

More Lessons from Fire while Filling Containers

As promised in the January 2009 Beacon, we will discuss another lesson from the incident reviewed in both the December 2008 and January 2009 issues of the Beacon.

A fire started in a packaging area while a 300-gal portable steel tank (a "tote") was being filled with ethyl acetate. Previous Beacons discussed static electricity as an ignition source, the importance of bonding and grounding, and the use of dip pipes or bottom loading for filling containers with flammable liquids. In this issue, we will discuss another important lesson from the same incident.

The consequence of this incident became much more severe because the initial fire spread to an adjacent flammable-material storage warehouse. The wall separating the two areas was not fire-rated. Large non-fire-rated doors between the warehouse and packaging area were kept open, and were not equipped with self-closing mechanisms. In addition, there was no fire-protection system (sprinklers or other fire-suppression system) in the flammable-material packaging area.

Spill containment is important whenever you are filling containers with any material, whether flammable or not. For flammable materials, containment helps to limit the area potentially impacted by a fire. And, for all materials, containment keeps spills from getting into drains, sewers, surface water drainage, or onto uncontaminated soil. While improper spill containment was not identified as a factor in this particular incident, the incident is a reminder of why containment is important.



What Can You Do?

- Conduct flammable-material container filling operations in areas that have been properly designed for this service. This would include, for example:
 - adequate fire protection facilities
 - separation of equipment, fire walls and fire-rated doors
 - spill containment
 - proper electrical classification of all equipment.
- Be sure that there is proper spill containment around any containers that you are filling. The spill containment must be liquid-tight, made of a material appropriate to contain the liquid being handled, and of sufficient size to contain a spill that could occur.
- Conduct a management-of-change review for any unusual operations that involve filling of containers in areas not originally designed for that purpose, and be sure to consider ignition source control, fire protection, and spill containment in this review.

A REVIEW

- We have done three Beacons (December 2008, January 2009, and this issue) on a single incident that occurred while filling containers with a flammable liquid. When filling containers or other vessels with flammable liquids, you should consider these safe design features:
 - bottom filling
 - grounded/bonded equipment
 - spill containment
 - inert gas in the vapor space (nitrogen or carbon dioxide, for example)
 - liquid inlet velocity controlled until dip pipe is covered
 - some type of emergency shutoff
 - sprinkler system, or other fire-protection system
 - other features as required by codes and standards for the safe handling of flammable liquids.

Fill flammable liquid containers in properly designed areas!

AIChE © 2009. All rights reserved. Reproduction for non-commercial, educational purposes is encouraged. However, reproduction for the purpose of resale by anyone other than CCPS is strictly prohibited. Contact us at ccps_beacon@aiche.org or 646-495-1372.

The Beacon is usually available in Afrikaans, Arabic, Chinese, Danish, Dutch, English, French, German, Gujarati, Hebrew, Hindi, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Marathi, Persian, Polish, Portuguese, Russian, Spanish, Swedish, Tamil, Thai, Turkish and Vietnamese.

Circle 103 on p.59 for a free electronic subscription to the Beacon.