SAFETY ALERT - #16 -2009
Tank Fire Caused By Improperly Installed & Maintained Burner
RELEASE DATE: SEPTEMBER 10, 2009

Function: Production Operations	**Incident Date:** May 2009
Incident Type: Fire and Explosion Hazard	**Country and Region:** Western Canada

Summary:

A tank fire occurred as a result of a flashback caused by an improperly installed and maintained tank burner.

Description of Incident:

While attempting to unload approximately 5 m^3 of oil into a storage tank on location, a fire occurred at the bottom of the tank. The fire quickly spread to the top of the tank. The tank was equipped with a fired heater and flame arrestor. The fire extinguished itself.

An inspection of the flame arrestor and truck unloading procedure was undertaken. The investigation revealed:

- A gasket was not used on the flange connection. Silicone was used to attempt a seal between the flanges; however, it was not effective.
- Bolt holes in the housing were ground-out resulting in potential leaks

Silicone Seal

Ground-Out Bolt Holes

Other deficiencies found during follow-up inspections include:

- The coil inside the flame arrestor was undersized thus not sealing adequately.
- The retaining ring in the flame arrestor housing, which the back of the coil sits against, was not sealed to the housing
- Some of the burner tube flanges which the flame arrestor bolts secured were home-made and not flat resulting in an inadequate seal.

SAFETY ALERT - #16 -2009
Tank Fire Caused By Improperly Installed & Maintained Burner
RELEASE DATE: SEPTEMBER 10, 2009

We Can Prevent Future Incidents:

This incident reinforces two important issues related to gas-fired equipment:

Design and Installation

Alberta, British Columbia and Saskatchewan have experienced issues with gas installations at oil field sites where the safety of operators and workers has been compromised. Investigations have revealed that current practices for installations have fallen short of the minimum requirements of the CSA B149 Gas Code. As a result, efforts are taking place in all three provinces to increase the enforcement of these requirements and ensure that a reasonable approach to enhancing the safety of gas burning installations at oil field sites.

Owners and operators can find relevant information on regulatory requirements for gas installations at oil field sites through the following documents:

Alberta: Alberta Municipal Affairs (Gas Safety Variance VAR-GAS-05-05 [Rev 2])

British Columbia: BC Safety Authority Gas Program (MAN-4014-00)

Saskatchewan: SaskPower Gas Inspections (Bulletin 05-2007)

Inspection & Servicing of Burners and Other Gas Fired Equipment:

All flame arrestors require regular and thorough inspections as per manufacturer specifications. As a result of this incident, the owner developed and implemented detailed operating and maintenance instructions including a flame arrestor inspection checklist. Related observations are:

- The owner submitting this alert discovered that numerous flame arrestors are failing the flashback test even after regular maintenance. Flashback testing may be required to ensure that the burner and flame arrestor are operating safely.
- API RP 12N provides a procedure for completing flashback testing of flame arrestors.
- Issues with the pilot and burner adjustments are indicating possible over-firing of the burners. Optimizing their performance can result in a reduction of fuel utilized.

Failed Flashback

Additional guidance on this issue is available in the following documents:

WorkSafe Alberta: SH014 - Safe Operation of Fired Equipment in Hazardous Locations

CAPP Guide: Industry Recommended Practice for Upstream Gas-Fired Equipment Requirements

CSA Standard: CSA B149.3-05 Code for the Field Approval of Fuel-Related Components

Contact:
Email: safety@enform.ca