REPUBLICA DE CABO VERDE

AGÊNCIA DE AVIAÇÃO CIVIL

CIVIL AVIATION AUTHORITY

Instruction Nº 03/DSV/2015

SUBJECT: RVSM APPROVAL PROCESS

DATE: 24/07/2015

1. PURPOSE

This instruction is intended to establish procedures to be used in the approval of aircraft and operators to conduct flight in airspace or on routes where Reduced Vertical Separation Minimum (RVSM) is applied.

2. APLICABILITY

This instruction applies to all operators with Cape Verde registered and/or foreign registered aircraft and aircraft intending to operate in airspace where an approval to conduct RVSM operations is required (airspace at FL between 290 and 410 inclusive, where a 1000 ft vertical separation minimum is applied)

3. REFERENCE

CV-CAR 5, 7, 8, 9.

4. DEFINITIONS AND ABBREVIATION

4.1.1 For the purpose of this instruction the following abbreviation shall apply:

(1) **Aberrant aircraft.** Those aircraft which exhibit measured height-keeping performance that is significantly different from the core height-keeping performance measured for the whole population of aircraft operating in RVSM airspace *(See non-compliant aircraft definition).*

(2) **Aircraft type groupings**. Aircraft are considered to belong to the same group if they are designed and assembled by one manufacturer and are of nominally identical design and build with respect to all details which could influence the accuracy of height-keeping performance.

(3) **Airworthiness approval.** The process of assuring the State authority that aircraft meet RVSM MASPS. Typically, this would involve an operator meeting the requirements of the aircraft manufacturer service bulletin for that aircraft and having the State authority verify the successful completion of that work.

(4) **Altimetry system error (ASE).** The difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure.

(5) **Altimetry system error stability**. Altimetry system error for an individual aircraft is considered to be stable if the statistical distribution of altimetry system error is within agreed limits over an agreed period of time.

(6) **Altitude-keeping device**. Any equipment which is designed to automatically control the aircraft to a referenced pressure altitude.

(7) **Assigned altitude deviation (AAD)**. The difference between the transponded Mode C altitude and the assigned altitude/flight level.

(8) **Automatic altitude-keeping device**. Any equipment which is designed to automatically control the aircraft to a referenced pressure-altitude.

(9) **Collision risk.** The expected number of mid-air aircraft accidents in a prescribed volume of airspace for a specific number of flight hours due to loss of planned separation.
Note.— One collision is considered to produce two accidents.

(10) **Flight technical error (FTE).** The difference between the altitude indicated by the altimeter display being used to control the aircraft and the assigned altitude/flight level.

(11) **Height-keeping capability**. The aircraft height-keeping performance that can be expected under nominal environmental operating conditions with proper aircraft operating practices and maintenance.

(12) **Height-keeping performance.** The observed performance of an aircraft with respect to adherence to cleared flight level.

(13) **Non-compliant aircraft**. An aircraft configured to comply with the requirements of RVSM MASPS which, through height monitoring, is found to have a total vertical error (TVE) or an assigned altitude deviation (AAD) of 90 m (300 ft) or greater or an altimetry system error (ASE) of 75 m (245 ft) or more.

(14) **NOTAM.** A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

(15) **Occupancy**. A parameter of the collision risk model which is twice the count of aircraft proximate pairs in a single dimension divided by the total number of aircraft flying the candidate paths in the same time interval.

(16) **Operational error**. Any vertical deviation of an aircraft from the correct flight level as a result of incorrect action by ATC or the aircraft crew.

(17) **Overall risk**. The risk of collision due to all causes, which includes the technical risk (see definition) and all risk due to operational errors and in-flight contingencies.

(18) **Passing frequency**. The frequency of events in which two aircraft are in longitudinal overlap when travelling in the opposite or same direction on the same route at adjacent flight levels and at the planned vertical separation.

(19) **RVSM approval**. The term used to describe the successful completion of airworthiness approval and operational approval (if required).

(20) **Target level of safety (TLS)**. A generic term representing the level of risk which is considered acceptable in particular circumstances.

(21) **Technical risk**. The risk of collision associated with aircraft height-keeping performance.

(22) **Total vertical error (TVE).** The vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

(23) **Track**. The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

(24) **Vertical separation**. The spacing provided between aircraft in the vertical plane to avoid collision.

(25) **Vertical separation minimum (VSM)**. VSM is documented in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) as being a nominal 300 m (1 000 ft) below FL 290 and 600 m (2 000 ft) above FL 290 except where, on the basis of regional agreement, a value of less than 600 m (2 000 ft) but not less than 300 m (1 000 ft) is prescribed for use by aircraft operating above FL 290 within designated portions of the airspace.

4.1.2 The following acronyms and abbreviations are used in this instruction:

(1) AAD – Assigned Altitude Deviation;

(2) ACAS – Airborne collision avoidance system;

(3) AC – Advisory Circular;

(4) AOC – Air Operator Certificate;

(5) ASE – Altimetry Systems Error;

(6) ASI – Aviation Safety Inspector;

(7) AVE – Avionics Error;

(8) BITE – Built In Test Equipment;

(9) CFL – Cruising Flight Level;

(10) CV-CAR– Cabo Verde Civil Aviation Regulations;

(11) FAC - Formal Application Checklist;

(12) FSD – Flight Safety Directorate;

(13) GMU – GPS Monitoring Unit;

(14) HMU – Height Monitoring Unit;

(15) ICAO – International Civil Aviation Organization;

(16) LOA – Letter of Authorization;

(17) MASPS – Minimum Aircraft System Performance Specifications;

(18) MEL – Minimum Equipment List;

(19) MMEL – Master Minimum Equipment List;

(20) Ops Specs – Operations Specifications;

(21) PASI – Pre-Application Statement of Intent;

(22) RVSM – Reduced Vertical Separation Minima;

(23) SSEC – Static Source Error Correction;

(24) STC – Supplemental Type Certification;

(25) TC – Type Certificate;

(26) TVE – Total Vertical Error;

(27) VSM – Vertical Separation Minimum;

(28) w/δ – Aircraft weight, W, divided by the atmospheric pressure ratio, δ.

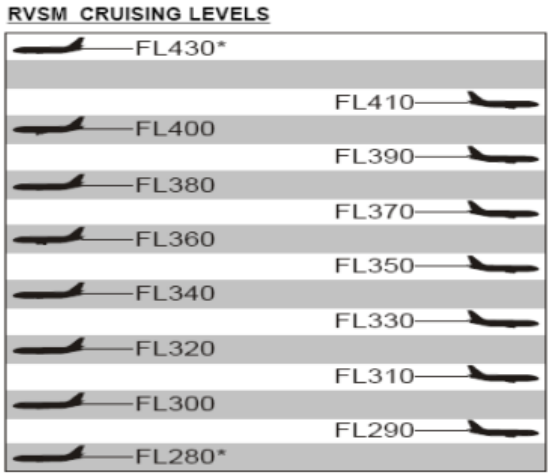
5. BACKGROUND

5.1.1 In the mid-1970s, the series of world fuel shortages and the resultant rapid escalation of fuel costs, allied to the growing demand for a more efficient use of the available airspace, emphasized the need for a detailed appraisal of the proposal to reduce the VSM above FL 290. The International Civil Aviation Organization (ICAO) initiated a comprehensive project of studies to examine the feasibility of reducing the Vertical Separation Minimum (VSM) applied above FL 290 from 2000 ft to 1000 ft.

5.1.2 Studies demonstrated that RVSM is safe, feasible and provides significant benefits in terms of economy and en route airspace capacity.

5.1.3 RVSM is the generic term for a reduction in vertical separation from 2000 ft to 1000 ft that can be applied to approved operators of approved aircraft operating between FL 290 and FL 410 inclusive. RVSM operations are mandated in the upper airspace of the Shannon FIR/UIR, NOTA and SOTA. RVSM airspace in the adjacent North Atlantic (NAT) region covers the same flight levels as in the EUR RVSM area. With the exception of State aircraft, non-RVSM Approved aircraft are not permitted to operate within the EUR RVSM airspace which includes the Shannon FIR/UIR, NOTA and SOTA,

5.1.4 The requirements for RVSM are published in the ICAO Regional Supplementary Procedures (Doc 7030 -EUR), Doc 9574 — Manual on Implementation of a 300 M (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive and Procedures for Air Navigation Services Air traffic Management (PANS ATM Doc 4444) plus this AAC directive.



5.1.5 Operators acquiring the operations specification “RVSM” must be in compliance with the requirements concerning Airworthiness, Operational Procedures and Training of all involved personnel. The Approval-Process includes the adoption of all parts of the Operations Manual System in the respective Chapters as well as the amendment of affected Maintenance Documentation, procedures and tasks.

6. BASIC REQUIREMENTS

6.1.1 No person shall operate Cape-Verde registered aircraft in airspace designated as Reduced Vertical Separation Minimum (RVSM) airspace unless:

(1) The operator and the operator's aircraft comply with the applicable requirements of the CV-CAR;

(2) The operator is authorised by AAC to perform RVSM operations; and

(3) The Operations Specifications are endorsed by the AAC, which authorizes the operator to conduct RVSM operations.

6.1.2 Airspace where RVSM is applied shall be considered special qualification airspace:

(1) The specific aircraft type or types that the operator intends to use is approved by the AAC before the operator conducts flight in RVSM airspace;

(2) Additionally, where operations in specified airspace require approval in accordance with an ICAO Regional Navigation Agreement, an operational approval is needed;

(3) The AAC must record, retain and maintain a description of each aircraft and operator approved to conduct flight in RVSM Airspace.

