SEAT ETSO / STC INTERFACE – RECARO EXPERIENCE

EASA, STC-Workshop May 16th/17th 2019

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WHAT IS AN ETSO?

The ETSO is one way, but not the only way, to:

- Approve a part in the terms of 21.A.305,
- Release a part for installation (21.A.307, but also Part-M),
- Make aircraft seats so expensive.

<u>The ETSO is not an installation approval</u>

The responsibility for a design change at aircraft level, ultimately including all aspects of the showing of compliance, stays with the STC-Holder!

Some regulatory reference…

21.A.305 Approval of parts and appliances

In all cases where the approval of a part or appliance is explicitly required by Union law or Agency measures, the part or appliance shall comply with the applicable ETSO or with the specifications recognised as equivalent by the Agency in the particular case.

21.A.307 Release of parts and appliances for installation

A part or appliance shall be eligible for installation in a type-certificated product when it is in a condition for safe operation, and it is (…) accompanied by an authorised release certificate (EASA Form 1), certifying that the item was manufactured in conformity to approved design data and is marked in accordance with Subpart Q (…)

WHAT ARE THE ADVANTAGES?

- Increased commercial value of the seats,
- AP-DOA ensures high standard in terms of know-how and processes,
- The Certification Package is reviewed by EASA at component AND installation level.
- Test witnessing delegation ,
- Article ETSO approval may be used to show compliance with some Certification Specification requirements,
- Supplier’s qualification made easier thanks to AP-DOA,
- Seats/spare parts released with a Form 1 even without DO/PO and SADD.

POTENTIAL ISSUES

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Based on our experience, the following issues may arise following an inadequate coordination between STC- and ETSO-Applicant

- Incorrect use of the ETSOA as a means of compliance in the certification programme of the Aircraft design change,
- Applicability of requirements/methods, as well as risk analysis, not timely provided by the STC-Applicant or not provided at all,
- Issues and misunderstandings concerning IFE / electrical components,
- Misunderstanding of relevant responsibilities, unclearness regarding the necessary deliverables,
- (Psychological): tendency to discharge responsibilities towards the seat supplier,
- Staggered EASA review (ETSOA and A/C-level).

DEFINITION OF APPLICABLE REQUIREMENTS

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The STC-Applicant must define applicability of the certification requirements and the related compliance activities.

The following topics are examples of aspects of the showing of compliance that are sometimes neglected or not properly addressed by the STC-Applicant

- Delethalisation (FAA AC25-17A Ch.1),
- Airbag special conditions,
- Lithium-batteries special conditions,
- Safety placards (esp. when they are not installed by the seat supplier)

Early sharing of the certification programme with ETSOA holder, defining requirements, responsibilities AND deliverables, is highly recommended!

