CASE STUDY

ASH OMNI Achieves 30% Reduction in Rework Time at Lufthansa Technik Turbine

Customer
Lufthansa Technik Turbine

Industry
Aerospace Component Repair

Challenge
Replace time-consuming and costly manual inspection of aerostructure components.

Solution
ASH Omni 3

APPLICATION BACKGROUND

In the intricate world of aerospace, aircraft are running more safely and efficiently than ever before and meticulous component repair plays a vital role in ensuring air travel continues to run effectively.

Lufthansa Technik Turbine Shannon (LTTS), based in Shannon, Co. Clare, Ireland, specialises in maintaining the high-pressure turbines (HPT) and low-pressure turbines (LPT) of CFMI and GE aircraft engines.

These high-value components work cohesively to ensure aircraft function correctly, and transport passengers and crew safely to their destination.

An effective repair not only leads to potential cost savings of up to 80% for airlines but also extends the aircraft's useful lifespan ensuring both safety and reliability.

THE CHALLENGE

A critical aspect of LTTS's work involves repairing HPT shrouds that are exposed to extreme temperatures, reaching several thousand degrees Fahrenheit, and pressures exceeding hundreds of pounds per square inch.

Repairing HPT shrouds involves a process that requires re-establishing sealing slots (0.5mm wide) on the end of the part, after weld or braze repair by EDM (Electro Discharge Machining) with the tolerance on the location of the slots being just 0.25mm.

LTTS faced several challenges with their traditional inspection method for HPT shroud repair. Traditional inspection methods using hard gauge fixtures proved tedious, prone to errors, and failed to verify the slot's location accurately, resulting in a maximum

permissible position verification. Its process involved using hard gauge fixtures under 4X magnification to inspect the slot location.

The problems meant the company faced a pressing need for a more accurate inspection method to enhance the precision of the automatic EDM set-up process.

THE SOLUTION

The OMNI digital microscope and measurement system, a precise and user-friendly solution provided by ASH - a trusted partner of Bowers Group - was deployed to ensure greater accuracy for the inspection of these high-value parts.

Calibrated photomasks and graticules, coupled with the OMNI system, allowed for setting tolerances for slot locations accurately. The machined part, post-EDM, could now be swiftly loaded under the OMNI, ensuring a quick and precise verification of the slot's correct location. This advanced inspection method not only elevated accuracy but also expedited the development of EDM programs for new part types.

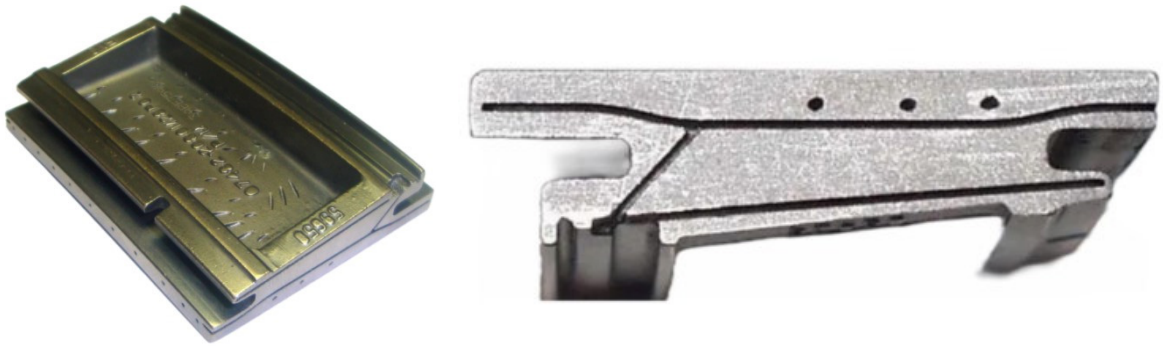
The implementation of the OMNI system brought about remarkable improvements. There was a substantial 30% reduction in rework time as instances of incorrect slot placements significantly diminished. This reduction in rework time not only saved on resources but also expedited the repair and maintenance process, ensuring quicker aircraft turnaround times and increased operational efficiency.

Also, the inspection time per part saw an impressive reduction of 2 minutes, thanks to the advanced graticule and measurement software of the OMNI, eliminating the need for manual measurements. This simultaneous achievement of accuracy and timesaving demonstrated the efficiency of the OMNI system in enhancing LTTS's operations.

Beyond this, the data obtained from the inspection process facilitated the optimization of EDM programming for new part types, resulting in faster program development and reduced test development time. Improved programming translated into faster machining processes and higher productivity, underlining the comprehensive benefits brought about by the OMNI system.

COMMENT

Patrick Crowe, Production Engineer at Lufthansa Technik, expressed his satisfaction with the OMNI 3 solution, saying: "ASH provided excellent support in developing a turnkey solution for our application. The result is a very user-friendly inspection system that has received positive feedback from all operators"



High Pressure Turbine Shrouds

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