

 <p>Phone: 263-4-585073-88 263-4-585018 Fax: 263-4-585100 E-mail: ais@caaz.co.zw</p>	<p>CIVIL AVIATION AUTHORITY OF ZIMBABWE</p> <p>AERONAUTICAL INFORMATION SERVICES</p> <p>P BAG 7716 CAUSEWAY, HARARE</p>	<p>AIC</p> <p>A004/08</p> <p>17 June 2008</p>
---	---	--

Aeronautical Information Circular

AIC A004/06 is hereby replaced

Reduced Vertical Separation Minimum (RVSM)

This AIC serves as Notice of Intent to implement RVSM in the Harare Flight Information Region effective 25 September 2008.

Reduced Vertical Separation Minimum is vertical separation of aircraft by 1,000 feet above Flight Level 290. Operators should have received RVSM aircraft (Airworthiness) and Operational approval timeously from the appropriate State Authority. Operator/Aircraft approval will enable air traffic services (ATS) to plan for orderly RVSM implementation.

Starting 25 September 2008 only RVSM compliant aircraft will be cleared to operate in the Harare FIR between F290 and F410 (inclusive). Aircraft that are not RVSM compliant (e.g., ferry and maintenance flights) will only be cleared to operate in the Harare FIR between F290 and F410 (inclusive) after prior co-ordination with the appropriate centre. 2,000 ft vertical separation will be applied to such aircraft. Harare centre contacts will be published on websites (if established) and in follow-up NOTAMs.

RVSM will be implemented in the Harare FIR in accordance with International Civil Aviation Organisation (ICAO) regional agreements. ICAO recommends that State authorities and operators use Federal Aviation Administration (FAA) Interim Guidance 91-RVSM (as amended); Joint Airworthiness Authorities (JAA) Temporary Guidance Leaflet 6 (TGL 6) or equivalent State documents as the basis for approving aircraft and operator programs for RVSM.

The Africa-Indian Ocean Region (AFI) has established that the task of monitoring safety in conjunction with implementation of RVSM and RNAV/RNP in the AFI Region be assigned to South Africa. Current information and RVSM approval documents, including revisions, can be found on the website maintained by the FAA, EUROCONTROL, SATMA, MIDRMA, ICAO ESAF and on individual State websites.

To access the FAA, EUROCONTROL, SATMA and MIDRMA RVSM websites, type:

www.faa.gov/ats/ato/rvsm1.htm
www.eur-rvsm.com
www.satmasat.com
www.midrma.com
www.icao.int/esaf/

The RVSM Documentation section of the FAA, EUROCONTROL websites contain guidance on aircraft/operator approval. Operators must begin coordination with the appropriate State Authority as soon as possible to ensure that they are approved to begin RVSM operations timeously

Further information on the aircraft and operator approval process, policy planning and implementation issues for RVSM can be obtained from the ARMA.

APPENDIX A

1. INTRODUCTION

- 1.1 This AIC provides information on the plan to implement a Reduced Vertical Separation Minimum (RVSM) of 1 000 ft between FL290 and FL410 inclusive in the AFI RVSM airspace. To meet the implementation schedule, operators and their aircraft are required to participate in the RVSM height keeping performance-monitoring program with RVSM MASPS compliant aircraft.
- 1.2 The intention of this Circular is to:
- provide a brief update on the progress of implementation planning;
 - re-iterate the RVSM approval requirements for operators and their aircraft;
 - specify the RVSM compliance deadlines in relation to the height monitoring requirements;
 - describe the arrangements and procedures for the height monitoring;

2. PROGRESS AFI RVSM PROGRAM

- 2.1 The AFI RVSM program will enable a significant increased en-route capacity. It is fully supported by the participating (53) States and airspace user associations, and is progressing on schedule. The other major milestone is the height monitoring program, which has already commenced and the readiness of operators to participate in this program is now critical to the AFI RVSM program.
- 2.2 ICAO has approved the amendment to Regional Supplementary Procedures - Doc 7030/4, AFI, Part 1 describing the area of applicability and aircraft requirements for AFI RVSM. The following paragraphs are an extract from the Doc 7030 amendment outlining the area of applicability for AFI RVSM.