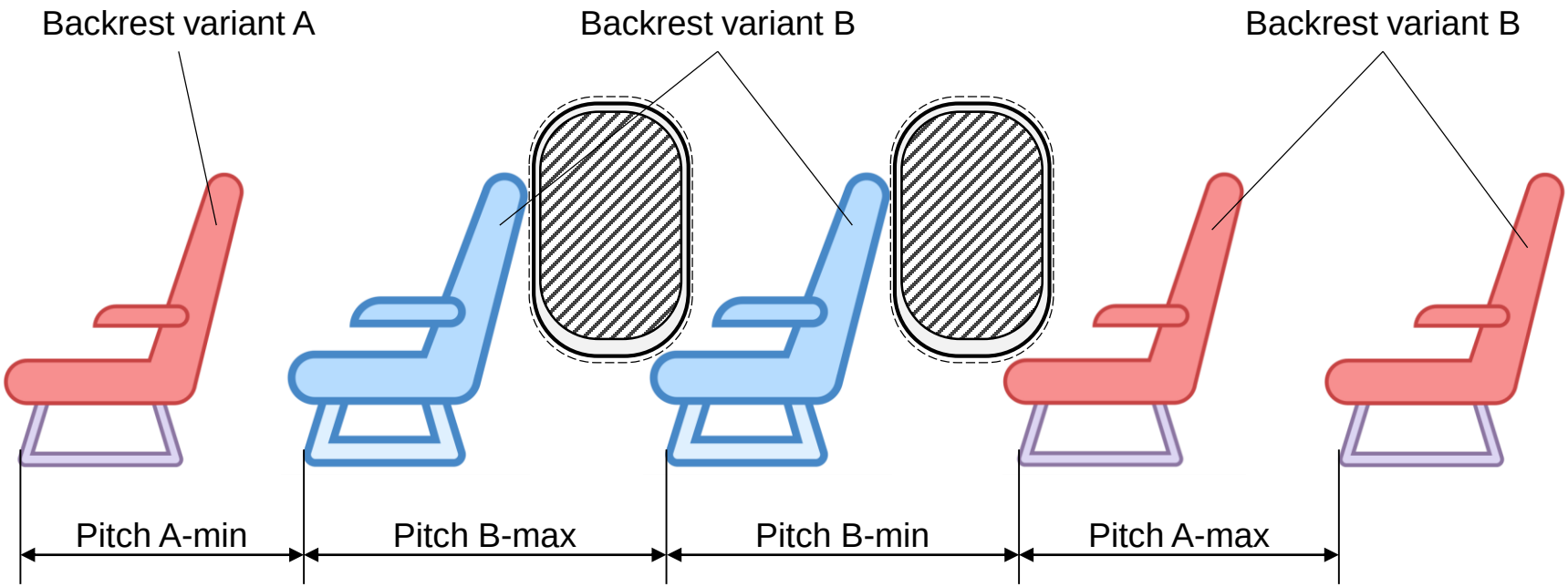
INSTALLATION INSTRUCTIONS AND LIMITATIONS

The IIL is the tool to streamline the interface between ETSOA- and STC-Holder.

The information you should expect and use for the compliance finding include:

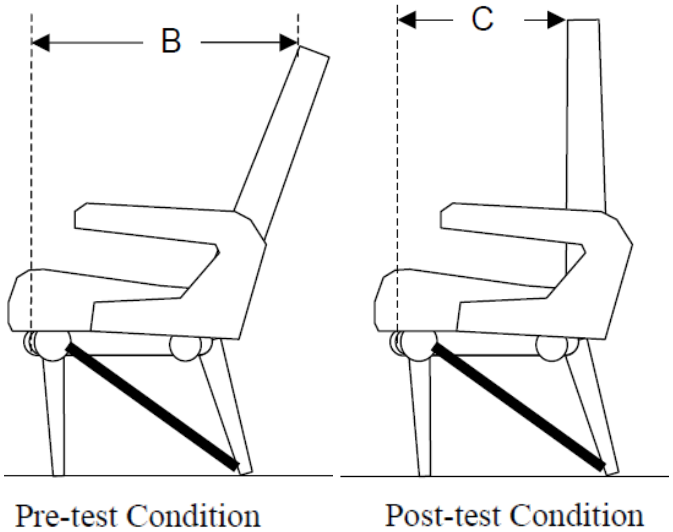
- Pitch range, distance to bulkhead,
- Seat deformations,
- Details on life vest retrieval,
- Non-ETSO items,
- Non-ETSO test (e.g. front-row test with a representative bulkhead),
- Elective MPS / ARP5526 sections that have been accounted for,
- Identification of special seats (e.g. track-break seats)
- …

