

## DEPARTMENT OF TRANSPORTATION

## Federal Aviation Administration

## 14 CFR Part 91

[Docket No. FAA-1999-5925; Notice No. 99-10]

## RIN 2120-AG82

## Reduced Vertical Separation Minimum

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The Federal Aviation Administration (FAA) intends by this proposed rule to enable the implementation of Reduced Vertical Separation Minimum (RVSM) in Pacific oceanic airspace. RVSM is the reduction of the vertical separation of aircraft from 2,000 feet to 1,000 feet at flight levels (FLs) between FL 290 (29,000 feet) and FL 410 (41,000 feet). RVSM is applied only between aircraft that meet stringent altimeter and auto-pilot performance requirements. RVSM is currently applied only in North Atlantic (NAT) Minimum Navigation Performance Specification (MNPS) airspace. The introduction of RVSM in Pacific oceanic airspace would make more fuel and time efficient flight levels and tracks available to operators and would enhance airspace capacity. Since March 1997 in the North Atlantic, RVSM has been shown to maintain an acceptable level of safety. International RVSM planning groups have agreed to implement RVSM on or before February 24, 2000.

**DATES:** Comments must be submitted on or before September 7, 1999.

**ADDRESSES:** Comments on this NPRM should be delivered or mailed, in triplicate, to: U.S. Department of Transportation Dockets, Docket No. [FAA-1999-5925], 400 Seventh Street SW., Room Plaza 401, Washington, DC 20590. Comments must indicate the Docket Number. Comments also may be submitted electronically to the following Internet address: 9-NPRM-CMTS@faa.dot.gov. Comments may be examined in Room Plaza 401 weekdays between 10:00 a.m. and 5:00 p.m. weekdays, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Mr. Roy Grimes, AFS-400, Flight Technologies and Procedures Division, Flight Standards Service, Federal Aviation Administration, 600 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267-3734.

## SUPPLEMENTARY INFORMATION:

## Comments Invited

This action is a product of international agreements under which the international aviation community, including the United States, plans to implement RVSM in Pacific airspace. The International Civil Aviation Organization (ICAO) Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the Informal Pacific Air Traffic Service Coordinating Group (IPACG), and the Informal South Pacific Air Traffic Service Coordinating Group have concluded that Pacific oceanic traffic will continue to increase significantly in the next few years. To accommodate this increase in air traffic, these groups have established a goal of implementing RVSM in Pacific Oceanic airspace on or before February 24, 2000. Affected FIRs include Anchorage Arctic, Anchorage Continental, Anchorage Oceanic, Auckland Oceanic, Brisbane, Edmonton, Honiara, Los Angeles, Melbourne, Nadi, Naha, Nauru, New Zealand, Oakland, Oakland Oceanic, Port Moresby, Seattle, Tahiti, Tokyo, and Vancouver.

Interested persons are invited to participate in this proposed rulemaking by submitting such written data, views, or arguments, as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that may result from adopting the proposals in this notice are also invited. Comments that provide the factual basis supporting the views and suggestions presented are particularly helpful in developing reasoned regulatory decisions. Comments should identify the regulatory docket number and be submitted in triplicate to the above-specified address.

Because this proposed rule was developed as a result of an international agreement, comments deemed substantive will be presented for consideration and reviewed by the international community under the auspices of ICAO. If considered salient, the comments will be included for use by all participating member States.

All comments received will be available both before and after the closing date for comments in the Department of Transportation Docket for examination by interested persons.

The FAA will acknowledge receipt of a comment if the commenter includes a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. FAA-1999-5925." The FAA will date, time stamp, and return the postcard.

## Availability of This Document

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-9677. Communications must identify the docket number of this rule.

Persons interested in being placed on the mailing list for future rulemaking actions should request from the above office a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

An electronic copy of this document may be downloaded, using a modem and suitable communications software, from the FAA regulations section of the Fedworld electronic bulletin board service (telephone 703-321-3339), the Federal Register's electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board Service (800-322-2722 or 202-267-5948).

Internet users may reach the FAA's web page at <http://www.faa.gov> or the Federal Register's Web page at [http://www.access.gpo.gov/su\\_docs](http://www.access.gpo.gov/su_docs) for access to recently published rulemaking documents.

## Background

*Statement of the Problem*

Air traffic on Pacific routes between the U.S. and Asia has increased steadily in the past few years and is projected to continue to increase. The North Pacific Track System (NOPAC) is the densest oceanic traffic area in the Pacific. Between 1994 and 1998, the annual traffic count on the NOPAC increased from 42,305 to 60,772 flights which represents an increase of 44 percent. The FAA Aviation Forecast for Fiscal Years 1998-2010 estimates that transpacific passenger traffic will continue to increase at 6.6 percent per year through 2010. Studies conducted by independent aviation industry analysts forecast the Pacific area to be the fastest growing area for flights to/from the United States.

Unless action is taken, as traffic increases, the opportunity for aircraft to fly at fuel-efficient altitudes and tracks will be significantly diminished. In addition, air traffic service providers may not be able to accommodate greater numbers of aircraft in the airspace without invoking restrictions that can result in traffic delays and fuel penalties.

With air traffic levels increasing annually worldwide, FAA airspace

planners and their international counterparts continually explore methods of enhancing the air traffic control (ATC) system's ability to accommodate traffic in a safe and efficient manner. NAT airspace was chosen to be the first airspace for RVSM introduction because it is the busiest oceanic airspace in the world and traffic is forecast to continue to increase. The NAT Traffic Forecasting Group Report shows that the number of annual flight operations increased 30 percent between 1991 and 1996 with a forecast 67 percent rise over the 1992 level of 228,200 by 2002.

Prior to the introduction of RVSM, 27 percent of flights in NAT airspace were issued clearances on tracks and at altitudes other than those requested by the operators in their filed flight plans. These flights were, therefore, generally conducted at less than optimum tracks and altitudes for the aircraft, resulting in time and fuel inefficiencies.

The North Atlantic Implementation Management Group has observed the following improvements in NAT operations due to the introduction of RVSM:

1. 50 percent of the fuel penalty attributed to NAT system operation was eliminated. (The total NAT system fuel penalty is estimated based on track design, meteorological forecast, cruise level and traffic congestion penalties).

2. 25 percent fewer fixed tracks were required to be published. (This allows more airspace for operators to fly preferred tracks).

3. There was a 5 percent increase in flights cleared to fly both at the altitude and on the track that the operator requested.

RVSM alleviates the limitation on air traffic management at high altitudes imposed by the conventional 2,000-foot vertical separation standard. Below FL 290, air traffic controllers can assign aircraft operating under Instrument Flight Rules (IFR) altitudes a minimum of 1,000 feet apart. Above FL 290, however, the Conventional Vertical Separation Minimum (CVSM) is 2,000 feet.

Note: Flight levels are stated in digits that represent hundreds of feet. The term flight level is used to describe a surface of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Rather than adjusting altimeters for changes in atmospheric pressure, pilots base altitude readings above the transition altitude [in the United States, 18,000 feet] on this standard reference. FL 290 represents the pressure surface equivalent of 29,000 feet based on the 29.29" Hg datum; FL 310 represents 31,000 feet, and so on.)

The 2,000-foot minimum vertical separation restricts the number of flight

levels available. Flight levels 310, 330, 350, 370, and 390 are flight levels at which aircraft crossing oceanic airspace operate most economically. At peak hours these FLS can become congested. When all RVSM FLS are utilized, six additional flight levels are available: FLS 300, 320, 340, 360, 380, and 400.

Increasing the number the FLS available in the Pacific region is projected to achieve operator benefits similar to those achieved in the NAT (i.e., mitigation of fuel penalties attributed to the inability to fly optimum altitudes and tracks). In the Pacific, RVSM is initially planned to be implemented between FL 290 and FL 390 (inclusive). At this time, traffic density above FL 390 does not warrant implementing RVSM at FL 400 and FL 410.

Another factor that has led Pacific planners to believe that RVSM implementation should be pursued aggressively is that a large percentage of Pacific operators and aircraft have already received approval to conduct RVSM operations. This is due to the fact that Pacific operators conduct operations worldwide and therefore, have been required to obtain RVSM approval to operate in NAT RVSM airspace. Aircraft that have been approved for RVSM are approved for RVSM in any area of the world where it is applied. The Pacific RVSM Implementation Task Force (Task Force) has reviewed the RVSM approval status of Pacific operators and aircraft and found that approximately 36 percent of Pacific operations are already conducted by RVSM approved operators and projected that this figure will grow to 56 percent in the near term.

#### History

The ICAO APAN/PIRG develops and provides oversight for plans and policy related to air navigation in the Pacific and Asia. The APAN/PIRG established the Task Force to develop and implement RVSM policy and programs in the Pacific. The Task Force is using the policy and criteria developed in other ICAO forums to build the RVSM program for the Pacific. The following reviews the RVSM program development in U.S. and ICAO forums.

