Deviation Request #112 for an ETSO approval for CS-ETSO applicable to Airborne Multipurpose Electronic Displays (ETSO-C113)

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 Deviation Requests

2.1 ETSO-C113#7 Airborne Multipurpose Electronic Displays

2.1.1 Summary of Deviation

For monochrome head up displays used as airborne multipurpose electronic displays use for the Multiple Mode Indications section 3.9 of SAE AS8055 in lieu of section 3.9 of SAE AS8034A.

2.1.2 Original Requirement

SAE AS8034A states in section 3.9 Multiple Mode Indications:
When a display system has more than one mode, each mode of operation shall be identified by the display system unless the mode is obvious. such as Horizontal Situation Indicator (HSI)-Full Compass and Arc mode.

2.1.3 Industry

SAE AS8055 states in section 3.9 Multiple Mode Indications:
When a HUD system has more than one operational mode, each mode shall be identified by the HUD system and shall be available to both pilots.

2.1.4 Equivalent Level of Safety

The requirements of SAE AS8055 section 3.9 form a superset of the requirements of SAE AS8034A section 3.9.

2.1.5 EASA position

As the requirements of SAE AS8055 section 3.9 form for head up displays a superset of the requirements of SAE AS8034A section 3.9 the deviation is granted.

2.2 ETSO-C113#8 Airborne Multipurpose Electronic Displays

2.2.1 Summary of Deviation

For monochrome head up displays used as airborne multipurpose electronic displays use for the Resistance to Dust and Moisture section 3.12 of SAE AS8055 in lieu of section 3.12 of SAE AS8034A.

2.2.2 Original Requirement

SAE AS8034A states in section 3.12 Resistance to Dust and Moisture:
Optics shall be designed to prevent contamination of surfaces by dust or moisture under all operating and test conditions of this standard that causes an unsafe condition.
When hermetically sealed, the case shall be filled with an inert gas, free of dust particles, and sufficiently dry so that fogging of the indicator glass does not occur during the low temperature and fogging tests of this document.

2.2.3 Industry

SAE AS8055 states in section 3.12 Resistance to Dust and Moisture:
Optics shall be designed to prevent contamination of internal surfaces by dust or moisture under all operating and test conditions including the low temperature and fogging tests of this document.

2.2.4 Equivalent Level of Safety

The requirement SAE AS8055 3.12 covers the entire intent of SAE AS8034A section 3.12 while not prescribing the means to achieve the intent.

2.2.5 EASA position

EASA accepts the deviation.

2.3 ETSO-C113#9 Airborne Multipurpose Electronic Displays

2.3.1 Summary of Deviation

For monochrome head up displays used as airborne multipurpose electronic displays use for the Mechanical Hazard System Protection section 3.13 of SAE AS8055 in lieu of section 3.13 of SAE AS8034A.

2.3.2 Original Requirement

SAE AS8034A states in section 3.13 Mechanical Hazard System Protection:
The display should be so designed that no hazard will result from implosion, or other mechanical failures.

2.3.3 Industry

SAE AS8055 states in section 3.13 Mechanical Hazard System Protection:

Within the environmental constraints of this document, the HUD system shall be designed such that no hazard will result from implosion, or other mechanical failures. When the HUD combiner is stowed, the combiner shall be designed such that it cannot be inadvertently deployed.

2.3.4 Equivalent Level of Safety

The requirements of SAE AS8055 section 3.13 precise the intent of SAE AS8034A section 3.13 for head up displays in adding a requirement for the stowed head up display combiner. The wording on the environmental constraint is implicitly also contained in SAE AS8034A.

2.3.5 EASA position

EASA accepts the deviation.

2.4 ETSO-C113#10 Airborne Multipurpose Electronic Displays

2.4.1 Summary of Deviation

For monochrome head up displays used as airborne multipurpose electronic displays use for the Fire Resistance section 3.14 of SAE AS8055 in lieu of section 3.14 of SAE AS8034A.

2.4.2 Original Requirement

SAE AS8034A states in section 3.14 Fire Resistance:
Except for small parts (e.g., fasteners, grommets, knobs, seals, small electrical parts), that would not contribute significantly to the propagation of a fire, all materials used must be self-extinguishing when tested in accordance with the requirements of Federal Aviation Regulation 25.853 and 25.1359 (d) and Appendix F thereto, with the exception that materials tested may be configured in accordance with paragraph (b) of Appendix F or may be configured as used.

2.4.3 Industry

SAE AS8055 states in section 3.14 Fire Resistance:
Except for small parts (e.g., fasteners, grommets, knobs, seals, small electrical parts) that would not contribute significantly to the propagation of a fire, all materials used shall be self-extinguishing when tested in accordance with the requirements of Federal Aviation Regulation 2X.853 and 25.869 Appendix F thereto, with the exception that materials tested may be configured in accordance with paragraph (b) of Appendix F or may be configured as used.

2.4.4 Equivalent Level of Safety

SAE AS8055 3.14 extends the testing compared to SAE AS8034A 3.14.

2.4.5 EASA position

EASA accepts the deviation.

2.5 ETSO-C113#11 Airborne Multipurpose Electronic Displays

2.5.1 Summary of Deviation

For monochrome head up displays used as airborne multipurpose electronic displays use for the Supplemental Heating/Cooling section 3.15 of SAE AS8055 in lieu of section 3.15 of SAE AS8034A.

2.5.2 Original Requirement

SAE AS8034A states in section 3.15 Supplemental Heating/Cooling:
Where supplemental heating or cooling is required by the equipment to ensure conformance with this standard, it shall be the responsibility of the manufacturer to specify such requirements. If the loss of supplemental heating or cooling during normal system operation could lead to hazardously misleading information, the heating or cooling sources shall be monitored and the flight crew alerted to the failure.

2.5.3 Industry

SAE AS8055 states in section 3.15 Supplemental Heating/Cooling:
Where supplemental heating or cooling is required by the equipment to ensure conformance with this standard, it shall be the responsibility of the manufacturer to specify such requirements. If the loss of supplemental heating or cooling during normal system operation could lead to hazardously misleading information, the heating or cooling sources shall be monitored and the flight crew alerted to the failure.

2.5.4 Equivalent Level of Safety

Requirements are word by word identical.

2.5.5 EASA position

As the requirements are word by word the same, EASA accepts the deviation.

2.6 ETSO-C113#12 Airborne Multipurpose Electronic Displays

2.6.1 Summary of Deviation

For monochrome head up displays used as airborne multipurpose electronic displays use for the Symbol Alignment section 4.2.4 of SAE AS8055 in lieu of section 4.2.2 of SAE AS8034A.

2.6.2 Original Requirement

SAE AS8034A states in section 4.2.2 Symbol Alignment:
Symbols which are interpreted relative to each other, (Le., cursors on scales, command bars against reference points. etc.), including mechanically produced symbols that are interpreted relative to electronically produced symbols, shall be aligned, including parallax effects throughout the design eye position viewing envelope, to preclude misinterpretation of information.

2.6.3 Industry

SAE AS8055 states in section 4.2.4 Symbol Positioning Alignment:
Symbols which are interpreted relative to each other shall be aligned to preclude erroneous interpretation of information. Symbols which are not interpreted relative to each other may overlap but shall not cause erroneous interpretation of display data.

2.6.4 Equivalent Level of Safety

The requirements express the same intent with different wording. “Misinterpretation of information” and “erroneous interpretation of display data” are consider equivalent.

2.6.5 EASA position

EASA accepts the deviation.