



Advisory Circular

Subject: Requirements to obtain Reduced Vertical Separation Minimum (RVSM) Specific Approval (SA)

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1.0 Introduction

- (1) Subject to paragraph (3), this Advisory Circular (AC) provides the conditions and associated guidance applicable to the Special Authorization/Specific Approval (SA) for Reduced Vertical Separation Minimum (RVSM). It describes the acceptable means of demonstrating compliance with regulations and standards. This AC on its own does not change, create, amend, or permit deviations from regulatory requirements.
- (2) Operators are expected to follow the means of compliance described in this AC in all respects.
- (3) The conditions of the associated SA appear in Appendix A of this AC.
 - (a) For air operators, the conditions published in Appendix A of the AC constitute part of the air operator certificate (AOC). As such, compliance with these conditions is mandatory.
 - (b) For private operators, section 604.56 of the *Canadian Aviation Regulations* (CARs) specifies the conditions for this authorization.

1.1 Purpose

- (1) The purpose of this AC is to provide air operators with information pertaining to the Special Authorization/Specific Approval to conduct flights in airspace where RVSM is required. This AC also provides guidance to operators on training requirements, aircraft RVSM equipment and maintenance requirements.
- (2) An operator may only operate in RVSM airspace those aircraft listed by registration on their RVSM SA, unless otherwise authorized by Transport Canada.

1.2 Applicability

- (1) This AC applies to Canadian operators holding an Air Operator Certificate (AOC) and to private operators holding a Private Operator Registration Document (PORD) issued under Subpart 604 of the *Canadian Aviation Regulations* (CARs) that wish to operate in RVSM airspace.

1.3 Description of changes

- (1) In alignment with International Civil Aviation Organization (ICAO) terminology, the term 'Specific Approval' replaces 'Special Authorization' for CARs Part VII air operations.
- (2) Updated background section to reflect NAV CANADA transition to space-based ADS-B and implementing the Canadian ADS-B mandate for Class A airspace in 2023.
- (3) Updated RVSM height monitoring information to reflect phase out of three remaining height Aircraft Geometric Height Measurement Elements (AGHME) and transition to ADS-B based height monitoring by the North American Approvals Registry and Monitoring Organization (NAARMO).

2.0 References and requirements

2.1 Reference documents

- (1) It is intended that the following reference materials be used in conjunction with this document:
 - (a) *Aeronautics Act* (R.S., 1985, C. A-2)

- (b) Subpart 604 of the *Canadian Aviation Regulations* (CARs) — Private Operators
 - (c) Subpart 605 of the CARs — Aircraft Requirements
 - (d) Subpart 702 of the CARs — Aerial Work
 - (e) Subpart 703 of the CARs — Air Taxi Operations
 - (f) Subpart 704 of the CARs — Commuter Operations
 - (g) Subpart 705 of the CARs — Airline Operations
 - (h) Transport Canada Advisory Circular (AC) No. 700-004 - Airborne Collision Avoidance System Advisory Material
 - (i) Transport Canada Designated Airspace Handbook (DAH) TP 1820E
 - (j) Chapter 537 of the Airworthiness Manual (AWM), Airworthiness Standards Appliances and Parts Subchapter B, Canadian Technical Standard Orders (CAN-TSOs) Chapter 551 of the AWM — Aircraft Equipment and Installation
 - (k) International Civil Aviation Organization (ICAO) Document 9574, Edition 03, 2012 — Manual on a 300 m (1000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive
 - (l) ICAO North Atlantic (NAT) DOC 007— North Atlantic Airspace and Operations Manual
 - (m) Federal Aviation Administration (FAA) Advisory Circular (AC) 91-85() - Authorization of Aircraft and Operators for Flight in Reduced Vertical Separation Minimum (RVSM) Airspace
 - (n) EUROCONTROL — Guidance Material for the Certification and Operation of State Aircraft in European RVSM Airspace Edition: 2.0, June 2014
 - (o) FAA RVSM Minimum Monitoring Requirements Tables
- (2) The following table outlines the authorization/approvals and applicable CARs for RVSM operations:

