PSC Group Conductor Fatality

Beaumont, Texas
October 28, 2022

1 Factual Information

1.1 Accident Description

On October 28, 2022, about 12:03 a.m. local time, a PSC Group conductor was struck and killed by train 3832 as the train was reversing during switching operations at an ExxonMobil lubricant plant in Beaumont, Texas.[1] The conductor was protecting the shoving movement from the ground near where the train cars were to be spotted, or placed, at the end of track 7 for product loading.[2] (See figure 1.) There were no eyewitnesses, and surveillance video recordings from the facility did not capture the accident. Visibility conditions at the time of the accident were dark and clear, and the weather was 64°F.

[1] (a) Visit www.ntsb.gov to find additional information in the public docket for this NTSB accident investigation (case number RRD23FR002). Use the CAROL Query to search safety recommendations and investigations. (b) All times in this report are local time unless otherwise noted. (c) *Switching* is moving cars from one track to another track or to different positions on the same track. (d) PSC Group is an operating company for the refining, petrochemical, terminal, and marine transportation industries.

[2] A *shoving movement* is the process of pushing railcars from the rear with a locomotive. Shoving movements are frequently used in switching operations.

Figure 1. Overhead view of accident area.

Train 3832 was composed of one locomotive and 19 tank cars. The train crew consisted of a locomotive engineer, the accident conductor, a brakeman, and a brakeman trainee.[3] All members of the train crew were employed by PSC Group, which provides rail switching services at the ExxonMobil facility.

A review of audio recordings from the two-way radios used by the train crew, as well as postaccident interviews with the National Transportation Safety Board (NTSB), showed that during the shoving movement the conductor, who was walking along the west side of the track, counted railcar lengths over the radio to the engineer as the rear of the train approached the north breezeway on track 7.[4] As the train cleared the north breezeway, about 12:02 a.m., the conductor radioed for the engineer to reverse five railcar lengths to the south breezeway. The conductor then

[3] A *brakeman* is a railroad worker who assists with train and yard operations.

[4] (a) A *breezeway* is a small pedestrian crossing over train tracks. Track 7, the accident track, had two breezeways, known as the north and south breezeways. (b) Railroad personnel commonly use railcar lengths to communicate distances during switching operations, with the conductor counting down the number of railcars before the engineer would need to slow and stop the train. PSC Group uses 60-foot railcar lengths as a standard for providing railcar counts.

communicated "three cars to the breezeway," and the engineer acknowledged this by radio.

Members of the train crew stated that after the three-car count, they heard no further radio communication from the conductor. Approximately 30 seconds later, data from the locomotive's event recorder show a sudden decrease in the train's brake pipe pressure. Investigators reviewed the inward facing image and audio recording data from the locomotive which showed a drop in the brake pipe pressure gauge reading and the sound of air being exhausted.[5] The data also showed the engineer making an emergency application of the train's air brakes and then attempting to radio the conductor.[6]

According to a postaccident interview with the NTSB, an ExxonMobil employee arrived at the accident location to assume product loading duties and found the deceased conductor beneath the last railcar in the consist, on the east side of track 7. This area was on the opposite side of the walking path designated by PSC Group procedures. (See figure 2.) Section 1.5 describes PSC Group's procedures.

