Overview
This project focused on improving the surface roughness of Dresser-Rand impellers. These impellers are used in natural gas compressors. The surface roughness of the impeller directly influences the efficiency of natural gas compressors. For every 1% increase in efficiency of the compressor the customer can increase their profits by $20 million.

Objectives
A method for reducing surface roughness of impellers, ranging from 27in to 60in diameter, should be found that:
- Can reduce the surface roughness of the impellers from 350 µin RMS to 63 µin RMS
- Costs less than $70/in diameter of impeller
- Can be completed in less than 8 hours

Approach
- Determine technical quantitative and qualitative needs from sponsor
- Research for potential methods of surface reduction
- Assign groups of processes to specific team members for further research
- Independently research the processes depth using journals, books, and trade literature
- Contact potential suppliers and job shops to receive information on cost and current equipment available
- Grade each process using scoring rubric established for qualitative criteria
- Create a spread sheet to calculate the final score of each process using the Ideal Value Method
- The Ideal Value Method shows which process is overall closest to the ideal value of each criterion.

Outcomes
- Abrasive Flow Machining (AFM) was given the lowest score by the Ideal Value Matrix, and will allow Dresser-Rand to reduce the surface roughness with a repeatable reliable process.
- Further research should be performed to determine the exact costs and processing times of AFM and other possible processes before making a capital investment.