

GEM HSSE Communication

Small Explosion Near Miss



Incident: Near Miss
Location of Incident: Missouri
Date of Incident: February 26, 2004
Time of the Incident: 10:00 am

Anyone who operates and maintains downhole hydrocarbon recovery pumps should carefully read and understand this near miss and take precautions to avoid such occurrences. Our downhole electric pumps are often suspended by cables. In addition, recovery of hydrocarbons can create conditions in these areas above the lower explosive limit.

Brief Account of Incident:

BP operates and maintains several remediation systems at a former Amoco refinery site, including an interceptor trench system that collects hydrocarbon-impacted ground water near the boundary of the site. Using submersible pumps, recovered ground water is pumped from a series of collection sumps. The sump where the incident occurred is located within the fenced BP property boundary and is adjacent to a public roadway within city limits. The collection sump, pump, and float controls are all enclosed within a concrete vault covered by a concrete cover. A hinged, gasketed lid in the cover allows access to the sump and prevents odors from escaping from the sump into the neighborhood.

During routine daily inspections, it was discovered that the concrete cover to the sump vault had been displaced and was laying upside down beside the vault. Apparently, a spark had ignited vapors within the enclosure, causing a small explosion that had displaced the lid. No one was injured, and there were no signs of a fire associated with this incident.

Root Cause:

Each time the pump started, the small torque caused the electric wire to rub against the steel cable suspending the pump. This eventually exposed the wire.



Photo showing displaced sump cover.

Actions:

1. Implemented a procedure requiring power to be disconnected during inspections of the sump interior, so possible injuries due to sparking during inspection will be eliminated.
2. Implemented a procedure to regularly inspect equipment and power cables.
3. Changed placement of pump and cables, and replaced power cable with more abrasion resistant material.

What went well:

1. No injuries were sustained from the incident.
2. The onsite crew reacted quickly to respond, report the incident, and repair the minor damage.

Lessons Learned:

1. Placement of pumping equipment within sumps and recovery wells is critical and should be carefully evaluated.
2. Periodic inspection of equipment and power cables is essential and can prevent electrical hazards from developing.