



Deviation request #66 TBD for an ETSO approval for CS-ETSO applicable to ETSO-C52b for Flight Directors Consultation Paper

1. Introductory note

The hereby presented deviation requests shall be subject to public consultation, in accordance with EASA Management Board Decision No 7-2004¹ products certification procedure dated 30 March 2004, 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-C52b for Flight Directors

Deviate from ETSO-C52B §3.1.1 which is based on SAE AS8008 (Flight Director Equipment) which requires in its §3.5 (a) the continuous display of selected heading (If applicable).

Requirement:

Deviate from SAE AS8008 §3.5 (a) Heading Selector - Means shall be provided to permit setting the desired heading into the Flight Director Equipment. The indication of the heading selected shall be continuously displayed.

3.5 Heading and Course Selectors (if applicable):

(a) Heading Selector - Means shall be provided to permit setting the desired heading into the Flight Director Equipment. The indication of the heading selected shall be continuously displayed.

Industry:

The intent of SAE AS8008 §3.5 (a) requirement is that the crew is aware of the selected heading the flight director will target when heading hold mode is engaged.

It should be noted that the equipment is designed for installation with integrated electronic indicator.

The equipment outputs a valid selected heading for display only when heading hold flight director mode is engaged. It is removed when the heading hold flight director mode is disengaged.

However, the equipment permit the crew to pre-select the heading target before engaging the heading hold mode.

In such a case, the equipment will output a valid pre-selected heading for display as soon as the crew have turned the heading selection knob. This pre-selected heading will then be permanently displayed until the heading hold mode is engaged by the crew. Following this action, the selected heading is output as valid by the equipment.

¹ Cf. EASA Web: http://www.easa.europa.eu/ws_prod/g/doc/About_EASA/Manag_Board/2004/mb_decision_0704.pdf

This feature is also available when the heading hold flight director mode is already engaged. In such a case, the pre-selected heading can be set by the crew and upon crew selection on a dedicated push-button, the pre-selected heading is transferred to the selected heading.

If no pre-selected heading has been set and that the crew engage the heading hold flight director mode, the selected heading will be set to the current heading at engagement.

In case of automatic heading hold flight director mode engagement (Go Around, Departure and SAR approach 1 modes), the selected heading is also reset to the current heading (disregarding pre-selected heading) to be consistent with commonly agreed procedures and avoid a dangerous turn.

In case of pre-selected heading control panel failure, no pre-selected heading can be set or modified. If the crew has not selected a heading before the failure, the selected heading at engagement will be limited to current heading. If the crew has selected a heading before the failure, the selected heading at engagement will keep this value.

As a result, it can be considered that an Equivalent Level Of Safety is provided as the intent of SAE AS8008 §3.5 (a) requirement is met:

- by the display of selected heading when heading hold flight director mode is engaged,
- by the display of pre-selected heading upon crew selection before engagement,
- and by the selected heading being set to the actual heading and displayed when pre-selected heading cannot or should not be used (no previous selection from the crew, automatic modes requiring holding current heading for a safe flight path).

EASA: This product is partial since it has to be interfaced with an integrated electronic indicator in order to implement all the requirements of ETSO-C52b. The “heading selector” requirement is provided by this system. Therefore, the related requirement of continuous display of the heading selected is also applicable.

The selected heading on the heading selector is not continuously displayed by the integrated electronic indicator because the selected heading does not always correspond to the value selected from the heading selector. In this implementation, the selected heading corresponds to the value which is subsequently used to maintain a heading. The flight crew would have to check the selected heading when actually using it or re-select it with the heading selector before using it. Not displaying the “selected heading” from the heading selector and substituting it by the actual heading when the data is not valid would be acceptable if the flight crew had a human factor cue indicating the failure.

The assessment of this specific human factor implementation can only be performed at the installation level and cannot be assessed in isolation at the ETSO level. This deviation would consist in not implementing completely a requirement and compensating it by filling a deviation with a limitation to a specific installation such as “for installation on XXX only”. The acceptability of the limitation could only be determined by the assessment of the cockpit installation.

Therefore, we do not recommend accepting such a deviation in the ETSO scope since there is no alternate means to meet the requirement in the ETSO scope. The assessment of the suitability of the selected heading logic must be assessed in the scope of the cockpit.