The task
Safe and efficient plant operation requires trained and skilled employees who are familiar with the operation within the technical environment and with the plant processes – even in critical, exceptional situations and even before the real plant exists.

Customer challenge
More than 42% of accidents occurring in a plant are due to human factors. Given this, it is obvious that safe and reliable plant operation must be guaranteed through specifically trained employees. One of the challenges here is to achieve the required skills level before the new plant or new unit starts to operate, at a time when no on-the-job training, or learning from others is feasible.

The second challenge is just on the other side of plant lifecycle: Many experienced plant operators are retiring – those who have a deep knowledge about safe operations in a plant. For this reason, a successful training of new staff must take place to handover knowledge even after the experienced people leave. And both challenges face the same issue with classical training classes: Conventional training, whether it is web-enabled or paper-based, provides theoretical knowledge about generic plants and processes, but no real-world experience.

Our solution
The approach: an operator training simulator of the individual specific plant delivers the best learning experience and results with the greatest possible repeatability of the learning. The SPPA-T3000 operator training simulator models your plant, so that, in a short time, you can train your operators via your original plant setup. It uses the SPPA-T3000 power plant library algorithms and function blocks. The simulator function is fully integrated into the DCS system software so it does not require separate engineering, which means the digital twin automatically develops during the real plant engineering phase with minimal additional effort. Besides minimizing the effort, this high-integration approach ensures a significant savings of time.

Benefit from your employees’ full potential from day one.
SPPA-T3000 Operator Training Simulator

Hands on operator training, even well ahead of commissioning.

The time advantage makes the difference: Operator training starts well ahead of operation and hands on operator training, even well ahead of commissioning.
The simulated power plant processes with nearly the same accuracy as a high fidelity simulator allow fundamental power plant operator training with all operator functions and control system navigations.

The simulator consists of its own SPPA-T3000 hardware and software platform, using the SPPA-T3000 project application data of the real plant. And the trainee will use the same operator workbench as in the real plant. The trainer can serve and provide various training scenarios via the instructor station and the simulator is controlled by the instructor station features.

The simulation models: to start training well ahead of commissioning the SPPA-T3000 Operator Training Simulator already comes with the required simulation models of plant components. From a long list of pre-existing, proven, pre-configured, and tested component simulation models, Siemens picks the right ones for your specific plant and arranges those in the same way as your plant configuration. This results in the simulation accuracy as required for operator training with all operator functions and control system navigations.

The simulation models of the components are based on thermodynamic and universal physical laws and proven Siemens experience in building and operating power plants. They use established constitutive relations, e.g., for heat transfer and fluid mechanics along with appropriate delays, gain factors and functional approximations to simulate the desired behavior of the real power plant components e.g., for:

- Turbine stages
- Heat exchangers
- Drum-boilers
- Evaporators
- Feedwater pumps,
- Condensers
- Hotwells.

Instructor station features

- Freeze / Run: Simulation state can be frozen and put into running at any time.
- Snapshot / Initial Conditions: Both are records of achieved conditions or of starting points of power plant operations, like full load, half load or hot start-up. Snapshots can be saved, named, loaded or deleted.
- Malfunctions: They can be initiated by the instructor. The simulator will allow the plant operators to expect for the unexpected.

Your benefits

- Gaining plant operation knowledge when it is most needed
- Realistic operator familiarization training prior to plant start-up
- Immediately available with minimum lead time
- Prepared to manage critical situations and malfunctions
- Simulator control system environment identical to real plant DCS
- Optimized investment alternative to higher fidelity simulation

Early training on the real system

Same operator workbench for the trainee, minimum additional hardware, full-control instructor station.

Published by Siemens AG 2019 | Power and Gas Division Energy Solutions | Freyslebenstrasse 1, 91058 Erlangen, Germany | Email: sppa-t3000.energy@siemens.com |

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