

Chemical Manufacturing – Chlorine Gas



CUSTOMER

Chemical Manufacturer

APPLICATION

A bayonet-style heat exchanger is used by this customer to heat and vaporize dry liquid Chlorine, to supply multiple reactors at various flow rates with Chlorine gas, at 130°F and 180 psig. Pure liquid Chlorine is fed to the vaporizer from a pressurized railcar. The heat source was low pressure steam. The existing system did not control the liquid level in the vaporizer, and the flow of the liquid CL₂, and the vaporizer's liquid level was limited by equilibrium.

CHALLENGE

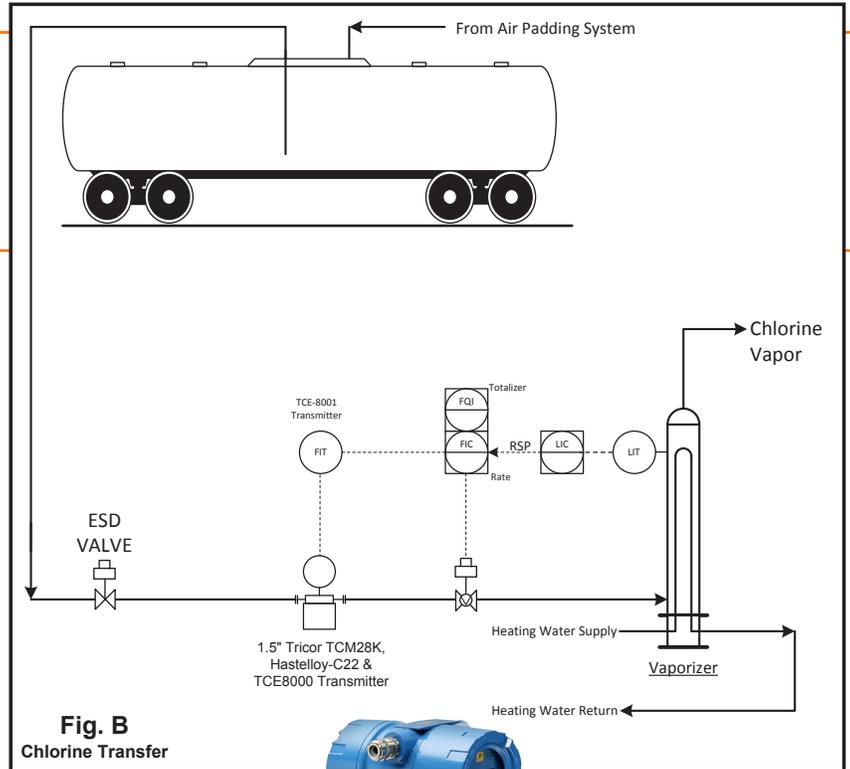
Chlorine has a high coefficient of thermal expansion. Process upsets or momentary shutdowns sometimes resulted in excessive liquid levels, which rapidly led to undesired pressure excursions. There were also cases of low liquid levels, which led to superheating of the gas. This problem is compounded by the over-sized tube bundle in the vaporizer.

SOLUTION

Since a very small amount of liquid CL₂ can lead to serious swings in level, and therefore over-pressure excursions, a highly accurate and repeatable flow meter was required. The customer chose the TRICOR TCM-28K Hastelloy C-22 flow meter. The C-22 alloy features excellent corrosion resistance to Chlorine, and has proven to be superior to C276 for these applications.

RESULT

The new system uses re-circulating hot water as a heat source, rather than steam, and the CL₂ liquid level is now controlled via a cascade master and a mass flow control loop.



TRICOR
products supplied:

- TCM-28K Hastelloy Coriolis Mass Flow Meter