6.1.3 The operator has to ensure that all Parts of the Operations Manual System are revised to be compliant with the requirements relevant for RVSM-Operations. All Airworthiness requirements must be fulfilled.
The following subjects must be covered:

(1) Evidence of the certification status of the affected aircraft has to be provided to AAC. (AFM/ Supplement). Stating that the aircraft has a vertical navigation performance capability

compliant with the criteria of the RVSM Minimum Aircraft Systems Performance Specification (MASPS);

(2) Standard Operating Procedures (OM-B) as well as the Training Programmes (OM-D) must be defined and implemented in the OM-System;

(3) Regional specific operational procedures and information must be implemented (OM-C);

(4) Occurrence Reporting Procedures have to be established and described accordingly (OM-A);

(5) Procedures in respect of continued airworthiness (maintenance and repair) practices and programmes must be implemented

6.1.4 Each aircraft type that an operator intends to use in RVSM airspace must have received RVSM airworthiness approval from the aircraft certificating authority prior to approval being granted for RVSM operations, including the approval of continued airworthiness programs.

6.1.5 Adequate maintenance facilities are required to enable compliance with RVSM maintenance procedures:

(1) Each operator requesting RVSM operational approval must establish RVSM maintenance and inspection practices acceptable to the AAC that include any required maintenance specified in the data package;

(2) Operators of aircraft subject to a continuous airworthiness maintenance program must incorporate these practices in their program.

7. APPROVAL PROCESS

7.1 Certification Process

7.1.1 Airspace where RVSM is applied should be considered special qualification airspace. Both the individual aircraft and the specific aircraft type or types that the operator intends to use will need to be approved by AAC before the operator conducts flights in RVSM airspace. Requirements of the CV-CAR shall be complied with for the approval of specific aircraft type or types and for airworthiness and operational approval.

7.1.2 Approval will encompass the following elements:

(1) Airworthiness aspects (including continued airworthiness);

(2) Operational requirements;

(3) Provision for height monitoring of operator's aircraft

7.1.3 On satisfactory compliance with the requirements given in the CV-CAR, the operator shall be given provisional approval for the specific aircraft. Approval may be regularized after the aircraft meets the Height Monitoring Performance using HMU/ GMU.

7.1.4 Prior to operating a civil aircraft of Cape Verde registry in RVSM airspace, aircraft operator(s) must first:

(1) Satisfactorily complete a certification process;

(2) Obtain an approval document for the specific aircraft or fleet from the AAC

7.1.5 The certification process is designed to ensure that prospective operators understand and are capable of fulfilling this duty. There are five (5) phases in the RVSM certification process.:

(1) Pre-Application;

(2) Formal Application;

(3) Document Evaluation;

(4) Demonstration and Inspection;

(5) Certification Actions.

7.1.6 Pre-application phase

(1) This is the period of time before the formal application is submitted, when the applicant is developing the documentation and discussing the minimum requirements with the AAC inspector personnel.

(2) As far in advance as possible of an anticipated start of operations, a prospective operator should contact the nearest AAC and inform the AAC of its intent to apply for an RVSM approval. Usually the initial contact is by telephone, fax or a letter of intent;

(3) The AAC will schedule a pre-application meeting, where the AAC inspectors will discuss AAC's requirements and expectations in regard to approval to operate in an RVSM environment. The content of the Operator's RVSM application, AAC review and evaluation of the application, validation flight requirements, and conditions for removal of RVSM approval shall be basic items of discussion.

(4) The AAC will designate one certification team member as the Project Manager (PM). The PM is the official AAC spokesperson throughout the certification project.

(5) The applicant will be required to submit, the AAC form FS.AER.43 RVSM application and required attachments for the RVSM package, in accordance with the Annex A of this directive.

(6) It is recommended that the formal application is submitted at least 90 days before RVSM operations are expected to begin, although the application should be submitted to the AAC Authority as far in advance of the proposed start-up date as possible.

7.1.7 Formal Application

(1) This is the period of time immediately following the applicant's submission of the complete formal application.

(2) The AAC will review the application to determine that it contains the required information and attachments. If there are omissions or errors, the formal application and all attachments will be returned with a letter outlining the reasons for its return. If the operator has a good understanding of the requirements, the formal application should be of sufficient quality to allow any omission, deficiency, or open question to be resolved during the formal application meeting.

7.1.8 Document Evaluation

(1) After the formal application has been accepted, inspectors will begin a thorough evaluation of all the manuals and documents that are required by regulation to be submitted to the AAC. The AAC Authority will endeavour to complete these evaluations of the package required in Annex D.

(2) If the content of the application is insufficient, AAC will ask for additional information from the Operator. When all the airworthiness and operational requirements of the application are met, AAC will proceed with the approval process.

(3) The AAC:

(a) May evaluate a training course prior to accepting a training certificate;

(b) May accept a statement in the Operator's application that the Operator will ensure that its pilots will be knowledgeable on RVSM procedures contained in Annex D; or

(c) May accept a statement by the Operator that it has or will conduct an in-house training program. Practices and procedures in the following areas shall be standardized using the guidelines of Annex D:

(i) Flight planning;

(ii) Pre-flight procedures at the aircraft for each flight;

(iii) Procedures prior to RVSM airspace entry;

(iv) In-flight procedures; and

(v) Flight crew training procedures.

(d) This phase is considered complete when all submitted documents have been

(e) Evaluated;

(f) Found to be acceptable for use in aviation; and

7.1.9 Demonstration and Inspection

(1) CV-CARs require an operator to demonstrate its ability to comply with regulations and safe operating practices before beginning actual operations.

(2) This is the period of time that the AAC conducts a series of inspections to determine that applicant's organization and personnel are qualified to conduct RVSM operations.

(3) The applicant's aircraft, support organizations and training will receive close scrutiny as they meet the requirements that will qualify them for the RVSM operations

(4) When all other airworthiness and operational requirements of the application are met, the AAC will authorize validation flight(s).

7.1.9.2Validation Flight (s)

(1) The final step of the approval process will be the completion of a validation flights. AAC Inspectors (Operations) may accompany the Operator on a flight through airspace where RVSM is applied to verify that operations and maintenance procedures and practices are applied effectively. The AAC will establish the required number of satisfactory validation flights to be conducted by the operator. These flights may be conducted in conjunction with the verification/monitoring program

(2) The AOC applicant must be found to have adopted RVSM operating policies and procedures for pilots and, if applicable, flight dispatchers

(3) The inspector must verify that each pilot has adequate knowledge of RVSM requirements, policies, and procedures.

7.1.10 Certification Actions

(1) This is the period of time that the AAC completes the necessary documentation to formalize the approval of the applicant to conduct RVSM operations in specific aircraft type(s).

(2) RVSM operational approval will only be issued if the RVSM airworthiness approval is in force. The approval will take the form of a certificate and will identify the Operator, each individual aircraft the approval covers, and any conditions on the approval (e.g. height monitoring program to be completed within a specified time of the approval being issued).

(3) That approval will be in the form of:

(a) For general aviation operators; an LOA valid for a period of 24 months; and

(b) For AOC holders, a revision to the:

(i) Master (formal) ops specs; and

(ii) Aircraft Display Ops Specs (for each type of aircraft).

7.2 RVSM Airworthiness Approval Requirements

7.2.1 Each aircraft that an Capeverdian Operator intends to use in RVSM airspace must have an RVSM airworthiness approval before an RVSM operational approval can be granted by AAC:

(1) Aircraft Systems and Equipment minimum requirement is:

(a) Two independent altitude measurement systems;

(b) One Secondary Surveillance Radar (SSR) altitude reporting transponder. If only one is fitted, it shall have the capability for switching to operate from either altitude measurement system;

(c) An altitude alert system;

(d) An automatic altitude control system;

(2) Maintenance practises:

(a) The maintenance and inspection program for the autopilot will need to ensure continued accuracy and integrity of the automatic altitude control system to meet the height keeping standards for RVSM operations. This requirement will typically be satisfied with equipment inspections and serviceability checks;

(b) Whenever the performance of installed equipment has been demonstrated to be satisfactory for RVSM approval, the associated maintenance practices will be verified to be consistent with continued RVSM approval;

(c) Maintenance procedures should provide that aircraft identified as exhibiting height keeping performance errors that require investigation should not be operated in RVSM airspace until the following actions have been taken:

(i) The failure or malfunction is confirmed and isolated; and,

(ii) Corrective action is taken as necessary and verified to support RVSM approval;

(d) Evaluate maintenance training as additional instruction may be necessary to support RVSM approval. Areas that may need to be highlighted for initial and recurrent training of relevant personnel are:

(i) Aircraft geometric inspection techniques;

(ii) Test equipment calibration and use of that equipment;

(iii) Any special instructions or procedures introduced for RVSM approval;

(e) Test equipment should have the capability to demonstrate continuing compliance with all the parameters established in the data package for RVSM approval or as approved by the responsible authority. Test equipment should be calibrated at periodic intervals using reference standards whose calibration is certified as being traceable to national standards acceptable to the AAC.

(3) Maintenance Program: The application for authorization to operate within RVSM airspace must include an approved RVSM maintenance program which must include the following:

(a) Manufacturer recommended or other approved frequencies for, maintenance, preventative maintenance, and Inspection;

(b) Identification of components considered to be RVSM critical, and identification of structural areas noted as RVSM critical areas;

(c) The name or title of the responsible person who will ensure that the aircraft is maintained in accordance with BASR requirements;

(d) The method the operator will use to ensure that all personnel performing maintenance on the RVSM system are properly trained, qualified, and knowledgeable of that specific system;

(e) The method the operator will use to notify the crew if the aircraft has been restricted from RVSM but is airworthy for an intended flight;

(f) The method the operator will use to ensure conformance to the RVSM maintenance standards, including the use of calibrated and appropriate test equipment and a quality

assurance program for ensuring continuing accuracy and reliability of test equipment, especially when outsourced.

(g) The method the operator will use to verify that components and parts are eligible for installation in the RVSM system, as well as to prevent ineligible components or parts from being installed.

(h) The method the operator will use to return an aircraft to service after maintenance has been performed on an RVSM component/system or after the aircraft was determined to be non-compliant.

(i) Periodic inspections, functional flight tests, and maintenance and inspection procedures with acceptable maintenance practices for ensuring continued compliance with the RVSM aircraft requirements.

(j) These elements may be listed in detail or described by reference to an acceptable program that is identified and controlled by revision or issue number.

