

Investigation Report

Worker Fatally Injured When Struck
and Run Over by Skid Steer Loader

January 20, 2014

The contents of this report

This document reports Occupational Health and Safety's (OHS) investigation of a fatal accident that occurred in January 2014. It begins with a short summary of what happened. The rest of the report covers this same information in greater detail.

Incident summary

A labourer was using a skid steer loader (loader) to transport a portable breathing air cylinder cart (air cart) to the designated cylinder filling area. While operating the loader near the cylinder filling area, the labourer struck the safety technician with the suspended air cart. The labourer drove over the safety technician with the loader, causing fatal injuries to the safety technician.

Background information

Newcart Contracting (1993) Ltd. (Newcart) is a 100% Canadian owned company located southeast of Rocky Mountain House, Alberta. Newcart provides specialized oil and gas facility construction, maintenance, repair, and safety services in Alberta, British Columbia, and Saskatchewan. In January 2014, Newcart employed sixteen full time employees and a varying number of contractor employees, depending on project activities.

Prestige Safety Services Ltd. (Prestige) is a Red Deer based safety consulting company (consultant), in operation since June 2013. The consultant began providing health and safety consulting services to Newcart on December 20, 2013. The consultant was working in the consultant's Newcart office at the time of the January 20, 2014 fatality.

The Newcart safety technician (safety technician) commenced working for Newcart on March 19, 2010. The safety technician was primarily self-directed in the safety technician's work, and was responsible for maintaining an inventory of safety equipment used by Newcart workers at oil and gas facility projects.

Prior to working for Newcart, the safety technician had acquired approximately 10 years of experience in the oil and gas industry. In 2009, the safety technician completed Advanced First Aid certification through the Canadian College of Emergency Medical Services.

The Newcart labourer (labourer) commenced working for Newcart on March 19, 2010, and was the common-law spouse of the safety technician. The labourer spent most of the labourer's working hours on oil and gas facility construction, maintenance and repair projects, away from the Newcart yard. When not working on projects, the labourer spent most of the labourer's time at the Newcart yard, assisting the safety technician with the safety technician's duties.

Prior to working at Newcart, the labourer had acquired approximately 13 years of experience in the mining and oil and gas industries. During this period the labourer also operated powered mobile equipment including excavators, loaders, graders, bulldozers and haul trucks. In 2009, the labourer completed Advanced First Aid certification through the Canadian College of Emergency Medical Services.

Equipment and materials

Bobcat S250 skid steer loader (loader) with trailer hitch (stinger) attachment

The loader was purchased in 2009 and was used for maintaining the Newcart equipment storage yard, for snow removal, and for moving equipment and trailers around the storage yard. The loader was equipped with a trailer hitch attachment (stinger) that was fabricated by Newcart, and was being used by the labourer to transport an air cart at the time of the January 20, 2014 fatality (Figure 1).



Figure 1. Loader with stinger attachment used by the labourer to transport the air cart (Royal Canadian Mounted Police (RCMP) Photo #DSCN0287).

Safety Technician Trailer (tech trailer)

The tech trailer is used as a work area for the safety technician to maintain the inventory of safety supplies and equipment. The tech trailer is situated at the northeast side of the Newcart yard, several hundred feet from the main office. The January 20, 2014, incident occurred behind the tech trailer (Figure 2 and Figure 3).