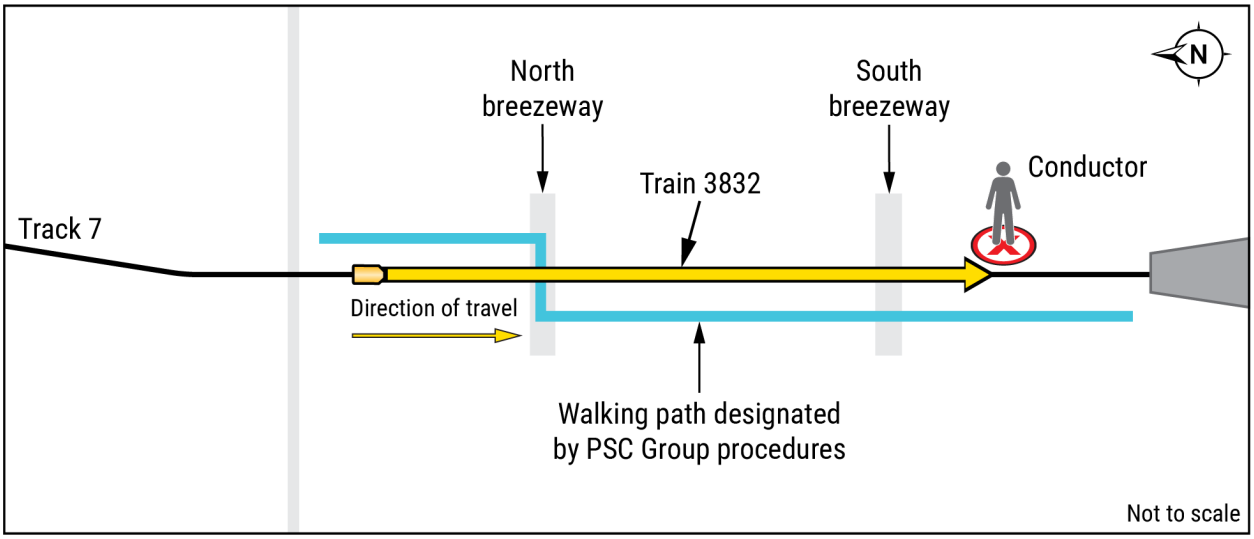

Figure 2. Diagram of accident.

The employee contacted the ExxonMobil control room to call for emergency response. Around the same time, the engineer radioed the brakeman to check on the conductor, having received no response from his attempt at radio contact. The brakeman approached the accident location and called his supervisor for assistance.

[5] A train's air brake system uses compressed air to slow or stop a train.

[6] An *emergency brake application* uses the maximum braking force available and is designed to stop a train as quickly as possible.

ExxonMobil emergency responders arrived and pronounced the conductor deceased.

1.2 Before the Accident

The crew of train 3832 reported for duty at the ExxonMobil lubricant plant at 6:00 p.m. on October 27, 2022. Members of the train crew stated in interviews that they participated in two briefings before switching out railcars on train 3832 at the ExxonMobil refinery yard, the ExxonMobil chemical plant, and on Tracks 8 and 9, which were adjacent to the accident location. The crew then prepared to switch out railcars on track 7.

The brakeman trainee informed the NTSB that he lined the switch to direct train 3832 into track 7, instructed the engineer to reverse the train three railcar lengths, and radioed the brakeman, who took control of the shoving movement at a highway–railroad grade crossing. Other crewmembers indicated that after the train had passed the highway–railroad grade crossing, the brakeman radioed the accident conductor, who took control of the movement into the end of track 7, where the product loading rack was located. The accident conductor first took over train 3832's reverse movement from the west side of track 7; this action was noted in interviews as the last time the crew saw the conductor.

1.3 Track 7

During postaccident site examinations on October 29, 2022, the NTSB observed hoses, wheel chocks, and other items left in the walking area at the end of track 7.[7] (See figure 3.)

[7] A *wheel chock* is a wedge placed against a wheel to help keep it from rolling.

