

**AERONAUTICAL SURVEILLANCE PANEL (ASP)**

**AIRBORNE SURVEILLANCE SUB-GROUP  
THIRD MEETING**

**Paris, September, 2008**

**ASSG Agenda Item: ACAS**

**Update for ACAS manual on the phantom RA  
by transponder test facilities**

(Presented by Shigeru Ozeki)  
(Prepared by Shigeru Ozeki)

**SUMMARY**

This working paper provides the draft amendment to chapter 10 of ACAS manual, especially for the update of information on phantom RAs. This paper is generated to react to the action items for ASSG which is generated at the ASP/WG fourth meeting on May 2008.

The WG tasked ASSG to develop changes to ACAS Manual based on the discussions at the WG meeting. The discussion in the WG meeting results that the ACAS manual needs to be reviewed, if it needs to be amended with referring to WP ASP04-48.

**References**

- [1]. ICAO/ASP/WG: "Draft Report of the 4th Meeting (Draft A)", ASP/WG #4, June 2008
- [2]. ICAO: "AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS) MANUAL", draft edition, December 2005.
- [3]. Christoph Gilgen: "TRANSPONDER TESTING ON GROUND TRIGGERING TCAS NUISANCE RAs", ASP/WG#4, WP ASP04-048, May 2008.

## 1. Introduction

1.1 The list of tasks for ASP/ASSG was generated at ASP/WG4 meeting in Bangkok on May 2008. The list includes the task on amendments to the ACAS manual. This paper explains the results of review of the ACAS manual to react to the later part of following action item.

New Action ASP04-12: ASSG to develop changes to ACAS Manual based on ASP04-21 (Rev 1) - note this should be done in conjunction with other ACAS Manual amendments.

1.2 The discussion in the WG meeting results that the ACAS manual needs to be reviewed, if it needs to be amended with referring to WP ASP04-48 or not.

## 2. Issues in ASP04-48

2.1 The WP ASP04-48 reports the incidence in Europe on the phantom RAs caused by the transponder test facilities and its operation with new requirements.

2.2 The incidents are also reported with the Eurocontrol "Safety Warning Message" dated February 27, 2008. Unfortunately, the message does not include the ACAS manual to its list of references even the ACAS manual has the explanation of risk for phantom RAs with transponder test facilities in its 10.2.12.1 for the first reason.

2.3 The publication of ACAS manual is required to avoid the lack of information on ACAS. On the other hand, it is hard to reach that section for readers searching without the key words "phantom RAs".

2.4 The author of WP ASP04-48 indicates that the transponder test facilities do not change the operational procedure by some reasons even with the Eurocontrol "Safety Warning Message". The WP ASP04-48 recommends as follows in its 3.3.

"3.3. The following suggestions and recommendations are put in from of the ASP-Panel and ICAO for consideration, and possibly action:  
- Initiation of an ICAO-information to all member States advising of the reported and identified safety risks of transponder testing in the "in-flight mode" and with using simulated altitudes;  
- Ask for States feedback and their suggestions of how best to enforce the "shielding" of transponder antennas when aircraft transponders are tested on ground;  
- To initiate a consultation process within ICAO in order to find out if the establishment of ICAO SARPS (with dedicated and clear provisions) addressing the "testing of the aircraft transponders on ground" is the best, safest and most efficient way to go forward and address this identified safety issue?."

2.5 The incidence reported in the WP ASP04-48 will be a reference to explain the example of phantom RAs.

3. **Recommendations**

3.1 ASSG members are invited to note that the reported issue in the WP ASP04-48 is an example for the case that ICAO provisions on ACAS related information is required by publishing the ACAS manual.

3.2 ASSG members are invited to review the change proposal and draft amendment to the ACAS manual in the attachment to this paper, if an example for the phantom RA is required.



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**Proposed change to: Annex 10**

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Submit to: Rapporteur ASP Working Group

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1. Change No TBD Date submitted: September 2008

*Title:* ACAS manual CP to update on the phantom RAs and on-the-ground operations

2. List of all relevant ASP Working Papers: ASP04-48

3. Background:

The ACAS manual refers other ICAO documents, for example, to explain the iterations with other equipments including ATC transponders and their test facilities. The ASP/WG members pointed out during the discussion on the paper ASP04-48 that ICAO have the chance with amending the ACAS manual to provide the guidance for the control of phantom RAs caused by the transponder test facilities.

4. Need for change:

- To provide the information for the implementation of safe and effective ACAS operation with explaining the potential false interactions between ACAS and other equipments.

5. Change: By adding new lines as 10.2.12.2 after 10.2.12.1.f).

## **CHAPTER 10**

### **ACAS-RELATED TRANSPONDER PERFORMANCE MONITORING**

#### **10.2 Transponder issues and their impact on ACAS.**

##### 10.2.12 Phantom RAs

10.2.12.1 The following activities can cause TCAS to establish tracks and issue phantom RAs.

a) transponder repair stations located near airports transmitting altitudes during transponder testing without proper shielding;

f) corruption of Mode C replies, e.g., aircraft operating in formations causing synchronous garble, or transponders operating with out of specification pulse width.

10.2.12.2 Phantom RAs may cause incidents on ACAS equipped aircraft. For example at an airport in Europe in 2008, the aircraft experienced a “Descend RA” just after its departure. The aircraft descended several hundred feet before climbing again, and this resulted in a “Slats over-speed warning” before the flaps could be retracted. The RA was phantom and was generated by a transponder test facility close to the airport. The facility was testing the altitude information in reply signals without sufficient shielding for the transponder antenna. The altitude in the reply was close to that of ACAS equipped aircraft on departure.

6. Category: (confirmed by Rapporteur)

1. Addition - new material e.g. new GICB, MSP, or Broadcast.
- X2. Update - technical change or correction to current document.

3. Useful - will enhance understanding of the document.
4. Cosmetic - needed to correct editorial error.

Submitted by: ASP Airborne Surveillance Subgroup

Organisation: ASP

Address: ICAO