Rising traffic volume and fuel costs, which made flight at fuel-efficient altitudes a priority for operators, sparked an interest in the early 1970s in implementing RVSM above FL 290. In April 1973, the Air Transport Association of America (ATA) petitioned the FAA for a rule change to reduce the vertical separation minimum to 1,000 feet for aircraft operating above FL 290. The petition was denied in 1977 in part because (1) Aircraft altimeters

has not been improved sufficiently, (2) improved maintenance and operational standards has not been developed, and (3) altitude correction was not available in all aircraft. In addition, the cost of modifying nonconforming aircraft was prohibitive. The FAA concluded that granting the ATA petition at that time would have adversely affected safety. Nevertheless, the FAA recognized the potential benefits of RVSM under certain circumstances and continued to review technological developments, committing extensive resources to studying aircraft altitude-keeping performance and necessary criteria for safely reducing vertical separation above FL 290. These benefits and data showing that implementing RVSM is technically feasible have been demonstrated in studies conducted cooperatively in international forums, as well as separately by the FAA.

Because of the high standard of performance and equipment required for RVSM, the FAA advocated initial introduction of RVSM in oceanic airspace where special navigation performance standards were already required. Special navigation areas require high levels of long-range navigation precision due to the separation standard applied. RVSM implementation in such airspace requires an increased level of precision demanded of operators, aircraft, and vertical navigation systems.

On March 27, 1997, RVSM was implemented in one such special navigation area of operation, the NAT MNPS, established in the ICAO NAT Region. In designated NAT MNPS airspace, tracks are spaced 60 nautical miles (NM) apart. Between Ffs 310 and 390 (inclusive), aircraft are separated vertically by 1000 feet. All aircraft operating in this airspace must be appropriately equipped and capable of meeting required lateral navigation performance standards of part 91, section 91.705 and vertical navigation performance standards of part 91, section 91.706. Operators must follow procedures that ensure the standards are met, and flight crews are trained and qualified to meet the standards. Each operator, aircraft, and navigation system combination must receive and maintain authorization to operate in the NAT MNPS. The NATSPG Central Monitoring Agency monitors NAT MNPS. The NATSPG Central Monitoring Agency monitors NAT aircraft fleet performance to ensure that a safe operating environment is maintained.

FAA data indicate that the altitude-keeping performance of most aircraft flying in oceanic airspace can meet the

standards for RVSM operations. The FAA and ICAO research to determine the feasibility of implementing RVSM included the following four efforts:

1. FAA Vertical Studies Program. This program began in mid-1981, with the objectives of collecting and analyzing data on aircraft performance in maintaining assigned altitude, developing program requirements to reduce vertical separation, and providing technical and operational representation on the various working groups studying the issue outside the FAA.

2. RTCA Special Committee (SC)-150. RTCA, Inc., (formerly Radio Technical Commission for Aeronautics) is an industry organization in Washington, DC, that addresses aviation technical requirements and concepts and produces recommended standards. When the FAA hosted a public meeting in early 1982 on vertical separation, it was recommended that RTCA be the forum for development of minimum system performance standards for RVSM. RTCA SC-150 was formed in March 1982 to develop minimum system performance requirements, identify required improvements to aircraft equipment and changes to operational procedures, and assess the impact of the requirements on the aviation community. SC-150 served as the focal point for the study and development of RVSM criteria and programs in the United States from 1982 to 1987, including analysis of the results of the FAA Vertical Studies Program.

3. ICAO Review of the General Concept of Separation Panel (RGCSP). In 1987, the FAA concentrated its resources for the development of RVSM programs in the ICAO RGCSP. The U.S. delegation to the ICAO RGCSP used the material developed by SC-150 as the foundation for U.S. positions and plans on RVSM criteria and programs. The Panel's major conclusions were:

- RVSM is technically feasible without imposing unreasonably demanding technical requirements on the equipment.
- RVSM provides significant benefits in terms of economy and en route airspace capacity.

• Implementation of RVSM on either a regional or global basis requires sound operational judgment supported by an assessment of system performance based on: aircraft altitude-keeping capability, operational considerations, systems performance monitoring, and risk assessment.

4. NATSPG and the NATSPG Vertical Separation Implementation Group (VISG).

The NATSPG Task Force was established in 1988 to identify the requirements to be met by the future NAT Region Air traffic services systems: to design the framework for the NAT airspace system concept; and to prepare a general plan for the phased introduction of the elements of the concept. The objective of this effort was to permit significant increases in airspace capacity and improvement in flight economy. At the meeting of the NATSPG in June 1991, all of the NAT air traffic service provider States, as well as the International Air Transport Association (IATA) and International Federation of Airline Pilots Association (IFALPA), endorsed the Future NAT Air Traffic Services System Concept Description developed by the NATSPG Task Force. With regard to the implementation of RVSM, the Concept Description concludes that priority must be given to implementation of this measure as it is believed to be achievable within the early part of the concept time frame. The NATSPG's initial goal was to implement RVSM between 1996 and 1997. To meet this goal, the NATSPG established the VSIG in June 1991 to take the necessary actions to implement RVSM in the NAT. These actions included:

- Programs and documents to approve aircraft and operators for conducting flight in the RVSM environment and to address all issues related to aircraft airworthiness, maintenance, and operations. The group has produced guidance material for aircraft and operator approval that ICAO has distributed to civil aviation authorities and NAT users. Also, ICAO has planned that the guidance material be incorporated in the approval process established by the States.

• Developing the system for monitoring aircraft altitude-keeping performance. This system is used to observe aircraft performance in the vertical plane to determine that the approval process is uniformly effective and that the RVSM airspace system is safe.

- Evaluating and developing ATC procedures for RVSM, conducting simulation studies to assess the effect of RVSM on ATC, and developing documents to address ATC issues.

The ICAO Limited NAT Regional Air Navigation Meeting held in Portugal in November 1992 endorsed the NATSPG RVSM implementation program. At the meeting, it was concluded that RVSM implementation should be pursued. The FAA concurred with the conclusions of the NATSPG on RVSM implementation.

## Reference Material

The FAA and other entities studying the issues of RVSM requirements have produced a number of studies and reports. The FAA used the following documents in the development of this amendment:

- Summary Report of United States Studies on 1,000-Foot Vertical Separation Above Flight Level 290 (FAA, July 1988).
- Initial Report on Minimum System Performance Standards for 1,000-Foot Vertical Separation Above Flight Level 290 (RTCA SC-150, November 1984): the report provides information on the methodology for evaluating safety, factors influencing vertical separation, and strawman system performance standards.
- Minimum System Performance Standards for 1,000-Foot Vertical Separation Above Flight Level 290 (Draft 7, RTCA, August 1990): the FAA concurred with the material developed by RTCA SC-150.
- The Report of RGCSP/6 (ICAO, Montreal, 28 November-15 December 1988) published in two volumes. Volume 1 summarizes the major conclusions reached by the panel and the individual States. Volume 2 presents the complete RVSM study reports of the individual State:
  - European Studies of Vertical Separation Above FL 290—Summary Report (prepared by the EUROCONTROL Vertical Studies Subgroup).
  - Summary Report of United States Studies on 1,000-Foot Vertical Separation Above Flight Level 290 (prepared by the FAA Technical Center and ARINC Research Corporation).
  - The Japanese Study on Vertical Separation:
    - The Report of the Canadian Mode C Data Collection.
    - The Results of Studies on the Reduction of Vertical Separation Intervals for USSR Aircraft at Altitudes Above 8,100 m (prepared by the USSR).
    - Report of RGCSP/7 (Montreal, 30 October-20 November 1990) containing a draft Manual on Implementation of a 300 M (1,000 Ft) Vertical Separation Minimum (VSM) Between FL 290 and 410 Inclusive, approved by the ICAO Air Navigation Commission in February 1991 and published as ICAO Document 9574.
    - Interim Guidance Material 91-RVSM. "Approval of Aircraft and Operators for Flight in Airspace Above FL 290 Where a 1,000 Foot Vertical Separation is Applied" (March 14, 1999). The interim guidance continues to provide recommended procedural steps for obtaining FAA approval.

. AC No. 91-70, "Oceanic Operations" (September 6, 1994).

- Flight Standards Handbook Bulletin for Air Transportation (HBAT) "Approval of Aircraft and Operators for Flight in Airspace Above Flight Level 290 Where a 1,000 Foot Vertical Separation Minimum is Applied" (HBAT 97-02).

. NATSPG Airspace Monitoring Subgroup Vertical Monitoring Report. (Issued quarterly)

### Related Activity

Projected increases in Pacific oceanic air traffic and the successful implementation of RVSM operations in the NAT support the addition of RVSM in the Pacific. Pacific operators and Air Traffic Service (ATS) providers have requested that RVSM be pursued aggressively.

