

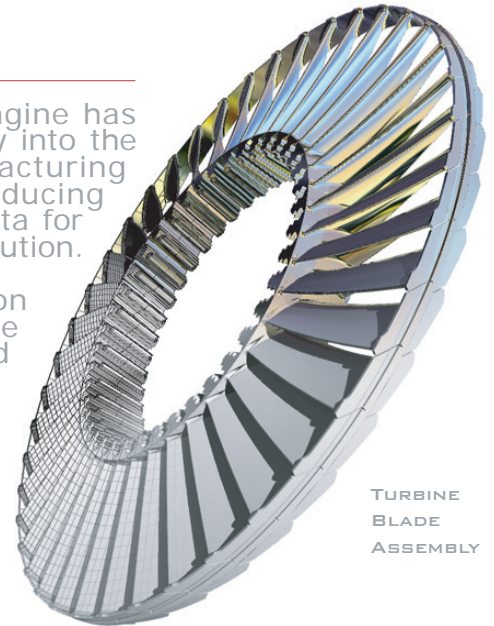
SITUATION

The affordability, efficiency, and quality of the turboprop engine has spurred its widespread use in various industries since its entry into the market. Acme Turbine Company*, a turbine blade manufacturing company, wanted to gain a competitive advantage by producing superior blades at a lower cost. However, they lacked CAD data for their blades, prompting their need for a reverse engineering solution.



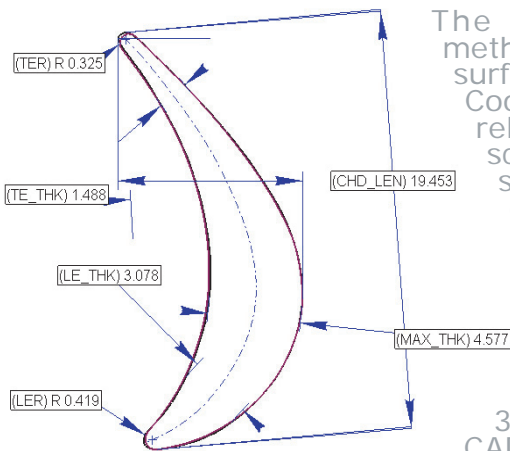
TURBOPROP ENGINE

The FAA imposes strict standards on the certification of airplane parts due to the inherent safety risks associated with the use of faulty turbine blades. Acme Turbine wants to be sure the blades they manufacture will achieve the level of quality and safety the industry demands.



TURBINE BLADE ASSEMBLY

SOLUTION



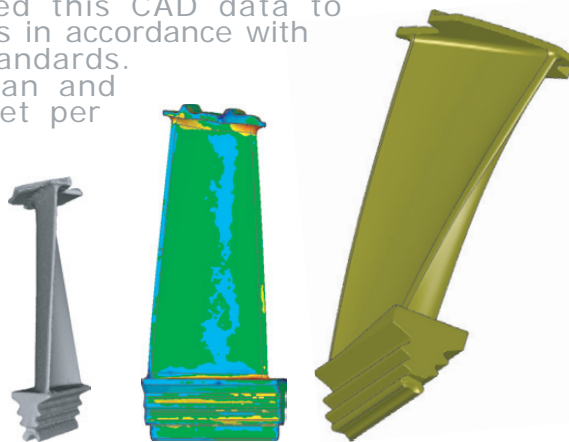
CROSS SECTION ANALYSIS

The traditional method of capturing turbine blade surface data is through the use of a Coordinate Measuring Machine (CMM). However, CMM technology relies on physical contact, which requires a significantly longer scanning period to capture the same number of points 3D laser scanning achieves. The ability of 3D laser scanning to quickly generate inspection reports made it the ideal solution for this project.

Acme Turbine supplied 3DScanCo with four sets of five turbine blades, each one two inches in length. These blades were scanned with the Konica Minolta VIVID 9i to generate scan data accurate to .002 inches. The scan data was then aligned and arranged to form a nominal blade model. 3DScanCo reverse engineered each nominal blade to create CAD data, which was then compared to the original blade scans to create a cross section analysis and a colormap inspection report. This reverse engineered CAD data is essential at every step of Acme Turbine's manufacturing process.

RESULTS




The level of accuracy and speed of 3D laser scanning combined with the assurance of quality inspection reports allowed 3DScanCo to deliver high quality CAD data to Acme Turbine. Acme Turbine then used this CAD data to manufacture turbine blades in accordance with the FAA's strict safety standards. 3DScanCo's ability to scan and reverse engineer each set per week resulted in significant time savings for the client compared to using a CMM. Acme Turbine has reliably and economically cast high quality blades using 3DScanCo's services, empowering them with a clear-cut competitive advantage.






SCAN COLORMAP CAD

*Actual company name has been changed.

TECHNOLOGY

-  Konica Minolta VIVID 9i
-  Geomagic
-  Rapidform

TECHNIQUES

-  Scanning Services
-  Quality Inspection
-  Reverse Engineering

APPLICATIONS

- Performance Surfaces
- Aerospace Engineering
- Tooling