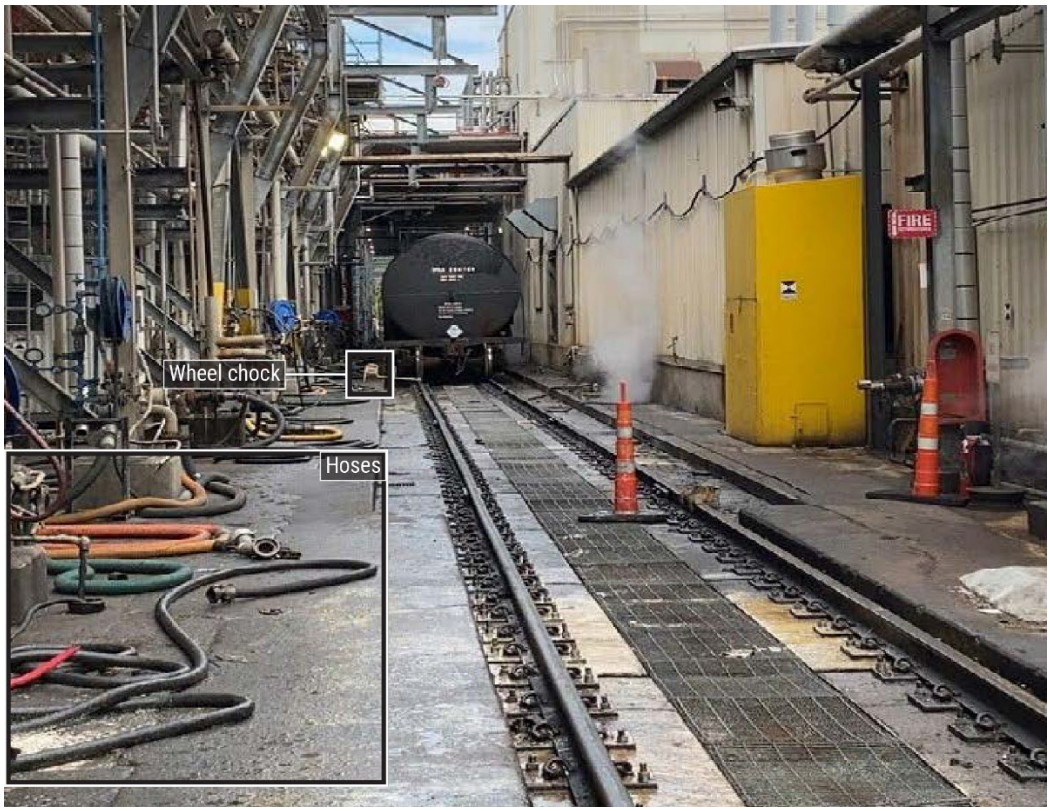

Figure 3. Walking conditions at the accident location.

1.4 Train 3832

The NTSB observed that the angle cock on the rearmost railcar in the consist of train 3832 was in the open position.[8] The angle cock was located in what is often called the "red zone," or an area where a person working on or near the track could be struck by moving equipment.[9] (See figure 4.)

An inspection of the air brake system of train 3832 revealed no broken brake pipe connections or damaged brake pipe hoses in the train consist.[10]

Figure 4. Open angle cock and red zone on the rearmost railcar in train 3832.

Data from the locomotive event recorder on train 3832, obtained and reviewed by the NTSB, showed a sudden decrease in brake pipe pressure at

[8] An *angle cock* is a hand-operated exterior valve that, when opened, releases air from the brake pipe on an individual locomotive or railcar.

[9] PSC Group safe switching procedures specify that the red zone encompasses the area inside the outer edge of its rail equipment and within 30 feet from each uncoupled end of equipment. See PSC Group, *General Safe Switching Procedure*, No. 0605-03-01-001, revised Aug. 20, 2022.

[10] The *brake pipe* is the line that connects the locomotives and railcars on a train for the passage of compressed air.

12:03:00 a.m., from 87 to 79 pounds per square inch. According to event recorder data, the engineer placed the train's brakes into emergency less than one second later. Data further showed the train reversed a total of 188.8 feet before coming to a stop at 12:03:07 a.m.

1.5 PSC Group Procedures

1.5.1 Rack Operations Procedures

PSC Group rack operations procedures in place at the time of the accident instructed employees to be positioned on the ground when spotting railcars that were being shoved into product loading racks.[11] Employees were not permitted to ride point (that is, ride on the rear of a railcar) during the shoving movement. These procedures further stated that 100% point protection, or ensuring the direction of travel was clear before any train movement, was required for shoving movements. Employees were directed to walk on the east side of the track north of the north breezeway and on the west side of the track from the north breezeway to the end of track 7. The procedures also noted that track 7 is very slippery and instructed workers to proceed slowly and use extreme caution.

1.5.2 Safe Switching Procedures

PSC Group safe switching procedures state that switching personnel must provide railcar counts at a frequency that allows the engineer to understand train speed and travel distance. For 10 or fewer railcar lengths, the rules require the conductor to provide an updated car count every two cars, with the command sequence during the final two-car count as follows: "Two cars, one and a half cars, one car, half a car, set of trucks or 10 feet, that will do." The rules further state that, if the engineer does not hear radio communication from the conductor, the engineer must stop the train in half the distance of the previous command.

1.6 Personnel Information

1.6.1 Engineer

The engineer was hired by PSC Group on April 2, 2018, and completed job training on April 5, 2018. He was recertified by PSC Group as a locomotive engineer

[11] PSC Group. *Rack Operations*. No. 14005-03-01-003, revised Nov. 26, 2019.

in April 2021.[12] He completed a monitoring check ride on October 21, 2022, with no failures noted.[13]

1.6.2 Conductor

The conductor was hired by PSC Group on May 29, 2018. His most recent recertification as a conductor was on December 8, 2020, and his most recent monitoring check ride was on December 3, 2021, with no failures noted.[14]

1.7 Postaccident Toxicology Testing

Postaccident toxicological testing of the engineer for alcohol and other drugs was conducted in compliance with Title 49 *Code of Federal Regulations* (*CFR*) Part 219 Subpart C. Results were negative for all tested-for substances.[15] The conductor's postmortem toxicology testing did not identify any drugs of abuse, including alcohol.

