



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**ASIA AND PACIFIC OFFICE**

**REPORT OF**

**THE SECOND MEETING OF  
THE SOUTH EAST ASIA SUB-REGIONAL ADS-B  
IMPLEMENTATION WORKING GROUP**

**(SEA ADS-B WG/2)**

**Bali, Indonesia, 27-29 February 2008**

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### **APPENDIX**

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**Appendix B:** Project scope of SEA Sub-Regional Implementation of ADS-B

### **ATTACHMENT**

**Attachment 1:** List of participants

**Attachment 2:** List of working and information papers

## 1. INTRODUCTION

1.1 The Second Meeting of the South East Asia Sub-Regional ADS-B Implementation Working Group hosted by DGAC Indonesia was held from 26-29 February 2008 at the Ramada Bintang Hotel, Bali, Indonesia.

1.2 On behalf of Directorate General of Civil Aviation, Mr. Nyoman Suanda Santra, Secretary of Directorate General extended welcome to all the participants from States and Industries to Bali. He highlighted the importance of harmonized implementation of ADS-B for flight safety and efficiency.

1.3 Mr. Y. Haryadi Abidin, Director of Aviation Electronic & Electricity Facilities DGCA also welcomed participants and expressed full support to the meeting.

## 2. ATTENDANCE

2.1 The meeting was attended by 25 Participants from Australia, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Viet Nam, IATA and 9 representatives from four industries. 25 observers from Indonesia also attended the meeting. List of participants is at **Attachment 1**.

## 3. OFFICERS AND SECRETARIAT

3.1 Mrs. Yudhi Sari, Dy. Director of Navigation and Surveillance, DGAC and moderator nominated by Indonesia chaired the Meeting. The meeting was also facilitated by Mr. Bambang Tjahjono, Director of Air Safety and Mr. Novi Riyanto Rahardjo, Deputy Director of System Procedure of Air Navigation, DGAC. Mr. Li Peng, Regional Officer, CNS of the ICAO Asia and Pacific Regional Office acted as Secretary for the meeting.

## 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. The meeting considered 6 working papers and 8 information papers. List of Working Papers and Information Papers is provided at **Attachment 2**.

**Agenda Item 1: Adoption of Agenda**

1.1 The agenda adopted by the meeting was as follows:

Agenda Item 1: Adoption of Agenda

Agenda Item 2: Election of Moderator

Agenda Item 3: Review the outcome of SEA ADS-B Implementation WG

Agenda Item 4: Review the Sample Documents:

- Sample Agreement for ADS-B data sharing
- Sample Document for implementation of requirements for ADS-B Out avionics equipage

Agenda Item 5: Review of sub-regional implementation plan

- Garuda
- Updates by member of States to the initial implementation plan

Agenda Item 6: Any Other Business

Agenda Item 7: Presentation by Suppliers:

- PT. AJN Solusindo: Airport Telecom. Infrastructure
- Thales : Installation in Indonesia
- ERA: ADS-B and Multilateration
- Indra: A Cost effective ADS-B System

Agenda Item 8: Date and venue for the next meeting

**Agenda Item 2: Election of Moderator**

2.1 The meeting recalled the agreement reached at the first meeting for the hosting State to provide a moderator for the Working Group meeting and issue a letter of invitation. Accordingly, the meeting elected Mrs. Yudhi Sari as the moderator for the meeting based on the nomination by Indonesia.

**Agenda Item 3: Review the outcome of SEA ADS-B WG/1**

3.1 Under this agenda item, the meeting reviewed the outcome of the first meeting as follows:

- The meeting reviewed directive of APANPIRG/18 and updates by ADS-B related ICAO Panels;
- Exchanged information on ADS-B related developments by States;
- Formulated the Terms of Reference (TOR) of the SEA Sub-Regional ADS-B Implementation Working Group (*Decision 1/1*);
- Agreed the baseline for technology harmonization (*Decision 1/2*);
- Developed cost appointment framework to be used for developing sample

- Agreement for ADS-B data sharing (*Decision 1/3*);
- Agreed the terms of cooperation on development of sample document for ADS-B Data Sharing based on the guidelines contained in a Eurocontrol Document (*Decision/14*);
  - Developed the following guidelines for the development of sub-regional Implementation Plan (*Decision 1/5*);
    - a) Minimize capital and operating costs of ADS-B data facilities;
    - b) Give priority to provide coverage over major traffic flows;
    - c) Provide ADS-B coverage in areas within 150 nm from FIR boundaries;
    - d) Suitable sites with power, shelter, access and data communication links shall be preferred;
    - e) Overlapping of ADS-B coverage is preferred.
  - Developed the initial implementation plan (*Decision 1/6*);
  - Developed method of working including meeting arrangement and facilitator for the future meetings;
  - Identified following further tasks to be taken by the member States before the next meeting;
    - Sample Agreement of ADS-B Data Sharing by – Singapore;
    - Appendices to the Sample Agreement - Australia;
    - Proposed Sub-Regional Surveillance Coverage Maps - IATA;
    - Each State to present its ADS-B data sharing policy at next meeting;
    - Sample ADS-B equipage Mandate – Australia.

#### **Agenda Item 4: Review the Sample Documents**

##### **Agreement for ADS-B data sharing**

4.1 Under this agenda item, the meeting reviewed the sample Agreement for ADS-B Data Sharing presented by Singapore and Australia.

4.1.1 The meeting recalled that the SEA ADS-B WG/1 meeting agreed to develop a **Sample Agreement for ADS-B Data Sharing** containing the following elements:

- Commitment to ADS-B data sharing;
- ADS-B station deployment plan;
- Modes of cooperation;
- Implementation schedule;
- Performance requirements;
- States' responsibilities;
- Performance monitoring.

4.1.2 According to the decision made by the first meeting of SEA ADS-B WG, Singapore prepared the draft sample agreement and Australia prepared the required annexes to the agreement.

