



International Civil Aviation Organization

**THE FOURTH MEETING OF ADS-B STUDY AND
IMPLEMENTATION TASK FORCE (ADS-B SITF/4)**

Nadi, Fiji, 26-28 October 2005

Agenda Item 3: Review the progress made by ADS-B related ICAO Panels

**1ST MEETING OF THE OPERATIONAL
DATA LINK PANEL (OPLINKP/1)**

(Presented by Nick King)

SUMMARY

This paper provides an update on the progress of draft ADS-B SARPs and Procedures developed by the Operational Data Link Panel and an extract of the OPLINKP/1 meeting report. The material in the report has not been considered by the Air Navigation Commission and the views expressed therein should be taken as advice of a panel of experts to the Air Navigation Commission but not as representing the views of ICAO.

1. INTRODUCTION

1.1 A meeting of the Operational Data Link Panel (OPLINKP) was held in Montreal from 12 to 23 September 2005. This was the first meeting of the Panel since ADSP/5 in 1999, and a substantial amount of material had been prepared by OPLINKP working groups in preparation for this meeting.

1.2 As Task Force participants would be aware, OPLINKP's Working Group A has been developing draft material for inclusion in various Annexes to the Chicago Convention, and had worked closely with the Separation and Airspace Safety Panel (SASP) to draft amendments to PANS-ATM (Doc 4444). These amendments were presented to the Panel for consideration, along with consequential amendments to PANS-ABC (Doc 8400) and a proposal to remove superseded material from the Manual of ATS Data Link Applications (Doc 9694).

1.3 This paper contains an extract of the OPLINKP/1 report relating to ADS-B in Paragraph 2. It should be noted that the report has not been considered by the Air Navigation Commission. The views expressed therein should be taken as advice of a panel of experts to the Air Navigation Commission but not as representing the views of ICAO. After the Air Navigation Commission has reviewed the report, a supplement setting forth the action taken by the Air Navigation Commission thereon will be issued to the report.

2. EXTRACT OF THE OPLINKP/1 MEETING REPORT – ADS-B SARPs AND PROCEDURES

2.1 Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM, Doc 4444) The meeting noted that the amendment to PANS-ATM concerning ADS-B was essentially a cooperative effort between OPLINKP and SASP. OPLINKP took the lead in advancing the relevant

procedures and re-writing Chapter 8 in a manner that incorporated ADS-B with the radar procedures and, at the same time, left much of the material generic enough to apply equally to radar, ADS-B and other forms of surveillance (e.g. multilateration). In this respect, the terms “radar” and “radar service” were removed (except where the applicable provision applied specifically to radar), and replaced them with the generic terms “ATS surveillance system” and “ATS surveillance service”. In this manner, the chapter could effectively apply to any ground-based system that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than a single monopulse SSR.

2.2 A view was expressed that additional work needed to be progressed to improve this definition of ATS surveillance system to support understanding of the PANS-ATM ADS-B-related proposed amendments. Furthermore, unless refinements to the definition and title of ATS surveillance system were made, achieving acceptance by panels, the Commission and the States would prove difficult. The meeting noted that with the presentation of a number of refinements each should be considered on its own merits, as each was not necessarily dependent on the others. Furthermore, it was noted that consequential amendments would need to be considered in the light of the proposed changes. In essence, however, the meeting felt that the refinements had not taken sufficient cognizance of the lengthy and difficult, but ultimately fruitful debate on the subject within the panel membership for the previous three years. Furthermore, the proposal could not be reconciled with the detailed working papers that had been presented at working group meetings on the subject of changes to terminology and the affect the changes would have on ICAO documentation in general. The meeting noted that revising terminology was not an easy task, and this was no exception. However, there was little favour for applying existing terms, such as “radar” generically to primary surveillance radar (PSR), secondary surveillance radar (SSR), ADS-B and other techniques, a position held by most of the members for some time. It was further noted that while each of the refinements proposed, in themselves might exhibit some merit, it was only as a collective term that consensus could be found and permit the amendment to be progressed. Furthermore, the meeting agreed that the definition met the needs of the provisions that it applied to and it met the conditions and rules specified in the Directives to Divisional-type Air Navigation Meetings and Rules of Procedure for their Conduct (Doc 8143) for the drafting of definitions.

2.3 The meeting noted that some changes were easily applied, for example, “radar display” would become “situation display”, “radar vectoring” would become “vectoring”; “procedural control” and “procedural separation”, always understood in the context of ATS, should now be formally added to the lexicon of ICAO. Other terms might take some getting used to, for example, the phrase “RADAR SERVICE TERMINATED” changing to “IDENTIFICATION TERMINATED”. These were the exceptions however, and in the main, the meeting agreed that the changes were intuitive and consistent with other phrases and terms used by ICAO.

