

Overflow + Ignition = Tank Farm Fire! (Part 1)

A large storage tank containing a flammable liquid overflowed. The spill was not detected until a security guard noticed a strong odor. He immediately reported his concern to operations personnel. Two operators responded, driving a truck to the area to investigate. Within minutes, there was a loud explosion followed by a fire. It is believed that the truck provided the ignition source. It took emergency response personnel a day and a half to extinguish the fires that spread through the tank farm. More than a dozen employees were hospitalized, and there was significant property damage. The incident investigation found that the tank was being filled and, unknown to the operators, the tank level gauge *and* the high-level alarm had failed. The operators did not monitor the filling operation closely because they believed that the tank still had plenty of capacity.



Coming in the October 2009 Beacon — More lessons from this incident, including a discussion of motor vehicles as potential ignition sources.

Do You Know?

- Overflowing a tank or other process vessel has been an important contributing cause to many major incidents in the process industries. Recent examples include the Texas City, TX, refinery explosion in March 2005 (a distillation column was overfilled), and the Buncefield, England, fire in December 2005 (overflow of a flammable-liquid storage tank).
- In many overflow incidents, there has been a failure of level instrumentation and high-level alarms.



What Can You Do?

- Recognize that transferring a flammable liquid is a hazardous operation with significant consequences if something goes wrong. Monitor flammable-liquid transfers closely so you can detect and respond to any spills and leaks.
- Before starting a transfer, make sure there is enough room in the destination tank for the material you intend to transfer. Check the level, temperature, and pressure in both the source and destination tanks at frequent intervals during transfers, and investigate any unexpected variation in the rate of change.
- When transferring liquids, estimate how much time it should take to fill the destination tank at the expected flow-rate, and investigate if the transfer takes too long.
- Complete each step of the transfer procedure before moving on to the next step, and record and sign off on the procedure if required.
- If you are aware of the failure of any critical instruments or alarms in your plant, report them immediately so they can be repaired.
- Follow up on reported failures to make sure that repairs are made in a timely fashion.

Don't try to put 10 gallons of liquid in a 5 gallon pail!

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