4.1.3 The sample Agreement was developed based on the Eurocontrol's sample agreement on radar data sharing.

4.1.4 Four additional annexes, Annexes F to I were proposed to be added to the Sample Agreement. The proposed nine annexes and their major changes are as listed below:

<b>Annex A</b>	Parties [ <i>similar to Eurocontro's guidelines</i> ]
<b>Annex B</b>	Interface Specification [ <i>significant changes</i> ]
<b>Annex C</b>	Maintenance [ <i>similar to Eurocontrol. Performance monitoring is described here</i> ]
<b>Annex D</b>	Cost [ <i>significant changes to take into account of agreement from SEA ADS-B WG/1</i> ]
<b>Annex E</b>	Correspondence [ <i>similar to Eurocontrol</i> ]
<b>Annex F</b>	Equipment Provided by One Party to the other [ <i>new</i> ]
<b>Annex G</b>	Implementation Schedule [ <i>new</i> ]
<b>Annex H</b>	Functional Performance Requirement [ <i>new</i> ]
<b>Annex I</b>	Coverage or Ground Station Details [ <i>new - Service level is described here</i> ]

4.1.5 In response to a query, Singapore clarified that the sample Agreement had been prepared for use by States in the South East Asia in the initial stage. The Secretariat was also requested to coordinate with Eurocontrol for using their guidelines for an agreement for the shared use of radar sensor data as baseline document.

4.1.6 The meeting further discussed the purpose of developing the sample agreement and recognized that the sample document would serve as a template or check list for use by States in achieving bilateral agreement for sharing ADS-B data.

4.1.7 After lengthy discussions on the draft document, the meeting adopted the *Sample Agreement for ADS-B data sharing* and formulated the following draft Conclusion:

**Draft Conclusion 2/1 – Sample Agreement for ADS-B Data Sharing**

That, the sample Agreement for ADS-B Data Sharing as shown in the **Appendix A** to the Report be adopted for use by the States in the South East Asia as guidelines for achieving bilateral agreement on sharing ADS-B data.

**Sample Document for implementation of requirements for ADS-B Out avionics equipage**

4.2 The meeting also reviewed a sample document containing draft clauses for the implementation of APANPIRG requirement of mandatory ADS-B Out avionics equipage.

4.2.1 In order to facilitate States planning to deliver ADS-B based ATS services to progress mandatory ADS-B deployment, SEA ADS-B WG/1 requested the development of a sample mandate in accordance with APANPIRG/18 Conclusion 18/35.

4.2.2 It is clearly desirable that the mandates in individual States are harmonized to the maximum extent possible because individual airframe operates in multiple States.

4.2.3 It was recognized that the mandates are legal documents developed by each State. Hence the form and content of these documents is governed by the legal processes in the State and needs to be tailored to meet the legal framework of the State. The purpose of a sample document is to outline the possible contents of a mandate and some wording that could, potentially, be adopted by individual States.

4.2.4 The meeting noted that an ADS-B mandate would normally be expected to specify the following:

- a) Definitions
- b) Which aircraft must be fitted with ADS-B?
- c) What does ADS-B fitment mean, and to what technical standards does this equipment comply? It may also require particular evidence of such compliance. It is possible to require that, if aircraft voluntarily choose to transmit ADS-B, that they should do so in compliance with a defined standard.
- d) When do aircraft need to be fitted?
- e) What exemptions apply and under what circumstances can an aircraft operate without operational ADS-B avionics

4.2.5 The meeting noted that as a normal practice, a mandate would also refer to an Advisory Circular that provides more technical details and interpretation of the rules. Some examples of the AC documents are provided at the following website:

<http://www.casa.gov.au/rules/1998casr/021/021c45.pdf>

[http://www.airweb.faa.gov/Regulatory\\_and\\_Guidance\\_Library/rgAdvisoryCircular.nsf/0/cfdc5da6c7fb51dc862570a0006059ef/\\$FILE/AC120-86.pdf](http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/cfdc5da6c7fb51dc862570a0006059ef/$FILE/AC120-86.pdf)

[http://www.faa.gov/aircraft/draft\\_docs/media/3376phase2ACcrPUB.doc](http://www.faa.gov/aircraft/draft_docs/media/3376phase2ACcrPUB.doc)

4.2.6 The meeting noted the example of ACAS mandate as implemented several years ago by States in the region to comply the requirement in ICAO Annex 6. It is likely that ADS-B OUT mandates will provide SSR (Mode S) capability in aircraft that may not have Mode S today.

4.2.7 It was recognized that mandates will be phased in force over time. The effective dates need to take into account time for industry to equip/upgrade and match ground infrastructure upgrades and ability to deliver benefits to customers.

4.2.8 IATA supported the inclusion of recommended sample mandates material into the ADS-B Implementation Guidance Document (AIGD). However, the meeting considered it did not mature enough to be included into the AIGD at this stage.

4.2.9 Concerns were expressed regarding the different standard referred in the sample document. It is desirable that ICAO SARPs and technical provisions should be referred whenever they are available for the requirements.

4.2.10 The meeting also discussed a proposal presented by Australia (Flimsy 2) to recommend amendment to the regional air navigation supplement (SUPP) for the minimum equipage for aircraft flying over the high seas. It also includes a proposal for the recommended standard including positional and positional integrity source to meet the interoperability requirements. However, the proposal was not endorsed by meeting as further study on the proposal by experts with operational background would be required. The meeting expressed concerns to make recommendations to amend the SUPPs at this stage. It was emphasized by some States that implementation of ADS-B should be introduced in a phased manner.

4.2.11 IATA indicated that benefits should be delivered through harmonized regional approach using the technology. We need to support the concept to move forward to enhance flight safety between FIR boundaries. Indonesia also expressed the need for manufactures to issue the certification for the ADS-B avionics.

4.3 The meeting noted the information provided by Australia regarding a sample of Administration Agreements relating to the Sharing of radar coverage.

#### **Agenda Item 5: Review of sub-regional implementation plan**

- Garuda
- Updates by member of States to the initial implementation plan

Under this agenda item, the meeting reviewed several papers presented to meeting by States and IATA.

