



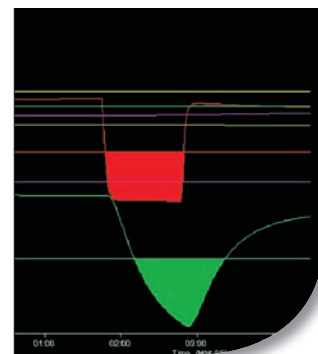
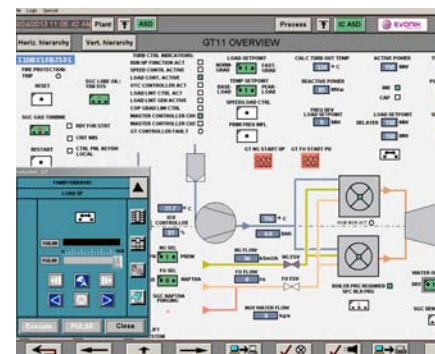
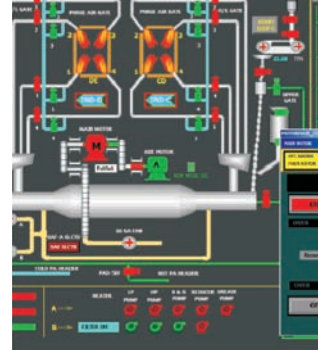
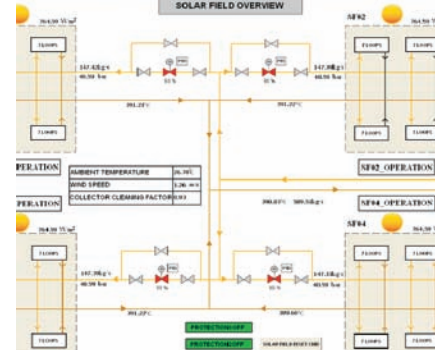
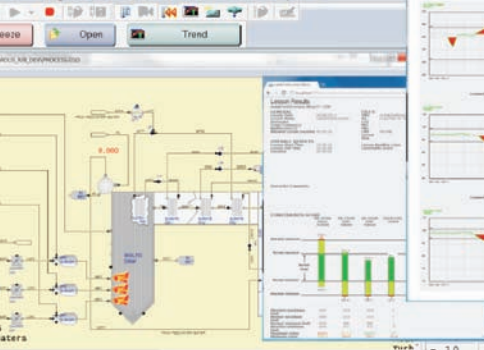
STEAG Energy Services

Power Plant Simulator Systems

The System Technologies division of STEAG Energy Services develops and supplies high-fidelity Simulator Systems for use as an effective tool for operator training and critical “what if” engineering analyses.

The practical applications of the simulator system enable power plant operators to upgrade the skills of their workforce or study complex abnormal conditions and even design modification – ultimately ensuring better operation practices and enhanced profitability.

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STEAG is a partner of TRAX International, USA – world leaders in the delivery of realistic, plant specific simulators for the supply of Simulators based on their well proven ProTRAX Simulation Toolkit.



- Over 150 simulators delivered worldwide, since 1987
- ProTRAX modeling tools include a comprehensive module library for all fossil plants and related subsystems: Drum Boiler | Super critical Once-through | Circulating Fluidized Bed | Combined Cycle | IGCC Hydro | Reservoir Systems | Electrical System | Auxiliaries
- Integrated solutions for all major DCS suppliers

High Fidelity Simulators

STEAG's High Fidelity Simulators, developed using the ProTRAX toolkit – aim at providing real world experience during normal plant operation as well as invaluable "what if" experience in abnormal situations.

- Plant Dynamics and Control System functions - identical to the Plant DCS/Graphics.
- Start Up, Shutdown Procedures
- Start Up, Shutdown & Abnormal Behavior
- Emergency and Abnormal Operations and Failure Handling
- Other customized Complex Operations

The Simulator is designed using the plant P&ID's and physical plant data, tuned with plant operating data, and then validated to meet ANSI/ISA-77.20 standards for steady state and transient behaviour.

Simulator Configurations

DCS controls are integrated into each simulator, providing the same controls behaviour as in the actual plant. Supported solutions may vary by DCS supplier.

- Virtual - Software hosting of actual DCS logic with Supplier HMI
- Emulated - Translated DCS logic with emulated DCS HMI or emulation of DCS Logic in ProTRAX and DCS HMI using other tools.

Benefits of STEAG Simulators

- Train New & Experienced Operators
- Validate DCS Logic and Screens
- Increase Operating Plant Efficiency
- Maximize Plant Availability

ProTRAX Runtime Executive

The feature-rich Runtime Executive enables scenario-based training, and allows users to dynamically create/invoke malfunctions, record/retain training results, and control the over all simulation. Special features:

- Realistic Operator Environment
- Available DCS Configurations-Virtual, Emulated.
- Structured Drag & Drop Modelling Environment
- Intuitive Instructor Executive
- Training/Runtime Executive Capabilities
- Proficiency - Records & archives training session results
- Button Overlay Bar Interface
- Session controls include:

- ◆ Run/Freeze ◆ Fast/Slow time ◆ Malfunction
- ◆ Snapshots ◆ Suspend/Resume

Experience

STEAG's simulator experience spans multiple plant technologies and a variety of DCS environments:

- 250 MW Hydro Power (TG-BHEL, DCS-ABB)
- 210 MW, 250 MW Coal fired (BTG-BHEL, DCS-ABB, Metso)
- 600 MW Coal fired (Boiler-Harbin, Turbine-Dong Fang, DCS-Invensys)
- 430 MW MW Combined Cycle (GT-Siemens, ST, HRSG-BHEL, DCS-Siemens)
- 500 MW Generic Coal fired
- 50 MW Generic Solar Thermal (Parabolic Trough)
 - ◆ Landmark project, first commercially available Solar Thermal Power Plant Simulator
 - ◆ Operator training tool and a test bed for studying the issues of plant optimization in the solar thermal technology