



International Civil Aviation Organization

**THE THIRD MEETING OF ADS-B STUDY AND
IMPLEMENTATION TASK FORCE (ADS-B TF/3)**

Bangkok, Thailand, 23-25 March 2005.

Agenda Item 5: Review result of ADS-B Working Group Meeting:

**WORKING GROUP MEETING OF
AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B) STUDY
AND IMPLEMENTATION TASK FORCE**

(Presented by Chairman of the Working Group)

SUMMARY

This paper presents the work accomplished by the Working Group of ADS-B Study and Implementation Task Force for review by the meeting.

1. INTRODUCTION

1.1 The Meeting of Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force Working Group was held from 14-15 October 2004 in conjunction with ADS-B Seminar held on October 13 at the Singapore Aviation Academy. The report of the meeting is provided in the Attachment 1 to this paper for detailed review which is also available on the ICAO APAC webpage: <http://www.icao.int/apac/meetings.htm>.

2. DISCUSSION

2.1 The conclusions and actions agreed by the Working Group meeting are provided in the appendices to the report. The following actions items have been summarized as Decisions and a draft conclusion for review by this meeting.

2.1.1 Decision 1/1 –ADS-B data exchange format

That, members from Australia and USA conduct study on ADS-B data exchange format and present result to the next ADS-B Task Force meeting.

2.1.2 Draft Decision 1/2 - Comments on ADS-B Problem Reporting System

That, Members of the ADS-B Task Force provide comments to Australia on the web based ADS-B Problem Report System.

2.1.3 Draft Conclusion 1/3 - Flight Identification Format

That, IATA issue a reminder to Directors of flight operations of its member airlines to use correct flight identification format required to enter into FMS or transponder.

Note: The aircraft identification entered should use the same as filled in item 7 of the ATS Flight Plan.

Australia undertook to contact Eurocontrol (John Law) to find out the approach taken by Europe to avoid this problem during the deployment of Elementary surveillance in Europe.

2.1.4 Decision 1/4 - Develop a checklist for implementation of ADS-B at Sub-regional basis

That, member of ADS-B Task Force from New Zealand and Singapore develop a checklist for implementation of ADS-B at sub-regional basis and present to the next meeting of ADS-B study and implementation Task Force.

2.1.5 Decision 1/5 - Specific project proposals

That, co-ordinators of the city pair study teams define and present papers for specific, appropriate ADS-B implementation projects for which both benefits and costs can be calculated.

2.1.6 Decision 1/6 –Use of ADS-B in an air space of North Asia

That, Member from IATA prepare and present a paper on study of using ADS-B technology in an airspace of North Asia at next Task Force meeting.

2.1.7 Decision 1/7 - ADS-B Operational Manual (AOM)

That, members from New Zealand and USA rewrite the draft of ADS-B Operational Manual by the end of December 2004 and provide to OPLINKP in February 2005 for consideration before its review by the next ADS-B Task Force meeting in March 2005.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review the report of the ADS-B Working Group Meeting provided in the Attachment 1;
- b) review the Actions agreed including Decisions, draft Decision and draft Conclusion formulated by the meeting.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA AND PACIFIC OFFICE

**REPORT OF
THE MEETING OF
AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) STUDY
AND IMPLEMENTATION TASK FORCE WORKING GROUP (ADS-B/TF/WG)**

Singapore, 13-15 October 2004

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Appendix B:	Outcome of the meeting and action items agreed
Appendix C:	Work Items of the ADS-B Working Group
Appendix D:	Subject/Tasks List of the ADS-B Study and Implementation Task Force

ATTACHMENTS

Attachment 1:	List of participants
Attachment 2:	List of working and information papers

1. INTRODUCTION

1.1 The Meeting of Automatic Dependent Surveillance – Broadcast (ADS-B) Study and Implementation Task Force Working Group was held from 14-15 October 2004 in conjunction with ADS-B Seminar on October 13 at the Singapore Aviation Academy.

1.2 On behalf of Civil Aviation Authority of Singapore, Mr. Yeo Cheng Nam, Senior Engineer Surveillance extended welcome to all participants and industries to the Seminar and expressed their full support to the meeting.

1.3 Mr. Greg Dunstone, Chairman of the Task Force, welcomed all the participants, highlighted work programme of the Seminar and the task of the Working Group Meeting.