#### **Australia**

5.1. Australia provided updates on the project of implementation of ADS-B in Australia. In addition to the information provided to the first meeting of the SEA ADS-B WG, the ADS-B ground station at the Thursday Island was installed and is operational since December 2007. The ADS-B data received by this Station can be shared by Indonesia and PNG. The meeting was also informed that 11 sites of ADS-B ground stations in the Australian ADS-B projects have been declared operational. The rest of the ground stations will be made operational by February 2009 as the redundancy telecommunication links from the ground station to the ATM systems are required to be selected from different service providers.

#### **Indonesia**

##### 5.2 Airworthiness

5.2.1 The meeting noted the Indonesian DGCA Airworthiness Plan for implementation of ADS-B. The plan is considered as a part of Roadmap to Safety Programme. The plan consists of elements of the legislation, airworthiness rule making and the implementation plan. According to the plan, in the phase I, ADS-B (Out) airborne airworthiness approval and airlines operational approval (voluntary plan) will be started at 2010 consisting of 3 major airlines i.e. Garuda, Lion and Mandala. DGCA of Indonesia has strongly committed to implement the ADS-B in line and harmonized with the sub-regional plan according to ICAO Guidance Materials and common global standard on airworthiness and operational of ADS-B.

##### Airlines perspective - Garuda

5.2.2 Representative from Garuda Indonesia presented to the meeting the ADS-B implementation strategies. The paper highlighted the ADS-B related regulation and procedure and current status of ADS-B avionics equipage of Garuda Aircraft fleet. The paper identified the issue of cost for upgrading the required avionics for ADS-B Implementation which was considered as one important factor in ADS-B implementation. An optimum and cost effective solution would be a benefit for the airlines.

##### ADS-B Implementation plan in Indonesia

5.2.3 The meeting noted the ADS-B implementation in Indonesia. Indonesia had installed 6 ground stations at Jakarta for Test Bed, Sorong, Makassar, Natuna, Kupang and Merauke and upgraded Makassar Advance Air Traffic Services (MAATS) capabilities to process ADS-B in 2007. In 2008, Indonesia has a plan to install additional 13 ADS-B ground stations.

### **The Philippines**

5.3 The Philippines informed the meeting of the current and proposed surveillance system in the Philippines including en-route SSR at Tagaytay, Laoag MSSR and Mt. Majic-Cebu MSSR. Additional 3 sets of en-route SSRs will be installed at Palawan, Davao and Zamboanga to secure a wider radar coverage of the Manila FIR.

5.3.1 The planned ADS-B ground station in the Manila FIR:

- |                           |                             |
|---------------------------|-----------------------------|
| 1. Manila ATM Center      | 7. Baguio Airport           |
| 2. Davao RCAG site        | 8. Cagayan de Oro           |
| 3. Basilan RCAG site      | 9. Legaspi Airport          |
| 4. Aparri site            | 10. Puerto Princesa Airport |
| 5. General Santos Airport | 11. Tacloban Airport        |
| 6. Bacolod Airport        | 12. Kalibo Airport          |

5.3.2 Three ground station sites were identified for possible data sharing:

1. Puerto Princesa Airport
2. Basilan RCAG site
3. General Santos Airport

5.3.3 The Philippines also informed that they have also identified a possible site (located on the South West portion of the boundary of Manila FIR) to fill the gap in the South East Asia region, but it is a private airport operated by RIO TUBA Nickel Mining Corporation. Thus, they have to evaluate and study further.

### **Viet Nam**

5. 4 Viet Nam informed the meeting of their Plan for ADS-B deployment and implementation.

5.4.1 Viet Nam identified ADS-B surveillance for use in the areas where radar coverage is not achievable or to complement radar coverage and also as a complement existing ADS-C for the oceanic area.

5.4.2. Based on the current status of ATS surveillance service and trend of application of ADS-B, Viet Nam's initial plan for ADS-B deployment and implementation include the following:

- The first phase: Viet Nam plans to provide ADS-B coverage for the oceanic area of South East of Ho Chi Min FIR where ADS-C/CPDLC are being used and for overlapping/complementing existing radar coverage in Ho Chi Minh FIR by installing ADS-B ground stations at the following locations: Truong Sa Island, Song Tu Tay Island, Phu Quy Island, Con Son Island, Phu Quoc Island, Cam Ranh, Tan San Nhat/Ho Chi Minh, Phu Bai and some other locations; and

The second phase: To expand by installing ADS-B ground stations in Hanoi FIR

- ADS-B data will be shared with adjacent States.

5.4.3 The meeting expressed interests with the potential additional locations for ADS-B ground sites to enhance the surveillance coverage in Ho Chi Min FIR which could be shared by other ACCs in the neighboring FIRs.

### **Malaysia**

5.5 Malaysia informed the meeting that the proposed site in the last meeting (SEA ADS-B WG/1) has been identified as Labuan Airport. The airport belongs to Royal Malaysian Air Force (RMAF). Presently Labuan Radar and Miri Radar are providing surveillance for the area. Labuan Radar and Miri Radar were commissioned in 1999 and 2003 respectively. Even though Labuan radar belongs to RMAF, the radar system is integrated into the Air Traffic Control System in Kota Kinabalu Air Traffic Control Centre.

### **IATA**

5.6 IATA presented a paper on the Regional Surveillance Coverage.

5.6.1 It was recalled that at SEA ADS-B WG/1, IATA was tasked with the responsibility of studying the proposed surveillance coverage on a regional basis. Each State was asked to provide:

- Current surveillance radar coverage
- Current ADS-B coverage
- Proposed surveillance radar or ADS-B installations
- Timelines including life expectancy of radar systems and installation of new equipment
- Any complications particular to them regards the introduction of ADS-B
- Any other issues

5.6.2 Major traffic flows were overlaid to identify potential coverage gaps and associated capture of en-route traffic.

5.6.3 Major traffic flows were identified through the South China Sea with moderate flows through Indonesia.

5.6.4 IATA stressed that it was important to consider consistent separations when prioritizing installations. Installations adjacent to areas with increased separation requirements may not be supported by a cost benefit analysis based on traffic alone. Each State has its own surveillance requirements, which should be subject to a separate analysis.

