210 MW POWER PLANT SIMULATOR

The PS5010: 210MW Power Plant Simulator consists of a comprehensive Model of a fossil fired (coal, oil, gas) power plant. The simulator can be operated in the full dynamic range, including startup from cold condition, load maneuvering, and shutdown. The fully integrated simulator includes an Instructor Console, and operator Stations. The Operator display software can be selected from a list of DCS emulations. The description of the power plant and the training features are summarized below.

CAPACITY
- 210 MW

FUELS
- Coal
- Heavy Oil (warm-up)
- Light Oil (ignition)

STEAM GENERATOR
- Drum type
- Natural Circulation

FURNACE AIR AND GAS SYSTEMS
- 2 Forced Draft Fans
- 2 Induced Draft Fans
- 4 Primary Air fans (1 for each Pulverizer)
- 1 Igniter Fan & 1 Scanner Fan
- Windbox
- 1 Regenerative Air Heater
- Soot blowers
- Electro-static precipitator

FUEL AND BURNER SYSTEMS
- 4 Coal Feeders
- 4 Pulverizers
- 2 Ignition Oil pumps
- 2 Fuel Oil Pumps
- Coal and Oil Burners at 4 Levels (1 at each level = 4)

BOILER WATER AND STEAM SYSTEMS
- Economizer
- Steam Drum
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- Downcomer
- Waterwalls
- Primary Superheater
- Secondary Superheater
- Reheater
- Attemperators for Superheater
- Auxiliary Steam Header

TURBINE AND GENERATOR SYSTEMS
- HP/IP/LP Turbines
- Main Stop Valve with Bypass
- 4 Turbine Control Valves
- Turbine Turning Gear
- 2 Turbine Lube Oil Pumps
- Turbine Lube Oil Cooler
- Turbine Lube Oil Cooling Water Pump
- Turbine Lube Oil Filters
- Bearing vibration monitors
- Rotor eccentricity monitor
- Diff exp monitor
- Generator with Exciter and Automatic Voltage Regulator
- Synchronoscope
- Hydrogen Cooler
- Hydrogen Seal Oil Pump
- Stator Cooling water Pump

CONDENSATE AND FEEDWATER SYSTEM EQUIPMENT
- Condenser
- 2 Air Ejectors
- 2 Circulating Water Pumps
- 2 Condensate Extraction Pumps
- Condensate Storage Tank
- 1 Makeup Pump
- Air Ejector Steam Condenser
- Gland Seal Steam Condenser with Exhaust Fan
- Condensate Polisher
- 3 Low Pressure Heaters
- Deaerator with Storage Tank
- 2 High Pressure Heaters
- 3 Boiler Feed Pumps (motor driven)
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MAJOR CONTROLS
- Main Steam Temperature
- Condenser Hotwell Level
- Deaerator Level
- Feedwater Flow
- BFW Pump Speed
- Pulverizer Exit Temperature
- Fuel Master
- Air Master
- Boiler Master (Main Steam Pressure)
- Drum Level (three element control)
- Furnace Pressure
- Induced Draft Fan Speed

INSTRUMENTATION
- 43 Controllers
- 17 Auto-Manual Control Stations
- 17 Manual Stations
- 127 Indicators
- 131 Switches
- 80 Explicit Alarms
- Trips and Alarm Logic / Interlocks.

INSTRUCTOR FUNCTIONS
- Pump trips
- Fan trips
- Turbine trip
- Generator trip
- Fuel trip
- Tube Leaks
- Valve malfunctions
- Instrument malfunctions
- Soot accumulation
- False alarms
- Air temperature
- Air humidity
- Cooling water temperature
- Low grade fuel
- External load demand