Why High-Fidelity Simulation? It just makes cents!

What if your process operators had recently practiced the plant start up procedures and experienced some of the unusual conditions that might occur?

- European off-shore oil production platforms would produce $1-2 million/day in profits at capacity; simulators for startup operator training alone were credited with saving 2-7 days of profits worth $2-14 million.
- Refinery unit startup operator training reduced a normal 7 day startup to a record 36 hours. Daily profit from this unit was about $500,000 valued at $2,500,000 for one startup.

What if better process and control understanding led to fewer abnormal situations and spurious shutdowns?

- A new refinery operation anticipated “as many as 18 process malfunctions in the first year of operation until the operators got used to the process.” Here they were referring to an upset in the operation that wasted product or raw materials, valued at $30,000 per upset. After operators and supervisors had been through simulator training, they experienced no such upsets in the first year giving the credit, worth $540,000, to the simulator training.
- The same company had been experiencing two spurious process shut downs a year prior to simulator training, after which they never exceeded one. Such a shutdown had a cost of $100,000 - 200,000.

What if the control system design (configurations and actions) could be verified before they were applied to the plant?

- During the design phase, engineers operated a simulated process and found the control valve sizing criteria would not allow process controllability through the desired range of throughputs.
  - 100+ control valves to check/re-size/re-order
  - 4 design manhours per valve (@ $50/hr) costing a minimum of $20,000 in the design phase
- If discovered in the construction phase this would have cost about $200,000
- If not discovered until process startup the cost impact would have been about $2,000,000

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GSE Systems
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What if new operating procedures, process modifications and improvements could be verified before they were applied to the plant?

- Having finished the building of a process model, simulation engineers were unable to startup the simulated process using the procedures provided by the process designer. The design representative verified the procedures would not work, had them revised, and verified the revisions - on the simulator.

- If this had not been discovered until startup, the loss of profits for a week would have been about $2,000,000, and waste materials and operating cost would have been about $200,000.

For over 40 years, GSE Systems has been developing operator training simulators that provide real solutions to challenging industry problems. As more organizations realize the potential benefits of dynamic simulation, the use of cost effective, high-fidelity process simulators has steadily increased.