

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 2: Safety and security in air traffic management (ATM)

2.5 Safety and security of the ATM infrastructure

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7: Aeronautical air-ground and air-to-air communications

ADS-B IN THE FUTURE ATM SYSTEM

(Presented by the Russian Federation)

SUMMARY

This paper considers the possible role of the ADS-B system in the future ATM system. It gives some brief information on the programme for the implementation of ADS-B in Russia. It proposes supporting States' activities in carrying out work related to ADS-B implementation.

Action by the conference is in paragraph 3.

1. INTRODUCTION

1.1 The new ATM-related systems and concepts are more and more built on digital data interchange in the air-to-air and air-ground modes using communications channels. In the design and implementation of communications channels and in the use of services based on communications channels, account is taken of safety and security matters in order to fully utilize the advantages of the new functions based on the new technologies.

2. DISCUSSION

2.1 In modern air traffic control (ATC) systems, the controllers are the central element for the detection and resolution of possible conflicts. Automated means are used for this purpose for ATC such as means to resolve conflicts and means to provide advice in decision-making. Unfortunately, this does not bring the success that is due in all possible situations.

2.2 In the automatic transmission of data from aircraft (position, speed and intent data) to ground systems, it is possible to optimize certain functions of the ATM systems. These functions will ensure the early detection of possible conflicts and unauthorized deviations from the flight plan. This will consequently increase the level of security.

2.3 An important principle of the automatic dependent surveillance-broadcast (ADS-B) system is data interchange using different data links. The most important components of the data are the identification of the aircraft, their position and their movement and intent parameters. The ADS-B data obtained and used by the ground systems increase the accuracy of the ATM functions and increase their efficiency. This helps to increase flight safety.

2.3.1 However, ADS-B has to play one more role in ensuring safety. The position and intent data coming from ADS-B increase knowledge about the surrounding situation in the cockpit and the knowledge of others involved, for example, the operators in the airline operations control centres and in search and rescue organizations' centres. ADS-B data can provide an "early look" of approximately 10 minutes unlike the 60 to 90 seconds that are characteristic of the airborne collision avoidance system (TCAS). When using the ADS-B system, more people will be informed about the situation that is developing; more pairs of eyes will observe what is happening in the air. This will increase the probability of the early detection of a dangerous situation and the prevention of an accident. In aircraft accident investigation, search and rescue work may be made easier by using information from a damaged aircraft which is stored in the ground infrastructure and/or in another aircraft or ground vehicle.

2.4 In view of the advantages indicated above and the ATC structure that has developed in Russia, the State Civil Aviation Authority of Russia adopted the concept and programme of the phased implementation of ADS-B in Russia based on VHF Datalink Mode 4. It is planned to create a network of ADS-B ground stations. The equipment developed in Russia is presently being certificated. Implementation of ADS-B will start in 2004 in the Tyumen region.

3. ACTION BY THE CONFERENCE

3.1 The conference is invited to:

- a) support the use of ADS-B in the future CNS/ATM system;
- b) note that in accordance with the concept and programme adopted by the State Civil Aviation Authority, Russia is undertaking phased implementation of ADS-B in its airspace; and
- c) request the Council of ICAO to monitor on a priority basis States' activities related to the development and implementation of ADS-B means and, as necessary, to develop recommendations with respect to supporting the development of these ATM means.

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