

Investigation Report
Worker Struck by Object
November 20, 2013

Final Report

The contents of this report

This document reports Occupational Health and Safety's (OHS') investigation of a fatal accident in November 2013. It begins with a short summary of what happened. The rest of the report covers this same information in much greater detail.

Incident summary

Workers were in the beginning stages of loading pipe onto a flat deck trailer via the use of a loader equipped with a fork attachment. While workers loaded and positioned the pipe, adjustments were made to a deck pin. During this adjustment, a piece of pipe rolled off the side of the trailer. One worker positioned on the ground near the front of the trailer, was struck by the pipe and was fatally injured.

Background information

Shaw Pipe Protection

Shaw Pipe Protection (Shaw) is part of Bredero Shaw, which is a division of ShawCor Ltd. Shaw specializes in products and services for the pipeline and petrochemical sectors. ShawCor has more than 70 manufacturing and service facilities in over 15 countries. Bredero Shaw is a manufacturer of pipe coatings for the oil and gas sectors and water industries. Workers associated with this incident were employees of Shaw.

Workers responsible for loading pipe, including the fatally injured worker, were part of a loading crew. These workers primary job task involved loading pipe of both varying length and diameter onto flat deck trailers. These work crews who load pipe usually consisted of three members; a loader operator (operates the loader), a tallyman (tracks linear pipe length and pipe count) and a swamper (labourer). Several of these crews operated simultaneously in different areas of Shaw's storage yard.

Two loading crews were associated with this incident. The crew who initially began to load the pipe (crew 1) and the assisting crew (crew 2). On this day Crew 1 had a fourth member; a recently hired worker who was on-site and participating in on-the-job training. This new worker was job shadowing the fatally injured worker. The fatally injured worker was hired in September 2013 and had participated in several of the employer's safety training courses and orientation.

Bailey's Welding & Construction Inc.

Bailey's Welding & Construction Inc. (Bailey's) is based in Drayton Valley, Alberta. Founded in 2002, Bailey's specializes in oilfield piping and structural welding. Bailey's also services other aspects of the oil and gas industry, including oilfield pipeline construction, oilfield facility maintenance and plant turnarounds.

Bailey's was at the Shaw pipe storage yard to pick up a load of 8.89 centimetre (cm) diameter by 19.81 metre (m) yellow jacket pipe (called yellow jacket due the colour of the protective coating).

Equipment and materials

Caterpillar 966F Loader

The heavy equipment referred to as a loader is described as a Caterpillar (Cat) Model 966F Loader, Shaw Pipe Unit # 11320 (Figure 1). This loader is equipped with a fork attachment and was the replacement loader being operated at the time of the incident.



Figure 1. Photo (looking north) identifying the replacement loader.

Caterpillar 966C Loader

The heavy equipment referred to as a loader is described as a Caterpillar (Cat) Model 966C Loader, Shaw Pipe Unit # 11309 (Figure 2). The loader is also equipped with a fork attachment. This was the initial loader used at the beginning of the job task, however was taken out of service as it had experienced a minor (unrelated to the incident) mechanical issue involving the parking brake.



Figure 2. Photo (looking northwest) identifying the initial loader.

Semi-Truck and Flat Deck Trailer

The semi-truck and flat deck trailer owned and operated by Bailey's (Figure 3).



Figure 3. Photo looking north identifying both the Bailey's semi-truck and flat deck trailer and the initial loader.

Deck Pins

The deck pin is a steel component that sits in the pin pockets of a flat deck trailer. Deck pins are used for various purposes, but are primarily used to temporarily prevent materials, especially pipe, from rolling off the sides of the trailer during the loading process. Deck pins used in this application have been wrapped in material similar to the coating found on the pipe that is being loaded. This wrapping was applied to the deck pin to prevent damage to the protective coating on the pipe (Figure 4).



Figure 4. Photo identifying a deck pin.

Yellow Jacket Pipe

This yellow jacket pipe (YJ) was 8.89 cm in diameter by 19.81 m in length. A typical load would require 27 lengths loaded on the base layer (Figure 5). Workers would tighten up the pipe between the deck pins via the use of dunnage (pieces of fiber board also referred to as ten-test). Having the base layer tight between the deck pins prevents the pipe from moving during the loading process. Once completely loaded, the yellow jacket pipe would be stacked in the shape of a pyramid.

Figure 5

Figure 5. Photo identifying yellow jacket pipe.

Sequence of events

On the morning of November 20, 2013 four workers employed by Shaw were tasked with loading a Bailey's flat deck trailer with several lengths of YJ.

