Issued: June 6, 2022 Railroad Investigation Report: RIR-22/10

BNSF Railway Employee Fatality

Louisiana, Missouri
April 7, 2021

1. Factual Information

1.1 Accident Description

On April 7, 2021, about 3:25 p.m. local time, a conductor of BNSF Railway (BNSF) Local 8371 was killed while dropping off and picking up railcars near the Dyno Nobel, Inc. (Dyno Nobel) industrial facility in Louisiana, Missouri.[1] Immediately before the accident, event recorder data indicated the engineer was moving the train southeast on Dyno Nobel industrial track at less than 9 mph with the conductor controlling a shoving movement (by radio communication with the engineer) from the ground.[2] There were no witnesses, and surveillance video recordings from the facility did not capture the accident. It was daylight and the weather was overcast, with a temperature of 73°F and southeast winds at 3.8 mph. Figure 1 provides an illustration of the accident location.

[1] (a) Visit ntsb.gov to find additional information in the public docket for this National Transportation Safety Board investigation (case number RRD21LR009). Use the CAROL Query to search safety recommendations and investigations. (b) All times in this report are local time unless otherwise noted.

[2] The track had an authorized maximum speed of 10 mph in accordance with *General Code of Operating Rules* (GCOR). See "6.12 FRA Excepted Track" in *GCOR*, 8th ed., April 1, 2020. (b) A *shoving movement* is the process of pushing railcars or pushing a train from the rear with a locomotive.

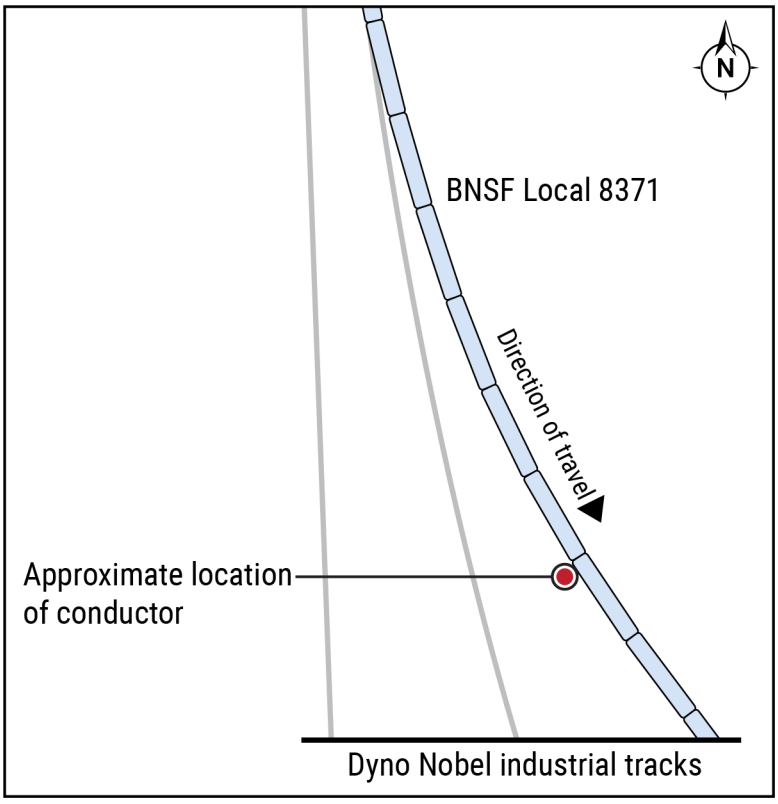

Figure 1. Overhead illustration of the accident location.

The train crew consisted of the conductor, one engineer, and one brakeman. About 12:31 p.m., the train departed the West Quincy yard with two locomotives and 20 empty railcars of various types, including a flat car converted into a shoving platform.[3] The crew arrived at Louisiana about 3:05 p.m. to make a shoving movement for about 1 mile on the BNSF mainline from Louisiana to the Dyno Nobel industrial facility. About 3:15 p.m., the engineer stopped the movement, and the conductor dismounted the shoving platform he was riding to place the Dyno Nobel derail into the non-derailing position.[4] He then returned to the shoving platform and rode to the first switch. The engineer stopped the movement, and the conductor dismounted the platform, lined the first switch to the Dyno Nobel facility, and proceeded to walk southeast to verify that the second switch was lined for the movement. After the switch was lined, the conductor walked on the south side of the train toward the locomotive.

