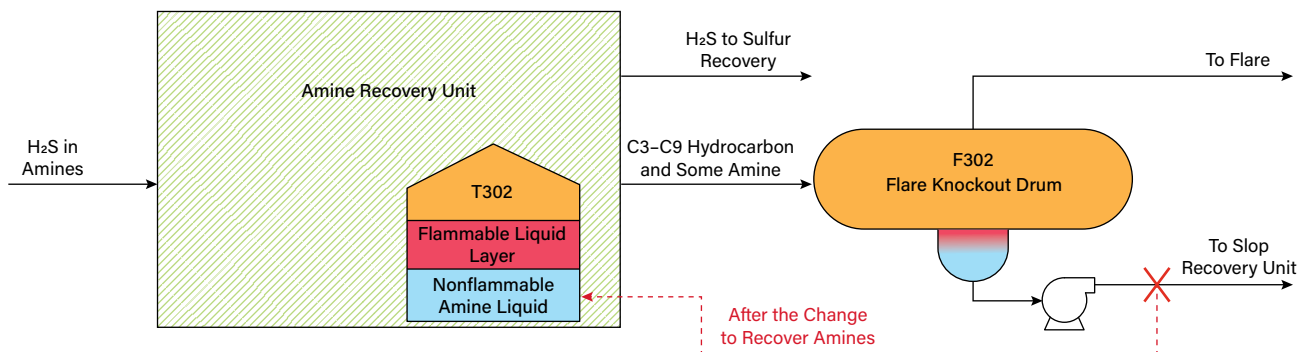


Effects from Changes May Take Years to Appear

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▲ A process change that rerouted a waste stream back to a storage tank (T302) was not documented, ultimately leading to a deadly explosion. Read the report for more details: www.hse.gov.uk/comah/chevron-pembroke-report-2020.pdf.

On June 2, 2011, a tank exploded at a refinery in the U.K., killing four people and seriously injuring another. The force of the explosion blew the five-ton steel tank roof more than 55 m (180 ft) and it 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 the amine in a waste hydrocarbon stream (slop) from the flare knockout drum. The slop stream was rerouted to Tank 302 (T302) 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 allowed flammable liquid hydrocarbons to accumulate on top of the amine liquid in T302. Some operators were aware of this hazard because they periodically drained the flammable liquid from T302.

At the time of incident, 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 was removing liquids through a manway at the top of T302 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 largest incidents in our industry have happened because a change had unintended effects on the process.
- Changes of all types require review and approval. This includes changes to equipment, chemicals, and technology, as well as operating and maintenance procedures.

What Can You Do?

- Watch for changes to process flow routing and other conditions (pressure, temperature, composition, etc.) that might not get recorded in drawings or procedures.
- Be alert to the impact of incremental changes. The effects of 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.