



International Civil Aviation Organization

**SIXTH MEETING OF THE SOUTHEAST ASIA
SUB-REGIONAL ADS-B IMPLEMENTATION
WORKING GROUP (SEA ADS-B WG/6)**



Singapore, 24 - 25 February 2011

Agenda Item 5: Review of sub-regional implementation plan

REVIEW ON ADS-B IMPLEMENTATION IN THE SOUTH CHINA SEA

(Presented by Hong Kong, China)

SUMMARY

During the 8th ADS-B SITF Meeting, a cost-benefit study on ADS-B implementation for two PBN routes in South China Sea region was presented which showed significant cost-savings and improvements in operational efficiency. This paper provides recommendation to provide seamless ADS-B surveillance for the region and have closer collaboration among the concerned ANSPs to share ADS-B data and harmonize timeline for ADS-B mandate along the two PBN routes.

1. BACKGROUND

1.1 During the 9th ADS-B SITF Meeting held in August 2010, the progress in ADS-B implementation in the South China Sea for two PBN routes L642 and M771 was reviewed. The initial implementation involved installation of several ADS-B stations and sharing of ADS-B data and VHF communications by the ANSPs of Indonesia, Singapore and Vietnam. The concerned CAA/ANSPs have been working closely to enhance surveillance in the South China Sea (SCS) region with good progress being made so far.

1.2 To make further steps in lining up various efforts being put into enhancing surveillance for the SCS region, this paper highlights the recommendation to explore possibilities in providing seamless ADS-B surveillance along the PBN routes L642 and M771, and the need for closer collaboration among the concerned ANSPs to share ADS-B data and harmonize timeline for ADS-B mandate in order to derive maximum benefits from the implementation.

2. DISCUSSION

2.1 The two unidirectional PBN routes L642 and M771 are among the routes with the highest traffic over the South China Sea region. During the 8th ADS-B SITF Meeting held in May 2009, a cost-benefit study on ADS-B implementation for these two PBN routes was presented showing a positive business case with annual savings of US \$4M and 3M lbs of fuel burn, and reduction in 10M lbs of carbon emissions per year.

2.2 The PBN routes L642 and M771 pass through four FIRs, namely Singapore, Ho Chin Minh, Sanya and Hong Kong FIRs (see Figure 1) with distance over 1300NM. In southern portion of the PBN routes, ADS-B surveillance will be provided by Singapore, Indonesia and Vietnam in which they have agreed on a collaborative project to install ADS-B and VHF stations in Singapore, Matak, Natuna (Indonesia) and Con Son (Vietnam), and share ADS-B data and VHF communications in order to provide radar-like separation for suitably equipped aircraft. The planned schedule is to conduct monitoring on performance of ADS-B surveillance in 2011, followed by operational trial in 2011-2012. Full ADS-B operations in exclusive airspace between FL310 and FL410 are targeted in first half of 2014.

2.3 In northern portion of the PBN routes L642 and M771, ADS-B surveillance will be provided by China and Hong Kong, China. Hong Kong, China plans to provide ADS-B surveillance and mandate ADS-B carriage by end 2013 for aircraft flying in exclusive airspace between FL290 and FL410 along these two PBN routes within Hong Kong FIR. In order to enhance surveillance in southern part of Hong Kong FIR, Hong Kong, China has collaborated with China to share ADS-B data and VHF communications for stations within Sanya FIR.

2.4 It is noted that CAA/ANSPs concerned have commenced respective enhanced surveillance programme, ADS-B or radar, over their FIRs on these parallel routes. In order to derive maximum operational benefits by having a uniform deployment of enhanced surveillance across the SCS region covering the entire PBN routes L642 and M771 without fragmentation, it is recommended that the concerned CAA/ANSPs should review the adequacy of enhanced surveillance coverage to achieve seamless surveillance coverage and provide enhanced surveillance in supporting RNP4 operations over the two PBN parallel routes.

2.5 As ADS-B surveillance on PBN routes L642 and M771 will involve multiple ANSPs including Singapore, Vietnam, China and Hong Kong, China, there is an obvious need to harmonize both equipage requirements and timeline for ADS-B mandate among the concerned ANSPs. While good progress has been made by ICAO on agreeing ADS-B equipage requirements and avionics approval standards, Hong Kong, China published in November 2010 an Airworthiness Notice on mandate for ADS-B equipage of Hong Kong registered aircraft flying along these two routes within Hong Kong FIR by end 2013, and Singapore has also planned to issue in second half of 2010 an AIP supplement on ADS-B mandate for these two routes within Singapore FIR by first half of 2014. It is recommended that the concerned ANSPs should discuss and harmonize their plan to mandate ADS-B for these two routes so as to derive maximum operational efficiency and economic benefits from the implementation. Besides, it is noted that ADS-B data sharing among several pairs of ANSPs in the region has been planned. It is recommended to explore feasibilities to expand scope of ADS-B data sharing with same version among the concerned ANSPs with an aim to improve safety and efficiency of cross border flights in the region.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

- a) note operational benefits in deploying uniform enhanced surveillance for PBN routes L642 and M771 and review the adequacy of enhanced surveillance coverage to achieve seamless surveillance coverage along these two routes; and
- b) consider the need to strengthen collaboration in ADS-B implementation in South China Sea region by harmonizing timeline for ADS-B mandate along PBN routes L642 and M771 and sharing of ADS-B data with same version among concerned ANSPs.