(k) The need for functional flight tests may be only be required for repairs or modifications that are deemed to warrant such testing and may be accomplished through monitoring height-keeping performance.

(l) The maintenance requirements listed in Instructions for Continued Airworthiness (ICA) associated with any RVSM associated component or modification.

(4) Maintenance Documents: Following documents are required along with application:

(a) Aircraft Flight Manual including all the supplements and amendments;

(b) Maintenance Manuals;

(c) Structural Repair Manuals: proper maintenance of airframe geometry for proper surface contours and the mitigation of altimetry system error, surface measurements or skin waviness checks will need to be made, as specified by the aircraft manufacturer, to ensure adherence to RVSM tolerances;

(d) Standards Practices Manuals;

(e) Illustrated Parts Catalogues: Illustrated parts catalogs must contain references for all equipment in the aircraft that relates to RVSM requirements;

(f) Maintenance Schedule;

(g) MEL: The MEL must incorporate RVSM required changes stated in MMEL approved by the State of Original Manufacture;

(h) Maintenance Control Manuals;

(i) Equipment Lists/Wiring Diagram Manuals;

(j) RVSM approval data package.

(5) Maintenance Training Requirements; the operator shall submit training curriculums and other appropriate material to the AAC to show that the airworthiness standards, practices,

procedures and training items related to RVSM operations are incorporated in initial and, where warranted, in the recurrent training program.

(6) Quality assurance: The operator shall submit Quality assurance programs which includes provisions to periodically audit maintenance service providers, calibration facilities and the procedures for controlling operators errors and unusul environmental conditions tha may affect calibration accuracy.

(7) RVSM approval data package: Following shall make up the RVSM approval data package:

(a) Performance and analytical data;

(b) Service Bulletin(s) or equivalent;

(c) The approved amendment or supplement to the AFM;

(d) Compliance Procedures;

(e) Operating Restrictions;

(f) Continued airworthiness instructions (Annex C)

7.3 RVSM Airworthiness Approval Process

7.3.1 Obtaining RVSM airworthiness approval is a two- stage process, which may involve more than one Authority

(1) In the case of a newly built aircraft:

(a) The aircraft design approved organization develops and submits the performance and analytical data that supports the RVSM airworthiness approval of a defined build standard;

(b) The data will be supplemented with maintenance and repair manuals giving associated continued airworthiness instructions;

(c) Compliance with RVSM criteria will be stated in the Aircraft Flight Manual (AFM) including reference to the applicable build standard, related conditions and limitations;

(d) Approval by the responsible Authority, or Validation of that approval by other authorities.

(2) In the case of an aircraft already in service:

(a) The aircraft constructor (or an approved design organization), submits to the responsible Authority, either to the state of manufacture or the state to the state of design, or the state in which the aircraft is registered(as appropriate), the performance and analytical data that supports RVSM airworthiness approval of a defined build standard;

(b) The data will be supplemented with a Service Bulletin, or its equivalent, that identifies the work to be done to achieve the build standard, continued airworthiness instructions;

(c) An amendment to the AFM stating related conditions and limitations;

(d) Approval by the responsible Authority.

7.3.2 Operator shall apply on prescribed form for airworthiness approval of specific aircraft. All necessary data as mentioned below shall be submitted to the Authority for necessary review. The approved data package shall be used by the Operator to demonstrate compliance with RVSM performance standards. The application will need to be supported by evidence confirming that:

(1) The performance and analytical data is available;

(2) Where necessary, modified in accordance with applicable Service Bulletins;

(3) It is of a type and build standard that meets the RVSM airworthiness criteria;

(4) The approved AFM amendment or supplement has been incorporated;

(5) The specific aircraft has been inspected and approved by the responsible Authority;

(6) The continued airworthiness instructions are available.

7.3.3 Post-Approval Modification: Any variation/modification from the initial installation that affects RVSM approval shall require clearance by the airframe manufacturer or approved design organization and be acceptable to AAC to show that RVSM compliance has not been impaired.

7.3.4 An operating history of the aircraft to be used should be included in the application to show any events or incidents related to poor height-keeping performance that may indicate weaknesses in training, procedures, maintenance or the aircraft group of intended use.

7.3.5 Continued Airworthiness: Refer to Annex C

7.4 RVSM Operational Approval

7.4.1 Each aircraft must have received an RVSM airworthiness approval before it will be listed on an Operator's RVSM operational approval.

7.4.2 RVSM Operational Approval: This approval covers not only the Operator but also each individual aircraft group and each individual aircraft to be used by the Operator in RVSM operations. Operational Approval pertains to guidance on the operational procedures and programs, which an Operator shall adopt for RVSM operation.

7.4.3 Aircraft operations manuals and checklists should be revised to include information and guidance on standard operating procedures (SOP) applicable to conducting flight in RVSM airspace including TCAS considerations in:

(1) Level flight; and

(2) Climbing; or

(3) Descending

7.4.4 Manuals should also include a statement of the airspeeds, altitudes and weights considered in RVSM aircraft approval to include identification of any operating restrictions established for that aircraft group.

(1) For example, an aircraft is restricted from conducting RVSM operations in areas of the full RVSM envelope where the value of mean ASE exceeds 120 ft. (37 m) and/or the absolute value of mean ASE plus three standard deviations of ASE exceed 245 ft. (75 m).
(2) When such a restriction is established, it should be identified in the data package and documented in appropriate aircraft operating manuals; however, visual or aural warning/indication systems are not be required to be installed on the aircraft.

7.4.5 Practices and procedures should be standardized using the guidelines described in the appendices to this AC for each of the following:

(1) Flight planning,

(2) Aircraft pre-flight procedures for each flight,

(3) Procedures prior to RVSM airspace entry;

(4) In-flight procedures; and

(5) Contingencies.

7.4.6 AAC shall ensure that each Operator can demonstrate that the Operator's aircraft can maintain high levels of height-keeping performance. Flight crew training, Operations manuals and operational programs will be evaluated for adequacy by AAC Inspectors. Approval will be granted for individual Operators.

7.4.7 Content/Attachments of Operator RVSM Application: An Operator applying (on prescribed form) for RVSM approval shall provide to AAC the following for review and evaluation at least 60 days prior to the intended start of RVSM operations.

(1) Description of Aircraft Equipment;

(2) Airworthiness Approval documents;

(3) Operations Manuals and Checklists;

(4) Past Performance;

(5) Minimum Equipment List;

(6) Maintenance Program;

(7) Training Programs and Operating Practices/ Procedures

8. PLAN FOR PARTICIPATION IN VERIFICATIONS/MONITORING PROGRAMS

The Operator shall provide a plan for participation in the verification or monitoring program. This program shall normally entail a check of at least a portion of the Operator's aircraft by an independent height-monitoring system (Refer to Annex F for this programme)

9. OCCURRENCES REPORTING AND CONDITIONS FOR SUSPENSION or REVOCATION OF RVSM APPROVAL

9.1 Occurrences reporting

9.1.1 The incidence of height-keeping errors, which can be tolerated in an RVSM environment, is very small.

9.1.2 Each operator is expected to take immediate action to rectify conditions that cause an altitude keeping error.

9.1.3 The operator must report an occurrence involving poor height keeping to the AAC within 72 hours with initial analysis of causal factors and measures to prevent further events. AAC will determine the requirement for follow-up reports.

9.1.4 Following errors caused by either malfunction of aircraft equipment and/or operational errors shall be reported and investigated:

(1) Total vertical error (TVE) equal to or greater than ±90 m (±300 ft.);

(2) Altimetry System Error (ASE) equal to or greater than ±75 m (±245 ft.); and

(3) Assigned Altitude Deviation (AAD) equal to or greater than ±90 m (±300 ft).

9.2 Conditions for suspension or revocation of RVSM approval

9.2.1 The Operator shall make an effective, timely response to each height-keeping error.

9.2.2 AAC may consider suspending or revoking the Operator's RVSM approval if the Operator's response to a height-keeping error is unsatisfactory.

9.2.3 The AAC will consider the operator's past performance in determining the action to be taken. If an operator shows a history of operational and/or airworthiness errors, then approval may be removed until the root causes of these errors are shown to be

(1) Corrected,

(2) Eliminated; and

(3) RVSM program and procedures are restored to an effective status.

9.2.4 An operator that experiences repeated altitude keeping errors should have approval for RVSM operations suspended or revoked until the required reliability can be achieved.

9.2.5 If a problem is identified which is related to a specific aircraft type, then RVSM approval may be suspended or revoked for that specific type within that operator's fleet.

9.2.6 In order to maintain RVSM approval, the operator must satisfy the AAC that the causes of height keeping errors are understood, are consistently monitored and addressed, and that the operator's RVSM programs and procedures are effective.

9.2.7 At its discretion and to restore confidence, the AAC may require an independent height monitoring check of affected aircraft be performed.

9.2.8 Following any rectification work, the operator would again be expected to demonstrate compliance with the RVSM MASPS by ensuring that the subject aircraft has been monitored by an independent height monitoring system at the earliest opportunity.

João dos Reis Monteiro
President of the Board

ANNEX A - CONTENTS OF THE DATA PACKAGE

The combination of performance and analytical data, Service Bulletin(s) or equivalent, continued airworthiness instructions, and the approved amendment or supplement to the AFM is known as the RVSM approval data package.

1. Scope

As a minimum, the data package shall consist of the following:

a) A definition of the aircraft group or non-group aircraft to which the data package applies;
b) A definition of the flight envelope(s) applicable to the subject aircraft;
c) The data needed to show compliance with the requirements;
d) The compliance procedures to be used to ensure that all aircraft submitted for airworthiness approval meet RVSM requirements; and
e) The engineering data to be used to ensure continued in- service RVSM approval integrity.

