ESTIMATING TOOL FOR SINGLE-PIECE IMPELLERS

Overview
Single-piece milling requires the flow passages of an impeller to be milled from both the outer and inner diameters with seamless integration, a process has proven challenging and costly. Dresser-Rand currently does not have an accurate way of determining if an impeller can be single-piece milled or a valid method of predicting the cycle time and costs associated with potential impeller designs. Dresser Rand hired this team to formulate a procedure that will determine the machinability of an impeller design and accurately predict cycle time and cost.

Objectives
- Manufacturability of Single-Piece Impellers
- Cycle Time
- Cost

Approach
The first step of this plan was to evaluate the Dresser-Rand Estimating Tool. Each team member would be using one of the three impeller CAD files. From there, the VBA code would be reviewed to understand the algorithm that is used by the tool. Next, alternative potential solutions to analyze were decided. Three software packages were to be evaluated: CNC-RP, Max-Pac and aPriori. Each software would be investigated to determine its feasibility of solving one or all of the objectives.

Outcomes
The results of the analysis determined that a software tool integration approach should be taken. This approach combines both Max-Pac and aPriori capabilities to produce a confident analysis. The first step in this software analysis approach is to determine if the impeller can be single-piece milled using Max-Pac. If Max-Pac determines the impeller can be single-piece milled, the CAD model should analyzed in aPriori for cycle time and cost analysis.