5.6.5. Surveillance gaps were identified in the South China Sea corresponding to main traffic flows. It was identified that the implementation plans presented by Viet Nam and the Philippines presented solutions although there was a difference in their installation timelines. IATA reiterated that major benefits were to be gained from harmonizing plans. This should include consideration of accelerating plans for installation of selected sites particularly covering FIR boundaries where an adjacent sector may be in a position to gain short-term operational benefits.

### **Project scope of SEA Sub-Regional Implementation of ADS-B**

5.7 Following the discussions on the presentation by Viet Nam and the Philippines, the meeting identified that SEA Sub-regional Implementation of ADS-B by the air space user would be useful for finalizing the sub-regional ADS-B implementation plan as intimated at the first Working Group meeting.

5.8 The proposal by Australia was supported by some States. However, concerns were also expressed whether the study is within the terms of reference agreed at the first meeting. Considering that the expected result of the study would facilitate the development of the sub-regional ADS-B implementation plan and benefits would be received by the airspace users for ideal locations of ADS-B ground stations along the major traffic flow within the sub-region, the meeting agreed to the proposal that IATA prepare a project plan with Project Scope as defined in the Appendix B to this Report. A

subsequent meeting will consider this project plan. Accordingly, the meeting formulated the following Decision:

**Decision 2/2 – SEA Sub-regional ADS-B implementation study project**

That, IATA conduct SEA Sub-regional ADS-B implementation study within the project scope as specified in the **Appendix B** to this Report and present the initial result of study to the next meeting of the SEA ADS-B Implementation WG.

**Agenda Item 6: Any Other Business**

6.1. The meeting noted the information provided by Australia regarding SA awareness as provided in the IP/02.

6.2 The meeting expressed thanks to DGAC, Indonesia for hosting the meeting and for the excellent arrangement made for the meeting including the impressive culture visit organized during the meeting.

**Policy on ADS-B Data Sharing**

6.3 The meeting noted information provided by Australia on the draft Australian Cross FIR flight data sharing. In response to a task assigned by the first meeting of the working group, States updated the meeting regarding the general approach on the ADS-B data sharing as follows:

- Australia supports the surveillance data sharing between neighbouring FIRs of States;
- Indonesia supports data sharing for the flight safety and efficiency;
- Malaysia supports in principle the idea for data sharing but need to look into the exact plan for the data sharing;
- The Philippines supported the data sharing to harmonize adjacent FIRs;
- Singapore supports the data sharing for civil applications;
- Thailand supports in principle but subject to State's approval for any exact proposal
- Viet Nam supports the data sharing.

6.4 Singapore agreed to present the outcome of both the first meeting and the second meeting of the SEA ADS-B Implementation Working Group to the next meeting of ADS-B SITF.

**Agenda Item 7: Presentation by the Suppliers**

7.1 The meeting appreciated the presentations provided by PT. AJN Solusindo on the airport telecommunication infrastructure; Thales ATM on ADS-B installation in Indonesia; Era on ADS-B and Multilateralism and Indra on a cost effective ADS-B System to the meeting. Discussions were held during the presentations and clarifications were provided to the questions raised on various subjects relating to ADS-B implementation.

**Agenda Item 8: Time and Venue of Next Meeting**

8.1 The meeting identified the need to organize another meeting to progress the sub-regional plan. The meeting appreciated the offer by Malaysia to host the next SEA ADS-B WG meeting in Kuala Lumpur in June 2008. The exact dates will be informed to the members States by Malaysia at due course.

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**Proposed Sample ADS-B Data Sharing Agreement**

INTERNATIONAL CIVIL AVIATION ORGANISATION  
ASIA AND PACIFIC OFFICE



**SAMPLE AGREEMENT  
FOR THE SHARED USE OF  
ADS-B DATA**

<b>Edition</b>	<b>:</b>	<b>1.0</b>
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**SOUTH EAST ASIA SUB-REGIONAL AUTOMATIC DEPENDENT  
SURVEILLANCE-BROADCAST (ADS-B) IMPLEMENTATION  
WORKING GROUP**

**Proposed Sample ADS-B Data Sharing Agreement**

**DOCUMENT CHANGE RECORD**

The following table records the complete history of the successive editions of the present document.

<b>EDITION</b>	<b>DATE</b>	<b>REASON FOR CHANGE</b>	<b>SECTIONS PAGES AFFECTED</b>
1.0	February 2008		

**Proposed Sample ADS-B Data Sharing Agreement**

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**Proposed Sample ADS-B Data Sharing Agreement**

**1. FOREWORD**

**1.1** The present document concerns the guidelines for the drafting of agreements for the shared use of ADS-B data.

**1.2** This document is related to the SEA ADS-B WG.

**1.3** These guidelines were constituted from:  
the Guidelines for an Agreement for the shared use of radar sensor data used by  
Eurocontrol.

**1.4** Notes containing extra information on the use of the proposed contract text are printed in light face, the status being indicated by the prefix **NOTE**.

**1.5** The original version of this document is in the English language.

## **Proposed Sample ADS-B Data Sharing Agreement**

### **2. SCOPE**

**2.1** This document constitutes the SEA ADS-B WG guideline concerning the drafting of an agreement for the shared use of ADS-B data between ATS Organisations in the SEA ADS-B WG and the provision of ADS-B data by service providers. This document contains the proposed text for a bilateral sharing agreement for ADS-B data. The changes required to make it a multilateral sharing agreement for ADS-B data are put in as suggestions.

**2.2** The agreement consists of the proposed text for twelve numbered articles and nine annexes, named Annex A up to Annex I. These annexes contain information which is likely to change from time to time. Deviations from the proposed text in the agreement as well as in the annexes, can be necessary due to legal, organisational or technical reasons. Examples of such changes are:

- The starting date could be set to the date the radar data has been delivered for the first time;
- The notice period to end the contract could be chosen differently;
- When installation at the providers' premises requires, i.e. additional staff, the cost could be charged to the user.

The clauses enclosed in brackets ([ ]) should be replaced by the information described in these clauses.

**Proposed Sample ADS-B Data Sharing Agreement**

**3. REFERENCE DOCUMENTS**

The following documents and standards contain provision which, through reference in this text, constitute provisions of the document. At the time of publication of this document the editions indicated for the referenced documents were valid.