2. Aircraft Group

For aircraft to be considered as members of a group for purposes of RVSM approval, they shall satisfy all of the following conditions:

a) Aircraft shall have been manufactured to a nominally identical design and be approved by the same Type Certificate (TC), TC amendment, or Supplemental TC, as applicable;

b) The static system of each aircraft shall be installed in a nominally identical manner and position. The same SSE corrections shall be incorporated in all aircraft of the group;

c) The avionics units installed on each aircraft to meet the minimum RVSM equipment requirements shall be manufactured to the manufacturer's specification and have the same part number; and

d) The RVSM data package shall have been produced or provided by the airframe manufacturer or design organization.

Note 1: *For derivative aircraft it may be possible to utilize the database from the parent configuration to minimize the amount of additional data required to show compliance. The extent of additional data required will depend on the nature of the changes between the parent aircraft and the derivative aircraft.*

Note 2: *Aircraft, which have avionics units that are of a different manufacturer or part number, may be considered part of the group, if it is demonstrated that this standard of avionics equipment provides equivalent system performance.*

3. Non-Group Aircraft

If an airframe does not meet the conditions to qualify as a member of a group or is presented as an individual airframe for approval, then it must be considered as a non-group aircraft for the purposes of RVSM approval.

4. Flight Envelopes

The RVSM flight envelope is defined as the Mach number, W/ δ (Aircraft weight, W, divided by the atmospheric pressure ratio, δ), and altitude ranges over which an aircraft can be operated in cruising flight within the RVSM airspace. The RVSM operational flight envelope for any aircraft may be divided into two zones as defined below:

a) Full RVSM Envelope

The Full RVSM Envelope shall comprise the entire range of operational Mach number and altitude values over which the aircraft can be operated within RVSM airspace. Parameters that shall be considered are:

	Lower Boundary is Identified by	**Upper Boundary is defined by**
Altitude	FL 290	The lower of the following: • FL 410 • Aircraft maximum certified altitude • Altitude limited by cruise thrust, buffet, other aircraft flight limitations
Mach or Airspeed	The lower of the following: • Maximum endurance (holding) speed • Maneuver Speed	MMO/VMO • Speed limited by cruise thrust, buffet, other aircraft flight limitations
Gross Weight	• The lowest gross weight compatible with operation in RVSM airspace	• The highest gross weight compatible with operation in RVSM airspace

b) Basic RVSM Envelope

i) The boundaries for the Basic RVSM Envelope are the same as those for the Full RVSM Envelope except in regard to the upper Mach boundary.

ii) For the Basic RVSM Envelope, the upper Mach boundary may be limited to a range of airspeeds over which the aircraft group can reasonably be expected to operate most frequently. The manufacturer or design organization shall declare this boundary for each aircraft group. The boundary may be defined as equal to the upper Mach/airspeed boundary defined for the Full RVSM Envelope or a specified lower value. This lower value shall not be less than the Long Range Cruise Mach Number plus 0.04 Mach, unless limited by available cruise thrust, buffet, or other aircraft flight limitations. Note: Long Range Cruise Mach number is the Mach for 99% of best fuel mileage at the particular W/delta under consideration.

5. Data Package Requirements

The data package shall contain data sufficient to substantiate that the accuracy standards are met.

a) General

i. **ASE will generally vary with flight condition**. The data package shall provide coverage of the RVSM envelope sufficient to define the largest errors in the basic and full RVSM envelopes. Note that in the case of group approval the worst flight condition may be different for each of the requirements and each shall be evaluated.

ii. Where precision flight calibrations are used to quantify or verify altimetry system performance they may be accomplished by any of the following methods. Flight calibrations shall only be performed once appropriate ground checks have been completed. Uncertainties in application of the method must be assessed and taken into account in the data package. The methods are:

- Precision tracking radar in conjunction with pressure calibration of atmosphere at test altitude;
- Trailing cone;
- Pacer aircraft; or
- Any other method acceptable to AAC.

b) **Altimetry System Error Budget:** It is implicit, for group approvals and for non-group approvals that a trade may be made between the various error sources, which contribute to ASE. Separate limits are not specified for the various error sources, which contribute to the mean and variable components of ASE as long as the overall ASE accuracy requirements are met. In all cases the trade-off adopted shall be presented in the data package in the form of an error budget, which includes all significant error sources.

c) **Avionics:** Avionics equipment shall be identified by function and part number. It shall be demonstrated that the avionics equipment can meet the requirements established according to the error budget when the equipment is operated in the environmental conditions expected to be met during RVSM operations. This equipment must conform to the details submitted to DAW along with the application.

d) **Groups of Aircraft:** Where approval is sought for an aircraft group, the data package shall be sufficient to show that the requirements are met. Because of the statistical nature of these requirements, the content of the data package may vary considerably from group to group.

i. The mean and airframe-to-airframe variability of ASE shall be established based on precision flight test calibration of a number of aircraft. Where analytical methods are available, it may be possible to enhance the flight test database and to track subsequent change in the mean and variability based on geometric inspections and bench test or any other method acceptable to the approving Authority. In the case of derivative aircraft it may be possible to utilize data from the parent as part of the database.

ii. An assessment of the aircraft-to-aircraft variability of each error source shall be made. The error assessment may take various forms as appropriate to the nature and magnitude of the source and the type of data available. For some error sources (especially small ones) it may be acceptable to use specification values to represent Three standard deviations (3SD). For other error sources (especially larger ones) a more comprehensive assessment may be required; this is especially true for airframe error sources where ‘specification’ values of ASE contribution may not have been previously established.

iii. In many cases one or more of the major ASE error sources will be aerodynamic in nature (such as variations in the aircraft surface contour in the vicinity of the static pressure source). If evaluation of these errors is based on geometric measurements, substantiation shall be provided that the methodology used is adequate to ensure compliance.

iv. An error budget shall be established to ensure that the standards are met. The worst flight condition may be different for each of these standards and therefore the component error values may also be different.

v. In showing compliance with the overall requirements, the component error sources shall be combined in an appropriate manner. In most cases this will involve the algebraic summation of the mean components of the errors, Root-Sum-Square (RSS) combination of the variable components of the errors, and summation of the RSS value with the absolute value of the overall mean. Care shall be taken that only variable component error sources, which are independent of each other, are combined by RSS.

e) **Non-Group Aircraft:** Where an aircraft is submitted for approval as a non-group aircraft, the data shall be sufficient to show that the requirements are met. The data package shall specify how the ASE budget has been allocated between residual SSE and avionics error.

The following data shall be established.

i. Precision flight-test calibration of the aircraft to establish its ASE or SSE over the RVSM envelope shall be required. Flight calibration shall be performed at points in the flight envelope(s) as agreed by the certifying Authority. One of the methods prescribed shall be used.

ii. Calibration of the avionics used in the flight test as required to establish residual SSE. The number of test points shall be agreed by the certifying Authority. Since the purpose of the flight test is to determine the residual SSE, specially calibrated altimetry equipment may be used.

iii. Specifications for the installed altimetry avionics equipment indicating the largest allowable errors will be presented.

iv. If subsequent to aircraft approval for RVSM operation avionics units, which are of a different manufacturer or part number, are fitted, it shall be demonstrated that the standard of avionics equipment provides equivalent altimetry system performance.

6. Compliance Procedures

The data package must include a definition of the procedures, inspections/tests and limits which will be used to ensure that all aircraft approved against the data package 'conform to type', and that all future approvals, whether of new build or in-service aircraft, meet the budget allowances developed. The budget allowances will be established by the data package and include a methodology that allows for tracking the mean and SD for new build aircraft. Compliance requirements must be defined for each potential source of error.

7. Operating Restrictions

Where an operating restriction has been adopted, the package shall contain data and information necessary to document and establish that restriction.

ANNEX B - RVSM PERFORMANCE & AIRCRAFT SYSTEM REQUIREMENTS

1. PERFORMANCE

1.1. General

The statistical performance statements of ICAO Doc. 9574 for a population of aircraft have been translated into airworthiness standards by assessment of the characteristics of Altimetry System errors and altitude control. The standards in this AC are consistent with the requirements of RVSM as provided in ICAO Doc. 9574

1.2. RVSM Flight Envelopes

For the purposes of RVSM approval, the aircraft flight envelope may be considered in two parts: the Basic RVSM Envelope and the Full RVSM Envelope. The Basic RVSM Envelope is the part of the flight envelope where aircraft operate the majority of time. The Full RVSM Envelope includes parts of the flight envelope where the aircraft operates less frequently and where a larger Altimetry System Error tolerance is allowed.

1.3. Altimetry System Error

1.3.1 Factors Affecting ASE

In order to evaluate a system against the ASE performance statements, it is necessary to quantify the mean and three standard deviation values for ASE, expressed as ASE mean and (ASE3SD) Altimetry System Error (three standard deviations). In order to do this, it is necessary to take into account the different ways in which variations in ASE can arise. The factors that affect ASE are:

a) Unit to unit variability of avionics;
b) Effect of environmental operating conditions on avionics;
c) Airframe to airframe variability of static source error; and
d) Effect of flight operating condition on static source error.

1.3.2 Assessment Requirement

The assessment of Altimetry System Error (mean) and Altimetry System Error (three standard deviations) whether based on measured or predicted data, must, therefore, cover all the factors affecting ASE. Evaluating ASE at the most adverse flight condition in an RVSM flight envelope can eliminate the effect of SSC as a variable.

1.3.3 Basic RVSM Envelope

The requirements in the Basic RVSM Envelope are:

a) At the point in the Basic RVSM Envelope where mean ASE reaches its largest absolute value, the absolute value shall not exceed 80 ft (25 m); and

b) At the point in the Basic RVSM Envelope where mean ASE plus three standard deviations of ASE reaches its largest absolute value, the absolute value shall not exceed 200 ft (60 m).

1.3.4 Full RVSM Envelope

The requirements in the Full RVSM Envelope are:

a) At the point in the Full RVSM Envelope where mean ASE reaches its largest absolute value, the absolute value shall not exceed 120 ft (37 m);

b) At the point in the Full RVSM Envelope where mean ASE plus three standard deviations of ASE reaches its largest absolute value, the absolute value shall not exceed 245 ft (75 m); and;

c) If necessary, for the purpose of achieving RVSM approval for an aircraft group, an operating restriction may be established to restrict aircraft from conducting RVSM operations in areas of the Full RVSM Envelope where the absolute value of mean ASE exceeds 120 ft (37 m) and/or the absolute value of mean ASE plus three standard deviations of ASE exceed 245 ft (75 m). When such a restriction is established, it shall be identified in the data package and documented in appropriate aircraft operating manuals, however, visual or aural warning/indication systems shall not be required to be installed on the aircraft.

