

The Client

The Defence School of Aeronautical Engineering (DSAE) based at RAF Cosford, approached OR3D to help with a particular engineering problem.

DSAE is the home for RAF Engineer Officer training and prides itself on being equipped with the latest training aids to support the learning of new Engineering Officers in the Royal Air Force.

The Project

As part of the Engineer Officer's syllabus, they study the phenomenon of surge within an axial flow compressor. A specialist piece of equipment was designed and manufactured in the 1950's, to help illustrate this aeronautical anomaly which can occur in jet engines under certain circumstances.

As part of the refurbishment of this equipment, a new compressor wheel was needed to be re-manufactured. Unfortunately the company who supplied the training aid was no longer trading and no drawings of the equipment existed.

OR3D used a laser arm to very accurately capture the geometry of the compressor vanes and hub.

The scan data was processed in Geomagic Design X to create a 'Design Intent' CAD model that would be used to CNC a new compressor.

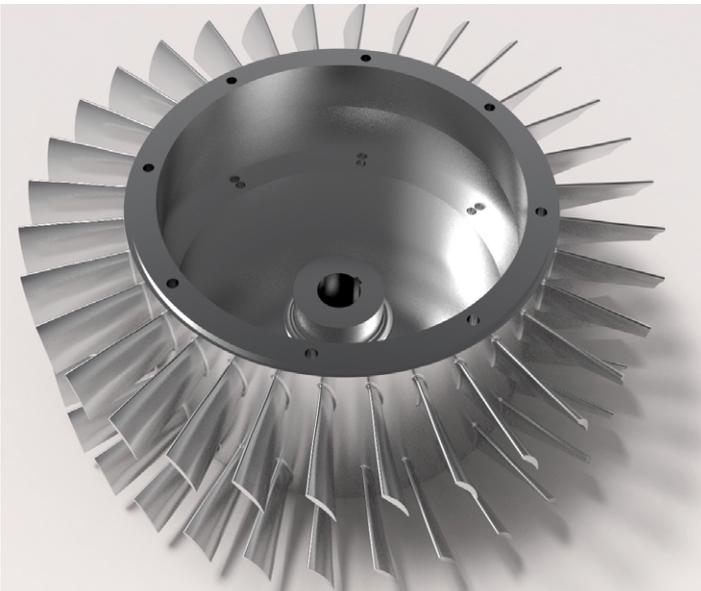


Photo realistic render of CAD compressor.



- 3D laser scanning technologies
- Inspection services
- Reverse engineering services
- 3D CAD modelling
- Portable on-site services
- Cost effective 3D solutions provider

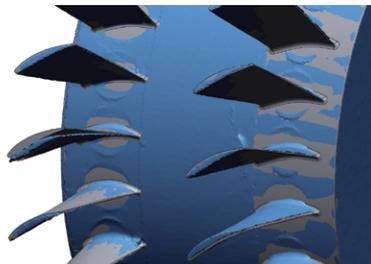


The project had within two days of modelling, created a highly accurate and optimised CAD model directly from scan data. ”

During the design of the CAD model from the scan data, there were a number of vanes that were originally positioned incorrectly. It was only through the design process that these errors became apparent.

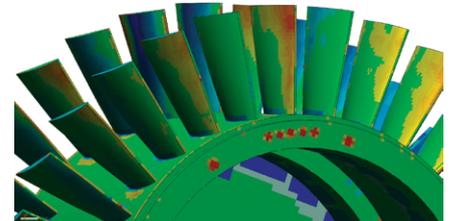


The image below shows the vane scan data (in blue) does not match the equally spaced positions of the design intent CAD model (in gray).



The image below shows the inconsistencies of manufacture of the original part when compared to the newly created CAD model.

Deviation set +/- 0.1mm – (Green colour)



Summary

Combining the expertise of the OR3D to operate a high end laser arm scanner and Geomagic Design X software. Meant that the project had within two days of modelling, created a highly accurate and optimised CAD model directly from scan data. With the design of the compressor now being re-created the Defence School of Aeronautical Engineering can continue to provide it's students with a world class engineering education.



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