CAR Subpart	Authorization/Approvals	Regulation Part
604	RVSM	604.05, 604.56
702	RVSM	702.08(g)(vii)
703	RVSM	703.08(g)(x)
704	RVSM	704.08(g)(vi)
705	RVSM	705.08(g)(vi)

2.2 Cancelled documents

- (1) Not applicable.
- (2) By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

2.3 Definitions and abbreviations

- (1) The following **definitions** are used in this document:

- (a) **NON-RVSM Aircraft:** an aircraft that does not meet RVSM requirements for certification and/or for operator authorization/approval.
 - (b) **Maintenance Program:** aircraft approved maintenance schedule and the operator's maintenance control system.
 - (c) **RVSM:** Reduced Vertical Separation Minimum. The application of 1000-ft vertical separation in RVSM Airspace.
 - (d) **RVSM Aircraft:** an aircraft that meets RVSM requirements for certification and for operator special authorization/approval.
 - (e) **RVSM Airspace:** all airspace within Canadian domestic airspace from FL 290 to FL410 inclusive as defined in the Designated Airspace Handbook (TP 1820).
- (2) The following **abbreviations** are used in this document:
- (a) **AC:** Advisory Circular
 - (b) **ACAS:** Airborne Collision Avoidance System
 - (c) **ADS-B:** Automatic Dependent Surveillance - Broadcast
 - (d) **AFM:** Aeroplane Flight Manual
 - (e) **AOC:** Air Operator Certificate
 - (f) **ATC:** Air Traffic Control
 - (g) **CARs:** *Canadian Aviation Regulations*
 - (h) **CASS:** *Commercial Air Service Standards*
 - (i) **COA:** Certificate of Approval
 - (j) **COM:** Company Operations Manual
 - (k) **FAA:** Federal Aviation Administration
 - (l) **HMU:** Height Monitoring Unit
 - (m) **ICAO:** International Civil Aviation Organization
 - (n) **MASPS:** Minimum Aircraft System Performance Specifications
 - (o) **MCM:** Maintenance Control Manual
 - (p) **MEL:** Minimum Equipment Lists
 - (q) **MRBR:** Maintenance Review Board Report
 - (r) **NAA:** National Aviation Authority
 - (s) **NAARMO:** North American Approvals Registry and Monitoring Organization
 - (t) **NAT-MNPS:** North Atlantic Minimum Navigation Performance Specifications
 - (u) **OCM:** Operational Control Manual
 - (v) **OPI:** Office of Primary Interest
 - (w) **OPS SPEC:** Operations Specification
 - (x) **PIC:** Pilot-in-Command
 - (y) **POI:** Principle Operations Inspector

- (z) **PORD:** Private Operator Registration Document
- (aa) **RMA:** Regional Monitoring Agency
- (bb) **SA:** Special Authorization/Specific Approval
- (cc) **SB:** Service Bulletin
- (dd) **SLOP:** Strategic Lateral Offset Procedures
- (ee) **SOP:** Standard Operating Procedures
- (ff) **SSEC:** Static Source Error Correction
- (gg) **SSR:** Secondary Surveillance Radar
- (hh) **STC:** Supplemental Type Certificate
- (ii) **TC:** Type Certificate
- (jj) **TCAS:** Traffic Alert and Collision Avoidance System
- (kk) **TCCA:** Transport Canada Civil Aviation

3.0 Background

3.1 Application and structure of this Advisory Circular

- (1) This Advisory Circular (AC) provides guidance and the conditions for operators to obtain an authorization/approval to operate in Reduced Vertical Separation Minimum (RVSM) airspace.
- (2) The main body of the AC provides the guidance applicable to the operational, aircraft and airspace requirements for operation in RVSM airspace and the application and process requirements related to RVSM authorizations/approvals.
- (3) Appendix A of this AC are the conditions which Canadian air operators must meet to be authorized to operate in RVSM airspace. The conditions, when enabled by the applicable *Canadian Aviation Regulations* (CARs) will appear on the air operator's Specific Approval (SA) of their Air Operator Certificate (AOC).