[Extract Doc7030]

RVSM will be applicable in that volume of airspace between FL 290 and FL 410 inclusive in the following Flight Information Regions (FIRs)/Upper Information Regions (UIRs):

Accra, Addis Ababa, Algiers, Antananarivo, Asmara, Beira, Brazzaville, Cairo, Canarias, Cape Town, Casablanca, Dakar, Dar es Salaam, Entebbe, Gaborone, Harare, Johannesburg, Kano, Khartoum, Kinshasa, Lilongwe, Luanda, Lusaka, Mauritius, Mogadishu, Nairobi, N'djamena, Niamey, Roberts, Sal Oceanic, Seychelles, Tripoli, Tunis, Windhoek.

3. AIRSPACE USER REQUIREMENTS

- 3.1 State authorities have already been informed about RVSM approval and monitoring requirements and time scales through relevant State Letters), AFI RVSM Seminar, AFI RVSM Task Force Meetings, local briefings, and direct contacts with the AFI RVSM Program OFFICE (ARPO). Information has also been made available on the AFI RVSM web site (www.icao.int/esaf). This AIC re-iterates the RVSM approval requirements, and refers to those requirements as specified in the proposed amendment to Doc 7030.
- 3.2 According to the ICAO Regional Supplementary Procedures - Doc 7030/4, AFI, Part 1, the following compliance requirements apply: *[extract Doc 7030:]*

Except for State aircraft, Operators intending to conduct flights within the volume of airspace specified in section 2.1 above where RVSM is applied will require an RVSM Approval either from the State in which the Operator is based or from the State in which

the aircraft is registered. To obtain such an RVSM approval, Operators will need to satisfy the said State:

- a) That aircraft for which the RVSM Approval is sought have the vertical navigation performance capability required for RVSM operations through compliance with the criteria of the RVSM Minimum Aircraft Systems Performance Specifications (MASPS);
- b) That they have instituted procedures in respect of continued airworthiness (maintenance and repair) practices and programs; and
- c) That they have instituted flight crew procedures for operations in the AFI RVSM airspace specified in section 2.1.

Note: - An RVSM approval is not restricted to a specific region. Instead, it is valid globally on the understanding that any operating procedures specific to a given region, in this case the AFI region, should be stated in the operations manual or appropriate crew guidance

- 3.3 Detailed technical guidance material on the airworthiness, continued airworthiness, and the operational practices and procedures for the AFI RVSM airspace is provided in the Joint Aviation Authorities Administrative and Guidance Material, Section 1: General Part 3: Temporary Guidance Leaflet No.6. (generally referred to as "JAA TGL6"). Given that the technical aircraft RVSM requirements are global requirements, also guidance developed through RVSM implementation in other regions may be consulted, such as FAA 91-RVSM.
- 3.4 Operators intending to operate in AFI RVSM airspace, need to meet above approval requirements to allow the required safety & feasibility assessments required for the "go-ahead" decision. Aircraft intending to operate in AFI RVSM airspace need to participate in the height keeping performance monitoring program. To be eligible for monitoring, the above requirements a) and b) need to be met.

4. HEIGHT MONITORING

4.1 Requirement for participation in the RVSM height-monitoring program.

4.1.1 The requirement for monitoring stems from the initial RVSM feasibility studies and associated guidance as developed by the ICAO RGCSF, and is specified in ICAO Doc 9574, "Manual on implementation of a 300 m (1 000 ft) Vertical Separation Minimum between FL 290 and FL 410 inclusive". As stated in this document, to support the pre-implementation safety case, the monitoring system has been designed to provide:

- i) confidence that the safety objectives will be met when RVSM is implemented;
- ii) guidance on the efficacy of the RVSM MASPS and on the effectiveness of altimetry system modifications; and
- iii) further evidence of the stability of Altimeter System Error (ASE). (ASE stability is a premise around which the monitoring system has been designed)

To meet these objectives it is necessary to obtain a sufficient set of data across the complete range of airframes and operators flying in the AFI RVSM Area.

4.1.2 In the Doc 7030 amendment the monitoring requirement is expressed as follows:

Monitoring of flight operations in the AFI RVSM airspace shall be conducted to assess the continuing compliance of aircraft with the height-keeping performance requirements.

