

Corroded Tanks Are Dangerous

A tank containing spent sulfuric acid (and some hydrocarbon) from a refinery alkylation process exploded in 2001 (Photo 1), injuring eight and killing one person. Some of the spilled sulfuric acid flowed into a nearby river, causing environmental damage.

Contractors were repairing a platform in the tank farm when the explosion occurred. A spark from the hot work ignited the flammable vapors in the tank. The tank was significantly corroded, and leaks had been found each year over several years. Each reported leak was repaired, except for one discovered a few months prior to the incident. At the time of the incident, several holes in the roof and shell of the tank had not been reported. However, an operator did file an unsafe condition report a few weeks before the explosion. A hot-work permit had been rejected previously because of high flammable vapor concentration, and management had not taken corrective actions.

A fatal incident at a different refinery in January 2016 was also caused by tank corrosion. During the evening shift, an operator went to a tank farm to manually measure the temperature and level in several tanks containing hot oil (Photo 2), which required him to climb to the top of the tanks.

The operator did not return for some time and did not respond to radio contacts. Concerned colleagues went to the tank farm to investigate. They found the operator's vehicle parked at the tank farm and a large hole in the top of one of the tanks (Photo 3). The tank was emptied and the body of the missing individual was discovered inside the tank. He had fallen through the hole into the tank. The tank roof was found to have severe internal corrosion, and it failed when the operator stepped onto the top of the tank.



◀ **Photo 1.** A spark from hot work ignited vapors leaking from this spent sulfuric acid tank.



▶ **Photo 2.** The operator had to climb on top of these hot oil tanks to conduct the monitoring task.



◀ **Photo 3.** When the operator stood on the corroded roof of the tank, it gave way and he fell inside.

Did you know?

Corrosion of tanks and other equipment can be dangerous for many reasons:

- Holes in tanks can allow toxic or flammable vapors to escape into the surrounding environment.
- Corrosion can weaken tanks, pipes, or other equipment so much that the equipment can fail under normal operating conditions.
- Equipment that is severely corroded may be structurally weakened. A tank top may not be able to support weight, pipes may weaken and break, and equipment supports or building structural steel can collapse.

What can you do?

- Report holes in tanks or severe corrosion to management. If there is no action to correct the problem, don't give up. Escalate the concern if necessary.
- Don't ever walk or climb on equipment that is not intended for that purpose. Do not walk or climb on anything if there are visible signs of corrosion; it might not support your weight.
- Report corrosion of piping, pipe supports, vessels, equipment supports, ladders, stairs, work platforms, building structural steel, or any other critical equipment.

Report corroded equipment and holes in tanks!

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