Note: The conditions of Appendix A do not apply to Private Operators complying with section 604.56 of the CARs, as this regulation includes conditions of authorization.

- (4) Appendix B of this AC provides specific guidance to conditions in Appendix A. The specific guidance uses the same numbering for the conditions in Appendix A and those contained in section 604.56 of the CARs.

3.2 General

- (1) All Canadian airspace between FL 290 and FL 410 is designated as RVSM airspace. Operators subject to Part VII and subpart 604 of the CARs require a Special Authorization/Specific Approval (SA) from the State of Registry of the aircraft, or the State of the operator prior to operating within Canadian RVSM airspace.
- (2) All air operators and private operators intending to operate aircraft within RVSM airspace are required to be equipped with altimetry and height-keeping systems, which meet RVSM Minimum Aircraft System Performance Specifications (MASPS).

- (3) An aircraft may be delivered from the manufacturer configured/equipped for RVSM operations and is typically stated by the manufacturer in the aeroplane flight manual (AFM). Alternatively, an aircraft can be modified for RVSM operations by incorporating the provisions prescribed in a service bulletin (SB) or via a supplemental type certificate (STC).
- (4) The FAA AC 91-85() - Authorization of Aircraft and Operators for Flight in Reduced Vertical Separation Minimum Airspace was adopted by the International Civil Aviation Organization (ICAO) for use by all Member States (including Canada) in their authorization programs. Paragraphs 722.08(2)(d), 723.08(2)(d), 724.08(2)(d), and 725.08(2)(d) of the *Commercial Air Service Standards* (CASS) and section 604.56 of the CARs make specific reference to document ICAO/FAA Document 91-RVSM, as well as ICAO NAT DOC 001 for RVSM standards. These references have been updated; ICAO/FAA Document 91-RVSM is now FAA AC 91-85() and ICAO NAT DOC 007 has replaced ICAO NAT DOC 001 for the purposes of this AC. Forthcoming regulatory amendments to section 604.56 of the CARs will update these requirements.
- (5) The FAA Final Rule *The Use of Automatic Dependent Surveillance–Broadcast (ADS-B) Out in Support of Reduced Vertical Separation Minimum*, came into effect on January 22, 2019. This rule has eliminated the requirement for operators in the United States to apply for specific RVSM approvals when aircraft are equipped with qualified ADS-B Out systems and meet specific altitude-keeping equipment requirements for operations in RVSM airspace. ADS-B Out plays a crucial role in enhancing aircraft monitoring capabilities including position information and enables efficient tracking of an aircraft's altitude-keeping performance.
- (6) NAV CANADA had provided partial air traffic control services based on ADS-B transmitted information using ground-based receivers until March 2019 when it began using space-based ADS-B communication. The service initially covered the North Atlantic and Northern Canada regions but was progressively extended to other Canadian domestic airspace in 2022.
- (7) Effective August 10, 2023 NAV CANADA began implementing the Canadian ADS-B mandate for Class A airspace, which includes RVSM airspace.
- (8) It is intended that an RVSM approval by Transport Canada will apply to all RVSM airspace in other States. However, this does not necessarily provide approval to fly in that airspace if other conditions must be met (e.g., NAT-MNPS or Required Navigation Performance (RNP-10)). The pilot-in-command is responsible for the operation of the aircraft and must comply with the policies and procedures applicable to each area of operations.
- (9) Traffic Alert and Collision Avoidance System (TCAS) / Airborne Collision Avoidance System (ACAS) provisions for operating in RVSM airspace are found in Transport Canada Civil Aviation (TCCA) Advisory Circular (AC) 700-004.

