



# News from the Hill

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## *FAA Announces Domestic Approval of RVSM*

October 27, 2003 marked an important milestone in the evolution of the National Airspace System, when the FAA published its final rule authorizing the adoption of Reduced Vertical Separation Minima, or RVSM, in United States airspace. The effective date of the new procedures will be January 20, 2005.

RVSM allows aircraft operating between flight levels 290 and 410 (29,000 to 41,000 feet above sea level) to maintain 1,000 feet of vertical separation from other traffic, instead of the 2,000-foot minimum allowed under existing rules. The change makes six new flight levels available to operators, allowing them greater flexibility in flight planning and easing congestion over existing airways. Operators will have more options for flying at more fuel-efficient altitudes, a development that the FAA calculates will result in collective fuel savings of over \$4.8 billion dollars over the next 10 years.

The implementation of domestic RVSM brings enroute air traffic management procedures in the United States into line with procedures already in place in Europe, northern Canada, Australia, and Southeast Asia, and on transoceanic routes across the Atlantic and Pacific. The effective date of the rule is timed to coincide with RVSM implementation in the rest of Canada and most of the Caribbean and South America.

The key to RVSM is enhanced avionics that can maintain altitude within tight tolerances. Approximately 30 percent of the turbojet aircraft in the United States, mostly airliners used on international RVSM routes, are already equipped with the necessary systems. In addition, approximately 44 percent of business jets are currently RVSM compliant. Almost all new airliners and business jets currently coming off the assembly line are equipped for RVSM operations. Nevertheless, there are still thousands of aircraft that will need to receive avionics upgrades in order to operate at or above flight level 290 once the new rule becomes effective. This represents a significant source of business for AEA members.

Operations in RVSM airspace require that an airplane be equipped with an autopilot, altitude alerter, transponder (per FAR 91.215) and two independent altimetry systems that are capable of maintaining altitude to strict tolerances. TCAS is not a requirement of RVSM, but if an airplane is already equipped with TCAS II, it must include Change 7 software to be eligible for RVSM approval. The autopilot must be able to hold altitude within 65 feet of acquired altitude and the altitude alerter threshold must not exceed  $\pm 300$  feet for older airplanes and  $\pm 200$  feet for airplanes type certified after April 9, 1997. Operators will need to prove these tolerances by flying a GMU or HMU test

flight within six months of receiving their RVSM Letter of Authorization from the FAA. A GMU (GPS-based Monitoring Unit) is a piece of hardware that flies on board the aircraft during the height-monitoring flight, while an HMU (Height Monitoring Unit) is a ground station that the airplane must fly over.

### **Costs and Benefits**

FAA estimates suggest that the benefits of RVSM implementation in the United States will significantly outweigh the associated costs. The economic benefits are expected to total some \$5.3 billion between 2005 and 2016, with the largest portion of that amount coming in the form of fuel savings. The FAA estimates that reductions in airborne and ground delays will result in savings of \$461 million. Eurocontrol, the organization that coordinates air traffic management in Europe, reports a 40 percent decrease in enroute flight delays since the introduction of RVSM in Europe. Other anticipated benefits include reduced average flight times, increased access to flight levels, reduced negative impacts from weather, increased flexibility for air traffic controllers, and enhanced airspace capacity. Eurocontrol has also reported a one to two percent reduction in airborne pollution emissions.

The FAA estimates the costs associated with RVSM to be \$869 million through 2016, with aircraft equipment

upgrades accounting for \$529.5 million. The other costs include pilot and air traffic controller training, ATC system upgrades, monitoring of system performance, and aircraft downtime costs for Part 135 charter operators.

Because the major cost of this program is associated with aircraft equipment upgrades, AEA's membership should see a disproportionate gain from this new rule.

### **Industry Concerns**

Despite the overall benefits offered by RVSM, the implementation of the new rule poses a number of problems and challenges to operators. One of the chief concerns centers on the cost of installing the required equipment upgrades, which many smaller operators fear could prove prohibitive. The added equipment costs take many forms. For example, the rule will require turboprop aircraft to carry two RVSM-capable altimeters, in order to ensure that the U.S. rule will be harmonized with international rules. Some industry groups have criticized the FAA's RVSM rulemaking process, accusing the agency of failing to adequately assess the rule's economic impact on Part 135 air charter operators and small flight departments. The Airline Owners and Pilots Association (AOPA) has warned that for some older aircraft, the cost of upgrades could exceed the value of the airframe—economic realities may simply preclude many of these aircraft from flying in the 290—410 altitude range. The potential burden is compounded in many cases by the costs of complying with TAWS/EGPWS equipage mandates.

Congress has taken up the banner of small businesses as well. Rep. Donald Manzullo (R-Ill.), chairman of the House Committee on Small Business, complained in a letter to the Office of Management and Budget that the high compliance costs of the FAA's pro-

posed RVSM rules could harm small general aviation businesses. Manzullo, a pilot, argued that the FAA had failed to comply with the Regulatory Flexibility Act, which requires federal agencies to prepare analyses that seek simpler, less burdensome ways for small businesses to comply with potentially costly federal requirements. Accordingly, he asked the OMB to send the final RVSM rule back to the FAA so that the agency can develop alternative means of implementing RVSM without unduly burdening small businesses. OMB ultimately approved the rule despite the letter from the Congressman.

