

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

- Agenda Item 1: Introduction and assessment of a global air traffic management (ATM) operational concept**
1.2 Enabling concepts in support of the global ATM operational concept
:

INITIAL GROUND SURVEILLANCE AND AIRBORNE SURVEILLANCE APPLICATIONS ENABLED BY ADS-B

(Presented by the European Organisation for the Safety of Air Navigation —
EUROCONTROL, on behalf of its Member States and those of ECAC)¹

SUMMARY

This paper reports on the Roadmap of Operational Improvements (OI's) to be implemented as part of the overall European ATM system enhancement up to year 2020, and in particular on the contribution of the envisaged ADS-B related applications.

These applications have been organized into 3 packages (Packages 1 to 3). Each package consists of a number of ground and airborne ADS-B applications.

The Conference is invited to adopt the content of the Package 1, set of applications to be used for initial implementation using ADS-B.

Action by the conference is in paragraph 4.

* English, French, Russian and Spanish versions provided by EUROCONTROL.

¹ The ECAC Member States are: **Albania**, Armenia, **Austria**, Azerbaijan, **Belgium**, Bosnia and Herzegovina, **Bulgaria**, **Croatia**, **Cyprus**, **the Czech Republic**, **Denmark**, Estonia, **Finland**, **France**, **Germany**, **Greece**, **Hungary**, Iceland, **Ireland**, **Italy**, Latvia, Lithuania, **Luxembourg**, **Malta**, **Moldova**, **Monaco**, **the Netherlands**, **Norway**, Poland, **Portugal**, **Romania**, Serbia and Montenegro, **the Slovak Republic**, **Slovenia**, **Spain**, **Sweden**, **Switzerland**, **The former Yugoslav Republic of Macedonia**, **Turkey**, Ukraine and **the United Kingdom**).

The 31 Member States of EUROCONTROL appear in **bold**

1. INTRODUCTION

1.1 The ICAO Operational Data Link (OPLINK) Panel is developing a concept of use for Automatic Dependent Surveillance – Broadcast (ADS-B). The draft concept includes a description of ADS-B Applications.

1.2 The EUROCONTROL Organisation has defined a Roadmap of Operational Improvements (OI's) to be implemented as part of the overall European ATM system enhancement out to 2020. The defined OI's should bring the capacity, safety and efficiency benefits required to meet the expected traffic growth in the period in question.

1.3 It has been demonstrated that a significant percentage (about 30%) of the defined OI's are enabled by both ground and airborne ADS-B applications as addressed in the draft document "ICAO OPLINK Panel Concept of Use for ADS-B V0.77."

1.4 The ICAO Surveillance and Conflict Resolution Systems Panel (SCRSP) is developing a circular on airborne separation assistance systems (ASAS) which will cover the whole range of ASAS applications included in Packages 1, 2 and 3. The ASAS applications are in conformity with the Operational Concept document of ICAO.

2. ROADMAP OF EUROPEAN ADS-B APPLICATIONS

2.1 The envisaged ADS-B related applications have for implementation feasibility reasons (including operational and technical development and validation, as well as required training and updates of the relevant documentation), been organised into 3 packages (Packages 1 to 3). Each package consists of a number of ground and airborne ADS-B applications.

2.2 In general, for each subsequent package the airborne ADS-B applications permit an increased level of transfer of aircraft separation responsibility to the cockpit. For the ground applications there is an increased level of use of Aircraft Derived Data, in particular in the area of aircraft intent.

2.3 Table 1 summarizes the contents and envisaged implementation time-scale of these packages. Each package includes both ground surveillance applications (GSA) and airborne surveillance applications (ASA).

Package No.:	Currently planned Time-scales	Package description
1	2008-2012	5 GSA's which include: - Provision of ATC Surveillance together with radars in En-route airspace; - Provision of ATC Surveillance in Terminal airspace; - Provision of ATC Surveillance in non-radar areas; - Provision of Airport Surveillance (possibly together with radars and multi-lateration); and - Use of aircraft-derived data for use by ground tools. 7 ASA's which include: a) Air Traffic Situational Awareness (ATSA) related: - Enhanced traffic situational awareness on the Airport surface; - Enhanced traffic situational awareness during flight operations; - Enhanced Visual Acquisition for See and Avoid; and - Enhanced Successive Visual Approaches; b) Airborne Spacing Applications (ASPA): - Enhanced Sequencing and Merging operations; - In-trail Procedure in Oceanic Airspace; and - Enhanced Crossing and Passing Operations.
2	2010-2015	The applications in this package are not yet defined in detail. As an indication they include: - Enhanced GSA/ASA's of Package 1; - Use of ADS-B for surveillance means in high-density airspace; - Airborne Separation Applications; and - Airborne self-separation Applications in low-density airspace.
3	2015-2020	The applications in this package are not yet defined in detail. As an indication, they include: - Enhanced GSA/ASA's of Package 2; and - Airborne Self-separation Application in medium/high-density airspace.

Table 1. Roadmap of ADS-B Applications

3. SUPPORT FOR PACKAGE 1

3.1 Package 1 can be supported by existing ADS-B data link technology (A separate paper is being submitted to this Conference under Agenda Item 7).

3.2 The implementation of Package 1 is supported by IATA Europe and the AEA (Association of European Airlines). In addition, the EUROCONTROL Organisation and the Commission of the European Community (CEC) support Package 1.

3.3 Recent discussions with the FAA indicate that a large commonality exists between the planned early ADS-B applications of the Safe Flight 21 initiative in the United States and Package 1.

3.4 Further discussions to achieve maximum cooperation and alignment are on going. This development is likely to promote the achievement of global interoperability for both future ADS-B applications and supporting data links.

4. **ACTION BY THE CONFERENCE**

4.1 The conference is invited to:

- a) endorse the content of Package 1, set of applications to be used for initial implementation using ADS-B; and
- b) recognize the need to implement Package 1, as part of the proposed roadmap of ADS-B application packages, to meet the future air traffic management requirements in terms of capacity, safety and efficiency.

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