4.0 RVSM approval process requirements

4.1 Information required for RVSM approval

- (1) The following information is required for each aircraft that is approved for RVSM operations. This information shall be forwarded by the TCCA POI to TCCA Commercial Flight Standards Branch where it will be added to the Canadian RVSM database. This database is distributed to all international monitoring agencies responsible for monitoring RVSM operations.
 - (a) State of Registry of the aircraft;
 - (b) Name of Operator (three letter ICAO designator, if applicable);

- (c) State of Operator;
- (d) ICAO Aircraft Type designation;
- (e) Aircraft model/series;
- (f) Manufacturer's serial/construction number;
- (g) Registration (Mark);
- (h) Aircraft mode S address code in hexadecimal format;
- (i) Date the RVSM capable aircraft received its certificate of approval (COA), or the date at which the airworthiness approval was issued for an aircraft that has completed a SB or STC (the date of issue of such approval should coincide with the date on which the modification was certified by the **operator** as being complete).

4.2 Operator requirements upon receipt of RVSM approval

- (1) Upon receipt of the SA for operations in RVSM airspace, the Air Operator Certificate (AOC) or Private Operator Registration Document (PORD) holder shall:
 - (a) ensure all aircraft with a RVSM SA are identified by Registration (mark) in the AOC or PORD and that only those operate in RVSM Airspace;
 - (b) maintain the currency of their RVSM SA by notifying TCCA in advance of all additions to, and removals from, their fleet of aircraft operating in RVSM airspace;
 - (c) maintain their aircraft in accordance with the operator's maintenance control system procedures and approved aircraft maintenance schedule to ensure in-service RVSM integrity;
 - (d) ensure the training program for personnel involved in the operator's maintenance control system includes initial and updated training on the operator's RVSM maintenance control system procedures.

4.3 Removal of RVSM approval

- (1) RVSM approved aircraft that are removed from the operator's AOC or PORD, or lose their RVSM approval for any reason, must be reported by the operator to the POI, and in turn to TCCA operator certification standards in order to maintain the accuracy of the RVSM database.

5.0 RVSM height monitoring program

- (1) Height monitoring ensures compliance with RVSM height-keeping performance system requirements crucial for maintaining the continued safe utilization of RVSM. Furthermore, it ensures that operators and their aircraft comply with the applicable RVSM requirements.
- (2) The North American Approvals Registry and Monitoring Organization (NAARMO) is the official RVSM Regional Monitoring Agency (RMA) supporting implementation and continued safe use of the North American RVSM airspace. Information on the responsibilities and procedures applicable to NAARMO can be accessed at:
https://www.faa.gov/air_traffic/separation_standards/naarmo/
- (3) There remain three Aircraft Geometric Height Measurement Element (AGHME) locations in North America: Atlantic City, Ottawa, and Lethbridge. Height monitoring information and procedures can

be found on the following website:

http://www.faa.gov/air_traffic/separation_standards/aghme/locations/

- (4) The United States terrestrial and Canada space-based implementation of ADS-B facilitates RVSM height-keeping performance monitoring since the aircraft's position is periodically broadcast through ADS-B Out, enabling the aircraft to be tracked. This will permit NAARMO to continue its role more effectively while being less reliant on the older AGHME technology. Consequently, it is planned that the Ottawa and Lethbridge AGHME sites will be decommissioned by January 24, 2024.
- (5) RVSM-authorized aircraft equipped and operating with ADS-B Out avionics that meet the performance requirements of Airworthiness Manual (AWM) 551.103 at an RVSM altitude where ADS-B height-monitoring is provided will be automatically height monitored.
- (6) All operators of aircraft approved to fly with a 1,000 ft. vertical separation in RVSM airspace are required to participate in the global RVSM height monitoring program. The number of aircraft that require monitoring depends on both the size of an operator's fleet, and the variety of aircraft types operated. It is important to note that monitoring requirements are operator and aircraft type specific. Evidence of previous height-keeping monitoring of an aircraft transfer to a new owner and may be used to meet the monitoring requirements. It is also critical to note that height-keeping monitoring events prior to the RVSM airworthiness approval being signed off will not be accepted by the monitoring agencies.
- (7) Aircraft which are constructed and maintained to the same Type Certificate (TC), STC, SB or TC amendment, and which are known to exhibit similar altimetry system error characteristics are categorized together in what is called an RVSM Monitoring Group. A summary of the RVSM Monitoring Groups is found in *RVSM Minimum Monitoring Requirements MMR Chart for North America, Appendix B - MMR Table 1 RVSM Monitoring Categories* at the following link https://www.faa.gov/air_traffic/separation_standards/naarmo/naarmo_documentation/
- (8) A height-keeping monitoring program is required prior to RVSM approval where:
 - (a) the RMA has insufficient data on the aircraft type, or
 - (b) for a new aircraft type produced by a manufacturer without a demonstrable track record of producing MASPS compliant airframes, or
 - (c) for an aircraft not included in *Appendix B - RVSM MINIMUM MONITORING REQUIREMENTS TABLES*, Table 1: MONITORING REQUIREMENTS TABLE (Civilian).
- (9) Typically, TCCA provides updated RVSM approvals to NAARMO on a bi-weekly basis.

