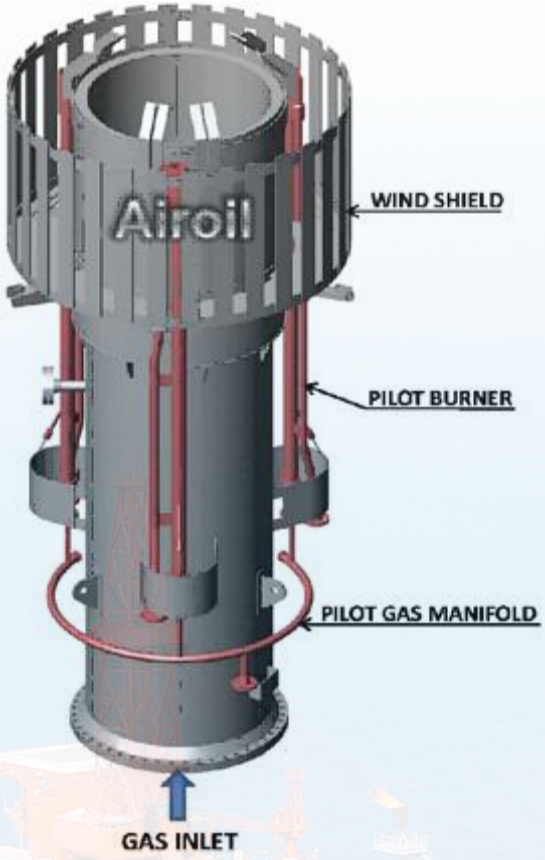
FLARES

Non-Smokeless Flares



The Non-Smokeless flare tips are used where the environmental condition allows the burning of smoke producing gases. They are also used with gases which produce either no smoke or so little that smoke suppression with steam, air or high-pressure gas is not required. Examples of gas used with these tips are Hydrogen, Blast Furnace waste gas, Coke Oven gas, Ammonia, Hydrogen Sulphide and Methane.

Advantages

- Heat shield/wind shield supplied as alternatives
- Unique refractory lining system
- Good flame retention
- Energy efficient & reliable pilots
- Continuous Pilot monitoring by means of thermocouple mounted inside the pilot as standard. Optional UV/IR detection available.
- Rugged design gives Prolonged tip life

Mode of operation

These flare tips are simple in design to allow straightforward flaring of gas not requiring specialized smoke suppression equipment. These have been designed to operate with all available pilot and ignition system, e.g. Natural Draught, Natural Draught Splitter System and Forced Draught.

Flame Stability

The Non-Smokeless Flare Tip is supplied as standard with a slatted windshield to prevent flame lick and to help cool the top of the flare tip closest to the flame envelop. In order to prevent flame, lift off from the tip, these have unique flame retention lugs positioned at the tip exit of the flare tip.

Refractory System

The unique refractory lining system is secured to tip by heat resistant steel bull horn sparges. Many thousands of fine stainless-steel needles are mixed thoroughly with the refractory to reinforce the material evenly over its full depth without producing expansion/contraction shear planes. This refractory installation procedure has been developed and proven over many years to give the longest possible operating life, even in the most arduous conditions.

Steam Assisted Flares (Smokeless Low Noise)

The Steam Assisted Smokeless flare tips are the most efficient flare tips utilizing external steam nozzles in addition to central steam nozzles and are suitable for sites where a general low noise flare tip is required.

The Steam-Assisted Smokeless Flare tips are based on externally mixing steam and air with the gas at the point of exit, utilizing steam injection nozzles. A ring of steam nozzles is located at the top leading edge of the flare tip, inside the wind shield.

The steam is discharged from the steam nozzles entraining large quantities of air into the heart of the gas steam. The gas/air/steam mixture is swirled to entrain large volumes of secondary air resulting in stable combustion condition. This prevents smoke formation from thermal cracking.

