

SUBJECT	:	Flight and navigation instruments - Indication removal from Primary Flight Displays during ground phases
REQUIREMENTS incl. Amdt.	:	JAR 25.1303(b) amdt 15, JAR 25.1322 amdt 15, JAR 25.1309 change 16, CS 25.1301 amdt 4
ASSOCIATED IM/MoC¹	:	Yes <input checked="" type="checkbox"/> / No <input type="checkbox"/>
ADVISORY MATERIAL	:	N/A

INTRODUCTORY NOTE:

The following Equivalent Safety Finding (ESF) has been classified as important and as such shall be subject to public consultation in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) 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."

IDENTIFICATION OF ISSUE:

A request for an Equivalent Safety Finding (ESF) to JAR 25.1303(b) was submitted for a large aeroplane introducing an Avionics feature, called 3D Airport Moving Map (AMM) intended to give the pilot a third-person view of the aircraft on the airport surface. The intended function of the 3D AMM is to improve short term situational awareness on ground at low speed by providing a synthetic vision of the airport environment on the Primary Flight Display (PFD) and is inhibited while the aircraft is airborne.

JAR 25.1303(b) requires that:

(b) The following flight and navigation instruments must be installed at each pilot station:

- (1) An airspeed indicator. If airspeed limitations vary with altitude, the indicator must have a maximum allowable airspeed indicator showing the variation of VMO with altitude.
- (2) An altimeter (sensitive).
- (3) A rate-of-climb indicator (vertical speed).
- (4) A gyroscopic rate of turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required on aeroplanes fitted with a third attitude instrument system usable through flight attitudes of 360° of pitch and roll, which is powered from a source independent of the

¹ In case of SC, the associated Interpretative Material and/or Means of Compliance may be published for awareness only and they are not subject to public consultation.

electrical generating system and continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system, and is installed in accordance with JAR 25.1321 (a).

(5) A bank and pitch indicator (gyro-scopically stabilised). (See ACJ 25.1303 (b)(5).)

(6) A direction indicator (gyroscopically stabilised, magnetic or non-magnetic).

The airport moving map feature introduces the display of airport features on the PFD which may negatively impact the readability of essential information to be transmitted to the flight crew. Therefore, the applicant propose to declutter the PFD by removing indications (1), (2), (3), (4) and (5) required by JAR 25.1303(b) so that minimal PFD information needed while the aircraft is on the ground is given to the flight crew.

The design provides interlock mechanisms based on among other parameters weight on wheels and ground speed which allow to revert back with a PFD view displayed all elements required by JAR25.1303(b).

The intent of JAR 25.1303(b) is to ensure that primary flight parameters are available for each flight crew member.

This requirement did not specifically consider the ground phase during which some parameters required by JAR 25.1303(b) are not necessary to maneuver the aircraft. To account for the ground operation of the aircraft and ensure equivalent safety, this ESF provides compensating factors in terms of:

- usability
- alerting
- documentation (AFM,training)

Considering all the above, the following Equivalent Safety Finding is accepted:

Equivalent Safety Finding ESF-F25.1303-01 to JAR 25.1303(b) amendment 15**Indication removal from Primary Flight Displays during ground phases****1. APPLICABILITY**

This ESF applies to large aeroplanes embedding avionic functions/ features (like airport moving map) on the PFD which may negatively impact the readability of essential information while on the ground. The following ESF is limited to ground phases until line up on the Take Off runway and after landing below 80kts."

1.1 AFFECTED CERTIFICATION SPECIFICATIONS

JAR 25.1303(b)(1)(2)(3)(4)(5) amendment 15

2. COMPENSATING FACTORS

In lieu of direct compliance to JAR 25.1303(b) and provided that the below compensating factors are complied with, some indications can be removed from primary flight displays during ground phases.

The applicant is expected to demonstrate that the usability, functionality and safety is equivalent to a full-time display of those indications. For this purpose, the applicant must show that:

- Each crew member does not need to use the indication when it is removed on the ground or can rely on an alternate information that is more relevant for this specific case (e.g. ground speed in place of indicated air speed),
- The removed indication is automatically displayed in ground phases when it is required (e.g. from line up on the take-off runway),
- The display of the removed indication can be manually selected by the flight crew without interfering with the display of other required information,
- If the indication is failed while removed (e.g. failure of the bank and pitch information when not displayed), the corresponding alerting is as efficient as when the indication is available,
- Mitigations have been put in place to compensate for the reduced exposure of flight crew to failures that may not be detected by the systems (e.g. frozen heading and airspeed on both sides),
- If the removed indication fails to be displayed when required or is erroneously removed during other flight phases (e.g. in cruise), the failure effect and compounding effects meet all applicable certification specifications,
- Appropriate procedures when needed to ensure Continued Safe Flight and Landing and to recover the removed information are introduced in the Aeroplane Flight Manual.