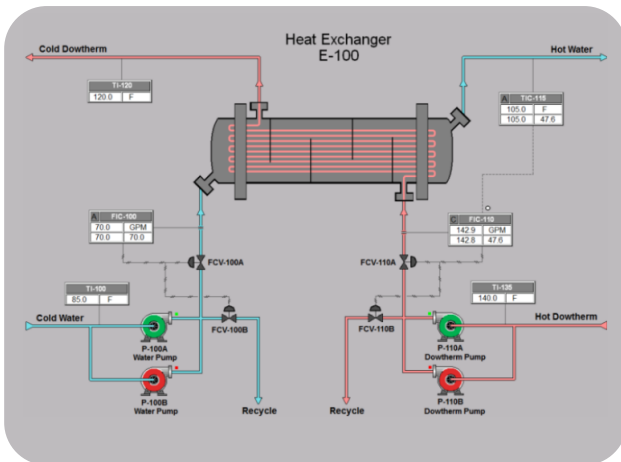


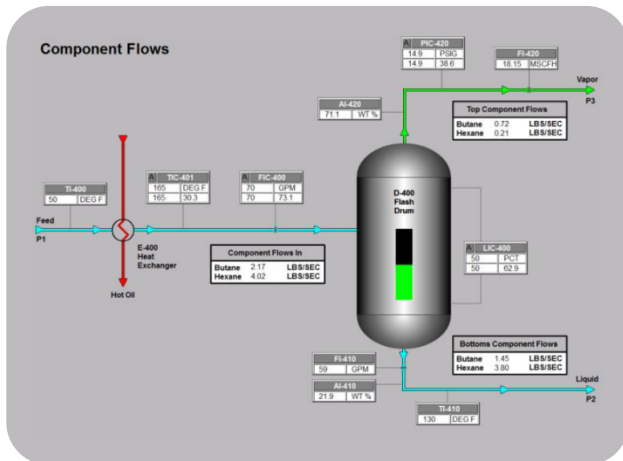
SEPARATIONS COURSE PROGRAMS AND HIGHLIGHTED SCENARIOS

HEAT EXCHANGER W/ VR OUTSIDE OPERATOR



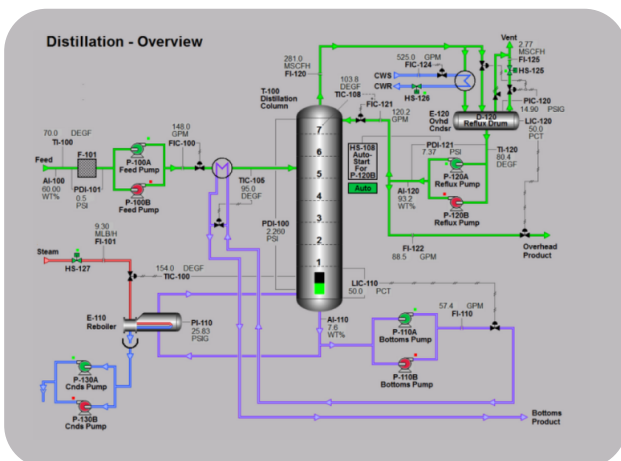
- Fundamentals of a Heat Exchanger
- Cascade Loop Explanation
- Safe Operations of a Startup Up an Exchanger
- Swinging Pumps
- Recognizing Exchanger Fouling
- Effect of Ambient Temp on Heat Exchangers

FLASH DRUM W/ VR OUTSIDE OPERATOR



- Fundamentals of Separation as a precursor to Distillation
- Effect of Temperature and Pressure on Product Flow Rates
- Effect of Temperature and Pressure on Product Purities
- Effect of Pressure on Vapor Pressure