The Pacific RVSM Implementation Task Force is the international body that is developing Pacific RVSM implementation plans. The Task Force is chaired by an FAA representative from the Air Traffic International Staff and supported by an ICAO representative from the Asia/Pacific Regional Office. The Task Force has three standing sub-groups: the Air Traffic Operations Group, the Aircraft Operations and Airworthiness Group and the Safety and Monitoring Group. The working groups are chaired by FAA air traffic and flight standards specialists. The Task Force includes representatives from Asia and Pacific civil aviation authorities, operators and the pilot and air traffic controller associations. The Task Force meets at approximately quarterly intervals to develop policy and procedure documents and to progress implementation tasks.

The Task Force chairperson and the three sub-group chairpersons will oversee the two phases of the Pacific implementation process:

### System Verification Phase

During the verification phase, aircraft will continue to be separated vertically by 2,000 feet. Operators and aircraft that have not already been approved for RVSM will begin to receive RVSM approval in accordance with part 91, section 91.706 and Appendix G (or their equivalent for foreign operators). The overall objectives of the system verification phase are to:

1. Confirm that the target level of safety (TLS) will continue to be met.
2. Confirm that aircraft approved for RVSM operation demonstrate altitude-keeping performance that meets RVSM standards. This will be achieved by:

- Identifying and eliminating any causes of out-of-tolerance altitude-keeping performance, in general or for specific aircraft groups; and

- Monitoring a sample of RVMS-approved aircraft and operators that is representative of the total Pacific population.

3. Verify that operational procedures adopted for RVSM are effective and appropriate.

4. Confirm that the altitude-monitoring program is effective. The principal purpose of this phase has been to gain confidence that the operational trial phase can begin.

### Initial Operational Capability/System Monitoring Phase

When the objectives of the system verification phase have been met, RVSM will be implemented at designated flight levels. The first year after implementation is considered the operational trials phase. The objectives of the operational trial phase are to:

1. Continue to collect altitude-keeping performance data.

2. Increase the level of confidence that safety goals are being met.

3. Demonstrate operationally that there are no difficulties with RVSM implementation.

Beginning February 24, 2000, only RVSM compliant aircraft will be cleared to operate in the major Pacific FIRs between FLs 290 and 390 (inclusive). Aircraft that are not RVSM compliant (e.g., State aircraft, ferry and maintenance flights) will only be cleared to operate between FLs 290 and 390 (inclusive), traffic permitting, after prior coordination with the appropriate oceanic center. 2,000-foot vertical separation will be applied to such aircraft.

Provided that all requirements continue to be met, at the end of one year, RVSM will be declared fully operational.

### Altitude-Keeping Performance

For the past three years, the FAA, in conjunction with the NATSPG, has monitored aircraft altitude-keeping performance of RVSM approved aircraft. A major objective of monitoring is to establish that the altitude-keeping performance of the aircraft fleet operating in airspace where RVSM is applied continues to meet minimum requirements.

Altimeter system error (ASE) is the major component of aircraft altitude-keeping performance. In the past three years, 36,000 measurements of altimetry system error have been taken for over 3,000 different airframes. Those measurements have shown that the

altitude-keeping performance of aircraft approved for RVSM operations is significantly better than the minimum requirement. The ASE requirement established for RVSM is that average ASE not exceed 80 feet and 99.9% of ASE observed not exceed 245 feet. The monitoring results have shown that actual average ASE is -4 feet and 99.9% of ASE is within 156 feet.

The FAA has determined that the appropriate method of assessing collision risk is the Reich collision risk model (CRM). As noted in AC No. 91-70, Oceanic Operations, collision risk refers to the number of midair accidents likely to occur due to the loss of separation in a prescribed volume of airspace for a specific number of flight hours.

Collision Risk Methodology (CRM) was used to develop the requirements for safe implementation of a 1,000-foot vertical separation standard. The United States supported the methodology used to derive the accepted level of safety for RVSM implementation.

The TLS that is being used in the North Atlantic and the Pacific regions to assess safety is no more than five fatal accidents in 1 billion flying hours. The level of safety was developed using historical data on safety from global sources. One precedent used was a period of 100 to 150 years between midair collisions. When the TLS of 5 accidents in a billion flying hours is projected in terms of a calendar year interval between accidents in the Pacific, it yields a theoretical interval of approximately 322 years between midair collisions. The accepted level of safety is consistent with the acceptable level for aircraft hull loss and is based on the precedence of extremely improbable events as they relate to system safety, the basis for certain requirements in certification regulations such as 14 CFR 25.1309.

To ensure that the TLS is met, the FAA is monitoring the total vertical error (TVE) and the remaining CRM parameters that are critical for safety assessment (probability of lateral and longitudinal overlap). TVE is defined as the geometric difference between the aircraft and the flight level altitude. To monitor TVE, the FAA has deployed measurement systems that will produce estimates of aircraft and flight level geometric altitude. The overall goal of monitoring is to ensure that airworthiness, maintenance, and operational approval requirements result in required system performance (and level of safety) in the flight environment on a continuing basis. One such measurement/monitoring system is a Global Positioning System (GPS)-

based monitoring system (GMS). The GMS has been used extensively in the NAT along with ground based Height Monitoring Units (HMUs). Due to the lack of land masses in the PAC, the GMS will be used for RVSM system verification and monitoring.

The on-going assessment of risk in the North Atlantic over the past two years has shown that the TLS of 5 accidents in 1 billion flight hours can be met. All sources of error related to aircraft performance and to human error have been assessed. One major incident that was observed in the on-going monitoring was judged to be a pilot error not related to the introduction of RVSM. In this incident, an aircraft did not fly the flight level to which it was cleared, but reported to ATC that it was flying the cleared level. This incident was advertised to the user community for emphasis in pilot training programs.

#### Current Requirements

Part 91 Section 91.706 (Operations within airspace designated as Reduced Vertical Separation Minimum Airspace.) and Appendix G to Part 91 (OPERATIONS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE) were published in April 1997. They are based on the ICAO Manual on RVSM. Technical and operational experts from the FAA, the European Joint Airworthiness Authorities (JAA), the aircraft manufacturers, and pilot associations developed the criteria in a joint FAA/JAA working group. Section 91.706 requires that aircraft and operators meet the requirements of Appendix G and receive authorization from the Administrator prior to flying in airspace where RVSM is applied. Appendix G contains requirements in eight sections:

1. Definitions
2. Aircraft Approval
3. Operator Authorization
4. RVSM operations (flight planning into RVSM airspace)
5. Deviation Authority Approval
6. Reporting Altitude-keeping Errors
7. Removal or Amendment of Authority
8. Airspace Designation

Flight Standards Handbook Bulletin (HBAT) 97-02 entitled "Approval of Aircraft and Operators for Flight in Airspace Above Flight Level 290 Where 1,000 Foot Vertical Separation Minimum Is Applied", has been distributed through Flight Standards District Offices (FSDOs). This document provides guidance to FAA Flight Standards inspectors on the process and procedures to follow before approving an operator and its aircraft for RVSM operations. It details inspector

responsibilities for assessment of airworthiness approval, maintenance program approval, and operations approval requirements in the rule. It discusses timing, process, and maintenance and operations material that the operator should submit for FAA review and evaluation normally at least 60 days before the planned operation in RVSM airspace. Operators under Title 14, Code of Federal Regulations (14 CFR) part 91 receive FAA approval in the form of a Letter of Authorization (LOA), and operators under 14 CFR parts 121, 125, and 135 receive Operations Specifications (OPS-SPEC) approval.

For operations over the high seas outside the United States, 14 CFR 91.703 requires that aircraft of U.S. registry comply with Annex 2 (Rules of the Air) to the Convention on International Civil Aviation. Annex 2, amendment 32, effective February 19, 1996, reflects the change from 2,000 feet to 1,000 feet vertical separation for Instrument Flight Rules (IFR) traffic between FL 290 and FL 410, based on appropriate airspace designation, international agreements, and conformance with specified conditions.

#### General Discussion of the Proposal

The proposal allows operation of civil aircraft of U.S. registration in Pacific oceanic airspace where RVSM is applied. It is based on improvements in altitude-keeping technology. These improvements include:

- Introduction of the air data computer (ADC), which provides an automatic means of correcting the known static source error of aircraft to improve aircraft altitude measurement capability.
- Development of altimeters with enhanced transducers or double aneroid for computing altitude.

Under this proposal, airspace or routes in the Pacific where RVSM is applied would be considered special qualification airspace. Both the operator and the specific types of aircraft that the operator intends to use in RVSM airspace would have to be approved by the appropriate FAA office before the operator conducts flights in RVSM airspace.

Implementation of a 1,000-foot vertical separation standard above FL 290 offers substantial operational benefits to operators, including:

- Greater availability of the most fuel-efficient altitudes. In the RVSM environment, aircraft are able to fly closer to their optimum altitude at initial level off and through step climbing to the optimum altitude during the enroute phase.