Revisions of the referenced documents shall not form part of the provisions of this document until they are formally reviewed and incorporated into this document.

In case of conflict between this document and the contents of these other referenced documents, this document shall take precedence.

1 [To list the relevant documents]

**Proposed Sample ADS-B Data Sharing Agreement**

**4. ABBREVIATIONS AND ACRONYMS**

For the purposes of these guidelines the following are used:

ADS-B Automatic Dependent Surveillance - Broadcast

ASTERIX All Purpose Structured Eurocontrol Radar Information Exchange

### **Proposed Sample ADS-B Data Sharing Agreement**

#### **5. PROPOSED TEXT FOR THE AGREEMENT**

The [name of the State’s responsible Organisation or name of the (privatised) ATC Organisation] represented by [function],

hereinafter called “the *Provider*”,

And

The [name of the State’s responsible Organisation or name of the (privatised) ATC Organisation] represented by [function],

hereinafter called “the *User*”;

**Suggestion:** If there are more than one Provider or more than one User, the above lines are to be repeated for each Provider or User.

In case the Providers are also Users (e.g. each party supplies information from an Automatic Dependent Surveillance – Broadcast (ADS-B) to the other party), one can replace the words Provider and User with the names of the Organisations and indicate in Annex A who is Provider and who is User for each source of the ADS-B data.

- Having regard to the South East Asia Sub-regional Automatic Dependent Surveillance – Broadcast (ADS-B) Implementation Working Group (SEA ADS-B WG) objectives, including the optimisation of the provision and use of the ADS-B surveillance function through the installation of new facilities or the sharing of ADS-B data;

**Proposed Sample ADS-B Data Sharing Agreement**

- With a view to the establishment of the categories of services through the airspace of the regions specified in Annex A and I;

**NOTE-** More reasoning and motivations for the contract can be inserted here

- Have agreed as follows:

**ARTICLE 1 - Objective of the Agreement**

1 The objective of this Agreement is to improve safety and operations efficiency of civil air traffic by enhancing ADS-B coverage and ADS-B data availability in the Flight Information Regions for which the *User* is responsible and the areas within 150Nm from the boundaries of these Flight Information Regions

2 For this purpose, the *Provider* shall provide its ADS-B data to the *User* with effect from [date] and in accordance with the implementation schedule in Annex G.

3 The ADS-B data to be provided are specified in Annex B, H and I.

**Proposed Sample ADS-B Data Sharing Agreement**

**ARTICLE 2 - Limitations**

1 The *User* shall use the ADS-B data provided only to ensure the safe, proper and continuous operation of civil Air Traffic Services or activities in support of his Air Traffic Services and for technical demonstration, evaluation and test purposes related to his operational tasks, unless otherwise specified in Annex A.

2 The *User* shall not communicate to any party not specified in this Agreement in any matter of form whatsoever any information supplied pursuant to this Agreement. The said information shall not be used for any purpose other than those specified in paragraph 1 hereof, without the prior written consent of the *Provider*.

[NOTE : To include a definition: Air Traffic Services shall mean Civil Air Traffic Services.]

**ARTICLE 3 - Installation**

1 The *Provider* and the *User* shall install all required equipment at their respective premises.

2 Both the *Provider* and the *User* shall arrange for the provision, installation and commissioning of private circuits and other associated equipment as specified in Annex B and F, required for the transmission of the ADS-B data from the *Provider* to the *User*.

**Proposed Sample ADS-B Data Sharing Agreement**

3 Initial testing of the equipment and private circuits for the provision of the ADS-B data shall be carried out in conjunction with the *Provider* and the *User*.

4 The provision of the present article shall also apply in the event of modifications to the equipment or private circuits.

**ARTICLE 4 - Maintenance**

1 Unless otherwise specified in Annex C, the routine maintenance, repair and replacement service for the equipment and the private circuits installed for the provision of ADS-B data under this Agreement shall be executed by technical staff available at the *Provider's* and at the *User's* premises.

2 Unless otherwise specified in Annex D, the routine maintenance, repair and replacement at the *Provider's* premises referred to in paragraph 1 hereof shall be carried out free of charge by the *Provider* to the standards of maintenance commonly adopted by the *Provider*.

3 The routine maintenance, repair and replacement at the *User's* premises shall be done by and at the expense of the *User* to the standard of maintenance commonly adopted by the *User*.

**ARTICLE 5 - Modifications**

1 Both the *Provider* and the *User* shall implement any modification in the equipment and the private circuits for the provision of ADS-B data at their respective premises due to any decision of the *Provider*. The modification shall be carried out in accordance with Article 3.

**Proposed Sample ADS-B Data Sharing Agreement**

2 The *User* may propose technical modifications of the specifications for the provision of ADS-B data to the *Provider*. The *Provider* shall decide on the implementation of it.

3 The modifications to be implemented shall be specified by the *Provider* in writing to the *User* not less than six months before the date the modification shall be implemented.

**ARTICLE 6 - Cost**

1 The cost apportionment for the use of ADS-B data as specified in Annex A, B and I shall be in accordance with Annex D.

**ARTICLE 7 - Integrity**

1 The *Provider* shall take all reasonable steps, in accordance with the standards commonly adopted by him, to monitor and maintain the quality and continuity of the provision of ADS-B data of the facilities specified in Annex B and F.

2 Where this is reasonably practicable the *Provider* shall give the *User* such notice in respect to any planned periodic break in service as soon as such information is available and a minimum of 24 hours notice in case of any other planned break in service.

3 The *Provider* shall report immediately or at the earliest reasonable opportunity any failure in the provision of the ADS-B data or any abnormality of ADS-B data provided, to the *User's* technical supervisor centre.

4 The *User* shall, in accordance with the standards commonly adopted by him, monitor the ADS-B data received from the *Provider* and report immediately or at the earliest

**Proposed Sample ADS-B Data Sharing Agreement**

reasonable opportunity any failure in the reception or any abnormality of the ADS-B data, to the *Provider's* technical supervisor centre.

