

## The Use of ADS-B Out in Support of RVSM Operations – Altitude Performance Still Rules!

**Subject:** Airworthiness of aircraft intended to operate in Reduced Vertical Separation Minimum (RVSM) airspace.

**Purpose:** An operator must evaluate and determine the RVSM airworthiness of their aircraft prior to conducting operations under the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 91, Appendix G, Section 9.

**Background:** The existing RVSM authorization process in Part 91, Appendix G was revised, effective January 2019, to allow operation of RVSM capable aircraft, properly equipped with ADS-B Out systems, without a requirement for the operator to apply to the Federal Aviation Administration (FAA) to obtain a specific authorization.

**Discussion:** As stated in the RVSM rulemaking Notice of Proposed Rulemaking (NPRM), the FAA has estimated that 99.9 percent of aircraft operating in RVSM airspace meet the required Altimetry System Error (ASE) containment standards. Additionally most aircraft capable of RVSM operation have approved designs and have been maintained in a state that they will continue to meet ASE standards.

Additionally, in the Final Rule, the FAA reiterated that for an aircraft to be eligible for operations in RVSM airspace it must meet strict height-keeping performance standards. ADS-B Out provides information used to determine an aircraft's ASE. ADS-B alone does not provide operators with the requisite height-keeping capability to conduct operations in RVSM airspace safely. Accordingly, the installation of a qualified ADS-B Out system in an aircraft that does not have the altitude keeping capability necessary to meet RVSM performance requirements would not permit that aircraft to operate in RVSM airspace.

The FAA has observed operators of some aircraft (mostly Turbo-Props), certified to maximum altitudes which include RVSM flight levels that have not been previously operated or maintained as RVSM compliant, are considering RVSM operation. Aircraft having designs certified for RVSM, in accordance with Appendix G Section 2, at a minimum require inspection and testing to assure they meet the airworthiness requirements of their design.

Aircraft which have not been designed and certified for RVSM operations require evaluation by the operator to assure they are capable of meeting the 200 feet ASE standard in Appendix G, Section 9(b). This evaluation involves engineering analysis, flight-testing, and measurement of system level performance. Many individual operators may not be capable of performing this evaluation alone. For operators of aircraft without approved RVSM designs, the FAA recommends contacting appropriate engineering consultants to obtain the appropriate substantiating information required to determine RVSM compliance (See AC 91-85B, *Authorization of Aircraft and Operators for Flight in RVSM Airspace* – Chapter 2 – Aircraft Eligibility and Appendix A.7 – Altimetry System Performance Substantiation).

Operation of an aircraft in RVSM airspace that does not meet the required ASE standard is unsafe and contrary to the regulations. ADS-B Out equipage as required by Appendix G, section 9 allows for enhanced monitoring of ASE performance but in no way assures ASE containment.

**Recommendation:** Operators and pilots intending operation in RVSM airspace under the provisions of Appendix G, Section 9 must ensure that their aircraft systems configuration and performance meet the requirements stated in Appendix G, Section 9. The FAA will review the operator's substantiating data concerning the suitability of their aircraft for RVSM operation when investigating incidents of aircraft exceeding an ASE of 200 feet in RVSM airspace.