

317076_ALM Projects Introduction

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(expleo)

Expleo Process for Cabin Parts Modification and Repair Solutions

① Request for Quotation

Customer raises an issue to be solved – not necessarily ALM-related in the first place.

② ALM Applicability Check

Check whether ALM Method can have optimization potential on price, delivery time, functionality, appearance, assembly or weight.

③ Feasibility Study

Breakdown of existing requirements and subsequent derivation of ALM design, either replacing, improving or repairing/supplementing the affected area and subsequent the loops approaching desired optimization

Note: Study in cooperation with ALM partner using their recommendations for material selection and software tools and methods like topology optimizer

④ Prototype Printing -> Fit-Check

Upon customer's agreement (PO), prototype printed and provided for **Fit-Check**

⑤ Trials with potential Optimization Loop

After successful fit-check, **Trial Series** parts will produced. Lessons learnt and conclusion of trial results incorporated in Serial Part Design and definition of a PSS (Product Supply Specification)

⑥ Design Approval by EASA 21J Design Organization (For Minor Repair or Minor Changes)

Compliance investigation and approval according to applicable Certification Specifications and EASA Guidelines for ALM

⑦ Serial Part Printing by EASA 21G Production Organization

Production of **Serial Kits** according approved data and issue of an EASA Form1

Expleo Process for Cabin Parts Modification and Repair Solutions

Customer centered approach

ALM parts can be much more than simple replacements. Expleo strives to provide integrated ALM solutions, based on statistical analysis of parts that are causing the customer concern due to frequent failures and/or high replacement costs.

Track record

Up to now, Expleo has fielded 6 Minor Change projects using ALM printed parts and 1 Minor Repair project.

In-depth analysis of the environment and development of innovative solutions

- 3D-Scanning of the environment
- Root-cause analysis
- Search for ways to be improve the design in order to not only solve the customer's issue but also to ensure that it doesn't re-appear in the future.

Involvement of the customer in trials and optimization loops

Ensure customer satisfaction and early identification of any potential design short-comings that may need to be addressed.

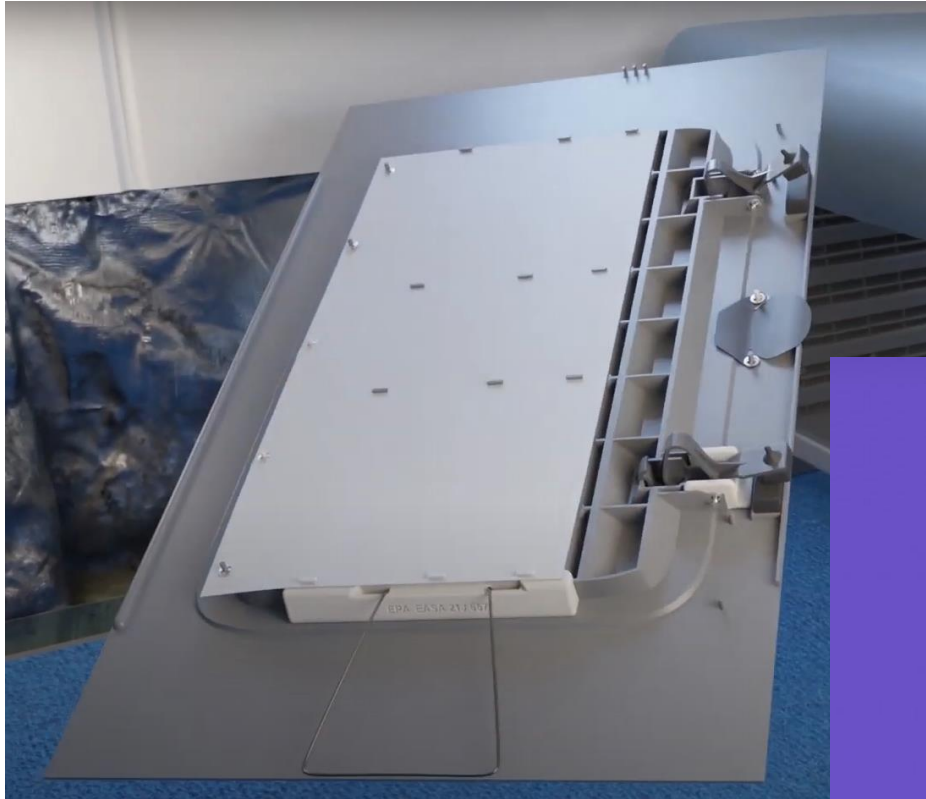
Use of EASA guidance and reporting of change approvals involving ALM to the DOATL

Project Description, Certification Program and Change Approval Certificate provided as a standard documentation package. Further discussion of ALM projects during EASA surveillance audits with encouraging feedback from EASA.

Listen to the experts

Drawing from the experience of the production organization to ensure that we make most of the design and ensure that we use all particular advantages of ALM – such as hidden hinges, foil hinges or springs/latches

Case Study – Dado Panel



Link to Video:

https://www.youtube.com/watch?v=g2G4l7_hxaI





Customer Request

- Constantly recurring small breakages on Dado Panel causes intensive repair or substitution



Customer Pain points

- Frequent breakage leading to cost for replacement or repair



Pre-Mod Condition

Broken Clip Mount

Broken Pins Rapid Decompression Flap



Broken Pins Mousehole cover

Broken Latch Mounts



Concepts

- Create a set of parts solving each breakage problem as repair kit
- Kit easy to be ordered and handled covering complete repair of one Dado Panel



Improvements

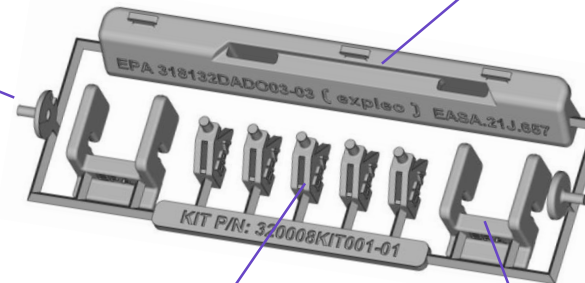
- Save costs due to repair instead of complete substitution
- Environmentally friendly



Post-Mod Proposal

2 ea. Pin Rapid Mousehole cover

1 ea. Clip Support



5 ea. Pin Decompression Flap

2 ea. Latch Supports

Extract from ALM Catalogue

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Customer Request

- Alternative part requested
- Delamination, breakage of body
- Breakage of lugs



Customer Pain points

- Yearly reorder of high number of parts
- OEM unwilling to improve the design



Pre-Mod Conditions



Concepts

- Root cause analysis
- Uncouple impact forces & retaining forces
- Material change
- Installation to same provisions



Improvements

- More secure mounting
- More robust cover
- No further breakage reported



Post-Mod Proposal

Improved mounting interface with integrated shock absorption



Final appearance



Extract from ALM Catalogue

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