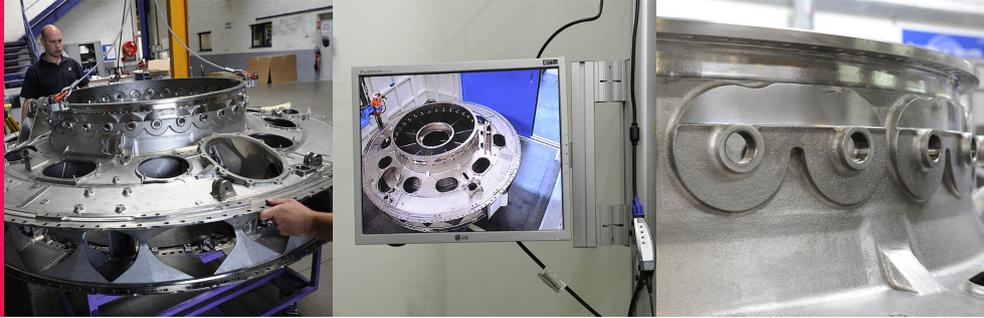


By



GE90-115 FAN HUB FRAME: Innovative salvage repair saves over \$1.5m in 21 days

The MRO Lab
Adaptive Innovations



CRMA has developed an innovative solution where the Fan Hub Frame can be repaired instead of being scrapped. The repair is adapted from the OEM recommendation to restore the affected Inlet Guide Vane Pad area to its original contours by using innovative welding and specific heat treatment methods.

The issue:

On April 25th 2014 CRMA took delivery of a GE 90-115 Fan Hub Frame for a **last-ditch salvage repair**. The module showed areas of wear and tear and according to the GE ESM, the area was out of limit for repair, and so should be scrapped.

The adaptive solution developed by AFI KLM E&M

CRMA's industrial policy is based on powerful key drivers :

- Our priority: time to market repair development and doing it **Right the First Time**
- **Repair design** to be included in OEM's ESM. An innovative approach, part of our **new stance**

In addition to its positioning on the CFM56 engine, CRMA is a major player in the VBE (GE90 - GP7000) marketplace. And, unlike certain mature engines, these new-generation VBEs require a large number of repairs not yet developed by the OEM.

The FHF is one of the best illustrations of **the ground-breaking approach our customers are requesting**. Because we repair such a wide variety of engine parts (200-plus parts and modules a week) we can transpose, adjust and customize a repair solution for one part to another. The repair process we used for the FHF, for example, comes from a process we have already used on another part: a titanium fan blade. Our engineering team identified the risk that welding and heat-treating titanium at 500°C in an uncontrolled atmosphere would result in oxidation on the surface of the part. This is why CRMA took this opportunity to demonstrate its know-how with all the infrastructure in place and the requisite skills for carrying out the appropriate repair. The CRMA engineering team applied a local heat treatment to the damaged area of the high-value titanium part using a specific technique to avoid any oxidation. Our engineering team submitted a CDR to GE for its innovative solution and it was immediately accepted by the OEM.

The outstanding thing is that we achieved the result of 0% oxidation on the part, reconditioning it and returning it to its **"as new" condition**.

On May 19th 2014, the part left CRMA, **REPAIRED within 21 days**.