6.0 Future disposition

- (1) TCCA is committed to maintaining a viable civil aviation transportation system, while not compromising safety. This AC will remain in effect for information purposes until further notice.

7.0 Information management

- (1) Not applicable.

8.0 Document history

- (1) Advisory Circular (AC) 700-039, **Issue 02**, RDIMS 15134375 (E), 15630328 (F), dated 2019-11-01 — Requirements to obtain Reduced Vertical Separation Minimum (RVSM) Special Authorization
- (2) AC 700-039, **Issue 01**, RDIMS 11726472 (E), 12027302 (F), dated 2017-11-24— Requirements to obtain Reduced Vertical Separation Minimum (RVSM) Special Authorization

9.0 Contact us

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Civil Aviation

Appendix A – Required conditions for Specific Approval to Canadian air operators to conduct operations in RVSM airspace

1.0 Authorization

- (1) Pursuant to paragraphs 702.08(f)(iii), 702.08(g)(xii), 703.08(f)(iii), 703.08(g)(x), 704.08(f)(iii), 704.08(g)(xi), 705.08(f)(iii) and 705.08(g)(xi) of the *Canadian Aviation Regulations* (CARs), no air operator shall authorize a pilot-in-command (PIC) to conduct a flight in reduced vertical separation minimum (RVSM) airspace and no PIC shall conduct a flight in RVSM airspace unless the following conditions have been met.

2.0 Training requirements

- (1) The air operator shall establish and maintain a ground and flight training program that is:
 - (a) Designed to ensure that each person who receives training acquires the competence to perform the person's assigned duties; and
 - (b) Approved by the Minister in accordance with the *Commercial Air Service Standards* (CASS).
- (2) The air operator's approved training program respecting operations in RVSM airspace shall comply with the applicable requirements specified in subsections 722.76(23), 723.98(31), 724.115(36), 725.124(53) of the CASS, as applicable to their operation.

3.0 Manual requirements

- (1) The air operator shall comply with the FAA AC 91-85() and meet the other applicable requirements of ICAO NAT DOC 007.
- (2) Air operators shall ensure that the requirements for operations in RVSM airspace stipulated above are contained in each of the following:
 - (a) Company operations manual (COM), including any constituent parts of the COM, pursuant to subsections 702.82(1) or 703.105(1) or 704.121(1) or 705.135(1) of the CARs as applicable to their operation;
 - (b) Standard operating procedures (SOPs), pursuant to subsections 702.84(1) or 703.107(1) or 704.124(1) or 705.138(1) of the CARs as applicable to their operation;
 - (c) Maintenance control manual (MCM), pursuant to subsection 706.08(1) of the CARs; and
 - (d) Minimum equipment list (MEL), pursuant to section 605.07 of the CARs.

Note: All operators with an approved MEL shall include RVSM compliant aircraft in their MEL.

4.0 Required procedures

4.1 General

- (1) The air operator shall establish procedures and provide guidance for flight crews and flight dispatchers (if applicable) respecting operations in RVSM airspace.