• Greater availability of the most time and fuel-efficient tracks and routes (and an increased probability of obtaining these tracks and routes). Operators often are not cleared on the track or route that was filed due to demand for the optimum routes and resultant traffic congestion on those routes. RVSM allows ATC to accommodate a greater number of aircraft on a given track or route. More time and fuel-efficient tracks or routes would therefore be available to more aircraft.

- Increased controller flexibility. RVSM gives ATC greater flexibility to manage traffic by increasing the number of flight levels on each track or route.

• Reduction of pilot and controller work load. When controllers are required to re-route aircraft from their filed track and/or altitude they are required to re-coordinate and revise clearances. Pilots are required to re-program aircraft navigation systems (which has been a major cause of navigational errors). RVSM will reduce the number of re-routes required and therefore reduce both pilot and controller workload.

- Enhanced flexibility to allow aircraft to fly across route systems. Operators are often required to remain at lower, less fuel-efficient altitudes until the aircraft crosses a route system. RVSM makes more flight levels available at higher, more fuel-efficient altitudes to allow aircraft to cross route systems.

• Enhanced safety in the lateral dimension. Studies indicate that RVSM produces a wider distribution of aircraft among different tracks and altitudes, resulting in less exposure to aircraft at adjacent separation standards. RVSM reduces the number of occasions when two aircraft pass each other separated by a single separation standard (e.g., 60 nm laterally). The benefit to safety is that, should an aircraft enter, as a result of gross navigation error, onto an adjacent track, and another aircraft is on that track, there is an increased probability that the two aircraft would be flying at different flight levels.

This amendment to Sec. 91.706, Appendix G, Section 8 would add the Pacific oceanic FIRs to the list of FIR's where RVSM can be applied

#### Regulatory Evaluation Summary

Executive Order 12866 directs federal agencies to promulgate new regulations or modify existing regulations after consideration of the expected benefits to society and the expected costs. Each federal agency shall assess both the costs and the benefits of proposed regulations while recognizing that some costs and benefits are difficult to

quantify. A proposed rule is promulgated only upon a reasoned determination that the benefits of the proposed rule justify its costs.

The order also requires federal agencies to assess whether a proposed rule is considered a "significant regulatory action." The Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. The Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. Finally, Public Law 104-4 requires federal agencies to assess the impact of any federal mandates on state, local, tribal governments, and the private sector.

In conducting these analyses, the FAA has determined that this rule: (1) generates benefits that justify its costs and is not "a significant regulatory action" as defined in the Executive Order; (2) is significant as defined in Department of Transportation's Regulatory Policies and Procedures; (3) does not have a significant impact on a substantial number of small entities; and (4) does not constitute a barrier to international trade. These analyses, available in the docket, are summarized below.

This proposal amends FAR 91.706. Section 8 (Airspace Designation) by adding the appropriate Pacific Oceanic Flight Information Regions (FIRs) where RVSM would be implemented. The benefits of this proposed rulemaking are (1) an increase in the number of available flight levels, (2) enhance airspace capacity, (3) permit operators to operate more fuel/time efficient tracks and altitudes, and (4) enhance air traffic controller flexibility by increasing the number of available flight levels, while maintaining an equivalent level of safety.

The FAA estimates that this proposed rule would cost U.S. operators \$21.7 million for the ten-year period 2000-2009 or \$19.5 million, discounted. Estimated benefits, based on fuel savings for the commercial airplane fleet over the years 2000-2009, would be \$120 million, or \$83.8 million, discounted. Therefore, based on a quantitative and qualitative evaluation of this action, the proposed rule would be cost-beneficial.

#### Initial Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational

requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agency must perform a review to determine whether a proposed or final rule will have significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

A review of the Pacific traffic data shows that no small entities operate in Pacific oceanic airspace where this rule applies. The FAA has also examined the impact of this rulemaking on small operators of general aviation aircraft. The FAA database of U.S. registered aircraft operators shows that these airplanes are all operated by commuter or air taxi operators. Commuter or air taxi operators do not operate in Pacific oceanic airspace.

The FAA has determined that there are reasonable and adequate means to accommodate the transition to RVSM requirements, particularly for general aviation operators (many of whom are small). As of May 1999, 50% of the U.S. registered GA aircraft were approved for RVSM operations based on the NAT application of RVSM.

The FAA conducted the required review of this proposal and determined that it would not have a significant economic impact on a substantial number of small entities. Accordingly, pursuant to the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Federal Aviation Administration certifies that this rule would not have a significant impact on a substantial number of small entities.

#### International Trade Impact Statement

The provisions of this proposed rule would have little or no impact on trade for U.S. firms doing business in foreign countries and foreign firms doing business in the United States.

#### Federalism Implications

The regulations proposed herein would not have a substantial direct effect on the State, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

#### Paperwork Reduction Act of 1995

The reporting and record keeping requirements associated with this rule remain the same as under the current rules and have previously been approved by the Office of Management and Budget under the provisions of the Paperwork Reduction Act of 1980 (Pub. L. 96-511) and have been assigned OMB Control Number 2120-0026. The FAA believes that this rule does not impose any additional record keeping or reporting requirements.

#### Unfunded Mandates Reform Act of 1995 Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted annual for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon state, local, and tribal governments, in the aggregate, of \$100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to

provide input in the development of regulatory proposals.

This proposed rule does not contain a Federal intergovernmental and private sector mandate that exceeds \$100 million a year, therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

#### International Civil Aviation Organization and Joint Aviation Regulations

In keeping with U.S. obligations under the Convention on International Civil Aviation Organization (ICAO), it is FAA policy to comply with ICAO Standards and Recommended Practices (SARP) to maximum extent practicable. The operator and aircraft approval process was developed jointly by the FAA and the JAA under the auspices of NATSPG. The FAA has determined that this amendment does not present any difference.

#### Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1 D, appendix 4, paragraph 4(j), regulations, standards, and exemptions (excluding those, which if implemented may cause a significant impact on the human environment) qualify for a categorical exclusion. The FAA proposes that this

rule qualifies for a categorical exclusion because no significant impacts to the environment are expected to result from its finalization or implementation.

#### Energy Impact

The energy impact of this proposed rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94-163, as amended (42 U.S.C. 6362). It has been determined that this proposed rule is not a major regulatory action under the provisions of the EPCA.

#### List of Subjects in 14 CFR Part 91

Air traffic control. Aircraft. Airmen, Airports, Aviation safety. Reporting and recordkeeping requirements.

#### The Proposed Amendment

For the reasons discussed in the preamble, the Federal Aviation Administration proposes to amend part 91 of Title 14 of the Code of Federal Regulations (14 CFR part 91) as follows;

#### PART 91—GENERAL OPERATING AND FLIGHT RULES

1. The authority citation for part 91 continues to read as follows:

**Authority:** 49 U.S.C. 106(g), 40103, 40113, 40120, 44101.44111, 44701, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46502, 46504, 46506-46507, 47122, 47508, 47528-47531.

2. Part 91, appendix G, is amended by revising Section 8 to read as follows:

#### Appendix G to Part 91—Operations in Reduced Vertical Separation Minimum (RVSM) Airspace

\* \* \* \* \*

##### Section 8. Airspace Designation

(a) RVSM may be applied in the NAT in the following ICAO Flight Information Regions (FIRs): New York Oceanic, Gander Oceanic, Sondrestrom FIR, Reykjavik Oceanic, Shanwick Oceanic, and Santa Maria Oceanic.

(b) RVSM may be applied in the Pacific in the following ICAO Flight Information Regions (FIR): Anchorage Arctic, Anchorage Continental, Anchorage Oceanic, Auckland Oceanic, Brisbane, Edmonton, Honiara, Los Angeles, Melbourne, Nadi, Naha, Nauru, New Zealand, Oakland, Oakland Oceanic, Part Moresby, Seattle, Tahiti, Tokyo, and Vancouver.

(c) RVSM may be effective in the Minimum Navigation Performance Specification (MNPS) airspace within the NAT. The MNPS airspace within the NAT is defined by the volume of airspace FL 285 and FL 420 extending between latitude 27 degrees north and the North Pole, bounded in the east by the eastern boundaries of control areas Santa Maria Oceanic, Shanwick Oceanic, and Reykjavik Oceanic and in the west by the western boundaries of control areas Reykjavik Oceanic, Gander Oceanic, and New York Oceanic, excluding the areas west of 60 degrees west and south of 38 degrees 30 minutes north.

Issued in Washington, DC, on June 30, 1999.

