

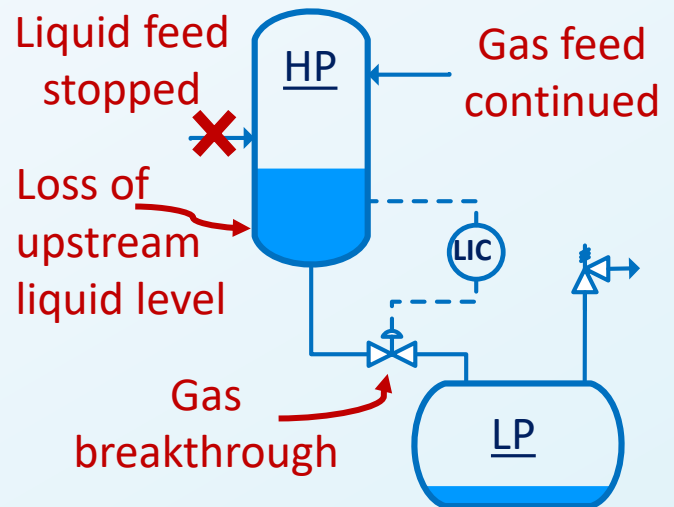
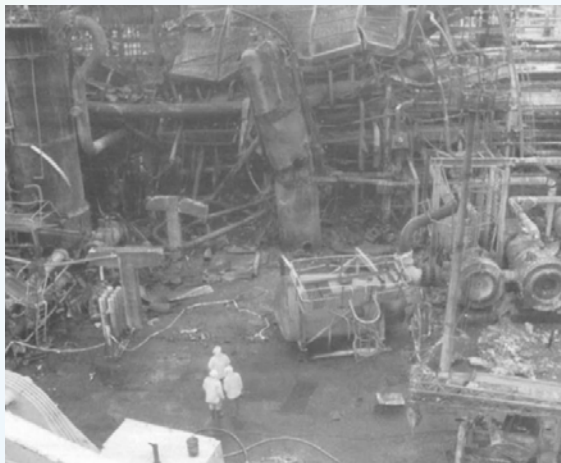
# Gas Explosion in a Cracking Unit

EPSC Learning Sheet February 2024



## What Happened:

During start-up of a Hydrogen Cracking Unit, the liquid level in the High Pressure (HP) separator disappeared. Gas breakthrough to the Low Pressure (LP) Separator caused over pressure and a rupture. The gas cloud ignited violently.



## Aspects:

- The low-level trip of the HP separator (to prevent gas breakthrough) was taken out of service, and the low-level alarm failed to go off, not informing the operator.
- The pressure relief device protecting the LP Separator was sized for fire, but not for gas flow from the HP Separator
- The upstream liquid seal can be lost even if liquid remains in the upstream vessel due to irregular liquid distribution
- During a HAZOP, be critical on changes in pressure design and unwanted flow from high to low pressure systems.

Evaluate overpressure due to gas breakthrough from HP to LP systems