

# Do You Ever Inspect Your Stage I Vapor Adaptors? You Should!

By Marshall Ryan

All tank owners should be aware of what can and does happen when a Stage I vapor recovery adaptor is misused. Improper use of a Stage I system can cause an immediate environmental impact to the air, soil and groundwater.

How does this happen? Before dropping fuel, the truck driver is responsible for connecting the Stage I vapor return hose to the tanker. When they think no one is watching, some drivers will wedge a rock, screwdriver or other foreign object into the top of the Stage I vapor adaptor instead of connecting the vapor return hose and covering this partially with the manhole plate. This open vent allows the majority of the fuel-rich gasoline laden vapors to escape into the atmosphere. Depending on atmospheric and weather conditions, some of the vapors will volatilize, but, being heavier than air, a percentage will fall around the vapor recovery adaptor neck and through the pea gravel and, in the 60-degree below-ground temperature, condense. Because fuel-rich gas vapors are heavier-than-air, some of it will settle in low areas like manholes and make both an unsafe condition and increase the probability of a hydrocarbon impact to the soil and groundwater. This illegal practice may lead to significant subsurface contamination if employed by a driver over a long period of time.

Another reason to inspect your Stage I vapor recovery adaptor is to make sure the seals are tight. The proper and satisfactory performance of a Stage I system depends on tight

seals between the tank fill outlet and the delivery hose and the seals between the vapor-return hose and the vapor-return adaptor (dry break).

The old school design of a Two-Point System had the Stage I vapor recovery adaptor positioned inside a bottomless (unsealed) skirted manhole. This design offered no secondary containment for such a release as I have described at the Stage I connection. The escaped vapor simply falls through the backfill and returns to liquid deep underground. For those older sites that do not have a barrier or containment, it is recommended to either install a spill containment device, or one can more economically isolate the backfill from the fuel-rich vapors by placing a three-inch layer of non-shrink grout inside the manhole skirt. Either will offer much more protection to the underground environment in the event of a vapor release. However, these modifications will not protect our atmosphere from the vapor releases by the misuse of the system. Only proper training of the driver and proper use of the equipment will eliminate the effects of improper venting.

Over the last six years or so, we have seen most designs specify a secondary containment device for the Stage I vapor riser and adaptor. Many underground storage tank systems installed over recent years are protecting the environment from potentially unknown hydrocarbon impact at the Stage I adaptor by use of this secondary containment device.

Some tank owners have converted gasoline tanks to diesel but, in the process, did not remove the Stage I vapor adaptor that is only required for gasoline. If the diesel system has this fitting, the tanker driver may very well be improperly rigging this adaptor to vent into the atmosphere and allowing some of the heavy vapors to settle into the backfill, contaminating your site. If the adaptor is in place but not required, consider removing it and capping to prevent the possibility of misuse that pollutes your property.

In summary, I recommend that all tank owners inspect their Stage I adaptors. Observe if they have scratch marks on the top of the dry break or if they don't seat tightly. Observation of these signs could be proof of improper use by a truck driver. Notify your fleet manager or common carrier immediately and let it be known that, if caught, the offending driver will be reported.

If your site is located in a non-attainment area requiring Stage I Vapor Recovery, consider modifying the connection point manhole to isolate the backfill material and the underground environment from any release of fuel-rich vapors. This may save your site from becoming contaminated and save you a very costly remediation project somewhere in the future. ■

*Marshall Ryan is President of Unified Services of Texas, Inc. (UST) in Fort Worth, TX. If you have questions or want to discuss this article further, please call (817) 481-9510 x109 or e-mail mryan@ust-inc.com*