4.2 Flight planning and pre-flight procedures

- (1) The air operator shall establish procedures which require flight crews and flight dispatchers (if applicable) to verify conditions which may affect operation in RVSM airspace.

4.3 Procedures prior to entry into RVSM airspace

- (1) The air operator shall establish procedures which require flight crews to address equipment failure prior to entering RVSM airspace.
- (2) The air operator's procedures shall require flight crews to verify, prior to entering RVSM airspace, that the equipment listed below is fully serviceable and functioning normally:
 - (a) Two independent primary altitude measurement systems;
 - (b) One automatic altitude-control system;
 - (c) One Secondary Surveillance Radar (SSR) altitude reporting transponder; and
 - (d) One altitude-alerting device.

4.4 In-flight procedures

- (1) The operator shall establish in-flight procedures which require flight crews to:
 - (a) comply with applicable aircraft operating limitations related to RVSM airworthiness approval;
 - (b) conduct regular cross-checks between the primary altimeters and the stand-by altimeter;
 - (c) ensure that the altimetry system being used to control the aircraft is selected to provide the input to the altitude-reporting transponder transmitting information to air traffic control (ATC); and
 - (d) take appropriate measures to exit RVSM airspace in the event of equipment failure degrading or prohibiting RVSM operations.

4.5 Post flight

- (1) The operator shall establish post flight procedures which require flight crews to verify logbook entries against malfunctions in height-keeping systems.

4.6 RVSM height monitoring

- (1) The operator shall ensure implementation of initial and recurrent requirements for the height-keeping monitoring of its aircraft, as applicable.

5.0 Aircraft requirements

- (1) The air operator shall ensure that each aircraft that is operated in RVSM airspace is certified and complies with the airworthiness and performance requirements specified in FAA AC 91-85(), *Authorization of Aircraft and Operators for Flight in Reduced Vertical Separation Minimum (RVSM) Airspace*. The air operator shall ensure that all equipment required for operations in RVSM airspace is verified operational prior to entry into RVSM airspace.

5.1 Airworthiness maintenance

- (1) The air operator's approved aircraft maintenance schedule shall contain the RVSM specific maintenance practices and/or inspection requirements outlined in the applicable aircraft manufacturer's instructions for continued airworthiness (ICA) including the Maintenance Review Board Report (MRBR) where applicable, or STC for each aircraft type and include the following items:

- (a) Maintain all RVSM equipment in accordance with the component manufacturer's maintenance requirements and the performance requirements outlined in the approved data package;
 - (b) Maintain airframe and static systems in accordance with the airframe manufacturer's inspection standards and procedures or SB/STC, if applicable;
 - (c) The approved aircraft maintenance schedule shall contain inspection requirements for the autopilot to ensure continued accuracy and integrity of the automatic altitude control system to meet the height-keeping standards for RVSM operations.
- (2) The air operator's maintenance control system must contain procedures to ensure that:
 - (a) any modification, repair, or design change that in any way alters the initial RVSM approval will be subject to a design review by persons approved by the approving authority;
 - (b) any maintenance practices that may affect the continuing RVSM approval integrity will be referred to the approving authority or persons delegated by the authority;
 - (c) the technical dispatch of RVSM compliant and non-RVSM compliant aircraft are addressed.
- (3) The air operator's approved aircraft maintenance schedule shall contain the RVSM specific maintenance/inspection requirements outlined in the applicable aircraft manufacturer's ICA or STC for each aircraft type.
- (4) The air operator's approved aircraft maintenance schedule shall include the following items:
 - (a) Maintenance of all RVSM equipment in accordance with the component manufacturer's maintenance requirements and the performance requirements outlined in the approved data package;
 - (b) Modification, repair, or design change that in any way alters the initial RVSM approval subject to a design review by persons approved by the approving authority;
 - (c) Reference to any maintenance practices that may affect the continuing RVSM approval integrity to the approving authority or persons delegated by the authority;
 - (d) Maintenance of airframe and static systems in accordance with the airframe manufacturer's inspection standards and procedures or SB/STC, if applicable;
 - (e) The method the air operator will use to dispatch the aircraft to service following maintenance on an RVSM component/system or after the aircraft was determined to be non-RVSM compliant;
 - (f) The approved aircraft maintenance schedule shall contain inspection requirements for the autopilot to ensure continued accuracy and integrity of the automatic altitude control system to meet the height-keeping standards for RVSM operations.

