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How to drain a pressurized hot oil system operating at 380 Deg C, with out opting for vent condenser as economy wont work for higher drain volume. Request for expert comments

VASANT NAVATI

HOD / MANAGER - ENGINEERING, OIL/GAS FIRED BOILERS & HEATERS

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4 comments



Mojtaba Habibi

Process Engineer at Wood Group
Top Contributor

Mojtaba

Dear Vasant,

One of the challenges for design of hot oil closed drain network can be to decide about maximum drainage temperature and design temperature of the network. Read more details in another Chemwork topic titled "Maximum Operating and Design Temperature of Closed Drain Network "

Best,
Mojtaba

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Saeid Rahimi Mofrad

Senior Specialty Process Engineer at Fluor

Below is the discussion Mojtaba is referring to:

<http://www.linkedin.com/groups/Maximum-Operating-Design-Temperature-Closed-3822450.S.84828638>

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VASANT NAVATI

HOD / MANAGER - ENGINEERING, OIL/GAS FIRED BOILERS & HEATERS

VASANT

Hi.. Thanks Habibi & Mofrad, for a quick response.

The link shared is of some relevance. However it could not clear my doubt completely,

- 1] The requirement mentioned in my topic, is about emergency drain of hot oil, operating at 380 deg C @ a pressure of 8.5 bar, from a process / pipeline under a hazard area.
- 2] Will pumping out the oil form the system / pipe line, in the hazard area will be a solution?
- 3] Can we opt for pressure draining of a closed loop system, by applying a high pressure inert gases (like N2 or CO2. say @ 9 bar or more) from the top most position in the system?
OR do u recommend, any other method, better than this?

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Saeid Rahimi Mofrad
Senior Specialty Process Engineer at Fluor

Hi Vasant,

1] I don't fully understand the relation between emergency drain and hazard area, could you please explain. The major section of the hot oil system including expansion drum, circulation pump, distribution network and hot oil side of users (except hot oil fired heater because of fuel no hot oil) are not hazardous area. Furthermore, hot oil is usually drained into the closed system which does not seem to create any hazard as long as it has been designed for 380C.

Do you want to drain a hot oil lines and equipment in a process area which has been classified as hazardous as quick as possible? does hot oil create any hazard? if hot oil leakage in hazardous area is a problem, what hazard is that?

Isolating hot oil inlet and outlet at process area battery limits is not enough to remove/minimize the hazard? This is what is usually considered for hot oil.

Is tripping fired heater and circulating hot oil through hot oil trim cooler is not sufficient to remove the potential hazard? this takes some time to become effective.

2] I guess you are concerned if hot oil is vaporized at closed drain pressure. right? That is where you need vent condenser on the drain drum vent line.

The circulation pump can be used to drain the system. You will need a cooler on drain header to an atmospheric tank in order to store the hot oil in atmospheric pressure. Since this is liquid-liquid cooler the size of exchanger will be smaller than vent condenser.

3] Using a dedicated pump or HP gas to keep the hot oil at high pressure during draining seems to be the right solution but you will need a blanketed pressure vessel maintained at above hot oil vapour pressure@380C, designed for 380C and large enough (as big as tank most probably) to hold the entire volume of hot oil system which does not look feasible.

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