

**AERONAUTICAL SURVEILLANCE PANEL (ASP)
Working Group**

Fourth Meeting

Bangkok, Thailand, 19-23 May 2008

Proposed Changes to ACAS Manual in relation to Effect of RVSM

Presented by Shigeru Ozeki (ENRI)
Prepared by Yasuto Sumiya (ENRI), Shigeru Ozeki (ENRI),
Masayuki Shirakawa (ENRI) and Kenji Miyabe (JCAB),
Garfield Dean (EUROCONTROL)

SUMMARY

This paper proposes an amendment of ACAS manual on the compatibility between ACAS logic and RVSM (Reduced Vertical Separation Minima) airspace. This proposal is based on the RA monitoring results from pilot reports about the effect of introduction of RVSM in Japan. The original proposal was amended at ASSG meeting to cover the monitoring results in other airspaces with referring the ACAS monitoring activities with various data sources including SSR mode S statistics in Europe. It contains amendment proposal to ACAS manual with respect to the effect of RVSM.

Reference:

- [1] Y.Sumiya, et al. : " ACAS II Operational monitoring report on the effect of RVSM in Japan", ASP04-XX, presented in Bangkok, May 2008
- [2]

1. Introduction

This paper proposes an amendment of ACAS manual on the compatibility between ACAS logic and RVSM (Reduced Vertical Separation Minima) airspace. This proposal is based on the RA monitoring results from pilot reports about the effect of introduction of RVSM in Japan. The results of this monitoring activity have been reported to the WG meetings of SCRSP and ASP.

The operational monitoring in Japan has provided the RA statistics before and after the introduction of RVSM airspace in Japan. The introduction of RVSM air structure into Japanese airspace was on September 2006. It is after the introduction of ICAO ACAS compatible units and also after the operational evaluation for them with more than three years. An operational evaluation for TCAS II was implemented in Japan from 1990. The operational evaluation made the transition to an actual operational monitoring for TCAS II after the official operation of ACAS II started from January 1996. The upgrade from TCAS logic version 6.04A to version 7 began on 2000. All TCAS II aircraft had been equipped with version 7 to be ICAO compatible by January 2003. The ICAO ACAS II logic is made to be compliant with RVSM.

Since it is important to investigate the consistency between ACAS logic and the operation in the RVSM airspace, the operational monitoring has been focusing on the effect of introduction of RVSM in Japan.

2. Needs for Amendment

ACAS Manual contains description of the safety assessment. However, there is no description in this section about the consistency between ACAS algorithms and the operation in the airspace introduced RVSM.

Therefore, we proposed the amendment in relation to the effect of RVSM to the safety assessment in ACAS Manual.

The original proposal was amended at ASSG meeting in Toulouse, March 2008, to cover the results in other airspaces.

3. Proposed Manual

4.4 AIRSPACE DESIGN CONSIDERATIONS

4.4.1 RVSM

...

4.4.1.3

The ACAS logic is designed to be compatible with the RVSM airspace structure. Even so, the relative frequency of different RA may vary with the introduction of RVSM structure into the airspace under ACAS operation. For example, a smaller proportion of RA are “climb” or “descend”. These changes are quite acceptable. It is also acceptable when the frequency of RAs above FL290 is observed to increase with RVSM introduction to a similar rate as in CVSM

The above statistical changes were observed by ACAS operational monitoring based on pilot reports and Mode S data.

#####