

Deviation Request ETSO-C4c#6 for an ETSO approval for CS-ETSO applicable to Bank and Pitch Instruments (ETSO-C4c) Consultation Paper

1 Introductory Note

The hereby presented deviation requests 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 ETSO-C4c#6 Bank and Pitch Instruments

2.1 Summary of Deviation

Deviate from SAE AS-396B §6.2 “Settling error” test method and associated alignment requirement to use DO-334 § 2.4.7 Multi-Axis Dynamic Accuracy Laboratory Test and selectable category Attitude performance, for Directional Gyro mode.

2.2 Original Requirement

ETSO-C4c refers to AS396B, which contains the following requirement on Settling Error (AS396B § 6.2):

“When the gyro has erected and attained equilibrium speed and the indicator and/or the gyro component has been oscillated on a roll, pitch and yaw, simulator through an angle of $\pm 7\frac{1}{2}$ deg. about each axis at a frequency of 5 to 7 cycles per minute for 30 minutes and then returned to level position, the alignment of the bank and pitch indicators with their respective zero indices shall be within one degree.”

2.3 Industry

Minimum Operational Performance Standard for Strapdown Attitude and Heading Reference System (AHRS) are described in DO-334, referred in New Proposed amendment NPA-2015- of CS-ETSO for future ETSO-C201. DO-334 defines the Heading mode and the Directional Gyro mode, and clearly states that the accuracy requirements of the outputs depend on the application and specifies different accuracy categories for each mode, to help in distinguishing AHRS of different capabilities.

DO-334 specifies in § 2.4.7 Multi-Axis Dynamic Accuracy Laboratory Test, test to be performed both for Gyrocompassing / Magnetic Slaving Heading Modes and Directional Gyro Modes. These requirements are equivalent to AS396B § 6.2 one. In particular, for Directional Gyro Mode, test to be performed is the same,

but duration, and required performance for attitude and heading are dependent from the declared category.

For Bank and Pitch Instruments, in Directional Gyro mode, deviation is then requested to use settling error test defined in DO-334 § 2.4.7.2 instead of AS-396B § 6.2, so that providing the same capability of adapting the requirements to the category. In this case, the Installation Manual will clearly identify all operating modes and associated equipment performance.

2.4 Equivalent Level of Safety

ELOS is provided by analogy to another standard, more recent, and for equipment providing Attitude data output equivalent to ETSO-C4c, and where the attitude accuracy performance after the same settling error test is selectable according to the category of the equipment expected performance in Directional Gyro mode. As a consequence the Installation Manual shall clearly identify all operating modes and associated equipment performance.

2.5 EASA position

We accept the deviation.