2. ATTENDANCE

2.1 The meeting was attended by 46 participants from Australia, China, Hong Kong China, Fiji, India, New Zealand, Singapore, Thailand, United States, IATA, SITA, and representatives from four industries. List of participants is at Attachment 1.

3. OFFICERS AND SECRETARIAT

3.1 Mr. Greg Dunstone, Senior Technical Specialist of Airservices Australia Chaired the Meeting. Mr. Li Peng, Regional Officer, CNS of the ICAO Asia and Pacific Regional Office acted as Secretary. Ms. Wee Toon Cheng, Melisa, Engineer of Civil Aviation Authority of Singapore provided all administrative support.

4. ORGANIZATION, WORKING ARRANGEMENTS AND LANGUAGE

4.1 The meeting met as a single body. The working language was English only inclusive of all documentation and this Report. Lists of Working Papers and Information Papers presented at the Seminar and Meeting are at Attachment 2.

ATTACHMENT

**LIST OF DESIGNATED CONTACT PERSONS
RESPONSIBLE FOR ADS-B STUDY AND IMPLEMENTATION
IN THE ASIA/PAC REGION**

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MONGOLIA			
MYANMAR			
NAURU			
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TONGA			
USA			
VANUATU, REPUBLIC OF			
VIETNAM			

CONCLUSIONS BY THE MEETING:

1. The meeting noted the significant growth in ADS-B equipage had occurred during the last 6 months. Significant numbers of airlines are equipping as a matter of course. It also noted the increasing availability of ~~ADS-B~~ ground stations.
2. The meeting concluded that the “City pair study work” needed to continue and progress from capturing generic costs and benefits to the definition of specific projects for costs and benefits could be attributed.
3. The meeting noted the ease by which ADS-B vendors were able to install and demonstrate ADS-B ground systems and associated displays. It is believed that demonstrations at many locations in Asia Pacific would be useful. The meeting thanked CAAS and providers of equipment for establishing these demonstrations.
4. The meeting noted the need for more information from individual avionics vendors on mode S equipage in addition to continuing updates from Airframe manufacturers.
5. The meeting recommended that stakeholders (States, Aircraft manufacturers, Airlines and ATC providers) have greater interaction during the formulation of ADS-B plans in individual states. It would be helpful if all parties knew who was committed to ADS-B and who wasn’t.
6. The meeting noted that there is increasing evidence that ADS-B performance matches radar. The meeting supports that the use of this ~~comparison~~ comparison is the best path towards approval of ADS-B separation standards.
7. The meeting noted that the states have the option of using ADS-B Service providers to deliver ADS-B reports as well as using traditional ~~ATM~~ provided surveillance facilities.
8. The meeting noted the need for low cost, low power consumption ADS-B avionics to support the General aviation market.
9. The meeting decided that the Asia Pacific ADS-B Operations manual ~~will~~ will continue to align with OPLINKP and SASP outcomes.
10. The meeting noted that it was considered possible to replace some ~~radars~~ with ADS-B. It was also considered possible for ADS-B to act as a backup to radar in some high density areas;
11. The meeting recommended that states with ADS-B experience of implementation allow other States to observe and learn from ~~the~~ the experience gained; Australia and USA invited representatives to contact their ADS-B Task Force members to initiate any proposed activity.
12. The meeting noted some inconsistencies that have been seen in some ADS-B data. The ADS-B operation manual will address these issues.
13. The meeting noted the critical importance of the ADS-B Operations ~~as~~ as manual, and noted that it may have an impact globally on ADS-B deployment.

14. The meeting noted the critical importance of ADS-B data sharing and its impact on site selection and hence the costs for ADS-B deployment. The meeting agreed that States should have agreement (LOA) for sharing ADS-B data;

15. The meeting agreed that the problem of entry of incorrect Flight numbers should be brought to attention of ATM/AIS/SAR sub-group of APANPIRG. The flight identification entered in the flight management system or transponder should match the aircraft identification (Item 7) in the ATS Flight Plan.

16. The next ADS-B Task Force meeting will be held in Bangkok, provisionally on 21-25 March 2005. It will consist of a 2 days seminar and a 3 days meeting.

AGREED ACTIONS TO BE TAKEN:

(These have been incorporated into Appendix C INCORPORATED — AT NEXT TASK FORCE MEETING)

1. States are to provide information to support the APANPIRG Regional plan. This can be in the form of comments beyond city pairs and additional required changes to incorporate ADS-B into the regional CNS/ATM plan including timing of national implementation into relevant tables of the Plan. Australia will collate these and present to the next Task Force Meeting.

