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CAR/SAM REGIONAL PLANNING IMPLEMENTATION GROUP (GREPECAS)
Fifth Meeting of the CNS Committee of the GREPECAS ATM/CNS Subgroup (CNS/COMM/5)
Lima, Peru, 13 to 17 November 2006

Agenda Item 3: Surveillance systems developments
3.2 Study of the regional ADS systems implementation.

REGIONAL ADS-B SERVICE CONCEPT

(Presented by SITA)

SUMMARY

This information paper provides a summary of the Regional ADS-B Service model that has been jointly developed by the Australian air navigation service provider- Airservices Australia and SITA. This service concept aims to accelerate ADS-B implementation and one that enables cross FIR data sharing in the Asia/Pacific region. This paper also presents the Indonesian ADS-B trial that will demonstrate the benefits of this approach incluing data sharing across international FIR boundaries.

References:

- 11th ICAO Air Navigation Conference, Final Report
- 13th GREPECAS, Final Report

1. Introduction

1.1 With ADS-B technology as an enabler for global ATM operational concept bringing safety and operational efficiency, the ICAO APANPIRG has encouraged States to implement cross Flight Information Region (FIR) data sharing between adjoining States.

1.2 The 11th Air Navigation Conference, held in Montreal, by Sep/2003 acknowledged ADS-B as a key data link application in a future ATM environment, providing new surveillance capabilities for both aircrew and air traffic services.

1.3 The Thirteenth GREPECAS, held in Nov 14-18, in Santiago, Chile, also address ADS B development in the CAR/SAM region through establishment of an ADS B trial program (**Conclusion 13/87**) and requested the States to propose actions to develop an initial ADS and ADS-B implementation plan (**Decision 13/54**).

2. Background

2.1 Although States have radar capability that can track aircraft in adjoining airspace, there is generally limited exchange of real time surveillance data between States around FIR boundaries In many parts of the world. Sometimes, aircraft appears at the boundaries at time, altitude or position different than expected resulting in potential compromises in safety.

2.2 ADS-B technology provides air navigation service providers with an inexpensive alternative to radar at FIR boundaries to effectively detect aircrafts. At the same time, this technology has also the benefits of overcoming any existing radar gaps or minimising overlapping coverage from individual States existing surveillance infrastructure.

3. ADS-B Regional Service Concept

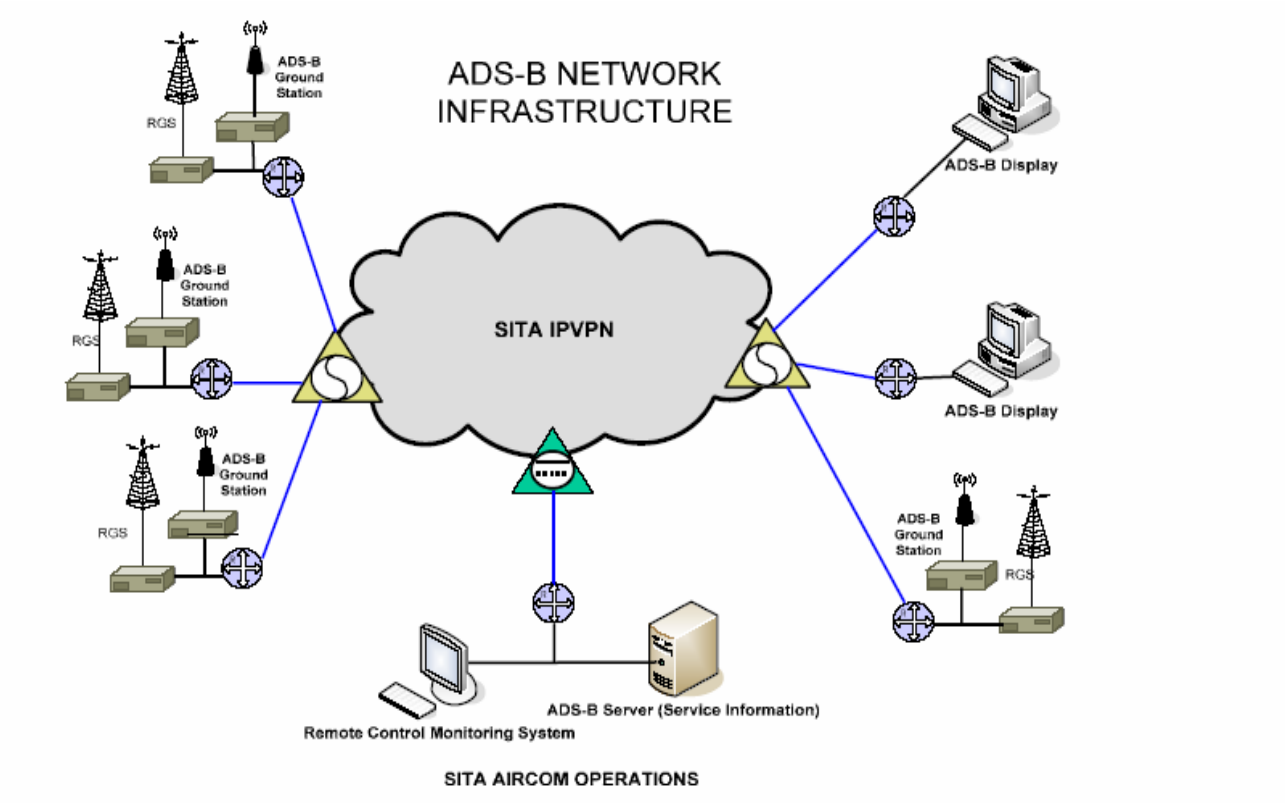
3.1 Due to potential improved safety and operational efficiency through surveillance data sharing between States particularly at FIR boundaries, there is a need to develop this ADS-B regional service concept that will push and accelerate ADS-B implementation across the CAR/SAM region. This concept aims to enable States to adopt ADS-B technology in the most cost effective and shortest time possible.