The steam nozzles produce very low noise compared with conventional external steam nozzle design. The swirling non-converging action of the steam from the nozzles gives maximum air entrainment and shapes the flame to avoid overheating of the tip. This also helps in preventing flame-lick under low gas flow and high wind condition. Steam nozzles are self-cleaning by virtue of the steam flow carrying foreign matter through the centre orifice.

Design Advantages

- Efficient steam injection into flame envelope.
- Steam economy.
- Stable construction.
- Good flame retention.
- Burn-back minimized.
- Energy efficient & reliable pilots
- Continuous Pilot monitoring by means of a thermocouple mounted inside the pilot as standard. Optional UV/IR detection available.
- Wind shield supplied as standard.

Flame Stability

The Steam-Assisted Smokeless Flare Tip is supplied as standard with a slatted windshield to prevent flamelike and to help cool the top of the flare tip closest to the flame envelop. In order to prevent flame, lift off from the tip, these have unique flame retention lugs positioned at the tip exit of the flare tip.

Refractory System

The unique refractory lining system is secured to tip by heat resistant steel bull horn sparges. Many thousands of fine stainless-steel needles are mixed thoroughly with the refractory to reinforce the material evenly over its full depth without producing expansion/contraction shear planes. This refractory installation procedure has been developed and proven over many years to give the longest possible operating life, even in the most arduous conditions.

Air Assisted Flares (Forced Air Type Smokeless)

The Air-Assisted Smokeless Flare Tip is used for smokeless combustion applications, where the use of steam is not desired. Smokeless combustion can be obtained even with heavy unsaturated hydrocarbon gases.

Advantages

- Low operation costs.
- No steam required.
- 100% smokeless combustion
- Non-luminous, low noise combustion
- Low pressure air for smoke suppression
- Simple control system for normal/maximum operation
- Energy efficient & reliable pilots
- Continuous Pilot monitoring by means of thermocouple mounted inside the pilot as standard. Optional UV/IR detection available.

Mode of Operation

There are two nodes of air supply; the first is a co-axial supply of air with the main gas riser centrally positioned. The second is an outside separate air riser alongside the main gas riser. The gas is distributed in the tip to a series of vanes with characterized slots for even gas spread into the air stream.

The air is directed from the tip with a swirling action at high velocity and, with the even gas spread and turbulent air mixing at the tip outlet, efficient combustion is achieved. Secondary air is entrained by the turbulent discharge from the tip.

The swirling action of the flame produces a well-formed flame with low luminosity, unaffected by wind and producing minimum downward radiation. This is achieved by supplying up to 50% of stoichiometric air from the low-pressure fan.

Performance Features

Full capacity can be flared smokeless with only part of the combustion air supplied by a fan at low pressure. The fan can be staged so that efficient use of electrical power is achieved. The fan speed can also be automatically controlled. As a result, efficient combustion is achieved without the use of expensive steam and with minimum noise, producing a flame of low luminosity which does not disturb the environment.

Design Characteristics

The gas riser and air riser can be run separately or co-axially to the tip allowing flexibility in the mechanical design of the stack. The fan can be part of the stack structure, mounted separately at the base or remotely.

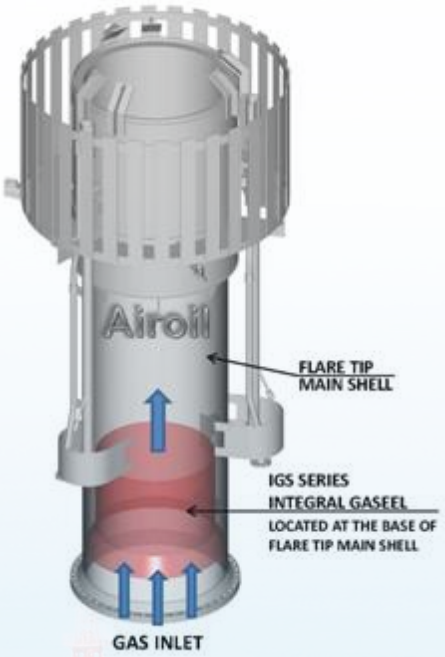
The controls and ignition panel can be sited at the stack base or remotely as required.