**L. Nicholas Lacey,**

*Director, Flight Standards Service.*

[FR Doc. 99-17360 Filed 7-7-99; 8:45 am]

**BILLING CODE 4910-13-M**

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 91

FAA 11/1999 -

11/1999  
7/2/99

[Docket No. 99-10 ; Notice No. 99-10]

RIN 2120-AG82

Reduced Vertical Separation Minimum

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

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**SUMMARY:** The Federal Aviation Administration (FAA) intends by this proposed rule to enable the implementation of Reduced Vertical Separation Minimum (RVSM) in Pacific oceanic airspace. RVSM is the reduction of the vertical separation of aircraft from 2,000 feet to 1,000 feet at flight levels (FLs) between FL 290 (29,000 feet) and FL 410 (41,000 feet). RVSM is applied only between aircraft that meet stringent altimeter and auto-pilot performance requirements. RVSM is currently applied only in North Atlantic (NAT) Minimum Navigation Performance Specification (MNPS) airspace. The introduction of RVSM in Pacific oceanic airspace would make more fuel and time efficient flight levels and tracks available to operators and would

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enhance airspace capacity. Since March 1997 in the North Atlantic, RVSM has been shown to maintain an acceptable level of safety. International RVSM planning groups have agreed to implement RVSM on or before February 24, 2000.

DATES: Comments must be submitted on or before [60 days after publication date].

ADDRESSES: Comments on this NPRM should be delivered or mailed, in triplicate, to: U.S. Department of <sup>11/11/99</sup> Transportation Dockets, Docket No. <sup>FAA 1999 - 7-299</sup> [5925], 400 Seventh Street SW., Room Plaza 401, Washington, DC 20590. Comments must indicate the Docket Number. Comments also may be submitted electronically to the following Internet address: 9-NPRM-CMTS@faa.dot.gov. Comments may be examined in Room Plaza 401 weekdays between 10:00 a.m. and 5:00 p.m. weekdays, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Mr. Roy Grimes, AFS-400, Flight Technologies and Procedures Division, Flight Standards Service, Federal Aviation Administration, 600 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267-3734.

**SUPPLEMENTARY INFORMATION:**

**Comments Invited**

This action is a product of international agreements under which the international aviation community, including the United States, plans to implement RVSM in Pacific airspace. The International Civil Aviation Organization (ICAO) Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), the Informal Pacific Air Traffic Service Coordinating Group (IPACG), and the Informal South Pacific Air Traffic Service Coordinating Group have concluded that Pacific oceanic traffic will continue to increase significantly in the next few years. To accommodate this increase in air traffic, these groups have established a goal of implementing **RVSM** in Pacific Oceanic airspace on or before February 24, 2000. Affected **FIRs** include Anchorage Arctic, Anchorage Continental, Anchorage Oceanic, Auckland Oceanic, Brisbane, Edmonton, Honiara, Los Angeles, Melbourne, Nadi, Naha, Nauru, New Zealand, Oakland, Oakland Oceanic, Port **Moresby**, Seattle, Tahiti, Tokyo, and Vancouver.

Interested persons are invited to participate in this proposed rulemaking by submitting such written data, views, or arguments, as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that may result from adopting the proposals in this notice are

also invited. Comments that provide the factual basis supporting the views and suggestions presented are particularly helpful in developing reasoned regulatory decisions. Comments should identify the regulatory docket number and be submitted in triplicate to the above-specified address.

Because this proposed rule was developed as a result of an international agreement, comments deemed substantive will be presented for consideration and reviewed by the international community under the auspices of ICAO. If considered salient, the comments will be included for use by all participating member States.

All comments received will be available both before and after the closing date for comments in the Department of Transportation Docket for examination by interested persons.

The FAA will acknowledge receipt of a comment if the commenter includes a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket  
7/2/93 FAA-1999-  
No. 5925 ." The FAA will date, time stamp, and return the postcard.

#### **Availability of This Document**

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue, SW.,

Washington, DC 20591, or by calling (202) 267-9677.

Communications must identify the docket number of this rule.

Persons interested in being placed on the mailing list for future rulemaking actions should request from the above office a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

An electronic copy of this document may be downloaded, using a modem and suitable communications software, from the FAA regulations section of the Fedworld electronic bulletin board service (telephone 703-321-3339), the Federal Register's electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board Service (800-322-2722 or 202-267-5948).

Internet users may reach the FAA's web page at <http://www.faa.gov> or the Federal Register's Web page at [http://www.access.gpo.gov/su\\_docs](http://www.access.gpo.gov/su_docs) for access to recently published rulemaking documents.

## **Background**

### **Statement of the Problem**

Air traffic on Pacific routes between the U.S. and Asia has increased steadily in the past few years and is

projected to continue to increase. The North Pacific Track System (NOPAC) is the densest oceanic traffic area in the Pacific. Between 1994 and 1998, the annual traffic count on the NOPAC increased from 42,305 to 60,772 flights which represents an increase of 44 percent. The FAA Aviation Forecast for Fiscal Years 1998-2010 estimates that transpacific passenger traffic will continue to increase at 6.6 percent per year through 2010. Studies conducted by independent aviation industry analysts forecast the Pacific area to be the fastest growing area for flights to/from the United States.

Unless action is taken, as traffic increases, the opportunity for aircraft to fly at fuel-efficient altitudes and tracks will be significantly diminished. In addition, air traffic service providers may not be able to accommodate greater numbers of aircraft in the airspace without invoking restrictions that can result in traffic delays and fuel penalties.

With air traffic levels increasing annually worldwide, FAA airspace planners and their international counterparts continually explore methods of enhancing the air traffic control (ATC) system's ability to accommodate traffic in a safe and efficient manner. NAT airspace was chosen to be the first airspace for RVSM introduction because it is the busiest oceanic airspace in the world and traffic is

forecast to continue to increase. The NAT Traffic Forecasting Group Report shows that the number of annual flight operations increased 30 percent between 1991 and 1996 with a forecast 67 percent rise over the 1992 level of 228,200 by 2002.

Prior to the introduction of RVSM, 27 percent of flights in NAT airspace were issued clearances on tracks and at altitudes other than those requested by the operators in their filed flight plans. These flights were, therefore, generally conducted at less than optimum tracks and altitudes for the aircraft, resulting in time and fuel inefficiencies.

The North Atlantic Implementation Management Group has observed the following improvements in NAT operations due to the introduction of RVSM:

1. 50 percent of the fuel penalty attributed to NAT system operation was eliminated. (The total NAT system fuel penalty is estimated based on track design, meteorological forecast, cruise level and traffic congestion penalties).
2. 25 percent fewer fixed tracks were required to be published. (This allows more airspace for operators to fly preferred tracks).

3. There was a 5 percent increase in flights cleared to fly both at the altitude and on the track that the operator requested.

RVSM alleviates the limitation on air traffic management at high altitudes imposed by the conventional 2,000-foot vertical separation standard. Below FL 290, air traffic controllers can assign aircraft operating under Instrument Flight Rules (IFR) altitudes a minimum of 1,000 feet apart. Above FL 290, however, the Conventional Vertical Separation Minimum (CVSM) is 2,000 feet.

Note: Flight levels are stated in digits that represent hundreds of feet. The term flight level is used to describe a surface of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Rather than adjusting altimeters for changes in atmospheric pressure, pilots base altitude readings above the transition altitude [in the United States, 18,000 feet] on this standard reference. FL 290 represents the pressure surface equivalent to 29,000 feet based on the 29.92" Hg datum; FL 310 represents 31,000 feet, and so on.)

The **2,000-foot** minimum vertical separation restricts the number of flight levels available. Flight levels 310, 330, 350, 370, and 390 are flight levels at which aircraft crossing oceanic airspace operate most economically. At

peak hours these FLs can become congested. When all RVSM FLs are utilized, six additional flight levels are available: FLs 300, 320, 340, 360, 380 and 400. Increasing the number of FLs available in the Pacific region is projected to achieve operator benefits similar to those achieved in the NAT (i.e., mitigation of fuel penalties attributed to the inability to fly optimum altitudes and tracks). In the Pacific, RVSM is initially planned to be implemented between FL 290 and FL 390 (inclusive). At this time, traffic density above FL 390 does not warrant implementing RVSM at FL 400 and FL 410.

Another factor that has led Pacific planners to believe that RVSM implementation should be pursued aggressively is that a large percentage of Pacific operators and aircraft have already received approval to conduct RVSM operations. This is due to the fact that Pacific operators conduct operations worldwide and therefore, have been required to obtain RVSM approval to operate in NAT RVSM airspace. Aircraft that have been approved for RVSM are approved for RVSM in any area of the world where it is applied. The Pacific RVSM Implementation Task Force (Task Force) has reviewed the RVSM approval status of Pacific operators and aircraft and found that approximately 36 percent of Pacific operations are already conducted by RVSM approved operators

and projected that this figure will grow to 56 percent in the near term.

## **History**

The ICAO APAN/PIRG develops and provides oversight for plans and policy related to air navigation in the Pacific and Asia. The APAN/PIRG established the Task Force to develop and implement RVSM policy and programs in the Pacific. The Task Force is using the policy and criteria developed in other ICAO forums to build the RVSM program for the Pacific. The following reviews the RVSM program development in U.S. and ICAO forums.

