SAFETY ALERT - #02 - 2009

IGNITION OF GASES TRAPPED IN STEEL SUPPORT PILINGS

RELEASE DATE: APRIL 3, 2009

Function: Construction Hazard	**Incident Date:** June 4, 2008/Feb 10, 2009
Location: Onshore	**Location Detail:** Gas Plant
Incident Type: Fire / Explosion Causing Injury	**Country and Region:** Canada, N & S Alberta

Summary:

In two separate incidents, electricians were burned when hydrocarbons trapped inside the steel pipe piling ignited while the workers were drilling holes into the piling to install ground connectors.

Description of Incident:

Incident A – June 4, 2008: As the worker came close to drilling a hole through the pile, he heard a pressure release from the pile. He stopped drilling and proceeded to use his personal gas monitor to check for combustibles. When hazardous gases were not detected, the electrician continued drilling. Once the drill bit broke through the remaining steel of the pile, the captured gas within the piling ignited causing 1st degree burns to the worker's wrists.

Incident B – Feb 10, 2009: An electrician was drilling a pilot hole through a steel pile to attach a grounding connector. Once the hole was completed, the bit was removed releasing trapped gases. The heat from the drill bit ignited the gas being emitted and burned the right leg of the journeyman's coveralls as well as the hair on one of his hands. The piles were recycled flare piping containing a hydrocarbon residue. Prior to the incident, another pile was drilled without incident.

Hazard Identification and Control Recommendations:

A detail review of the incidents concluded that there are several ways that hydrocarbon gases can become trapped in steel piles creating a potential fire and explosion hazard:

- Natural decomposition processes in muskeg areas that can generate methane gas.
- Piles located in hydrocarbon-contaminated soil.
- Residual hydrocarbons in used steel piles as a result of prior use.

Recommended control measures include the following:

- Ensure that all new piling installs are notched prior to install of top plate to ensure any trapped gases are vented. The same notch is to be used for monitoring for the presence of trapped gas.
- Ensure that probe-style gas monitors tools are available (tube samplers, etc) and used to confirm that there is no gas in the piling prior to beginning drilling or welding on the pile.
- Utilize equipment that is less likely to be an ignition source such as a pneumatic drill rather than an electric drill. Utilize cutting oil to reduce heat to the bit.
- Whenever working on a piling where the potential for trapped gas cannot be confirmed prior to commencing work, treat job as hot work. Implement appropriate hot work practices and PPE.

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