# Canadian Boiler Society 2019 Education Days

# Re-Thinking Design of Steam Systems

Speaker:

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First for Steam Solutions

EXPERTISE | SOLUTIONS | SUSTAINABILITY

# Typical Selection Criteria

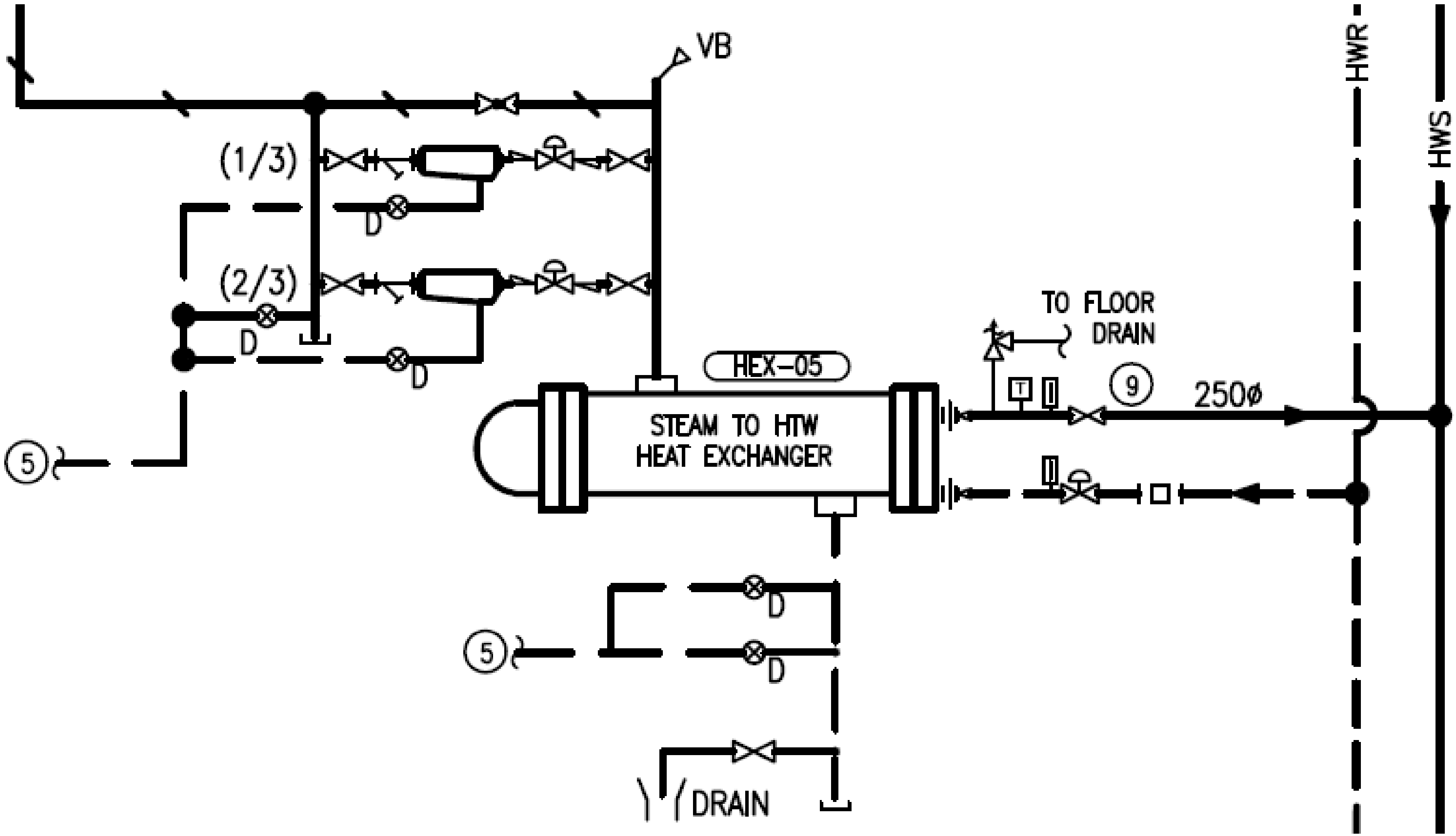
## Common Considerations:

- Budget
- Efficiency
- Safety

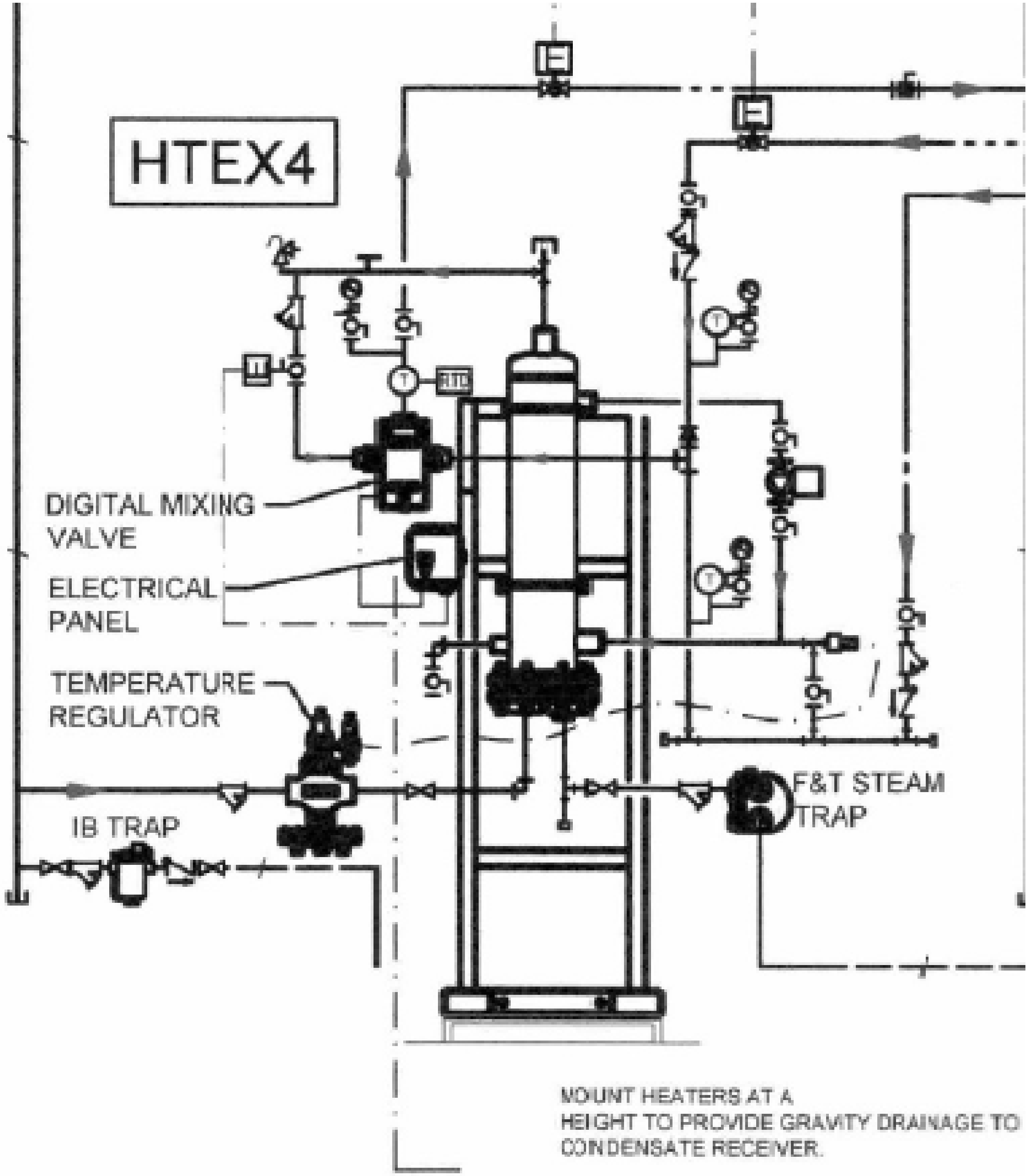
## Rarely Considered:

- Total Cost of Ownership
- Reliability/Maintainability

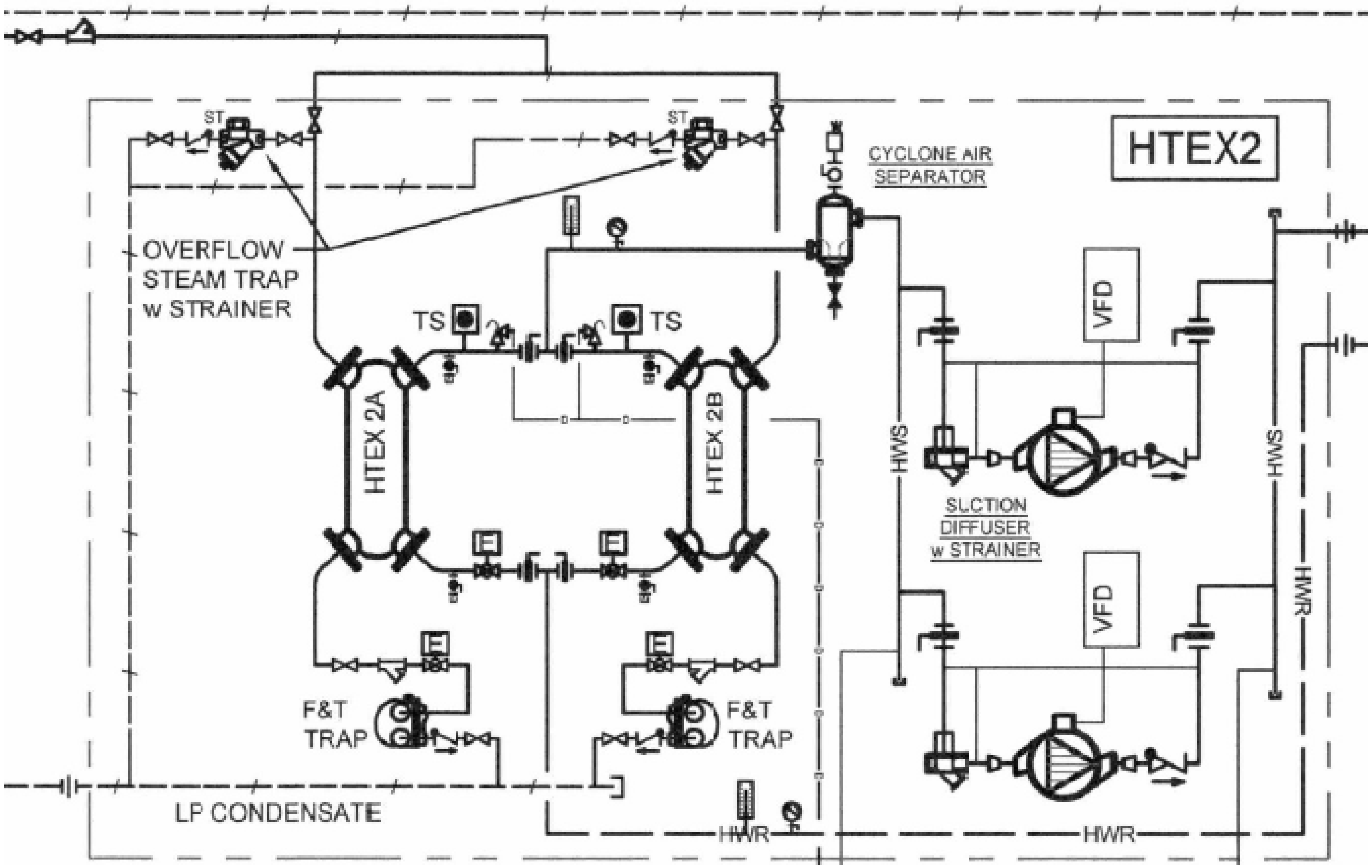
# Typical Heat Exchanger Design Example – 2018 Project



