Advanced Impeller Manufacturing

Overview
This project focuses on researching and implementing advanced impeller manufacturing techniques to find the most cost-effective solution for Dresser-Rand within the project budget of $1000. Currently, there are long lead times and low capacities, where the high operation manufacture of impellers is approximately 100 per month.

Objectives
The team aimed to find the best alternative method with lower costs and increased capacity while also meeting Dresser-Rand’s quality standards and geometric tolerances for the best impeller performance possible.

Approach
- The methods explored were based on the availability both from Dresser-Rand and the services accessible at Penn State, feasibility of process for advance impeller manufacturing design and services and information.

- 9 of 15 weeks of the semester dedicated to technical research
  a. Organized into five subtasks
  b. Technical Report followed investigation and analysis to present relevant information, challenges, advantages, and steps forward for Dresser-Rand to implement these processes within the industry

Outcomes
- Four manufacturing methods were investigated.
- Each method is summarized into an individual technical reports that was delivered to Dresser-Rand.
- A final report with suggested routes for Dresser-Rand to take.
- A ‘T’ laser-weld was performed on ¾ inch 410 stainless steel and cut into three individual sections: start-up, middle-process, and power-down for welding section comparison and analysis