CASE STUDY

Simulation Study for a Multinational Conglomerate

PROJECT SUMMARY

The client is a multinational conglomerate that focuses on industrial engineering and steel production. PMC offered a discrete-event simulation model to evaluate the design of a new production line and validate the throughput capacity envisioned by the client.

Our utilization of discrete-event simulation techniques allowed the client to test different layout and process configurations in their design phase of their project.

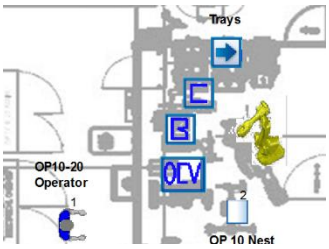
SYSTEM DESCRIPTION

The facility has four operations - two assembling operations, one press area and one assembling/testing process split into various work stations.

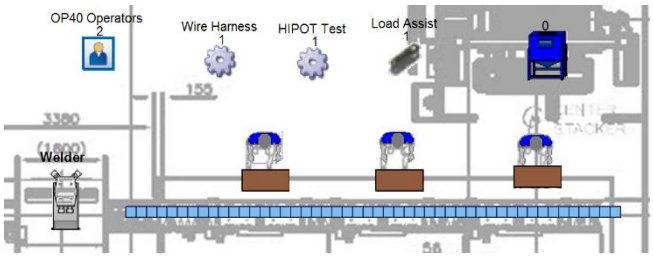
One operator replenishes raw components for the first two operations and there is one robotic arm in each of the operations to transfer parts between the work stations.

The press area contains one press that receives assembled parts from previous operations and compress them so one of the three operators, on the last two operations, can pick and transfer the compressed part to the last operation.

The fourth operation has one welder, one conveyor, three work stations and three operators who will finish assembling the parts and perform various tests accordingly.



Assembling Operation



Assembling/Testing Operation

OPPORTUNITY

The current line design was not finalized and had not been tested to see if it was able to meet customer demands in terms of volume, cost, and quality. Hence, there was a need to simulate the different operations to identify any design problems, equipment utilization, headcount and overall throughput capacity.

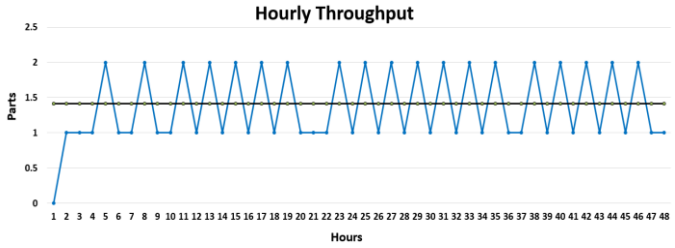
APPROACH

The data and layout provided by the client was imported to SIMUL8®. The four different operations were included in the model. An Excel® interface was created to input data for the simulation model. This unique technique by PMC allowed the client to have the flexibility of changing most of the inputs for the simulation directly from the Excel® interface, reducing the modeling time for all the different scenarios. Static calculations were performed to validate the results of the simulation model.

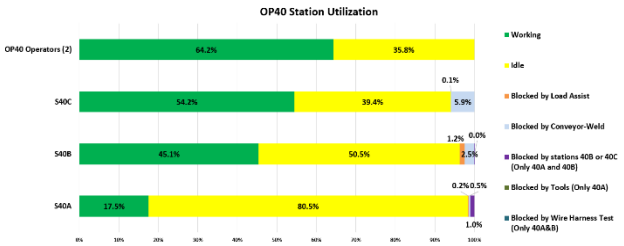
Production Modeling Corporation ♦ 15726 Michigan Avenue, Dearborn, MI 48126
Phone: 313-441-4460 ♦ Fax: 313-441-6098
Website: www.pmcorp.com ♦ Email: sales@pmcorp.com

SOLUTION

The discrete-event simulation model successfully and accurately determined the overall throughput capacity of the given production line design as well as the utilization of the different operators and equipment. Using the results from the baseline model, process improvements were made to the original production line. These improvements were then tested by running the simulation model for multiple scenarios. The results were used to find the best configuration that would maximize the overall throughput capacity and reduce the headcount.



Overall Throughput



Workstation/Operator Utilization

BENEFIT

In addition to the simulation study, an Excel® interface was provided to the client for making changes to the operation processing times, which will allow them to run what-if scenarios in case the process specifications change. Additionally, by using the simulation model to test different layout and process configurations, the client reduced the headcount by one and the number of tools used on the last operation by two. Furthermore, the client also found the best way to use its resources and maximize the line production capacity. The ROI on this project was 10 times the amount invested on the simulation study.