[3] A *shoving platform* is a converted flat car with secure positions for train crew members.

[4] *Derails* are track-mounted devices that render sections of track physically inaccessible, a requirement for work being performed on non-controlled track under Title 49 *Code of Federal Regulations* Part 214.327.

About 3:24 p.m., the conductor announced over the radio that he was on the ground protecting the movement and instructed the engineer to go back 20 railcars. After backing up the train the length of about 10 railcars, radio communication between the conductor and the engineer ceased, so the engineer stopped the movement in accordance with General Code of Operating Rules 5.3.7.[5] The brakeman then observed the conductor lying on the ground on the south side of the track.

The brakeman announced "emergency" over the handheld radio, and the engineer dialed 911 on the locomotive radio. Shortly after the call to 911, emergency responders arrived on-scene and the conductor was pronounced deceased. While on-scene, the responders identified the first signs of harm to the conductor in the ballast on a walking space adjacent to the tracks near the accident location.[6] (See figure 2.)

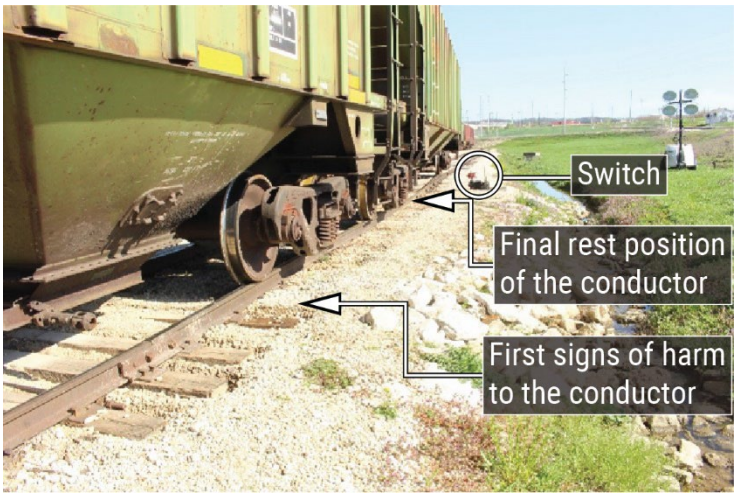

Figure 2. Area where the conductor was found.

The National Transportation Safety Board (NTSB) investigators interviewed the engineer and brakeman, neither of whom witnessed the accident. Investigators also reviewed the available facility surveillance video recordings of the conductor's actions before he went out of view. The recordings did not capture the accident.

[5] Under GCOR Rule 5.3.7, radio communications for shoving movements must specify the direction and distance of the movement. In the absence of further communication, movements must cease within half the distance specified in the last communication. See "5.3.7 Radio Response" in *GCOR*, 8th ed., April 1, 2020. Railroad personnel commonly use railcar lengths to communicate distances during these types of operations.

[6] *Ballast* is the material, usually crushed stone, used for holding the track in line and at the surface.

1.2 Before the Accident

BNSF Local 8371 is a local crew assignment that originates and terminates in West Quincy, Missouri, primarily dropping off and picking up railcars at industries from West Quincy to Louisiana, Missouri. The BNSF train crew went on duty on April 7, 2021, about 11:00 a.m. at the West Quincy yard. The crew conducted a job briefing, assembled the train, and performed an initial terminal train air brake test.[7]

This was a regular assignment for the conductor and engineer. The brakeman was not regularly assigned to this job but had worked the assignment frequently. All three employees had received more than the required statutory rest period before reporting for duty.[8]

1.3 The Conductor

1.3.1 Employment History

The conductor was hired by BNSF in 1996. His employment records with BNSF indicated that he had over 20 years of experience and had completed all required training. NTSB found no record of discipline in the conductor's work history. In interviews with NTSB investigators, BNSF employees stated that the conductor was knowledgeable in his job and performed his duties in a safe manner.

