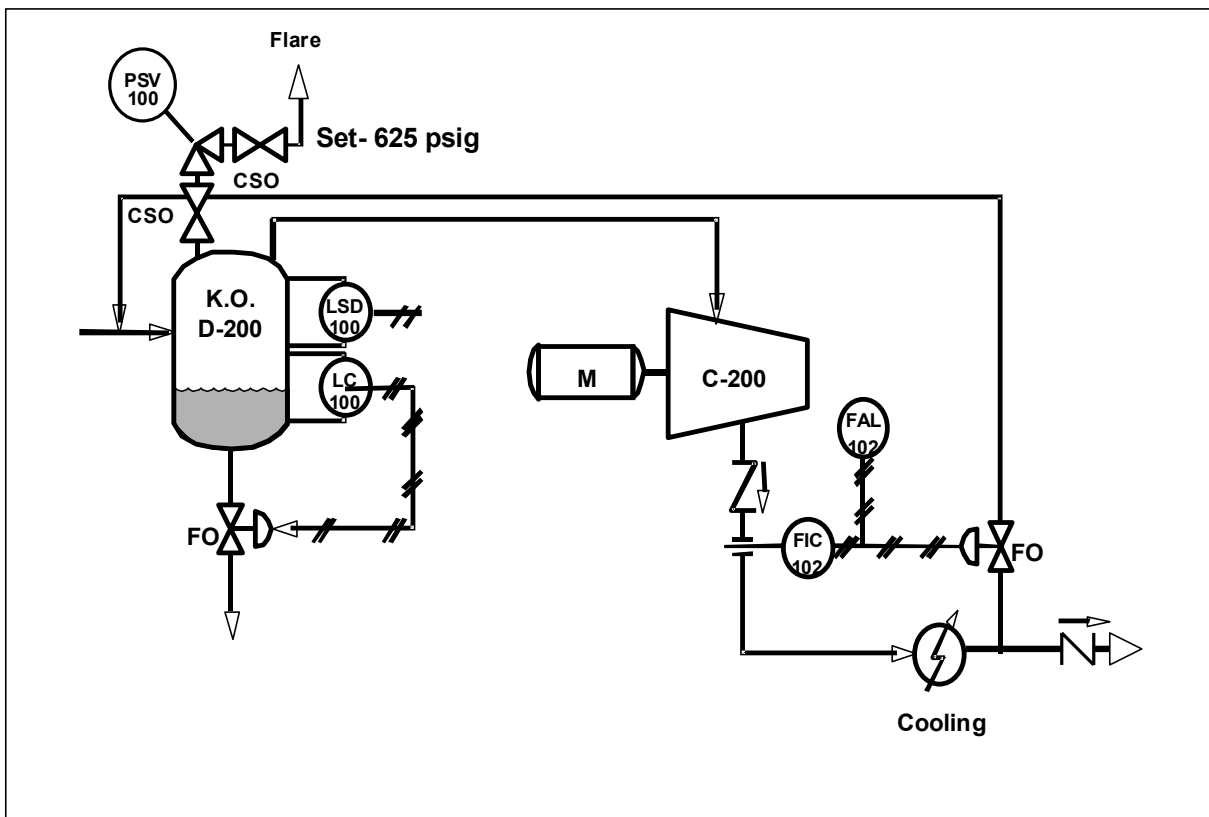


Pressure Relieving Devices Workshop Problem

Problem

- A Deethanizer overhead compressor knockout drum (clean service) has a Maximum Allowable Working Pressure (MAWP) of 602 psig.
- The process normally operates at 560 psig and 20 degrees F.
- The controlling safety relief contingency is fire, but there are others including a blocked compressor outlet.
- The vessel is currently protected by a single 6" X Q X 8" (Area 11.05 inches) conventional safety relief valve that relieves to a closed flare system.
- The valve is shopped (tested) annually and there is no history of mechanical damage that would indicate the valve has ever chattered.
- The recently updated Safety Relief Review (SRR) has verified the calculated accumulated vessel overpressure in the event of a safety valve relieving event is less than 10% for all contingencies except for fire. In the fire case, the overpressure can go as high as 120% of MAWP. At design flow conditions the calculated inlet line pressure drop is 5% and the total backpressure at design flow conditions is 9%.
- A Hazard and Operability (HAZOP) review team has identified a concern with the 625 psig safety valve set pressure.



Pressure Relieving Devices Workshop Problem

QUESTIONS:

- 1) Does the HAZOP Team have a valid concern? If not why not?
- 2) What is your recommended resolution to the identified HAZOP concern?
- 3) What other design solutions would you consider?
- 4) How would your response change if the vessel were in a fouling service?