**ARTICLE 8 - Liability**

*[The requirements on this Article should be agreed bilaterally between States]*

**ARTICLE 9a - Legal Aspects**

**ARTICLE 9b - Settlement of Dispute**

**Proposed Sample ADS-B Data Sharing Agreement**

**ARTICLE 10 - Correspondence**

1 Correspondence to be applied in the framework of this Agreement is specified in Annex E.

**ARTICLE 11 - Annexes**

1 Annex A, B, C, D, E, F, G, H and I are attachments to this Agreement. The *Provider* and *User*, in mutual consent and formal acceptance, are allowed to amend and up-date, as circumstances deem necessary, the contents of the Annexes, in so far as the amendments are not in contradiction to or out of scope with the text in this Agreement.

**ARTICLE 12 - Duration**

1 The present Agreement shall enter into force on the day on which it is signed by the last of the contracting Parties, for a period of [duration to be decided by the Parties].

2 Thereafter, that period shall be automatically prolonged unless any of the contracting Parties has, by giving written notice at least [duration to be decided by the Parties] before the expiry of the contract period or the termination date of prolonged period, terminated the Agreement.

3 The Agreement can early terminate in the event the provision of ADS-B data as specified in Annex A hereof is to be permanently withdrawn from service. The *Provider* shall give to the *User* not less than [duration to be decided by Parties] notice in writing in advance thereof.

4 The Agreement can early terminate on request of the *User* in the event of modifications

**Proposed Sample ADS-B Data Sharing Agreement**

to be implemented. The *User* shall give to the *Provider* not less than [duration to be decided by Parties] notice in writing in advance thereof.

In witness whereof, the undersigned having been duly authorized, sign the present Agreement.

Done at [place] on [date] in the English language in [number] originals.

NOTE-If the Agreement is in more than one language the following text can be used to replace the previous paragraph.

Done at [place] on [date] in the English, [other language(s)] languages in [number] originals. In the event of any inconsistency, the text in the [language] language will prevail.

For [State's Organization/name of the (privatized) ATC Organisation, Provider] :  
[ name ]  
[ function ]

For [State's Organization/name of the (privatized) ATC Organisation, User] :  
[ name ]  
[ function ]

**ANNEX A. PARTIES**

**A.1** In the Framework of this Agreement the providers and users are :

*Provider 1* :

*Provider 2*:

*User 1*:

*User 2*:

*(NB: In a many cases, each ANSP is likely to be both a Provider and user. Ie ANSP sends & receives*

**Proposed Sample ADS-B Data Sharing Agreement**

*ADS-B data))*

. Having regard to Article 2 : Limitations,

the *Provider* authorises the *User* to communicate the provided ADS-B ground station data to the following parties :

. insert the name of the 3<sup>rd</sup> parties (if any)

USER 1 :

- List of 3<sup>rd</sup> parties (if any)

USER 2 :

- List of 3<sup>rd</sup> parties (if any)

**A.2** For this purpose, the *User* to this Agreement shall arrange for (an) identical ADS-B ground station Sharing Agreement(s) acting as *Provider*, with the specified parties.

**NOTES -**

*Whenever the user wants to supply the ADS-B ground station data or a processed version thereof to a third party, the name of the third party has to be added to the list in this annex. The sharing agreement made between the user and the third party must be approved by the Provider in writing. The Provider decides whether it is necessary to update this agreement between Provider and user(s). The User could become a Provider of data to another specified party*

**ANNEX B. INTERFACE SPECIFICATION**

**B.1** This Annex describes the Interface Specification, needed for the interfacing between the *Provider* and the *User* to share ADS-B ground station data.

## **Proposed Sample ADS-B Data Sharing Agreement**

### **B.2 ADS-B Data sharing interface**

#### **B.2.1 Data Elements**

ADS-B messages shall comprise the data elements defined in Eurocontrol Asterix Category 21 version 0.23.

[NOTE : To include a definition: Asterix Category 21 shall mean Eurocontrol Asterix Category 21 Version 0.23.]

ADS-B Data received from each aircraft from each ADS-B ground station shall be transmitted at a rate of <Rate to be agreed between *User & Provider*>

The Asterix Category 21 version 0.23 standard allows packaging of multiple ADS-B records into a single data block, or alternatively to place a single ADS-B record per data block. Record packaging shall be performed to the extent possible to minimise communication bandwidth requirements without delaying transmission of any given record.

#### **B.2.2 Message Description**

The message format shall be in accord with the Asia Pacific ADS-B data interface sharing standard : Namely Asterix Cat 21 version 0.23.

<*Not required*>

#### **B.2.4 Communication Protocol**

NOTE : The communication protocol should be decided by the Parties. Relevant aspects of the communication protocol should be specified in this Annex such as ;

- name of the communication protocol including version of the protocol;
- options used of the protocol, if any;
- parameter setting;
- addressing issue;
- link speed; etc

**Proposed Sample ADS-B Data Sharing Agreement**

{eg *The network layer is to be implemented using the Internet Protocol (IP). The network shall support Internet Group Management Protocol (IGMP) level 0, 1 and 2 as defined in RFC3300.*

*Note: IGMP level 1 supports transmission of Multicast datagrams, level 2 supports transmission and reception of multicast datagrams, while level 0 corresponds to IP unicast.*

*For Asterix messages, the Network Layer shall use the Internet Protocol (IP) for the delivery of packets using MULTICAST broadcast techniques. A multicast addressing scheme, as agreed, shall be used. }*

**B.2.5 Physical Aspects**

Add appropriate details as available.

Eg DDS circuit using service from <Company>

Eg: Satellite datalink service using <Company> and Modems...

**ANNEX C. MAINTENANCE**

**C.1** The maintenance, repair and replacement service for equipment installed at the *Provider's* and the *User's* premises shall include the following activities during normal working hours:

. routine maintenance, repair and replacement service for the equipment installed at the *Provider's* and the *User's* premises;

. support by staff for testing the equipment and modifications.

**C.2** During as well as outside normal working hours, the maintenance service at their premises shall be carried out by the *Provider* and the *User* in accordance with the standards of maintenance commonly adopted by the *Provider* and the *User*.

**C.3** The *User* shall collect and replace any faulty equipment or spare part, subject of this Agreement, at the *Provider's* and the *User's* premises.