3.2 With the above consideration, in Asia/Pacific region, Airservices Australia and SITA have recently established an “ADS-B Alliance” that will develop and implement this ADS-B regional service concept. The key components of this service concept is the integration of Airservices’ capabilities and experiences with ADS-B technology in Australia with SITA’s service delivery experience and infrastructures as a global data link service provider.

3.3 By installing the ADS-B ground stations on existing SITA sites that are currently used for air to ground communications, air navigation service providers (ANSP) can within the shortest possible time receive ADS-B data via SITA’s worldwide network. ANSPs can have this ADS-B data integrated into their existing ADS-B capable air traffic management systems or, as an interim, have the data presented on stand-alone displays for trials and evaluation purposes. Alternatively, the ADS-B ground stations can also be installed at ANSP sites and connected to the SITA network.

3.4 Depending on each States requirement in Asia/Pacific region, the developed service concept will ensure that State receive consistent controller training, ATC procedure development and safety case development from Airservices Australia, the first air navigation service provider in the world to have introduced operational ADS-B enabled services..

3.5 The ADS-B regional service concept will be typically based upon the architectural concept presented below.



3.6 This ADS-B regional service concept is already accelerating implementation by States and ensure uniform implementation of cross FIR data sharing through the Asia/ Pacific region, and the successful trials being carried out by some of them is the proof of that. The adoption of this model in CAR/SAM region can provide equivalent development, on more cost effective and timely basis.

4. Cross FIR ADS-B Data Sharing

4.1 Radar is expensive and traditionally each State has located radars for optimum State FIR coverage, not optimum regional coverage because of sovereignty and security concerns. This has often resulted in overlapping surveillance system coverage and the inefficient use of resources from a regional interest view.

4.2 States can improve aircraft coordination errors and safety through surveillance data sharing between states particularly at FIR boundaries. By having neighbouring States to adopt FIR data sharing collaboration with deployment of ADS-B ground stations at sites near FIR boundaries, effective surveillance can be developed at a lower cost as compared if each State has to install ADS-B independently.

4.3 Examples of possible sites from which such sharing could readily be achieved, such as Mexico, Central America and Caribbean States, included as identified airspace as shown in the Appendix BI to the GREPECAS 13 Final Report.

