



Worker crushed by hydraulic equipment

January 19, 2020

The contents of this report

This document reports the Alberta Occupational Health and Safety (OHS) investigation of a fatal incident that occurred in January 2020. It begins with a short summary of what happened. The rest of the report covers this same information in greater detail.

Incident summary

A worker sustained fatal injuries when crushed by hydraulic equipment on a drilling rig at an oilsands mine north of Fort McMurray, Alberta.

Background information

Prime contractor

Syncrude Canada Ltd. (Syncrude) was incorporated in 1964 and began operations 40 kilometres (km) north of Fort McMurray in 1978. Syncrude operated a large oilsands mine, utilities plant, bitumen extraction plant and upgrading facility that processed bitumen into lighter petroleum products for use domestically and for export. The Aurora Mine site was located 75 km north of Fort McMurray and began operating in 2001. Syncrude employed approximately 4700 people at the time of the incident.

Employer

Cross Borders Consulting Ltd. (Cross Borders) was a family owned and operated drilling company established in 1956. Cross Borders was an oil and gas drilling company that was registered as an Alberta corporation in 2006 and provided geotechnical and environmental services such as in-situ testing, auger drilling, sonic drilling, mud rotary, and air rotary drilling.

On August 24, 2016, Syncrude and Cross Borders entered into a contractual agreement for drilling services.

Cross Borders had 150 employees and was drilling for core samples at Syncrude Aurora in the overburden area at the time of the incident.

Floor-hand

The Floor-hand was hired in October 2018 by Cross Borders as a Sonic Rig Floor-hand. The Floor-hand was signed off as a competent operator of the rod handler in December 2018 and was performing that role at the time of the incident.

Driller

The Driller had been employed by Cross Borders Drilling since 2017. The Driller had four years of sonic drilling rig experience and was the leader of the crew on duty at the time of the incident. The Driller was the first witness on scene following the incident.

Work site, equipment and materials

Rod handler

The Bohrmeister rod handler, model BM100RH-RM, was used as a hands-free method of delivering lengths of pipe (rod) to the drill head assembly of the sonic rig. The lengths of pipe were held in a rotating pipe carousel and delivered to the drill head assembly by a rod clamp that was hydraulically controlled by an operator known as a Floor-hand.

Using the operator's controls, the Floor-hand would rotate the carousel and drop a pipe onto the lifting skirt that included rollers that would advance the pipe towards the clamp. The clamp was then moved in against the carousel to facilitate attachment of the clamp to the pipe.

The pipe clamp contained jaws that could be opened or closed using the rod handler hydraulic controls to either grab or release a section of pipe. Once the jaws were closed onto the pipe, the Floor-hand would extend the clamp away from the carousel and rotate the clamp 90° to the vertical position.

The pipe was then vertical, and the Driller would thread the drill head to the far end of the pipe. The clamp jaws of the rod handler were then opened to release the pipe, and the Driller then proceeded to add that section of pipe down hole. The Floor-hand would then return the clamp to the horizontal position and prepare to attach and deliver the next section of pipe to the Driller.



Figure 1. Bohrmeister rod handler. Image provided by Google Images.

- A. Pipe/rod
- B. Carousel housing
- C. Lifting skirt
- D. Pipe clamp

Sequence of events

On January 18, 2020, the Driller and Floor-hand conducted a pre-use inspection for the rod handler and completed the associated documentation. Under the pipe handler tripping out section of the form, point six, the crew mentioned that the advance of pipe to the clamp was not functioning with a comment that the *“gears are stripped won’t rotate”*. The Supervisor co-signed the document.

On January 19, 2020, the night shift crew arrived for their shift on Sonic Rig 701, at 6:45 p.m. The crew included a Driller, Floor-hand, and Derrick-hand.

The night crew began work that night with the task of tripping rod out. This entailed attaching the drill head to the pipe that had been previously drilled into the bore hole and removing it from the ground. The removed pipe was then taken by the rod handler and returned to the rod handler carousel.

Upon completion of tripping out activities, the Driller discovered that the core barrel was not attached to the bottom of the last section of drill pipe. The Floor-hand and Driller commenced tripping pipe back into the hole to retrieve the missing core barrel. This process entailed removing pipe from the rod handler with the pipe clamp assembly and delivering the pipe up to the drill head where it could be drilled down hole. During this activity, the Driller left the driller’s controls and went to the core shack to ask another worker to complete a field level hazard assessment for the upcoming task of a rig move. The Floor-hand stayed on the rig floor and continued to work, using the rod handler to have pipe in position for the Driller upon their return.

