



The
University
Of
Sheffield.

Innovate UK

Funded by Innovate UK

Autonomous Aero Turbine Blade Re-Manufacturing System

VBC Instrument Engineering Limited in partnership with Sheffield University successfully entered an application to the Innovate UK competition earlier this year.

We have now been awarded funding and support from Innovate UK to work alongside Sheffield University on a project to design and manufacture an Autonomous Aero Turbine Blade Re-Manufacturing System which, if successful, will revolutionise the way in which the aerospace industry deals with MRO (Maintenance, Repair and Operations) in relation to the blade repair systems for their turbine engines.

In short, high value aerospace gas turbine blades are subjected to extreme temperatures during operation, resulting in wear, deformation & distortion over time. After ~30,000 hours of air time, engines are entirely overhauled, the blades are taken out & repaired using manual weld deposition then refinished. Major problems have been identified through errors in the weld build-up process. Half of all blades are reclaimable, although current yield is only around 80 per cent of that half owing to high heat input during welding & poor practice.

The objective of this industrial research project is to provide a turnkey automated solution that identifies both wear on the blade and carries out a low heat input weld build up, potentially doubling existing service life. The autonomous system will provide wear data from a scanning system allowing a repair to the specific area only as opposed to the full area. Real time welding evaluation data is applied to NDT using a novel technique to increase throughput and save the scrapping of blades. This data can be fed back to the manufacturer to further both service life, design and efficiency.

Our Inter Pulse technology is ideally suited to any application that benefits from low heat input. VBCie Ltd are well placed to allow UK representation in this growing market and if successful will make the UK world leaders in this field!

