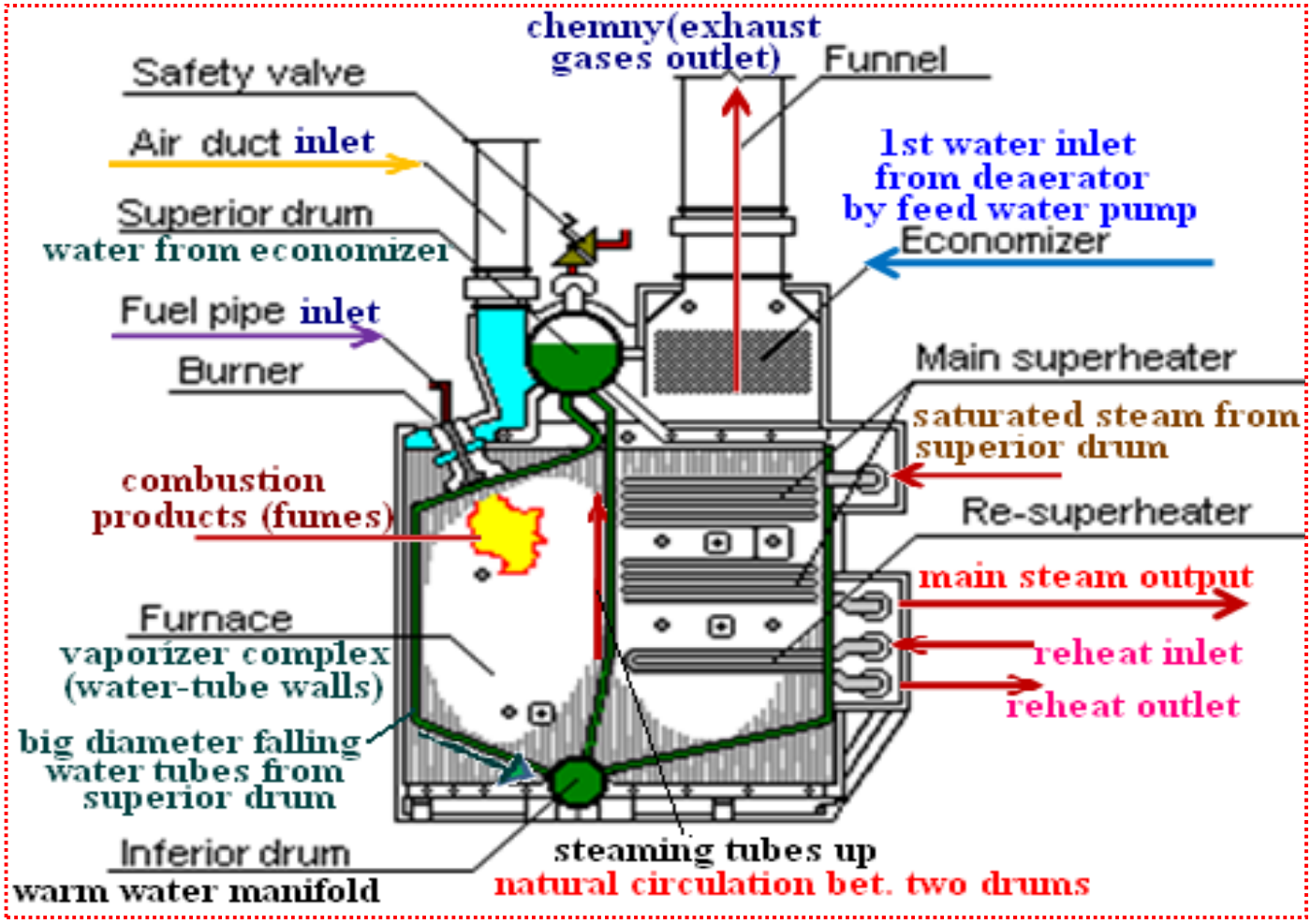
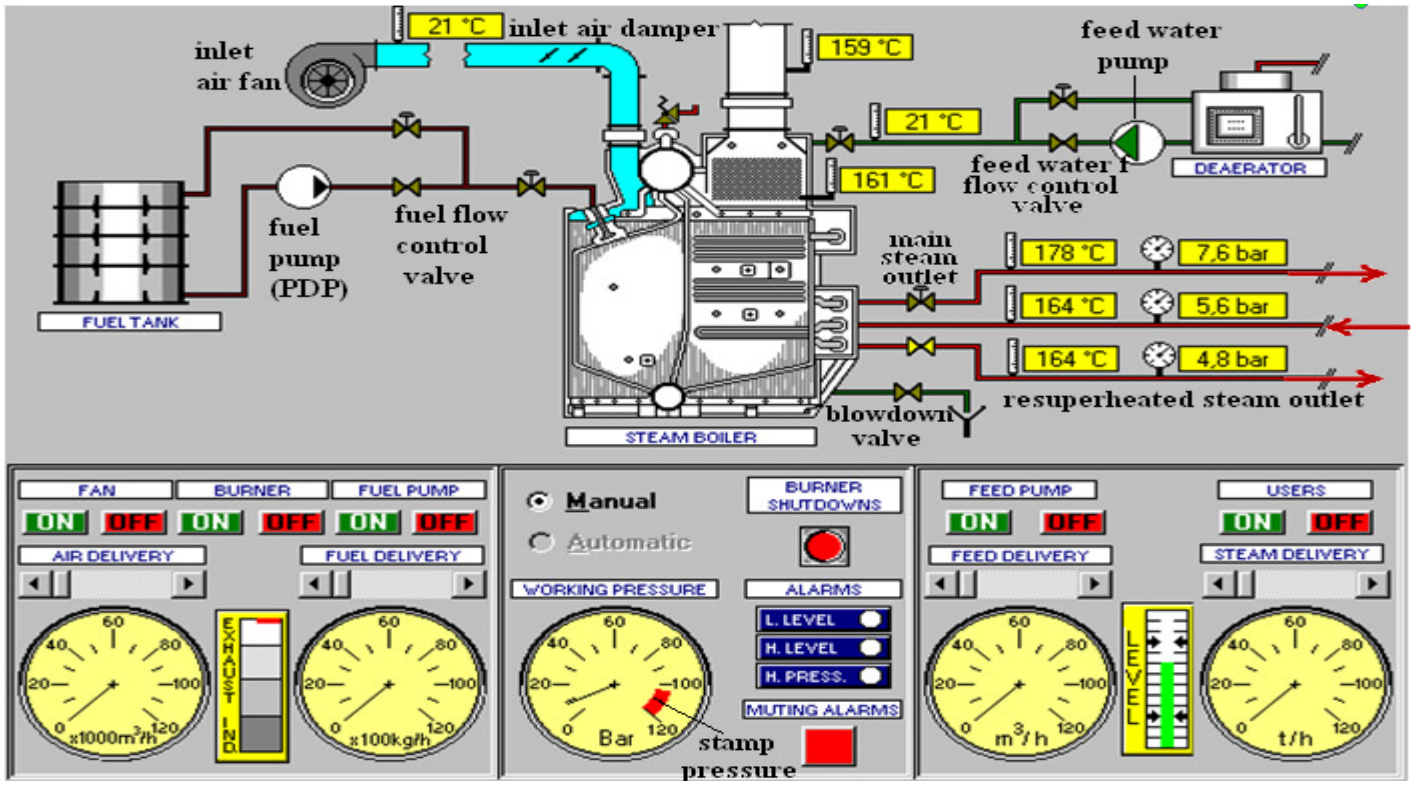
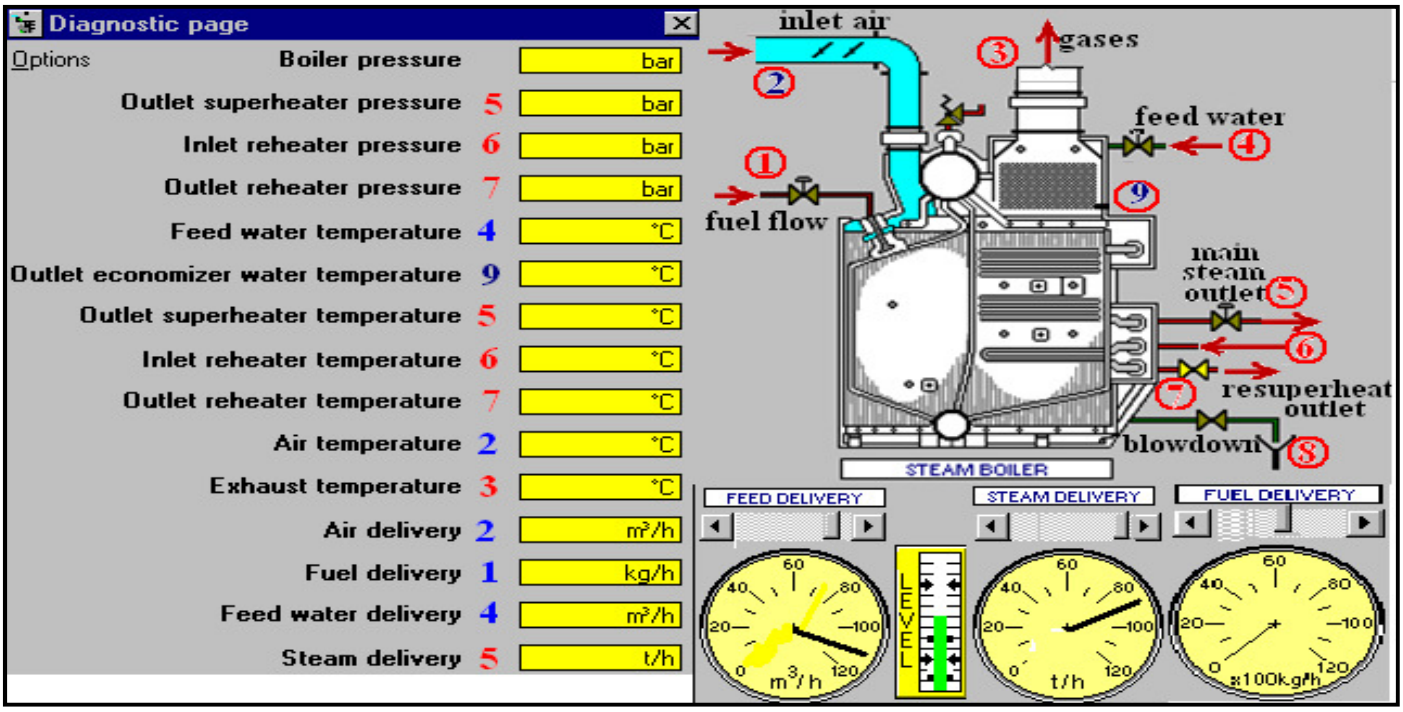
Design Projects in 2010/2011:
1) Automatic Control Virtual Lab of Water-Tube Boiler