As the Driller was returning from the core shack (approximately 20 metres away), they heard the Floor-hand yell. The Driller hurried to the rig floor and upon arrival saw the Floor-hand facing away from them, pinned between the pipe clamp and the carousel of the rod handler.

The Driller also noticed that the rod unloading from the carousel was crooked (Figure 2) and that the Floor-hand’s knee was stuck on the telescopic arm control lever that moved the clamp in towards the carousel (Figure 3). The Driller moved the Floor-hand’s leg off the telescopic arm control lever and released the pressure on the Floor-hand’s back by pulling the lever and retracting the pipe clamp away from the carousel.

The Floor-hand then fell to their knees. The Driller used a cell phone to call for help. At that time the Floor-hand was conscious but soon began to fall in and out of consciousness while waiting for emergency services personnel to arrive.

Emergency Services arrived at the remote incident location about a half an hour later. The Floor-hand was pronounced deceased enroute to the hospital.



Figure 2. Sonic Rig 701, rig floor.

- A. Drill head
- B. Jammed rod
- C. Pipe clamp
- D. Pipe (mostly drilled down hole)



Figure 3. Rod handler control levers.

- A. Telescopic arm control lever

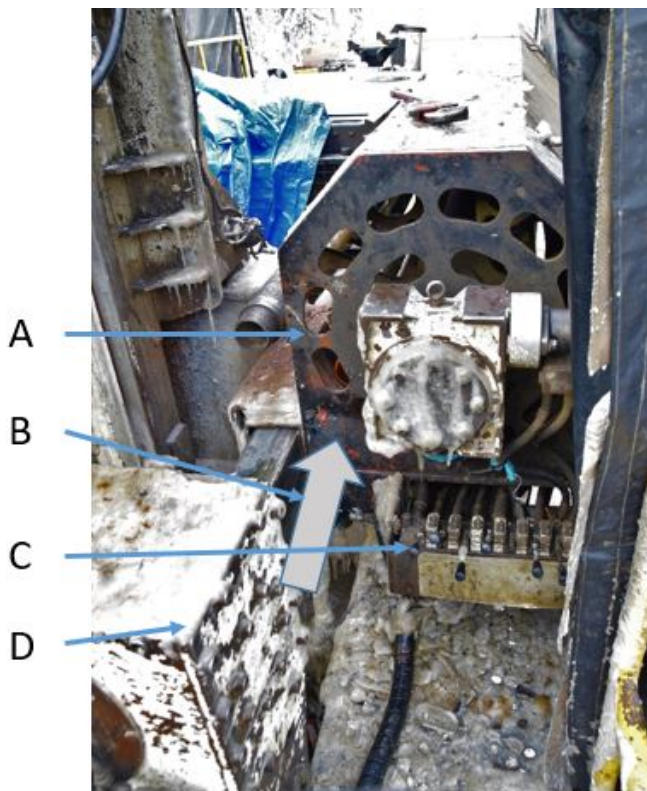


Figure 4. Rod handler work area.

- A. Crush point between rod carousel and rod clamp
- B. Arrow shows direction of travel for the rod clamp when lever (C) was pushed forward
- C. Telescopic arm control lever
- D. Pipe clamp

Completion

A review for enforcement action was completed on July 30, 2020, and it was determined that the file would be referred to Alberta Justice for review. The entire file was sent to Alberta Justice on November 20, 2020. Charges were laid on November 29, 2021.

Cross Borders Consulting Ltd. pled guilty to contravention of Section 3(1)(a)(i) of the *Occupational Health and Safety (OHS) Act*, for failure to ensure the safety of workers engaged in the work of that employer by preventing work using a broken, dysfunctional, or malfunctioning machine (or part of a machine). At sentencing on November 7, 2022, Cross Borders Consulting Ltd. was fined \$270,000, plus a \$54,000 Victim Fine Surcharge and placed on two years of enhanced regulatory supervision.

This investigation was completed on February 1, 2023.

Signatures

ORIGINAL REPORT SIGNED

Lead Investigator

January 31, 2023

Date

ORIGINAL REPORT SIGNED

Manager

February 1, 2023

Date