International Civil Aviation Organization

AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST SEMINAR AND ELEVENTH MEETING OF AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) STUDY AND IMPLEMENTATION TASK FORCE (ADS-B SITF/11)

Jeju, Republic of Korea, 24-27 April 2012

Agenda Item 2: **Review the outcome of the APANPIRG/22 on ADS-B SITF/10 and SEA/BOB ADS-B WG/7 Meetings**

Agenda Item 3: **Review progress made by ADS-B related ICAO panels**

ATM AND PBN DEVELOPMENTS RELEVANT TO THE ADS-B SITF

(Presented by the Secretariat)

SUMMARY

This paper presents information on developments in the Air Traffic Management (ATM) and PBN (performance-Based Navigation) fields relevant to the ADS-B SITF.

1. INTRODUCTION

1.1 The First Meeting of the ICAO Asia/Pacific Seamless ATM Planning Group (APSAPG/1) was held in Bangkok, Thailand from 31 January to 3 February 2012. This body was established by APANPIRG/22 under Decision 22/56 and reports directly to APANPIRG.

1.2 The Ninth Meeting of the ICAO Asia/Pacific Performance-Based Navigation Task Force (PBN/TF/9) was held at Bangkok from 27 until 30 March 2012. An important part of the PBN/TF's work was to evaluate and facilitate the development of PBN-related standards which emanated from the PBN Study Group (PBNSG) and Separation and Airspace Safety Panel (SASP).

1.3 It should be noted that the Sixth Meeting of the Southeast Asia Route Review Task Force (SEARR/TF/6) and the Nineteenth Meeting of the Southeast Asia ATM Coordination Group (SEACG/19) would be held in Bangkok from 30 April until 4 May 2012.

2. DISCUSSION

APSAPG

2.1 APSAPG was tasked with developing a plan that facilitated inter-operable and harmonised systems related to ATM across the Asia/Pacific Regions. A key part of the planning process was the assessment of current aircraft equipage mandates and Air Traffic Service (ATS) capabilities in order to determine the areas that need improvement to reach a minimum regional specification. Minimum aircraft equipage levels had previously been established in other regions within certain portions of airspace, but the intent in the Asia/Pacific was to also apply minimum airspace and Air Navigation Service specifications, in order to harmonise standards from 'gate to gate' where possible.

2.2 The APSAPG was required through its Terms of Reference to ensure that the Aviation System Block Upgrades (ASBUs) were an important part of its planning. The ASBU consist of several elements, either technology or procedurally-based, that were assembled into a 'block' of available solutions. Of key interest to the ADS-B SITF are the following ASBU Block '0' elements:

- B0-75: Improved Runway Safety through Surface Movement Surveillance – technologies which often utilise ADS-B input;
- B084: Ground-Based Cooperative Surveillance – technology that includes ADS-B and Multilateration (MLAT);
- B085: Air Traffic Situational Awareness – use of ADS-B OUT to provide quicker acquisition of conflicting traffic;
- B086: Climb/Decent Procedures – In-Trail Procedure (ITP) using ADS-B; and
- B0102: Safety Nets – ATM systems with Minimum Safe Altitude Warning (MSAW), Short Term Conflict Alert (STCA), and Area Proximity Warning (APW) using Mode C/S transponder or ADS-B OUT services.

2.3 APSAPG was expected to produce a final draft Asia/Pacific Seamless ATM Plan which guided the overall regional development of systems, including ASBU, for APANPIRG/24's consideration (June 2013). During the development of this draft, it was expected that the APSAPG would identify areas of the Asia/Pacific that had not progressed as fast as other areas; thus this 'gap' analysis would inevitably provide valuable information on priorities for the ADS-B SITF.