Rising traffic volume and fuel costs, which made flight at fuel-efficient altitudes a priority for operators, sparked an interest in the early 1970s in implementing RVSM above FL 290. In April 1973, the Air Transport Association of America (ATA) petitioned the FAA for a rule change to reduce the vertical separation minimum to 1,000 feet for aircraft operating above FL 290. The petition was denied in 1977 in part because (1) aircraft altimeters had not been improved sufficiently, (2) improved maintenance and operational standards had not been developed, and (3) altitude correction was not available in all aircraft. In addition, the cost of modifying nonconforming aircraft was

prohibitive. The FAA concluded that granting the ATA petition at that time would have adversely affected safety. Nevertheless, the FAA recognized the potential benefits of RVSM under certain circumstances and continued to review technological developments, committing extensive resources to studying aircraft altitude-keeping performance and necessary criteria for safely reducing vertical separation above FL 290. These benefits and data showing that implementing RVSM is technically feasible have been demonstrated in studies conducted cooperatively in international forums, as well as separately by the FAA.

Because of the high standard of performance and equipment required for RVSM, the FAA advocated initial introduction of RVSM in oceanic airspace where special navigation performance standards were already required. Special navigation areas require high levels of long-range navigation precision due to the separation standard applied. RVSM implementation in such airspace requires an increased level of precision demanded of operators, aircraft, and vertical navigation systems.

On March 27, 1997, RVSM was implemented in one such special navigation area of operation, the NAT MNPS, established in the ICAO NAT Region. In designated NAT MNPS airspace, tracks are spaced 60 nautical miles (nm) apart. Between **FLs** 310 and 390 (inclusive), aircraft are separated

vertically by 1000 feet. All aircraft operating in this airspace must be appropriately equipped and capable of meeting required lateral navigation performance standards of part 91, section 91.705 and vertical navigation performance standards of part 91, section 91.706. Operators must follow procedures that ensure the standards are met, and flight crews are trained and qualified to meet the standards. Each operator, aircraft, and navigation system combination must receive and maintain authorization to operate in the NAT MNPS. The NATSPG Central Monitoring Agency monitors NAT aircraft fleet performance to ensure that a safe operating environment is maintained.

FAA data indicate that the altitude-keeping performance of most aircraft flying in oceanic airspace can meet the standards for RVSM operations. The FAA and ICAO research to determine the feasibility of implementing RVSM included the following four efforts:

1. FAA Vertical Studies Program. This program began in mid-1981, with the objectives of collecting and analyzing data on aircraft performance in maintaining assigned altitude, developing program requirements to reduce vertical separation, and providing technical and operational representation on the various working groups studying the issue outside the FAA.

2. RTCA Special Committee (SC)-150. RTCA, Inc., (formerly Radio Technical Commission for Aeronautics) is an industry organization in Washington, DC, that addresses aviation technical requirements and concepts and produces recommended standards. When the FAA hosted a public meeting in early 1982 on vertical separation, it was recommended that RTCA be the forum for development of minimum system performance standards for RVSM. RTCA SC-150 was formed in March 1982 to develop minimum system performance requirements, identify required improvements to aircraft equipment and changes to operational procedures, and assess the impact of the requirements on the aviation community. SC-150 served as the focal point for the study and development of RVSM criteria and programs in the United States from 1982 to 1987, including analysis of the results of the FAA Vertical Studies Program.
3. ICAO Review of the General Concept of Separation Panel (RGCSF). In 1987, the FAA concentrated its resources for the development of RVSM programs in the ICAO RGCSF. The U.S. delegation to the ICAO RGCSF used the material developed by SC-150 as the foundation for U.S. positions and plans on RVSM criteria and programs. The panel's major conclusions were:

- RVSM is technically feasible without imposing unreasonably demanding technical requirements on the equipment.
- RVSM provides significant benefits in terms of economy and en route airspace capacity.
- Implementation of RVSM on either a regional or global basis requires sound operational judgment supported by an assessment of system performance based on: aircraft altitude-keeping capability, operational considerations, system performance monitoring, and risk assessment.

#### 4. NATSPG and the NATSPG Vertical Separation Implementation Group (VSIG).

The NATSPG Task Force was established in 1988 to identify the requirements to be met by the future NAT Region air traffic services system: to design the framework for the NAT airspace system concept; and to prepare a general plan for the phased introduction of the elements of the concept. The objective of this effort was to permit significant increases in airspace capacity and improvements in flight economy. At the meeting of the NATSPG in June 1991, all of the NAT air traffic service provider States, as well as the International Air Transport Association (IATA) and International Federation of Airline Pilots Association (IFALPA), endorsed the Future NAT Air Traffic Services

System Concept Description developed by the NATSPG Task Force. With regard to the implementation of RVSM, the Concept Description concludes that priority must be given to implementation of this measure as it is believed to be achievable within the early part of the concept time frame. The NATSPG's initial goal was to implement RVSM between 1996 and 1997. To meet this goal, the NATSPG established the VSIG in June 1991 to take the necessary actions to implement RVSM in the NAT. These actions included:

- Programs and documents to approve aircraft and operators for conducting flight in the RVSM environment and to address all issues related to aircraft airworthiness, maintenance, and operations. The group has produced guidance material for aircraft and operator approval that ICAO has distributed to civil aviation authorities and NAT users. Also, ICAO has planned that the guidance material be incorporated in the approval process established by the States.
- Developing the system for monitoring aircraft altitude-keeping performance. This system is used to observe aircraft performance in the vertical plane to determine that the approval process is uniformly effective and that the RVSM airspace system is safe.

- Evaluating and developing ATC procedures for RVSM, conducting simulation studies to assess the effect of RVSM on ATC, and developing documents to address ATC issues.

The ICAO Limited NAT Regional Air Navigation Meeting held in Portugal in November 1992 endorsed the NATSPG RVSM implementation program. At that meeting, it was concluded that RVSM implementation should be pursued. The FAA concurred with the conclusions of the NATSPG on RVSM implementation.

### **Reference Material**

The FAA and other entities studying the issue of RVSM requirements have produced a number of studies and reports. The FAA used the following documents in the development of this amendment:

- Summary Report of United States Studies on 1,000-Foot Vertical Separation Above Flight Level 290 (FAA, July 1988).
- Initial Report on Minimum System Performance Standards for 1,000-Foot Vertical Separation Above Flight Level 290 (RTCA SC-150, November 1984); the report provides information on the methodology for evaluating safety, factors influencing vertical

separation, and strawman system performance standards.

- Minimum System Performance Standards for 1,000-Foot Vertical Separation Above Flight Level 290 (Draft 7, RTCA, August 1990); the FAA concurred with the material developed by RTCA X-150.
- The Report of RGCSP/6 (ICAO, Montreal, 28 November-15 December 1988) published in two volumes. Volume 1 summarizes the major conclusions reached by the panel and the individual States: Volume 2 presents the complete RVSM study reports of the individual States:
- European Studies of Vertical Separation Above FL 290--Summary Report (prepared by the EUROCONTROL Vertical Studies Subgroup).
- Summary Report of United States Studies on 1,000-Foot Vertical Separation Above Flight Level 290 (prepared by the FAA Technical Center and ARINC Research Corporation).
- The Japanese Study on Vertical Separation.
- The Report of the Canadian Mode C Data Collection.
- The Results of Studies on the Reduction of Vertical Separation Intervals for USSR Aircraft at Altitudes Above 8,100 m (prepared by the USSR).

- Report of RGCSP/7 (Montreal, 30 October-20 November 1990) containing a draft Manual on Implementation of a 300 M (1,000 Ft) Vertical Separation Minimum (VSM) Between FL 290 and 410 Inclusive, approved by the ICAO Air Navigation Commission in February 1991 and published as ICAO Document 9574.
- Interim Guidance Material 91-RVSM, "Approval of Aircraft and Operators for Flight in Airspace Above FL 290 Where a 1,000 Foot Vertical Separation is Applied" (March 14, 1994). The interim guidance continues to provide recommended procedural steps for obtaining FAA approval.
- AC No. 91-70, "Oceanic Operations" (September 6, 1994).
- Flight Standards Handbook Bulletin for Air Transportation (HBAT) "Approval of Aircraft and Operators for Flight in Airspace Above Flight Level 290 Where a 1,000 Foot Vertical Separation Minimum is Applied" (HBAT 97-02).
- NATSPG Airspace Monitoring Sub-group Vertical Monitoring Report. (Issued quarterly)

## **Related Activity**

Projected increases in pacific oceanic air traffic and the successful implementation of RVSM operations in the NAT support the addition of RVSM in the Pacific. Pacific operators and Air Traffic Service (ATS) providers have requested that RVSM be pursued aggressively.

