



FIFTH MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 23 – 24 March 2006)

Agenda Item 5.1: Funding for regional safety monitoring agencies for reduced vertical separation minima (RVSM), required navigation performance (RNP) and automatic dependent surveillance-contract/controller-pilot data link communications (ADS-C/CPDLC)

THE NEED FOR A MECHANISM TO COORDINATE RVSM MONITORING ISSUES

(Presented by the Secretariat)

SUMMARY

This paper presents an overview of the role of Regional Monitoring Agencies (RMA) in ensuring that the monitoring programme meets agreed safety targets. It also proposes measures to enable coordination between the RMAs that would improve the effectiveness of RVSM monitoring, and highlights issues that need to be resolved.

Action by ALLPIRG/5 is in paragraph 5.

1. INTRODUCTION

1.1 Requirement for monitoring

1.1.1 The requirements to carry out post-implementation monitoring in airspace where reduced vertical separation minimum (RVSM) has been implemented are contained in Annex 11 — *Air Traffic Services* (paragraphs 2.26.4 and 3.3.4.1 refers). The methodology and responsibilities of a Regional Monitoring Agency (RMA) are contained in ICAO *Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive* (Doc 9574) (2nd Edition).

1.1.2 In accordance with Doc 9574, the overall responsibility for deciding that RVSM should be implemented and continued rests with the planning and implementation regional group (PIRG). The Organization and overall control of the system and height-keeping performance monitoring mechanisms also rests with the PIRG.

1.2 Background – Previous RMA meetings

1.2.1 A meeting of the EUR and NAT RMAs, with the participation of the United States, was held in Brussels from 24 to 25 January 2001 with the principal objective of harmonising efforts being carried out by the monitoring agencies. Subsequently, a Special Meeting of all the existing and planned RMAs was held in Montreal from 4 to 7 November 2002. The meeting was convened in follow up to ALLPIRG Conclusion 4/6. The principal objective was to address the issues identified by the ALLPIRG and to initiate the development of a roadmap that would facilitate improved co-operation and co-ordination between all RMAs. The main deliverable of the meeting was a draft RMA handbook.

1.2.2 Another meeting of the RMAs was held in Paris from 10 to 11 February 2003 in order to finalise the draft RMA Handbook. The final outcome of the RMA meetings was a *Handbook for a Regional Monitoring Agency Supporting Implementation and Continued Safe Use of the Reduced Vertical Separation Minimum*, which was finalised in August 2003. A copy of the Table of Contents is at the Appendix. The purpose of the handbook is to provide a set of working principles common to all RMAs and to lay down the guidelines for the exchange of information between the RMAs. It was not intended to provide exhaustive guidance on how to operate an RMA. The handbook has not yet been published.

2. DISCUSSION

2.1 The role of the Regional Monitoring Agency

2.1.1 Monitoring should provide the mechanism to identify "rogue" height deviations and to take necessary actions with the relevant State and operator to determine the likely cause of the height deviation. It should also provide the ability to verify the approval status of the relevant operator and to recommend, wherever possible, remedial action. The RMA has a significant role to play in all aspects of the monitoring process, but one of its priorities is the establishment of a database of aircraft approved by the State authorities. This is an essential part of the monitoring process because this information is crucial if the height-keeping performance data collected by the monitoring systems is to be used in the risk assessment.

2.1.2 It is evident that the collection and, more importantly, sharing of information between RMAs is extremely important. Without this exchange of data, some RMAs would not be able to compile their annual safety assessment for their PIRG. The alternative would be to install a monitoring infrastructure in each region and for each region to maintain its own database, a very costly proposition and, in some instances an impractical one.

2.2 Current issues

The need to exchange monitoring data between regions

2.2.1 The EUR and NAT Height Monitoring Units (HMU), together with those in North America, are able to obtain data that can be used in a number of RVSM safety cases. At present the NAT, EUR and North American data is shared. There are issues associated with the compatibility of data, technical performance of the monitoring systems and the legal responsibilities for the exchange and use of data that need to be addressed to ensure that there is a commonly agreed process for the exchange of information in order to avoid unnecessary repetitive monitoring.

