IGS INTEGRAL GASEELS

The Gaseel IGS Series, located integrally at the base of the flare tip, has been designed to prevent air ingress into the flare system and has a number of advantages over gas inversion seals.

ADVANTAGES

- Lower purge gas rates on smaller diameter stacks
- Lower pressure drop
- Negligible structural load
- No maintenance
- Low capital cost

MODE OF OPERATION

The Gaseel functions by presenting a smaller cross sectional area of the stack to the rising gases, thereby reducing the volume of gas needed to maintain a fixed purge velocity. It also prevents the passage of air currents down the stack riser section.

In order to give maximum protection to the stack, the Gaseel should be fitted inside the flare tip. Thus for a fixed flare tip length of 12 feet (which is common in the industry) and small diameter tip, the Gaseel is positioned a number of nominal diameters from the stack exit. The Gaseel operation consequently benefits not only from the reduction in cross-sectional area but also from positioning the control point relatively well down into the stack.

At the other extreme, large diameter stacks do not benefit in the same way from the effect of fall off in oxygen percentage with depth of penetration and must rely solely on the reduction in cross-sectional area. Consequently the use of such a seal is seen to best advantage in small diameter stacks.

DESIGN FEATURES

In order to minimize the amount of purge gas flow needed various seal device have been developed. One such device employs a double reversal of direction of flow (Flarex Seal) and has been used in the industry for many years. A simplified seal has also been developed by Airoil-Flaregas which is a conical device situated in the base of the flare tip itself.

Normally when a stack is in shut down condition, unless special arrangements are made, the safest course is to assume that it is full of air. Subsequent introduction of a combustible gas means that at some stage, as the gas displace the air, a flammable mixture will result. In order to prevent an explosive condition developing it is possible, either to ensure that no ignition source is present during this period, or to replace the air with gas rapidly to preclude the danger of flame regression into the gas/air mixture.

When the stack is filled with a gas which is lighter than air there is a natural tendency for this gas to decant, being replaced by air. A low of gas counteracts the decanting action and prevents air penetrating deeply into the stack. The depth of air penetration is a function of the gas velocity. By adopting a standard of acceptability for oxygen in the upper section of the flare it is possible to arrive at a range of purge gas flows which vary with flare diameter and depth of acceptable oxygen concentration in the stack.