2.4 The attention of the meeting was drawn to proposed text, in the form of a note, that indicated that provisions on the content of ADS-B reports could be found in Annex 10 — Aeronautical Telecommunications, Volume III — Communication Systems. This was based on the work completed by the first meeting of the Surveillance and Conflict Resolution Systems Panel (SCRSP/1, Montreal 8 to 19 November 2004). The meeting noted, however, that during its review of the Report of SCRSP/1, the Air Navigation Commission had deferred action on Recommendations 1/3, 2/3 and 2/5 (relating to amendments to Annex 10) pending the result of a study on the formulation of SARPs and the means of referencing the work of other standard-making organizations. It was understood that there was a concern about the continuing addition of appendices that contained detailed material requiring frequent or significant amendments. This meant that it was not clear where the provisions that applied to the contents of ADS-B reports, would ultimately reside.

2.5 In recalling Assembly Resolution A35-14, Appendix A, the meeting noted the applicability of Resolving Clause 3 in relation to complex aeronautical systems. In this respect, it was noted that for such systems, any technical specifications necessary to achieve these requirements shall be appendices to Annexes. While it was outside the purview of OPLINKP to comment on the adequacy of referencing other standard-making bodies or placing such material in another ICAO document, the meeting noted a number of associated matters that should be considered in the context of the above mentioned study and any decision on the word “necessary” in the context of ICAO technical specifications. This included the fact that all of the operational requirements prepared by OPLINKP and SASP were in the context of the technical specifications of the existing Appendix 1 and the newly proposed Appendix 2 to Annex 10 Volume III, Part I, Chapter 5. Furthermore, while comparable industry standards were available from both RTCA and EUROCAE for Appendix 1, the comparable industry standard to Appendix 2 had only been published by RTCA. The meeting noted that this scenario might prove to be a suitable test case for studying the future course of developing or promulgating technical specifications in ICAO.

2.6 The meeting noted that the work of SASP had concentrated on advancing the development of separation minima for ADS-B and focussing on issues raised in connection to the comparative assessment of ADS-B with a single monopulse SSR. The horizontal separation minima supported by the work to date, based on radar and/or ADS-B alike, was 9.3 km (5.0 NM). As well as playing a role in drafting conditions upon which 9.3 km (5.0 NM) could be applied, SASP was also finalizing a safety case document that captured all the relevant arguments, information and documentation in support of the task of developing the separation minima. While the meeting noted that this document was not completed in time for OPLINKP/1, it was expected to be completed prior to presentation of the Report of OPLINKP/1 to the Air Navigation Commission.

Annex 10 — Aeronautical Telecommunications, Volume III — Communication Systems

The definition of “automatic dependent surveillance — broadcast (ADS-B)” in Annex 10 Volume III was amended to more accurately reflect the contents of ADS-B messages.

Annex 2 — Rules of the Air, and Annex 11 — Air Traffic Services

As a consequence of the introduction of automatic dependent surveillance - broadcast (ADS-B) (i.e. a means of surveillance additional to radar), amendments to terminology in Annexes 2 and 11 were considered necessary. Effectively, where the existing operational requirement applying to radar equally applied to other means of surveillance, the text was amended to reflect this fact.

Annex 4 — Aeronautical Charts and Annex 15 — Aeronautical Information Services

As a consequence of amendments to the PANS-ATM concerning the introduction of ADS-B, consequential amendment to terminology in Annexes 4 and 15 was considered necessary. Of particular note, was the need to amend “Radar minimum altitude chart” to read “ATC minimum altitude chart” to reflect that the chart was used by the pilot to cross-check altitudes assigned by ATC and the relevant provisions applied equally to all ATS surveillance systems. In this way, the chart should not be confused with any other aeronautical chart.

Annex 15 was further amended to provide for a description of data link services and associated operating procedures within the contents of the AIP.

Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400)

The abbreviations “ADS-B” and “ADS-C” were incorporated into the document so as to standardise their use in operational communication. The terms ADS-B and ADS-C were also proposed for radio-telephony pronunciation in a non-phonetic form. This was in accord with common industry terminology for the two systems and was consistent with the proposed amendments to PANS-ATM. A new NOTAM code for ADS-B was proposed and the existing description of the code for CPDLC/ADS-C was modified to distinguish more readily between the two applications.

Manual of Air Traffic Services Data Link Applications (Doc 9694)

A significant amount of work has now been completed by OPLINKP and SASP on the ADS-B amendment to the PANS-ATM. Combined with the work completed by SCRSP/1 concerning the development of ADS-B technical specifications (SCRSP/1, Recommendation 2/3 refers), Part VII of the Manual had become largely redundant and deletion of this Part was considered necessary.

Concluding its discussion on the SARPs, procedures and guidance material, the meeting agreed to the following recommendation.

RSPP	Recommendation 4/1 — Amendment to Annexes 2, 4, 11 and 15, the PANS-ATM and PANS-ABC, Doc 9694 and Annex 10 (Volume III) concerning ADS-B
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That Annexes 2, 4, 11 and 15, the PANS-ATM and PANS-ABC, Doc 9694 and Annex 10 (Volume III) be amended as shown in Appendices A, B, G, H, I, J, K and O to the Report.
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3. NEXT STEPS

3.1 The report will now be considered by the Air Navigation Commission. Consultation with States on proposed amendments could be expected during 2006, with the likely effective date for changes being November 2007.

4. RECOMMENDATION

4.1 The meeting is invited to note the progress of draft ADS-B SARPs and Procedures.