Another concern, even for those who can afford the new equipment, is that the huge anticipated demand for installation services will result in a backlog at avionics shops that will make it impossible for many operators to meet the rule's January 2005 implementation deadline. AOPA and the National Business Aviation Association (NBAA) have expressed concerns over the FAA's limited approval resources, which could prevent some in the industry from upgrading in a timely fashion. They have suggested that RVSM implementation be phased in over a longer period to allow smaller operators sufficient time to upgrade their equipment.

The FAA projected, however, that in January of 2005, less than 10 percent of aircraft capable of operating in proposed RVSM airspace would not be equipped to do so. The agency ultimately was unwilling to delay implementation and further postpone the anticipated benefits for such a relatively small number of affected parties. While rules like the revised Part 145 have been subject to significant slippage in their implementation dates, it appears likely that the RVSM rule will be implemented on January 20, 2005 as planned. This conclusion is supported by FAA statements, by the

recent practice of manufacturing new aircraft that are already RVSM compliant, and by the pressures of international harmonization.

Despite genuine concerns over costs and timing, no major voices in the industry oppose RVSM outright. There is considerable agreement that implementation is an important contribution toward resolving the problem of airspace congestion, and one that offers the potential for real cost savings overall. In other parts of the world, RVSM has proven itself safe and effective in over 6.5 million flights.

### **Installation and Maintenance**

It is important to bear in mind that RVSM equipage encompasses more than one or two upgraded avionics devices. Making an aircraft RVSM compliant involves the installation and maintenance of an entire RVSM system. Operators must also institute an approved RVSM maintenance program as well that is distinct from maintenance programs that may already be in place to satisfy other requirements.

Obtaining RVSM airworthiness approval is a two-step process involving approval of both the aircraft itself and the operator. First, the manufacturer or design organization develops the data package through which airworthiness approval should be sought, and submits the package to the appropriate Aircraft Certification Office (ACO) for approval. Once the ACO approves the data package, the operator applies the procedures defined in the package to obtain approval from the FSDO or CMO (as appropriate) to utilize its aircraft to conduct flight in RVSM airspace. Operator approval comes in the form of appropriate ops specs for Part 121 or Part 135 operators, or the issuance of a letter of authorization (LOA) for Part 91 operators.

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The installation of RVSM-capable avionics system components on an aircraft, by itself, is not sufficient to obtain RVSM airworthiness approval. Approval requires that the total aircraft performance (e.g., aircraft avionics interfaces, sensors, altimetry performance, skin waviness, etc.) meet the requirements contained in FAA Interim Guidance 91-RVSM. Similarly, it is not possible to obtain RVSM airworthiness approval for avionics equipment independent of an aircraft. Approval is based on the performance of the entire altimetry system when installed in a specific aircraft.

RVSM airworthiness approval also encompasses the development and implementation of an approved RVSM maintenance program. The requirement for such a program was explained in May 2003 in Revision 16 to Chapter 5 of the Airworthiness Inspector's Handbook, 8300.10. Revision 16 made it clear that operators that do not currently have an approved aircraft maintenance program—such as many Part 91 operators—are required to develop and obtain approval of a specific RVSM maintenance program. The RVSM maintenance program is not required to include elements not related to RVSM maintenance. Revision 16 stressed that inspection programs such as an Approved Aircraft Inspection Program (AAIP) or manufacturer's recommended inspection program do not satisfy the RVSM requirements because they do not contain specific procedures to maintain RVSM aircraft. Operators who maintain their aircraft under a continuous airworthiness maintenance program (CAMP), however, have the option of incorporating the RVSM maintenance requirements into that program.

In key respects, these RVSM

maintenance programs represent a new paradigm in maintenance instructions, because they involve instructions that are particular to a given aircraft and may vary considerably depending on the desires of the individual FAA inspector approving them. The approved RVSM maintenance program elements are specific to the operator and aircraft for which they are approved and are not transferable.

This has important implications for repair stations. Repair stations that perform maintenance on RVSM system components must be careful to do so in accordance with that operator's RVSM maintenance program. Failure to do so could result in the system being rendered ineligible for operations in RVSM airspace. Repair stations that do not think of themselves as handling RVSM systems need to be cognizant of the fact that individual components may now be part of the aircraft's total RVSM system.

### Where To Find Out More

The FAA offers a wealth of information on its website, including comprehensive instructions and checklists covering the procedures for obtaining operator approvals and airworthiness certifications. The FAA RVSM homepage can be found at [www2.faa.gov/ats/ato/RVSM/default.asp](http://www2.faa.gov/ats/ato/RVSM/default.asp). The site includes links to RVSM-related documentation and guidance, to include Interim Guidance 91-RVSM. A comprehensive list of solutions for aircraft is located on the FAA website at [www.faa.gov/ats/ato/150\\_docs/GA-RVSM-070302.doc](http://www.faa.gov/ats/ato/150_docs/GA-RVSM-070302.doc). □