ACTION: ALL and Australia

1. Australia agreed to draft regional procedure to amend SUPPs –Doc7030 - for use of ADS-B from aircraft g

2. Greater than 12 NM over offshore airspace.

ACTION: AUSTRALIA

3. NZ/US are to progress the ADS-B operations Manual (AOM). They are to distribute a rewrite in December 2004 to — TF members + relevant panels — rewrite by 12/04 and is to be provided to OPLINK in FEB 05.

ACTION: NEW ZEALAND and USA

4. Thailand is to identify an find out existing ICAO definition of low density of airspace.

ACTION: THAILAND (NB: Already provided)

5. Australian and USA are to coordinate a recommendation to the next Task Force, recommending an ASTERIX format message set to be used for sharing of ADS-B data in the Asia Pacific region for the to be further studied by OZ/US coordinate to provide result at next meeting (Most likely it will be either format 21 or 33).

ACTION: AUSTRALIA & USA

6. Singapore and New Zealand will prepare a Business case matrix or template (checklist) (Singapore/NZ) by next meeting.

ACTION:- NEW ZEALAND and SINGAPORE

7. _____

7. The ADS-B City pair co-coordinators will develop specific appropriate ADS-B implementation project proposals for which benefits and costs can be calculated.

ACTION:- CITY PAIR COORDINATORS

8. IATA will —continue a survey of fitment plans and will report at the ~~by~~ next TF meeting.

ACTION: IATA

9. IATA agreed to encourage airlines to attend the next Seminar.

-ACTION:- IATA

10. IATA issue a reminder to directors of flight operations of its member airlines for the correct flight identification format required to enter into FMS or transponder.

ACTION:- IATA

11. IATA will prepare and present a paper on study of using ADS-B technology in airspace in the North Asia at next Task Force meeting.

ACTION:- IATA

12. _____

12. -Australia undertook to contact Eurocontrol (John Law) to find out the approach taken by Europe to avoid Flight ID entry problems during the deployment of Elementary surveillance in Europe and report at the next meeting.

ACTION:- Australia

13. ~~Action:~~ All members are asked to consider hosting the October 2005 meeting. The objective is to maximize the exposure of ADS-B to as large an ATM provider community as possible.

ACTION: ALL

~~7. IATA encourage airlines to attend next Seminar~~

~~8. —~~

~~9. Next meeting 21-25 March 2005~~

~~10. 2 days Seminar and 3 days meeting.~~

~~11. —~~

~~12. —~~

~~13. —~~

~~14. —~~

~~15. —~~

~~16. —~~

~~17. _____~~

~~18.~~
~~19.~~
~~20.~~
11.

WORK ITEMS OF THE ADS-B WORKING GROUP (Updated in Singapore Meeting)

Serial No.	Work Items	Action to be taken by	Target date
1	Ascertain timing with FAA for the issue of DO260A based TSO	USA	CLOSED
2	Research maximum traffic densities now & expected in 2015	All members	2005
3	Report organizational policy on ADS-B data sharing with neighbors	All members	2005
4	Make available radar-ADS_B comparison analyses	USA	2004
5	Distribute analyses on use of GPS TSO129 vs TSO145/6 avionics for ADS-B (Lee & Moody papers)	USA	2004
6	Prices: • GS prices (any ground station provider); • Communication and ATC automation costs (each State); • Big Aircraft & regional aircraft avionics prices; • Small GA aircraft avionics prices.	Industry All members IATA Australia	2004 CLOSED CLOSED CLOSED
7	Coordinate examination of sites for city pairs (existing route structure: aim for capacity increase): • Australia – Singapore • Hong Kong, China- Tokyo • Singapore - Delhi	Singapore Japan India	CONTINUING CONTINUING CONTINUING
8	Bay of Bengal presentation of IATA envisaged benefits to ADS-B TF including avionics fit etc.	IATA	2004

