

Still Overflowing Tanks!

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Multiple tanks burning in the fire



Damage to the facility after the fire

The United States Chemical Safety Board (CSB) recently released the results of their investigation of a tank farm fire in a petroleum products storage facility in Puerto Rico on October 23, 2009¹. We have published a number of *Process Safety Beacons* on tank overflow incidents – for example, Sept. 2004, Sept. 2006, and Sept. and Oct. 2009. Notice that the last of these is the same month that the incident occurred in Puerto Rico!

The CSB report includes (Appendix B) a list of 22 major tank farm fires since 1962, and the list does not include all such events – the incident described in the 2009 *Beacons* was not included. It is interesting that 19 of the 22 incidents listed in the CSB report involved a tank overflow. With all of the complex operations going on in many process facilities, it is surprising that putting more material into a tank than will fit is a frequent contributor to major incidents.

Unreliable instruments, inadequate procedures, and the lack of independent overflow protection systems on storage tanks were some of the significant operational and technical causes of the Puerto Rico incident, and likely for many of the other similar incidents.

¹ <http://www.csb.gov/caribbean-petroleum-refining-tank-explosion-and-fire/>

Did you know?

- Although the operations in your storage tank farm may not seem to be very complex, they may actually be more complicated than you think. There may be many interconnections between tanks, you may have to put material in tanks that are already part full, or divide incoming material among several tanks.
- Your tank farm probably contains the largest inventory of hazardous material in your plant. If an incident occurs it is likely to be large.

What can you do?

- Never underestimate the consequences of overflow of flammable, combustible, or toxic material from a tank!
- Read the “What can you do?” sections of the 9/2004, 9/2006, 9/2009, and 10/2009 *Beacons*. These are posted on line (scroll through the file to find your language, if available):
 - 9/2004 - <http://www.aiche.org/ccps/resources/process-safety-beacon/200509/english>
 - 9/2006 - <http://www.aiche.org/ccps/resources/process-safety-beacon/200609/english>
 - 9/2009 - <http://www.aiche.org/ccps/resources/process-safety-beacon/200909/english>
 - 10/2009 - <http://www.aiche.org/ccps/resources/process-safety-beacon/200910/english>

Stop tank overflows!

Questions:

1. **(10 min)** List two measures that could have been taken to prevent the 2009 CAPECO incident. You may find helpful the full CSB [incident report](#).
2. **(5 min)** *What did you learn?*
What lessons have you learned about storage tank safety and protocol, the impact of tank overflow, and how you can apply this to your chemical engineering career to prevent similar disasters from happening?