AFG Combustion's low gas consumption pilots can be used with the choice of electric, non-electric, manual or automatic ignition systems.

The use of forced draught air maintains the air and gas riser and the flare tip at low temperature and eliminates the need for a refractory lining.

The extremely stable upright flame, achieved by using forced draught sir, minimizes ground level radiation and, therefore, lower stack can be used with safety. Furthermore, the short, well-formed flame is less affected by cross winds and prevents flame lick. Liquid and/or gas seals can be accommodated into the flare system if required.

Velocity Seals



The Velocity Seal, 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 drops
- 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.

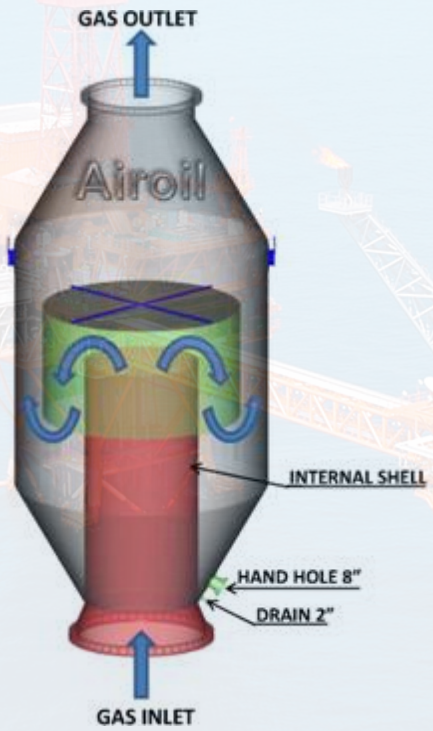
Design Characteristics

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.

Molecular Seals



The Molecular Seal is located just below the flare tip and has been designed to prevent air ingress to the flare riser thus preventing the formation of an explosive mixture in the system.

The seal is a gas inversion device causing the gas normally flowing in an upward direction to be turned through 180 degrees in the original direction of the flow.

In a static condition, gases lighter than air will tend to collect in the upper bend sealing off the stack against the back flow of air. Heavier gases will tend to settle in the lower bend with the same effect. Some wind and atmospheric action will affect these interfaces slightly, and molecular diffusion of the two gases will take place at the interface. In order to counteract these effects a small continuous bleed of gas, dependant on the flare nominal diameter, must be maintained in order to ensure that air does not penetrate the seal.

Advantages

- Molecular Seals have a safety factor for momentary loss of purge gas
- Lower purge gas rates
- Cost saving on purge gas
- No maintenance required
- Robust construction
- Molecular Seals can be used as a support for a flare tip lifting davit

Design Characteristics

Flare stacks are designed to dispose of flammable gases safely by ensuring the combustion of these gases at the exit of the stack (flare tip). It is undesirable to have a flarestack filled with a mixture of gas and air (oxygen) within the flammable limits because of the dangers of internal flash-back or explosion.

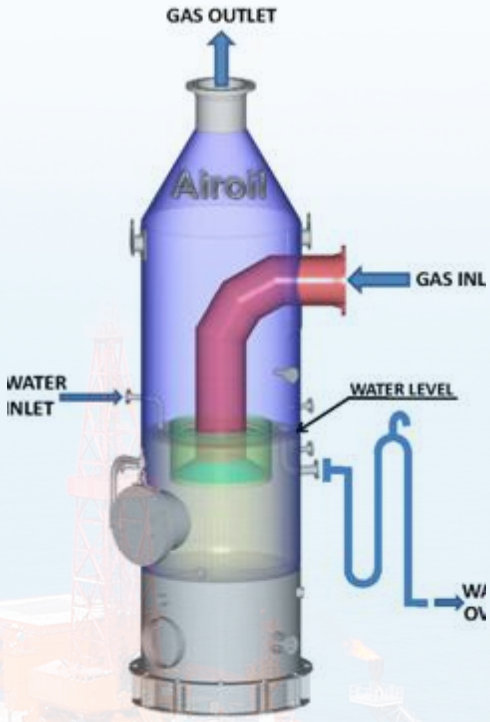
Normally when a stack is in a shutdown condition, unless special arrangements are made, the safest course is to assume that it is full of air. Subsequent introduction of a combustible gas means that at some stage, as the gas displaces the air, a flammable mixture will result. In order to prevent a dangerous situation arising, 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 mixture.

