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?