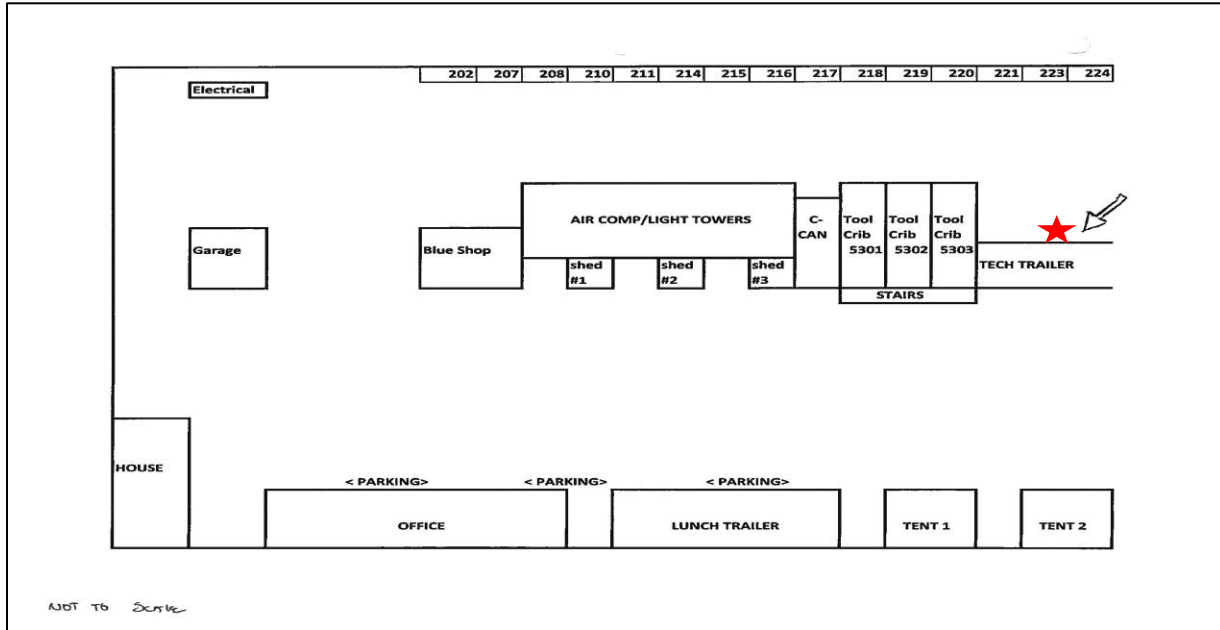


Figure 2. Newcart yard layout showing the location of the tech trailer with the “★” marking the approximate position of the loader when the incident occurred.



Figure 3. East end of the tech trailer (yellow and white) with the “★” marking the approximate position of the loader when the incident occurred.

Breathing Air Compressor Trailer (air compressor trailer)

The air compressor used to fill air carts is mounted inside the air compressor trailer located behind the tech trailer (Figure 4).



Figure 4. Air compressor trailer located behind the tech trailer.

The air compressor draws ambient air and compresses it to approximately 31 005 kilopascals (kPa) (4500 pounds per square inch (psi)). The compressed air passes through an air filtering and purifying system. The purified compressed air is discharged into a three-bottle filling system (cascade system) mounted next to the air compressor (Figure 5).

