Chrysler saved $250,000 by taking the guesswork out of capital investment

Leading automotive manufacturer Chrysler avoided $250,000 of capital investment by proving that the current system was able to cope with demand.

Headquartered in Auburn Hills, Michigan, The Fiat Chrysler Group operates 33 manufacturing facilities in four countries and employs more than 52,000 people. The Jefferson North assembly plant of Fiat Chrysler Automotive produces the Jeep Grand Cherokee and Dodge Durango with an annual output of 300,000 vehicles. The plant employs 4,000 employees and runs 2 shifts with 3 crews.

Chrysler's simulation team wanted to find out if an additional 15 clamshell carriers were required to increase throughput at Trim Chassis Final (TCF) in the Jefferson Plant.

The Challenge

The Jefferson North Plant was experiencing some throughput issues and the plant thought that this was due to the line being short of Clamshell Carriers at the Trim Chassis Final Stage. The plant submitted a proposal to add 15 more Clamshell Carriers to the line, which would require $250,000 of investment from Chrysler.

Before the investment was made the simulation team was asked to conduct a simulation study to confirm if the line was short of Clamshell carriers. They were tasked with determining a feasible range for the total number of carriers that would ensure the system is not short of carriers, and not overcrowded with too many clamshell carriers either.

The Solution

The simulation team created a simulation of the assembly shop for the Jefferson North Assembly Plant. The study was to determine a feasible range for the total number of carriers and decide how much capital investment would be needed to make the line run efficiently.

The simulation team has base simulation models for the assembly lines and this simulation has been used as the template for creating the simulation. The team has then been able to change the number of carriers so that they can determine the feasible range for carriers in the system that wouldn't affect throughput.

By changing the number of clamshell carriers in the simulation you could see the different throughput numbers that the assembly plant could produce. This allowed an upper and lower limit of clamshell carriers to be determined.

Chrysler used real life data in their simulation that had been collected from the factory floor using their Factory Information system which collects the data from PLC, a real time recording system which records line speed, cycle time, MTTR and MTBF. This was then imported into the simulation, meaning no assumptions needed to be made, all the input data was real.

The simulation was run for one month using the real data and the results validated by comparing them with the real throughput amounts over the same time period, when the throughput numbers were close then that validated that the simulation was working like the real system. The simulation was then used to test varying numbers of carriers until a feasible range was determined.

"It doesn't take long to get results when you change the number of carriers. It takes like a few seconds, maybe less than half a minute to run the simulation and then you start to get a curve."

Steve Lin, Throughput and Simulation Specialist Chrysler

The Result

The simulation showed that the feasible range for Clamshell Carriers on the line was between 426 and 502. Any less than 426 and any more than 502 begins to make the system less efficient and begins to have a negative impact on throughput.

There were 475 Clamshell Carriers in the system already, so the simulation showed that with the current number of carriers in the simulation the system was working within the feasible range. This meant that the desired throughput could be achieved and therefore additional clamshell carriers were not needed for the plant. This allowed Chrysler to avoid a $250k investment without having an impact on their throughput targets.

The simulation also highlighted that although the line appeared to have a shortage of clamshell carriers; it was more likely an issue with downtime upstream and that should be where improvements are made.

Not only did this simulation help ensure the correct decisions were made about capital investment at the Jefferson plant, but it will also be reused to test the number of Clamshell Carriers needed at other plants. This is one of nine plants that Chrysler operates with Clamshell Carriers, and this simulation can be used to test the number of carriers needed at any plant simply by changing the relevant data making the simulation invaluable to Chrysler.

What's next?

Chrysler's simulation team continue to use SIMUL8 across the organization to help make effective business decisions, this can be on projects ranging from pre-launch studies of new plants and lines, to how to make existing lines work more efficiently. They've even started to outsource their team to their tier 1 suppliers to ensure efficiency right through the process.

Further Reading

Increasing revenue by $1m a day

Read about our work with The Brampton Plant and how we helped them **increase revenue by $1,000,000 a day** without increasing costs.

Saving $5 million with SIMUL8

Read about how the Throughput and Simulation team at Chrysler is on target to save **$5 million** using a Line Speed Reduction tool created using SIMUL8 software.

For more information on SIMUL8 products and solutions, contact:

t: (Europe) +44 141 552 6888 **(US)** 800-547-6024 / **e:** info@SIMUL8.com / **w:** www.SIMUL8.com