Note: Monitoring will be conducted in accordance with the appropriate material issued by ICAO. When notified, operators will be required to cooperate in the monitoring program

4.1.3 For AFI RVSM, South Africa (ATNS) will act as "Regional Monitoring Agency" (RMA). RVSM compliance and monitoring data will be closely co-ordinated with the NAT Central Monitoring Agency (NAT CMA) and the Asia/Pacific Approvals Registration and Monitoring Organisation (APARMO), Eurocontrol and MID RMA.

4.1.4 The height monitoring data will be input to the AFI RVSM pre-implementation safety case. This safety case will be an essential element for the "go-ahead" decision to implement RVSM. The preparation for this decision determines the monitoring and aircraft compliance time scales.

4.2 Monitoring requirements and time scales

4.2.1 The pre-implementation monitoring will take place within the existing 2000 ft VSM airspace. However, the pre-implementation safety case requires height keeping performance data which is representative for RVSM approved aircraft. Therefore aircraft can only be monitored after they have been prepared according to the RVSM MASPS airworthiness directives and are being maintained in accordance with the MASPS requirements (i.e. when complying with requirements a. and b. as quoted from Doc 7030).

Note: Aircraft which have been monitored successfully in the NAT, Europe, Middle East, Pacific RVSM and CAR/SAM monitoring programs do not need additional monitoring, and will be taken into account in determining the specific AFI RVSM monitoring requirements.

4.2.2 As referred to above, the monitoring and aircraft compliance time scales are driven by the required activities to prepare the pre-implementation safety case as input for the "go-ahead decision." This safety case requires, amongst others, height keeping performance data which is representative for operations with RVSM approved aircraft. Consequently, the number of aircraft monitored needs to be representative for the population of aircraft which will operate in AFI RVSM airspace.

4.2.3 The endorsed RVSM Program requires that operators intending to operate in AFI RVSM airspace be approved for RVSM operations Given:

- a. the need for results of the monitoring as input to this safety case, and
- b. the time which elapses between aircraft becoming eligible for monitoring and the actual monitoring, and
- c. that the capacity of the monitoring infrastructure is designed to obtain the required data over the entire pre-implementation monitoring period, and will not be able to cope with a large proportion of aircraft requiring monitoring in the last months towards RVSM implementation.

4.3 Monitoring Systems

4.3.1 The AFI RVSM monitoring system will consist of portable GPS Monitoring Units (GMUs), which would collect the required data. This system is briefly described below.

4.3.2 The GMU is a portable carry-on recording system. Using antennas fitted to the rear flight deck windows it can receive and record the GPS data which, together with ground station differential corrections provides accurate 3D aircraft positions. The GMU has been produced to meet aircraft equipment standards and will be accompanied with the appropriate documentation to allow on-board carriage and use.

4.4 Organisation of Monitoring Activities

4.4.1 As previously stated, South Africa will act as "Regional Monitoring Agency" (RMA). The information which will be obtained through the monitoring program on aircraft compliance status and measured height keeping performance will be combined with the information available at the North Atlantic Central Monitoring Agency (NAT CMA), Eurocontrol, the Asia/Pacific Approvals Registration and Monitoring Organisation (APARMO) and the Middle East RMA (MIDRMA), so as to make full use of all available data. The RMA tasks are performed by ATNS and the GMU operators.

4.4.2 For aircraft operators, the primary contact for the AFI Monitoring Program will be the AFI RMA (ARMA). For the AFI RVSM program, the ARMA will support operators (and approval authorities) on any issue related to RVSM approval and monitoring. Further, for the monitoring program the ARMA will require information on the aircraft which are intended to operate in AFI RVSM airspace, and which therefore are required to participate in the monitoring program. To this end, the ARMA will also be in contact with State approval authorities. The ARMA is based at Johannesburg Airport (for contact details see §5).

4.4.3 The ARMA will ensure the continuous operation of the monitoring systems, and will manage the measured height keeping performance data. The ARMA will be informed of any height deviations which are outside the specifications of the RVSM MASPS, which will allow the ARMA to perform follow-up activities as required. The ARMA will also ensure the availability of the measured data for the required safety assessments.

4.4.4 The portable GPS Monitoring Units (GMUs) are operated by a GMU operator contracted by ARMA. After initial agreement between ARMA and aircraft operators on the airframe(s) that are to be monitored by GMU, the aircraft operator will be contacted by the GMU operator to agree on arrangements for the monitoring flight. Based on those arrangements, the GMU operator will deal with installation and operation of the GMU on board the aircraft.

