

The Success of Operator Training Simulators (OTS)

Introduction

A modern-day simulation software run on regular PC's and can inexpensively replicate real-world situations in a virtual environment. When creating a training simulator, a model is built to imitate how the plant actually behaves. This involves looking at multiple drawings, engineering schematics, design criteria, etc. so the plant behavior can be reproduced, by using engineering equations and correlations. Once the initial model is developed to simulate the plant, the model equations and correlations are then "tuned" to match plant data. This tuning helps to make the simulator more representative of the actual plant.

Lastly the best OTS systems take that model and integrate it into a control system environment that Operators use the run the plant. Automation companies have software that emulates control system controllers on a PC. So the plant model is integrated with the controller that is configured to run the virtual plant. Along with the controllers is the Human Machine Interface (HMI) which mimics the Operator's actions to control the plant.

A good candidate for OTS installations could include the following reasons:

- Operations that require a high-availability plant and where downtime can be very expensive
- An operation that is experiencing a high turnover of knowledgeable operators;
- The plant may have scenarios, (ex. power bump) where an Operator needs to make several correct decisions in a short period of time otherwise there is the risk of extended down time;
- With a high-availability operation, there can be unplanned events for an operator who may not have encountered the situation for many years;
- The unplanned event may carry significant safety or environmental risks.
- A new greenfield plant which requires a fast start-up can only be done with good Operator training
- Greenfield plants that can have the control systems checked out before actually running them

Successful Implementations

Operator Training Simulators have been successfully installed for facilities like Roasters, Acid plants, and water treatment plants. Whether these facilities are controlled by DCS platforms or they're operations run with PLC's. Simulators are considered as additional tools to complement existing training manuals.

For greenfield project sites, Operator Training Simulators can:

1. assist with pre-training operators on the new plant and,
2. test the controls for the new plant prior to its construction completion

Control systems normally cannot be tested in a new installation until the plant is ready to start-up. With an Operator Training Simulator, control check-out becomes an activity that becomes largely before part of plant commissioning.

Benefits

With an OTS system, operations now have the ability to setup multiple scenarios where they can regularly put an operator through the training until that operator feels comfortable with handling the system. The trainer can pause the scenario at any time and discuss any issues that an operator may be having. This has given young operators more confidence and knowledge of how to handle these unplanned events in a controlled and safe manner.

For greenfield sites, case examples have shown pre-start-up testing can resolve control sequences and configuration. Resolving these issues beforehand saved time on plant commissioning and prevented possible equipment damage.

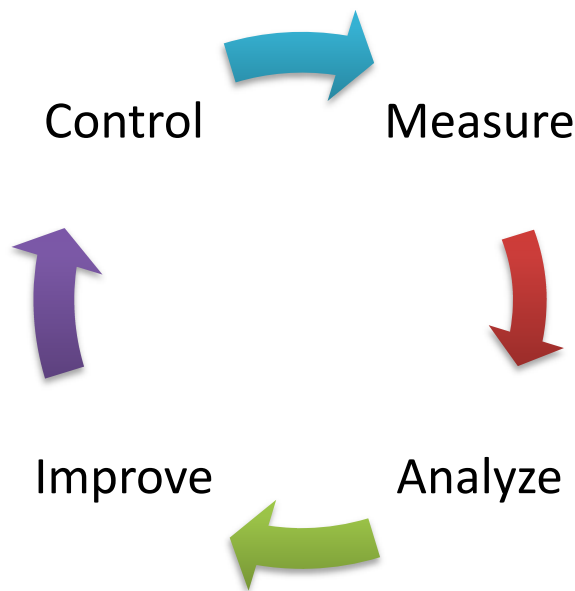


Figure 1 Operating Training Simulators (OTS) is the ideal Continuous Improvement companion

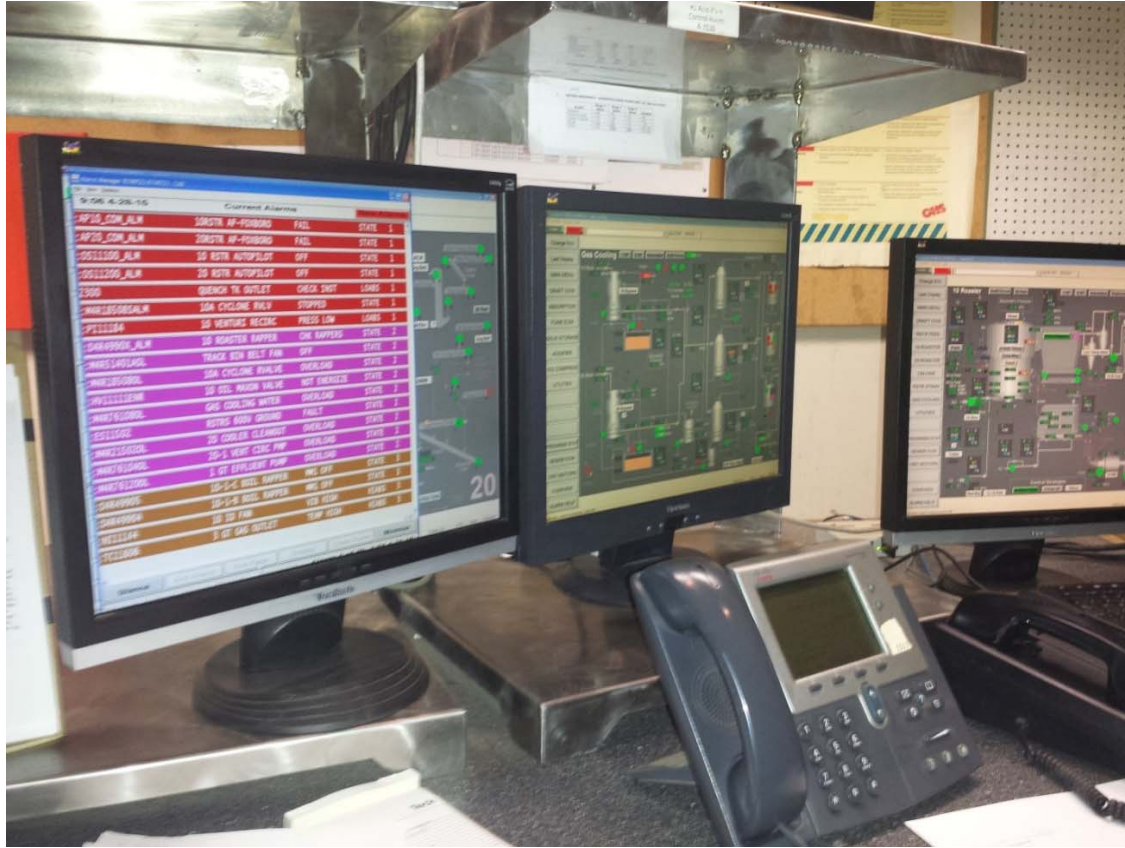


Figure 2 An Operator Training simulator provides the real-life experience of running the plant