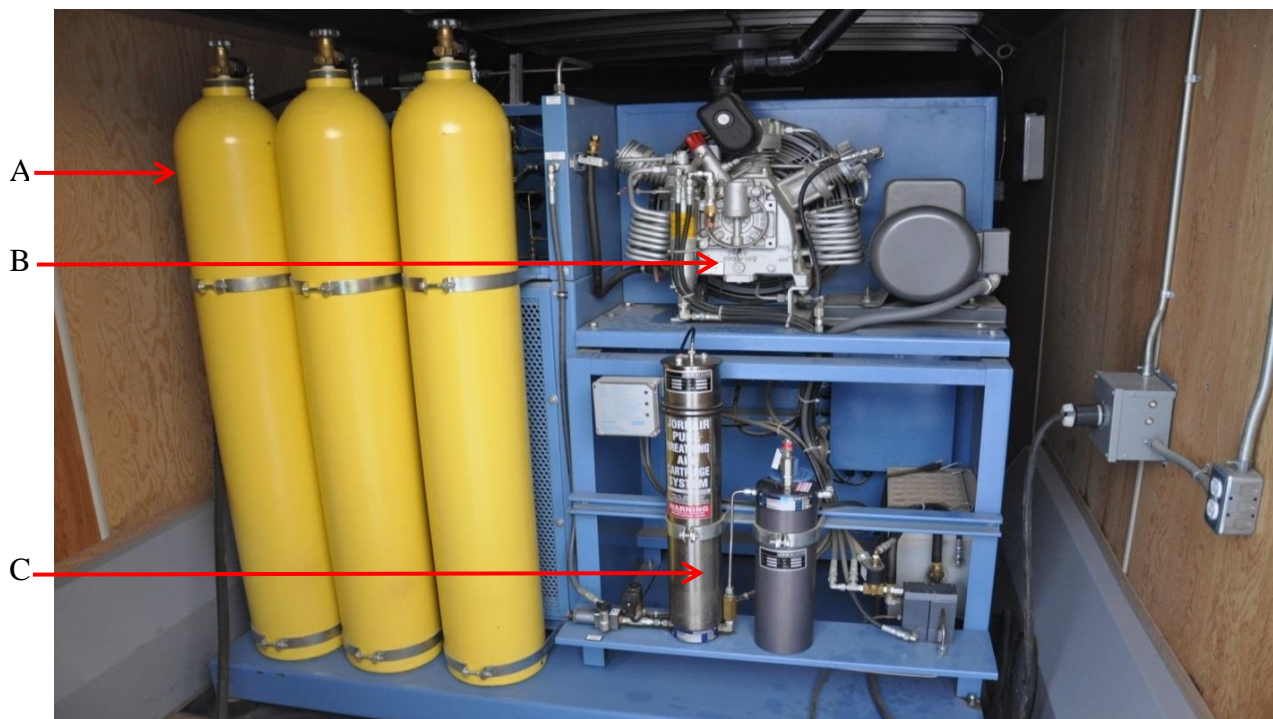


Figure 5. Air compressor cascade system for filling the air carts.

Breathing air cylinder cart (air cart)

The air cart was manufactured by Air System International and rated for a maximum pressure of 27 560 kPa (4000 psi). The air cart frame is 123 centimetres (cm) tall, 64 cm wide and weighs 51 kilograms (kg) without cylinders. It is equipped with two 41 cm pneumatic tires. It is designed to store two breathing air cylinders.

The air cart cylinders are manufactured by Norris Cylinder Company and are 141 cm high, 23.6 cm in diameter and weigh 61 kg each. The volume of each cylinder is 49.1 metres³ (m). The cylinder service pressure when filled is approximately 16 536 kPa (2400 psi). Each cylinder includes a threaded valve attached to the top of the cylinder to which the air compressor is attached while filling the cylinder.

A hose from the cascade system is equipped with a regulator and is connected to the breathing air cylinders to fill them. Once the breathing air cylinders have been filled, the “charged” air carts are loaded into breathing air trailers.

The breathing air trailers are transported to Newcart oil and gas projects. The Newcart workers connect their breathing air supply lines from the air carts to the respirators that they wear when working in hazardous locations (Figure 6).



Figure 6. Air cart as moved from behind the tech trailer to the front of the tech trailer for examination by OHS.

Sequence of events

At approximately 7:30 a.m. on January 20, 2014, the safety technician and the labourer drove from their Caroline residence to the Newcart workplace in the safety technician's company truck.

At 7:51 a.m., the safety technician and labourer punched their time cards in the Newcart lunchroom. After punching their time cards, the safety technician and labourer left the lunchroom and walked to the tech trailer.

At approximately 10:00 a.m., the safety technician left the tech trailer, and walked to the Newcart office trailer in the southwest corner of the yard, to use the washroom. The safety technician spoke briefly with the office manager and then walked back to the tech trailer.

At approximately 10:10 a.m., the safety technician asked the labourer to transport an air cart from a storage container (C-can), located approximately 0.5 kilometres (km) southeast of the Newcart main yard, to the air compressor trailer situated behind the tech trailer.

The labourer retrieved the loader equipped with the stinger attachment from the storage tent located across the yard from the tech trailer. The labourer drove the loader from the storage tent to the air compressor trailer located behind the tech trailer.

The labourer used the loader stinger attachment to connect to a cargo trailer that was positioned between the air compressor trailer and two adjacent crew buses. The labourer pulled the cargo trailer to the front of the tech trailer and disconnected it from the stinger attachment (Figure 7).



Figure 7. Travel path of the loader (yellow arrows) while the labourer moved the portable cargo trailer from behind the safety trailer to provide a travel-way to the air compressor trailer.

A. Air compressor trailer.

After disconnecting the loader from the portable cargo trailer, the labourer drove the loader and followed the safety technician while the safety technician drove the safety technician's truck from the tech trailer to the C-can.

The safety technician and labourer retrieved an air cart from the C-can. The safety technician drove back to the tech trailer to wait for the labourer to deliver the air cart to the air compressor trailer (Figure 8).



Figure 8. The safety technician's truck parked in front of the tech trailer after the safety technician returned from the storage container (C-can).

The labourer used a 1.22 m long synthetic fibre sling to connect the air cart to the loader stinger attachment. The labourer installed the sling with one end choked around the handle of the air cart, and the other end hooked over the hitch ball of the stinger attachment. The labourer raised the boom arms of the loader to hoist the air cart above the ground and drove the loader back towards the tech trailer.

In his statement to the RCMP, the labourer stated that as the labourer drove the loader from the C-can towards the tech trailer, the labourer had the air cart elevated approximately 30 cm above the ground. The labourer stated that when the labourer reached the tech trailer, the labourer drove the loader behind the tech trailer and then through the travel-way between the air compressor trailer and adjacent crew buses.