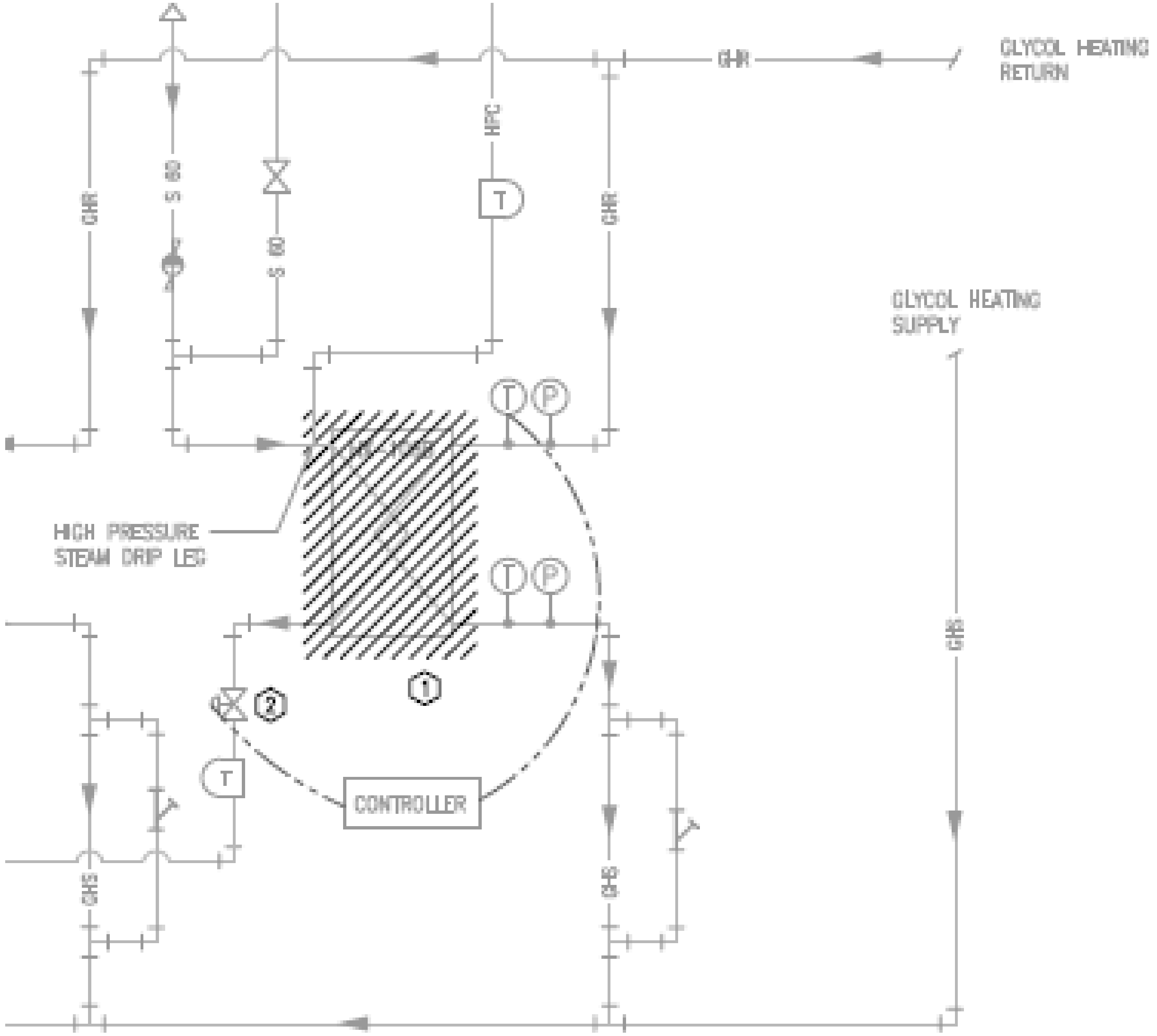
# 2018 Project Example

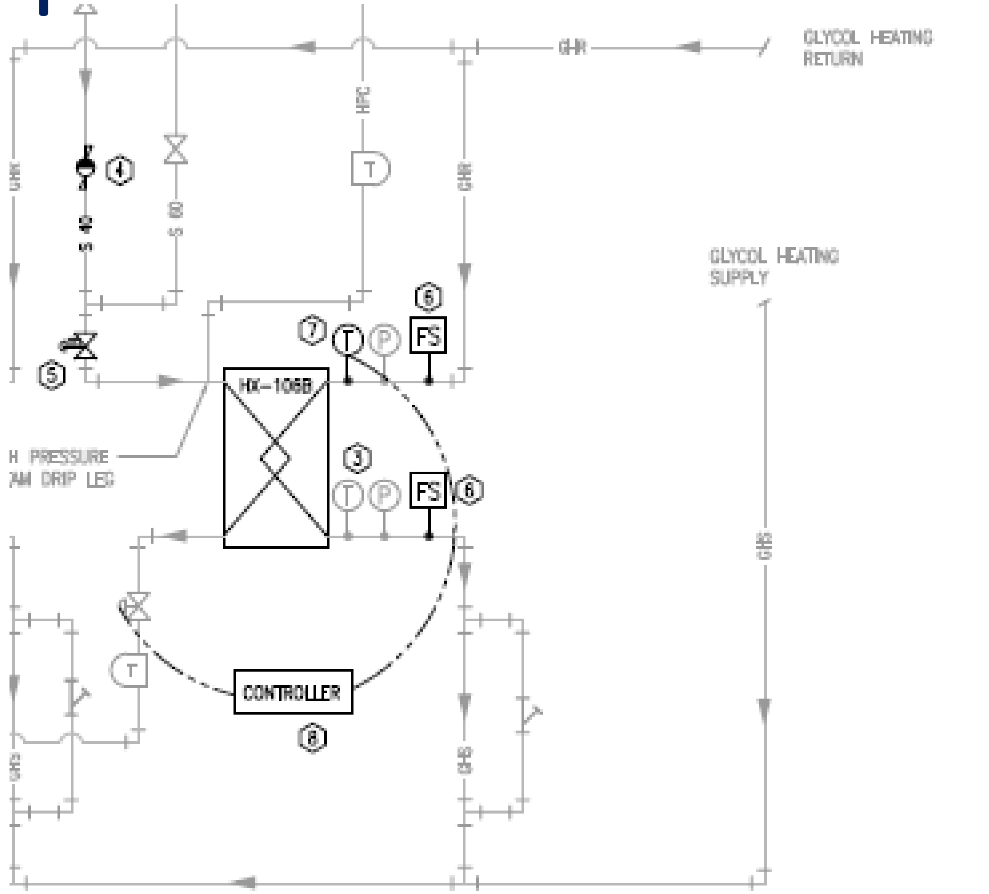


# 2018 Project Example



# 2019 Project Example



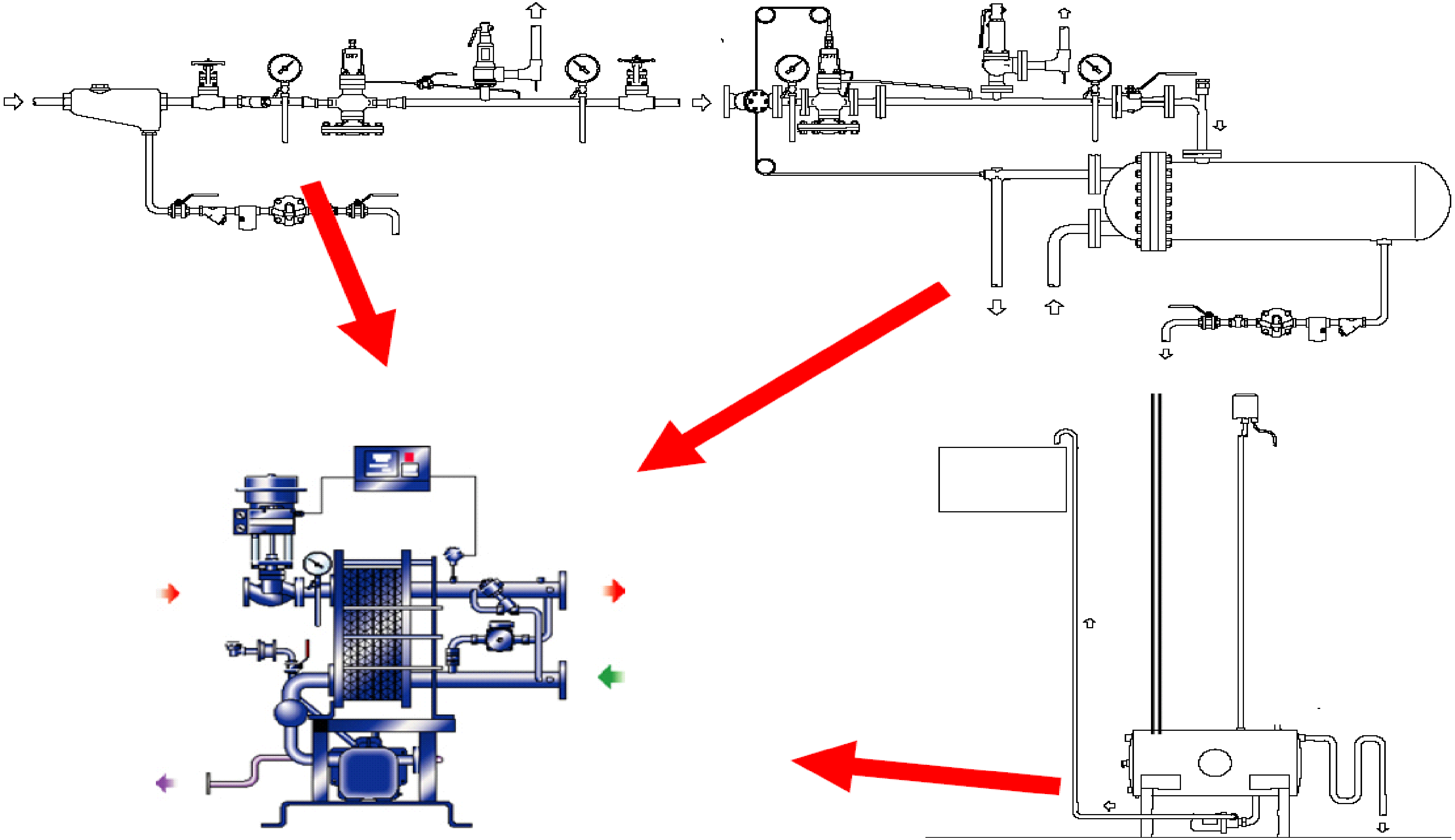




4. CALIBRATE EXISTING STEAM PRV TO PROVIDE 40PSIG STEAM INTO THE NEW HEAT EXCHANGER.