**Proposed Sample ADS-B Data Sharing Agreement**

The *User* shall procure at its own expense the following maintenance and repair support service contracts:

. [equipment] with [maintenance and repair support agency]

.....

. [equipment] with [maintenance and repair support agency]

The *Provider* shall procure at its own expense the following maintenance and repair support service contracts:

. [equipment] with [maintenance and repair support agency]

*<In some cases it may be appropriate for the Provider to procure or provide the maintenance of equipment located at the Provider premises>*

**C.4** For routine co-ordination and report the following technical supervisor centres shall be responsible:

At the *Provider's* premises : [telephone and fax number]

At the *User's* premises : [telephone and fax number]

**ANNEX D. COST**

*<the details of cost issues will be agreed bi-laterally>*

**D.1 General**

Costs borne by parties will based on a mutually-agreed basis between ANSPs of adjoining member States and/or ADS-B data service providers.

Costs considered include equipment costs, installation costs, maintenance costs, line or equipment

### **Proposed Sample ADS-B Data Sharing Agreement**

lease costs, costs of performance reporting and costs of related services.

Cost apportionment is based upon the user-pays principle, elaborated as follows:

- (a) If an ADS-B ground station serves solely (or significantly) the need of the Provider, as far as possible the cost of installation and maintenance should be borne by the Provider.
  
- (b) If an ADS-B ground station provides surveillance data to the *Provider* as well as the *User*, the Provider may, if it desires to do so, work out the cost apportionment with the User. Cost apportionment should be on a mutually-agreed basis between the User & Provider, and could cover three cost components: (i) installation of the ADS-B ground station; (ii) maintenance of the ADS-B ground station; and (iii) costs of sharing of ADS-B surveillance data.
  
- (c) If it is necessary for an ADS-B ground station to be installed to serve solely (or significantly) the need of the *User*, the cost of installation and maintenance should, as far as possible be borne by the *User*.

#### **D.2 Data Cost**

The cost for providing ADS-B ground station data itself, as agreed between *provider(s)* and *User(s)* should be specified here. When the data is supplied free of charge it should be mentioned here too.

#### **D.3 Installation Cost**

The cost of installing communication circuits and the equipment for the provision of ADS-B ground station data as agreed between *provider(s)* and *User(s)* should be specified here.

#### **D.4 Maintenance Cost**

The routine maintenance, repair and replacement service for the equipment installed for the provision of ADS-B ground station data as agreed between *provider(s)* and *User(s)* should be specified here..

#### **D.5 Periodical Cost**

Periodic cost of rental of private circuits, private circuit line checks, service contracts or any other

**Proposed Sample ADS-B Data Sharing Agreement**

periodic rent or fee as agreed between *provider(s)* and *User(s)* should be specified here.

The use at the *Provider's* premises and the *User's* premises of any installation space and the use of the power supply as agreed between *provider(s)* and *User(s)* should be specified here.

**D.6 System technical and operational support Cost**

The cost of any technical or operational support provided by one party to the other to establish an operational and sustainable *Provider* ADS-B system as agreed between *provider(s)* and *User(s)* should be specified here..

**D.7 Termination costs**

The pre-agreed cost of termination of the *Provider* ADS-B system as agreed between *provider(s)* and *User(s)* should be specified here..

**D.8 Modification costs**

If the *User* require and *Provider* may agree to modify the service. In such cases, the costs of any modification shall be negotiated in good faith taking into account the principles of cost sharing as described above,.

**ANNEX E. CORRESPONDENCE**

All correspondence in connection with this agreement shall be mail as follows:

[*Provider* State's Organisation or name of ATC Organisation, mail address, email address, telephone and fax number]

[*User* State's Organisation or name of ATC Organisation, mail address, email address, telephone and fax number]

**ANNEX F. EQUIPMENT PROVIDED BY ONE PARTY to the OTHER.**

### **Proposed Sample ADS-B Data Sharing Agreement**

*(only required if necessary – which is unlikely)*

#### **ANNEX G. IMPLEMENTATION SCHEDULE**

Define Milestones :

##### **FIR1 to FIR2**

- a) Inter FIR datalink installed for testing :<Dates>
- b) Completion of data link testing :<Dates>
- c) Ground station installation : <Dates>
- d) Availability of ADS-B data for testing :<Dates>
- e) Use of ADS-B data for situational awareness by ATC :<Date>
- f) Use of ADS-B data for delivery of separation services: :<Date>

##### **FIR2 to FIR1**

- g) Inter FIR datalink installed for testing :<Dates>
- h) Completion of data link testing :<Dates>
- i) Ground station installation : <Dates>
- j) Availability of ADS-B data for testing :<Dates>
- k) Use of ADS-B data for situational awareness by ATC :<Date>
- l) Use of ADS-B data for delivery of separation services: :<Date>

#### **ANNEX H. FUNCTIONAL PERFORMANCE REQUIREMENT**

**Capacity** : The *Provider* ADS-B system shall be able to support no less than <to be agreed between Parties> aircraft from every site at one time.

**Accuracy** : Accuracy is provided by the airborne avionics and no accuracy requirement is imposed on the *Provider* ground system.

**Update Rate** : The *Provider* ADS-B system shall provide positional and information updates at a rate of <To be agreed> times per second.

### **Proposed Sample ADS-B Data Sharing Agreement**

The *Provider* ADS-B system may collect received ADS-B messages between updates and then transmit a composite message to the ATC centre using the most up to date positional data. This allows collection of velocity and positional data into a single Asterix package and lowers the processing load of the ATC system. When data is received from an aircraft, the *Provider* ADS-B system track data is updated.

**Network latency** : The ADS-B network shall deliver reports to the User interface within 2 seconds of their output from the ADS-B ground station for 95% of the time. (Tier 1)

**Network latency** : The ADS-B network shall deliver reports to the User interface within 15 seconds of their output from the ADS-B ground station for 95% of the time. (Tier 2)

The *Provider* ADS-B system shall provide a MTBF (loss of ADS-B Service) to the User interface exceeding 50,000 hours. (Tier 1)

This requirement will typically require

= the communications infrastructure to be completely duplicated without a single point of failure.

