

ETSO Workshop 2022 - Industry session -

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Non-ETSO functions in mechanic ETSOs

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Non-ETSO functions in mechanic ETSOs

- Background
- Non-ETSO function definition and acceptance conditions
- Non-ETSO function in mechanical equipment
- Examples
- EASA recommendations

Non-ETSO functions in mechanic ETSOs

→ Background

- Recent design of equipment integrating specific features not required by the related ETSO requirements (MPS)
- Inputs from incidents/accidents investigations leading to recommendations
- Occurrence with current approved designs with optional/additional features
- Establish clear boundaries for the approved equipment
- Additional functionalities -> *non-ETSO functions*

Non-ETSO functions in mechanic ETSOs

- Definition of *non-ETSO function* in general
 - A non-ETSO function is one that is not covered by an existing ETSO minimum performance standard (MPS)
 - Non-ETSO function(s) may be included and accepted on a non-interference basis within an approved ETSO equipment

Non-ETSO functions in mechanic ETSOs

- EU Reg. 748/2012 and latest Amendments (Amdt.19)
 - AMC 21.A.605(a)(1) **Certification programme**
 - (b) *The certification program should contain the following information:*
 - (1) *a detailed description of the relevant European technical standard order (ETSO) article, including all of its configurations to be certified, and the identification of ETSO and **non-ETSO functions**, if any;*

Non-ETSO functions in mechanic ETSOs

- EU Reg. 748/2012 and latest Amendments
 - **AMC 21.A.606(d) Declaration**
 - *The related declaration should confirm that compliance with the applicable ETSO is successfully demonstrated and that all the assumptions, constraints, deviations, limitations, and open problem reports that are relevant for the approval of the installation are defined for both the ETSO and the **non-ETSO functions**.*
 - *Additionally, the applicant should demonstrate and declare that the **non-ETSO functions** do not interfere with the ETSO functions.*

Non-ETSO functions in mechanic ETSOs

→ General acceptance *Conditions*:

- There is no applicable ETSO for the non-ETSO function
- The added non-ETSO function does not affect or interfere with the hosting ETSO equipment article's required MPS
- The hosting ETSO article's environmental qualification, hardware and software design assurance levels adequately support the non-ETSO function.
 - Generally, specific to Environmental qualification and Software and Airborne Electronic Hardware

Non-ETSO functions in mechanics ETSO

→ In mechanical equipment

- Generally there will be a clear physical interface (neat separation) between the hosting ETSO equipment and the non-ETSO portion of the equipment's design
 - Generally referred as “provisions”
- Functionalities are generally physically independent
- Additional function in certain condition (normal or malfunction/defect) could affect the functions of the hosting ETSO equipment

Non-ETSO functions in mechanics ETSO - Examples

- Personal Locator Beam(PLB) embedded in a constant wear life vest
 - PLB is not required by the Life vest ETSO standard (ETSO-2C504)
 - No ETSO standard for PLB (prior than CS-ETSO Amdt.17, ETSO-2C520)
 - PLB functionality is a non-ETSO function
 - Applicant may demonstrate the non-interference base with life vest basic functionalities
 - During the investigation the PLB proper functioning will not be investigated
 - PLB proper transmission of the distress signal etc.
- The ETSO approved life vest design will not approve PLB functionalities
- ETSO Authorization shall set a boundary to make clear to which extent the presented design is approved (i.e. not including PLB functionalities)

Non-ETSO functions in mechanics ETSO

- Example 2. “Active” Cargo Containers
- Cargo containers that provide functionalities for environmental control (EC) (temperature and humidity)
 - Functionalities are not required by the ETSO standard (ETSO-C90d)
 - Neither generally an existing ETSO standard covers for these functionalities
 - These systems could be accepted as non-ETSO functions
 - The ETSOA cargo container will not include EC functionalities
 - Generally are approved at Operations level
 - ETSOA shall set a boundary to make clear to which extent the presented design is approved (not including EC functionalities)

Non-ETSO functions in mechanics ETSO

- Example 3. Extra functionality powered by a non-rechargeable lithium battery
 - This is not an non-ETSO function as a standard for non-rechargeable lithium batteries do exist (ETSO-C142b)
 - In addition, CS-ETSO Subpart A (par.2.8 Embedded Batteries) outlines clearly that in such case and within certain conditions batteries shall be approved
 - In this case EASA would expect the battery to be ETSO approved

Non-ETSO functions in mechanics ETSO – EASA recommendations

- Certification program describes with sufficient details the Non-ETSO functions
 - AMC 21.A.605(a)(1) Certification programme
 - (b)(1) The certification programme should contain... and the identification of ETSO and non-ETSO functions, if any;
- Compliance demonstration shall be built having in mind the non-interference demonstration
- EASA would expect a clear reference to the non-ETSO configuration control:
 - Assembly or Sub-assembly P/Ns or D/Ns with related revision
 - Design is approved based on a „non interference basis“ with the standard requirements for a definite configuration
- Changes to a non-ETSO function in mechanical ETSOs shall be at least minor with EASA involvement
 - Unless the change does not affect the extra functionality and basic ETSO functionalities and shall be included in the procedures for minor change management of the APDOA upon agreement with EASA PCM&DOA TL
- DDP shall include clear reference to the non-ETSO functions.
 - DDP shall included the declaration according to *AMC 21.A.606(d) Declaration* relevant also to non-ETSO functions
- ETSO Authorization will refer to the NTF explicitly

Questions?
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