The most common and most acceptable safety measure is to purge the system with a non-flammable gas prior to introducing the combustible gas, thus injecting a barrier between the two active agents. If the period between starting the purge and introducing flammable gas is to be prolonged a reasonable course of action is to include in the system a device which assists in keeping air from the stack, whilst reducing the amount of purge gas needed to accomplish this. The use of such a device is also advantageous when it is necessary to keep a flare on stand-by but not operating for a long period, when saving in purge gas will pay for the capital outlay on the device.

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 displaces 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.

Liquid Seal Drums



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

Performance Features

- 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 Characteristics

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.

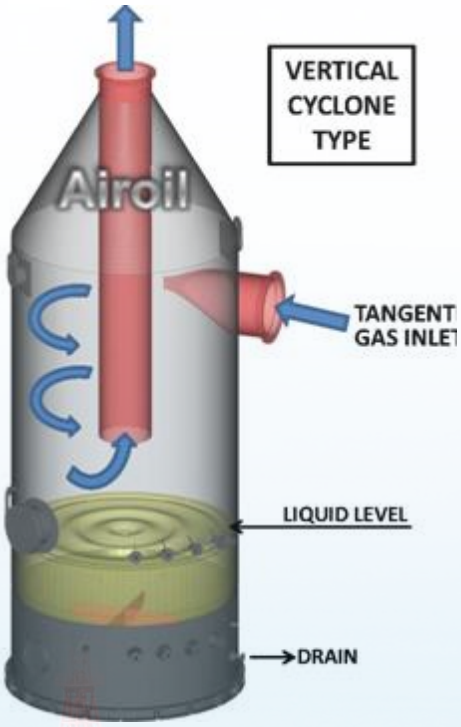
The basic concept is simple but if the liquid seal is not correctly designed, bubbling of gas through the liquid at low flows, or a surging motion of the liquid, can result in a pulsating flow of gas.

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 **AFG Combustion** 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.

Knock Out Drums



The Knock out drum is a vessel in the flare header designed to remove & accumulate condensed & entrained liquids from the relief gases.

Both the horizontal & vertical design is a common consideration for the Knock out drum, which is determined based on the operating parameters as well as other plant conditions. If large liquid storage capacity is desired and the vapour flow is high, a horizontal drum is often more economical. Also, the pressure drops across horizontal drums is generally the lowest of all the designs. Vertical knockout drums are typically used if the liquid load is low or limited plot space is available. They are well suited for incorporating into the base of the flare stack.

Design Features

Although horizontal and vertical knockout drums are available in many configurations, the differences are mainly in how the path of the vapour is directed. The various configurations include the following:

- Horizontal drum with the vapour entering one end of the vessel and exiting at the top of the opposite end (no internal baffling)
- Vertical drum with the vapour inlet nozzle entering the vessel radially and the outlet nozzle at the top of the vessel's vertical axis. The inlet stream should be baffled to direct the flow downward
- Vertical vessel with a tangential nozzle. Vertical centrifugal separators differ from vertical settling drums in that the flow enters tangentially and spins around a centre tube, which extends below the liquid inlet nozzle. The gas and liquid flow radially downward through the annulus causing liquid droplets to coalesce along the walls and collect in the bottom of the drum. The vapour changes direction once below the centre tube and flows upward to the outlet nozzle. To avoid liquid re-entrainment, vapour velocity has to be kept low in the turnaround

section of the drum. An additional measure to prevent liquid re-entrainment is a baffle plate below the turnaround section of the drum. The maximum liquid level is the same as vertical settling drums

- Horizontal drum with the vapour entering at each end on the horizontal axis and a centre outlet
- Horizontal drum with the vapour entering in the centre and exiting at each end on the horizontal axis
- Combination of a vertical drum in the base of the flare stack and a horizontal drum upstream to remove the bulk of the liquid entrained in the vapour. This combination permits the use of larger values for the numerical constant in the velocity equation.