1.3.5 Aircraft Types

a) Aircraft types for which application for type certification or major change in type design is made after 1 January 1997 shall meet the criteria established for the Basic RVSM Envelope in the Full RVSM Envelope.

1.3.6 Interpretation of ICAO Requirements

The standards given above may not apply to non-group aircraft approval because there can be no group data with which to develop airframe-to-airframe variability. Therefore, a single ASE value is established that controls the simple sum of the altimetry system errors. In order to control the overall population distribution, this limit is set at a value less than that for group approval. The standard for submission of non-group aircraft for approval is:

a) For all conditions in the Basic RVSM Envelope:

Residual static source error + worst case avionics 160 ft (50 m)

b) For all conditions in the Full RVSM Envelope:

Residual static source error + worst case avionics 200 ft (60 m)

1.4. Altitude Keeping

An automatic altitude control system is required and must be capable of controlling altitude within
±65 ft (±20 m) about the acquired altitude when operated in straight and level flight under non- turbulent, non-gust conditions.

NOTE: Aircraft types for which application for type certification or major change in type design is made prior to 1 January 1997 which are equipped with automatic altitude control systems with flight management system/performance management system inputs allowing variations up to ±130 ft (±40 m) under non-turbulent, non-gust conditions do not require retrofit or design alteration.

2. AIRCRAFT SYSTEMS REQUIREMENTS

2.1. Equipment for RVSM Operations: The minimum equipment fit is:

a) Two independent altitude measurement systems. Each system shall comprise of the following elements:

i. Cross-coupled static source/system, provided with ice protection if located in areas subject to ice accretion;

ii. Equipment for measuring static pressure sensed by the static source, converting it to pressure altitude and displaying the pressure altitude to the flight crew;

iii. Equipment for providing a digitally coded signal corresponding to the displayed pressure altitude, for automatic altitude reporting purposes;

iv. SSEC, if needed to meet the performance requirements of altimetry system errors, as appropriate; and

v. The equipment fit shall provide reference signals for automatic control and alerting at selected altitude. These signals shall preferably be derived from an altitude measurement system meeting the full requirements of this document, but must in all cases enable the requirements of Altitude control and altitude alert to be met.

b) One Secondary Surveillance Radar (SSR) altitude reporting transponder. If only one is fitted, it shall have the capability for switching to operate from either altitude measurement system;

c) An altitude alert system; and

d) An automatic altitude control system.

Note: Details of the above equipment shall be forwarded by the Operator to as an attachment to application.

2.2. Altimetry

The altimetry system of an aircraft comprises all those elements involved in the process of sampling free stream static pressure and converting it to a pressure altitude output.

2.2.1 The elements of the altimetry system fall into two main groups:

a) Airframe plus static sources; and
b) Avionics and/or instruments.

2.2.2 Altimetry System Outputs

The following altimetry system outputs are significant for RVSM operations:

a) Pressure altitude (Baro Corrected) display;
b) Pressure altitude reporting data; and
c) Pressure altitude or pressure altitude deviation for an automatic altitude control device.

2.2.3 Altimetry System Accuracy

The total system accuracy shall satisfy the requirements of Basic and full RVSM Envelope or
ICAO standards on the subject, as appropriate.

2.2.4 Static Source Error Correction (SSEC)

If the design and characteristics of the aircraft and altimetry system are such that the basic and/or full RVSM envelope or ICAO standards on the subject, are not satisfied by the location and geometry of the static sources alone, then suitable Static Source Error Correction (SSEC) shall be applied automatically within the avionics part of the altimetry system. The design aim for static source error correction, whether aerodynamic/geometric or avionics, shall be to produce a minimum residual static source error, but in all cases it shall lead to satisfaction of the above standards, as appropriate.

2.2.5 Altitude Reporting Capability

The aircraft altimetry system shall provide an output to the aircraft transponder.

2.2.6 Altitude Control Output

The requirements are:

a) The altimetry system shall provide an output, which can be used by an automatic altitude control system to control the aircraft at a commanded altitude. The output may be used either directly or combined with other sensor signals. If Static Source Error Correction is necessary in order to satisfy the requirements of this AC, then an equivalent Static Source Error Correction (SSEC) must be applied to the altitude control output. The output may be an altitude deviation signal, relative to the selected altitude, or a suitable absolute altitude output; and

b) Whatever the system architecture and Static Source Error Correction system the difference between the output to the altitude control system and the altitude displayed must be kept to the minimum.

2.2.7 Altimetry System Integrity

During the RVSM approval process it must be verified analytically that the predicted rate of occurrence of undetected altimetry system failures does not exceed 1 x 10-5 per flight hour. All failures and failure combinations whose occurrence would not be evident from cross- cockpit checks, and which would lead to altitude measurement/display errors outside the specified limits, need to be assessed against this budget. No other failures or failure combinations need to be considered.

2.3. Altitude Alert

The altitude deviation warning system must signal an alert when the altitude displayed to the flight crew deviates from selected altitude by more than a nominal value. For aircraft for which application for type certification or major change in type design is made before 1 January 1997, the nominal value shall not be greater than ±300 ft (±90 m). For aircraft for which application for type certification or major change in type design is made after 1

January 1997, the nominal value shall not be greater than ±200 ft (±60 m). The overall equipment tolerance in implementing these nominal threshold values shall not exceed ±50 ft (±15 m).

2.4. Automatic Altitude Control System

a) As a minimum, a single automatic altitude control system must be installed which is capable of controlling 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-gust conditions.

Note: Aircraft for which application for type certificates was made prior to 1 January 1997, which are equipped with automatic altitude control system with flight management system/performance management system inputs which allow variations up to ±130 ft (±40 m) under non-turbulent, non-gust conditions do not require retrofit or design alteration.

b) 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.

ANNEX C - CONTINUED AIRWORTHINESS (MAINTENANCE REQUIREMENTS)

1. General

It is imperative that all aircraft continue, during their service life, to satisfy the requirements of the RVSM MASPS. While height-monitoring data from independent sources, as recommended by ICAO, should help to detect any long-term deterioration in altimetry system performance. Operator´s maintenance and inspection practices must be reviewed and updated to reflect the specific airworthiness requirements applicable to RVSM operations.

The integrity of the design features necessary to ensure that altimetry systems continue to meet RVSM standards shall be verified by scheduled tests and/or inspections in conjunction with an approved maintenance program. The Operator shall review its maintenance procedures and address all aspects of continuing airworthiness, which are affected by RVSM requirements.

Each Operator shall demonstrate that adequate maintenance facilities are available to ensure continued compliance with the RVSM maintenance requirements.

2. Maintenance Program Approval Requirements

Each Operator requesting an RVSM operational approval shall submit a maintenance and inspection program which includes any maintenance requirements defined in the approved data package as part of a continued airworthiness (approved system) of maintenance program approval.

3. Maintenance Documents Requirements

The following items shall be reviewed as appropriate for RVSM maintenance approval:

a) Maintenance Manuals;

b) Structural Repair Manuals;

c) Standards Practices Manuals;

d) Illustrated Parts Catalogues;

e) Maintenance Schedule;

f) MMEL/MEL;

g) Maintenance Control Manuals; and

h) Equipment Lists/Wiring Diagram Manuals.

4. Maintenance Practices

If the Operator is subject to an ongoing approved maintenance program, that program shall contain the maintenance practices outlined in the applicable aircraft and component manufacturer's maintenance manuals for each aircraft type. The following items shall be

reviewed for compliance and if the Operator is not subject to an approved maintenance program the following items shall be followed:

a) All RVSM equipment shall be maintained in accordance with the component manufacturer's maintenance requirements and the performance requirements outlined in the approved data package;

b) Any modification, repair, or design change, which in any way alters the initial RVSM approval, shall be subject to a design review by persons approved by the approving Authority;

c) Any maintenance practices which may affect the continuing RVSM approval integrity, e.g. the alignment of pitot/static probes, dents, or deformation around static plates, shall be referred to AAC;

d) Built-In Test Equipment (BITE) testing is not an acceptable basis for system calibrations, (unless it is shown to be acceptable by the airframe manufacturer with AAC's agreement) and shall only be used for fault isolation and troubleshooting purposes;

e) Some aircraft manufacturers have determined that the removal and replacement of components utilising quick disconnects and associated fittings, when properly connected, will not require a leak check. While this approach may allow the aircraft to meet static system certification standards when properly connected, it does not always ensure the integrity of the fittings and connectors, nor does it confirm system integrity during component replacement and re-connections. Therefore, a system leak check or visual inspection shall be accomplished any time a quick disconnect static line is broken;

f) Airframe and static systems shall be maintained in accordance with the airframe manufacturer's inspection standards and procedures;

g) To ensure the proper maintenance of airframe geometry for proper surface contours and the mitigation of altimetry system error, surface measurements or skin waviness checks shall be made if needed to ensure adherence to the airframe manufacturer's RVSM tolerances. These tests and inspections shall be performed as established by the airframe manufacturer. These checks shall also be performed following repairs, or alterations having an effect of airframe surface and airflow;

h) The maintenance and inspection program for the autopilot shall ensure continued accuracy and integrity of the automatic altitude control system to meet the height-keeping standards for RVSM operations. This requirement will typically be satisfied with equipment inspections and serviceability checks; and

i) Where the performance of existing equipment is demonstrated as being satisfactory for RVSM approval, it shall be verified that the existing maintenance practices are also consistent with continued RVSM approval integrity.

5. Maintenance Practices for Non-Compliant Aircraft

Those aircraft positively identified as exhibiting height-keeping performance errors that require investigation, shall not be operated in airspace where RVSM is applied until the following actions have been taken:

(a) The failure or malfunction is confirmed and isolated by maintenance action; and
(b) Corrective action is carried out as required and verified to ensure RVSM approval integrity.

