope

About SkyGrid

SkyGrid, a Boeing Company, exists to open the sky for autonomous flight. Based in Austin, Texas, SkyGrid builds high-assurance third-party services to enable the safe operation and integration of autonomous aircraft. SkyGrid also acts as the operational nexus for Advanced Air Mobility, integration, and managing data, infrastructure, access, and traffic to support scaled operations. For more information, visit [www.skygrid.com](#).