Flare Pilots (Flare Ignition Systems)

AFG Combustion's flare pilots are suitable for use on all types of Elevated Flare Tips, Ground flares and Burn Pits, in the worst weather conditions which may exist off-shore or on-shore, from sub-zero ambient conditions of Antarctica to the sand/wind storms of Middle East and Africa.

The pilots have very wide application ranging from standard LPG or natural gas to low BTU gases like bio gas or coke oven gas & also for gases with high hydrogen content. The pilot nozzle is basically a pilot stabilized tunnel burner designed for a high inspiration rate, normally 80% to 85% primary air.

Advantages

- Energy efficient, stable & reliable performance.
- Reliable ignition in all-weather condition
- Heat resisting nozzle casting
- Flame retention in all-weather condition
- Thermocouple housing facility supplied
- Suitable for ignition of natural draught, forced draught, semi-forced draught, manual / automatic ignition systems.

Mode of Operation

The **AFG Combustion's** Flare Pilots are the inspiriting type of varying length, depending on the application. On elevated Flare Tips, the pilot is generally 2.7 meters long, whereas on Burn Pits the length could be 30 meters or more.

The pilot nozzles have built-in flame retention and include a shield to ensure a stable flame and enable positive re-ignition in high winds. Ignition of the pilot is via a flame front generated at a remote panel and fed to the pilot nozzle via a 1 in. igniter tube. (The pilot gas is supplied via a ½ in. inlet to the venture with an air adjuster). The air is pre-mixed with gas in a 2 in. gas tube and is ignited at the nozzle by the flame front.

Flame Indication

For flame indication, or flame failure, a heat resisting clad thermocouples is fitted internally in the nozzle and the gas mixture tube where it is protected from the main flame and cooled by the flow of gas passing over the thermocouple.

Elevated Staged Flares

Optimization of an Elevated Staged Flare for a Large Refinery or a Gas Plant

In recent years most of the refineries, petrochemicals & gas processing plants are seen to be of larger capacities.

Flare system for such plant are required to operate at two extreme flow conditions, one very high flow rates (in excess of 1000 tons per hour or the maximum design capacity rate) as well as at minimum flow conditions (few 100 kg per hour). Further considering environmental issues the flares are expected to perform smokeless operation at certain specified capacities. All these at optimum operating cost pose a difficult challenge for flare design & how an optimum solution can be arrived:

- Optimum in terms of efficient operation.
- Optimum in terms of operating cost.
- Optimum in terms of smokeless operation control
- Optimum in terms of longer equipment life
- Lower CO_2 emission. Carbon credits.

The most traditional configuration for a flare system is to provide a single elevated pipe flare. Flare stack riser & flare tip are generally sized based on the allowable pressure drop which is usually very low & these results in large diameters for the stack riser & the flare tip.

At normal plant operating conditions, the relief gases to flare are very low (few leakages only) resulting in to very low tip exit velocities & together under the wind influence at high elevation the gases start burning much lower in to the flare tip body rather than at the exit (Burn back). Continuous operation as above results in to thermal degradation of the flare tip material calling for early replacement. Using high Nickel raw material for flare tip body does provide some extended life but thermal fatigue cannot be completely ruled out if the operation of the flare is continuously seeing such very low flow rates causing burn back.

To counter the burn back sufficiently high tip exit velocity is needed (1 to 3 FPS) to maintain a healthy flare tip life. If actual flow rates for the flare are low than an additional purge gas is required to be injected to avoid burn back. On large diameter flares this is a substantial quantity & can cause a big hole in the pocket.

Further flares are specified to operate smokeless at certain flows which again are much lower as compared to the maximum design case.