Appendix B – Guidance for Appendix A conditions

Condition	Guidance
1.0 Authorization	<p>The regulatory basis to Commercial Air Operators for the Specific Approval (SA) to authorize the conditions in Appendix A are paragraphs 702.08(f)(i), 703.08(f)(i), 704.08(f)(i), and 705.08(f)(i) of the <i>Canadian Aviation Regulations</i> (CARs) as applicable to the air operator's Air Operator Certificate (AOC).</p> <p>The regulatory basis to private operators for the Special Authorization (SA) to authorize is subpart 604.56 of the CARs as applicable to the private operator's Private Operator Registration Document (PORD).</p>
2.0 Training requirements	<p>Subsections 702.76(1), 703.98(1), 704.115(1) and section 705.124 of the CARs require that the air operator shall establish and maintain a ground and flight training program.</p> <p>The operator seeking approval to operate in RVSM airspace is required to address RVSM training in their initial and recurrent training programs and develop a training program for flight crew and personnel involved in the operator's maintenance control system.</p> <p>The areas of RVSM operations and type of aircraft used will determine the training, checking and currency requirements.</p> <p>Ground training must cover the following as a minimum:</p> <ul style="list-style-type: none"> (a) the floor, ceiling and horizontal boundaries of RVSM airspace; (b) standard ATC phraseology regarding RVSM areas of operations; (c) the rules on the exclusion of non-RVSM-compliant aircraft from the airspace; (d) aircraft system failures that would prevent RVSM operation; (e) the procedures to be followed by flight crew members with respect to: <ul style="list-style-type: none"> (i) pre-flight and in-flight altimeter checks; (ii) use of the automatic altitude control system; (iii) items on the minimum equipment list; (iv) in-flight contingencies; (v) weather deviation procedures; (vi) track offset procedures for wake turbulence; (vii) inconsequential collision-avoidance systems alerts; and (viii) pilot level-off call.

	<ul style="list-style-type: none"> (f) crew members cross checking each other to ensure that ATC clearances are promptly and correctly complied with; (g) the problems of visual perception of other aircraft at 1,000 ft. (300 m) planned separation during night conditions, when encountering local phenomena such as northern lights, for opposite and same direction traffic, and during turns; (h) operating procedures and characteristics of the Traffic Alert and Collision Avoidance System (TCAS)/Airborne Collision Avoidance System (ACAS) in an RVSM environment; (i) the relationship between the altimetry, automatic altitude control, and transponder systems in normal and abnormal situations; (j) for operators authorized to conduct oceanic operations — use of Strategic Lateral Offset Procedures (SLOP) in oceanic airspace to mitigate the effect of wake turbulence and the effect of operational errors; (k) methodology for entering logbook entries that accurately describe any malfunction of RVSM required equipment.
3.0 Manual requirements	Subparagraphs 722.08(2)(d)(ii), 723.08(2)(d)(ii), 724.08(2)(d)(ii) and 725.08(2)(d)(ii) of the CASS require that the air operator shall comply with the FAA AC 91-85() and meet the other applicable requirements of ICAO NAT DOC 007.
4.0 Required procedures	<p>4.1 General</p> <ul style="list-style-type: none"> (1) Examples of procedures must include, but is not limited to the following: <ul style="list-style-type: none"> (a) Verify that the aircraft is approved for RVSM operations, and if required, ensure that the aircraft operating limitations are considered; (b) Annotate block 10 (equipment) of the ICAO flight plan to indicate that the aircraft and operator are authorized for RVSM operations; (c) Verify that the reported and forecast weather conditions on route of the flight are appropriate for RVSM flight; (d) Verify the minimum equipment requirements and associated MEL pertaining to height-keeping systems; and (e) Ensure crews/dispatchers are familiar with the procedures for flight of non-RVSM approved aircraft for maintenance, humanitarian and delivery flights. <p>4.2 Flight Planning and Pre-Flight Procedures</p> <ul style="list-style-type: none"> (1) Pre-flight procedures can include, but is not limited to the following: <ul style="list-style-type: none"> (a) Ensure that flight crews review appropriate logs and forms to ascertain the condition of the equipment