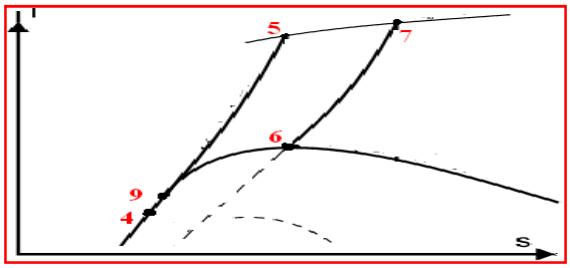


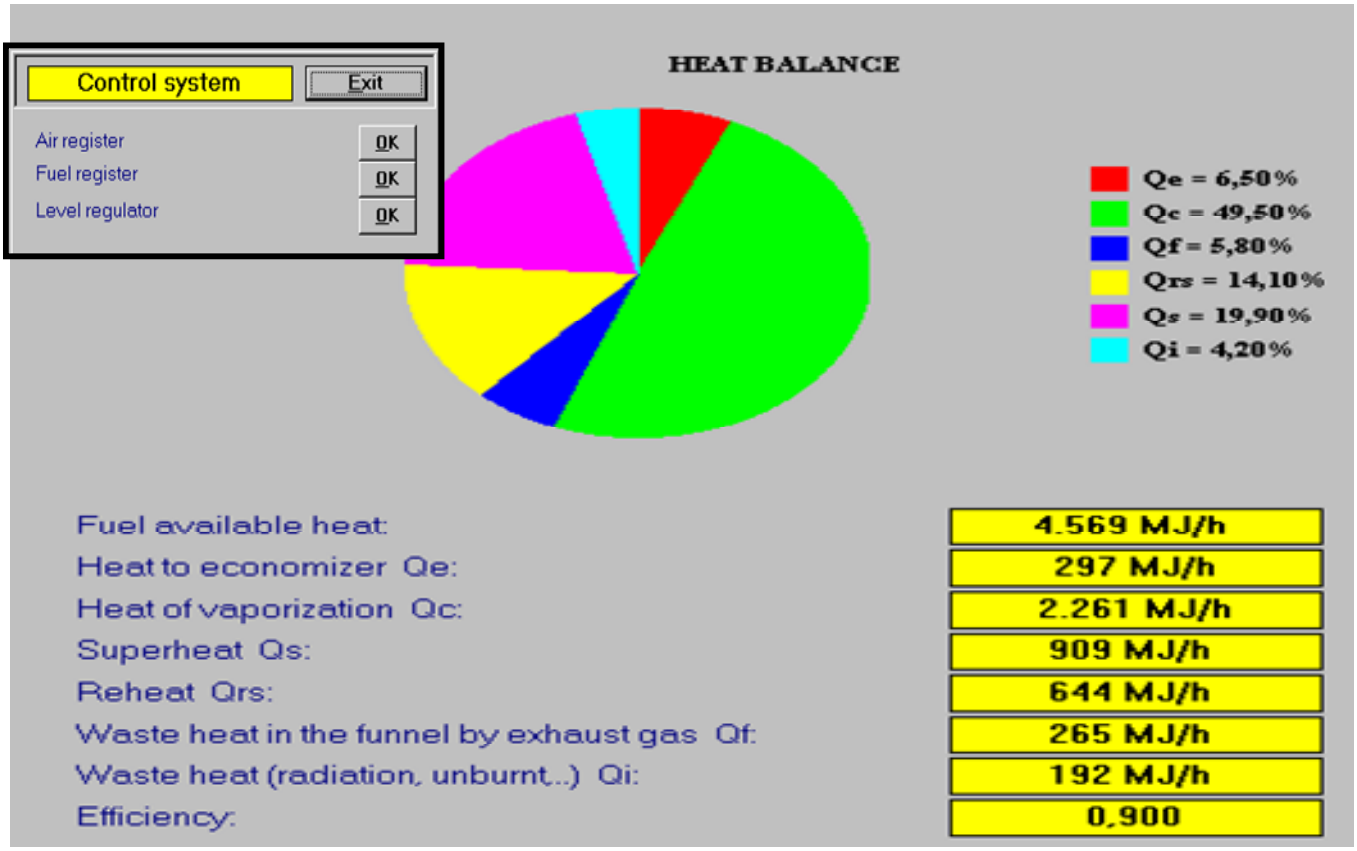




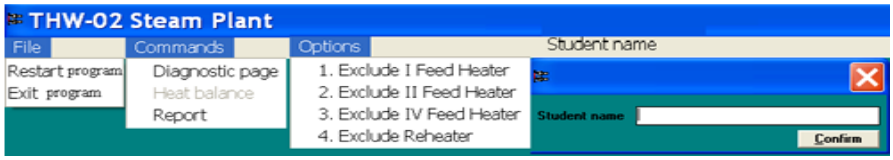
Boiler Thermal and Heat balance:

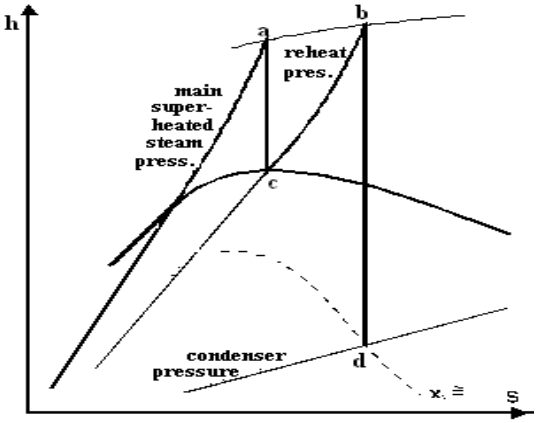
- Quantity of available heat in the fuel Qd;
- Quantity of heat used in the economizer Qe;
- Quantity of heat used in the generator tubes Qg;
- Quantity of heat used in the superheater Qs;
- Quantity of heat used in the re-superheater Qrs;
- Quantity of heat lost in the funnel for fumes Qf;
- Quantity of heat lost for radiation and unburned Qi.