- To prevent smoke formation, sufficient energy is necessary to create turbulence and improve mixing of the flare gas & entrained atmospheric air. However due to large size of the flare tip (diameter sized based on flare maximum relief case & allowable pressure drop) steam assisted flare tip could generate fuel rich zones where smoke occurs because of bad steam/air penetration inside the core of the flaring gas, leading to reduced effectiveness of the smokeless process.
- Air assisted flare tips is an option could be employed but when analyzed got rejected due to the huge quantity of combustion air requirement, leading to tough mechanical design & installation issues for gas & air pipes. Also air assisted flare would call for flare tip size (abnormally large) which is not referenced in operation, and a weight that could be dangerous if supported by a single stack. Not a viable solution.

The unusual pipe flare tip diameter, combined with the wide range of flaring rates, presents problems with the flame stability, burn back (internal burning within the tip shell) and flashback (which occurs in a flammable mixture of air and gas when the local velocity of the combustible mixture becomes less than the flame velocity causing the flame to travel back towards the stack). In the standby case of only purge gas flaring, the purge gas consumption required sustaining a uniform flame and to avoid burn back & flashback is very high, which dramatically increase the operating cost as well as the carbon dioxide emissions.

- The energy to promote uniform air distribution throughout the flame may also be present in the gas in the form of pressure (High pressure Sonic Flare tip). However, for a single flare, this gas pressure would only be available at high flow rates, not at smokeless rates. Moreover, if a sonic flare tip is designed, it cannot be equipped with necessary ancillaries such as steam assemblies for smokeless flaring at low flows due to vibrations occurring as a result of a too high gas exit velocity at maximum design flow.
- Open multi-burner ground flares offer many advantages particularly where strict environmental issues have to be considered. They consist of a large number of small staged burners installed at ground level in a very large flaring areas surrounded by protective fencing. Staging allows operation of each group of burners (stage) to be at set pressures where smoking will not occur.

The split of flow rate in many burners enables high smokeless capacities along with reduced visual impact. Multi-burner flare systems utilize the available pressure energy of the gas to entrain additional air, which improves combustion efficiency as flare gas is better mixed with the air. A smokeless flame is obtained only through the high exit gas velocities, and for low flaring rates this is achieved by providing a large number of stages that require higher pressure at the inlet manifold to manage the operation of the staging valves. This solution was not feasible due to low available pressure and also the presence of acid gases also flared inside the same available sterile area, would result in emissions levels not acceptable to prevailing site regulations. Although the exit velocity of gases is quite high, the source elevation is near to grade and this could result in exceeding pollution limits in the presence of sour products.

- Enclosed chamber ground flares enable flaring without the flame being visible from outside the chamber. However, the capacity of this flare is limited and cannot match with the capacity of the elevated flare.
- Burn pits were not considered because of stringent pollution limits.

Staged Elevated Flares

In order to solve all the technical difficulties and problems listed above; safety, process, operability, environmental, mechanical and fabrication investigation studies have been performed with most modern software and technologies. An elevated staged flare system was considered the best flare configuration.

Under normal plant operation the flare gas quantity being very low the flare gas is routed on the primary stage & flared, the water cover for the primary stage water seal being lower in height as compared to second stage water seal. During the first stage operation the back pressure from the primary (small) flare constantly tries to overcome the water cover of the second stage water seal which has larger water cover in comparison to the first stage. As the flare gas quantity increases above certain range/value the resulting higher back pressure from the primary stage flare overcomes the water cover of the secondary water seal & the flare gas is able to break the seal & the gas flow is established to the second flare. Once the flaring rate reduces the water immediately seals the second stage flare & in such way the second stage becomes dormant or standby.

Segregating the total stream into different flares allows a reduction in the diameter of each flare tip. The reduced diameter of the flare tips ensures proper smokeless operation, as the flare tip of the first stage can be designed for the maximum continuous operational flaring rate, and can be fitted with steam facilities to ensure a smokeless flame. The second stage flare tip which comes in to operation only during some major upsets in the upstream plant need not be designed for smokeless operation which giver great savings & very efficient smokeless operations. Most importantly the normal low flaring quantities being diverted to smaller diameter flare tip of 1st stage, there is no problem of burn back since the exit velocity is safe for this smaller diameter. Further the purge gas requirement is very low as compared to single large diameter since there is no question of burn back. The purge flow required are only that required by dynamic/gas seals to avoid air entry in to the system from the top, this are in the range of 0.01 FPS much saving as compared to 1 to 3 FPS required to counter the burn back.