6. Maintenance Training Requirements

Training requirements shall be provided for RVSM approvals processes. Areas that may need to be highlighted for initial and recurrent training of maintenance personnel are:

a) Aircraft geometric inspection techniques;
b) Test equipment calibration/usage techniques; and
c) Any special documentation or procedures introduced by RVSM approval.

7. Test Equipment

The test equipment shall have the capability to demonstrate continuing compliance with all the parameters established for RVSM approval in the initial data package or as approved by the approving Authority.

8. Standards

Test equipment shall be calibrated utilizing reference standards whose calibration is certified as being traceable to the national standard. It shall be calibrated at periodic intervals as agreed by the approving Authority. The approved maintenance program shall encompass an effective quality control program, which includes the following:

a) Definition of required test equipment accuracy;
b) Regular calibrations of test equipment traceable to a master in-house standard.

Determination of calibration interval shall be a function of the stability of the test equipment. The calibration interval shall be established on the basis of historical data so that degradation is small in relation to the required accuracy;

c) Regular audits of calibration facilities both in-house and outside;
d) Adherence to acceptable maintenance practices; and
e) Procedures for controlling Operator errors and unusual environmental conditions which may affect calibration accuracy

ANNEX D - TRAINING PROGRAMS AND OPERATING PRACTICES/PROCEDURES

1. Introduction

Flight crews will need to have an awareness of the criteria for operating in RVSM airspace and be trained accordingly. The items detailed in this Annex shall be standardized and incorporated into training programs and operating practices and procedures. Certain items may already be adequately standardized in existing procedures. New technology may also remove the need for certain actions required of the flight crew. If this is so, then the intent of this guidance can be considered to be met.

2. Flight Planning

During flight planning the flight crew shall pay particular attention to conditions that may affect operation in RVSM airspace. These include, but may not be limited to:

a) Verifying that the airframe is approved for RVSM operations;
b) Reported and forecast weather on the route of flight;
c) Minimum equipment requirements pertaining to height keeping & alerting systems;
d) Any airframe or operating restriction related to RVSM approval.

3. Pre-Flight Procedures at the Aircraft for Each Flight

The following actions shall be carried out during the pre-flight procedure:

a) Review technical logs and forms to determine the condition of equipment required for flight in RVSM airspace. Ensure that maintenance action has been taken to correct defects to required equipment;

b) During the external inspection of aircraft, particular attention shall be paid to the condition of static sources and the condition of the fuselage skin near each static source and any other component that affects altimetry system accuracy. This check may be accomplished by a qualified and authorized person other than the pilot (e.g. a flight engineer or ground engineer);

c) Before takeoff, the aircraft altimeters shall be set to the QNH of the airfield and shall display a known altitude, within the limits specified in the aircraft operating manuals. The two primary altimeters shall also agree within limits specified by the aircraft operating manual. An alternative procedure using QFE may also be used. Any required functioning checks of altitude indicating systems shall be performed; and

d) Before take-off, equipment required for flight in RVSM airspace shall be operative, and any indications of malfunction shall be resolved.

4. In-Flight Procedures

4.1 General

The following practices shall be incorporated into flight crew training and procedures:

a) Flight crews will need to comply with any aircraft operating restrictions, if required for the specific aircraft group, e.g. limits on indicated Mach number, given in the RVSM airworthiness approval.

b) Emphasis shall be placed on promptly setting the sub-scale on all primary and standby altimeters to 1013.25 hPa (29.92 in.Hg) when passing the transition altitude, and rechecking for proper altimeter setting when reaching the initial cleared Flight Level;

c) In level cruise it is essential that the aircraft is flown at the cleared Flight Level. This requires that particular care is taken to ensure that ATC clearances are fully understood and followed. The aircraft shall not intentionally depart from cleared Flight Level without a positive clearance from ATC unless the crew is conducting contingency or emergency maneuvers;

d) When changing levels, the aircraft shall not be allowed to overshoot or undershoot the cleared Flight Level by more than 150 ft (45 m);

Note: It is recommended that the level off be accomplished using the altitude capture feature of the automatic altitude-control system, if installed.

e) An automatic altitude-control system shall be operative and engaged during level cruise, except when circumstances such as the need to re-trim the aircraft or turbulence require disengagement. In any event, adherence to cruise altitude shall be accomplished by reference to one of the two primary altimeters. Following loss of the automatic height keeping function, any consequential restrictions will need to be observed;

f) Ensure that the altitude-alerting system is operative;

g) At intervals of approximately one hour, cross-checks between the primary altimeters shall be made. A minimum of two will need to agree within ±200 ft (±60 m). Failure to meet this condition will require that the altimetry system be reported as defective and notified to ATC:

i. The usual scan of flight deck instruments shall suffice for altimeter cross-checking on most flights;

ii. Before entering RVSM airspace, the initial altimeter cross check of primary and standby altimeters shall be recorded;

Note: Some systems may make use of automatic altimeter comparators.

h) In normal operations, the altimetry system being used to control the aircraft shall be selected for the input to the altitude reporting transponder transmitting information to ATC;

i) If the pilot is advised in real time that the aircraft has been identified by a height-monitoring system as exhibiting a TVE greater than ±300 ft (± 90 m) and/or an ASE greater than ±245 ft (±75 m) then the pilot shall follow established regional procedures to protect the safe operation of the aircraft. This assumes that the monitoring system will identify the TVE or ASE within the set limits for accuracy; and

j) If the pilot is notified by ATC of an assigned altitude deviation, which exceeds ±300 ft (±90 m) then the pilot shall take action to return to the cleared Flight Level as quickly as possible.

4.2 Procedures Prior to RVSM Airspace Entry

The following equipment must be operating normally for entry into RVSM airspace:

a) Two primary altitude measurement systems;
b) One automatic altitude-control system;
c) One altitude-alerting device; and
d) An operating transponder.

***Note**: Dual equipment requirements for altitude-control systems will be established by regional agreement after an evaluation of criteria such as mean time between failures, length of flight segments and availability of direct pilot controller communications and radar surveillance.*

***Note:** An operating transponder may not be required for entry into all designated RVSM airspace. The Operator shall determine the requirement for an operational transponder in each RVSM area where operations are intended. The Operator shall also determine the transponder requirements for transition areas next to RVSM airspace.*

***Note:** If any of the required equipment fail prior to the aircraft entering RVSM airspace, the pilot must*

Request a new clearance to avoid entering this airspace.

4.3 Contingency Procedures after Entering RVSM Airspace

The pilot shall notify ATC of contingencies (equipment failures, weather), which affect the ability to maintain the cleared Flight Level, and co-ordinate a plan of action appropriate to the airspace concerned. Examples of equipment failures, which shall be notified, to ATC are:

a) Failure of all automatic altitude-control systems aboard the aircraft;
b) Loss of redundancy of altimetry systems;
c) Loss of thrust on an engine necessitating descent; or
d) Any other equipment failure affecting the ability to maintain cleared Flight Level; The pilot shall notify ATC when encountering greater than moderate turbulence. If unable to notify ATC and obtain an ATC clearance prior to deviating from the cleared Flight Level, the pilot shall follow any established contingency procedures and obtain ATC clearance as soon as possible.

5. Post-Flight Procedures

In making technical log entries against malfunctions in height keeping systems, the pilot shall provide sufficient detail to enable maintenance to effectively troubleshoot and repair the system. The pilot shall detail the actual defect and the crew action taken to try to isolate and rectify the fault. The following information shall be recorded when appropriate:

a) Primary and standby altimeter readings.
b) Altitude selector setting.
c) Sub-scale setting on altimeter.
d) Autopilot used to control the aeroplane and any differences when an alternative autopilot system was selected.
e) Differences in altimeter readings, if alternate static ports selected. Use of air data computer selector for fault diagnosis procedure.

f) The transponder selected to provide altitude information to ATC and any difference noted.

6. Special Emphasis Items: The following items shall also be included in crew training:

a) Knowledge and understanding of standard ATC phraseology used in each area of operations;
b) Importance of crew members cross-checking each other to ensure that ATC clearances are promptly complied with;
c) Use and limitations in terms of accuracy of stand-by altimeters in contingencies. Where applicable, the pilot shall review the application of static source error correction/position error correction through the use of correction cards (note: such correction data will need to be readily available on the flight deck);
d) Problems of visual perception of other aircraft at 1 000ft (300m) planned separation during night conditions, when encountering local phenomena such as northern lights, for opposite and same direction traffic, and during turns;
e) Characteristics of aircraft altitude capture systems which may lead to the occurrence of overshoots;
f) Relationship between altimetry, automatic altitude control, and transponder systems in normal and abnormal situations; and
g) Any airframe operating restrictions, if required for a specific aircraft group, related to an RVSM airworthiness approval.

ANNEX E - CONTINGENCY PROCEDURES

1. The basic concepts for contingencies are:

a) Guidance for contingency procedures shall not be interpreted in any way, which prejudices the final
Authority and responsibility of the pilot in command for the safe operation of the aircraft.

b) If the pilot is unsure of the vertical or lateral position of the aircraft or the aircraft deviates from its assigned altitude or track for cause without prior ATC clearance, then the pilot must take action to mitigate the potential for collision with aircraft on adjacent routes or flight levels. In this situation, the pilot should alert adjacent aircraft by making maximum use of aircraft lighting and broadcasting position, flight level, and intentions on 121.5 MHz (as a back-up, the appropriate VHF inter-pilot air- to-air frequency may be used);

c) Unless the nature of the contingency dictates otherwise, the pilot should advise ATC as soon as possible of a contingency situation and if possible, request an ATC clearance before deviating from the assigned route or flight level.

d) If a revised ATC clearance cannot be obtained in a timely manner and action is required to avoid potential conflict with other aircraft, then the aircraft should be flown at an altitude and/or on a track where other aircraft are least likely to be encountered. This can be accomplished by offsetting from routes or altitudes normally flown in the airspace. The recommendations on the order of preference for pilot actions are:

i) The pilot may offset half the lateral distance between routes or tracks.
ii) The pilot may offset half the vertical distance between altitudes normally flown.
iii) The pilot may also consider descending below FL 285 or climbing above FL 410.

e) When executing a contingency maneuver the pilot should:
i. Watch for conflicting traffic both visually and by reference to ACAS, if equipped.
ii. Continue to alert other aircraft using 121.5 MHz (as a back-up, the VHF inter-pilot air-to-air frequency may be used) and aircraft lights.
iii. Continue to fly offset tracks or altitudes until an ATC clearance is obtained. iv. Obtain an ATC clearance as soon as possible.

