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AIR NAVIGATION SERVICES

COMMUNICATION

ADS-B 1090 MHz and Mode S “Extended Squitter” AIRCRAFT TRANSPONDER REQUIREMENTS IN SOUTH AFRICA

1. Purpose

The purpose of this AIC is to inform the South African ATM community of intended developments in terms of enhancing and improving Air Traffic Surveillance Services. It also serves as a means to open dialogue for the purposes of consultation with the Aviation Industry prior to the proposed implementation of the Surveillance Services.

In the Republic of South Africa, transponder equipage; and operation in CLASS A, and CLASS C airspace is mandated according to SA-AIP ENR 1.6.1 to ENR 1.6.5. Furthermore, Regulation 91.05.1 of the Civil Aviation Regulations, 2011 (CAR 2011) read together with the SA-CATS 91.05.1; provide further clarity and support to this ENR mandate.

2. Introduction

In order to continue with the provision of safe, orderly, expeditious and efficient Air Traffic Management solutions and associated services; it is necessary to continuously review the enabling technologies that allow for improved continuation of these services.

To this extent, the need to inform Aviation Industry of more flexible, efficient, and cost-beneficial Surveillance Technologies such as Automatic Dependant Surveillance-Broadcast (ADS-B) has been identified; with a view to replace legacy, less efficient, and more expensive Primary Surveillance Radar (PSR) and Monopulse Secondary Surveillance RADAR (MSSR) technologies.

Due to the increase traffic volumes, especially in complex terminal areas, the introduction of Mode Select (Mode S) transponders are also required to ensure operational performance of the surveillance sensors.

The positive gains in Total Surveillance System Performance that ADS-B and Mode S provides has been proved by other ANSP's; and as such, ADS-B been identified to be suitable for fitment on all relevant Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) flights in the RSA in order to ensure that pertinent and essential information is fed to the Automated Air Traffic Management System, which is in support of the future operating environment.

3. General

If a new transponder is installed in an IFR or VFR aircraft, it is highly recommended that it be equipped with serviceable ADS-B and Mode S transponder in order to comply with the future effective dates for planned Mode S and ADS-B equipage.

Mode S and ADS-B Planned Dates of Applicability

The proposed fitment of approved ADS-B equipage is as follows:

2018 – IFR Forward fit: *Any aircraft that is first registered on or after 1 January 2018 and is operated under IFR must carry a serviceable Mode S and ADS-B transponder that complies with the requirements below.*

2020 – All IFR aircraft: On and after 1 April 2020 operated under IFR must carry a serviceable Mode S and ADS-B transponder that complies with the requirements below.

2020 –New aircraft and Newly installed transponders: Any aircraft that is first registered or modified by having its transponder replaced on or after 1 April 2020, and is operated in Class A, B, C or E airspace must carry a serviceable ADS-B and Mode-S transponder that complies with the requirements below.

Mode S and ADS-B Transponder Requirements

In order to realise the full operational benefits of ADS-B, it is recommended that the equipment meets the current standard 1090ES ADS-B Link Version 2 (RTCA/DO-260B/EUROCAE ED-102A) for transponders fitted to aircraft operating in South African airspace.

Aircraft that are additionally equipped with antennae fitted on to the top and bottom of the fuselage will have the benefit of line-of-sight to the evolving based services as well as terrestrial services (e.g. ACAS, ADS-B, etc).

(RTCA/DO-260B/EUROCAE ED-102A) transponders feature both ADS-B “out”, as well as ADS-B “in” for the purposes of Traffic Information, Service Broadcast (TIS-B), and Flight Information.

In South Africa, (RTCA/DO-260B/EUROCAE ED-102A) compliant transponders shall include only those operating on 1090 MHz. This standard will expressly exclude the use of Universal Access Transceivers (UAT) that operates on 978 MHz.

In addition to meeting the above requirements, the equipment shall also be certified in accordance with the FAA or EASA (E)TSO-C166() or a later approved version.

The mode S transponder equipment shall be certified in accordance with the FAA or EASA (E)TSO-C112 or a later approved version.

The aircrafts unique 24 bit address’ (otherwise known as the mode S code issued by the Authority) shall be strapped to the transponders without error and ensuring that it corresponds exactly with the binary or hexadecimal address issued. Confirmation of the correct strapping must be conducted by using the correct ramp test equipment. Application for this code must be made to the Authority using form CA 91-12 which can be found on the SACAA website and must be accompanied by the prescribed fee.


The GNSS position source shall be certified in accordance with FAA or EASA (E)TSO-C145a, (E)TSO-C146a or (E)TSO-C196a or later approved versions. Some later versions of GNSS receivers certified to (E) TSO-C129 may also meet the requirements, such as those having FDE and HPL features incorporated.

The altitude source equipment supplying the pressure altitude to be transmitted by the ADS-B equipment shall be certified in accordance with the FAA or EASA (E)TSO-C88a or a later approved version.

4. Conclusion

Installations carried out on South African registered aircraft to meet the above requirements must be carried out strictly in accordance with Part 21 and Part 43 of the CAR, 2011 and must be conducted by an Aircraft Maintenance Organisation holding the current and appropriate rating to do so.

For further information, please contact the ATNS ADS-B helpdesk atads-b@atns.co.za


DIRECTOR OF CIVIL AVIATION