



National Transportation Safety Board

Railroad Accident Brief

BNSF Railway Employee Fatality Minneapolis, Minnesota

The Accident

On May 25, 2015, at 11:39 a.m. central daylight time, a BNSF Railway engineering department foreman died while directing the unloading of track panels from flat cars located on a side track adjacent to a main track.¹ While the foreman directed the work from one of the flat cars, the machine operator was attempting to unload two track panels; however one panel slid off the fork lift and struck two locomotives passing on the adjacent main track. The foreman jumped or fell from the flat car to the ground just as the falling panel struck a panel on the flat car forcing it to slide onto the foreman below. (See figure 1.) The accident occurred near milepost (MP) 9.7 on the BNSF Midway Subdivision in Minneapolis, Minnesota. The passing locomotive was operating at 13 miles per hour (mph). The temperature at the time of the accident was 63°F with wind of 17°mph.

The Investigation

On May 23 and 24, 2015, the crew performed assigned engineering and construction tasks, but rain prevented them from completing their assigned tasks. Because of this, the same crew met at their lodging on May 25, and the foreman conducted a job briefing before they left for the work site.² The employees said the job briefing included a discussion of the work at the switch panel construction site and a mention of the upcoming job of unloading the track panels from flat cars that were on a side track. They decided no roadway worker protection was needed at the switch panel construction site because it was not near any active tracks. However, the foreman said they would lock the entrance to the unloading area on the side track making it inaccessible to other equipment for the crew's protection. No protection was implemented that would have restricted train movement on the adjacent main track.

The adjacent main track is a signaled main track where freight and passenger trains operate. The crew believed that since the equipment was working from the ground level of the side track and away from the main track, they were not required to establish adjacent track protection because they would not be close to the main track.

¹ All times in this report are central daylight time.

A track panel consists of two rails affixed to timber crossties with a box anchor pattern affixed to the base of the rails and rail joint bars attached at one rail end. The overall length of a track panel is about 42 feet.

² The five-person work crew included a foreman (the deceased), two class II machine operators (heavy equipment operators), a welder, and a section laborer.

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Figure 1. In this postaccident photo, the red arrow shows the fork lift operator’s position when he tried to lift two track panels. The green arrow shows the foreman’s likely position. The blue arrow indicates the direction of the train; “X” shows the location of the deceased. (Photo: BNSF Railway)

Construction crew employees said their first task was to finish assembling switch panel segments.³ After completing that task, the crew moved to the area where the loaded flat cars were positioned on the side track. This task had a different set of risks. Contrary to regulations, the construction crew did not engage in a job briefing at the second location or review the task at hand, which contained a different set of risks and work hazards from the previous work location.⁴

After arriving at the side track, the foreman and a welder secured the track.⁵ The foreman instructed the employees to remove the chains and securements holding the track panels to the flat

⁴ The Federal Railroad Administration’s Roadway Worker Protection Rule (Part 214), Subsection 214.315, Supervision and communication; paragraph (d) states “Before any member of a roadway work group fouls a track, the designated person providing on-track safety for the group under paragraph C of this section shall inform each roadway worker of the on-track safety procedures to be used and followed during the performance of the work at that time and location. Each roadway worker shall again be so informed at any time the on-track safety procedures change during the work period.”

⁵ A lock was placed on the derailed at the east switch; the west switch was locked at the switch stand. The foreman also placed a maintenance-of-way lock on the switch west of the flat cars.

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cars. To release the securements, employees had to climb on top of the stacks of track panel and work at ground level on the side track next to the main track. (See figure 2.) According to the Federal Railroad Administration's Roadway Worker Protection regulation, when an employee is within 4 feet of an adjacent track, protection must be provided. The workers who were releasing the securement on the main track side of the flat cars should have had protection.⁶

