



International Civil Aviation Organization

**The First Meeting of the APANPIRG ATM Sub-Group
(ATM /SG/1)**

Bangkok, Thailand, 20 – 24 May 2013

Agenda Item 4: ATM Systems (Modernisation, Seamless ATM, CNS, ATFM)

SURVEILLANCE COVERAGE PREDICTIONS

(Presented by the Secretariat)

SUMMARY

This paper discusses the ATM planning requirement for accurate surveillance coverage predictions.

This paper relates to –

Strategic Objectives:

A: Safety – Enhance global civil aviation safety

C: Environmental Protection and Sustainable Development of Air Transport – Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment

Global Plan Initiatives:

GPI-1 Flexible use of airspace

GPI-6 Air traffic flow management

GPI-7 Dynamic and flexible ATS route management

GPI-8 Collaborative airspace design and management

GPI-9 Situational awareness

GPI-12 Functional integration of ground systems with airborne systems

GPI-16 Decision support systems and alerting systems

GPI-17 Data link applications

1.1 The SWGs (SUR) of the combined SAIOCG/3 and SEACG/20 meeting conducted a study of current surveillance in South Asia and South-East Asia. **Figure 2** represents gaps in required surveillance coverage in the South Asia/Bay of Bengal area. **Figure 3** represents surveillance gaps of concern in the South China Sea area. Note that the surveillance coverage indicated is based on planned ADS-B implementation.

