



Managing the Hazards of Heavier-than-Air Vapors

On June 30, 2007, workers at a Little General gas station and convenience store in Ghent, West Virginia, were transferring propane from an existing propane tank (that did not meet safety codes) to a new propane tank (that did meet safety codes). During the transfer, the old tank began to leak flammable propane vapor. The vapor traveled inside the store, where it encountered an ignition source; within 30 minutes of the initial leak, the tank exploded, destroying the store and killing four people.

Protection Strategies:

To control the hazards of heavier-than-air vapors, use a combination of awareness, source control, ventilation, and updated code compliance.

Awareness. Pay attention not only to chemicals and activities that are part of normal production processes but also to chemicals and activities that are unusual. The decommissioning of a process vessel, for example, may put hot work and flammable chemicals together, while painting an office could fill a normally habitable room with noxious vapors.

Remember also that not all hazardous, heavier-than-air vapors may be generated on your site. If your site is located in an industrial area, vapors may flow from off-site onto your site, collecting in low-lying areas and creating a hazard. Know what your neighbors are doing.

Source control. Preventing chemicals from entering the air is an important way to control the levels that accumulate outside of process tanks and vessels. Proper maintenance of process vessels and piping can prevent leaks. Safe work practices, such as permitting an oven to completely vent before it is opened, will help minimize releases of chemicals. Proper storage (for example, inside a flammables cabinet) helps control the release of vapors, as does minimizing the use of hazardous, heavier-than-air chemicals.



Ventilation. Properly designed ventilation is key to the control of heavier-than-air vapors. Ensure that vents are positioned correctly. In laboratories, for example, chemical storage cabinets may need to be ventilated from the bottom rather than from the top to collect accumulated vapors.

For flammable vapors, ventilation systems must be explosion-proof. For toxics, care must be taken not to recirculate the vapors within the facility. Do your homework carefully or use a qualified contractor when designing ventilation systems for heavier-than-air vapors.

Code compliance. Another issue—pointed out by the Little General explosion and by a long history of residential explosions in which gas cans were stored too close to natural gas water heaters equipped with open pilot lights—has to do with up-to-date code compliance. In the Little General explosion, the existing propane tank was located against the back wall of the convenience store, under the eaves. When propane was released, it immediately infiltrated the store. Since that tank was installed, codes had changed to require propane tanks to be located at least 10 feet from any structure.

Codes for natural gas water heaters have also changed to require that they be installed off the floor and to require that pilot lights be protected. If you have heavier-than-air flammable vapors in your workplace, make sure that your equipment and storage are up to current codes.

Remember: “No task is so important that it be done at the risk of Safety.”