Process Safety Beacon
Messages for Manufacturing Personnel
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An AIChE Technology Alliance
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Effects from changes may take years to appear!

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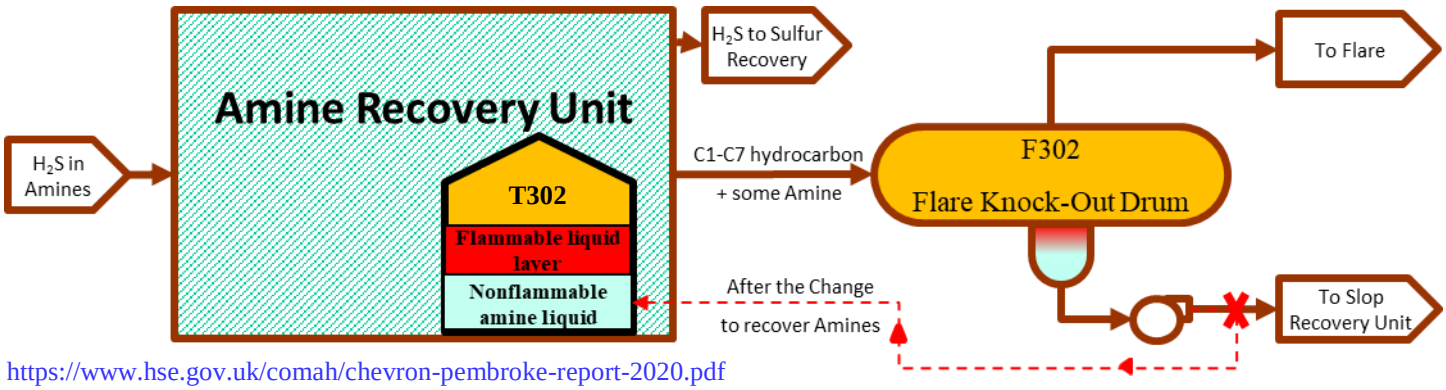

https://www.hse.gov.uk/comah/chevron-pembroke-report-2020.pdf

Fig 1. Original Flows. Some Amine lost to Slop Unit

On June 2, 2011, a tank exploded at a refinery in the United Kingdom (UK) which killed four contractor employees and seriously injured another. The force of the explosion blew the five-ton steel tank roof over 55 meters (180 ft.) and narrowly missed striking a pressurized sphere of highly flammable butane. The cause of the explosion was ignition of a flammable atmosphere within the tank. The probable ignition source was static electricity.

More than 10 years before the incident, the facility changed the Amine Recovery Unit (ARU). To recover and reuse amine contained in a waste hydrocarbon stream (slop) from the Flare Knockout Drum were rerouted back to Tank 302 in the ARU rather than to the slop system that was designed to safely dispose of the waste stream. The facility had not documented this practice. This change resulted in accumulation of flammable liquid hydrocarbons on top of the amine liquid in T302. Some operators were aware of this hazard because they periodically drained the flammable liquid from tank 302.

The tank was being cleaned in preparation for maintenance. Neither the details of the tank drain system, nor instructions for proper draining of the hydrocarbons were used when preparing the tank. A vacuum truck removing liquids through a manway at the top of Tank 302 when the explosion occurred. A non-conductive hose was connected to the vacuum truck which caused a static charge, the probable ignition source. The permit issued for the cleaning work did not include the presence of flammable liquids.

Did You Know?

- Management of Change (MOC) is included in all Process Safety regulations.
- Many of the biggest incidents in our industry have happened because a change had unintended effects on the process.
- Changes of all types - equipment, chemicals, technology as well as operating and maintenance procedures - require review and approval.

What Can You Do?

- Watch for changes to process flow routing and other conditions (pressure, temperature, composition, etc.) that might not get recorded either on drawings or in the procedures.
- Be alert to the impact of incremental changes. The effects of an unmanaged changes can be subtle and go unnoticed for a long time – even years.
- Follow your procedures for changes. Some companies have different systems to manage various types of changes.
- A procedure may be updated following a change. Read the procedure carefully and do not proceed until you understand how to do the task safely.

Any change to a process needs to be managed.