EnVision
e-Learning & Universal Simulation

Co-Generation Boiler

A self-paced MultiMedia based Tutorial/CBT and real-time dynamic simulation of a Power Boiler System.

Tutorial/CBT:

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for a Power Boiler System using Voice, Video, Animation and Graphics.

Overview
- Applications of Boiler
- Types of Boiler

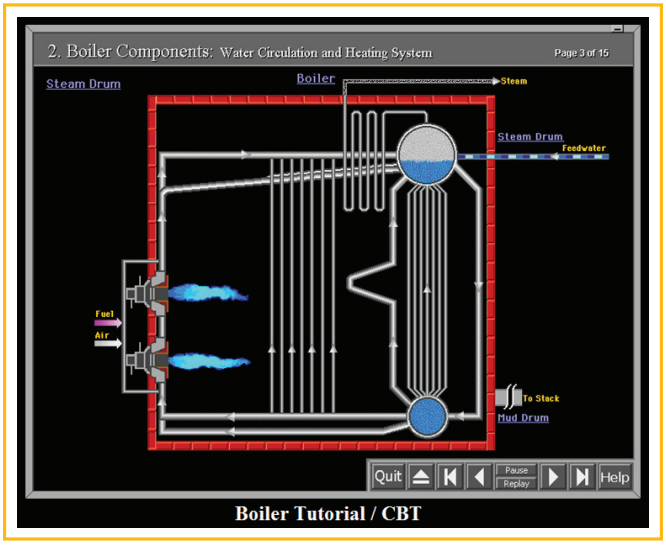
Boiler Components
- Deaerator and Feedwater System
- Drum, Water Circulation and Heating System
- Superheater and Heat Recovery System
- Combustion System
- Draft System
- Steam Distribution System

Boiler Performance
- Burner Characteristics
- Combustion Air
- Damper and Air Registers
- Fuel Characteristics

Control System
- Three-Element level Control
- Steam Temperature Control
- Steam Pressure Control
- Fuel Control
- Total Calorie Control
- Combustion Air Control
- Oxygen Control
- Cross Limit Control

Basic Operations
- Pre-Startup
- Startup
- Shutdown
- Post Shutdown

Normal Operations
- Effect of Load Change on Pressure
- Effect of Load Change on Level



Boiler Tutorial / CBT

Operating Considerations
- Combustion Conditions Leakage in Boiler
- Soot on Heating Tubes
- Error in Measurements

Troubleshooting
- Low Steam Drum Level
- Rupture of Heating Tubes
- Flame Out of All Burners

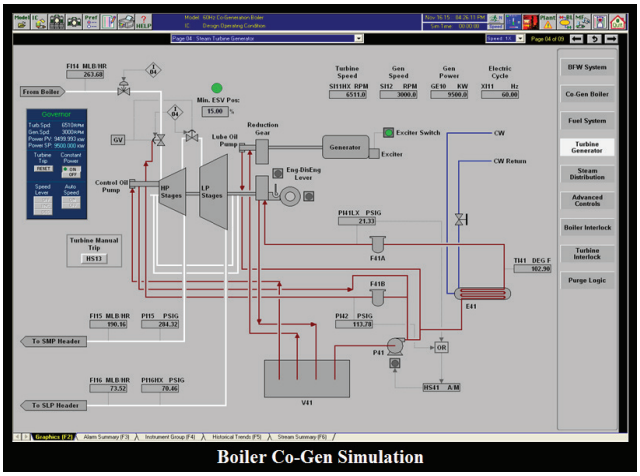
- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch, French, German, Spanish and Swedish

Simulation

GSE's EnVision simulation is a real-time dynamic process simulation program used for Operator Training. It is based upon a rigorous and High-Fidelity mathematical process model to provide a realistic dynamic response of a process unit.

The Simulator allows a Trainee to Practice:

- Startup and Shutdown Operations
- Normal Operations
- Emergency Shutdown Operation
- Control Exercises
- Troubleshoot and practice recovery from Equipment, Instrument, and Control Valve Malfunctions


Boiler Co-Gen Simulation

Major Equipment:

Boiler and Feedwater System:

- Boiler
- Feedwater Preheaters
- Deaerator
- Adv. Combustion Control

Generator System:

- Two Stage Turbine with Governor
- Generator with Exciter
- Lube Oil System with Oil Cooler
- MP and LP Headers

Fuel System:

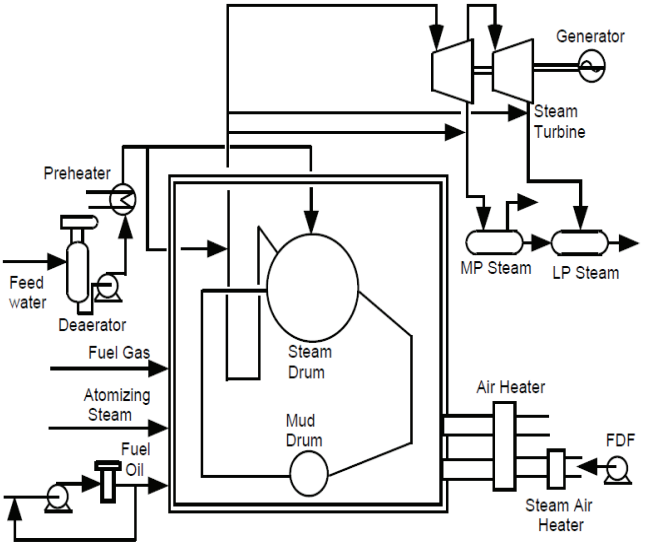
- Combined Oil and Gas Firing
- Four Burners, Wall Mounted

Combustion Air System:

- Forced Draft Fan
- Air Preheaters

Key Operating Variables:

- Power Generation: 9.5 MW
- Steam Generation:
  - HP Steam: 150 Tons/Hr (328 MLB/HR)
    9.8 MPa (1420 PSIG)
    475.0 C (890 F)
  - MP Steam: 105 Tons/Hr (230 MLB/HR)
    1.9 MPa (270 PSIG)
    270.0 C (520 F)
  - LP Steam: 57.5 Tons/Hr (125 MLB/HR)
    450.0 KPa (65 PSIG)
    165.0 C (330 F)



- Simulation comes with a Learning Management System (LMS) called SimAdmin that allows an instructor to register trainees and monitor their performance
- Simulation is available as Standalone (Single or Dual Monitor) and Instructor-Trainee versions

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