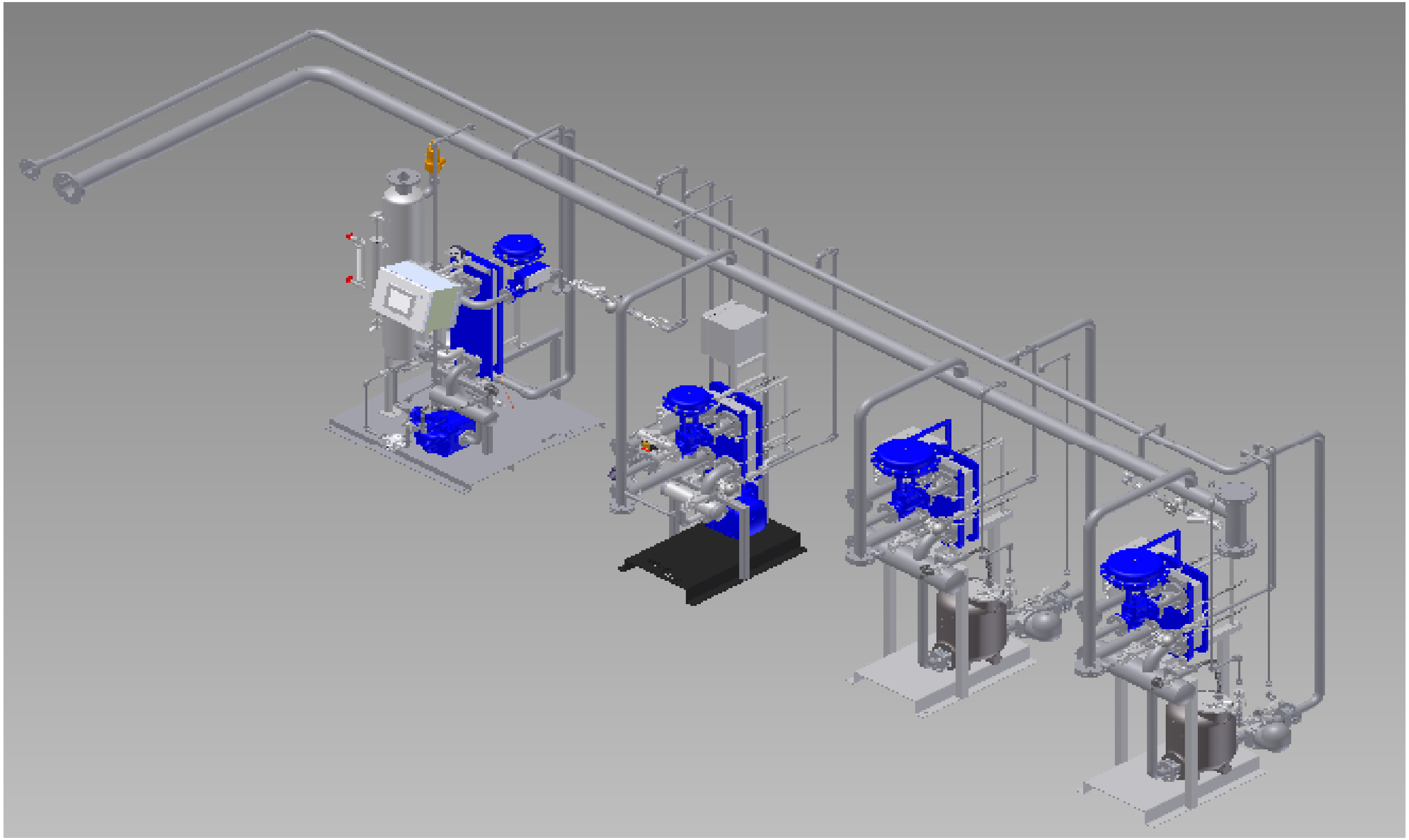
5. INSTALL NEW BRAY HIGH PERFORMANCE BUTTERFLY STEAM SAFETY SHUTOFF VALVE C/W ELECTRIC ACTUATOR ON THE STEAM INLET TO THE NEW HEAT EXCHANGER. STEAM SHUTOFF TO OPERATE UNDER LOW FLOW (GLYCOL)/HIGH TEMPERATURE CONDITIONS.

