



CIRCULAR 29-2019

ARMA OBJECTIVES DUTIES AND RESPONSIBILITIES

Introduction

ARMA circular 5-2013 is presented to provide a quick reference to the ARMA objectives duties and responsibilities which are not always readily available to the Aviation Community in the RVSM environment.

Background

The requirements and procedures for the introduction of a 300 M (1 000 FT) vertical separation between FL 290 and FL 410 inclusive, generally referred to as Reduced Vertical Separation Minimum (RVSM), were developed by the Review of the General Concept of Separation Panel (RGCSP), which has since been renamed the Separation and Airspace Safety Panel (SASP). The provisions necessary for the application of RVSM have been incorporated into ICAO Annex 2 — Rules of the Air, Annex 6 — Operation of Aircraft, Annex 11 — Air Traffic Services and the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444). More detailed guidance material is provided in the ICAO Manual on Implementation of a 300 M (1 000 FT) Vertical Separation Minimum between FL 290 and FL 410 Inclusive (Doc 9574).

In order to ensure that the overall safety objectives of the Air Traffic Services (ATS) system can be met, all aircraft operating in airspace where RVSM has been implemented are required to hold an RVSM Operational Approval, issued by the State of the Operator or State of Registry as appropriate, indicating that they meet all the technical and operational requirements for such operations. This requirement, and the responsibility of States with regard to the issuance of these approvals, is specified in ICAO Annex 6, Parts I and II.

ICAO Doc 9574 states that there is a need for system performance monitoring post-implementation of RVSM. In all regions where RVSM has been implemented, regional monitoring agencies (RMA's) have been established by the appropriate planning and implementation regional groups (PIRGs) to undertake these functions. In the case of AFI the APIRG established the ARMA and continues to oversee the RMA and RVSM.

Objectives

The objectives of the RVSM monitoring programme include, inter alia:

- verification that the RVSM approval process remains effective;
- verification that the target level of safety will continue to be met;
- monitoring of the effectiveness of the altimetry system modifications which have been implemented to enable aircraft to meet the required height-keeping performance criteria;
- evaluation of the stability of altimetry system error (ASE).

Key Performance Areas

The Key Performance Areas of an RMA are summarized as follows:

- maintain databases of RVSM approvals and Height Monitoring Records;
- monitor aircraft height-keeping performance and the occurrence of LHDs and report the results appropriately;
- conduct safety assessments and report the results appropriately;
- monitor operator compliance with State approval requirements; and

- initiate necessary remedial actions if RVSM requirements are not met.

Working Principles Common to All RMA's

Maintain a database of aircraft approved by its State authority for operations in RVSM airspace in the region for which the RMA has responsibility that will also be recognised Globally. This information is necessary for two reasons:

- the RMA is responsible for verifying the approval status of all aircraft operating within its region; and
- height-keeping performance data must be correlated to an approved airframe.

This information is of vital importance if the height-keeping performance data collected by the height-monitoring systems are to be effectively utilized in the risk assessment.

Monitoring and Reporting Height-Keeping Performance and the Occurrence of Large Height Deviations must be collected by an RMA to assess the in-service technical height-keeping performance of the aircraft operating in the airspace for which it has monitoring responsibility. In addition, it must establish procedures for the collection of information concerning large deviations from the cleared flight level and operational errors caused by noncompliance with ATC instructions or loop errors within the ATC system.

The principal objectives of an RVSM monitoring programme are to provide:

- evidence of the effectiveness of the RVSM MASPS, and altimetry system modifications made in order to comply with the MASPS, in achieving the desired height-keeping performance;
- confidence that the technical TLS will be maintained after implementation
- evidence of ASE stability.

Monitoring the occurrence of large height deviations

Experience has shown that LHDs — errors of 90 M (300 FT) or more in magnitude — have had significant influence on the outcome of safety assessments before and after implementation of RVSM. RMAs play a key role in the collection and processing of reports of such occurrences.

The causes of such errors have been found to be:

- an error in the altimetry or automatic altitude control system of an aircraft;
- turbulence and other weather-related phenomena;
- the crew not following established contingency procedures during an emergency descent by an aircraft;
- the response to airborne collision avoidance system (ACAS) resolution advisories;
- not following an ATC clearance, resulting in flight at an incorrect flight level;
- an error in issuing an ATC clearance, resulting in flight at an incorrect flight level; and
- coordination errors between adjacent ATC units in the transfer of control responsibility for an aircraft, resulting in flight at an incorrect flight level.

Conducting Safety Assessments

A safety assessment consists of estimating the risk of collision associated with RVSM and comparing this risk to the agreed to RVSM safety goal, the TLS. An RMA needs to maintain an in-depth knowledge of the use of the airspace within which RVSM is implemented. It is also important that RMA personnel have sufficient understanding of the way in which an ATC system operates to enable them to correctly interpret the information from these sources.

The responsibility for conducting safety assessments continues after RVSM is introduced and in AFI is conducted at annual intervals.

Safety assessment

Preparations for the conduct of a safety assessment are time consuming and complicated with the RMA taking account of all the factors which influence collision risk within the airspace where RVSM will be applied.

