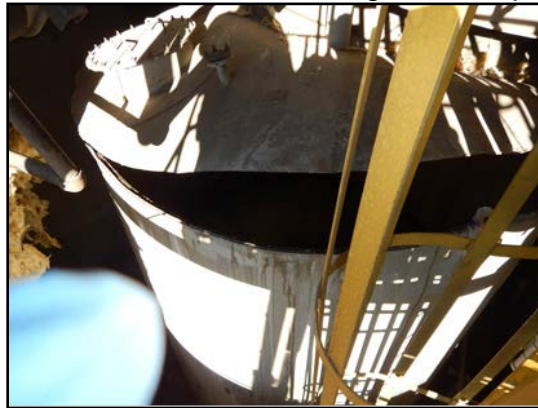


METAL / NONMETAL Serious Accident Alert

Surface – Copper Ore Molybdenum Recovery Circuit – On November 3, 2016, an explosion occurred when incompatible chemicals were mixed in a tank. A miner unloaded a truckload of sodium hydrosulfide (NaHS) solution into a chemical storage tank that contained calcium polysulfide (CaPS) solution. NaHS and CaPS are hazardous chemicals that give off hydrogen sulfide (H₂S), a flammable and toxic gas that produces a “rotten-egg” odor. The operator had installed a charcoal filter on the tank’s vent line to control the odors. When these chemicals came into contact in the tank, an explosive concentration of H₂S gas was liberated. The concentration of H₂S exceeded the filter’s capacity, resulting in a chemical reaction generating enough heat to ignite the filter. H₂S vapors in the tank ignited causing a violent explosion damaging the tank, surrounding area, and building. This accident occurred because the operator changed its processes, which resulted in the mixing of incompatible chemicals.



BEST PRACTICES

- Prior to implementing a process change, such as the introduction of a new chemical, thoroughly evaluate hazards, including chemical compatibility and reactivity.
- Establish procedures for the safe handling and storage of chemicals, ensuring chemical compatibility with the process and equipment.
- Equip chemical storage tanks with properly-designed pressure relief devices that are safely vented.
- Ensure that chemical filters and scrubbers are properly designed and rated for the intended application.
- Conduct continuous H₂S monitoring in areas where it may be liberated.
- Do not use pressurized air to off-load NaHS solution.
- Train miners on chemical hazards and emergency response procedures.
- Use proper personal protective equipment during chemical handling.
- For additional safe practices and precautions when handling NaHS, refer to the U.S. Chemical Safety and Hazard Investigation Board’s Safety Bulletin No. 2003-03-B (November 2004) <http://www.csb.gov/assets/1/19/SodiumHydrosulfideBulletin.pdf>



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