Exchange of data on aircraft performance

2.2.2 To bring the monitoring systems together, it is imperative that "rogue" measurements obtained in one region are shared amongst all regions in order to improve the quality of the risk analysis

that is presented to the PIRG. Furthermore, it is necessary to ensure that incident reports are correctly disseminated so that they can be analysed by the appropriate RMA and that the State concerned is informed. Without this exchange of information, remedial action may be problematic.

Altimetry System Error (ASE)

2.2.3 In deciding that RVSM could be implemented, the understanding was that ASE would be stable. The experience of both the NAT and EUR Region's monitoring is that, whilst this is true in the medium term, there is a day-to-day variation in performance and there is a long-term drift in performance. This matter needs to be resolved.

Monitoring infrastructure

2.2.4 For both the NAT and EUR Regions, the main source of height monitoring data has been the ground based HMUs. These have provided the bulk of recordings used because it is possible to monitor some airframes many times in one year. However there remain some airframes, which never pass over the HMU in normal service. For these the carriage of a GPS Monitoring Unit (GMU) continues to be required. The HMUs are considered vital to the long term monitoring and, given that there is no other means at present of detecting the actual performance of aircraft with the precision required for RVSM, it is considered necessary to ensure continued operation of the HMUs. There is however, an expectation that the availability of Global Navigation Satellite Systems (GNSS) and data link could provide a means monitor RVSM operations with sufficient precision to avoid the need for HMUs. The unnecessary proliferation of HMUs needs to be avoided, as they are costly.

Collision risk model

2.2.5 The current Collision Risk Model (CRM) was developed several years ago for an environment that has since changed. The CRM has to be kept under review and updated as required to meet changing requirements, such as the implementation and use of data link technologies.

Different monitoring requirements between regions

2.2.6 The experience in the EUR Region has identified the need for repeated monitoring to ensure that the altimetry errors can be detected and corrected. The density of operations and nature of operations between regions may place less demands upon the technical performance for a specific region. Again, this type of information needs to be shared amongst all of the RMAs to ensure that the risk analysis is appropriate for their environment.

3. CONCLUSION

3.1 Monitoring RVSM operations will remain as a requirement for the foreseeable future and the only current effective method of carrying out this function is using ground based HMUs, data input from States or ANSP and an analysis cell within an RMA. The lack of a global coordination mechanism is an impediment to the smooth and economic functioning of RVSM operations. Different monitoring requirements in different regions can cause confusion for the operators and add costs to the monitoring function. In addition, there is no mechanism for the RMAs to coordinate necessary changes to the monitoring requirements to cater for the increases in traffic and the changing environment such as route structures and the implementation of surveillance. Furthermore, no forum exists for the RMAs to exchange information on operational experience, monitoring data and best practices.

3.2 Global planning mechanisms, such as panels and study groups, are not structured to address the day-to-day needs of the RMAs because they are mainly structured to develop SARPS, PANS

or to address a specific issue. RMAs are operational units that serve their respective PIRG. However the PIRG itself is not equipped to ensure global coordination. Therefore, another mechanism needs to put in place.

4. **RECOMMENDATION**

4.1 In is proposed that global coordination between the various RMAs would meet the objective to allow them to exchange operational information, monitoring data and best practices. It should also provide a forum for the RMAs to ensure that monitoring requirements were uniform and not regional as is sometimes the case. This should remove any confusion from the operators, offer the possibility of economies and improve the efficiency of the monitoring process itself. From a safety view, the availability of more and better quality data should allow the RMAs to provide their PIRG with more accurate information about the level of risk in the system therefore allowing them to make more informed decisions about any mitigation that would need to be put in place.