2. Guidance to the Pilot (Including Expected ATC Actions) in the Event of Equipment Failures or

Encounters with Turbulence after Entry into RVSM Airspace.

In addition to emergency conditions that require immediate descent, such as loss of thrust or pressurization, ATC should be made aware of the less explicit conditions that may make it impossible for an aircraft to maintain its CFL appropriate to RVSM. Controllers should react to such conditions but these actions cannot be specified, as they will be dynamically affected by the real- time situation.

a) Objective: The following material is provided with the purpose of giving the pilot guidance on actions to take under certain conditions of equipment failure and encounters with turbulence. It also describes the expected ATC controller actions in these situations. It is recognized that the pilot and controller will use judgment to determine the action most appropriate to any given situation. For certain equipment failures, the safest course of action may be for the aircraft to maintain the assigned FL and route while the pilot and controller take precautionary action to protect separation. For extreme cases of equipment

failure, however, the safest course of action may be for the aircraft to depart from the cleared FL or route by obtaining a revised ATC clearance or if unable to obtain prior ATC clearance, executing the established contingency maneuvers for the area of operation.

b) Contingency Scenarios. These scenarios summarize pilot actions to mitigate the potential for conflict with other aircraft in certain contingency situations. These should be reviewed in conjunction with the expanded contingency scenarios detailed in Paragraph 3, which contain additional technical and operational detail.

Scenario 1: The pilot is:

1) Unsure of the vertical position of the aircraft due to the loss or degradation of all primary altimetry systems, or

2) Unsure of the capability to maintain CFL due to turbulence or loss of all automatic altitude control systems

The Pilot should:	
Maintain CFL while evaluating the situation;	
Watch for conflicting traffic both visually and by reference to ACAS;	
If considered necessary, alert nearby aircraft by 1) Making maximum use of exterior lights; 2) Broadcasting position, FL, and intentions on 121.5 MHz (as a backup, the VHF inter-pilot air-to-air frequency may be used).	
	ATC can be expected to:
Notify ATC of the situation and intended course of action. Possible courses of action include:	Obtain the pilot's intentions and pass essential traffic information.
1) Maintaining the CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	1) If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting ATC clearance to climb above or descend below RVSM airspace if the aircraft cannot maintain CFL and ATC cannot establish adequate separation from other aircraft.	2) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
3) Executing the Doc 7030 contingency maneuver to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	3) If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation.
	4) Notify adjoining ATC facilities/sectors of the situation.

Scenrio 2 - There is a failure or loss of accuracy of one primary altimetry system (e.g. greater than 200 feet difference between primary altimeters)

The Pilot should

Cross check standby altimeter, confirm the accuracy of a primary altimeter system and notify ATC of the loss of redundancy. If unable to confirm primary altimeter system accuracy, follow pilot actions listed in the preceding scenario.

3) Expanded Equipment Failure and Turbulence Encounter Scenarios: Operators may consider this material for use in training programs.

Scenario 1: All automatic altitude control systems fail (e.g., Automatic Altitude Hold).

The Pilot should: Initially
Maintain CFL
Evaluate the aircraft's capability to maintain altitude through manual control.
Subsequently
Watch for conflicting traffic both visually and by reference to ECAS.

If considered necessary, alert nearby aircraft by 1) Making maximum use of exterior lights; 2) Broadcasting position, FL, and intentions on 121.5 MHz (as a back-up, the VHF inter-pilot air-to-air frequency may be used.)	
Notify ATC of the failure and intended course of action. Possible courses of action include:	**ATC can be expected to**
1) Maintaining the CFL and route, provided that the aircraft can maintain level.	1) If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting ATC clearance to climb above or descend below RVSM airspace if the aircraft cannot maintain CFL and ATC cannot establish lateral, longitudinal or conventional vertical	2) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
3) Executing the contingency maneuver to offset from the assigned track and FL, if ATC clearance cannot be obtained and the aircraft cannot maintain CFL.	3) If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation.
	4) Notify adjoining ATC facilities/ sectors of the situation.

Scenario 2: Loss of redundancy in primary altimetry systems

The Pilot should	**ATC can be expected to**
If the remaining altimetry system is functioning normally, couple that system to the automatic altitude control system, notify ATC of the loss of redundancy and maintain vigilance of altitude keeping.	Acknowledge the situation and continue to monitor progress

Scenario 3: The primary altimeters diverge by more than 200ft (60m)

The Pilot should
Attempt to determine the defective system through established trouble-shooting procedures and/or comparing the primary altimeter displace to the standby altimeter (as corrected by the correction cards, if required)

If the defective system can be determined, couple the functioning altimeter system to the altitude keeping device.
If the defective system cannot be determined, follow the guidance in Scenario 3 for failure or unreliable altimeter indications of all primary altimeters.

Scenario 4: All primary altimetry systems are considered unreliable or fail:

The Pilot should	
Maintain CFL by reference to the standby altimeter (if the aircraft is so equipped).	
Alert nearby aircraft by 1) Making maximum use of exterior lights; 2) Broadcasting position, FL, and intentions on 121.5 MHz (as a back-up, the VHF inter-pilot air-to-air frequency may be used).	
	ATC can be expected to
Consider declaring an emergency. Notify ATC of the failure and intended course of action. Possible courses of action include:	Obtain pilot's intentions, and pass essential traffic information.
1) Maintaining CFL and route provided that ATC can provide lateral, longitudinal or conventional vertical separation.	1) If the pilot intends to continue in RVSM airspace, assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting ATC clearance to climb above or descend below RVSM airspace if ATC cannot establish adequate separation from other aircraft.	2) If the pilot requests clearance to exit RVSM airspace, accommodate expeditiously, if possible.
3) Executing the Doc 7030 contingency maneuver to offset from the assigned track and FL, if ATC clearance cannot be obtained	3) If adequate separation cannot be established and it is not possible to comply with the pilot's request for clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation.
	clearance to exit RVSM airspace, advise the pilot of essential traffic information, notify other aircraft in the vicinity and continue to monitor the situation.
	4) Notify adjoining ATC facilities/sectors of the situation

Scenario 5: Turbulence (greater than moderate) which the pilot believes will impact the aircraft's capability to maintain flight level.

The Pilot should	
Watch for conflicting traffic both visually and by reference to TCAS, if equipped.	
If considered necessary, alert nearby aircraft by: 1) Making maximum use of exterior lights; 2) Broadcasting position, FL, and intentions on 121.5 MHz (as a back-up, the VHF inter-pilot air-to-air frequency may be used).	
Notify ATC of intended course of action as soon	**ATC can be expected to**

1) Maintaining CFL and route provided ATC can provide lateral, longitudinal or conventional vertical separation.	1) Assess traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal, or conventional vertical separation, and if so, apply the appropriate minimum.
2) Requesting flight level change, if necessary.	2) If unable to provide adequate separation, advise the pilot of essential traffic information and request pilot's intentions.
3) Executing the Doc 7030 contingency maneuver to offset from the assigned track and FL, if ATC clearance cannot be	3) Notify other aircraft in the vicinity and monitor the situation
	4) Notify adjoining ATC facilities/ sectors of the situation.

4) Special Procedures for In-Flight Contingencies Published for Individual ICAO Regions in Doc 7030.

a) The Doc 7030 should be considered the source document for specific contingency procedures applicable to individual ICAO regions. Doc 7030 should always be consulted before training material or manuals are developed.

5) Wake Turbulence Procedures.

These procedures provide for the contingency use of a 2 NM lateral offset to avoid exposure to wake turbulence. The procedures are published in NOTAMS, AIPs, and Regional Supplementary Procedures. These procedures should be incorporated in pilot training programs and manuals.

6) Transponder Failure and RVSM Transition Areas.

Transition areas are planned to be established between airspaces where different vertical separation standards are applied. The specific actions that ATC will take in the event of transponder failure in RVSM transition areas will be determined by the provider States.

ANNEX F - VERIFICATION/MONITORING PROGRAMS

1. General

A program to monitor or verify aircraft height-keeping performance is considered a necessary element of RVSM implementation for at least the initial area where RVSM is implemented. A height-monitoring system based on Global Positioning System (GPS) satellites or an earth-based system may fulfill this function. However, it is expected that most Capeverdian Operators will employ a GPS-based Monitoring System (GMS).

2. Organisation of Monitoring Activities

2.1 AFI Regional Monitoring Agency (ARMA)

AFI Regional Monitoring Agency (ARMA) is the agency responsible for this function in the African region. The ARMA acting on behalf of ICAO is delegated to South Africa and hosted by ATNS.

Current RVSM minimum monitoring requirements and information on Height Monitoring Unit flights are detailed in AFI RMA website http://www.atns.com.za.

It is anticipated that the necessity for such programs may be diminished or possibly eliminated after confidence is gained that RVSM programs are working as planned. AFI RMA website has all the necessary Forms i.e. F1& F2 and guidance for procedure to be followed for monitoring program. Subject material on AFI RMA website is not included in this AC as it is likely to change. Monitoring can only be undertaken after AAC has issued an RVSM approval for the aircraft or group of aircraft.

2.2 EUR Regional Monitoring Agency (RMA)

On behalf of ICAO the EUROCONTROL Agency acts as the RMA. The main responsibilities of the RMA are to conduct statistical safety assessments, monitor height-keeping performance and verify the approval status of aircraft operating with 1000 ft vertical separation in European RVSM airspace.