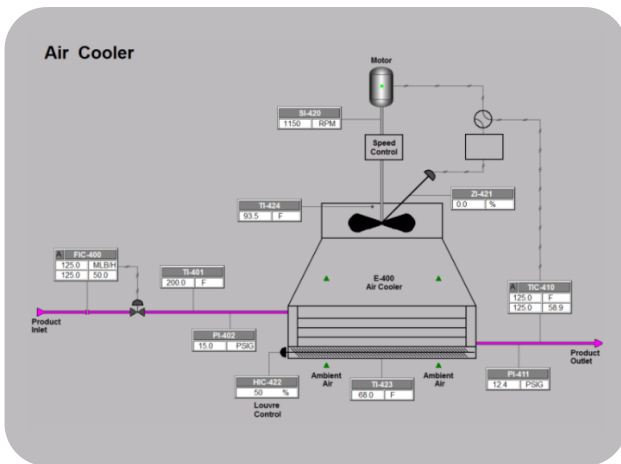
DISTILLATION W/ VR OUTSIDE OPERATOR



- Binary Tower separating C5 and C6
- Effects of changing Bottoms Temperature, Overhead Pressure, and Reflux Flow Rate on Production
- Energy Recovery with a Pre-Heat Exchanger
- Level Management during Startup Procedure
- Dealing with a change in Feed Flow Density
- Loss of Cooling, Loss of Preheat, Tower Flooding, Steam Leak, etc.
- Optimizing Tower and staying within Spec

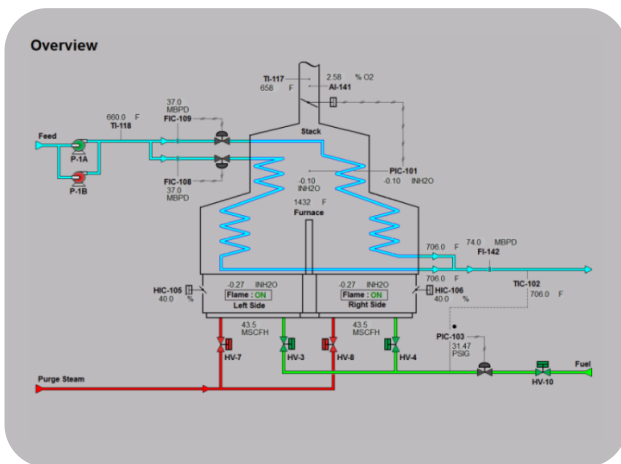
HEATER COURSE PROGRAMS AND HIGHLIGHTED SCENARIOS

AIR COOLER W/ VR OUTSIDE OPERATOR



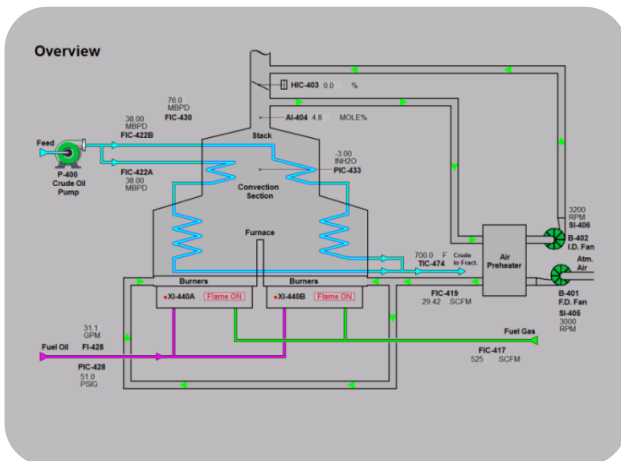
- Speed vs Pitch Control
- Effect of Weather on Air Cooler Operation
- Safety Regarding Motor Overspeed
- Manual Louver Control

NATURAL DRAFT FIRED HEATER



- Heater Outlet Temp Resets Fuel Pressure
- Manual Air Registers and Managing %O2
- Controlling Fuel/Air Ratio and Recognizing Flame Out
- Recognizing Change in Fuel BTU
- Recognizing a Fuel Rich Heater and How to Respond
- Heater "Bogging" and "Huffing"
- Tube Leaks, Uneven Heating, Air Leaks and other common heater troubleshooting scenarios

