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International Civil Aviation Organization
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Transition to the CNS/ATM Systems in the CAR and SAM Regions

Third Meeting/Workshop of Air Traffic Management (ATM) Authorities and Planners
(Lima, Peru, 20.24 May 2002)

Agenda Item 4: Analysis of the Action Plan for RVSM Implementation in the CAR/SAM Regions

RVSM Action Plan

(Presented by the Secretariat)

Summary

This working paper presents the Action Plan for the implementation of RVSM in the CAR/SAM Regions.

References:

- Report of the CAR/SAM RAN/3 Meeting
- CAR/SAM ANP -FASID
- Report of GREPECAS/10
- UNDP/ICAO RLA /98/003 Project
- Doc. 9574, RVSM Manual
- Doc. 9613, RNP Manual
- Doc. 9689, Manual on Airspace Planning Methodology for the determination of Separation Minima
- Doc. 4444 – Air Traffic Management

1 Introduction

1.1 Implementation of the reduced vertical separation minima (RVSM) in the North Atlantic, Asia-Pacific, South Atlantic (SAT) EUR/SAM corridor and recently in the WATRS region (Western Atlantic Route System) has clearly shown its advantages and that it undoubtedly represents the best possible solution for increasing the availability of optimum flight levels.

1.2 The Third CAR/SAM RAN Meeting instructed the CAR/SAM Regional Planning and Implementation Group (GREPECAS) to conduct studies and evaluate the need for and benefits from the implementation of a reduced vertical separation minimum (RVSM) in the CAR/SAM Regions.

1.3 The GREPECAS/10 meeting (Las Palmas, Canary Islands, Spain, October 2001), considering that RVSM application in the two Regions would allow for better airspace use, with the resulting economic benefits for air transportation, decided that RVSM implementation in the CAR/SAM Regions should begin in April 2004.

1.4 The Fourth Co-ordination Meeting for the UNDP/ICAO RLA/98/003 Project, "Transition to the CNS/ATM Systems in the CAR and SAM Regions" (Lima, Peru, December 2001) decided to extend the scope of its activities to include the preparation and execution of measures aimed at helping States to implement RVSM in the CAR/SAM Regions.

2 Analysis

2.1 According to the analysis made by Project RLA/98/003 of the main traffic flows identified by GREPECAS, there are already some airspace sectors that experience traffic congestion, particularly during peak periods and peak hours, and, as a result, a significant number of aircraft do not operate at their optimum flight levels. This is having a negative effect on the efficiency of air operations.

2.2 In light of the need to increase airspace capacity, the Third CAR/SAM RAN Meeting acknowledged that the uniform application in an ATS route structure of the most reduced longitudinal separation minima available in several flight information regions (FIRs) would contribute to more efficient use of the airspace. Consequently, most of the ACCs in the CAR/SAM Regions are already applying 10-minute MNT and 80 MN RNAV longitudinal separation minima.

2.3 Nonetheless, according to information supplied by the States and the analysis made by Project RLA/98/003, the increase foreseen in air traffic will raise the percentage of aircraft that do not operate at their optimum flight levels, and these longitudinal separation minima will not be sufficient to increase the airspace capacity and the availability of optimum flight levels to meet the demand in the CAR/SAM Regions.

2.4 The en-route ATM evolution for the CAR/SAM Regions has been planned bearing in mind, first, improvements that could be implemented homogeneously on the basis of existing systems and the technology that aircraft have available at present. According to information provided by IATA, a large percentage of airlines with aircraft operating in the CAR/SAM Regions already have RVSM operational approval and certification, respectively, and, therefore, the application of reduced separations using RVSM is one of the available alternatives for obtaining this necessary increase in airspace capacity. (*Doc. 9574, Manual for the Implementation of a 1000-ft Vertical Separation Minimum between FL 290 and FL 410, inclusive,* details the requirements applicable to all aircraft that want to operate in a RVSM airspace.)

2.5 Safe implementation of RVSM in the CAR/SAM Regions requires the establishment of safety management measures; this includes, among other steps, an airspace safety assessment before implementing and establishing an airspace surveillance programme that will guarantee maintenance of the required safety level. (*Doc. 9689, Manual on the Airspace Planning Methodology for Determining Separation Minima* offers a detailed description of the aspects related to the implementation process.)

2.6 Consequently, considering the many parameters that need to be examined in order to implement the CNS/ATM systems, it is advisable during said process to gradually introduce the elements needed for an evolutionary transition while operational experience is gained and operational and economic benefits are obtained, and, at the same time, to maintain or raise the required safety levels.

2.7 In this regard, the meeting should also consider aspects concerning the costs involved in said programme, as well as the benefits expected as a result of said implementation. There will be costs that will have to be financed by the administrations involved, as well as by the operators.

2.8 Appendix A to working paper 8 (WP/8) sets out the Action Plan for the Implementation of RVSM in the CAR/SAM Regions, which describes the activities that should be carried out by the States, GREPECAS, the Regional Monitoring Agency, the body that will assess safety, the users, IATA and ICAO. It also shows the target dates for completion of said activities. The dates included in this Plan are tentative and are meant as reference. In light of the agreements reached during the meeting, this Action Plan should be revised and any relevant modifications made.

2.9 **Appendix A** to this working paper shows some requirements that should be met before implementation.

3 Suggested action

3.1 The meeting is invited to examine the Action Plan for the Implementation of RVSM in the CAR/SAM Regions and, if applicable, to propose any changes it deems appropriate.

Appendix A

Prerequisites for RVSM implementation

1. Identification of the operational need

- Traffic congestion during “peak” periods and hours;
- Aircraft that do not operate at their optimum flight levels;
- Fuel consumption

2. Impact on airspace

- Simultaneous operation of aircraft with RNAV equipment and aircraft not RNAV-equipped and/or that do not meet the requirements , and application of the same ATS procedures, especially the longitudinal separation minima;
- Availability of more optimum flight levels;
- Need for better airspace sectorising;
- Establishment of RVSM transition airspaces;
- Sectorising of RVSM transition airspaces;

3. Impact on Air Traffic Services

- Normal and contingency ATS procedures in RVSM airspace;
- ATS procedures in RVSM transition airspace;
- *Ad-hoc* procedures for ACAS contingencies;
- Appropriate amendments to the CAR/SAM Regional Supplementary Procedures;
- Training of ATC personnel;
- ATC workload;
- Reduction in the number of incidents;
- Increased safety of air operations

4. Impact on aircraft fleet

- Aircraft with RVSM equipment that meets the requirements;
- Installation/streamlining of *ad-hoc* ACAS equipment for RVSM airspace;
- State approval of RVSM equipment

5. Impact on the crew

- Normal and contingency operational procedures;
- Crew training;
- *Ad-hoc* training in the use of ACAS in RVSM airspace

6. Cost-benefit analysis

- Air traffic forecasts;
- Reduction of traffic congestion;
- Greater availability of optimum flight levels;
- Reduced delays;
- Fuel and flight time savings;
- Financial feasibility

7. Impact on civil aviation administrations

- Implementation planning;
- Establishment of a method for assessing airspace safety, considering the desired safety level of 5×10^{-9} established by the Third CAR/SAM RAN Meeting;
- Establishment of a Central Altitude Oversight and Surveillance Agency during the pre-operational trial phase to ensure compliance with pre-determined safety criteria;
- Modification of the proposed system parameters after the trial phase, if necessary;
- Operational implementation;
- Maintenance of altitude and safety oversight and surveillance