The information which will be obtained through the monitoring programme on aircraft compliance status and measured height keeping performance will be combined with the information available from monitoring agencies in other regions. The RMA will support operators and approval authorities on any issue related to RVSM approval and monitoring. The RMA will require information on the aircraft which are intended to operate in EUR RVSM airspace, and which will, therefore, need to be monitored on a periodic basis as part of the continuing safety assessment. To this end the RMA will also be in contact with State approval authorities. The RMA is based at the EUROCONTROL headquarters in Brussels, Belgium.

The RMA will ensure the continuous operation of the monitoring systems and will manage the measured height keeping performance data. The RMA will identify any height deviations that are outside the specifications of the ICAO RVSM performance requirements, and will follow-up as required.

A network of height monitoring unit (HMU) systems provides the data for the safety assessment and aircraft heightkeeping performance, while the approval status is confirmed by comparing GAT/IFR flight plans with the database of aircraft approved for RVSM flights in Europe.

Current RVSM minimum monitoring requirements and information on Height Monitoring Unit flights are detailed in AFI RMA website www.eurocontrol.int/articles/european-rvsm-approvals.

ANNEX G – APPLICATION FOR REDUCED VERTICAL SEPARATION MINIMUM (RVSM) APPROVAL

AAC AGÊNCIA DE AVIAÇÃO CIVIL	**APPLICATION FOR REDUCED VERTICAL SEPARATION MINIMUM (RVSM) APPROVAL**	Reference:	FS.DSV.043
		Revision:	Revision 1
		Date:	21-07-2015

Applicability: RVSM Operations in accordance with Instrução Nº 03DSV2015 RVSM Approval Process, CV-CAR , ICAO DOC 9574,

Completion of form: Please complete those fields that are relevant to your aircraft and operations.

Each relevant box should be completed with a tick (v) or a (x). Items marked with an asterisk (*) to be completed only for first aircraft of each aircraft type / model in operator's fleet. Where form must be completed by referring to a document of applicant's documentation of system, add manual reference chapter and sub-chapter. Please ensure all applicable areas are completed.

Application Accuracy of information provided. All information will be used to assess RVSM compliance. An incomplete, poorly prepared or inaccurate application may:

- Result in rejection of the application
- Result in delays
- Add to the cost of the assessment
- Result in a refusal to issue the approval

Note: It is an offence to make a false declaration in this form.

Applications for RVSM approval shall be made using AAC FS.DSV.43. Submit the form and application package required by Instrução Nº 03DSV2015 to:

AGENCIA DE AVIAÇÃO CIVIL (AAC)
Av. Cidade de Lisboa, Nº 34 – Várzea
C.P. 371 – Praia, Cabo Verde

1. GENERAL

General Information		
1. Applicant:		
2. Aircraft Registration:		
3. Aircraft Manufacturer:		
4. Aircraft Type Designation / Model Designation:		
5. Serial No.:		
6. Aircraft Address (Hexadecimal):		
Scope of Application	**Yes**	**No**
7. Application for RVSM approval?	☐	☐
8. Initial request for RVSM approval for aircraft type referenced in 1.4?	☐	☐

2. AIRWORTHINESS

Type Design Approval for referenced Aircraft Type Designation

1. The RVSM type design approval is reflected in:

☐ AFM ☐ AFM Supplements ☐Type Certification Data Sheet

☐ Supplemental Type Certificate ☐ other:

2. Aircraft Flight Manual (AFM) or AFM Supplement refers to following airworthiness approval basis for RVSM system installation:

☐ JAA Temporary Guidance Leaflet (TGL) No. 6 ☐FAA Document 91-RVSM ☐other:

	Yes	**No**
3. Group aircraft? (see CT-30-009 RVSM Approval Process)	☐	☐
4. Non-group aircraft? (see CT-30-009 RVSM Approval Process)	☐	☐
5. Basic RVSM flight envelope? (see CT-30-009 RVSM Approval Process)	☐	☐
6. Full RVSM envelope? (see CT-30-009 RVSM Approval Process)	☐	☐

7. Airworthiness performance requirements in the form of a Minimum Aircraft Systems Performance Specification (MASPS):

MASPS compliance demonstrated by: Manufacturer:

MASPS compliance data package: Design organisation:

Reference number:

Navigation System Eligibility for referenced Aircraft Serial Number

8. Equipment for RVSM operations:

Model: Altitude measurement systems: Make:
Model: SSR Transponder: Make: Model:
Altitude Alerting system: Make: Model:
Automatic altitude control system: Make: Model:

9. The approval of the RVSM systems installation is based on:

□ Type design □ FAA STC □ STC □ Service Bulletin
□ JAA STC □ Major Modification □ other:

Maintenance Program (*)	**Yes**	**No**
10. The applicant should have an established Maintenance Program that contains all RVSM related maintenance requirements prescribed by manufactured or design organization. RVSM Maintenance program established?	☐	☐
Minimum Equipment List (*)		
11. The applicant should revised parts of Minimum Equipment List to reflect system requirements (e.g. redundancy levels) appropriate to the intended RVSM operations? Minimum Equipment List revised?	☐	☐

Maintenance Practices and Procedures (*)	
The applicant must institute procedures in respect of continuing airworthiness practices for RVSM. These procedures should cover the following subjects:	*To be completed by applicant* RVSM Maintenance Practices and Procedures are described in (Add manual reference, chapter and sub-chapter)
12. Maintenance of RVSM equipment (adherence to manufacturer's maintenance instructions, modification procedures, system calibration policy, leak check policy, skin waviness checks, autopilot / automatic altitude control maintenance practices, handling on-board systems, etc.)	
13. Action/Procedures for non-compliant aircraft (downgrading reporting to AAC, response to inquires from ARMA, corrective actions, upgrading, etc.)	
14. Maintenance Training (training of applicant's maintenance management staff, training of contractor's maintenance personnel, initial training, recurrent training, training syllabi, etc.)	
15. Test Equipment (use of test equipment, handling, calibration, etc.)	

3. OPERATION

Operating Practices and Procedures (*)	
The applicant must institute RVSM Operating Practices and Procedures. These practices and procedures should cover the following subjects:	*To be completed by applicant* RVSM Operating Practices and Procedures are described in (add manual reference, chapter and sub-chapter):
1. Flight planning procedures for operations in RVSM airspace (RVSM approval of aircraft, reported and forecast weather, use of minimum equipment list (MEL), airframe or operating restrictions, etc.)	
2. Pre-flight procedures for each flight in RVSM airspace (review of technical log, external inspection, functional check of altitude measurement and control systems, etc.).	
3. RVSM in-flight procedures (prior to RVSM airspace entry, serviceability of required equipment, altimeter settings, adherence to ATC instructions, phraseology, changing flight levels, use of altitude control and alerting systems, altimeter cross-checks, ACAS procedures, specific regional operating procedures (MNPS, European RVSM, Pacific Airspace, etc.), reporting of wake turbulence encounters in EUR RVSM airspace, etc.).	

4. Procedures with respect to flight crew response to abnormal situations (reporting of altitude deviations and altimetry system errors, contingency procedures after entering RVSM airspace, etc.).	
5. Post-flight procedures (technical log entries, defects description, reporting of altitude deviations and altimetry system errors, etc.).	
Flight Crew Training and Qualification (*)	
The applicant is required to establish the following (covering subjects under 3.1 to 3.5):	*To be completed by applicant* Description in (add manual reference, chapter and subchapter):
6. Flight crew qualification requirements.	
7. Description of initial and recurrent training, checking-and training-syllabi.	

4. APPLICATION PACKAGE

Documentation to be submitted to the CCAA	Submitted?	
	Yes	**No**
1. Compliance statement which shows how the criteria of CT -30-008 have been satisfied (*).	☐	☐
2. Sections of the AFM or AFM Supplements that document RVSM airworthiness approval	☐	☐
3. MASPS compliance data package (*)	☐	☐
4. Flight crew RVSM training programmes and syllabi for initial and recurrent training (*).	☐	☐
5. Operation manuals and checklists that include RVSM operating practices and procedures (OM-A, OMB, OM-D, AOM, FCOM, Route Manuals, stand-alone RVSM manual, etc.) (*).	☐	☐
6. Minimum Equipment List (MEL) that include items pertinent to RVSM operations (*).	☐	☐
7. Maintenance program or revision thereof that include items pertinent to RVSM equipment (*).	☐	☐
8. RVSM maintenance practices & procedures (MME, maintenance program, stand-alone document) (*).	☐	☐
9. Service Bulletin, Supplemental Type Certificate (STC) or Major Modification Approval Documentation, if approval based on documents as detailed in 2.9 above (except if based on approved type design).	☐	☐
10. Plan for participation in the RVSM monitoring program (*)	☐	☐

5. APPLICANT'S STATEMENT

The undersigned certifies the above information to be correct and true and that aircraft system installation, continuing airworthiness of systems, minimum equipment for dispatch, operating procedures and flight crew training comply with the requirements of CV-CAR and Instrução Nº 03DSV2015 No. 6.

Name of Post Holder Maintenance:	**Signature:**	**Date:**
Name of Post Holder Operations:	**Signature:**	**Date:**
Name of Post Holder Training:	**Signature:**	**Date:**

FOR OFFICIAL USE ONLY				
Subject	**Responsible**	**Date**	**SRS Nº**	**Signature**
1. AAC Form 30- XXX and package checked for completeness.	FOI			
2. Applicant requested to complete ARMA Form 2.	FOI			
3. Airworthiness Approval granted (ANNEX to Certificate of Airworthiness).	AWI			
4. Operational Approval granted (AOC, Operiations Specification and Letter of Authorisation).	FOI			
5. Notification of RVSM Approval submitted to ARMA	FOI			

6. RVSM approval process administratively completed (OPS Update, Billing, and Exchange of Certificates).	FOI			

Withdrawal of RVSM Approval

Reason:

Notification to ARMA by:

Name: *Date:* *Signature:*