Workers (crew 1) had begun to load the base layer onto the deck. The loaded YJ would rest on four bunk boards (pieces of wood that span the width of the trailer). Bunk boards keep loaded pipe from lying directly on the deck of the trailer which allows forklifts and other loading equipment to easily position their forks under the pipe.

Workers would typically load 27 of this YJ pipe on a standard flat deck. Workers identified the bunk boards associated with this tractor/trailer unit to be slightly shorter than the width of the trailer, preventing the 27 lengths from lying flat. To address the matter, the workers had decided to decrease by one the number of lengths of pipe that would make up the base layer. They would fill in the gap between the pipe and the deck pins with dunnage. Therefore, the base layer would consist of 26 lengths of YJ pipe. The 27th length of pipe remained on the deck, and was to become part of the second layer.

The base layer is an important part of the load. It is crucial that this layer is flat and snug between the deck pins. This allows the remaining layers to be easily loaded and stay in place prior to securement of the load. Five of the six deck pins were seated within their pockets on the trailer (two on either side at the front of the trailer, two on either side at the back of the trailer and one on the passenger side at the middle of the trailer).

As workers loaded the base layer, the loader operator encountered a minor mechanical malfunction with the parking brake of the unit # 11309. The operator removed the unit from service and parked it away from the work area.

Nearby, a second work crew, consisting of three workers, had just completed loading their third load of the day. This second crew (crew 2) radioed the yard supervisor for direction on what to do next as they had completed loading their trailer. They were asked to go over and assist crew 1 because their forklift's parking brake had malfunctioned.

As the two crews joined up, the loader operator of crew 2 maneuvered his loader (Unit # 11320) into position. The next step in the loading process would be to 'square up' the lengths of pipe. Squaring up the pipe is performed to even up lengths of pipe as they sit on the trailer and make any over-hang parallel to the back end of the trailer.

The tallymen from both crews discussed the base layer. It was now determined that rather than having a base layer of 26 lengths of pipe, they could extend the width of the bunks via the use of wooden timbers and dunnage. This would maintain the original plan of loading 27 lengths of pipe to make up the base layer.

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The tallyman from crew 1 observed that the rear deck pin on the trailer's driver side was not seated within the pin pocket as well as it could have been. The Tallyman made a motion to adjust the deck pin. This worker pushed a length of pipe away from the deck pin with one hand and began to re-position the deck pin with their other hand.

The loader operator from crew 2 then maneuvered Unit # 11320 into a position near the rear of the load (on the driver's side). The loader operator then positioned the loader's fork in a manner that would raise the pipe the tallyman was pushing up and out of the way. The loader operator slightly lifted the end of the pipe, which provided assistance to the tallyman and gained better access to re-adjust the rear deck pin. As Unit # 11320 sat stationary in this position, the tallyman began to adjust the pin.

As the tallyman attempted to adjust the deck pin, the deck pin came out of the trailer pocket. With the deck pin no longer in the pocket restraining the pipe at the rear end of the trailer, the pipe moved. A length of pipe partially rolled off the rear of the trailer, however a portion of the same length of pipe remained on the trailer as it was restrained by the trailer's driver's side front deck pin. The driver's side middle deck pin had not been inserted. This pin is routinely removed while loading the base layer, as it could impede the loader's ability to access, load and clear the side of the trailer. The tallyman from crew 2 was positioned near the middle of the trailer and was prepared to install the driver's side middle deck pin.

As the pipe rolled off the rear of the trailer, the tallymen from both crews moved away from the trailer and the falling pipe.

The length of pipe that fell from the rear of the trailer struck the ground resulting in the opposite end of the pipe rising high enough to clear the height of the trailer's driver's side front deck pin. The falling pipe struck swamper 1 from crew 1 who was positioned near the front of the trailer.

All workers from the two loading crews immediately attended to the injured worker, provided first aid and summoned Emergency Medical Services (EMS) by dialing 911. Tragically the injuries the worker sustained in this incident were fatal.



Figure 6. Photo (looking south) identifying the incident scene.

- A. Approximate location of where the fatally injured worker was standing.*
- B. Area where the driver's side rear deck pin was located prior to adjustment.*
- C. Identifies the driver's side rear deck pin.*

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Completion

Alberta Justice conducted a preliminary screening on February 26, 2014. On December 19, 2014 Alberta Justice determined the case did not support any charges under the Occupational Health and Safety Legislation.

Signatures

Original Report Signed

March 30, 2015

Lead Investigator

Date

Original Report Signed

March 30, 2015

Manager

Date

Original Report Signed

March 31, 2015

Director

Date