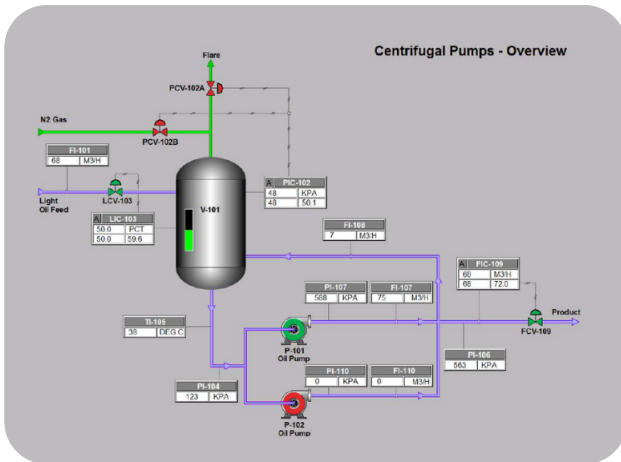
BALANCED DRAFT FIRED HEATER



- Outlet Temp Resets Fuel Pressure and Air Flow
- FD / ID Fan System including Air Preheater
- Swinging Fuels between Fuel Gas and Fuel Oil
- Uneven Heating, Coking, Fouling, Loss of Burner
- Shutdown Logic to Run Heater as Natural Draft (ie. Loss of ID or FD Fan)
- Lead/Lag Control Scheme (Air Leads Fuel)
- Dynamic Profitability Analysis to Assess Heater Efficiency

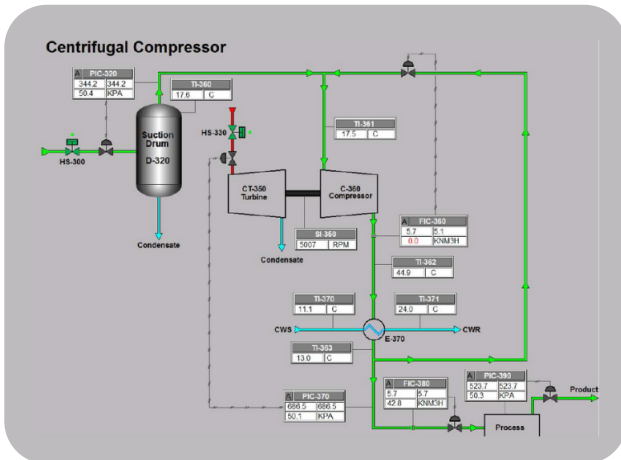
PUMPS & COMPRESSORS COURSE PROGRAMS AND HIGHLIGHTED SCENARIOS

CENTRIFUGAL PUMPS W/ VR OUTSIDE OPERATOR



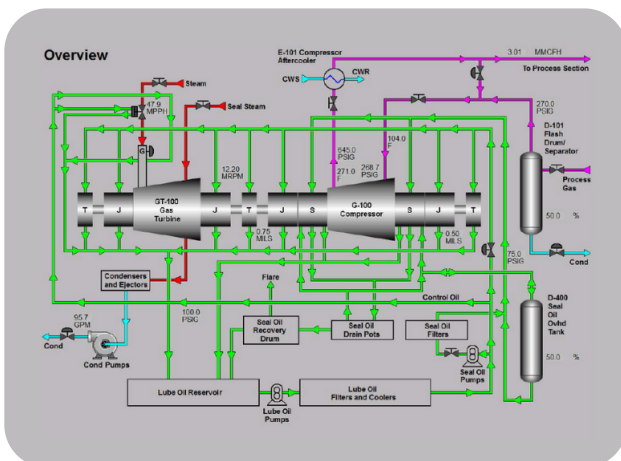
- Impact of variable flow rate on head & pump performance
- Managing field equipment when commissioning a pump
- Safely switching between pumps under normal conditions
- Factors that cause pump cavitation
- Troubleshooting scenarios of low suction pressure, changing flow density and temperature, as well as equipment and instrumentation failures

CENTRIFUGAL COMPRESSOR W/ VR OUTSIDE OPERATOR



- Impact of process flow on discharge pressure and temperature
- Impact of downstream pressure or flow demands
- Starting up and shutting down compressors
- Scenarios involving compressor recycle valve failures
- Scenarios involving high vibration as well as variable power to equipment
- Troubleshooting scenarios regarding upstream disturbances that affect compressor operations
- Optimization of compressor performance

CENTRIFUGAL COMPRESSOR WITH UTILITIES



- Exploration of a discharge pressure to speed control loop
- Complete startup of a system including seal oil, lube oil, steam turbine as well as compressor
- Scenarios regarding compressor logic including trips on vibration, surge tank levels, lube oil availability and temperatures
- Troubleshooting lube and seal oil high temperature or low level
- Varying process flow and temperature with an emphasis on expected results of equipment