The Pacific RVSM Implementation Task Force is the international body that is developing Pacific RVSM implementation plans. The Task Force is chaired by an FAA representative from the Air Traffic International Staff and supported by **an** ICAO representative from the Asia/Pacific Regional Office. The Task Force has three standing sub-groups: the Air Traffic Operations Group, the Aircraft Operations and Airworthiness Group and the Safety and Monitoring Group. The working groups are chaired by FAA air traffic **and** flight standards specialists. The Task Force includes representatives from Asia and Pacific civil aviation authorities, operators and the pilot and air traffic controller associations. The Task Force meets at approximately quarterly intervals to develop policy and procedure documents and to progress implementation tasks.

The Task Force chairperson and the three sub-group chairpersons will oversee the two phases of the Pacific implementation process:

## **System Verification Phase**

During the verification phase, aircraft will continue to be separated vertically by 2,000 feet. Operators and aircraft that have not already been approved for RVSM will begin to receive RVSM approval in accordance with part 91, section 91.706 and Appendix G (or their equivalent for foreign operators). The overall objectives of the system verification phase are to:

1. Confirm that the target level of safety (TLS) will continue to be met.
2. Confirm that aircraft approved for RVSM operation demonstrate altitude-keeping performance that meets RVSM standards. This will be achieved by:
  - Identifying and eliminating any causes of out-of-tolerance altitude-keeping performance, in general or for specific aircraft groups; and
  - Monitoring a sample of RVSM-approved aircraft and operators that is representative of the total Pacific population.
3. Verify that operational procedures adopted for RVSM are effective and appropriate.

4. Confirm that the altitude-monitoring program is effective. The principal purpose of this phase has been to gain confidence that the operational trial phase can begin.

#### **Initial Operational Capability/System Monitoring Phase**

When the objectives of the system verification phase have been met, RVSM will be implemented at designated flight levels. The first year after implementation is considered the operational trials phase. The objectives of the operational trial phase are to:

1. Continue to collect altitude-keeping performance data.
2. Increase the level of confidence that safety goals are being met.
3. Demonstrate operationally that **there are** no difficulties with RVSM implementation.

Beginning February 24, 2000, only RVSM compliant aircraft will be cleared to operate in the major Pacific **FIRs** between **FLs** 290 and 390 (inclusive). Aircraft that are not RVSM compliant (e.g., State aircraft, ferry and maintenance flights) will only be cleared to operate between **FLs** 290 and 390 (inclusive), traffic permitting, after prior coordination with the appropriate oceanic center. 2,000-foot vertical separation will be applied to such aircraft.

Provided that all requirements continue to be met, at the end of one year, RVSM will be declared fully operational.

#### **Altitude-Keeping Performance**

For the past three years, the FAA, in conjunction with the NATSPG, has monitored aircraft altitude-keeping performance of RVSM approved aircraft. A major objective of monitoring is to establish that the altitude-keeping performance of the aircraft fleet operating in airspace where RVSM is applied continues to meet minimum requirements.

Altimeter system error (ASE) is the major component of aircraft altitude-keeping performance. In the past three years, 36,000 measurements of altimetry system error have been taken for over 3,000 different airframes. Those measurements have shown that the altitude-keeping performance of aircraft approved for RVSM operations is significantly better than the minimum requirement. The ASE requirement established for RVSM is that average ASE not exceed 80 feet and 99.9% of ASE observed not exceed 245 feet. The monitoring results have shown that actual average ASE is -4 feet and 99.9% of ASE is within 156 feet.

The FAA has determined that the appropriate method of assessing collision risk is the Reich collision risk model (CRM). As noted in AC No. 91-70, Oceanic Operations, collision risk refers to the number of midair accidents likely to occur due to the loss of separation in a prescribed volume of airspace for a specific number of flight hours.

Collision Risk Methodology (CRM) was used to develop the requirements for safe implementation of a 1,000-foot vertical separation standard. The United States supported the methodology used to derive the accepted level of safety for RVSM implementation.

The TLS that is being used in the North Atlantic and the Pacific regions to assess safety is no more than five fatal accidents in 1 billion flying hours. The level of safety was developed using historical data on safety from global sources. One precedent used was a period of 100 to 150 years between midair collisions. When the TLS of 5 accidents in a billion flying hours is projected in terms of a calendar year interval between accidents in the Pacific, it yields a theoretical interval of approximately 322 years between midair collisions. The accepted level of safety is consistent with the acceptable level for aircraft hull loss and is based on the precedence of extremely improbable events as they relate to system safety, the basis for

certain requirements in certification regulations such as 14 CFR 25.1309.

To ensure that the TLS is met, the FAA is monitoring the total vertical error (TVE) and the remaining CRM parameters that are critical for safety assessment (probability of lateral and longitudinal overlap). TVE is defined as the geometric difference between the aircraft and the flight level altitude. To monitor TVE, the FAA has deployed measurement systems that will produce estimates of aircraft and flight level geometric altitude. The overall goal of monitoring is to ensure that airworthiness, maintenance, and operational approval requirements result in required system performance (and level of safety) in the flight environment on a continuing basis. One such measurement/monitoring system is a Global Positioning System (GPS)-based monitoring system (GMS). The GMS has been used extensively in the NAT along with ground based Height Monitoring Units (HMUs). Due to the lack of land masses in the PAC, the GMS will be used for RVSM system verification and monitoring.

The on-going assessment of risk in the North Atlantic over the past two years has shown that the TLS of 5 accidents in 1 billion flight hours can be met. All sources of error related to aircraft performance and to human error have been assessed. One major incident that was observed in

the on-going monitoring was judged to be a pilot error not related to the introduction of RVSM. In this incident, an aircraft did not fly the flight level to which it was cleared, but reported to ATC that it was flying the cleared level. This incident was advertised to the user community for emphasis in pilot training programs.

### **Current Requirements**

Part 91 Section 91.706 (Operations within airspace designated as Reduced Vertical Separation Minimum Airspace.) and Appendix G to Part 91 (OPERATIONS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE) were published in April 1997. They are based on the ICAO Manual on RVSM. Technical and operational experts from the FAA, the European Joint Airworthiness Authorities (JAA), the aircraft manufacturers, and pilot associations developed the criteria in a joint FAA/JAA working group. Section 91.706 requires that aircraft and operators meet the requirements of Appendix G and receive authorization from the Administrator prior to flying in airspace where RVSM is applied. Appendix G contains requirements in eight sections:

1. Definitions
2. Aircraft Approval

3. Operator Authorization
4. RVSM operations (flight planning into RVSM airspace)
5. Deviation Authority Approval
6. Reporting Altitude-keeping Errors
7. Removal or Amendment of Authority
8. Airspace Designation

Flight Standards Handbook Bulletin (HBAT) 97-02 entitled "Approval of Aircraft and Operators for Flight in Airspace Above Flight Level 290 Where 1,000 Foot Vertical Separation Minimum Is Applied", has been distributed through Flight Standards District Offices (FSDOs). This document provides guidance to FAA Flight Standards inspectors on the process and procedures to follow before approving an operator and its aircraft for RVSM operations. It details inspector responsibilities for assessment of airworthiness approval, maintenance program approval, and operations approval requirements in the rule. It discusses timing, process, and maintenance and operations material that the operator should submit for FAA review and evaluation normally at least 60 days before the planned operation in RVSM airspace. Operators under Title 14, Code of Federal Regulations (14 CFR) part 91 receive FAA approval in the form of a Letter of Authorization (LOA), and operators under

14 CFR parts 121, 125, and 135 receive Operations Specifications (OPS-SPEC) approval.

For operations over the high seas outside the United States, 14 CFR 91.703 requires that aircraft of U.S. registry comply with Annex 2 (Rules of the Air) to the Convention on International Civil Aviation. Annex 2, amendment 32, effective February 19, 1996, reflects the change from 2,000 feet to 1,000 feet vertical separation for Instrument Flight Rules (IFR) traffic between FL 290 and FL 410, based on appropriate airspace designation, international agreements, and conformance with specified conditions.

#### **General Discussion of the Proposal**

The proposal allows operation of civil aircraft of U.S. registration in Pacific oceanic airspace where RVSM is applied. It is based on improvements in altitude-keeping technology. These improvements include:

- Introduction of the air data computer (ADC), which provides an automatic means of correcting the known static source error of aircraft to improve aircraft altitude measurement capability.
- Development of altimeters with enhanced transducers or double aneroid for computing altitude.

Under this proposal, airspace or routes in the Pacific where RVSM is applied would be considered special qualification airspace. Both the operator and the specific types of aircraft that the operator intends to use in RVSM airspace would have to be approved by the appropriate FAA office before the operator conducts flights in RVSM airspace.

Implementation of a 1,000-foot vertical separation standard above FL 290 offers substantial operational benefits to operators, including:

- Greater availability of the most fuel-efficient altitudes. In the RVSM environment, aircraft are able to fly closer to their optimum altitude at initial level off and through step climbing to the optimum altitude during the enroute phase.
- Greater availability of the most time and fuel-efficient tracks and routes (and an increased probability of obtaining these tracks and routes). Operators often are not cleared on the track or route that was filed due to demand for the optimum routes and resultant traffic congestion on those routes. RVSM allows ATC to accommodate a greater number of aircraft on a given track or route. More time and fuel-efficient tracks or routes would therefore be available to more aircraft.