1.3.2 Medical Conditions

A review of the conductor's employment history showed few gaps in attendance for medical issues over his career with the railroad. BNSF's medical officer determined the conductor was medically fit for duty. NTSB investigators reviewed the conductor's personal medical records and found he had medical conditions that could cause difficulty walking, increase the likelihood of falls, or impact psychomotor performance.[9]

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[7] Title 49 *Code of Federal Regulations* Part 232.205 requires that a qualified employee or a qualified mechanical inspector conduct a Class 1 air brake test to inspect the functioning of all moving parts of the brake system on each railcar, safety appliances, and to test brake pipe integrity.

[8] *Statutory rest period*, or statutory off-duty period, is the minimum period of 8 or 10 consecutive off-duty hours between on-duty periods required for train or signal employees under hours-of-service laws.

[9] *Psychomotor performance* refers to movement tasks that require the coordination of both thinking and motor processes. Examples include fine motor skills such as using scissors and buttoning, gross motor skills such as walking and balancing, and more complex skills such as driving a car or operating a machine.

1.3.3 Toxicology Testing and Autopsy

In accordance with Title 49 *Code of Federal Regulations* Part 219.201, postaccident toxicology testing for alcohol and other drugs was performed on the deceased conductor.[10] The results were negative for all tested-for substances.

The autopsy report from the Pike County, Missouri, coroner determined the cause of death to be blunt force trauma to the neck secondary to a railroad accident.

1.4 Accident Location and Equipment

The track at the accident location was maintained by Dyno Nobel. On April 9, 2021, NTSB investigators inspected the area of the accident and took measurements of the walking space. At the time of this measurement, there was only 21 inches of walking space between the end of the crosstie and the large rocks. (See figure 3, left.) Further, during these inspections, investigators noted insufficient walking space; large rocks were located on the south side of the track near a decline leading to a drainage ditch. (See figure 3, right.)

Figure 3. Measurement of the walking space near the accident location.

[10] Postaccident toxicology testing performed by the Federal Railroad Administration includes amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, MDMA/MDA, methadone, opiates/opioids, phencyclidine, tramadol, ethyl alcohol, brompheniramine, chlorpheniramine, diphenhydramine, doxylamine, and pheniramine.

1.5 Postaccident Actions

The NTSB requested that the Missouri Department of Transportation (MoDOT) conduct a postaccident inspection of the walking space at the accident location. Upon inspection, the MoDOT inspector found that the walking space located in the area of the accident did not meet the requirements of Missouri Code of State Regulations, which state:

> Except in cases in which the division finds that construction or reconstruction is impracticable, unnecessary, or where existing structures or tracks prevent construction, walkways shall be constructed along each side of industrial railroad trackage a minimum of eight feet six inches (8'6") from the center of track measured at right angles to the center. Walkways shall be reasonably level with the top of the railroad ties and beginning at the end of the railroad ties. not exceed a drop of two inches (2") per foot to provide drainage and a surface reasonably level on which to walk as well as permit the safe performance of trackside duties, taking into consideration existing structures and tracks.[11]

The MoDOT required Dyno Nobel to complete remedial action within 30 days. In response, Dyno Nobel reconstructed all walking spaces along trackage within the facility to be 9 feet from the center of the track, which is 6 inches wider than the state minimum requirements. (See figure 4.)

[11] 7 Missouri Code of State Regulations 265-8.110.