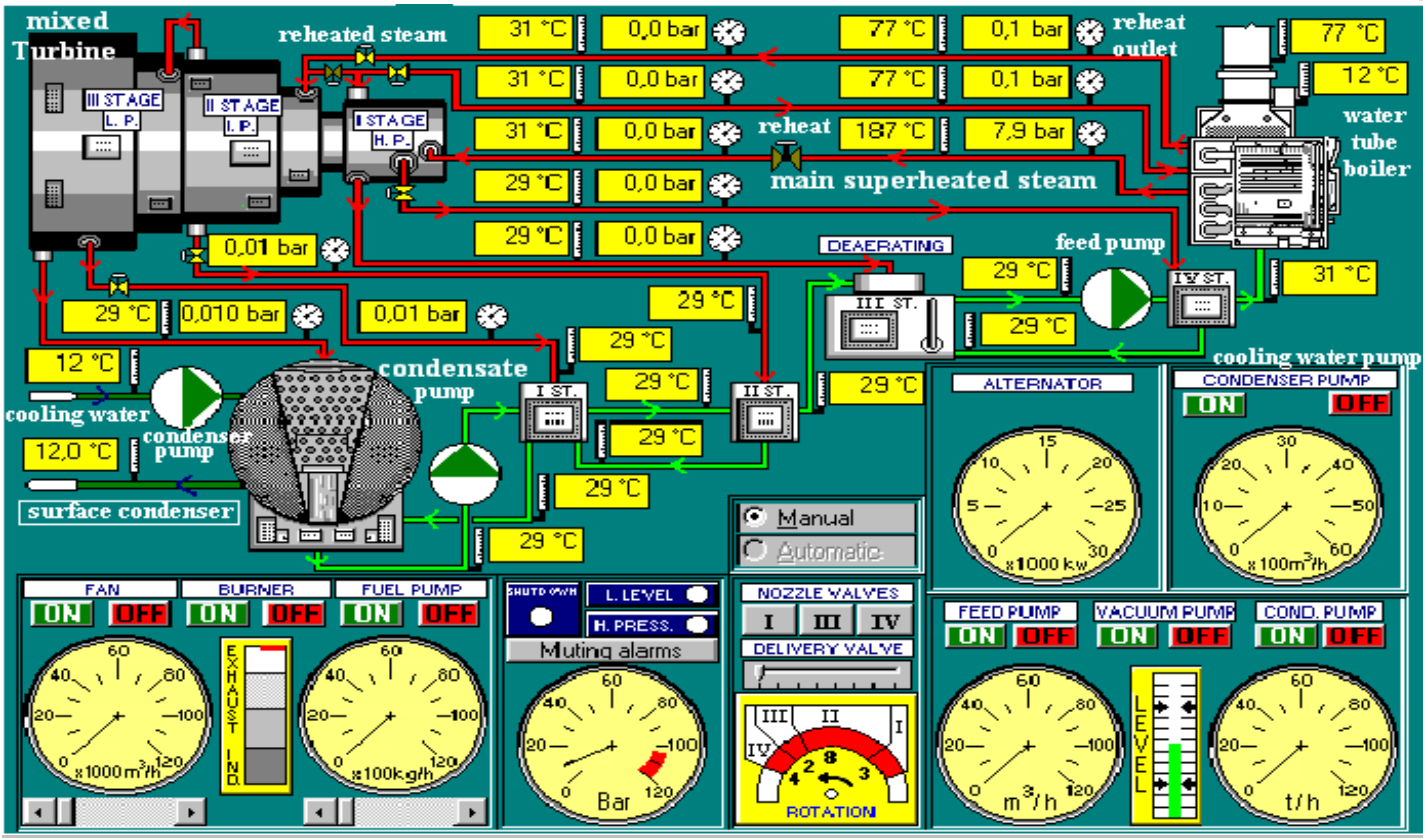
2) Automatic Control Virtual Lab design of Steam Power Plant





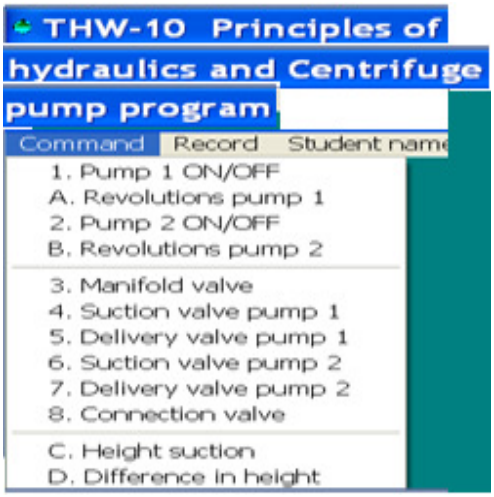
Plant different Design Parameters:

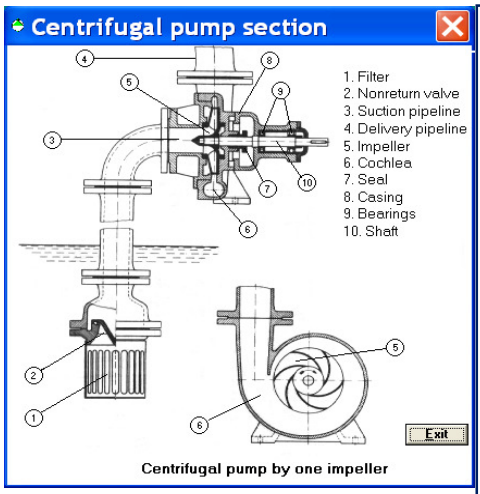
Include Reheater + deaerator # III	Exclude Reheater + deaerator # III
Include only feed water heater # I (same as exclude II + IV)	Include only feed water heater # I (same as exclude II + IV)
Include only feed water heater # II (same as exclude I + IV)	Include only feed water heater # II (same as exclude I + IV)
Include only feed water heater # IV (same as exclude I + II)	Include only feed water heater # IV (same as exclude I + II)
Include only feed water heater # I + II (same as exclude IV)	Include only feed water heater # I + II (same as exclude IV)
Include only feed water heater # I + IV (same as exclude II)	Include only feed water heater # I + IV (same as exclude II)
Include only feed water heater # II + IV (same as exclude I)	Include only feed water heater # II + IV (same as exclude I)
Include all feed water heaters # I+II + IV	Include all feed water heaters # I+II + IV