6. INSTALL NEW FLOW SWITCHES ON THE GLYCOL SUPPLY AND RETURN LINES AS SHOWN. THE FLOW SWITCHES WILL SERVE AS LOW FLOW INDICATORS FOR THE STEAM SAFETY SHUTOFF VALVE.

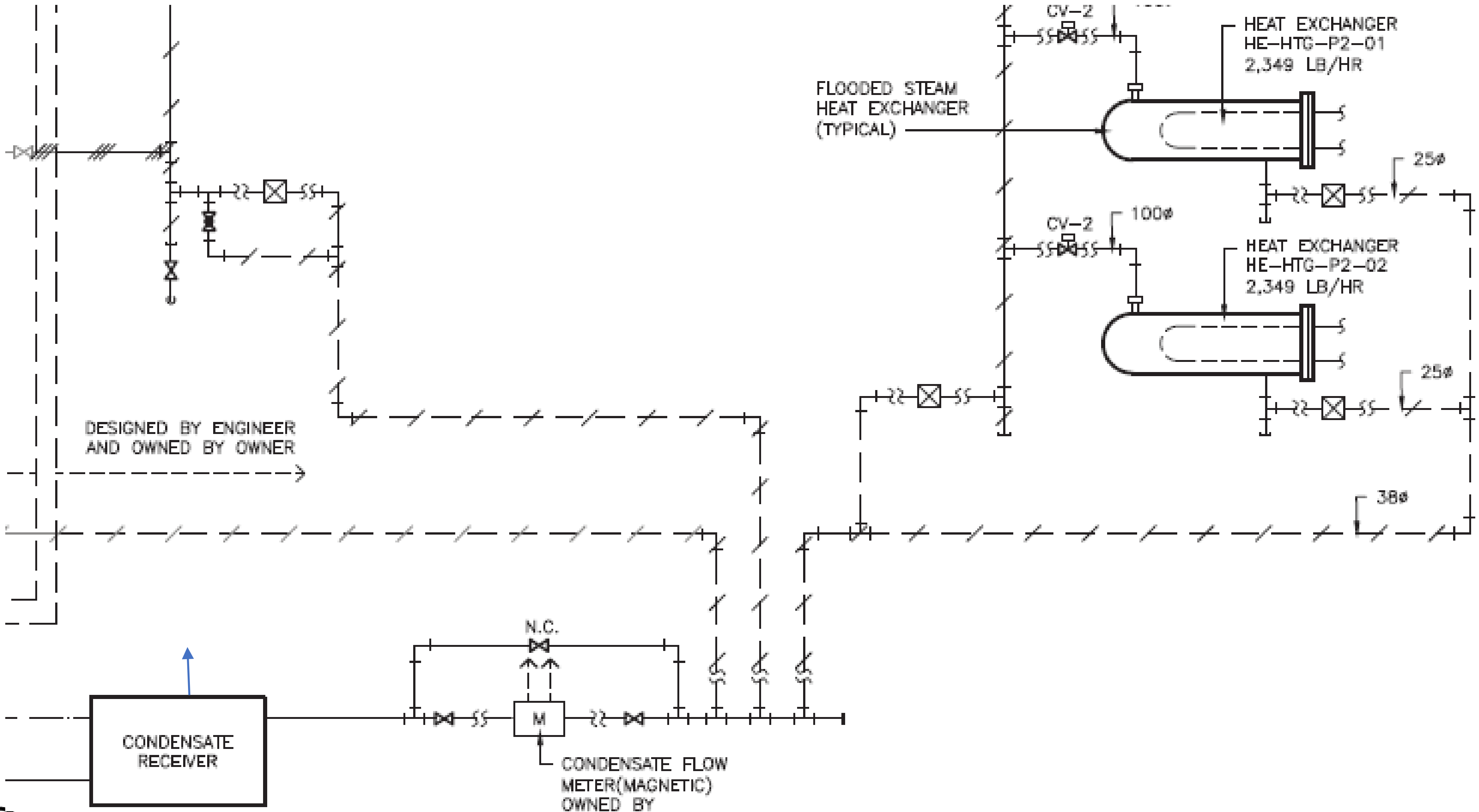
# Heat Exchanger Systems – Improved Design