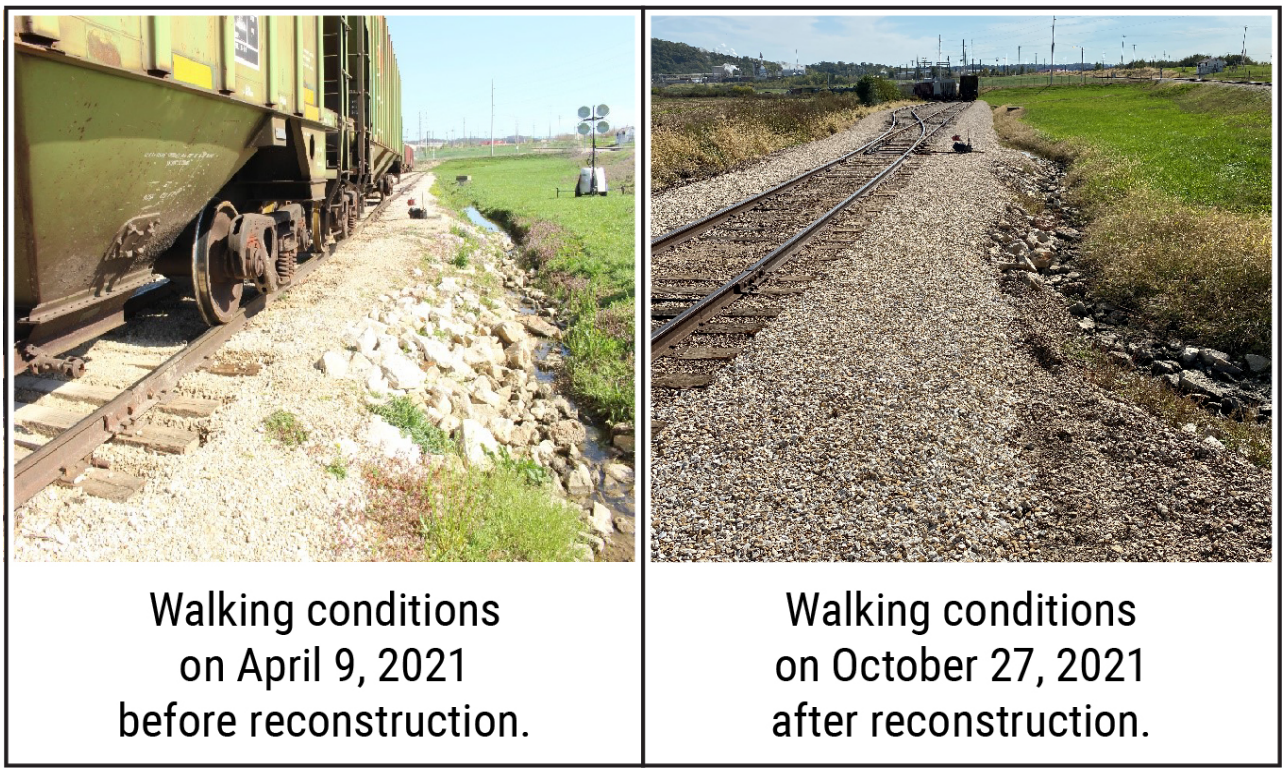

Figure 4. Walking conditions at the time of the accident (*left*) and walking conditions after reconstruction (*right*).

2. Analysis

In this accident, a BNSF conductor with over 20 years of experience was killed while protecting a shoving movement into an industrial facility from the ground. During the movement, radio communication between the conductor and the engineer ceased, the engineer stopped the train movement in accordance with procedures, and the brakeman discovered the deceased conductor.

A review of the conductor's personal medical records showed that he had medical conditions that could cause difficulty walking, increase the likelihood of falls, or impact psychomotor performance. The NTSB could not determine if one or more of these medical conditions contributed to this accident. A review of the conductor's employment history found that BNSF determined he was medically fit for duty.

While there were no witnesses, and surveillance video footage did not capture the accident, the responders identified the first signs of harm to the conductor in the ballast near the accident location with insufficient walking space. Further, NTSB investigators found the walking space where the conductor was likely protecting the train movement from the ground to be challenging terrain consisting of a narrow walkway with a steep, rocky drop-off into a drainage ditch.

Upon the NTSB's request, the MoDOT inspected the walking space at the accident location and found that it did not meet Missouri Code of State regulations. In response, Dyno Nobel reconstructed all walking spaces along trackage within the facility to be 9 feet from the center of the track, making the walkways 6 inches wider than the state minimum requirements.

3. Probable Cause

The National Transportation Safety Board determines that the probable cause of the employee fatality at the Dyno Nobel facility was a result of the conductor being impacted by the moving railcars during a shoving movement while located in an area with insufficient walking space available for the employee to perform trackside duties.

The National Transportation Safety Board (NTSB) is an independent federal agency dedicated to promoting aviation, railroad, highway, marine, and pipeline safety. Established in 1967, the agency is mandated by Congress through the Independent Safety Board Act of 1974, to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the NTSB investigations website and search for NTSB accident ID RRD21LR009. 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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