



Deviation request #95 for an ETSO approval for CS-ETSO applicable to 406 MHz Emergency Locator Transmitter (ELT) (ETSO- C126a) 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 12-2007¹ 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-C126a#4 406 MHz Emergency Locator Transmitter (ELT)

Deviate from EUROCAE/ED-62a paragraph 4.5.7.3 to make EUROCAE/ED-62a 4.5.7.3 (f) not applicable to ELT(S).

Requirement:

4.5.7.3 Crash Shocks

- a. The equipment shall be secured to a shock tester by the mounting means or packaging techniques intended for use in equipment installations. The mounting of the equipment shall include those non-structural connections which are a normal part of the installation. One of the three major orthogonal axes of the equipment shall be aligned with the direction of the shock.
- b. The ELT shall be switched to ARMED, (or OFF in the case of an ELT (S)).
- c. A Shock pulse of minimum amplitude 500 g, and of duration 4 (± 1) ms, shall be applied to the equipment. If the equipment is an ELT (S), the shock pulse shall be of 50 'g' minimum amplitude and of 11 (± 2) ms duration.
- d. An ELT fitted with a crash acceleration sensor (g switch) may or may not activate as a result of this test. (This level of shock is within the DON'T CARE portion of the 'g' switch specification). The activation mechanism shall be reset in preparation for the next shock, and the equipment shall be reoriented.
- e. Steps c. And d. Shall be repeated until a total of six shocks have been applied to the equipment, one of each polarity in each of the three principal axes, i.e. UP, DOWN, FORWARD, BACKWARD, SIDEWAYS (two directions).
- f. Steps a. through e. shall be repeated using a shock pulse of 100 'g' with a duration of 23 (± 2) ms. This test does not apply to ELT (AD).
- g. Upon completion of these tests, the ELT shall be turned ON. The ELT shall meet the requirements of the aliveness test.

¹ Cf. EASA Web: <http://easa.europa.eu/management-board/docs/management-board-meetings/2007/04/MB%20Decision%2012-2007%20amending%20the%20certification%20procedure.pdf>

Industry:

1. No mention of 'crash acceleration sensors' in paragraph f. suggests that the additional 100 'g' shocks are required for the ELT(S), contrary to ED-62. However, this requirement for the repeated tests at 100 'g' is unclear. The instructions could be interpreted to repeat step 'a.' through 'e.' at 100 'g' regardless of the ELT type, or alternatively the reduction to 50 'g' for the ELT(S) could still apply during the repeated steps.
2. Since for an ELT(S), with no crash acceleration sensor, the 50 'g' and 100 'g' test requirements are identical, the 50 'g' 11 ms test appears to be redundant. Furthermore, for an ELT with a g switch, there is no reference to the automatic activation requirements for the 100 'g' tests at all, even though in the preceding ED-62, it is explicit that the ELT should have automatically activated as a result of this test.
3. Table 4-1, pg 30 of ED-62A, states Crash Shock to be a mandatory test for the ELT(S), but does not clarify the necessity of the additional 100 'g' tests. This is not conclusive, however, as the same table declares that the crash shock test is N/A for an ELT(AD), although as seen above, the text only spares the ELT(AD) from the additional 100 'g' tests.

Considering the remarks above Industry proposes:

Allow crash shock test deviation in accordance with EUROCAE ED-62, Para. 4.5.7.3 Crash Shocks, for ELT(S) for ETSO-C126a/TSO-C126a application for the reasons given above.

Industry considers that an equivalent level of safety is provide as follows:

This deviation allows an ELT(S) to be fully tested to EUROCAE ED-62A requirements with the exception of crash shock which will be tested to EUROCAE ED-62 requirements.

EASA:

EUROCAE ED-62a 4.5.7.3 f and c together requires that for ELT(S) each 50 'g' shock in both directions along each of the 3 axis is applied twice, but no 100 'g' shocks are required for ELT(S).

TSO-C126a requires for ELT(S) shock tests only the test equivalent to EUROCAE ED-62a 4.5.7.3 a to e and g, so for ELT(S) each 50 'g' shock in both directions along each of the 3 axis is applied only once.

TSO-C126a exempts ELT(S) and ELT(AD) from crash tests (i.e. 100g 23.0±2.0 milliseconds for both directions along each of the 3 axis (EUROCAE ED-62a 4.5.7.3 f)) via DO-204A 2.2.5.

ETSO-C126a and TSO-C126a are considered technically equivalent. For harmonisation with TSO-C126a this deviation is granted.

EASA will contact EUROCAE in order to review the requirements of EUROCAE ED-62a, § 4.5.7.3 (f) which shall be harmonized with DO-204A 2.2.5.