- Increased controller flexibility. RVSM gives ATC greater flexibility to manage traffic by increasing the number of flight levels on each track or route.
- Reduction of pilot and controller work load. When controllers are required to re-route aircraft from their filed track and/or altitude they are required to re-coordinate and revise clearances. Pilots are required to re-program aircraft navigation systems (which has been a major cause of navigational errors). RVSM will reduce the number of re-routes required and therefore reduce both pilot and controller workload.
- Enhanced flexibility to allow aircraft to fly across route systems. Operators are often required to remain at lower, less fuel-efficient altitudes until the aircraft crosses a route system. RVSM makes more flight levels available at higher, more fuel-efficient altitudes to allow aircraft to cross route systems.
- Enhanced safety in the lateral dimension. Studies indicate that RVSM produces a wider distribution of aircraft among different tracks and altitudes, resulting in less exposure to aircraft at adjacent separation standards. RVSM reduces the number of occasions when two aircraft pass each other

separated by a single separation standard (e.g., 60 nm laterally). The benefit to safety is that, should an aircraft enter, as a result of gross navigation error, onto an adjacent track, and another aircraft is on that track, there is an increased probability that the two aircraft would be flying at different flight levels.

This amendment to Sec. 91.706, Appendix G, Section 8 would add the Pacific oceanic FIRs to the list of FIR's where RVSM can be applied.

#### **Regulatory Evaluation Summary**

Executive Order 12866 directs federal agencies to promulgate new regulations or modify existing regulations after consideration of the expected benefits to society and the expected costs. Each federal agency shall assess both the costs and the benefits of proposed regulations while recognizing that some costs and benefits are difficult to quantify. A proposed rule is promulgated only upon a reasoned determination that the benefits of the proposed rule justify its costs.

The order also requires federal agencies to assess whether a proposed rule is considered a "significant regulatory action." The Regulatory Flexibility Act of 1980

requires agencies to analyze the economic impact of regulatory changes on small entities. The Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. Finally, Public Law 104-4 requires federal agencies to assess the impact of any federal mandates on state, local, tribal governments, and the private sector.

In conducting these analyses, the FAA has determined that this rule: (1) generates benefits that justify its costs and is not "a significant regulatory action" as defined in the Executive Order; (2) is significant as defined in Department of Transportation's Regulatory Policies and Procedures; (3) does not have a significant impact on a substantial number of small entities; and (4) does not constitute a barrier to international trade. These analyses, available in the docket, are summarized below.

This proposal amends FAR 91, Section 91.706, Section 8 (Airspace Designation) by adding the appropriate pacific oceanic Flight Information Regions (FIRs) where RVSM would be implemented. The benefits of this proposed rulemaking are (1) an increase in the number of available flight levels, (2) enhance airspace capacity, (3) permit operators to operate more fuel/time efficient tracks and altitudes, and (4) enhance air traffic controller flexibility by

increasing the number of available flight levels, while maintaining an equivalent level of safety.

The FAA estimates that this proposed rule would cost U.S. operators \$21.7 million for the ten-year period 2000-2009 or \$19.5 million, discounted. Estimated benefits, based on fuel savings for the commercial airplane fleet over the years 2000-2009, would be \$120 million, or \$83.8 million, discounted. Therefore, based on a quantitative and qualitative evaluation of this action, the proposed rule would be cost-beneficial.

#### **Initial Regulatory Flexibility Determination**

The Regulatory Flexibility Act of 1980 establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be **clear**.

A review of the Pacific traffic data shows that no small entities operate in Pacific oceanic airspace where this rule applies. The FAA has also examined the impact of this rulemaking on **small** operators of general aviation aircraft. The FAA database of U.S. registered aircraft operators shows that these airplanes are all operated by commuter or air taxi operators. Commuter or air taxi operators do not operate in Pacific oceanic airspace.

The FAA has determined that there are reasonable and adequate means to accommodate the transition to RVSM

requirements, particularly for general aviation operators (many of whom are small). As of **May 1999**, 50% of the U.S registered GA aircraft were approved for RVSM operations based on the NAT application of RVSM.

The FAA conducted the required review of this proposal and determined that it would not have a significant economic impact on a substantial number of small entities. Accordingly, pursuant to the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Federal Aviation Administration certifies that this rule would not have a significant impact on a substantial number of small entities.

#### **International Trade Impact Statement**

The provisions of this proposed rule would have little or no impact on trade for U.S. firms doing business in foreign countries and foreign firms doing business in the United States.

#### **Federalism Implications**

The regulations proposed herein would not have a substantial direct effect on the States, on the relationship between the

national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

**Paperwork Reduction Act of 1995**

The reporting and record keeping requirements associated with this rule remain the same as under the current rules and have previously been approved by the Office of Management and Budget under the provisions of the Paperwork Reduction Act of 1980 (Pub. L. 96-511) and have been assigned OMB Control Numbers 2120-0026. The FAA believes that this rule does not impose any additional record keeping or reporting requirements.

**Unfunded Mandates Reform Act of 1995 Assessment**

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may

result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon state, local, and tribal governments, in the aggregate, of \$100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This proposed rule does not contain a Federal intergovernmental and private sector mandate that exceeds

\$100 million a year, therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

### **International Civil Aviation Organization and Joint Aviation Regulations**

In keeping with U.S. obligations under the Convention on International Civil Aviation Organization (ICAO), it is FAA policy to comply with ICAO Standards and Recommended Practices (SARP) to maximum extent practicable. The operator and aircraft approval process was developed jointly by the FAA and the JAA under the auspices of NATSPG. The FAA has determined that this amendment does not present any difference.

### **Environmental Analysis**

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), regulations, standards, and exemptions (excluding those, which if implemented may cause a significant impact on the human environment) qualify for a categorical exclusion. The FAA

proposes that this rule qualifies for a categorical exclusion because no significant impacts to the environment are expected to result from its finalization or implementation.

### **Energy Impact**

The energy impact of this proposed rule has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94-163, as amended (42 U.S.C. 6362). It has been determined that this proposed rule is not a major regulatory action under the provisions of the EPCA.

### **List of Subjects in 14 CFR Part 91**

Air-traffic control, Aircraft, Airmen, Airports, Aviation safety, Reporting and record-keeping requirements.

### **The Proposed Amendment**

For the reasons discussed in the preamble, the Federal Aviation Administration proposes to amend part 91 of Title 14 of the Code of Federal Regulations (14 CFR part 91) as follows:

**PART 91--GENERAL OPERATING AND FLIGHT RULES**

1. The authority citation for Part 91 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40113, 40120, 44101, 44111, 44701, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46502, 46504, 46506-46507, 41122, 47508, 47528-47531.

2. Part 91, appendix G, is amended by revising Section 8 to read as follows:

APPENDIX G TO PART 91--OPERATIONS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE

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*Section 8. Airspace Designation*

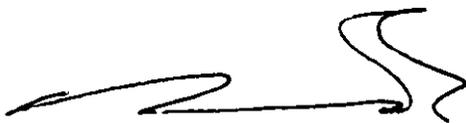
(a) RVSM may be applied in the NAT in the following ICAO Flight Information Regions (FIRs): New York Oceanic, Gander Oceanic, Sondrestrom FIR, Reykjavik Oceanic, Shanwick Oceanic, and Santa Maria Oceanic.

(b) RVSM may be applied in the Pacific in the following ICAO Flight Information Regions (FIRs): Anchorage Arctic, Anchorage Continental, Anchorage Oceanic, Auckland Oceanic, Brisbane, Edmonton, Honiara, Los Angeles, Melbourne, Nadi,

Naha, Nauru, New Zealand, Oakland, Oakland Oceanic, Port Moresby, Seattle, Tahiti, Tokyo, and Vancouver.

(c) RVSM may be effective in the Minimum Navigation Performance Specification (MNPS) airspace within the NAT. The MNPS airspace within the NAT is defined by the volume of airspace FL 285 and FL 420 extending between latitude 27 degrees north and the North Pole, bounded in the east by the eastern boundaries of control areas Santa Maria Oceanic, Shanwick Oceanic, and Reykjavik Oceanic and in the west by the western boundaries of control areas Reykjavik Oceanic, Gander Oceanic, and New York Oceanic, excluding the areas west of 60 degrees west and south of 38 degrees 30 minutes north.

Issued in Washington, DC, on June 30, 1999.

A handwritten signature in black ink, appearing to read 'L. Nicholas Lacey'. The signature is fluid and cursive, with a long horizontal stroke at the beginning and a large, stylized 'S' shape at the end.

L. Nicholas Lacey  
Director, Flight Standards Service