International Civil Aviation Organization

FIFTEENH MEETING OF THE ADS-B STUDY AND IMPLEMENTATION TASK FORCE (ADS-B SITF/15)

Bangkok, Thailand, 18 - 20 April 2016

Agenda Item 4: Review States' activities and interregional issues on implementation of ADS-B and multilateration

FAA ADVISORY CIRCULAR (AC) 90-114A CHG1 AND ADS-B PREFLIGHT AVAILABILITY PREDICTION

(Presented by United States/Federal Aviation Administration)

SUMMARY

This paper presents notable changes to FAA AC 90-114A and requirements for ADS-B preflight availability prediction. The AC contains three significant changes: equipment qualification for ADS-B, preflight planning requirements and FAA Exemption 12555.

1. INTRODUCTION

1.1 This paper presents notable changes to FAA Advisory Circular (AC) 90-114A including requirements for ADS-B preflight availability prediction for flights in U.S. ADS-B-mandated airspace after January 1, 2020.

2. DISCUSSION

2.1 FAA AC 90-114A Change 1 was published on March 7, 2016. It contains three significant changes from the previous version of the AC: revised equipment qualification resulting from a technical amendment to U.S. 14 CFR 91.225, preflight planning requirements for flight into ADS-B-mandated airspace and FAA Exemption 12555.

Equipment Qualification for ADS-B

2.2 On May 28, 2010, the FAA published 14 CFR Section 91.225 which provides the ADS-B equipment requirements necessary to operate in certain classes of airspace effective January 1, 2020. The regulation stated that in order to operate an aircraft in Class A airspace, an aircraft must have installed equipment that "meets the requirements of TSO-C166b." Under paragraph (b)(1) of that section, in order to operate an aircraft below 18,000 feet MSL, and in other airspace described subsequently in section 91.225, an aircraft must be equipped with equipment that "meets the requirements of TSO-C166b; or TSO-C154c". After publication, the FAA noted that the regulatory text implied that the equipment must meet all the requirements of the referenced Technical Standards Orders (TSO). As the ADS-B Out rule is a performance-based rule, it was not the FAA's intent to limit operators to only install equipment marked with a TSO in accordance with 14 CFR Part 21,

subpart O. The FAA's intent was to permit equipment that meets the performance requirements set forth in the referenced TSOs.

2.3 In February 2015, the FAA issued a Technical Amendment to 14 CFR 91.225. In the amendment, the revised sections now state that the installed equipment must meet "the performance requirements" of the referenced TSOs. This means that compliance with the rule can be met with equipment that meets the performance requirements, but is not manufactured under TSO Authorization. This is an important distinction which provides a means for compliance for the large number of Experimental category aircraft. AC 90-114A CHG 1 includes details for installation approval and qualification for ADS-B.

ADS-B Preflight Availability Prediction

2.4 The AC summarizes the performance characteristics of SA-ON and SA-AWARE GPS position sources and their impact on rule performance. SA-ON and SA-Aware may have periods of Navigation Integrity Category (NIC) and Navigation Accuracy Category for Position (NACp) less than required by the rule. To avoid operational impact to the U.S. national airspace system (NAS) and to ensure compliance with the rule, operators with these systems are expected to perform a preflight availability prediction. Operators of aircraft equipped with Satellite Based Augmentation Systems (SBAS) are not expected to perform a preflight availability prediction. The AC notes that some GPS receivers manufactured with a TSO-C129a approval are SA-Aware, and so have the same NIC and NACp availability as TSO-C196() approved equipment.

2.5 **The AC describes three preflight availability predictions methods**

2.5.1 The operator may use their own tool that accurately predicts the performance for their aircraft. The tool needs to account for the GPS satellites that are in service at the time of the prediction, and account for unique characteristics of the GPS receiver, aircraft integration or installation. The FAA will not evaluate or approve a particular tool. However, the FAA may evaluate the basis of the operator's determination that the tool is appropriate to their aircraft, in the event that there are repeated events of non-compliance.

2.5.2 The operator may use the FAA provided Service Availability Prediction Tool (SAPT) that has been developed by the FAA. The SAPT may be used in one of two ways. There is a flight plan interface and an Extensible Markup Language (XML) interface batch submission. The flight plan interface is intended for single flight predictions. The XML interface is most suitable for operators of large fleets of aircraft and may be incorporated into the operator's flight planning system.

2.6 Initial predictions can be made 48 to72 hours prior. However, a performance prediction should be conducted as close to departure time as feasible while allowing for sufficient time to re-plan the flight or obtain ATC prior approval in the event a segment of the flight will not be compliant. The prediction should be reevaluated prior to flight if a new NOTAM identifies an unscheduled GPS satellite outage.

2.7 Except as provided in FAA Exemption 12555, in the event of predicted drop of NIC and NACp below required values for any part of the flight where ADS-B is required, the flight must be delayed, canceled or re-routed, unless specific ATC authorization is obtained as described in the regulation. (Refer to 14 CFR 91.225(g).

2.7 It may be necessary for ATC to authorize operations in airspace for which ADS-B is required at times when the required performance cannot be met. During interference outages of GPS the FAA may revert to alternate surveillance as necessary for the affected areas. ATC will issue a NOTAM should that occur. ATC will also issue a NOTAM if the FAA-provided SAPT is not available.

FAA Exemption 12555

2.8 Some operators, using TSO-C129-compliant (SA-On) or TSO-C196-compliant GPS receivers for ADS-B Out may obtain limited relief from NIC and NACp performance requirements under FAA Exemption 12555. (Refer to IP titled *U.S. Federal Aviation Administration Exemption 12555 Applicability And Process*.) It is a time-limited grant of exemption from the NIC and NACp requirements specified in Title 14 of the U.S. Code of Federal Regulations (CFR). Exemption 12555 is valid from January 1, 2020 through December 31, 2024 and is subject to certain conditions and limitations.

2.8.1 Under the conditions of the exemption, operators with receivers meeting the performance requirements of TSO-C196() may operate in designated airspace for which ADS-B Out is required when the aircraft's NACp and NIC do not meet the performance specified in the rule. For these operations, the operator does not need to conduct any preflight availability prediction.

2.8.2 Operators using TSO-C129-approved GPS receivers that do not meet the performance requirements of TSO-C196, TSO-C145, or TSO-C146 may operate in airspace where ADS-B Out is required when the aircraft's NIC and NACp do not meet the performance specified in the rule, when the FAA determines that other surveillance is available. SAPT will indicate if the FAA has determined that surveillance is predicted to be available during a predicted performance outage. Since the FAA must make the determination that alternate surveillance is predicted to be available, the SAPT is the only tool which can provide this capability. Operators may elect to use a combination of preflight availability prediction tools, to leverage a custom tool for normal flight planning and the SAPT for managing predicted outages under Exemption 12555.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this papers; and

b) discuss any relevant matters as appropriate.

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