

# Worker struck by piping – N<sub>2</sub> release (Hydraulic Fracturing)

**SAFETY ALERT**

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### Enform

Enform is the health and safety association for Canada's upstream oil and gas industry. We provide leading health and safety training, programs and services, touching the lives of hundreds of thousands of workers each year. We are dedicated to the continuous improvement of safety with a vision of eliminating work-related incidents or injuries in the upstream oil and gas industry.

### An Industry Product

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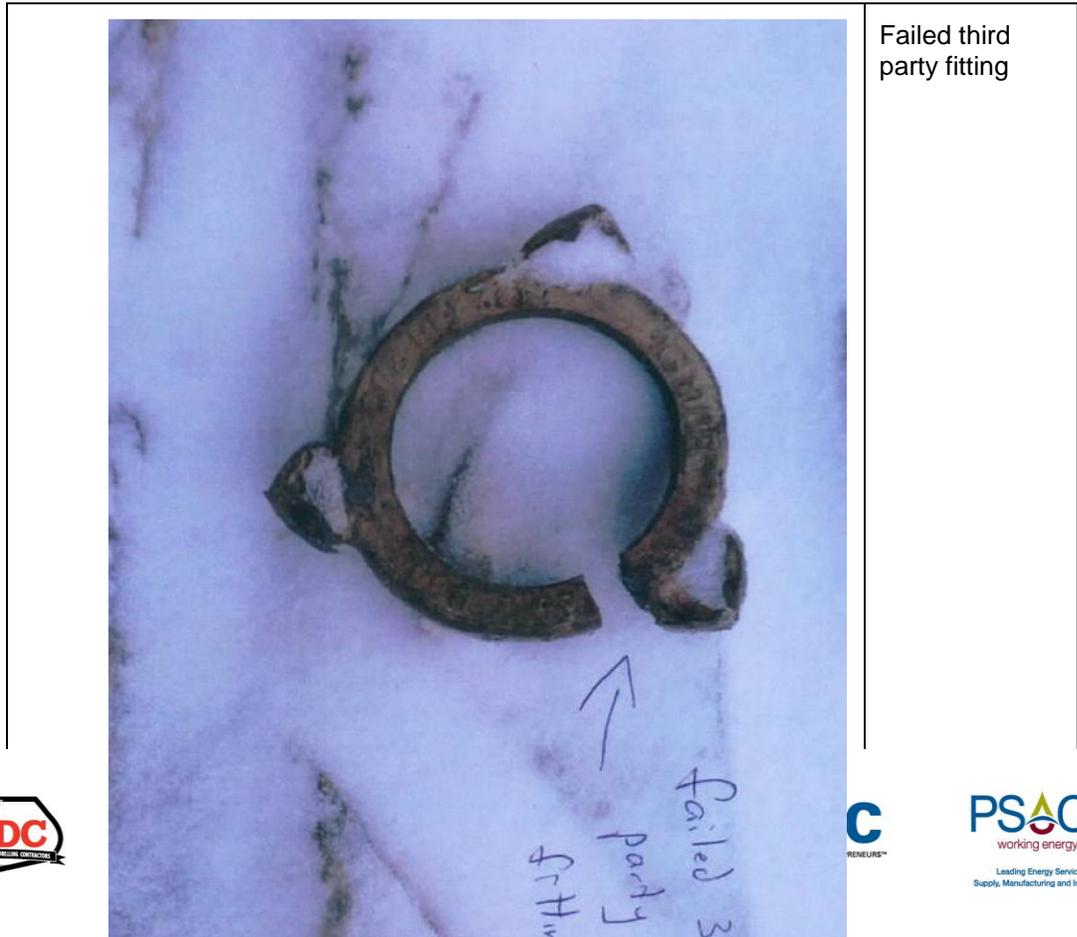
For more information on this event,  
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### Description of Incident:

A coil rig was being purged with nitrogen through the frac manifold at the end of a job. 2.7 E3M3 of nitrogen was purged through the manifold, coil, and out to the flow back tank. Nitrogen was confirmed at the flow back tank. The nitrogen truck was then disconnected at the manifold, and the nitrogen pumping iron was depressurized and rigged out.

The coil operator informed the frac supervisor that pressure was building on the back side. At approximately the same time the frac employee noticed a leak on the third party flow back iron hammer union (see photo below). During this time, the frac employee who was at the manifold notified all workers to leave the area and attempted to bleed down at the manifold.

Prior to attempting to depressurize at the manifold, the third party hammer union failed on the flow back line, causing the frac iron to swing around and strike the worker in the right leg. All workers on site met at the muster point where a head count was taken. The injured employee was then removed from the area and transported by paramedics to the nearest hospital.



Failed third party fitting

By industry, for industry

## What Caused It:

The root cause was a failed flow back hammer union. At no time did the pressure on the piping exceed maximum allowable working pressure (MAWP) of the frac iron or the flow back iron. Post incident, the hammer union was inspected and found to have a pre-existing crack beside one of the nuts on the union. The cracked portion of the union was noticeably rusted indicating it has been like that for quite some time.

## Corrective/Preventive Actions:

Investigation provided the following recommendations:

- All frac iron was removed from service and sent in for recertification.
- Iron restraints were taken out of service and visually inspected.
- Amendment to ERP section of the safety manual. Release of N<sub>2</sub> or energized fluid will constitute an emergency. No worker will enter the “hot zone” in the event of an N<sub>2</sub> leak.
- Development of a safe operating practice of not purging coil through the frac manifold. Elimination of frac equipment removes the risk of worker exposure.