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Agenda Item 34: Aviation safety and air navigation policy

ENHANCING SAFETY AND EXPANDING CAPACITY; IMPLEMENTATION OF ADS-B OUT IN THE UNITED STATES

(Presented by the United States)

EXECUTIVE SUMMARY

Automatic Dependent Surveillance – Broadcast (ADS-B) Out technology is a foundational element to the implementation of the ICAO Global Air Navigation Plan (GANP) and associated Aviation System Block Upgrades (ASBUs). The benefits of ADS-B Out are well-defined, providing substantial safety and capacity benefits to the global aviation system. In 2010, the United States Federal Aviation Administration (FAA) published a regulatory requirement to implement ADS-B Out in the United States. All aircraft operating within certain airspace are required to be equipped with ADS-B Out technology by January 1, 2020.

To ensure preparedness throughout the aviation community, and prevent any operational disruptions, the United States is working collaboratively with industry and States to promote awareness so that all aircraft operating to the United States will be sufficiently equipped with ADS-B Out by January 1, 2020.

<i>Strategic Objectives:</i>	This working paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
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<i>Financial implications:</i>	This paper has no significant financial implications for ICAO.
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<i>References:</i>	Doc 9750, <i>Global Air Navigation Plan</i>
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1. INTRODUCTION

1.1 The benefits of Automatic Dependent Surveillance – Broadcast (ADS-B) have been well recognized by the international community. At the 38th Session of the ICAO Assembly, Member States endorsed the Global Air Navigation Plan (GANP) and the associated Aviation System Block Upgrades (ASBUs). The ASBUs provide the direction necessary for States and industry to implement and integrate new flight technologies and procedures into their national systems, in a manner compatible globally and incorporated by prioritized phases (or blocks). ADS-B Out is a part of Block 0 in performance improvement area 3: “Optimum Capacity and Flexible Flights – Through Global Collaborative ATM”. Block 0 includes those technologies already in use in some ICAO States and regions, and considered the critical building blocks needed to recognize future advancements in future blocks.

1.2 ADS-B is one of the most important, underlying technologies in the Federal Aviation Administration’s (FAA) plan to transform air traffic control from the current radar-based system to NextGen, a satellite-based system. ADS-B is bringing the precision and reliability of surveillance based on satellite-based positioning to the United States. Detailed information on United States implementation of ADS-B is available at <https://www.faa.gov/nextgen/programs/adsb/>.

1.3 The United States ADS-B mandate will affect both United States and foreign aircraft operators. To ensure preparedness throughout the aviation community, and prevent any operational disruptions, the United States is promoting awareness so that aircraft intending to operate within the affected airspace will be sufficiently equipped with ADS-B Out technology by January 1, 2020.

2. DISCUSSION

2.1 ADS-B uses Global Positioning System (GPS) technology to determine specific aircraft information, which is then broadcasted to other equipped aircraft and air traffic controllers via a nationwide network of ground stations. Its numerous performance benefits include: the ability to provide more frequent position update rates than radar; deliver more precise location and velocity information for the aircraft; and offer critical in-cockpit traffic information.

2.2 The improved accuracy, integrity and reliability of satellite signals over radar means controllers will be able to safely reduce the mandatory separation between aircraft. This will increase capacity in the national airspace system. ADS-B also provides greater surveillance coverage, since ADS-B ground stations are much easier to place than radars. Remote areas without radar coverage, such as the Gulf of Mexico and parts of Alaska, are now covered by ADS-B.

2.3 The FAA published Federal Regulation 14 CFR 91.225 and 14 CFR 91.227 in May 2010 for ADS-B Out equipage after January 1, 2020. This rule mandates performance requirements for ADS-B avionics that will be required to fly in certain U.S. airspace.

2.4 Several other States and regions have implemented ADS-B within their own systems. The U.S. mandate and the E.U. mandate define requirements to support current and planned ADS-B applications in the relatively congested, “radar airspace” of the U.S. and Europe. The United States mandate requires ADS-B Version 2 and defines 19 parameters required to provide the data necessary for current and planned services, including ATC separation service. The European Union mandate also requires ADS-B Version 2. The European Union mandate requires five parameters that are not part of the United States mandate (three of which are conditional on the actual availability of the data on board the aircraft). The United States mandate requires one parameter that is not part of the European Union

mandate. These differences are consistent with the current differences in surveillance requirements between the United States and the European Union. However, multiple manufacturers who are building avionics for both regions have implemented solutions which meet the superset of the United States and European Union requirements, so global interoperability of such ADS-B Version 2 systems is assured.

2.5 Several States have implemented ADS-B for ATC separation services, such as Canada, Australia, and many countries in the ICAO Asia-Pacific Region. These States are primarily using ADS-B Out to provide surveillance services in mostly low-density airspace for ATC separation or as support for existing secondary surveillance radar services in higher density en route and terminal airspace. At this point, the implementation of ADS-B was based on a need to provide delivery of existing levels of ATC surveillance service in new locations at low cost using existing avionics installations rather than aiming at a generational paradigm shift. These States will likely transition to more demanding ADS-B requirements over time as their fleets and airspace requirements change.

3. CONCLUSION

3.1 ADS-B is a critical aspect of the ICAO GANP ASBUs, and its implementation is necessary to support future advancements to the safety and efficiency of the global air traffic management system. Implementation of ADS-B in the United States is a significant foundational element of the United States NextGen program, and the January 1, 2020 deadline will not change.

3.2 States with operators that intend to operate within the affected United States airspace are encouraged to promote awareness of this upcoming requirement. Timely installations will allow the approving authority to ensure that the equipage installations are compliant with the requirements; will allow the operators sufficient preparation to account for the expense and time needed to complete the installation; and will ensure that aircraft can operate in United States domestic airspace on 1 January 2020.

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