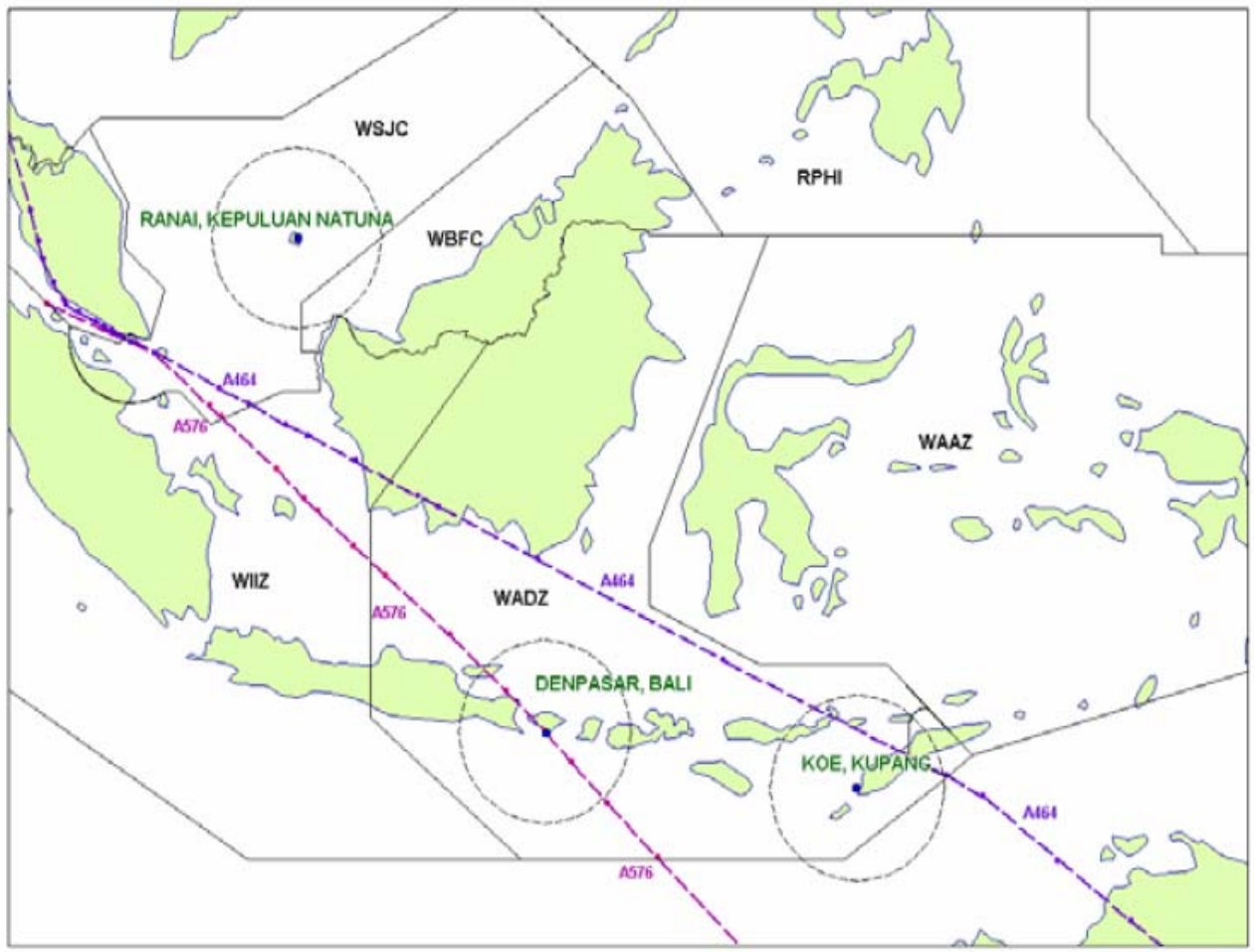
5. Benefits of ADS-B Regional Service Concept

5.1 The benefits of adopting this ADS-B regional service concept in the CAR/SAM region are as follows:

a) Increase safety especially around FIR boundaries;
b) Avoid fragmented and sub-optimal ground infrastructure deployment;
c) Avoid cost of expensive radar installations and upgrades;
d) Immediate operational benefits;
e) Enhancement aircraft surveillance data for ANSPs and airlines;
f) Lower cost benefits of ADS-B adoption for adjoining states; and
g) Uniform implementation across CAR/SAM region

6. ADS-B Trial in INDONESIA

6.1 The Directorate General Aeronautical Communications (DGAC) Indonesia is sponsoring the Airservices/SITA Alliance to implement a pilot ADS-B trial in Indonesia that will involve the deployment of up to three ADS-B receivers at strategic sites on Indonesian territory as shown in following:



6.2 The ADS-B data will be presented on stand-alone ADS-B displays in the Indonesian Area Control Centres in Makassar and Jakarta. In addition, in order to promote cross FIR border data sharing the DGAC Indonesia has agreed that ADS-B data received by the Natuna ADS-B receiver will be presented to the Singapore Area Control Centre and that received by the Kupang ADS-B receiver will be presented to the Brisbane Area Control Centre in Australia.

6.3 DGAC Indonesia has also agreed to present all received data on an ADS-B display that will be installed at the regional ICAO office in Bangkok in order to demonstrate DGAC's promotion of regional co-operation and the benefits of airspace surveillance using ADS-B.

6.4 The Indonesian trial has the potential to expand to providing an operational ADS-B service across Indonesia and cross FIR data sharing between neighbouring States representing a significant shift in the provision of future regional CNS services in Asia/Pacific region.

6.5 The promotion of a similar exercise in CAR/SAM region will certainly impact on regional CNS /ATM environment. Such approach should be considered by States in order to obtain concrete elements that can consolidate a common deployment strategy across the region.

7. Conclusion

7.1 ATM/CNS S/G5 is invited to note the ADS-B regional service concept being promoted in the Asia/Pacific region as a means to accelerate ADS-B implementation for States in the most cost effective and shortest time possible and one that enables cross FIR data sharing in that region.

7.2 The establishment of a funded trial program in CAR/SAM region, as already recognized by 13th GREPECAS, can demonstrate ADS-B concepts and benefits enabling States to better assess implementation model to be adopted in this region.

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