AIRFRANCE INDUSTRIES KLM Engineering & Maintenance

ADAPTIVENESS®

ON-WING FAN CASE ABRADABLE SEAL REPAIR
MAXIMIZING AIRCRAFT AVAILABILITY WITH ON-WING REPAIR

The MRO Lab
Adaptive Innovations

AFI KLM E&M has developed an On-Wing alternate procedure to repair eroded Fan Case Abradable Seals without removing the voluminous Fan Case and shipping it for repair to a shop. This procedure is easier, faster and cheaper, and is suited to a range of engine types: CFM56-7B, CF6, GE90-100/115 and GEnx.

The issue

Most of the thrust from a high bypass jet engine is generated by the fan. Fan blade tips operate within a small clearance from an abradable seal in the fan casing. The fan blade tips can rub into this shroud, especially in engines operated in harsh environments, and cause erosion of the fan case abradable seal. The first signs of this erosion are commonly observed during zonal inspection and will further deviate until they go beyond the limits and need repair. Typically, the abradable seal needs to be repaired long before the engine itself requires overhaul.

Repair and replacement of the abradable seal involves removing the fan case and shipping it to an approved repair shop. To prevent the aircraft from standing idle, a replacement fan case is in most cases required.

The adaptive solution developed by AFI KLM E&M

AFI KLM E&M achieves savings on both the measurement of the erosion and on the repair time and cost for repairing the abradable seal. The erosion measurement procedure developed by AFI KLM E&M avoids the need for special tooling, does not require an engine run-up, and saves considerably in terms of man-hours and ground time. The affected area of the abradable seal can be repaired on-wing, obviating the need to replace the fan case and all the logistics and associated cost of sending a replacement fan case and returning the removed case to an approved repair shop.

The on-wing abradable repair can be performed on a platform or in a hangar. AFI KLM E&M has developed a specially-designed inflatable tent that surrounds the entire Fan Case area and includes an air conditioning unit.

There are two reasons for this:

- Contain and collect the grinding debris and filter the air in the working area. This allows parallel activities on the aircraft and even simultaneous activities on the rear side of the engine.
- Create a temperature & humidity controlled environment during the filler application and curing process.

Our extensive capabilities enable us to combine this repair with other corrective actions such as replacing fan blades, platforms, or trim balance test runs, as needed.

Key benefits

- Erosion measurement without special tooling
- No engine removal / installation needed
- No splitting and mating of propulsor / fan case needed.
- No replacement fan case needed
- No special transportation needed for fan case shipment
- No risk of damage and delays due to sheer size of fan case
- Other parallel hangar activities possible due to tent construction
- Can be performed on a platform or in a hangar
- Significant cost savings in repair and transportation costs
- Turnaround time similar to or even shorter than fan case replacement
- Optional fan blade platform replacement and repair

The MRO Lab
Adaptive Innovations

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

"Easier, Faster, Cheaper"

This solution has been developed by **AFI KLM E&M Component Services department Schiphol**.
For further information please contact your Sales Manager.

afiklmem.com

@afiklmem

AIRFRANCE INDUSTRIES KLM Engineering & Maintenance

ADAPTIVENESS®