

Deviation Request CS-ACNS#2 for the certification of an ELS/EHS/ADSB-out installation (Major Change) and its compliance to CS-ACNS

Consultation Paper

1 Introductory Note

The hereby presented deviation request shall be subject to public consultation, in accordance with EASA Management Board Decision No 7-2004 as amended by EASA Management Board [Decision No 12-2007](#) products certification procedure dated 11th September 2007, Article 3 (2.) of which states:

“2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency.”

2 Deviation Requests

2.1 System and Installation Requirements for Pressure Altitude Reporting

2.1.1 Summary of Deviation

Deviate from CS ACNS.D.ELS.025 (initial issue) by not meeting the requirement of using the same pressure altitude data source for the primary altimeter and for the transponder. Consistency between the indication of the primary altimeter and the transponder altitude reporting is ensured by other means and the integrity requirements of Commission Implementing Regulation (EU) No 1207/2011 are met.

2.1.2 Original Requirement

CS-ACNS:

CS ACNS.D.ELS.025 Altitude Source

(c) The altitude source connected to the active transponder is the source being used to fly the aircraft.

2.1.3 Industry Position

Economic analysis performed by the applicant shows that following the above paragraph literally would require costly modifications in the altimetry system, especially for those aircraft equipped with an analogue or Gillham Code based barometric altimetry system. Although CS ACNS.D.ELS.025 is applicable for ELS it also affects EHS and/or ADSB-out because their altitude reporting requirements are based on those for ELS. That would render ELS/EHS/ADSB-out related design changes impractical for many General Aviation aircraft or small rotorcraft.

The requirements of the CS implicitly assume that there is consistency between the altitude indication the pilot uses to fly the aircraft and the altitude reporting via the transponder. However, the applicant's assumption is that the intent of CS ACNS.D.ELS.025 to ensure that consistency can be met by ensuring that the integrity of output of the altitude source that is being installed is adequate.

The applicant proposes to install a pressure altitude data source exclusively for the transponder and proposes to demonstrate compliance with the intent of the CS, considering:

- CS ACNS.D.ELS.025 (a) and (b) are met as written,
- the pressure altitude source is directly connected (e.g. via a T-junction) to the same (pitot)/static pressure line(s) as the altitude source being used to fly the aircraft,
- the pressure altitude source has a built-in test equipment (BITE) permanently or frequently running an automatic system self-test and triggering a "FAIL" annunciator/indicator (e.g. an amber light) in the pilot's normal field of view,
- the altitude data is transferred via a serial protocol, no Gillham coding allowed.
- the altitude source may be integrated in the transponder if the above requirements are met. The fourth bullet may not be applicable in that case.
- the altitude source meets design and performance standards that ensure an adequate level of integrity of its output to mitigate the risk of a possible inconsistency between the output of the altitude source and the altimeters used by the flight crew to fly the aircraft.

2.1.4 EASA position

Compliance to CS-ACNS has been elected by the applicant to ensure compliance with Commission Regulation (EU) No 1207/2011, which will be required for all IFR flights in the European airspace from 2015 or later, depending on the date of issuance of the certificate of airworthiness.

EASA appreciates that with certain older designs, in particular those found in GA and small rotorcraft, compliance with CS ACNS.D.ELS.025 (c) may be impractical. Although the design requirement of CS ACNS.D.ELS.025 (c), when taken literally, cannot be met by the installation proposed by the applicant, the mitigations provided by the applicant ensure a level of integrity that is adequate to mitigate the risk of inconsistencies between the data that is being provided to the transponder and the data presented to the flight crew.

For those reasons, EASA accepts the deviation.