

Refinery Fire at ExxonMobil

By: Christina Meyer

<https://www.csb.gov/exxonmobil-refinery-chemical-release-and-fire/>

Activity

In the ExxonMobil Refinery in Baton Rouge, Louisiana it contains a sulfuric acid alkylation unit. This unit contains a pipe that pumps isobutane. On November 22, 2016 maintenance was taking place on this unit.

Hazards

The Safety Data Sheet for isobutene notes the hazards of this material including:

- Extremely flammable gas
- May form explosive mixtures with air
- Contains gas under pressure; may explode if heated
- May cause frostbite
- May displace oxygen and cause rapid suffocation

Preventative Actions and Safeguards

When forming accepted practices around the site, ensure the appropriate safety hazard analysis is performed.

Contingency Action/ Mitigating Actions

The procedures that are being performed should be well written and taught to all those who will perform these actions.

Initiating Event

While performing maintenance, the operators attempted to open a valve on a spare isobutane pump trying to put the pump into service. In order to open this valve, you had to operate it by a hand wheel, which connects the gearbox containing the gears to make it easier to open and close the valve. The gearbox on this valve was not working properly and would not open the valve. The operators following the accepted practice removed the gearbox and the support bracket from the valve. The operators did not know that this valve was one of very few that was of the older design. This older design included an important piece of pressure-containing equipment called the top-cap. When the gearbox was removed, this left the top cap disconnected and the valve exposed to pressure increase. With the top-cap not being secured, the operators tried to open the valve with a pipe wrench.

Incident

Immediately this caused the valve to fail and come apart allowing pressurized isobutane escape from the valve. This isobutane release formed a flammable white vapor cloud, which found an energized welding machine close by. The cloud ignited resulting in a large fire. Four workers received severe burns.

Lessons Learned

Human factors should be taken into account with the equipment. A hierarchy of controls should be applied in order to mitigate the identified hazards. Detailed and accurate procedures should be implemented for all potentially hazardous work and the proper training should go along with these procedures.

