PSV relief load calculation in super critical condition

Mohammadreza Ebrahimi
Senior Process Eng. at Nargan Engineers & Constructors

Dears

Could somebody share his/her experience in calculation of PSV load in super critical condition?
As per API-521 for hydrocarbons near the critical point, latent heat will be considered 50 btu/lb. But what shall I do, if PSV set pressure is more than critical pressure (e.g. PSV set pressure=30 barg and critical pressure=20 barg).

Best Reagards

Mohammad reza

Comments

samane jamali likes this

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Hooman

Hooman Tabaraei
Specialist Process Engineer (MIChemE, CEng)

Hi Mohammadreza,

Please let me have your email address to send you an article that would useful for your case.

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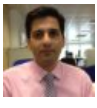

Saeid R. Mofrad
Principal Process Engineer at Petrofac (P.E.)
Top Contributor

If you project standard is API, API-521 section 5.15.2.2.2, Vessels containing only gases, vapours or super-critical fluids, has already covered this subject.

The discharge areas for pressure-relief devices on vessels containing super-critical fluids, gases or vapours exposed to open fires can be estimated using Equation (8). In certain cases, the normal operating pressure can be below the thermodynamic critical conditions but the relieving pressure is supercritical. In such cases, the guidance in 5.15.2.2.2 can be used to size the relief device.

I guess the following papers are going to be shared:

http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&ved=0CDUQFjAA&url=http%3A%2F%2Fwww.clarkson.edu%2F~wilcox%2FDesign%2Freliefv2.pdf&ei=HmfhUMzuJorKswa_olHADA&usg=AFQjCNHuwXrkyrHYKTP868sfLpuywut9DA&bvm=bv.1355534169,d.Yms

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%2Ffiles.engineering.com%2Fdownload.aspx%3Ffolder%3D59ebd24d-747b-4672-9111-f2b9fffc418b%26file%3DDesigning_for_Pressure_Safety_Valves_in_Supercritical_Service.pdf&ei=HmfhUMzuJorKswa_olHADA&usg=AFQjCNGWtgD1rf7Vyk-1zChYhT_ibqlJ0A&bvm=bv.1355534169,d.Yms

The second one has some typo in equation (9). Read it as W = Q / V

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