

H₂S Gas Release During Ultrasonic Tank Neutralization

Description

On June 18, 2026, a P&V crew at the CEDA Nisku Shop transferred approximately 2,700 L of hydrochloric acid (HCl) into the ultrasonic dip tank to neutralize spent solution for disposal. During the transfer, the HCl reacted with iron sulfide contaminants in the tank, releasing hydrogen sulfide (H₂S) gas. The building's fixed gas monitoring system detected the H₂S and triggered the building alarm, notifying the local Fire Department.

Immediate Actions Taken

- Employees silenced the alarm, believing it was related to previous false alarms. Once notified that the fire department had been dispatched, employees evacuated and froze the scene.
- Emergency responders arrived on scene and assessed all crew members; no injuries or symptoms of exposure were reported. Emergency responders detected approximately 150 ppm H₂S outside the building.

Findings

- The tank transfer pump was used instead of the recommended diaphragm pump, increasing the transfer rate.
- The potential for H₂S was not communicated to the crew or identified through the Hazard Identification & Risk Assessment (HIRA) process:
 - A task-specific Job Hazard Analysis (JHA) and written neutralization procedure were not in place.
 - Atmospheric monitoring requirements were not established.
 - Verbal guidance was provided to transfer "slowly", rather than defining the required transfer rate through an approved procedure.
 - Following CEDA's HIRA Practice as intended would have provided an opportunity to identify the H₂S hazard and implement appropriate controls, potentially preventing this event.
- The Management of Change (MOC) process was not completed when the ultrasonic tank was acquired and commissioned, and ownership of the neutralization task was not defined between Pressure & Vacuum and Chemical Cleaning
- Repeated nuisance alarms had eroded confidence in the fixed gas detection system, resulting in the alarm and odour not being treated as stop-work triggers.
- Required H₂S training was outstanding for two of the leaders involved.

Corrective & Preventative Actions

Engineering & System Modifications:

- Install an emergency dump line from the ultrasonic tank to the 400-bbl tanks.
- Add valving to the ultrasonic tank connections and permanently blind all unused piping connections.

Process & Documentation:

- Develop a written neutralization procedure and revise the Site HSE Plan, JHA, and Emergency Response Plan to include task-specific hazards and controls.
- Implement the MOC process and define responsibilities in the organizational chart
- Develop a preventative maintenance schedule based on manufacturer's recommendations.

Training & Competency:

- Develop base training and competency evaluations for P&V tank operation and Chemical Cleaning neutralization.
- Introduce a foulant check sheet for each item entering the tank before neutralization.
- Complete ERP drills covering all shop alarm types.

For further information, please contact your regional HSE Advisor or hse@cedagroup.com.