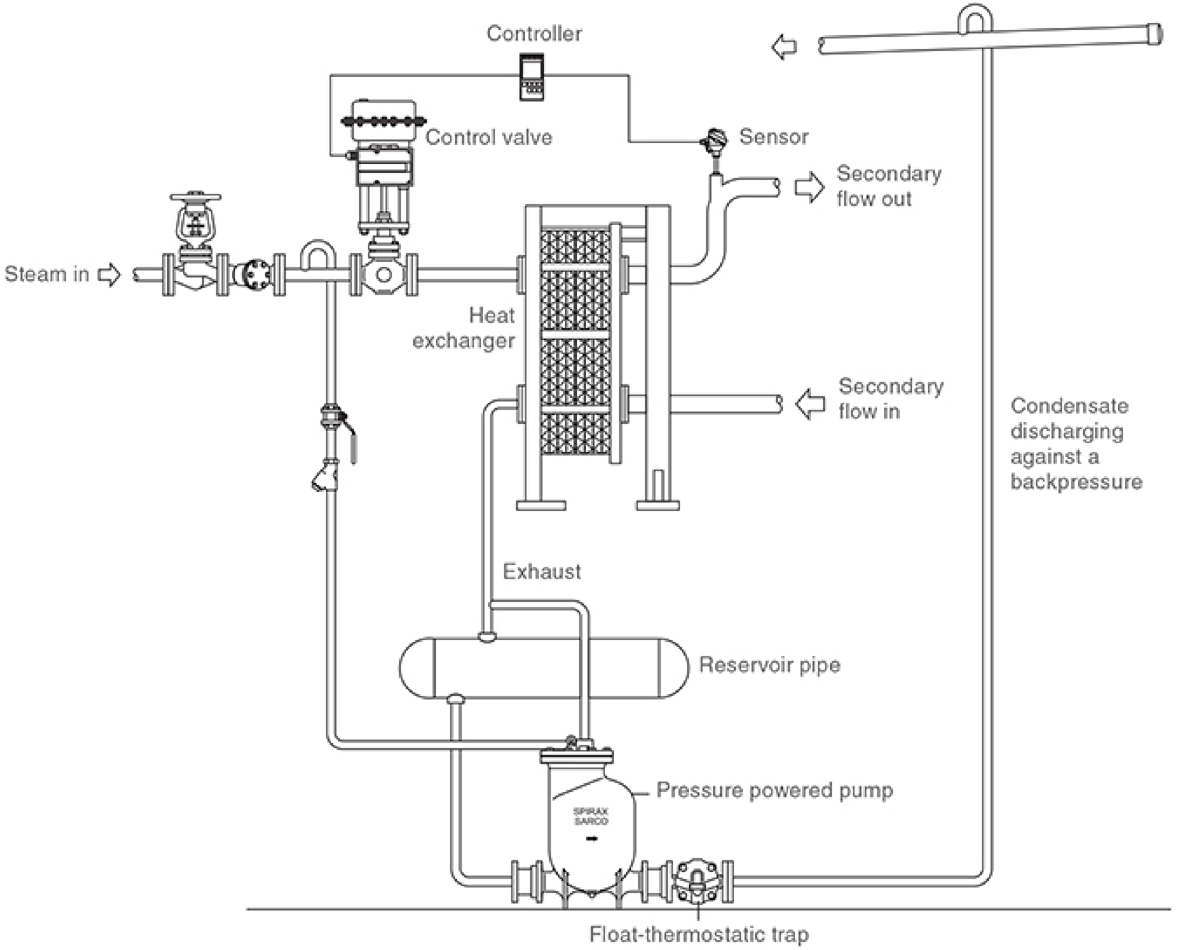
# Heat Exchanger Systems – Modern Mechanical Room