Legend

- (1) "X" - Location of ADS-B ground station
- (2) [O - 20xx] Planned year for ADS-B in operational use*
- (3) [T - 20xx] Planned year for ADS-B in trial

 Existing ADS-B Coverage with Trial Activities**

 Proposed ADS-B Coverage with Planned Date**

Note :

(*) Pre-requisites for ADS-B in operational use may include :-

- (a) Availability of ground station, communication backbone and ATM system that could meet ICAO requirements for ADS-B separation services [by ANSP]
- (b) Operational approval on aircraft equipage [by regulators & airlines]
- (c) Approval on safety cases for ADS-B separation services [by regulators & ANSP]

(**) Coverage assumes to be 250nm at FL410

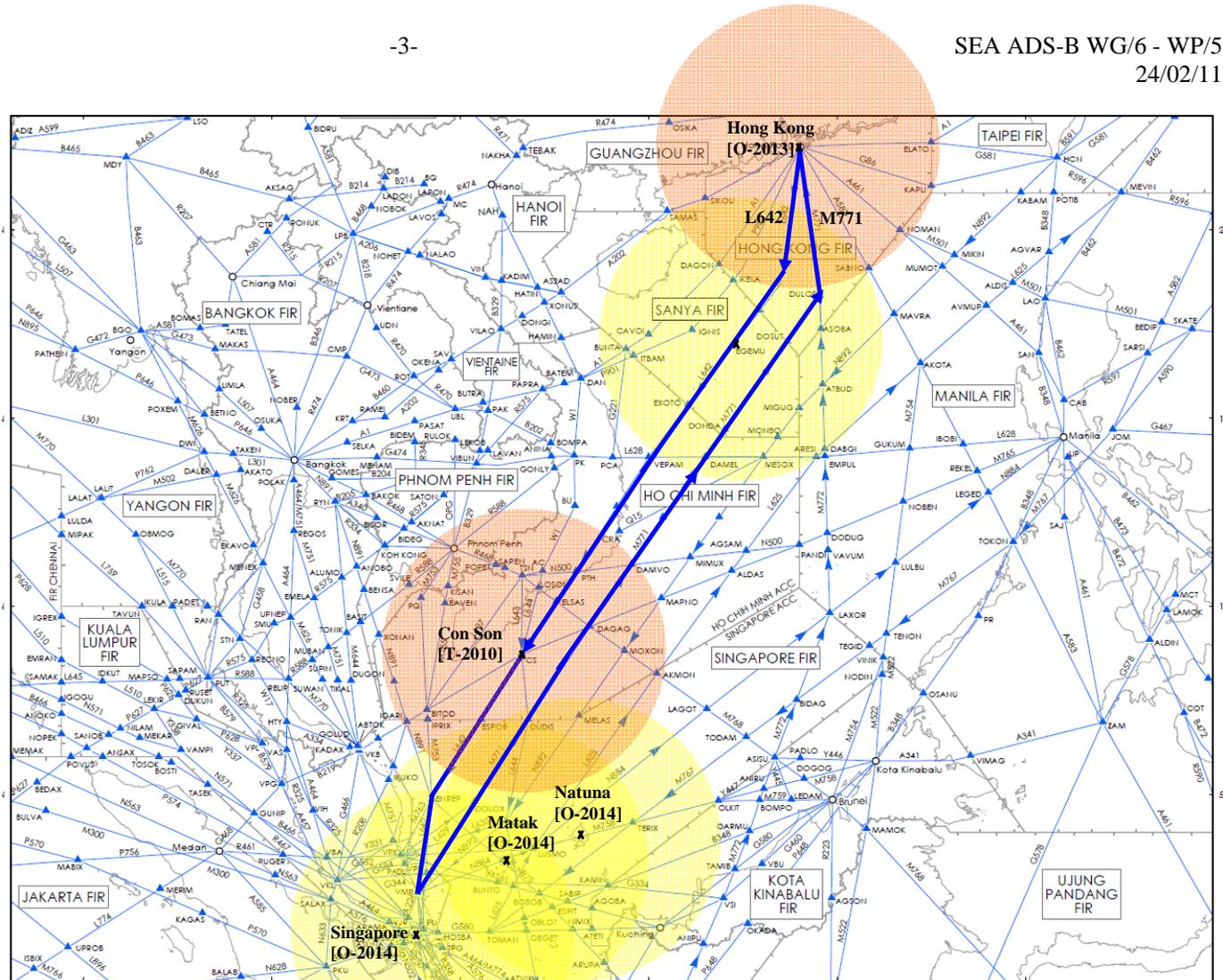


Figure 1 : ADS-B Implementation in South China Sea