PITCH RANGES

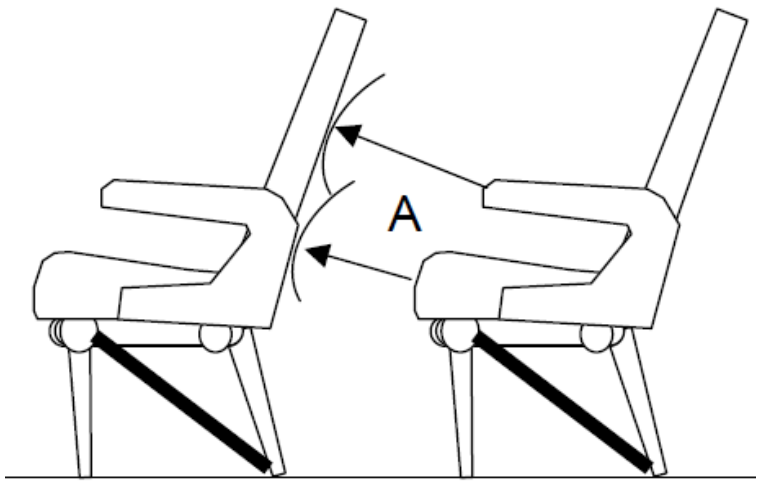


This is the kind of information the IIL should include

DEFORMATIONS – SOME EXAMPLES



C over B would be easy to address @ seat level…



But deformation for egress (25.562 [c][8]) is more tricky!

25.562 (c)(8): *"Seats must not yield (…) to the extent they would impede rapid evacuation of the aeroplane occupants".*

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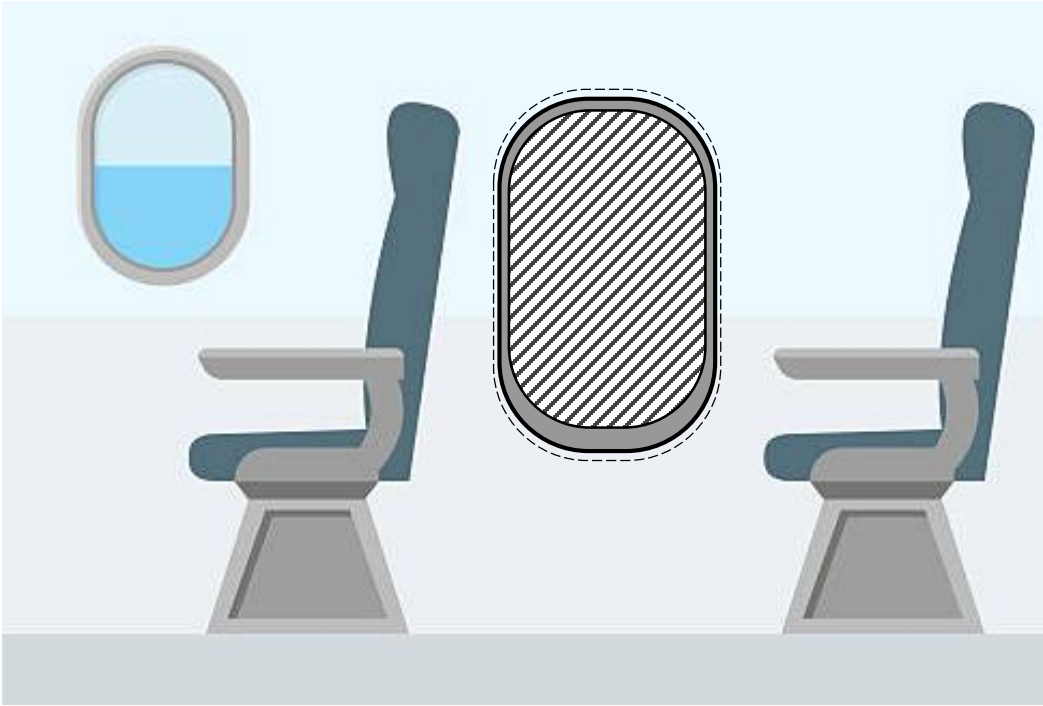
And in some areas it become even trickier!



Note: in the ETSO there is no direct or indirect reference whatsoever to CS 25.813, and rightly so: there is no easy, univocal Pass/Fail for OWE, and therefore access to the Emergecy Exits must be evaluated by the STC Applicant.