4.5 Monitoring Procedures

4.5.1 This section describes the different steps required to fulfil the AFI RVSM monitoring requirements. The procedures have been developed with the objective to make the monitoring as transparent as possible to operators.

4.5.2 Operators will provide the State authority with data on aircraft type and series, registration number, manufacturers serial number and aircraft Mode S address code (in hexadecimal format), of all aircraft that they intend to operate in AFI RVSM airspace.

4.5.3 Operators will inspect and/or modify aircraft in accordance with the appropriate RVSM airworthiness requirements and institute procedures in respect of continued airworthiness (maintenance and repair) practices and programs (e.g. as specified in JAA TGL6) in order to prepare for their aircraft for monitoring.

4.5.4 Operators will provide the State authority with any documentation that may be required for those aircraft that have been inspected and/or modified in accordance with the RVSM airworthiness documents.

4.5.5 Operators will notify the ARMA using **ARMA Form 1** (attached) or by electronic means, of all aircraft that have been modified in accordance with the appropriate airworthiness requirements and for which procedures have been instituted in respect of continued airworthiness (maintenance and repair) practices, i.e. when the aircraft are eligible for monitoring.

***Note 1:** Given the monitoring program time scales it is imperative that operators notify (using the form) the ARMA as soon as possible after an aircraft has met the requirements for monitoring.*

***Note 2:** If, for a particular airframe, the ARMA has already been informed, through a questionnaire or otherwise, that it has met the requirements to become eligible for monitoring (i.e. satisfying both items a. and b. as specified in Doc 7030.), a form for that airframe does not need to be submitted again.*

4.5.6 The ARMA will ask the operator for initial agreement for a GMU monitoring flight. Based on this agreement, arrangements will be made for the GMU operator to install and operate the system on a suitable flight in the AFI airspace. The GMU operator, on behalf of ARMA, will contact the operator to agree on GMU flight details. The GMU operator will be responsible for installation of the GMU on the flight deck. Whether the GMU operator will stay with the GMU during the measurements, is subject to the agreement with the aircraft operator.

- 4.5.7 If aberrant or anomalous height keeping performance is measured which is deemed to require follow-up, the ARMA will contact the operator to address the issue.
- 4.5.11 It is important for the ARMA to have an accurate record of a point of contact for any queries that might arise from ongoing height monitoring. Operators are therefore requested to include a completed **ARMA Form 2** with their first reply to the ARMA. Thereafter there is no further requirement unless there has been a change to the details requested on the form.

5. RVSM APPROVAL

- 5.1 Meeting the pre-requisites for monitoring, i.e. satisfying the appropriate RVSM airworthiness requirements and institute procedures in respect of continued airworthiness (maintenance and repair) practices and programs, is not sufficient for RVSM approval.
- 5.2 To obtain RVSM approval, Operators will need to satisfy the said State that all three requirements specified in Doc 7030 have been met, i.e. the requirements which make the aircraft eligible for monitoring and that they have instituted flight crew procedures for operations in the AFI RVSM airspace.
- 5.3 Once the Authority is satisfied that all the steps (ref Doc 7030) have been completed satisfactorily, an RVSM approval, with notified airframes, can be granted. This will be recorded on the State Authority RVSM Approvals database and will be shared with relevant monitoring and verification agencies, in this case for AFI RVSM the ARMA.
- 5.4 Operators and their aircraft which are approved for RVSM in another region will be considered as approved for AFI RVSM operations, on the understanding that States have ensured that those particular operators have amended their operations manuals and training program for operations in AFI RVSM airspace;
- 5.5 As explained in Par 4.2.3, RVSM approval should be obtained timeously.