Include no feed water heater (same as exclude all # I+II+IV)	Include no feed water heater (same as exclude all # I+II+IV)

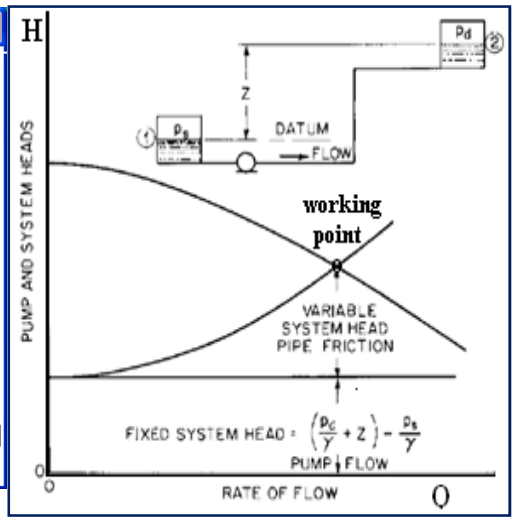


Boiler pressure	43.8 bar	Electric power	0 kW
Outlet Superheater pressure	43.0 bar	Outlet Superheater temperature	430 °C
Inlet Hight Pressure Turbine pressure	0.0 bar	Inlet Hight Pressure Turbine temperature	29 °C
Outlet Hight Pressure Turbine pressure	0.0 bar	Outlet Hight Pressure Turbine temperature	29 °C
Inlet Reheater pressure	0.1 bar	Inlet Reheater temperature	73 °C
Outlet Reheater pressure	0.1 bar	Outlet Reheater temperature	73 °C
Inlet Intermediate Pressure Turbine pressure	0.0 bar	Inlet Intermediate Pressure Turbine temperature	29 °C
Inlet Condenser pressure	-0.19 bar	Inlet Condenser temperature	27 °C
Inlet I Stage steam pressure	0.01 bar	Inlet I Stage steam temperature	27 °C
Inlet II Stage steam pressure	0.0 bar	Inlet II Stage steam temperature	27 °C
Inlet III Stage steam pressure	0.0 bar	Inlet III Stage steam temperature	27 °C
Inlet IV Stage steam pressure	0.0 bar	Inlet IV Stage steam temperature	27 °C
Steam delivery	0.00 t/h	Water vapor ratio	0.000
I Bleeding delivery	0.00 t/h	II Bleeding delivery	0.00 t/h
