Digital Twin maximizes ROI for modernization of legacy distributed control system

RESULTS

- Eliminated 3 weeks from commissioning time and cost by resolving configuration issues before FAT
- Eliminated 3 weeks of operator training time due to by training on the system concurrent with FAT and increased efficiency of operator training
- Gained 6 weeks in production time due to configuration testing and operator training
- 840% return on simulator investment due to production ahead of schedule

APPLICATION

Batch starch slurry modification process—including reactors, chemical additions, and storage.

CUSTOMER

Food & Beverage processing plant modernizing their legacy distributed control system.

CHALLENGE

The customer determined they were budgeting extra time and effort in the project schedules to fix configuration issues missed during acceptance testing. They also identified their operators' inexperience with the control system and process was causing unplanned production delays. With a planned modernization project, plant management wanted to reduce those delays and optimize the project schedule.

SOLUTION

Emerson's Digital Twin technology, Mimic Simulation Software, was used for a medium fidelity simulation approach across all process areas. The IO modeling of the simulation scope was approximately 1000 points, with a total cost of about $250 per IO point.

With the Digital Twin solution, the plant was able to begin production a total of 6 weeks ahead of the planned schedule. Those extra weeks of unscheduled product justified the investment 8x over.

For more information:
www.emerson.com/mimic

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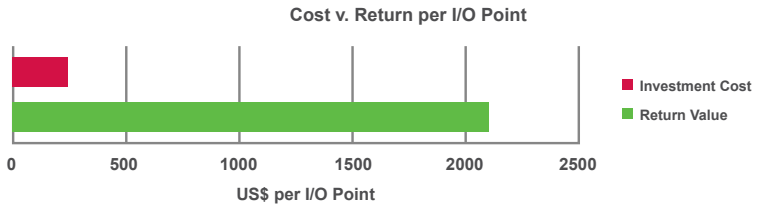
By applying the appropriate level and fidelity of dynamic simulation, the control system configuration was tested and checked out throughout the different stages of the project, including internal control system configuration testing and Factory Acceptance Testing (FAT). This saved time spent fixing the control system configuration post FAT on previous projects. There were 16 weeks budgeted for acceptance testing, and only 13 weeks were used—eliminating 3 weeks from the project schedule. The FAT time was reduced 20%, saving the time of both the plant personnel and control system configuration team. In addition, the plant was ready for production 3 weeks earlier. The time saved allowed the plant to be up and producing 6 weeks ahead of schedule.

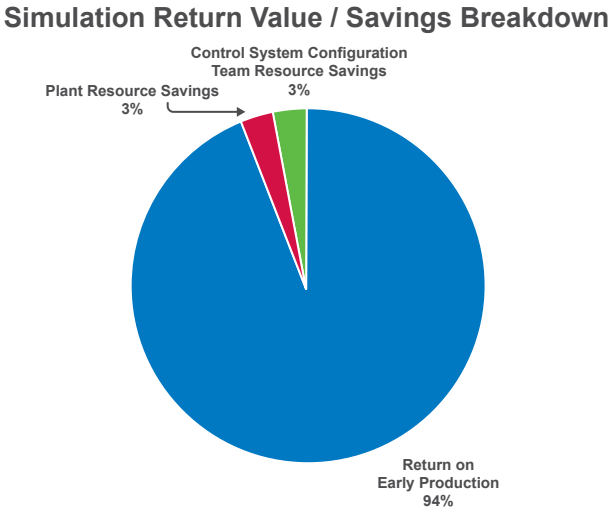
The quantified return from the reduced time to production and manpower savings came to about $2,100 per IO point. Resulting ROI for the plant came out 840%.

With the same dynamic simulation, operators became familiar with the control system during and after acceptance testing, eliminating production delays. The configuration team used the simulation to identify and fix incorrectly configured equipment modules.

The Digital Twin solution allowed the project team to accomplish their goals ahead of schedule. And it justified continued use of dynamic simulation for future process improvements and control system modernization projects.



ROI of 840%



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