6. FURTHER INFORMATION

- 6.1 Information on the RVSM program is available through the Internet by addressing the AFI RVSM Web site www.icao.int/esaf. Aircraft that are successfully monitored will be promulgated via the ARMA
- 6.2 For exchange of data on aircraft RVSM compliance status and for any information on the AFI RVSM approval and monitoring aspects, please contact the
ARMA,
Private Bag X1
Bonaero Park
1622
South Africa
Tel: [27] (11) 928-6506
Fax: [27] (11)928-6420
Email: afirma@atns.co.za
- 6.3 For any further information on policy, planning and implementation issues for RVSM in the AFIRVSM area, please contact the
AFI RVSM Program Office,
ICAO Eastern and Southern Africa Office
United Nations Accommodation
Limuru Road,
Gigiri,
Nairobi,
Kenya
Tel: [254] (20) 7622-378
Fax: [254] (20) 7623-028
Email: icao@icao.unon.org

AFI REGIONAL MONITORING AGENCY (ARMA)

ARMA forms for use in obtaining information from a State authorities and/or Service Providers

NOTES TO AID COMPLETION OF ARMA FORMS

Please read these notes before attempting to complete forms for the ARMA.

It is important for the ARMA to have an accurate record of a point of contact for any queries that might arise from on-going height monitoring. States are therefore requested to identify their National Program Manager with their first reply to the ARMA. Thereafter, there is no further requirement unless there has been a change to the information requested on the form

If recipients are unable to pass the information requested to the ARMA through the Internet, by direct electronic transfer, or by data placed on a floppy disk/CD, a hard copy must be completed.

- (1) Enter the single letter ICAO identifier as contained in ICAO Doc 7910. In the case of their being more than one identifier designated for the State, use the letter identifier that appears first.
- (2) Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "IGA". For military aircraft, enter "MIL". If none, place an X in this field and write the name of the operator/owner in the Remarks row.
- (3) Enter the ICAO designator as contained in ICAO Doc 8643, e.g., for Airbus A320-211, enter A320; for Boeing B747-438 enter B744.
- (4) Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.
- (5) Enter ICAO allocated Aircraft Mode S address code.
- (6) Date example: For October 26, 1998 write 10/26/98.
- (7) Use a separate sheet of paper if insufficient space available.

AFI REGIONAL MONITORING AGENCY (ARMA)

**POINT OF CONTACT DETAILS/CHANGE OF POINT OF CONTACT DETAILS FOR MATTERS
RELATING TO RVSM APPROVALS**

This form should be completed and returned to the address below on the first reply to the ARMA or when there is a change to any of the details requested on the form (PLEASE USE BLOCK CAPITALS).

STATE OF REGISTRY: enter State here

STATE OF REGISTRY (ICAO 2 LETTER IDENTIFIER): enter 2 letters State here

Enter the 2-letter ICAO identifier as contained in ICAO Doc 7910. In the event that there is more than one identifier for the same State, the one that appears first in the list should be used.

ADDRESS:

CONTACT PERSON:

Full Name: enter full name here

Title: enter title here

Surname: enter surname here

Initials:

Post/Position:

Telephone #: enter phone here

Fax #: enter fax here

E-mail: enter email here

Initial Reply/Change of Details (*Delete as appropriate*)

When complete, please return to the following address:

RMA Address: Mr Kevin Ewels, Manager: ARMA Private Bag X1, Bonaero Park South Africa 1622

Telephone: 27-11- 928-6433

Fax: 27-11-928-6420

E-Mail: afirma@atns.co.za

AFI REGIONAL MONITORING AGENCY (ARMA)

(FORM F3)

WITHDRAWAL OF APPROVAL TO OPERATE IN RMA RVSM AIRSPACE

1. When a State of Registry has cause to withdraw the approval of an operator/aircraft for operations within the ARMA airspace, details as requested below, must be submitted to the ARMA by the most appropriate method.
2. *Before providing the information as requested below, reference below, reference should be made to the accompanying notes (PLEASE USE BLOCK CAPITALS).*

State of Registry:

--	--

Name of Operator:

--	--	--

State of Operator:

--	--

Aircraft Type:

--	--	--	--

Aircraft Series:

--	--	--	--	--	--

Manufacturers Serial No:

--	--	--	--	--	--

Registration:

--	--	--	--	--	--

Aircraft Mode S Address Code:

--	--	--	--	--	--

Date of Withdrawal of RVSM Approval:

--	--	--	--	--	--

Reason for Withdrawal of RVSM Approval:

Remarks:

When complete, please return to the following address.

RMA Address: Mr Kevin Ewels, Manager: ARMA Private Bag X1, Bonaero Park South Africa 1622

Telephone: 27-11- 928-6433

Fax: 27-11- 928-6420

E-Mail: afirma@atns.co.za



David Chawota
General Manager