

Reduced Vertical Separation Minimum

The goal of RVSM is to reduce the vertical separation above flight level (FL) 290 from the current 2000-ft minimum to 1000-ft



minimum. This will allow aircraft to safely fly more optimum profiles, gain fuel savings and increase airspace capacity. The process of safely changing this separation standard requires a study to assess the actual performance of airspace users under the current separation (2000-ft) and potential performance under the new standard (1000-ft). In 1988, the ICAO Review of General Concept of Separation Panel (RGCSPP) completed this study and concluded that safe implementation of the 1000-ft separation standard was technically feasible

Vertical Separation Minima (RVSM)

Reduced Vertical Separation Minima or **Minimum** (RVSM) describes the reduction of the standard vertical separation required between aircraft flying at levels between [FL290 \(29,000 ft.\)](#) and FL410 (41,000 ft.) from 2,000 feet to 1,000 feet (or between 8,900 metres and 12,500 metres from 600 metres to 300 metres in China). This therefore increases number of aircraft that can safely fly in a particular volume of airspace. The North Atlantic System Groups that implemented RVSM first determined that they were only implementing a change to one minimum from 2,000' to 1,000'; therefore, that minimum being singular the correct terminology is minimum not minima.

Historically, standard vertical separation was 1,000 feet from the surface to FL290, 2,000 feet from FL290 to FL410 and 4,000 feet above this. This was because the accuracy of the pressure [altimeter](#) used in aircraft to determine level decreases with height. However over time [Air data computers](#) (ADC) combined with altimeters have become more accurate and [autopilots](#) more adept at maintaining a set level, therefore it became apparent that for many modern aircraft, the 2,000 foot separation was too cautious. It was therefore proposed by [ICAO](#) that this be reduced to 1,000 feet.

Between 1997 and 2005 RVSM was implemented in all of Europe, North Africa, Southeast Asia and North America, South America, and over the North

Atlantic, South Atlantic, and Pacific Oceans. The North Atlantic implemented initially in March 1997 at flight levels 330 through 370. The entire western hemisphere implemented RVSM FL290-FL410 on January 20, 2005.

Only aircraft with specially certified altimeters and autopilots may fly in RVSM airspace, otherwise the aircraft must fly lower or higher than the airspace, or seek special exemption from the requirements.

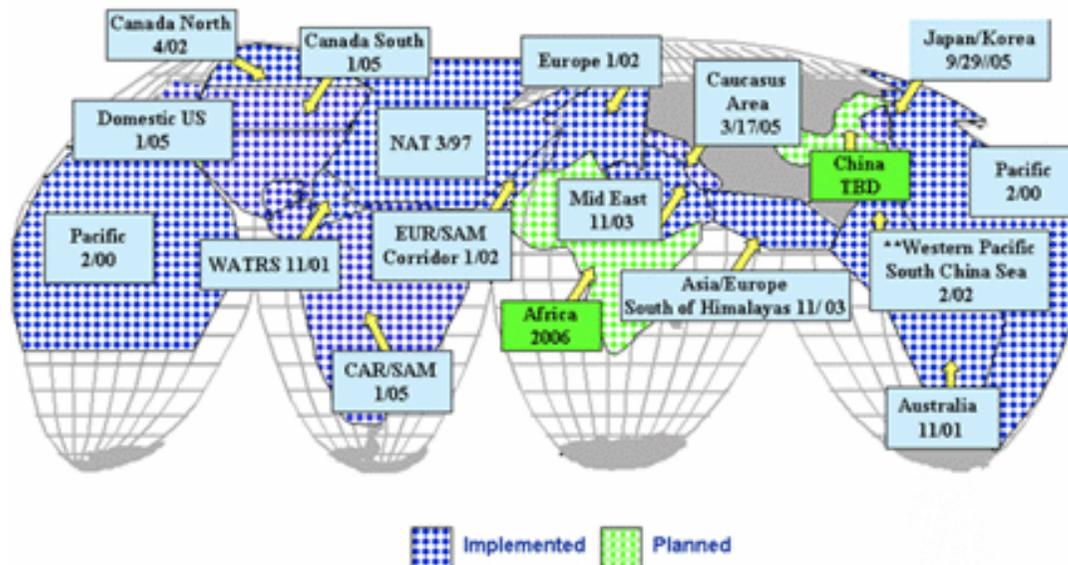
Critics of the change are concerned that by reducing the space between aircraft, RVSM may increase the number of mid-air collisions and conflicts. In the ten years since RVSM was first implemented not one collision has been attributed to RVSM. In the US this program was known as the *Domestic Reduced Separation Minimum* (DRVSM).

Implementation

Since 1999 RVSM procedures have been implemented between specified levels in many parts of the world, including for example, Europe and the North Atlantic, bringing corresponding increases in capacity.

RVSM Status Asia/Pacific		
Pacific:	February 24, 2000	FL 290-390
*FL 410 is available for non-RVSM approved flights	Tactical Use	FL 400-410
Australia:	November 2001	FL 290-410
Western Pacific/South China Sea	Feb 21, 2002	Consult AIPs
Mid East:	11/2003	Consult AIPs
Asia-Europe/South of Himalayas:	11/2003	Consult AIPs

RVSM Status Americas - Europe		
North Atlantic:	March 27, 1997	FL 330-370
	October 1998	FL 310-390
	Jan 24, 2002	FL 290-410
West Atlantic Rt Syst (WATRS):	Nov 1, 2001	FL 310-390
	24 January 2002	FL 290-410
Europe Tactical (UK, Ireland, Germany, Austria)	April 2001	FL 290-410
Europe-wide	24 January 2002	FL 290-410
South Atlantic:	24 January 2002	FL 290-410
Canada Northern Domestic	18 April 2002	FL 290-410
Canada Southern Domestic	January 20, 2005	FL 290-410
Domestic US	January 20, 2005	FL 290-410
Caribbean/Central/South America	January 20, 2005	Consult AIPs



Reduced Vertical Separation Minima Approval **RVSM EXAMPLE**

Requirements:

- An operator shall not operate an aeroplane in defined portions of airspace where, based on Regional Air Navigation Agreement, a vertical separation minimum of 300m (1,000ft) applies unless approved to do so by the Authority (RVSM Approval). (JAR-OPS 1.241)
- Prior to granting the RVSM approval ... the State shall be satisfied that:
 - a) the vertical navigation performance capability of the aeroplane satisfies the [laid down requirements];
 - b) the operator has instituted appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programmes; and
 - c) the operator has instituted appropriate flight crew procedures for operation in RVSM airspace.

Note: An RVSM approval is valid globally on the understanding that any operating procedures specific to a given region will be stated in the [Operations Manual](#) or appropriate crew guidance. (ICAO Annex 6 Part I Chapter 7, Para 7.2.5.)
- An operator shall ensure that aeroplanes operated in RVSM airspace are equipped with:
 - (1) Two independent [altitude measurement systems](#);
 - (2) An [altitude alerting system](#);
 - (3) An automatic altitude control system; and
 - (4) A secondary surveillance radar ([SSR](#)) [transponder](#) with altitude reporting system that can be connected to the altitude measurement system in use for altitude keeping. (JAR-OPS 1.872)

For compliance with the requirements of RVSM, there must be no damage or deformation of the fuselage skin profile



within the marked area surrounding the left and right static plates as shown in the picture

RVSM FINAL VIDEO SUMMARY