Conclusion

The analysis to identify the best configuration for a flare to adequately manage the largest flaring rate from a single header confirms that a single large flare is neither practical nor convenient, as it presents technical difficulties to secure the stability of the flame, the safety of the system and to guarantee the smokeless requirements.

The proposed alternative, consisting of an elevated staged flare, has shown the advantages of:

- Limiting the size of the flare tips, which do not introduce flame stability issue?
- Design 1st stage for smokeless operation gives optimum smokeless performance.
- Guaranteeing a longer lifecycle for the flare tips, as they are not prone to burn back.
- Do away with additional purge requirement to avoid burn back, a great saving.

References

1. API RP 521, Guide for Pressure–Relieving and Depressuring Systems.
2. API RP 537, Flare Details for General Refinery and Petrochemical Service.
3. DEP SHELL 80.45.10.10, Pressure relief, emergency, depressuring, flare and vent systems.

Demountable Flares

The Demountable Flare System features a derrick structure with the one or multiple flare risers, mounted in such a way as to permit the lowering of the flare burner to grade for service without the need for an expensive heavy-duty crane. Further the flare burner is lowered to grade without the need of any personnel to climb to the top of the stack. Flare Systems with multiple risers allows for service/replacement on any flare burners, while other Flares operations remain uninterrupted. This means flare maintenance can be performed safely without shutting the flaring. Therefore, NO shutdown on upstream operating facility due to shortcoming on one flare. Flare is available permanently, NO process/production outage saving significant time and money.

Key Advantages:

- Multiple risers allow flare tip to be lowered to grade - while the flare system and plant remain in operation.
- Multiple risers allow for smaller ground space.
- Extra space on derrick can be planned for accommodating additional risers for future expansion.
- Avoid unnecessary downtime with accessibility at hand.
- No loss of production due to maintenance downtime.

Designed around accessibility, **AFG Combustion**'s Demountable Flare System can easily accommodate ALL your flaring needs. Our demountable flaring system can utilize one flare stack riser as a spare by easily bypassing the flare gas inlet stream when the primary flare stack is out of service. By incorporating multiple flare stack risers to a single structure, the overall space required for a large capacity flare , integrated refinery/chemical plant/production facility is reduced by the system's capacity to support the flaring needs for many different process units. Maintenance equipment such as cranes are no longer required since the demountable flare system allows each flare tip to be lowered to grade for necessary inspections and completely eliminates any requirement to shut down your facility for flare maintenance.

Demountable Flare comprises of derrick-type support structure for multiple flare risers. All the risers are sectioned & provided with flanged end plus all the utility lines, thermocouple cables etc. are dressed up on each riser section. Also, each riser section has its own junction box to allow for easy accessibility to all electrical and instrumental wiring. The self-contained winch systems are used in conjunction with ropes, sheaves, and pulleys for mounting/demounting the risers. Major platforms are included in the derrick structure to facilitate easy access for mounting & demounting operation.

AFG Combustion's demountable flare concept can be applied to any type of flare including simple utility flare tips, steam assisted flare tips, gas assisted flare tips, sonic flare tips, and even blower air assisted flare tips. Our systems can be designed to exceed over 200 meters (650 ft) in overall height and accommodate multiple flare stack riser of any diameter.

Our demountable type multiple flares with staged operating philosophy are in operation in many refineries & have proven performance track record with client reaping the maximum benefits.

AFG Combustion provides optimum solution for any complex flare requirement with best flaring technology. Why looks anywhere else? Choose to work with our dedicated, flexible, and innovative team, and you won't be disappointed.

Call or email us today to request a quote or to learn more about our proprietary combustion systems.