MEG Injection in Gas Dewpoint Control

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Following up on Kumar's earlier subject of fouling in MEG Regeneration system, we presently have another issue with MEG injection into Wet Gas, upstream of the Gas Dewpointing Package. The Gas Dewpoint system comprises of:
(1) Upstream Gas-Gas Exchanger to pre-chill the incoming wet gas (tube side) with out-going cold dewpointed gas (shell side)
(2) A Joules-Thompson Valve to effect pressure drop and further chill the wet gas to condense water and heavy hydrocarbons
(3) Chilled, Dewpointed gas routed to a Low Temperature Separator (sometimes called Cold Separator) to separate processed gas and condensed liquids. The chilled process gas gets heated up after exchanging cold in the Gas-Gas Exchanger.

Typically, MEG is injected/sprayed on the tube sheet of the Gas-Gas Exchanger at the warm end; to absorb water (in mist form in the wet gas) and prevent hydrate formation; as the downstream temperatures are below the hydrate formation temperature.

The problem we are facing is, instead of a typical Shell & Tube HX, Client is insisting on a PCHE (Priinted Circuit Heat Exchanger). Unlike a S&T HX where MEG is sprayed on the tube sheet face; a PCHE design offers no provision for MEG spray nozzles. Therefore, MEG is injected in the upstream line through an injection quill. As a backup, HX downstream injection quill is also provided.
The concern we have is - How to ensure proper distibution of MEG in the wet gas to prevent hydrate problems. Uneven MEG distribution would leave free water in certain gas pockets, which may then form hydrates in the PCHE and plug the PCHE.

Question to the forum is: Has anyone employed PCHEs or other than S&T type of heat exchangers in this service; and if yes, how do one ensure proper MEG distribution into the gas?

Some ideas thrown around include using a static in-line mixer (a structured packing block to increase turbulence); employing a CFD study; etc.
But we are looking for actual implemented and working design. If you can provide reference and design details of the actual facility, will be of further help.

Thanks in advance.
Vinay Singhal

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Krishna Kumar
Chief Process Consultant

Krishna

Hi Vinay
MEG injection distributed in each gas flow path of PCHE was done in ConocoPhilips Kerisi CPP project.
Heatric vendor had a prop internal to do that. they suppplied the eq in that project.
pls speak to vendors like them.

if i get hold of some dwg i will send you later.

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Vinay Singhal
Process Engineering Manager at McDermott International Inc.

Thanks a tonne, Krishna - this takes off a big worry from my shoulders

Vinay

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