= Two ADS-B ground stations shall be installed at each site. There shall be no common point single point of failure . Each ground station shall provide ADS-B data to the ATC centre.

The *Provider* ADS-B system shall provide a MTBF (loss of ADS-B Service) to the User interface exceeding 400 hours. (Tier 2)

**Availability** : The service shall be provided with a service availability from each ground station site of better than 99.9%. In calculation of availability, planned outages shall be included. (Tier 1)

**Availability** : The service shall be provided with a service availability from each ground station site of better than 95%. In calculation of availability, planned outages shall be included. (Tier 2)

#### **Integrity**

Integrity of ADS-B data is critical to system safety. The ADS-B ground station, the data communication system, and any processing before the interface shall not introduce errors (compared to the received ADS-

### **Proposed Sample ADS-B Data Sharing Agreement**

B messages) more frequent than 1 in every million messages ( $1 * 10^{-6}$ ).

The provided service shall not deliver any received data to the interface which has not satisfied ADS-B downlink message cyclic redundancy checks (CRC)

#### **Ground Station Receiver & Processing functionality requirements**

The *Provider* ADS-B system shall be based upon Mode S extended squitter technology.

The *Provider* ADS-B system shall receive and decode all Mode S DF17, DF18 and DF19 messages defined in the RTCA standards DO-260 and DO-260A.

The *Provider* ADS-B system shall receive and decode Mode S DF17, DF18 and DF19 messages using the Lincoln Laboratory error detection and decoding techniques specified in RTCA DO-260 or demonstrate equivalent performance using other techniques

The *Provider* ADS-B system shall be configurable to transmit or not to the interface

- ◆ Messages for aircraft indicating they are “on ground”
- ◆ Messages resulting from aircraft equipped with DO260 compliant avionics
- ◆ Messages resulting from aircraft equipped with DO260A compliant avionics

The *Provider* ADS-B system shall be designed so that when DO260A messages are received, the *Provider* ADS-B system must calculate a Asterix FOM field. The FOM value for each combination of NIC, NAC and SIL shall be configurable and agreed

#### **Site Monitor**

The concept of the ADS-B Site Monitor is to independently test the end to end functional performance of the ADS-B System. The position, geometric altitude, FOM value, other asterix data and presence of the site monitor is tested by the ATC automation system

Site monitor Asterix messages including GPS determined position and GPS geometric altitude from each

**Proposed Sample ADS-B Data Sharing Agreement**

ADS-B ground station shall be transmitted to the interfaces to provide an independent system integrity verification function.

The FOM value that is transmitted to the ATC centre shall be based upon the HPL value of the GPS receiver

A failure of the site monitor shall not adversely affect the operation of the *Provider* ADS-B system equipment.

**ANNEX I. COVERAGE or GROUND STATION DETAILS**

- The category of service and coverage of each source of ADS-B data provided;
- Which party is the provider for each source

Describe either the coverage volume or ground station supporting the shared service:

Eg:

Coverage volume : Above FL180 within the geographical region defined in the attached diagram.>

Or

Within line of sight coverage from ADS-B ground station at <lat-Long>

### **Project Scope**

**Objective:** Provide safety and efficiency benefits to airspace users in the airspace between Ho-Chi-Minh FIR, Manila FIR, Singapore FIR, Kota Kinabalu FIR and Indonesia FIRs using ADS-B and co-operate sharing of the ADS-B data.

### **Envisaged project**

- Provide ADS-B ground stations as follows, networked into the Air Traffic Control Centre(s) served by these ground stations:
  - 3 ADS-B Ground stations situated on Island offshore from mainland Vietnam;
  - 1 ADS-B Ground station situated in Eastern Malaysia;
  - 1 ADS-B Ground station situated in the southern island chain of The Philippines (perhaps Puerto Princesa);
  - 1 ADS-B Ground station situated on Natuna Island Indonesia; and
  - 1 ADS-B Ground station situated in Singapore.
- Ensure VHF coverage within the appropriate FIRs
- Develop Data sharing agreements as required based on the agreed sample ADS-B data sharing agreement
- Develop operational procedures required to make the above operational

The project proposal will propose a draft:

- Project schedule
- Project cost
- List of possible project responsibilities

and will discuss

- Benefits and Constraints
- Possible avionics equipage procedures & requirement
- Risks and issues associated with the proposal

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**THE SECOND MEETING OF THE SOUTH EAST ASIA SUB-REGIONAL  
ADS-B IMPLEMENTATION WORKING GROUP**

**Bali, Indonesia, 27-29 February 2008**

**LIST OF PARTICIPANTS**

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**SECOND MEETING OF THE SOUTH EAST ASIA  
SUB-REGIONAL ADS-B IMPLEMENTATION  
WORKING GROUP (SEA ADS-B WG/2)**

Bali, Indonesia, 27-29 February 2008



**LIST OF WORKING PAPERS**

<b>WP/IP No.</b>	<b>Agenda Item</b>	<b>Subject</b>	<b>Presented by</b>
1	1	Provisional Agenda	Secretariat
2	4	Sample ADS-B Out Mandate	Australia
3	4	Sample Agreement for ADS-B Data Sharing	Australia & Singapore Secretariat
4	3	Review result of first meeting of SEA ADS-B WG	Secretariat
5	5	Garuda Indonesia ADS-B Implementation Strategy	Indonesia
6	5	Update Indonesia DGCA Airworthiness Review Plan	Indonesia

**LIST OF INFORMATION PAPERS**

1	5	Australian ADS-B Programme Update	Australia
2	6	Significance of SA Aware GPS for ADS-B	Australia
3	5	Vietnam's Plan for ADS-B Deployment and Implementation	Viet Nam
4	4	Sample of Administration Agreements Relating to the Sharing of Radar Coverage	Australia
5	5	Indonesia status and ADS-B Implementation plan, and ADS-B Implementation in Indonesia	Indonesia
6	5	Regional Surveillance Coverage	IATA
7	5	The Surveillance System in the Philippines	The Philippines
8	5	Draft Australian cross flight information region (FIR) surveillance data sharing policy	Australia