The labourer stated that as the labourer attempted to position the air cart near the air compressor trailer doors near the west end of the air compressor trailer, the labourer determined there was too much snow. The labourer stated that the labourer then decided to back up in the loader, and to try to reach the air compressor trailer doors at the west end of the trailer, by driving around and behind the adjacent crew buses.

The labourer stated that as the labourer was driving the loader in reverse to turn around, the labourer suddenly observed the safety technician lying face up on the ground near the left front tire of the loader. The labourer stated that the labourer observed that the safety technician was bleeding badly from the safety technician's mouth and nose. The labourer stated that the labourer stopped the loader and jumped out of the cab to assess and to try to assist the safety technician.

Evidence acquired at the incident site by OHS, and from records obtained by OHS from the Medical Examiner's Office, indicates that the information provided by the labourer to the RCMP is not accurate.

The OHS evidence indicates that when the labourer arrived back at the tech trailer with the air cart suspended from the loader stinger attachment, the labourer drove behind the tech trailer and towards the west end air compressor trailer (Figure 9).



Figure 9. The intended travel path of the loader (red arrow) between the air compressor trailer and adjacent crew buses to position the air cart close to the air compressor trailer doors. (RCMP Photo DSCN0307).

The OHS evidence also indicates that while driving the loader forward through the travel-way between the air compressor trailer and adjacent crew buses, the labourer had the air cart elevated in excess of 1 metre above the ground, effectively blocking the labourer's visibility through the windshield of the loader of the labourer's travel path.

Blood spatter evidence at the incident site indicates that the safety technician was positioned near the front side (east) corner of the air compressor trailer and facing the loader when the labourer drove towards that area.

As the labourer drove the loader towards the safety technician, the safety technician was struck on the left side of the safety technician's forehead by the left cylinder of the suspended air cart and knocked to the ice covered ground. The safety technician sustained blunt force trauma wounds to the left side of the safety technician's forehead as a result of being struck by the suspended air cart cylinder (Figure 10).

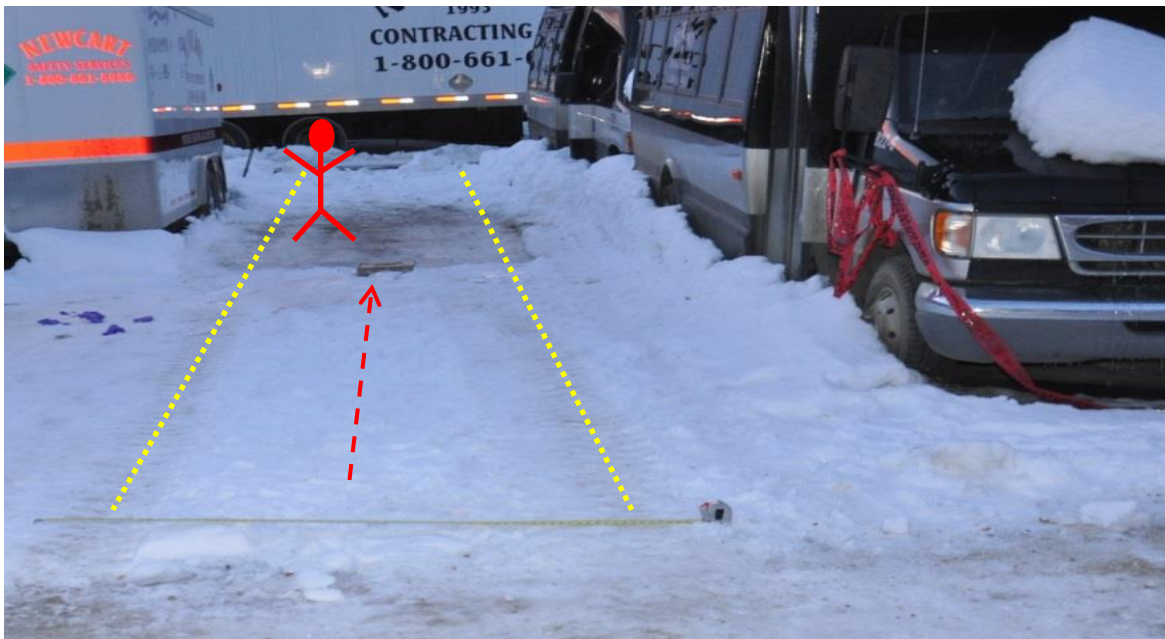


Figure 10. Approximate standing position of the safety technician when the safety technician was struck by the suspended air cart and run over by the loader. Yellow lines showing the location of the loader tire tread marks. Red arrow showing the direction of travel of the loader when it struck the safety technician.