	<p>required for flight in RVSM airspace and that, if required, corrective maintenance action has been taken to ensure the minimum required equipment for RVSM operations is serviceable.</p> <p>(b) Flight crews conduct an external inspection of the aircraft to confirm condition of RVSM components, and at a minimum include:</p> <ul style="list-style-type: none"> (i) Static sources; (ii) Fuselage skin near each static source; and (iii) Any other component that affects altimetry system accuracy <p>(c) Aircraft altimeters are set to the local altimeter atmospheric pressure setting and display a known elevation within the limits specified in aircraft operating manuals.</p> <p>(d) The two primary altimeters agree within the limits specified in the aircraft operating manual.</p> <p>(e) Ensure that before takeoff, equipment required for flight in RVSM airspace is operational and indications of malfunction are resolved.</p>
4.3 RVSM height monitoring	<p>(1) Depending on the aircraft type, the initial requirement for the height-keeping monitoring can follow within six months of the initial RVSM approval.</p> <p>(2) Recurrent height monitoring is required every 24 months or 1,000 hours, whichever is longer.</p>
5.0 Aircraft requirements	<p>(1) The RVSM capability of an aircraft is stated by the manufacturer in the aeroplane flight manual (AFM) or as a supplement to the AFM.</p> <p>(2) Required RVSM equipment certified installation.</p> <p>(3) Two independent altitude measurement systems. Each system should be composed of the following elements:</p> <ul style="list-style-type: none"> (a) Cross-coupled static source/system, provided with ice protection if located in areas subject to ice accretion; (b) Equipment for measuring static pressure sensed by the static source, converting it to pressure altitude and displaying the pressure altitude to the flight crew; and (c) Equipment for providing a digitally coded signal corresponding to the displayed pressure altitude, for automatic altitude reporting purposes. <p>(4) One SSR altitude reporting transponder with switching capability to obtain input from either altitude measurement system.</p> <p>(5) For aircraft which an application for type certification or a major change in type design was on or before April 9, 1997, an altitude alert system with a nominal value not greater than ± 300 ft. (± 90 m). For all other aircraft which an application for</p>

	<p>type certification or a major change in type design was made after April 9, 1997, the altitude alert system's nominal value shall not be greater than ± 200 ft. (± 60 m). The overall equipment tolerance in implementing these nominal threshold values should not exceed ± 50 ft. (± 15 m).</p> <p>(6) An automatic altitude control system capable of operation from either of the two required independent altitude measurement systems.</p> <p>Altimetry</p> <p>(1) The aircraft altimetry system shall provide an output to the aircraft.</p> <p>(2) The altitude deviation warning system shall signal an alert when the altitude displayed to the flight crew deviates from the selected altitude by more than a nominal value.</p> <p>(3) At a minimum, a single automatic altitude control system shall be installed which can control aircraft height within a tolerance band of ± 65 ft. (± 20 m) about the acquired altitude when the aircraft is operated in straight and level flight under non-turbulent, non-gusty conditions. The automatic altitude control system shall be verified analytically in so that that the predicted rate of occurrence of undetected altimetry system failures does not exceed 1×10^{-5} per flight hour.</p> <p>(4) Where an altitude select/acquire function is provided, the altitude select/acquire control panel must be configured such that an error of no more than ± 25 ft. (± 8 m) exists between the display selected by the flight crew and the corresponding output to the control system.</p>
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