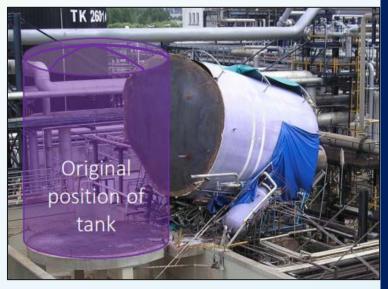
## **Explosion in a Tank**

**EPSC Learning Sheet April 2022** 

## What Happened:

A Sulfuric acid tank was emptied, aerated and prepared for inspection. During removal of rusted bolts of a cover on the tank roof using a grinder, an explosion occurred. Hydrogen had collected under the tank roof.



**FPS** 

## Aspects:

- Concentrated Sulfuric acid with some water becomes very corrosive for carbon steel and generates hydrogen: H<sub>2</sub>SO<sub>4</sub> + Fe → H<sub>2</sub> + FeSO<sub>4</sub>
- Measuring the presence of flammable gas was done at the manhole (entry) at the bottom of the tank. The explosive mixture (hydrogen/air) however accumulated under the dome at the top of the tank.
- Hydrogen in air has a very wide explosive range, it has a very low ignition energy at stoichiometric concentration and leads easily to a violent deflagration or detonation upon ignition. Assure top venting of acid tanks that are prepared for maintenance and inspection.

Avoid accumulation of hydrogen at high locations.

Hydrogen can accumulate at high locations forming an unexpected explosive mixture

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