Discussions about the advantages and disadvantages of orifice plate and pressure vacuum valves are as old as vapour recovery systems at petrol stations.

As we all know in a storage tank pressure or vacuum conditions can be created through temperature differences, such as between day and night, delivery of petrol, vapour recovery Stage IB, vapour recovery Stage II, and so on.

With an installed pressure/vacuum valve at the vent pipe displacement of (VOC) vapours are significantly reduced and the idea of environmental protection is maintained.

Unfortunately most arguments have two sides and this is the case with the pressure vacuum valve (p/v) versus orifice plate issue.

To open a p/v valve pressure has to be created up to e.g. 20 mbar. This 20 mbar pressure doesn't sound like much, but in nearly empty 10,000 litre storage tank this pressure can create up to 200 litre of (VOC) pressurised vapours.

That means 200 litre of (VOC) vapours will escape as soon vapour recovery stage IB or/and delivery point has been opened. The tanker driver is exposed to these vapours several times every day over years. This cannot be a healthy working environment.

For health reasons the installation of orifice plates are now required in many countries. An orifice plate is simply a hole normally 10 mm dia in a plate at the top of the vent. This means no pressure can be created in the storage tank and consequently there are no health concerns for employees. The disadvantage of an orifice plate is that there is a constant displacement of vapours in and out of the storage tank.

To create positive environmental and healthy solutions at the same time is difficult, however, there is a new solution available. Parallel to the vent a bypass pipe with manual valve and flame arrester installed at top can be installed. This solution has health and environmental advantages.

Before opening the storage tank, the tanker driver or station manager can release the tank pressure manually through the bypass valve. After releasing the pressure the valve closes automatically and the pressure/vacuum valve is in charge again.

This solution provides a safer and healthier environment for both the employees and members of the public.

The flame arrester at the top of bypass pipe is approved in accordance with BS EN 12874 and is in line with Blue Book requirement (8.5.4.4 Venting). This flame arrester is protecting the storage tank in the same way as it does the flame arrester under the pressure vacuum valve.

BS EN 12874 is a new standard for flame arresters and has superseded BS 7244. That means that all new installed flame arresters have to be in accordance to new BS EN 12874.

If the flame arrester is approved for explosion group IIA (petrol) in accordance with BS EN 12874 it can also be used together with HBEF fuel (e.g. E85) up to 90% Ethanol.

For more information please contact the writer Mirjan Maiberger at www.Flammer.co.uk.