

First-principle Simulation



Your Requirements:

- Train control room operators for efficient response to normal and abnormal plant operation
- Evaluate trainee performance for operator qualification programs
- Verify control logic prior to implementation in the “live” control system
- Develop and validate best practice operating procedures
- Study plant responses to “what-if” scenarios through changes in energy production, fuel usage, material balances, stoichmetric ratios, or other physical parameters

The Best Scenario:

Scenario® first-principle simulation incorporates robust high-fidelity models that duplicate your plant’s live operations to provide your staff with keen insight into your plant’s behavior during normal and abnormal operating conditions. Plant models are based on dynamic first-principle engineering and thermodynamic relationships that accurately reflect the operation and interaction of your facility’s equipment. Scenario first-principle models are created from a suite of graphic-based software tools especially designed for power plant thermo-hydraulic modeling. These tools use conservation equations in a complex matrix solver for mass, energy, and momentum balances to provide fast and stable responses for pressures and flows.

Operators can use Scenario first-principle simulation to efficiently perform fast-paced operating activities with confidence. As a decision support tool, your operators can gain a higher level of process familiarity and develop best-practice procedures that ultimately contribute to reduced plant outages, downtime,

and startups. Scenario is the perfect tool to capture the wealth of specific plant process understanding embodied in your operations staff and easily transfer this knowledge to new employees, arming them with skills gained through years of on-the-job experience.

As an engineering analysis tool, Scenario first-principle simulation can be used to tune system parameters, validate new or changed control strategies, optimize alarm management, and test various “what-if” ideas to determine a feasible reactive procedure.

Customers constructing new plants can use Scenario first-principle simulation to fine-tune control schemes, train new operators, upgrade skills of existing operators, and verify that all operational aspects of the plant are ready for generation well in advance of commissioning.

Benefits

- Trains operators for efficient responses to unit operations including recognizing and avoiding incidents that could result in lost production
- Tests and validates new or changed control strategies prior to live operation
- Fine-tunes and verifies control system design prior to plant startup to minimize commissioning time
- Assists in development of best-practice operating procedures for efficient unit operation
- Transfers operational knowledge from experienced staff to new employees
- Enhances operator confidence for quick response to dynamic operating conditions

(Continued)

Scenario Simulation Solutions

Function	Tie-back	Algorithmic	First-principle
Models			
Built from control system algorithms developed specifically for the power generation industry	X	X	
Built using high-fidelity, thermodynamic, first-principle mathematical models			X
Functionality			
Control logic testing and verification	X	X	X
Operator training and qualification	X (limited)	X	X
Procedure development and validation	X (limited)	X	X
Engineering test bed for normal and abnormal operations		X	X
Engineering analysis for "what-if" scenarios			X
Full Instructor functionality with trainee evaluation tools			X

The contents of this publication are presented for informational purposes only, and while every effort is made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our software licensing agreement, and terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our product at any time without notice.

© 2008 Emerson Process Management Power & Water Solutions, Inc.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Ovation, Scenario, SmartProcess, SureService, PlantWeb, and AMS Suite are marks of Emerson Process Management. All other marks are property of their respective owners.

Emerson Process Management
Power & Water Solutions, Inc.
 200 Beta Drive
 Pittsburgh, PA 15238
 USA
 Phone: 1-412-963-4000
 Fax: 1-412-963-4447
www.EmersonProcess-PowerWater.com