# Condensate Return Systems – Typical Design

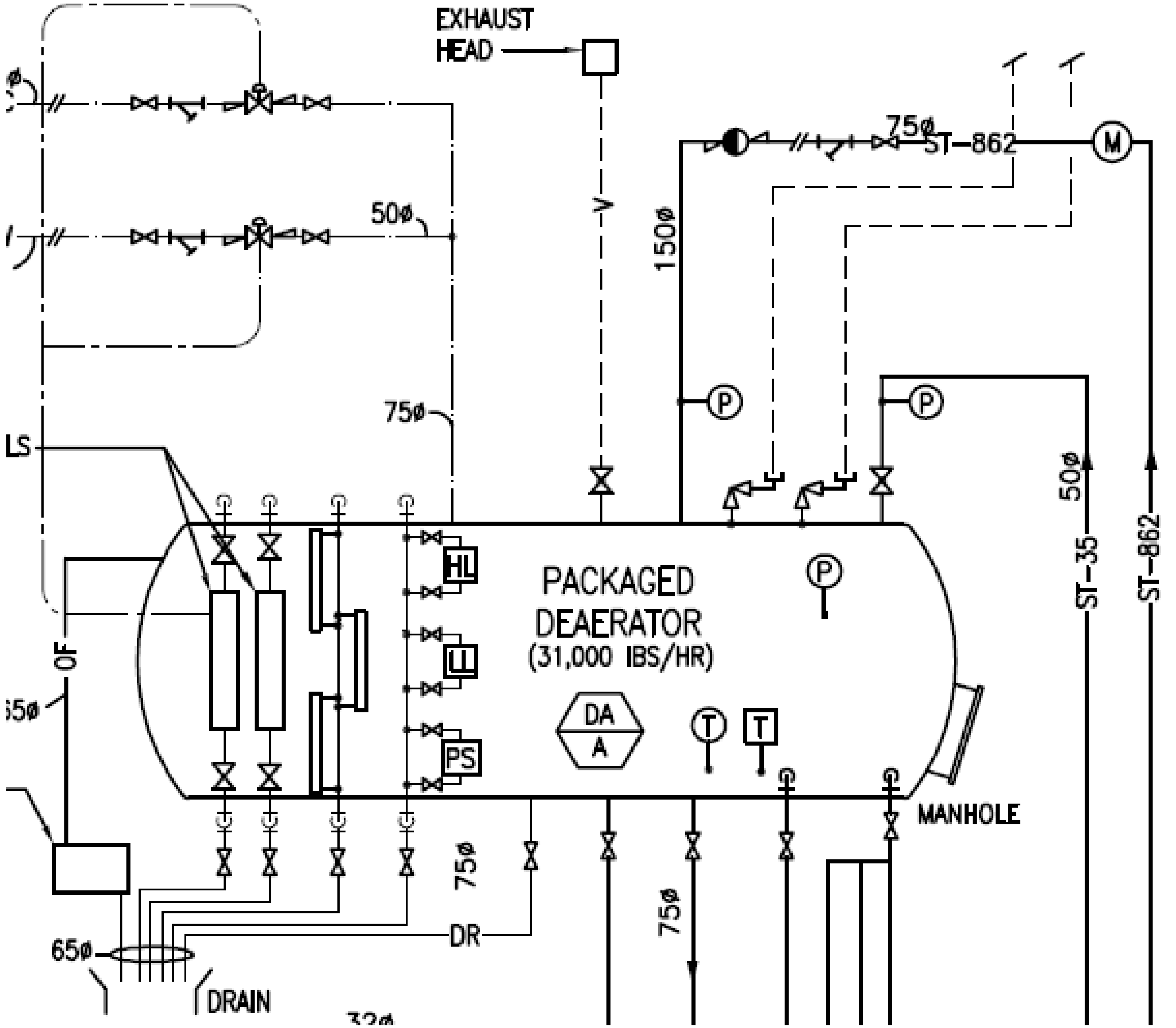


# Condensate Return Systems




- Electrical Condensate Pump issues
- Mechanical Displacement pumps – Steam or Compressed Air

# De-Aerator Systems Project 2018



# De-Aerator Systems

- Ineffective Air Removal
- Boiler Feed Pump issues
- Undersized - draws a vacuum
- Controlling both Pressure & Temperature