After being struck by the suspended air cart cylinder and knocked to the ice covered ground, the safety technician was trapped underneath the undercarriage of the loader as the labourer continued driving the loader forward.

When the labourer realized the labourer had struck and drove over the safety technician, the labourer put the loader in reverse and started to back up. At some point while the labourer was backing up the loader, the front left tire of the loader made contact with the

safety technician's head. The safety technician sustained serious cranium and neck injuries as a result of being run over by the loader.

As the labourer continued to back up the loader, the safety technician was dragged approximately 2 metres away from the initial impact area before the safety technician was freed from the undercarriage of the loader (Figure 11).



Figure 11. Travel path of the loader (red hatched line) as it backed up and off of the safety technician.

A. Standing position of the safety technician when the safety technician was struck in the forehead by the suspended air cart while the loader travelled forward towards the safety technician.

B. Position of the safety technician after being dragged under the undercarriage of the loader as it backed off of the safety technician.

After backing the loader up and off of the safety technician, the labourer ran from behind the tech trailer yelling for assistance and hollering that the safety technician had been injured.

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The Newcart HR manager (HR manager), who was in the HR manager's office in the lunchroom trailer, heard the labourer yelling and called 911 using a phone in the lunchroom.

The 911 operator directed the HR manager to call 911 again using the HR manager's cell phone, and to go to the incident location behind the tech trailer, so the 911 operator could give instructions to the Newcart workers providing first aid and cardiopulmonary resuscitation (CPR) to the injured safety technician.

The HR manager called 911 using the HR manager's cell phone and ran to the incident location, behind the tech trailer, to give instructions to the first aid providers.

While waiting for the labourer's co-workers to arrive at the incident site to help the labourer, the labourer climbed back into the loader and backed it away further from the safety technician. The labourer then climbed out of the loader and tried to assist the injured safety technician.

A Newcart mechanic and welder, who were in a nearby shop, also heard the labourer yelling for help. They ran to the incident site behind the tech trailer. The welder directed the labourer to stop moving the injured safety technician. The welder started assessing the safety technician and started doing CPR.

The mechanic noted that the position of the suspended air cart near the injured safety technician posed additional hazards and would impede access by emergency response personnel dispatched to the site. The mechanic climbed into the loader and backed it up further to eliminate the hazard, and to provide more room for emergency first aid and CPR.

The safety consultant was in the safety consultant's office when the safety consultant heard someone yelling for help. When the safety consultant looked out of the office window, the safety consultant observed the labourer standing by the tech trailer yelling for help. The safety consultant grabbed the safety consultant's jacket and ran towards the tech trailer.

When the safety consultant arrived at the incident area behind the tech trailer, the safety consultant asked the mechanic to take the labourer away from the area as the labourer was extremely distraught. The safety consultant asked the welder to get a first aid trauma kit from inside the tech trailer. The safety consultant assessed the injured safety technician and started doing CPR.

After assessing the safety technician's condition, and with verbal instructions being provided by the 911 operator through the HR manager's cell phone, the safety consultant and welder took

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turns doing CPR. They also tried to clear the safety technician's nose, mouth and airway that were continuing to fill with blood, to be able to start doing artificial respiration (AR).

At 11:04 a.m., an Emergency Medical Services (EMS) ambulance crew arrived at the incident location and attended to the injured safety technician.

At 11:15 a.m., the EMS ambulance crew declared the safety technician deceased.

Completion

OHS completed its preliminary investigation on August 25, 2015. The entire investigation file was sent to Alberta Justice on August 28, 2015.

On December 3, 2015, Alberta Justice requested that OHS conduct a formal Review for Enforcement Action (REA), based on the unusual circumstances of the file.

An REA was completed by OHS on December 11, 2015, and it was determined that the file would be once again referred to Alberta Justice for further review.

On January 7, 2016, Alberta Justice concluded that charges under the OHS legislation were not recommended.

This investigation file was closed on January 22, 2016.

Signatures

ORIGINAL REPORT SIGNED

February 18, 2016

Lead Investigator

Date

ORIGINAL REPORT SIGNED

February 18, 2016

Manager

Date

ORIGINAL REPORT SIGNED

February 29, 2016

Director

Date

