FMC Technologies Increases Output by 50% using SIMUL8

FMC Technologies Brazil, global market leader in subsea systems is using SIMUL8 to optimize and improve manufacturing processes across the organization. As the leading provider of technologies in oil and gas, FMC Technologies Brazil is using SIMUL8 to expand manufacturing operations to meet a surge in market demand.

Named by Forbes® Magazine as one of the World's Most Innovative Companies in 2013, FMC Technologies has over 20,000 employees and operates 28 production facilities in 17 countries. The organization designs and manufactures products, and provides services for the oil and gas sector that include:

- subsea systems
- fluid control
- measurement solutions
- material handling systems

FMC Technologies has been successfully using SIMUL8 for over 2 years to inform operational planning. Simulation was first introduced to FMC Technologies by GPS Lead and Planning Specialist Ricardo Fernandes when he began working at the plant. Ricardo used SIMUL8 at university and saw a huge opportunity to use SIMUL8 to improve manufacturing processes. Since then he has been using SIMUL8 to transform decision-making across the organization, increase output and saved millions of dollars.

Leading a small team, Ricardo has delivered multiple simulation projects, from increasing the capacity of SCMs by 50% (the control center of Christmas trees), to identifying bottlenecks in manufacturing lines and forecasting 5 year production to ensure output is aligned with market growth. Ricardo's team is using simulation to collectively understand and improve performance across all product lines.

FMC Technologies is using SIMUL8 to model a variety of projects, enabling them to understand capacity and ensure they can deliver to fluctuating market demands. Simulations have been developed in as little as one week. The ability to develop rapid simulations and modify processes based on the results, has been key to the successful integration of SIMUL8 as a core business planning tool.

"SIMUL8 gave us a technical way of understanding capacity, identifying bottlenecks and changing data to achieve new capacities, new goals and new logics. We never had this ability before."

Ricardo Fernandes

GPS Lead and Planning Specialist

The Challenge

A sharp rise in market demand in the past year meant FMC Technologies' operations had to shift from producing small quantities of equipment, to delivering larger quantities for much larger fields. The increased pressure on production meant they needed a tool to understand current production, and to test improvement scenarios that would eliminate bottlenecks and maximize capacity. SIMUL8 was the optimum solution: it enabled them to test multiple product combinations moving through a line to determine the most efficient process. Product combinations could be tested risk-free, without impacting manufacturing production.

Due to the repetition in delivering higher quantities of the same product, FMC Technologies used SIMUL8 to:

- Understand and optimize processes
- Increase production
- Identify bottlenecks
- Understand resource requirements
- Reduce risk
- Inform spending decisions on staffing and equipment

Financial penalties incurred upon late delivery to clients meant FMC Technologies needed to prove their ability to deliver to agreed timescales. By using SIMUL8, not only could FMC Technologies prove their ability to deliver on time, they could also work out how this would be achieved and communicate this to senior decision makers. This provided the evidence for capital expenditure and the confidence in their proposals.

For more information on SIMUL8 products and solutions, contact:

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

The Solution

To meet the increased demand, Ricardo and his team developed a range of simulations to increase output across their product range, understand bottlenecks and forecast future production. The simulations proved extremely successful and accumulatively FMC Technologies achieved the following results:

- Increased output of Christmas Trees by over 100%, using no additional spend
- Increased monthly capacity of SCMs by 50% with no capital expenditure
- Balanced multi-product line to reduce bottlenecks and a meet a surge in market demand

FMC Technologies use SIMUL8 to continuously **test**, **evaluate**, and **implement** changes based on results. Below are some of the many ways SIMUL8 is being used across the organization:

Identify Bottlenecks:

Using SIMUL8, FMC Technologies is able to identify bottlenecks and ensure that by eradicating a bottleneck in one area, they are not introducing them elsewhere. In a recent project, SIMUL8 highlighted a bottleneck at the testing stations so the line layout was revised to introduce a fork design with double the number of test stations.

Increase production:

SIMUL8 was used to test the impact of (a) reducing cycle times, and (b) the addition of a new machine to understand the most viable way to increase production. They identified that reducing cycle times would have the greatest impact and using SIMUL8 they could calculate exactly how much cycle time needed to be reduced by, and at which stations, to increase productivity.

Isolate single product in multi-product line:

SIMUL8 enabled FMC Technologies to understand the performance of one product in a multi-product line, if given 100% dedicated resource. They achieved this by developing a simulation that mirrored the physical line layout with only 1 product assembly. Simulation was the only solution that enabled them calculate exact throughput without halting production.

Line balancing:

With multiple products entering a single line, with millions of possible combinations, SIMUL8 was used to understand the product input mix and balance the line. By testing multiple scenarios they were able to determine the optimum combination for increased throughput. SIMUL8 also helped them recognize constraints in existing physical assets including people, cranes and pits. By re-balancing the line and addressing current constraints they were able to increase output by up to 50%.

Forecasting:

The software was used to forecast 5 year production in line with expected market growth. This ensured their ability to deliver to their clients' required output in accordance with future market demand. By using SIMUL8 for forecasting, FMC Technologies could advise clients early if there was a need for future investment.

The Result

SIMUL8 has enabled FMC Technologies to increase throughput across the organization by an average of 15 - 20%. This has been as high as 50% in the case of the SCM Assembly – the main component and control center of the Christmas tree.

Since FMC Technologies began using SIMUL8, Ricardo and his team have transformed manufacturing processes across the organization. By understanding capacity and effective line balancing of their multiple-product line, they have successfully increased output to meet market demand. This has been achieved through testing multiple product input combinations and eliminating the formation of bottlenecks.

"If we hadn't used SIMUL8 and were unable to measure capacity; that would mean not being able to deliver on time and therefore be an erosion of profit."

Ricardo Fernandes,

GPS Lead and Planning Specialist

By using SIMUL8, FMC Technologies has saved millions of dollars by ensuring on-time delivery of products to clients. Cost savings have also been made by avoiding spend on expensive manufacturing equipment and resources. In many cases, the solution lies elsewhere such as in changing the layout of the line, rather than on capital expenditure. This is where simulation proves most effective – it enables multiple scenarios to be tested virtually to identify the best solution without impacting production. This ensures no loss in revenue.

FMC Technologies is continuing to use SIMUL8 as an integral operational planning tool to streamline manufacturing processes. They have some large simulation projects in the pipeline including one around goods inspection and the other in warehouse receiving. Using SIMUL8, FMC Technologies is able to keep ahead of the competition, ensuring they are able to meet growing market demand.