DELIVERABLES

Typical requests from the STC-Applicant that should be avoided:

- “Just send me whichever document you send to the OEM xyz”,
- “Please tell me which documents I need to find compliance”,
- “You revised a drawing to modify a foot note, please update all compliance documents that reference that drawing”,
- “Where is your LODA / letter of minor change approval?”,
- “Wasn’t it part of the ETSO-package?”

Common goal should be to keep the number of deliverables/revisions low – i.e. only what is really needed; identification of requirements by the STC-Applicant is key, to define which documents we have to deliver.

DELIVERABLES

As an ETSOA Holder this could be the minimum set of documents provided to the STC-Applicant to take “credits” of the ETSO for the installation showing of compliance:

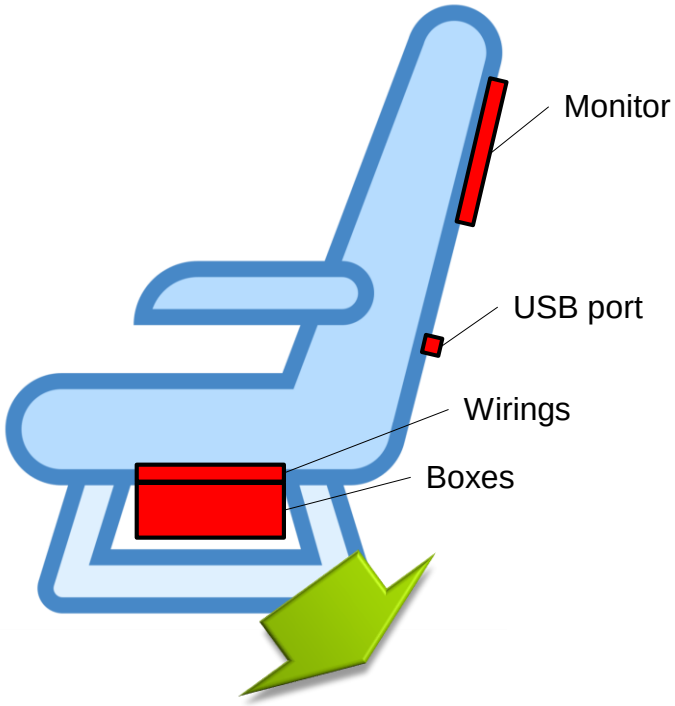
- ETSO-Authorisation,
- DDP or equivalent (statement of compliance for the seat P/Ns),
- Installation instructions and limitations,
- Envelope drawings.

The following documents may be produced by the seat supplier upon request of the STC-Applicant to support its compliance activities:

- Test plan/report for HRSC (C127a) and occupant injury,
- Environmental qualification and (most) abuse loads reports,
- ELA, software qualification, safety analyses,
- Layout drawing,
- (and many others…).

IFE COMPONENTS

Typical IFE components…



IFE attributes that *may be* accounted for under the ETSO *if defined* in the seat design (IIL)		
Item	ETSO-C39	ETSO-C127
Retention (static)	Yes	Yes
Mass/CoG (static)	Yes	Yes
Sharp edges	Yes	Yes
Flammability	Yes	Yes
Retention (dyn.)	N/A	Yes
Mass/CoG (dyn.)	N/A	Yes
Effect on HIC	N/A	Part.
Lumbar loads	N/A	Yes

Attributes accounted for by the seat supplier are PROJECT-SPECIFIC.
Attributes not listed in the table will not be accounted for in the ETSO.
Responsibilities for configuration control of the IFE, conformity of test articles AND of serial parts have to be defined in advance.

FINAL RECOMMENDATIONS

In order to optimize the cooperation with the seat supplier, the STC-Applicant should define or clarify from the beginning:

- Which IFE attributes are accounted for in the ETSO,
- Elective MPS,
- Minimum required ETSO-documentation,
- Deliverables (and compliance activities) not covered by the ETSO,
- Amount of involvement regarding tests.

THANK YOU FOR YOUR ATTENTION

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