

ELEVATED FLARES



GUY-WIRED SUPPORTED

GUY SUPPORTED FLARES
are usually the most economic choice.

For this type of flare the structural design is the most complex but computer aided structural planning is available to solve the problems connected to differences in stack and ambient temperature and also to forces generated by wind and/or earthquake.

The guy ropes add large damping forces and frequently overcome aerodynamic loading problems.

The major disadvantage associated with the use of guy ropes is the land usage required to locate the anchor points as an allowance has to be made for the deadman radius which is usually up to 55% of the length of the guy-supported stack. Three deadmen usually anchor up to five ropes from the stack and are designed to resist the horizontal and vertical components of the tension in each rope. The horizontal load determines the concrete area to be used against the frictional resistance of the ground and the thickness of the block calculated against the allowable bearing pressure in the ground to counteract the vertical load of the guys.

In order to reduce maintenance on the ropes, wire rope cores should be used rather than fibre and ropes and fittings should be heavily galvanized. If pretensioned ropes are used retensioning after initial erection will be minimised.

Erection of guyed stacks relies heavily on the use of tall craning and this should be a consideration at design stage. Single piece lift using strongback techniques to stiffen the riser tube are also possible as are self build units using a climbing davit.

ELEVATED FLARES



- DERRICK SUPPORTED - CONSTANT DERRICK GUY-WIRED SUPPORTED

DERRICK SUPPORTED FLARES:

comprise a simple riser tube housed within and supported by a braced framework.

This design is particularly suited to taller flares where guyed units are not practical and self supported stacks are uneconomic. Generally these structures are expensive to erect and maintain, but are sufficiently flexible to suit erection needs and may be assembled piecemeal where only limited craneage is available. To minimise maintenance the derrick structure should be galvanised.

Foundations are probably simpler than with self supported flares and the final design is usually adaptable for subsequent changes to the stack or service piping.

For extreme temperature or corrosive service where special materials may be needed, it is often preferable to use derrick support which allow the risers to economise on thickness or even to be replaced as part of a scheduled maintenance programme.

Derrick supported flares permit the installation of a multi flare system with demountable flare stacks divided in flanged sections. This system is advantageous for refineries and petrochemical plants where there is a limitation in locating several flares on the available plot plan and allow an easy maintenance of a single flare while the others are in service.

CONSTANT DERRICK GUY-WIRED SUPPORTED FLARES:

allow internal or external flare riser installation. This particular flare structure is desirable when handling hot waste gases.

Guy wires are not effected by expansion or contraction of the flare gas riser as they are anchored to the structure. The structure incorporates all required piping, wiring, ladders and platforms.

ELEVATED FLARES

SELF SUPPORTED



SELF SUPPORTED FLARES:

These are completely free-standing structures. Although designed to simple structural principles this type of structure faces the biggest challenge with respect to aerodynamics and seismic forces.

The self supported flare has the smallest footprint and is an attractive option when space is at a premium. However, for flare stacks of any appreciable height it is likely to be the least favourable with regard to capital investment.

Design challenges of a self-supported flare include wind induced oscillations and stress reductions to prevent plate buckling. Most codes cover vortex shedding oscillations and seismic considerations.

The foundations for a self supported flare are usually more involved than other designs as the whole wind load and bending moment must be carried by a single foundation.

Erection relies on available craning. However, the greater stiffness of the self-supported design (over the guyed type) facilitates lifting.



ELEVATED FLARES



MULTI FLARES

DEMOUNTABLE RISERS

MULTI FLARE DEMOUNTABLE RISERS ON DERRICK STRUCTURE

ITAS Multi Flare Demountable Risers Derrick Structure has been designed in order to be able to take down or put up a stack without taking the other flares out of service. It is advantageous for Refineries and Petrochemical Plants where there is a limitation in locating several flares on the available plot plan.

The supporting structure can be a three or four leg steel tower, capable of bearing multiple flare stacks. The supporting structure is manufactured from pipe or rolled steel section (profiles).

On the vertical surface of the derrick, guide rails (two for each flare) are installed. Sufficient ladders and platforms are provided for the demountable operation of the flare stack(s). For access to the elevated platforms caged ladders are installed.

A thermal radiation shield is provided above the working platform as protection during change out of flare.

The flare stack(s) is divided in flanged sections of an approx. length of 20 metres. All the utility lines (pilot gas, ignition and steam lines) are attached to the stack sections and are likewise flanged. Each section of the stack(s) is provided with support arms with rollers that can turn along the guide rails. The distance between the top of the flare tip and the top of the supporting structure is about 10 metres.

The hoisting system for lowering and lifting the stack sections consists of electrical or hydraulic winches. The winches are equipped with automatically operated brakes to prevent an accidental release of the load. Winches are mounted on a sub-frame so as to allow storage indoors.

ITAS Multi Flare Demountable Risers Derrick Structure can be utilised for flare systems up to 200 metres high.

ELEVATED FLARES



PORTABLE FLARES

This type of flare is particularly useful for pipeline and maintenance operations or where a large sterile area is available.

The ITAS portable flare consists of a flare tip mounted directly onto a base mounted molecular seal or K. O. drum. They are usually assembled on service vehicle and can be erected by one man in a few minutes. The flares include a stainless steel tip, and the ignition system can be either electrical, with battery back-up or piezo-electric.

The portable flares can be equipped with a gas/liquid separator.