1.8 Cell Phone Use

Data from the inward-facing locomotive camera showed the engineer was not using a cell phone at the time of the accident. The deceased conductor did not have his cell phone on his person at the time of the accident.

1.9 Postaccident Actions

1.9.1 PSC Group

After the accident, PSC Group reviewed their rack operations procedures, radio communications, and safety in and around equipment red zones. They revised the rack operations procedures for shoving trains into track 7 to require the conductor to take a position at the final car stop location, face the movement, and

[12] See 49 *CFR* Part 240—Qualification and certification of locomotive engineers.

[13] A *monitoring check ride* is a practical skills evaluation, usually conducted by a supervisor.

[14] See 49 *CFR* Part 242—Qualification and certification of conductors.

[15] Federal Railroad Administration postaccident toxicology screens urine for amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, MDMA/MDA, methadone, opiates/opioids, phencyclidine, tramadol, and sedating antihistamines (brompheniramine, chlorpheniramine, diphenhydramine, doxylamine, and pheniramine), as well as a blood test for ethanol.

direct the train back with proper car counts. Walking alongside the movement is no longer permitted.[16]

PSC Group also increased observational testing of engineers on response to emergency scenarios such as a loss of communication from a conductor. Such tests are now required to be conducted weekly at a minimum.[17]

1.9.2 ExxonMobil

After the accident, ExxonMobil cleaned up identified walking areas at the site by installing brackets for storing wheel chocks, adding storage for product loading hoses, pressure-washing the walking area, and removing unused scaffolding. ExxonMobil also added rail crossing signs at breezeways and more facility lighting.

2 Analysis

While protecting a shoving movement from the ground at the end of track 7 at the ExxonMobil lubricant plant in Beaumont, Texas, a PSC Group conductor was struck and killed by reversing train 3832. Postaccident evidence showed that the conductor had been walking on the east side of track 7 when he was struck, despite last having been seen on the west side of the track by fellow crewmembers. This indicates he crossed over to the east side of the track in front of the train while it was reversing. Because there were no eyewitnesses to the accident, the NTSB could not identify exactly when the conductor crossed to the east side of the track or for what reason. The NTSB found that the walking area in the east side of track 7 had wheel chocks, hoses, and other items, but could not determine whether these conditions contributed to the accident. ExxonMobil cleaned up walking areas at its facility after the accident.

In this accident, the conductor's final instruction to the engineer was to reverse the train 3 railcar lengths, or 180 feet. When no further instructions from the conductor were received, according to PSC Group operating rules, the engineer should have stopped the train after 90 feet (half of the 180-foot movement). Event recorder data show the train moved a total of 188.8 feet before the engineer placed the train into emergency. Had the engineer stopped the train after 90 feet and waited for additional instructions from the conductor, the accident may not have occurred.

[16] PSC Group. *Rack Operations*. No. 14005-03-01-003, revised May 1, 2023.

[17] PSC Group. RE: [EXTERNAL] PSC operating rules discussion. Nov. 29, 2023.

PSC Group now requires testing of engineers on response to emergency scenarios such as a loss of communication from a conductor at least weekly.

The postaccident position of the conductor beneath the final railcar in the consist, the railcar's open angle cock, and a loss of brake pipe pressure before the engineer placed the train into emergency indicate that, for unknown reasons, the conductor had opened the angle cock immediately before the accident occurred. To open the angle cock from alongside the track while the train is in motion, a person must reach into the red zone, where the likelihood of being struck by equipment is higher. PSC Group's rack operations procedures in place at the time of the accident stated that 100% train protection was required from the ground. In practice, this meant that personnel walked alongside the train during the movement. After the accident, PSC Group revised their rack operations procedures, no longer allowing employees to walk alongside train movements.

3 Probable Cause

The National Transportation Safety Board determines that the probable cause of the October 28, 2022, PSC Group conductor fatality was (1) the conductor, for unknown reasons, entering the red zone where there is an increased risk of being struck by equipment and (2) the engineer not following PCS Group operating procedures to stop the train after hearing no additional instructions from the conductor.

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For more detailed background information on this report, visit the NTSB Case Analysis and Reporting Online (CAROL) website and search for NTSB accident ID RRD23FR002. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting –

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