III Bleeding delivery	0.00 t/h	IV Bleeding delivery	0.00 t/h
Air temperature	10 °C	Exhaust temperature	151 °C
Air delivery	18,200 m³/h	Fuel delivery	1,454 Kg/h
Feed water delivery	0.00 m³/h	Condenser cooling water delivery	5149.4 m³/h
Inlet Condenser cooling water temperature	4 °C	Outlet Condenser cooling water temperature	4.0 °C
Inlet I Stage feed water temperature	27 °C	Inlet Condenser condensate temperature	27 °C
Inlet II Stage feed water temperature	27 °C	Inlet I Stage condensate temperature	27 °C
Inlet III Stage feed water temperature	27 °C	Inlet III Stage condensate temperature	27 °C
Inlet IV Stage feed water temperature	27 °C	Feed water temperature	29 °C

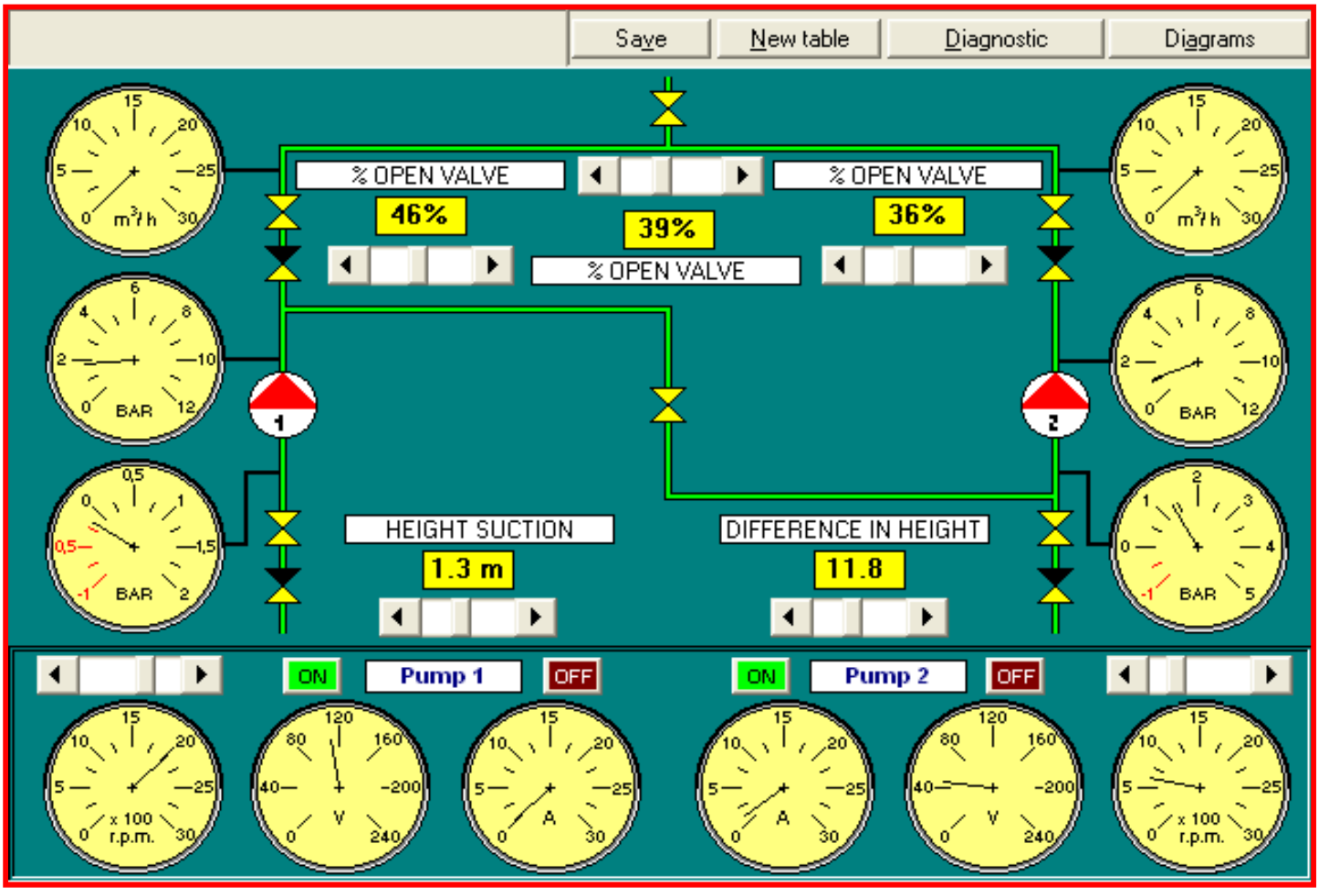
3) Automatic Control Virtual Lab design of Centrifugal pumps station







The station includes two centrifugal pumps which may work separately or work as pairs in parallel or in series. The pumps are provided with separated controls and instrumentation. Each of the two pumps can be operated independently from the other pump. The simulation allows changing all the operation conditions of each pump including the rpm, the inlet suction head, and the output discharge. This allows investigation of the H-Q curves of the plant for all possible different flow conditions. Also the characteristic H-Q curve of each pump can be obtained at full load conditions. The simulation includes many critical control alarms, input/output signals, operation and instrumentation parameter-boards, diagnostic page tools, error-report filling, help/trouble-shooting menus and Thermal Balance Calculations and Plotting tools.



4) Automatic Control Virtual Lab design for filling different vertical tanks with liquids:

This is a practical automatic control and real fluid processes existing in filling different vertical tanks with liquids. The plant includes a venture-meter at output and flow control valve at inlet. The simulation allows adjusting flow/speed values, working data, and venture meter values. The tank filling time is calculated and the diagram of head-pressure is plotted, presented and updated instantaneously. The simulation includes many critical control alarms, input/output signals, operation and instrumentation parameter-boards, diagnostic page tools, error-report filling, help/trouble-shooting menus and Thermal Balance Calculations and Plotting tools.