4.2 To accomplish the above task, the RMAs should meet in order to establish a coordination mechanism. One of the tasks of the meeting would be to update the RMA Handbook. Because the ICAO EUR/NAT Office already liaises with two RMAs, and Canada and the United States are represented in the NAT CMA, it is suggested that the it acts as the initial focal point. It is further suggested that the RMA Handbook be maintained by the RMAs, that it be accessed through the EUR/NAT web site and that appropriate hyperlinks be made to the document from other sites.

Draft Conclusion 5/x – Coordination between regional monitoring agencies

That the ICAO EUR/NAT Office act as the initial focal point for the required coordination between regional monitoring agencies (RMA) in order to:

- a) facilitate the exchange of monitoring and operational data between RMAs;
- b) facilitate the exchange information about best practices between RMAs;
- c) ensure that incident reports are correctly disseminated to the appropriate RMA;
- d) provide a forum to manage changes to monitoring requirements; and
- e) ensure the maintenance of the RMA Handbook.

5. **ACTION BY ALLPIRG**

5.1 The ALLPIRG/5 Meeting is invited to:

- a) note the information provided in this working paper; and
- b) endorse the draft conclusion in paragraph 4.2.

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APPENDIX

TABLE OF CONTENTS

PART 1

1. INTRODUCTION

- 1.1 Background
- 1.2 Purpose of the Handbook
- 1.3 General Description of RMA Functions
- 1.4 Experience With the Role of the RMA in RVSM Implementation and Use
- 1.5 Standards for Establishment and Operation of an RMA

List of Abbreviations and Acronyms

List of Definitions

PART 2

2. WORKING PRINCIPLES COMMON TO ALL REGIONAL MONITORING AGENCIES

- 2.1 Establishment and Maintenance of an RVSM Approvals Database
- 2.2 Monitoring and Reporting Aircraft Height-Keeping Performance and the Occurrence of Large Height Deviations

Monitoring Aircraft Height-Keeping Performance

Monitoring the Occurrence of Large Height Deviations

- 2.3 Conducting Safety and Readiness Assessments and Reporting Results before RVSM Implementation Safety Assessment

Establishing the Competence Necessary to Conduct a Safety Assessment

Preparations for Conduct of a Safety Assessment

Review of operational concept

Agreed Process for Determining Whether the TLS is Met as the Result of a Safety Assessment

Collision Risk Model Used in Safety Assessment

Readiness Assessment

- 2.4 Safety Reporting and Monitoring Operator Compliance with State Approval Requirements after RVSM Implementation
- 2.5 Remedial Actions

LIST OF APPENDICES

- APPENDIX A – Regional Monitoring Agency Duties and Responsibilities
- APPENDIX B – States and Cognizant RMA for the reporting of RVSM approvals
- APPENDIX C – RMA forms for use in obtaining record of RVSM approvals from a State authority
- APPENDIX D – Minimal informational content for each State RVSM approval to be maintained in electronic form by an RMA
- APPENDIX E – Minimum Monitoring Requirements
- APPENDIX F – Sample letter to an Operator of an aircraft observed to have exhibited an altimetry system error in excess of 245 ft in magnitude
- APPENDIX G – Minimum information for each monitored aircraft to be maintained in electronic form by an RMA
- APPENDIX H – Altimetry System Error Data and Analysis to be provided to State and Manufacturer by an RMA
- APPENDIX I – Suggested Form for ATC Unit Monthly Report of Large Height Deviations
- APPENDIX J – Sample Content and Format for Collection of Sample of Traffic Movements
- APPENDIX K – Description of Models Used to Estimate Technical and Operational Risk
- APPENDIX L – Letter to State authority requesting clarification of the approval State RVSM Approval Status of an Operator
- APPENDIX M – Guidance to Reduce Minimum Monitoring Requirements
- APPENDIX N – Information on the merits of HMU and GMU Monitoring Systems

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