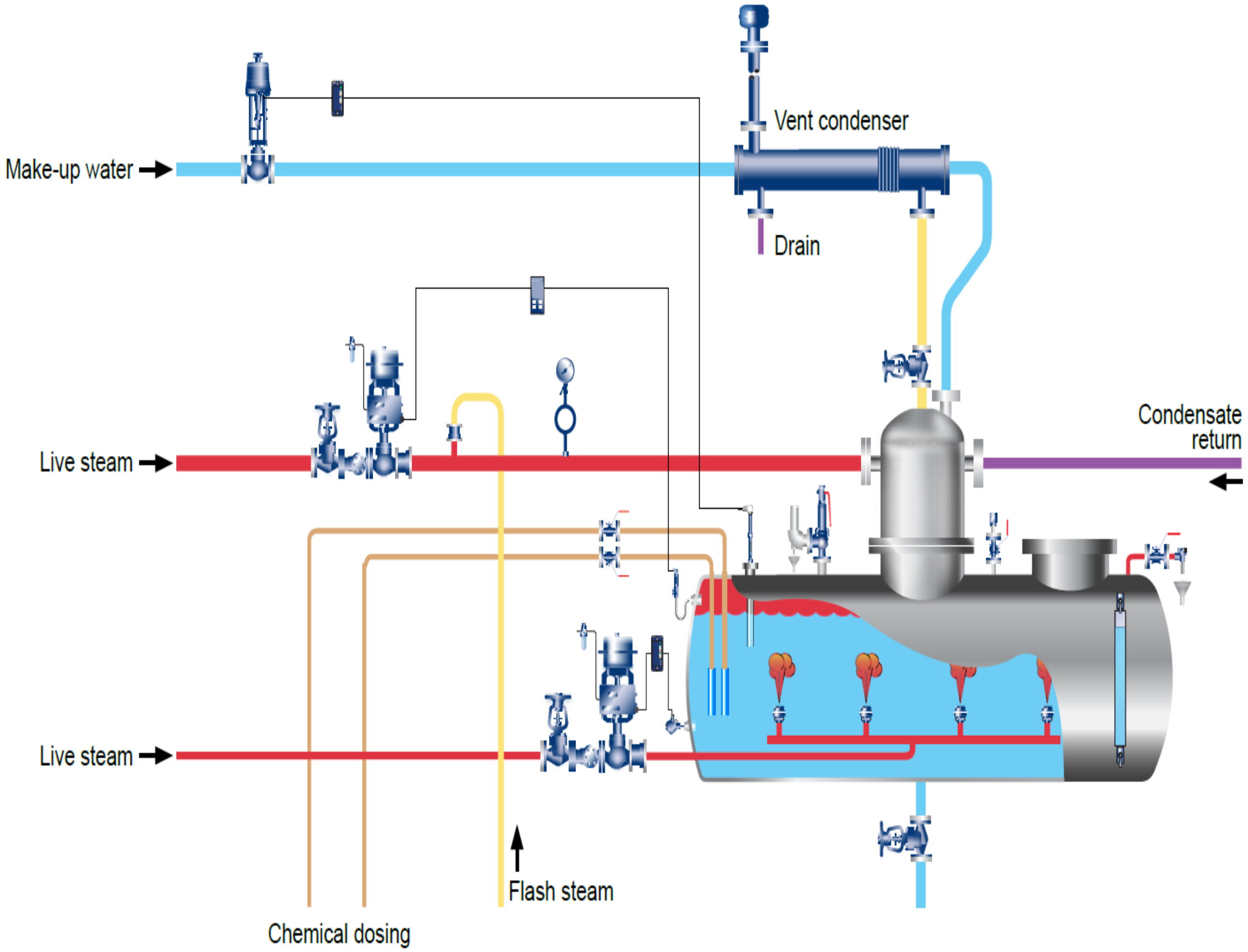
# De-Aerator Systems

- Total Cost of Ownership
- Efficiency
- Maintainability
- Diminished Life Cycle due to poor design selection
- Safety

Example – 700HP system with a DA providing 50ppb instead of the 7ppb required. Assuming a 5% blowdown.

**Chemical cost increase will be $3,680 per Year**

# DeAerator Systems




**PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT**

.1 Installed equipment whose performance is questioned by the Owner or his representative may be subject to performance verification.

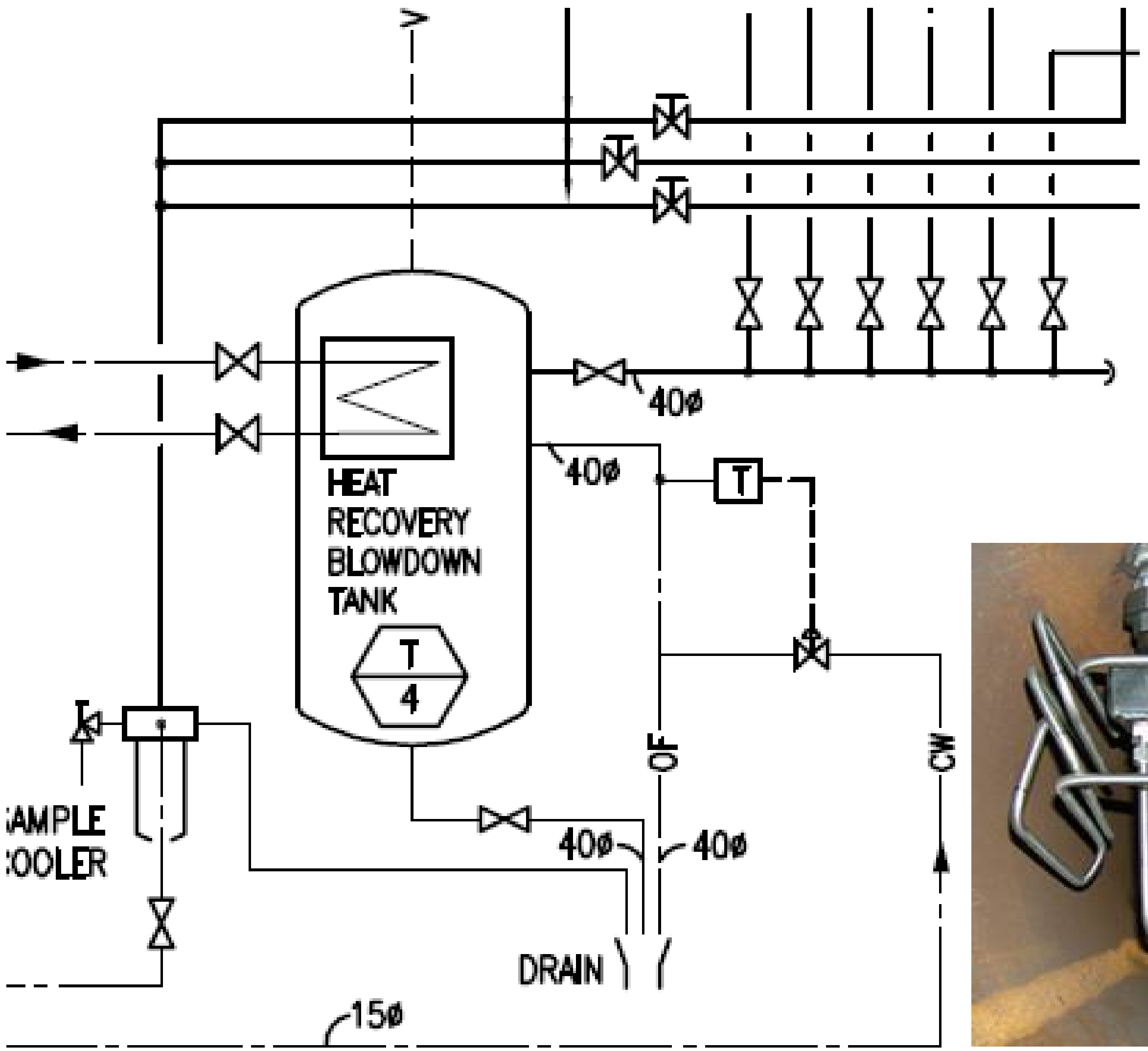
.2 When performance verification is requested, equipment shall be tested to determine compliance with specified performance requirements.

.3 The Owner will determine by whom testing shall be carried out. When requested, the Installing Contractor will be asked to arrange for services of an independent testing agency.

.4 Testing procedures shall be approved by the Engineer.

.5 Should test results reveal that originally installed equipment meets specified performance requirements, the Owner will pay all costs resulting from performance verification procedure.

# Blowdown Heat Recovery – Typical Design




# Blowdown Heat Recovery

# Thank you

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