



International Civil Aviation Organization

**Thirteenth Meeting of the APANPIRG ATS/AIS/SAR Sub-Group
(ATS/AIS/SAR/SG/13)**

Bangkok, Thailand, 23 – 27 June 2003

Agenda Item 3: Review and progress the tasks assigned to the ATS/AIS/SAR/SG by APANPIRG

**CARRIAGE AND OPERATION OF PRESSURE-ALTITUDE TRANSPONDERS
AND AIRBORNE COLLISION AVOIDANCE SYSTEMS II (ACAS II)**

(Presented by the Secretariat)

SUMMARY

This paper presents an update on the status of States' implementation plans for the mandatory carriage of pressure-altitude reporting transponders and ACAS II in the Asia/Pacific Region. Information is also provided on proposed consequential amendments to the MID/ASIA and PAC *Regional Supplementary Procedures* (Doc 7030/4) in respect to ACAS II, and the results of a European study on ACAS II operations in the European environment.

1. INTRODUCTION

1.1 The second and latest survey on the States' implementation plans for the mandatory carriage of pressure-altitude reporting transponders and ACAS was conducted by the Asia/Pacific Regional Office in August 2000 and the results presented to APANPIRG/12. This survey was intended to obtain detailed information clearly differentiating between the implementation plans for the carriage and operation of pressure-altitude reporting transponders and those of ACAS II.

1.3 The APANPIRG/13 updated the status of the implementation plans for the mandatory carriage and operation of pressure-altitude reporting transponders and ACAS II. This is shown at **Appendices A and B** respectively to this paper.

1.4 As a consequence to amendments to SARPS and PANS in regard to ACAS provisions and operating procedures, a proposed consequential amendment to the *Regional Supplementary Procedures* (SUPPS, Doc 7030) will be presented to the Air Navigation Commission.

2. DISCUSSION

Carriage and operation of pressure-altitude reporting transponders and ACAS II

2.1 The meeting is reminded that APANPIRG/12 considered it necessary that situations where States had not established the requirement for the carriage and operation of pressure-altitude reporting transponders specified as a Standard in Annex 6, be listed as a "Deficiency".

2.2 From 1 January 2003, Annex 6 requires aeroplanes that have a maximum certificated take-off mass in excess of 15000 kg or that are authorized to carry more than 30 passengers shall be fitted with ACAS II. With effect from 1 January 2002, all aeroplanes shall also be equipped with a pressure-altitude reporting transponder as required in ICAO Annex 10, Volume IV.

2.3 The APANPIRG/13 meeting re-emphasized the critical importance of aircraft not equipped with a pressure reporting transponders not being permitted to share airspace used by aircraft equipped with ACAS. The performance of ACAS is totally dependant on all aircraft in the vicinity being equipped with pressure-altitude reporting transponders, in order to detect conflicting traffic and issue a Traffic Advisory (TA) or Resolution Advisory (RA).

2.4 The meeting in reviewing the status of ACAS II implementation should bear in mind that TCAS Version 6.04a was not designed for an RVSM environment and is not compatible with RVSM. However, ACAS II (TCAS Version 7.0) has improved compatibility with RVSM.

2.5 Information is provided in **Appendix C** on the results of a study carried out in Europe in 2001 by the Centre d'Etudes de la Navigation Aérienne (CENA) along with the Eurocontrol Experimental Centre (EEC) and the Defence Evaluation Research Agency (DERA) on ACAS/RVSM interaction in the European environment. The study shows the importance for aircraft to operate TCAS version 7.0 and not version 6.04a in RVSM. A copy of the report can be obtained on www.eurocontrol.fr/ba_saf/acas/

Consequential amendment to Regional Supplementary Procedures (Doc 7030)

2.6 On 1 May 2003 Amendment 12 to the fourth edition of the PANS/OPS, Volume I ? *Flight Procedures* (Doc 8168) was approved by the Ai Navigation Commission. Requirements for carriage and operation of ACAS will be incorporated in Annex 6 ? *Operation of Aircraft, Part I ? International Commercial Air Transport ? Aeroplanes*, while the procedures related to the responsibility for separation of aircraft during ACAS manoeuvres and ACAS performance monitoring have been incorporated in the PANS-ATM (Doc 4444), Chapter 15. As a consequence, a proposal for the consequential amendment of the SUPPS (Doc 7030), which will delete some of the current provision in the SUPPS will be presented to the Commission. The proposed amendment to the MID/ASIA and PAC SUPPS is shown at **Appendix D**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) update the information on the implementation plans for the mandatory carriage and operation of pressure-altitude reporting transponders and ACAS contained in the tables at Appendices A and B respectively;
- b) note the information on aircraft operating with TCAS II version 7.0 compared to version 6.04a in Appendix C;
- c) note the information on the consequential amendment to the Regional Supplementary procedures in regard to ACAS II in Appendix D; and
- d) consider further action required by States and/or ICAO to facilitate the implementation of the requirements for pressure-altitude reporting transponders and ACAS II (TCAS II version 7.0) in the Asia/Pacific Region, in particular in regard to RVSM operations.