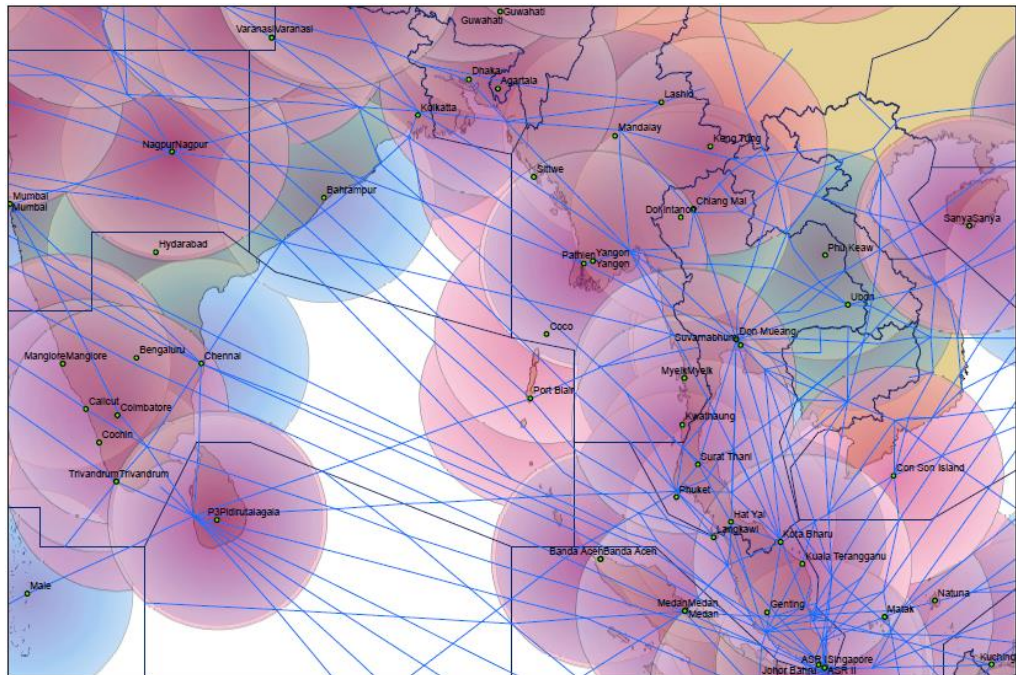


Figure 2: Planned Surveillance Coverage – Bay of Bengal

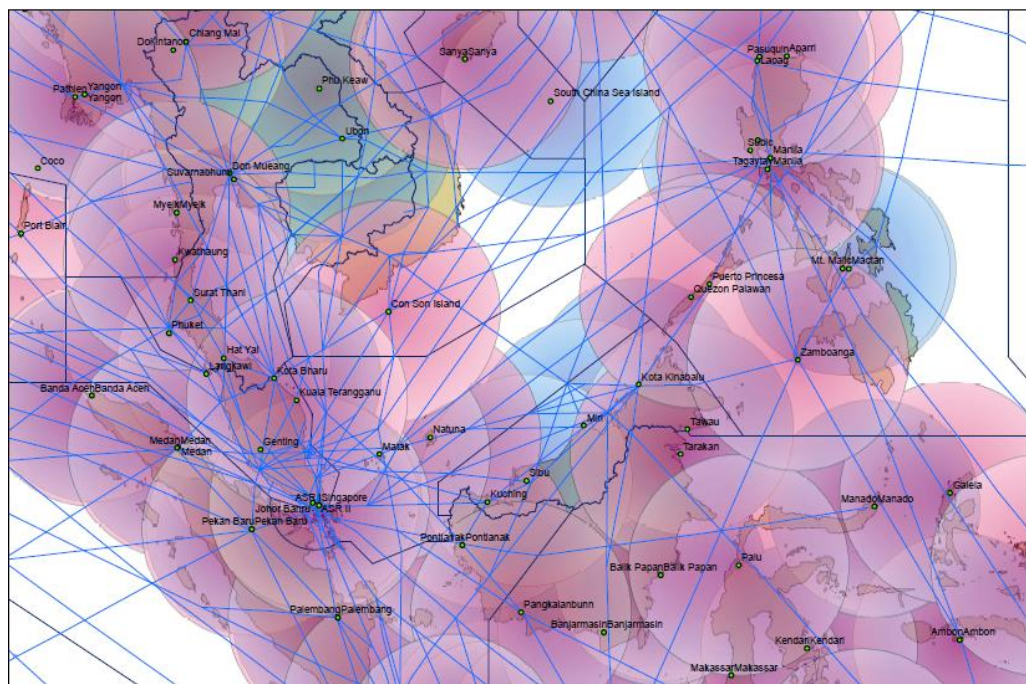


Figure 3: Planned Surveillance Coverage – South China Sea

1.2 Particularly in the case of the South China Sea, there is a significant gap in the combined SSR and ADS-B surveillance coverage of airspace which is becoming increasingly congested, and is identified as Category S airspace in the Seamless ATM Plan. Management of this airspace requires large non-surveillance separation standards, supported by a Flight Level Allocation scheme. Without surveillance based separation the airspace will continue to be managed in this restrictive and inflexible way, and the ATC systems of a significant number of participating and surrounding states, and the controllers themselves, will suffer capacity constraints.

1.3 The meeting is invited to also note that the surveillance analysis and planning being conducted by SAIOCG and SEACG SWGs is based on generic circular 250NM radius coverage estimates. These are highly inaccurate, and may lead to unrealistic expectations of currently planned surveillance capability in the region. There is a pressing need for high integrity coverage predication diagrams to be made available for this purpose. **Figures 4 and 5** provide examples of accurate ADS-B coverage predictions. **Figures 6 and 7** demonstrate an SSR coverage prediction, and the coverage realized in operation.



Figure 4: ADS-B Coverage Prediction

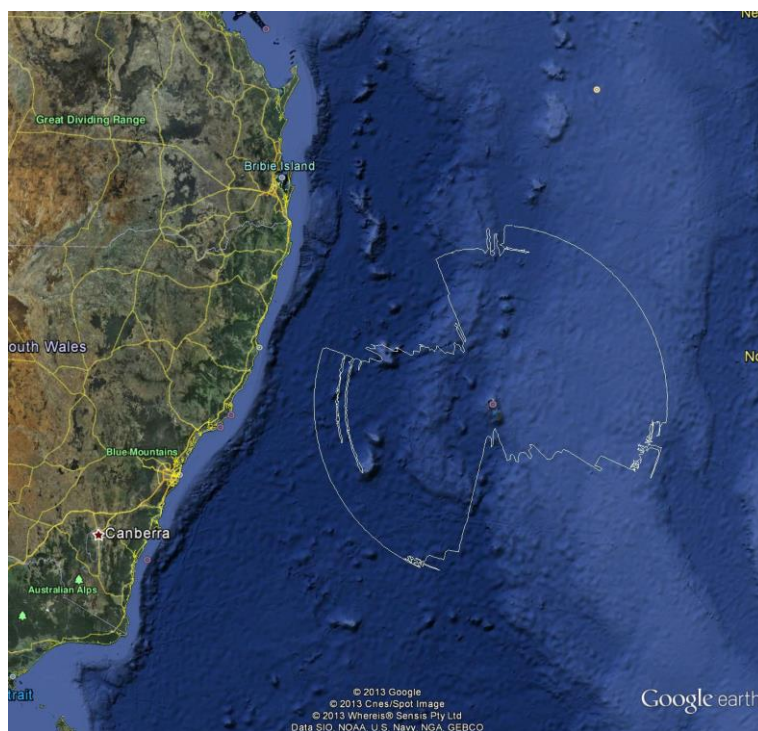


Figure 5: ADS-B Coverage Prediction



Figure 6: SSR Coverage Prediction

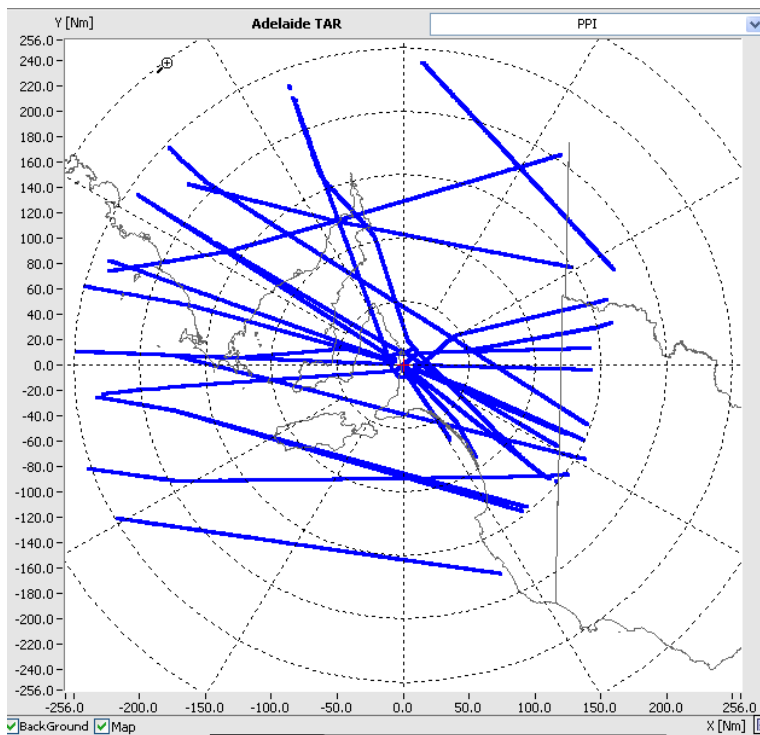


Figure 7: Actual SSR Coverage

1.4 Reliable and robust analysis and planning of ADS-B coverage to support improved capacity under the seamless ATM initiative cannot be achieved without accurate coverage modeling. States should ensure that surveillance engineering/technical teams are provided with reliable modeling tools and that reliable coverage predictions are provided for ATM analysis and planning.

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