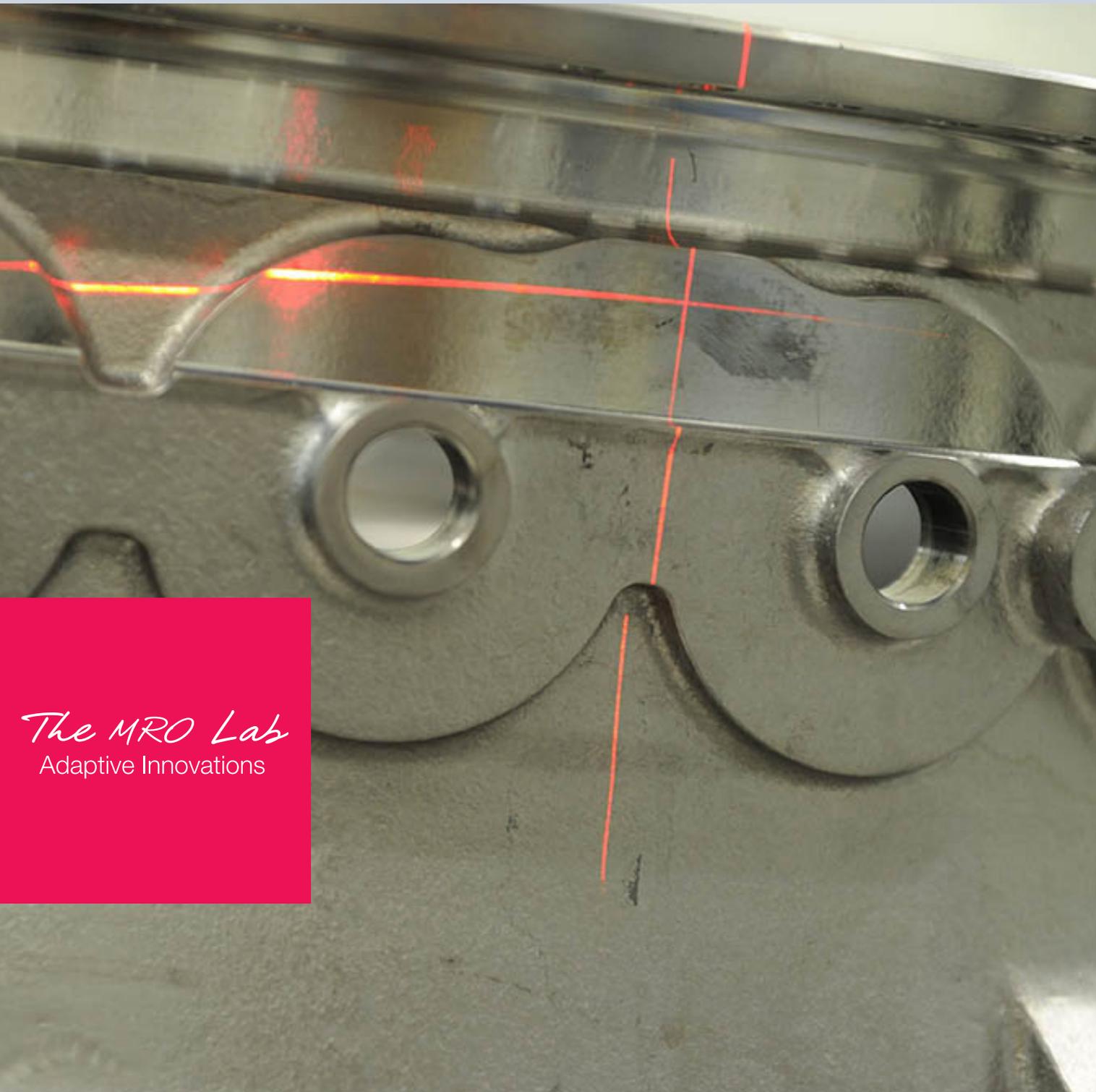
CRMA is currently the only shop in the world performing this repair. Based on this success, OEM GE intends to include it in its ESM.



Key benefits

- Repair rather than replace
- More than \$1.5 million in cost savings compared to part replacement
- Scrap rate cut from 100% to 0% on this part
- An innovative repair developed, industrialized and applied within the TAT of a standard repair
- An OEM-approved repair now being offered to all our customers





AFI KLM E&M - Adaptiveness® - June 2015 - Design: LOVE IT - Photos: Patrick Delapierre

The MRO Lab
Adaptive Innovations

“ CRMA is currently the only shop in the world performing this repair. ”

This adaptive solution was developed by the **CRMA Engineering team**.
For further information please contact your Sales Manager.



afiklmem.com

@afiklmem



A D A P T I V E N E S S ®