2.4 The APSAPG/1 meeting noted there were three main areas which required the development of Seamless ATM principles: People, Facilities, and Technology and Information. Under these headings, a total of 53 draft Seamless ATM Principles were being considered by the APSAPG, including the following related to ADS-B development:

People: Cultural and Political Background

1. High-level political support for Seamless initiatives, including military cooperation.

People: Aviation Regulations, Standards and Procedures

7. An emphasis on delivery of tactical ATM services based on CNS capability, resulting in flexible, dynamic systems.

People: ATM Coordination

10. Cross-border/FIR cooperation for use of aeronautical facilities and airspace, collaborative data sharing, airspace safety assessment and ATM Contingency planning.

Facilities: Navigation Aids

24. The continued transition from ground-based aids to satellite-based PBN procedures, while maintaining a necessary redundancy and contingency network.

25. Support for a GNSS-based, integrated regional PBN approval standard.

Facilities: ATS Surveillance

32. The encouragement of ADS-B and/or MLAT implementation to improve ATS surveillance coverage, redundancy and multiple tracking capability.

33. Establishment of ADS-C where radar, ADS-B and/or MLAT is not possible.

34. Expansion of ATS surveillance data-sharing initiatives.

38. The encouragement of airborne capabilities such as of Self-Separation and Spacing and Advanced Strategic Lateral Offset Procedures (SLOP), in order to support Trajectory-Based Operations.

Technology and Information: Safety Nets

50. Regional mandates for MSAW, STCA, TCAS (ACAS), EGPWS (TAWS).

Technology and Information: ATM Modernisation Projects

51. Inter-regional cooperation (‘clustering’) for the research, development, tendering of contracts and implementation of ATM projects.

52. A focus on simpler universal technologies for earliest deployment and best cost benefits, using a staged implementation.

53. The encouragement of sub-regional and regional regulatory, service provision, research and development, and other industry bodies that cluster capabilities and optimise resources for Seamless ATM development.

PBN/TF/9

2.5 Based on a proposal made by Australia, PBNTF/8 had earlier proposed to include the minimum requirement of GNSS-enabled area navigation systems for all RNP navigation authorizations in the *Strategy for the Provision of Navigation Services in the Asia/Pacific Region*. This had been reflected in the revised Navigation Strategy proposed by the CNS/MET SG/15 meeting. The increasing importance of GNSS in the Asia/Pacific Region was of interest to the ADS-B SITF as the enabling navigational source for ADS-B. APANPIRG/22 adopted the following Conclusion to support the requirement projected by PBN Task Force:

Conclusion 22/22 - GNSS minimum requirement for RNP Navigation Specifications

That, GNSS-enabled area navigation systems for all RNP navigation specifications be adopted as minimum requirement in the Asia/Pacific Region.

2.6 The PBN/TF/9 was apprised of global PBN developments from the PBNSG, which included the following navigation specifications:

a) an RNP 2 navigation specification for en-route application, including remote and continental use, including high and low continuity applications;

b) application of Radius-to-Fix (RF) turn principles beyond terminal airspace as Fixed Radius Turns for all RNP applications;

c) an Advanced RNP navigation hierarchical specification applicable for en-route (RNP1), arrival, departure and approach to avoid the need for separate approvals for the different phases of flight and which includes parallel offset capability;

d) an RNP 0.3 navigation specification for helicopter operations but which can also be applied by low speed fixed wing operations; and

e) the RNP AR APCH (Required Navigation Performance Authorization Required) navigation spec was expected to be extended to departures and for one engine inoperative situations.

2.7 The new PBN standards being discussed may be implemented in a strategic manner by applying these on Standard Instrument Departures and Arrivals, Instrument Approaches, ATS Routes, with tactical monitoring by ATS surveillance such as ADS-B. To be effective, the SASP was working on separation standards for RNP 2 and also for ATS routes against Special Use Airspace such as danger areas.

2.8 The forthcoming ICAO PBN Symposium was highlighted to the PBN/TF, which was due to be held at Montreal, Canada from 16 to 19 October 2012 (http://www.icao.int/Meetings/PBN-Symposium/Pages/default.aspx).

3. ACTION TAKEN BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this paper;

b) discuss how the Seamless ATM initiative can be supported; and

c) discuss the draft Seamless ATM Principles relevant to ADS-B.

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