Issued: July 19, 2022 Railroad Investigation Report: NTSB/RIR-22/11

Pan Am Railways Employee Fatality

Newington, New Hampshire
May 19, 2021

1. Factual Information

1.1 Accident Description

On May 19, 2021, about 2:15 p.m. local time, the conductor of a Pan Am Railways (PAR) train, Local D01, was fatally injured while performing switching operations near the SubCom Industries (SubCom) facility in Newington, New Hampshire.[1] The conductor was pinned between two couplers while attempting to couple a pair of unbraked railcars to the stationary train.[2] (See figure 1.) The conductor was transported to a local hospital where he subsequently died from his injuries. The weather at the time of the accident was clear, 72°F, with winds from the southeast at 10 mph.

[1] (a) All times in this report are local time unless otherwise noted. (b) Visit www.ntsb.gov to find additional information in the public docket for this National Transportation Safety Board (NTSB) accident investigation (case RRD21FR010). Use the CAROL Query to search safety recommendations and investigations. (c) *Switching* is moving cars from one track to another track or to different positions on the same track. It includes the moving of cars in the makeup and breakup of trains; moving cars on industrial switching tracks or interchange tracks; and the general movement of cars within terminals or junctions.

[2] (a) *Coupling* is the process of joining railcars or other on-track equipment. (b) *Unbraked railcars* refer to railroad freight cars intentionally stored in yard locations without mechanical brakes applied in order to facilitate coupling operations.

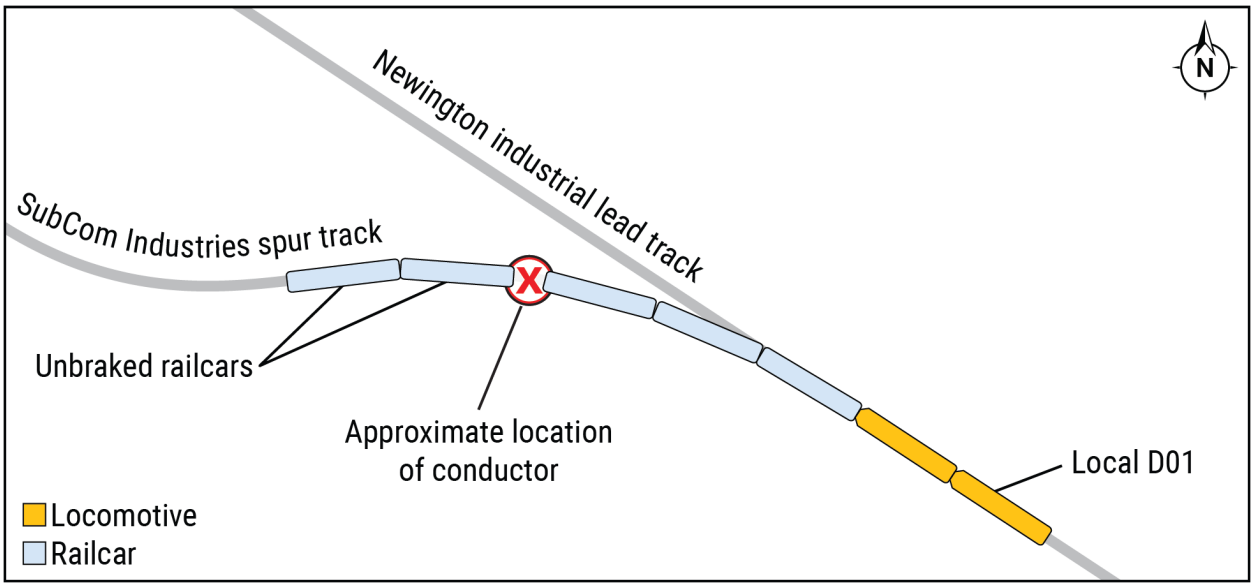

Figure 1. Diagram of accident location.

On the day of the accident, the train crew (comprising an engineer and a conductor) was picking up three empty railcars and delivering two loaded railcars to the SubCom facility. The three empty railcars were positioned on the SubCom spur track linking the Newington industrial lead track to the SubCom facility. The empty railcar nearest the industrial lead track needed to be coupled to the second and third empty railcars, which were already coupled together as shown in figure 1.[3]

According to the engineer, the crew was attempting to assemble the train using the *gravity coupling* method: using track grade (gravity) to allow railcars not part of a train to roll toward the end of the train and couple. The Subcom spur track grade descends from the west to the east, meaning that unbraked railcars roll east. At this site, if the unbraked railcars fail to couple to the train, the engineer can move the train east (down-grade) away from the unbraked railcars. This creates a gap between the train and uncoupled railcars. The unbraked railcars then begin rolling east again, closing the gap and allowing another attempt to mechanically couple. During gravity coupling, as with other coupling methods, a conductor sometimes enters these gaps to manipulate couplers—for example, to ensure that the couplers are open, aligned and ready to couple. In this case, employees that would need to move between railcars are subject to PAR safety rules (see section 1.6).