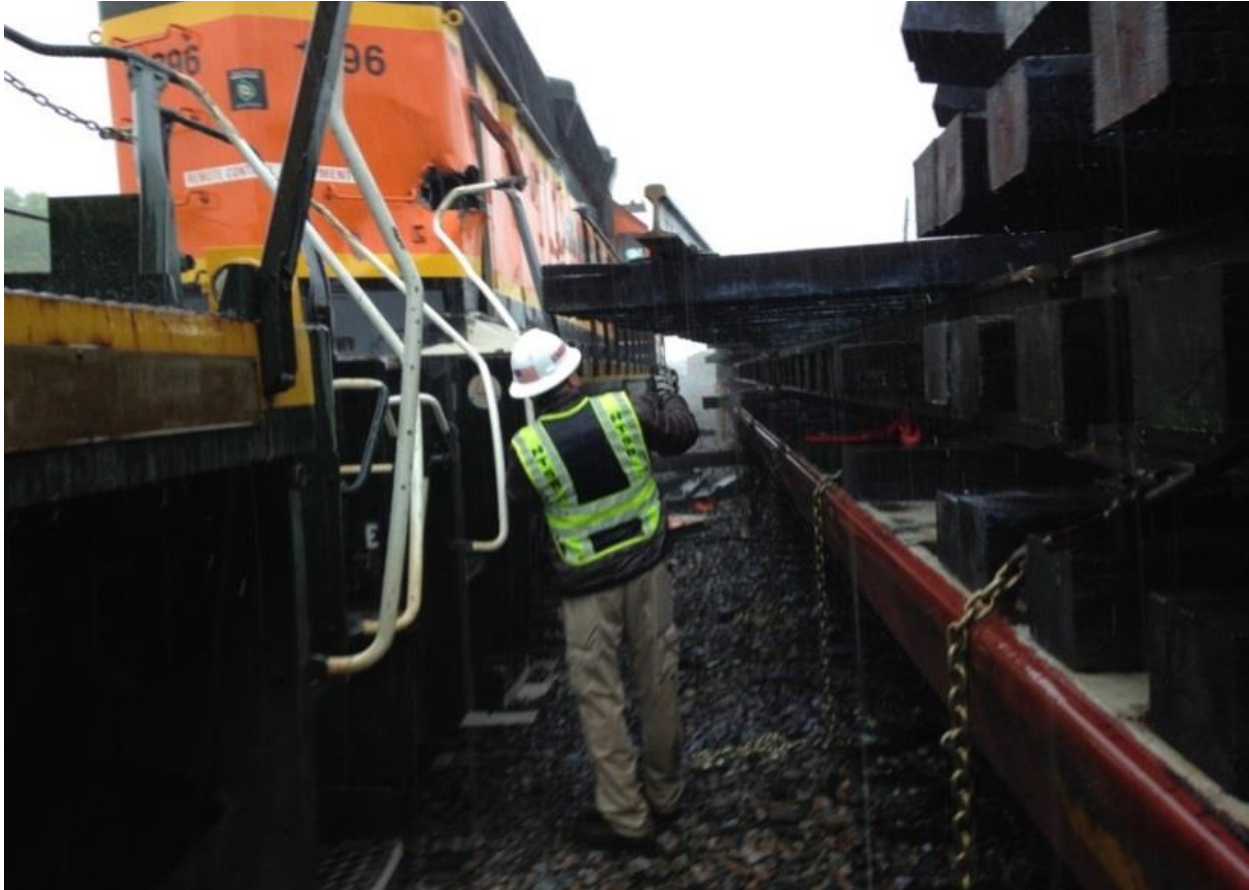


Figure 2. Dislodged track panel and damage to the BNSF train. (Photo: Federal Railroad Administration)

The construction crew said they did not use a watchman during the release of the securement. Crew members said the foreman was assisting with the release of the chains, so he could not be considered a watchman for the crew.

After the securements had been removed, the operator of one of the front end loaders approached the track panel on top of the stack on the east flat car. During interviews, both machine operators said they had no prior experience unloading track panels from a flat car. The operator unloading the panels said he had never used a set of forks for unloading, but the unloading went on as planned as the last task of the day.

The machine operator said he had trouble seeing where the forks fit under the top track panel and decided to lift the top two track panels. (See figure 1.) Meanwhile, the foreman remained

⁶ See Title 49 *Code of Federal Regulations*, Part 214.

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on top of the stack of track panels on the flat car at the west end (opposite from where the operator was to begin unloading). The machine operator said he did not know the foreman was on top of the panels on the west flat car.

Before the locomotives passed the flat cars, they approached an interlocking located about one-half mile east of the accident site. The locomotive event recorder data showed that the horn was sounded near the interlocking; 51 seconds elapsed between the horn being sounded and the accident. The data showed the horn did not continually sound and was not activated again before the accident. The locomotive engineer said he saw a work crew ahead and kept the locomotive's bell ringing while approaching and passing the work site; however, the event recorder data did not record bell activations.

According to a witness, just before the machine operator tried to lift the first two track panels, the foreman tapped the top of his hard hat as a signal to a second machine operator (who was not working and was at the west flat car) that a train was approaching. The second machine operator radioed the unloading machine operator to tell him a train was approaching; however, the unloading operator continued lifting the two track panels.

During a postaccident interview, the machine operator said he thought he had time to finish lifting the panels because he could not see the approaching train. He also said he believed the fork lift bumped the top track panel, which caused it to slide off of the track panel underneath it and into the side of the first locomotive moving past on the adjacent main track. The machine operator said he thought the taper of the forks added to the slant of the load he was lifting.