RMA therefore have the means for collecting and organizing the pertinent data and other information that is needed to adequately assess all the relevant airspace factors.
Traffic flow data i.e. traffic en-route movements should be collected for the entire airspace where RVSM risk is to be assessed.

Monitoring Operator Compliance with State Approval Requirements

One important post-implementation activity is to carry out periodic checks of the approval status of operators and aircraft using airspace where RVSM is applied. This activity is especially important in FIRs or other areas of responsibility where RVSM is applied on an exclusionary basis. This activity is termed monitoring operator compliance with State approval requirements.

An RMA will require two sources of information to monitor operator compliance with State approval

Requirements:

- a listing of the operators, aircraft type and registration of aircraft operating in the airspace; and
- the database of State RVSM approvals.

Ideally, this compliance monitoring should be done for the entire airspace on a daily basis. However, difficulties in accessing traffic movement information, including flight plans, may make such daily monitoring impossible. As a minimum, the ARMA is conducting compliance monitoring of the complete airspace every 30-days.

When conducting compliance monitoring, the filed RVSM approval status shown on the flight plan of each traffic movement should be compared to the database of State RVSM approvals. When a flight plan shows an aircraft as RVSM-approved, but the approval is not recorded in the database, the appropriate State authority should be contacted for clarification of the discrepancy.

Remedial Actions

Remedial actions are those measures taken to remove causes of systematic problems associated with factors affecting safe use of RVSM. RMAs must be proactive in the identification, reporting and resolution of all causes of risk. Remedial actions may be necessary to remove the causes of problems such as the following:

- failure of an aircraft-type group to comply with group ASE requirements;
- failure of individual airframes to meet ASE compliance requirements;
- aircraft operating practices resulting in LHDs; or
- operational errors.

An RMA should design its height-keeping performance monitoring programme to provide ongoing summary information of ASE performance by aircraft-type group so that adverse trends can be identified quickly

The RMA should report to the PIRG, in accordance with agreed procedures, any issue that has an impact on the safe operation of RVSM. It is especially important that RMAs conduct an annual review of reports of LHDs with a view to uncovering systematic problems. Should such a problem be discovered, the RMA should report its findings to the body overseeing RVSM in the region i.e. the PIRG that authorised the establishment of the RMA.

Duties and Responsibilities of an RMA

The duties and responsibilities of an RMA are to:

- maintain databases of aircraft approved by the respective State authorities for operations within RVSM airspace in that region;
- receive reports of height deviations of aircraft observed to be non-compliant, based on the following criteria:
 - TVE. 90 M (300 FT); ○ ASE. 75 M (245 FT); ○ AAD. 90 M (300 FT);
- take the necessary action with the relevant State and operator to:
 - determine the likely cause of the height deviation; and ○ verify the approval status of the relevant operator;

- recommend, wherever possible, remedial action;
- analyse data to detect height deviation trends and, hence, take action as above;
- undertake such data collections as are required by APIRG to:
 - investigate height-keeping performance of the aircraft in the core of the distribution;
- establish or add to a database on the height-keeping performance of:
 - the aircraft population; ○ aircraft types or categories; and ○ individual airframes;
- monitor the level of risk as a consequence of operational errors and in-flight contingencies as follows:
 - establish a mechanism for collation and analysis of all reports of height deviations of 90 M (300 FT) or more resulting from the above errors/actions; ○ determine, wherever possible, the root cause of each deviation together with its size and duration;
 - calculate the frequency of occurrence; ○ assess the overall risk (technical combined with operational and in-flight contingencies) in the system against the overall safety objectives (see Doc 9574); and
 - initiate remedial action as required;
- initiate checks of the RVSM approval status of aircraft operating in the relevant RVSM airspace, identify non-approved operators and aircraft using RVSM airspace and notify the appropriate State of Registry/State of the Operator accordingly;
- circulate regular reports on all height-keeping deviations, together with such graphs and tables necessary to relate the estimated system risk to the TLS, employing the criteria detailed in Doc 9574, for which formats are suggested.
- submit annual reports to APIRG.
- Manage/Participate in TAG/AIAG/Scrutiny Group
- Attend and submit relevant papers to the Global RMA Coordination meeting.
- Receive reports of non-compliance (Doc 9869 refers) with RSP180 and RCP240 from AFI ANSPs and transmitting reports to the respective RMA associated with the State of the respective operator/aircraft.
- Receive and maintain records of RCP and RSP approvals issued by States of Operator/Registry associated with current State responsibility and incorporating into expanded RVSM/PBCS approvals database and follow-up as appropriate instances of non-approved aircraft being identified in PBCS airspace. This would be determined by augmenting the existing monthly RVSM approvals check to incorporate a similar check against PBCS Approvals where these have been included in the flight plan but no approvals record is held by RMAs;
- Sharing records of RCP and RSP approvals between RMAs in line with current sharing practices of RVSM approvals for the ability of States/ANSPs to verify that aircraft operators filing PBCS capabilities in the flight plan are authorized to do so.