EnVision
e-Learning & Universal Simulation

Utility Boiler

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

Tutorial/CBT:

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for a Forced Draft, Drum-Type Utility Boiler using Voice, Video, Animation and Graphics.

Overview
- Applications of Boiler
- Types of Boiler

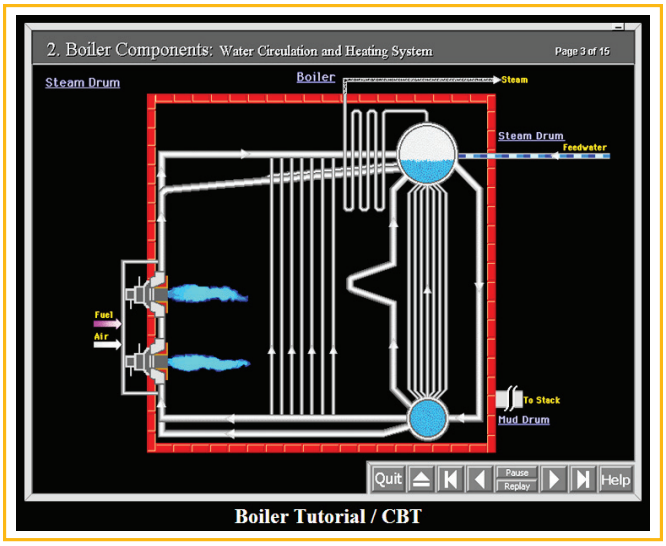
Boiler Components
- Deaerator and Feedwater System
- Drum, Water Circulation and Heating System
- Superheater and Heat Recovery System
- Combustion System
- Draft System
- Steam Distribution System

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

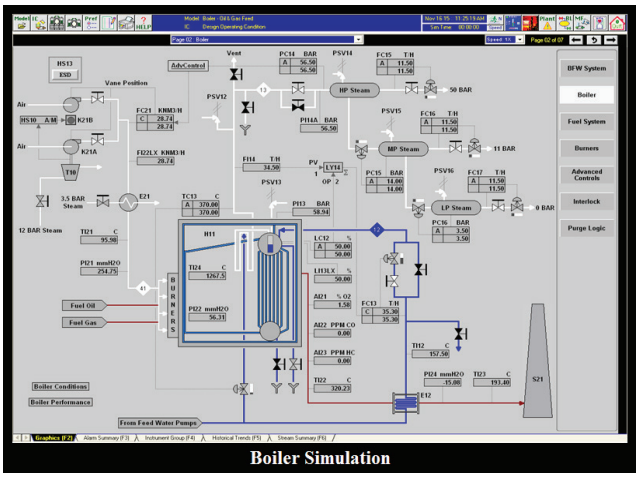
- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch,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



Major Equipment:

Boiler and Feedwater System:

- Steam & Mud drum
- Economizer
- Superheater & Desuperheater
- LP, MP and HP steam headers
- Deaerator

Fuel System:

- Combined oil and gas firing
- Four burners, wall mounted

Combustion Air System:

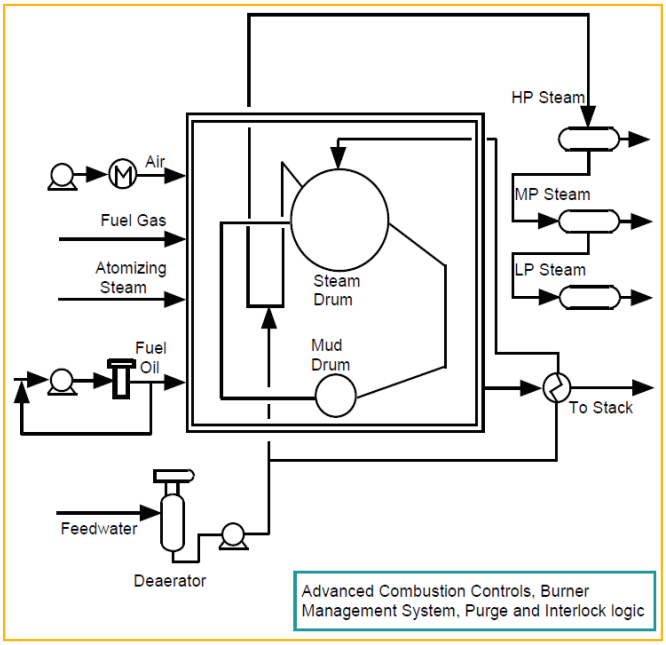
- Forced draft fan
- Air preheater

Key Operating Variables:

• Steam Generation:	34.5 T/H	(76 MLB/HR)
• HP Steam Pressure:	56.5 BAR	(800 PSIG)
• HP Steam Temperature:	370.0 C	(698 F)
• MP Steam Pressure:	14.0 BAR	(200 PSIG)
• LP Steam Pressure:	3.5 BAR	(50 PSIG)

Controls:

- Advanced combustion controls with cross limit firing
- Purge permissive and purging operation
- Boiler trip and interlock system



- 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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