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NEWS BULLETIN #3

TANK BLANKETING VALVES

Tank blanketing valves are commonly used in tank storage systems where it is desirable to reduce the hazards associated with flammable liquids being vented to the atmosphere, to minimize product contamination from drawing air into the tank's vapor space, to minimize evaporation losses (and therefore product losses), to minimize internal corrosion from air or moisture drawn into the tank and to prevent the tank from collapsing due to a vacuum condition.

Blanketing Valves are usually installed on top of a storage tank (along with a PVRV and an EPRV as required) and use the supply of high pressure gas to maintain a blanket of low pressure gas above the product in a storage tank. The Blanket Valve provides primary vacuum relief for the tank. It opens and supplies gas to the vapor space when pressure decreases below the valve's set point, and reseals as the pressure increases to the set point. All blanket valves and tank venting equipment should be installed above the vapor space they are protecting. Blanket gas is usually non-flammable and chemically non-reactive when mixed with the vapors of the stored product. Nitrogen and Natural Gas are frequently used.

Blanketing a tank can be achieved in 2 ways; through a series of regulators that reduce the supply pressure to oz/in², or through the use of a pilot operated blanket valve. When regulators are chosen, 2 to 3 regulators are used to step down the supply pressure. Between each of the regulators a pressure relief device is required to prevent the downstream regulator and ultimately the storage tank from damage in the event the regulator cannot withstand the full line pressure. Many systems using regulators either overshoot the set point or undershoot the set point resulting in the use of excessive blanket gas.

A pilot operated blanket valve replaces the series of regulators and pop valves with one valve. The main valve inlet connects to the high pressure gas supply and the valve outlet to the tank vapor space. A sense or pilot line runs from the tank vapor space to the valve's sense port, thus supplying control pressure for the valve.

An important consideration is to understand how the set point on the valve is defined. The set point is defined as the pressure at which the valve closes on rising pressure; the valves will not overshoot this pressure. The valve can be set to be fully open at -0.2" water column below the set point, and to close at the set point. There will be a savings in blanket gas and the tank PVRV's will only open during upset conditions.

Blanket valves can provide an option for a flow plug which limits the flow through them in case the valve fails open. Thus, the PVRV can be sized not only for the normal venting rate but also for the blanket valve failure rate.