OEM Manufacturing Process Improvement

Overview

In the project proposal, our team had a variety of problems that could have been fixed regarding the CIU plant in Changzhou, China. Ranging from defective parts, ineffective factory layout, to waste of materials, we decided that it would be most beneficial for the plant in Changzhou, China to increase the production rates and throughput of parts being manufactured at the plant. We decided to pursue the improvement of throughput because our two teammates from Shanghai Jiao Tong University (SJTU), Stella and Fox, realized at the CIU plant, workers are paid for each part made, not each quality part made.

Objectives

- Allow for short runs of parts to become more financially feasible by increasing throughput

Approach

- Team members, Stella and Fox, visited CIU multiple times to collect data, observe everyday operations, and gather knowledge from workers
- Accurately model the CIU facility and manufacturing process with Arena Simulation Software
- Analyze current system, based on model, to determine which areas needed improvement
- Two proposed changes were tested individually as well as simultaneously and compared to original results
- Results of original system were validated by researching and averaging the daily throughput of the facility and comparing the two
- Data on queue times of stations, throughput, flow time, machine and resource utilization were collected and used to compare each model

Outcomes

- Long wait times and inefficient transports were determined to be the bottleneck of the process
- By purchasing and using a forklift to alleviate the high utilization of the crane in area 3 of the plant as well as adding an additional squeezing machine:
  - Squeezing queue time reduced 91%, from 69.1 to 6.34 minutes
  - Flow time was decreased 68%, from an average of 170.06 to 53.80 minutes
  - Throughput was increased 33%, from an average of 26700 parts to 35625 parts
  - System variability decreased significantly