LIQUID SEAL DRUMS

The purpose of a liquid (commonly water) seal drums in a flare gas system in three fold:-

- It operates as a non-return device preventing interaction from the outlet to the inlet of the drum.
- It operates as an upstream pressure relief valve preventing gas flow from the inlet to the outlet until a particular upstream pressure, frequently predetermined, is reached.
- It acts as a diversionary unit for: - Ground flare to elevated flare systems; ground flare to ground flare systems; Elevated flare to elevated flare systems; Fuel gas recovery systems to elevated flare.

ADVANTAGES

- Designed to prevent pulsing of the gas flow to the flare.
- Ensures totally safe flare operation.
- Can be designed to accommodate a future fuel gas recovery scheme.
- Cost saving for fuel gas recovery installations.

MODE OF OPERATION

Part of the gas supply line dips below the surface of a reservoir of liquid contained in the drum. The depth to which this dip tube is covered by liquid controls the gas pressure required to cause flow. The pressure of the incoming gas displaces sustain the flow and maintains the liquid displacement. When the flow or pressure falls the liquid regains its original level and the flow ceases.

Water is normally used as the sealing medium but other liquids may be used for low temperature applications or to prevent the gas being absorbed.

DESIGN FEATURES

Many variations of seal drum are available to suit requirements but all serve the same basic function. In all cases the inlet tube forms the dip leg and the gas, having displaced all liquid from the tube, bubbles through the liquid to the riser. The level of liquid controls the back pressure.

The basic concept is simple but if the liquid seal is not correctly designed, bubbling of gas through the liquid at low flows, or a surging motion of the liquid, can result in a pulsating flow of gas.

A pulsating flow is a serious problem when the seal is used in conjunction with a smokeless flare tip. The smoke suppressing effect of the tip remains constant whilst the gas flow pulsates and this produces changes in the flame pattern creating smoke and excessive noise.

An Airoil Flaregas designed liquid seal eliminates pulsating flows as well as ensuring that sufficient water is retained to seal the flare header as soon as flaring ceases.

The liquid seal can be supplied as an integral part of a flare stack or as a remote unit. It is designed to pressure vessel codes as required, and can be horizontally or vertically positioned.