The National Transportation Safety Board investigators' interview with the engineer and review of surveillance camera images and locomotive event recorder data show that about 2:05 p.m., the train crew coupled Local D01 (then consisting of two locomotives and two loaded railcars) to the first empty railcar. After that

[3] Compass directions are used throughout this report. Timetable directions along the Newington industrial lead track invert the local east-west axis. (See *Pan Am Timetable No. 4*.)

successful coupling, the crew made five unsuccessful attempts to couple the train to the pair of empty railcars. The engineer told investigators that the conductor was growing frustrated with the unsuccessful coupling of the railcars, and the conductor did not perform additional required job briefings during these five attempts. Based on surveillance camera images, about 5 feet of separation opened between the train and uncoupled railcars during each attempt.

During the sixth attempt, the conductor stepped into the gap between the stationary train and the unbraked pair of railcars. As the unbraked railcars rolled downhill towards the train, the conductor was pinned between the couplers of the stationary train's last railcar and the nearer of the pair of unbraked railcars. (See figure 1.)

The conductor radioed his injury to the engineer and asked him to move the train forward. This movement allowed the conductor to extricate himself from between the railcars and lie down on the grass nearby. (See figure 2.) The engineer called 911. The Newington Fire Department and Newington Police Department both responded, and police and an ambulance arrived on the scene within 5 minutes. The conductor was transported to a local hospital where he later died from his injuries.

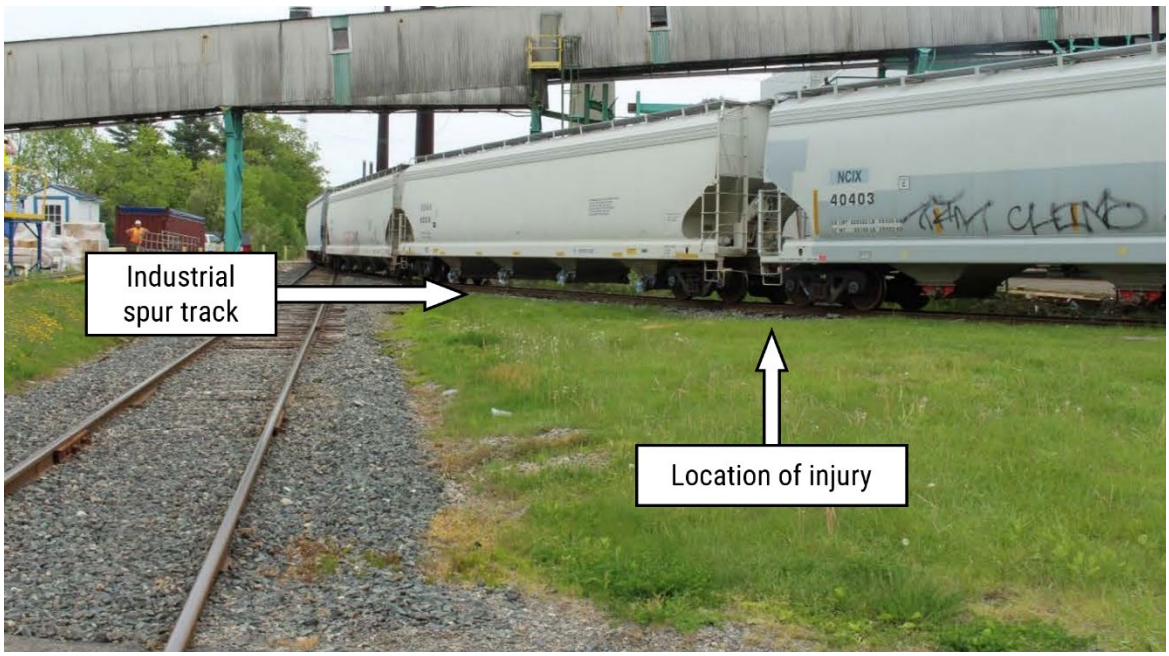

Figure 2. Reconstructed accident scene.

1.2 Before the Accident

The crew went on duty about 9:00 a.m. on May 19, 2021. Local D01 arrived at the SubCom facility about 2:02 p.m. and approached the spur track from the Newington industrial lead track. The train crew completed a job briefing before

attempting to pick up the empty railcars. The conductor dismounted the train to line the switch from the Newington industrial lead track to the SubCom spur track and direct the coupling operation.

1.3 Train Crew

1.3.1 Train Conductor

The conductor completed his most recent rules training on July 14, 2020. From July 14, 2020, to December 7, 2020, the conductor completed 13 certification classes, and was deemed qualified to perform his assigned duties. The conductor's medical records also showed completion of the required Federal Railroad Administration (FRA) vision and hearing testing most recently on December 7, 2020.[4]

1.3.2 Train Engineer

According to training records, the engineer completed nine training classes from June 23, 2020, to June 26, 2020, which included his engineer recertification. He had worked the SubCom job on several occasions but began handling the assignment regularly in November 2020. In interviews, he said he had worked with the conductor off and on for about 30 years.