APPENDIX A

**SECOND SURVEY ON CARRIAGE AND OPERATION OF ACAS AND PRESSURE-
ALTITUDE REPORTING TRANSPONDERS**

(AP-ATM0551dated 17 August 2000)

(Appendix F to the Report on Agenda Item 2.1 APANPIRG/13)

AIRBORNE COLLISION AVOIDANCE SYSTEMS

APPENDIX B

**SECOND SURVEY ON CARRIAGE AND OPERATION OF ACAS AND
PRESSURE-ALTITUDE REPORTING TRANSPONDERS
(AP-ATM0551 dated 17 August 2000)**

(Appendix F to the Report on Agenda Item 2.1 APANPIRG/13)

PRESSURE-ALTITUDE REPORTING TRANSPONDERS

APPENDIX C

**EXTRACT FROM THE EUROPEAN ACAS PROGRAMME ACASA PROJECT
(Work Package 3, September 2001)**

FINAL REPORT ON ACAS/RVSM INTERACTION

APPENDIX D

**PROPOSED CONSEQUENTIAL AMENDMENT TO THE MID/ASIA AND PAC
REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030) IN REGARD TO THE
AIRBORNE COLLISION AVOIDANCE SYSTEMS (ACAS)**

2nd Survey on Carriage and Operation of ACAS and Pressure-Altitude Reporting Transponders

(AP-ATM0551 dated 17 August 2000)

Editorial note: Changes are arranged to show "deleted text" using strikeout (~~text to be deleted~~), and "new text" in bold Italics (***new text to be inserted***).

Pressure-Altitude Reporting Transponders

State/Territory	Effective date (dd/mm/yy)	Applicable airspace	Applicable to			Aeronautical Publication
			aeroplanes engaged in international air transport operations	aeroplanes engaged in international general aviation operations	helicopters engaged in international commercial air transport or international general aviation operations	
Australia	Early 1990's	Controlled airspace inside radar coverage	YES	YES	YES	AIP
Bangladesh						
Bhutan						
Brunei Darussalam	1-Jul-01	Brunei terminal control area	YES	YES	YES	
			* State aircraft as well			
Cambodia	1-Jan-03	All airspace within FIR				
China	31-Dec-00 01-1-02	All airspace within FIR	YES	YES	YES	To be published as AIC 05/2001
Hong Kong,China	1980	Controlled airspace within Hong Kong FIR	YES	YES	YES	AIP Hong Kong GEN 1.5-2
Macau, China	2-Jan-97	Controlled airspace within Macau ATZ	All aircraft flying within Macau ATZ			AIP Macau GEN 1.5-1 dated 2 Jan 1997
Cook Islands						
DPR Korea						
Fiji						
France (French Polynesia)	23-Jan-03	All airspace within FIR	YES	YES (All aircraft in general aviation)	YES	AIP
(New Caledonia)						
India	07-9-99	All airspace within FIRs	YES	YES	YES	Civil Aviation Requirements Section2, Series "R", PART IV
Indonesia						
Japan	10-Oct-75	Airspace defined by Minister of Transportation	YES	YES	YES	AIP dated 1 Oct 1975

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Pressure-Altitude Reporting Transponders

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			aeroplanes engaged in international air transport operations	aeroplanes engaged in international general aviation operations	helicopters engaged in international commercial air transport or international general aviation operations	
Kiribati						
Lao PDR						
Malaysia	1-Jan-03	All airspace within FIRs	YES	YES	YES	AIC 6/2000 dated 10 Mar 2000
Maldives	2002	Defined portion	YES	YES	YES	
Marshall Islands						
Micronesia, Federated States of						
Mongolia	1-Jan-02	International routes	YES	NO	NO	To be published in Dec 2001
Myanmar	1-Jan-00	All airspace within FIR	YES	YES	YES	Notice to owner T/41 dated 20 Jan 1999
Nauru						
Nepal	Not specified	Not specified	YES	YES	YES	Flight Operations Requirements, Amendment Number 2 dated 18 Feb 2000
New Zealand	01-4-97	Transponder Mandatory Airspace prescribed in NZ Air Navigation Register				Civil Aviation Rules Part 91
Pakistan	1-Jul-01	All airspace within FIR	YES			AIP
Palau						
Papua New Guinea						
Philippines	31-Jan-01	Airspace defined by Air Transport Office (ATO)	20%			
	31-Jan-02		50%			
	31-Jan-04		ALL			
Republic of Korea	30-Nov-94	All airspace within FIR	YES	YES	NO	Aviation Law

2nd Survey on Carriage and Operation of ACAS and Pressure-Altitude Reporting Transponders

(AP-ATM0551 dated 17 August 2000)

Pressure-Altitude Reporting Transponders

State/Territory	Effective date (dd/mm/yy)	Applicable airspace	Applicable to			Aeronautical Publication
			aeroplanes engaged in international air transport operations	aeroplanes engaged in international general aviation operations	helicopters engaged in international commercial air transport or international general aviation operations	
Samoa	2000	All airspace within FIR	YES	NO	NO	NOTAM will be issued on 30 Sep 2000
Singapore	Jul-81	All airspace within FIR	YES	YES	YES	AIP in 1981
Solomon Islands						
Sri Lanka						
Thailand	26-Feb-99	*All airspace within FIR:all comercial transport aeroplanes and international operation helicopters *Defined portion:all general aviation and helicopters	YES	YES	YES	
Tonga						
U.S.A.		Defined portion	The requirements are based on the location of aircraft operation, not the weight, engine configuration or type of operation of aircraft			FAR, Part 91
Vanuatu	01-1-00	All airspace within FIR	YES	N/A	N/A	
Viet Nam						

Note: Blank indicates that no information has been provided.