Appendix C to the Report of ADS-B Task Force Working Group Meeting

Serial No.	Work Items	Action to be taken by	Target date
9	States are to provide information to support the APANPIRG Regional plan. This can be in the form of comments and additional required changes to incorporate ADS-B into the regional CNS/ATM plan including timing of national implementation into relevant tables of the Plan. Australia will collate these and present to the next Task Force Meeting.	ALL and Australia	March 2005
10	Draft regional procedure to amend SUPPs –Doc7030 - for use of ADS-B from aircraft greater than 12 NM offshore.	Australia	March 2005
11	Rewrite the draft ADS-B operations Manual (AOM) and distribute it in December 2004 to TF members and is to be provided to OPLINK in FEB 05. Singapore Decision 1/7	New Zealand/ USA	December 2004
12	Identify an existing ICAO definition of low-density airspace.	Thailand	March 2005
13	Coordinate a recommendation to the next Task Force, recommending an ASTERIX format message set to be used for sharing of ADS-B data in the Asia Pacific region	Australia / USA	March 2005
14	Prepare a Business case matrix or template (checklist) Singapore Decision 1/4	Singapore and New Zealand	March 2005
15	Develop specific appropriate ADS-B implementation project proposals for which benefits and costs can be calculated. Singapore Decision 1/5	City Pair coordinators	March 2005
16	Continue a survey of fitment plans and will report at the next TF meeting.	IATA	Completed
17	Encourage airlines to attend the next Seminar.	IATA	Completed
18	IATA issue a reminder to directors of flight operations of its member airlines for the correct flight identification format required to enter into FMS or transponder.	IATA	March 2005

Appendix C to the Report of ADS-B Task Force Working Group Meeting

Serial No.	Work Items	Action to be taken by	Target date
19	IATA will prepare and present a paper on study of using ADS-B technology in airspace in the North Asia . Singapore Decision 1/6	IATA	March 2005
20	Contact Eurocontrol (John Law) to find out the approach taken by Europe to avoid Flight ID entry problems during the deployment of Elementary surveillance in Europe and report at the next meeting.	Australia	March 2005
21	Members to consider hosting the October 2005 meeting. The objective is to maximize the exposure of ADS-B to as large an ATM provider community as possible.	ALL	March 2005

Appendix D to the Report of ADS-B Task Force Working Group Meeting

Subject/Tasks List of the ADS-B Study and Implementation Task Force

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
1	APANPIRG Concl.13/19 TOR	Subject: Selection of links for near term and long term Task: 1) Select near term link; 2) Select long term link. .	A	1) SSR Mode S 1090 ES has been selected for the near term. 2) Additional data links may be specified as necessary	Completed TBD
2	APANPIRG Concl. 14/21	Subject: Guidance material for implementation of ADS-B in Asia and Pacific regions Task: Develop a guidance package	A	1) Sample Business case component; 2) Based on OPLINK Concept of use and other ICAO Docs for ADS-B air-ground surveillance service	2006 completed
3	APANPIRG Concl. 14/21	Subject: Report of ADS-B problem. Task: Establish a problem reporting system	A	Develop a database and a form of report	completed
4		Subject: Draft amendment proposal to SUPPs 7030 Regional Supplemental Procedures Task: Prepare a draft for consideration by ATM/AIS/SAR Sub Group of APANPIRG.	B	Prepare a draft for amendment to Doc7030 for implementation of ADS-B in the Asia and Pacific regions pending separation criteria developed by relevant ICAO panel.	2005/Australia
5	APANPIRG Concl. 14/21	Subject: ASIA/PAC ADS-B operational manual Task: Develop operational procedure manual for using ADS-B.	A	Develop a draft operational manual (include material on NOTAM and available manual data)	2005/NZ,USA
6	APANPIRG Concl. 14/21	Subject: Coordination between States at planning level Task: Coordination for timing of implementation And designate focal point of contact, points of contact for regulators, airframes & ground systems.	A	1) Develop an coordinated implementation plan by cities pairs; 2) Inform ICAO regional office names of designated focal point of contact.	2 005/States concerned 2004/States

Appendix D to the Report of ADS-B Task Force Working Group Meeting

No.	Ref.	Task	Priority	Action Proposed/In Progress	Target
7	APANPIRG Concl. 14/21	Subject: Regional implementation plan Task: Develop a Regional implementation plan taking into account the individual national plans in accordance with a coordinated plan between cities pairs.	B	1) States present their ADS-B plans (including any necessary associated air ground voice communication) as WPs to ADS-B study and implementation Task Force. 2) Implementation date, sites being considered and plans for mandates (if any) should be specified. 3) Develop optimal regional plan based on State inputs	2005
8		Subject: Number of airframes fitted Task: Report on number of airframes fitted	A	Collect and report to the Task Force information on types, operators (numbers of each) and NUC (NIC/NAC/SIL)	2005/USA