1.4 SubCom Spur Track Operations

The SubCom Industrial spur track is a curved spur track that runs in an east-west direction, and its grade descends from the SubCom facility in the west towards the PAR Newington industrial lead track in the east.

In interviews with investigators, PAR employees said that coupling operations on the SubCom spur track presented challenges because of the track's curvature. PAR crews were (before the accident) permitted to use a variety of strategies to pick up railcars, such as shoving railcars into the SubCom facility or rolling railcars to the PAR industrial lead track, where the track is straight. PAR allowed its crews to determine how to conduct these coupling operations; gravity coupling was permitted if conducted in accordance with the railroad's rules.

[4] See Title 49 *Code of Federal Regulations* (*CFR*) Part 240 for federal standards on vision and hearing for railroad employees.

FRA regulations required PAR to maintain and operate the track near the accident as Class 1 track, with a maximum operating speed of 10 mph for freight trains.[5]

1.5 Toxicology and Autopsy Results

Postaccident toxicology testing was performed on the conductor for alcohol and other drugs in compliance with Title 49 *Code of Federal Regulations* Part 219.201.[6] The results were negative for all tested-for substances.

An autopsy conducted by the State of New Hampshire Office of the Chief Medical Examiner determined the conductor's cause of death to be blunt force trauma.

1.6 Operating Rules

At the time of the accident, PAR's rulebook permitted gravity coupling but subjected it to several safety rules.[7] Specifically, PAR's rules prohibited giving a signal to move a locomotive or railcar while an employee is walking between equipment; walking between moving railcars; and manually adjusting couplers when railcars or locomotives are about to couple. Before walking between railcars standing on a descending grade, employees must make certain the railcars are secured against unexpected movement. Employees must use the coupler lever whenever possible to avoid entering the space between railcars.[8] Any manual adjustment of couplers must be performed when railcars are stationary and with a minimum of 50 feet of separation between the equipment being coupled.

1.7 Postaccident Actions

After the accident, PAR and SubCom officials met to discuss related safety issues, which included safe switching, track inspection and maintenance, and safe walking conditions. Some of PAR's postaccident actions include (1) the discontinued use of gravity coupling at SubCom, and (2) an extra weekly pick-up to facilitate picking up only two railcars at a time. Further, SubCom has arranged to shut down an

[5] See 49 *CFR* 213 for track safety standards.

[6] The testing screened for substances including amphetamines, barbiturates, benzodiazepines, cocaine, alcohol and cannabis metabolites, methadone, methaqualone, MDA-analogues, opiates, 6-acetylmorphine, oxycodone, opiates, phencyclidine, and propoxyphene.

[7] PAR, *Safety Rules Book*, "Coupling and Uncoupling," revised February 2014.

[8] A *coupler lever* is an arm that reaches from the coupler to the side of the railcar, allowing a rail worker to open couplers without moving between railcars. Lifting the lever unlocks the coupler knuckle and lets it swing open, allowing railcars to be pulled away from each other.

area inside its facility whenever three railcars need to be picked up, allowing PAR to shove the railcars back into SubCom's facility to couple them on straight track.

2. Analysis

The conductor of PAR train Local D01 was pinned between a pair of unbraked railcars that rolled east along a descending grade toward the last railcar of the stationary train during switching operations. The crew was attempting to finish assembling the train using gravity coupling.

Before the conductor was pinned between two railcars, the crew made five unsuccessful attempts to use gravity coupling to assemble the train. Interviews with PAR employees noted that coupling was difficult on the curved spur track, which likely contributed to the repeated attempts.

These repeated attempts occurred without a pause for additional job briefings that could have identified alternative coupling procedures or provided an opportunity to reiterate safeguards. The conductor then entered the small (about 5-foot) space between moving railcars. This action violated PAR safety rules that prohibited walking between unbraked equipment such as railcars less than 50 feet apart.

Gravity coupling involves free-rolling railcars. As such, there are inherent safety risks. PAR's rules provided an administrative control for those risks by prohibiting movement between unbraked railcars unless they were secured from movement. A crew's control of unbraked railcars is limited, and safety depends on remaining clear of the path of any free-rolling railcars. In this case, failure to follow procedures in the presence of unbraked railcars led to the conductor's death.

Following the accident, PAR changed its rules and now prohibits gravity coupling on the SubCom spur track. PAR also changed its schedules and procedures in cooperation with SubCom to improve coupling operations. These changes include an extra weekly pick-up and a revised pick-up procedure whenever more than two railcars must be picked up at the same time. The elimination of gravity coupling and provision of alternatives are intended to reduce potentially unsafe interactions with unbraked equipment.

3. Probable Cause

The National Transportation Safety Board determines that the probable cause of the May 19, 2021, Pan Am Railways employee fatality was the conductor's failure to adhere to Pan Am Railways safety rules prohibiting movement between unbraked, moving equipment during gravity coupling, which resulted in the conductor being pinned between railcars.

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For more detailed background information on this report, visit the NTSB investigations website and search for NTSB accident ID RRD21FR010. 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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