When the track panel hit the locomotive, the panel struck other unsecured track panels forcing them off the flat car. (See figure 2.)

As the track panels slid from the east flat car, the other panels were quickly dislodged. Meanwhile, the foreman either jumped or fell to the ground near the west end of the west flat car. A witness said the foreman appeared to be hurt, but before the foreman could move away, a track panel struck him. Before the crew could react, another track panel fell on top of the first one with the foreman still underneath. (See figure 3.)

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Figure 3. Dislodged track panels. (Photo: BNSF Railway)

Method of Operation

Operations on this portion of the Midway Subdivision—including the location accident site—are governed by system timetable and operating rules.⁷ The train dispatcher controls train traffic at control points.

Railroad operations in the accident area are conducted on a single main track with signals in both directions. The track runs north and south, but BNSF designates this territory in the timetable as east and west. The side track where the cars were being unloaded was classified as “other than main track.”⁸

Both freight and passenger trains operated on the Midway Subdivision. Train traffic on this subdivision included two Amtrak passenger trains and about 45 freight trains daily in the vicinity of the accident. The maximum authorized speed was 30 mph for passenger trains and 25 mph for freight trains.

⁷ The General Code of Operating Rules, Seventh Edition [including BNSF amendments], effective April 1, 2015. Train operations on the Midway Subdivision are also governed by the Twin Cities Timetable No. 5, in effect at 0800 central continental time August 22, 2012.

⁸ The classification “other than main track” refers to yard tracks, industry tracks, and anything that is not the main track.

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Emergency Response

The Hennepin County Sheriff's Office 911 Emergency Communications Facility received a call on May 25, 2015, at 11:45 a.m. reporting a fatality at Minneapolis Junction MP 9.5 in Minneapolis.

The Hennepin County Medical Examiner's Office was at the scene and determined the construction foreman died when the track panels fell on him. On May 28, 2015, an autopsy was conducted. According to the autopsy, the medical examiner determined the cause of death was multiple blunt force injuries, and the manner of death was accidental. The results of tests performed by the Federal Aviation Administration's Civil Aerospace Medical Institute showed the foreman was not impaired by drugs or alcohol.⁹

Exclusionary Factors

The following were not causal or contributory to the accident: the mechanical condition or performance of the locomotives or the unloading equipment, cell phone usage, drugs or alcohol, and radio operation.

Previous National Transportation Safety Board Actions

Roadway Worker Protection Special Investigation Report

The National Transportation Safety Board's special investigation report—*Special Investigation Report on Railroad and Rail Transit Roadway Worker Protection*—details 14 roadway worker employee fatality accidents, resulting in 15 fatalities, during 2013.¹⁰ Two of the safety issues addressed in the report concerned the quality, content, and importance of a thorough a job briefing and the positive effects of a “peer-to-peer” safety culture.

Job Briefings

Before the accident, the foreman in charge of the project conducted a job briefing when all members of both crews were present. The job briefing covered general work planning and the adjacent track rules, but it did not cover hazard recognition and mitigation associated with the specific tasks that were to be completed during the day's work (for example, adjacent track train movement in conjunction with the potential hazards of unloading of track panels).

A second job briefing that included hazard recognition and mitigation plans should have taken place once the crew reached the unloading site because the work changed

⁹ The Federal Aviation Administration's Civil Aerospace Medical Institute (CAMI) analyzes specimens using immunoassay, chromatography, gas chromatography/mass spectrometry (MS), high performance liquid chromatography/MS, or gas chromatography/Fourier transform infrared spectroscopy. Drugs and/or their metabolites that are not impairing or abused may be reported from the initial tests. See the CAMI drug information website for additional information (<http://jag.cami.jccbi.gov/toxicology/>).

¹⁰ *Special Investigation Report on Railroad and Rail Transit Roadway Worker Protection*, NTSB/SIR-14/03 (September 24, 2014) Washington, DC: NTSB.

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dramatically—from assembling switch panels away from a main track to working near a main track, which could present a serious hazard from train movements.

The NTSB’s special investigation report addressed job briefings, stating:

Before beginning any roadway work, the roadway worker in charge (RWIC) must consider safety first, then recognize and analyze the multitude of risks and hazards of the job and work environment, and take steps to mitigate the hazards. Second, the foreman must discuss these risks and hazards with all workers in a job briefing. Finally, additional job briefings must be conducted any time the work changes or a new person joins the work crew. The NTSB therefore concludes that the primary safety issue illustrated by these accidents is the importance of basic safety awareness.

In this accident, the work crew did not discuss several risk factors at their morning job briefing including: (1) the need for track protection when unloading track panels; (2) the inexperience of the unloading machine operator at lifting track panels (his first time was the day of the accident); (3) communications if foreman saw a train approaching and a plan to stop working when the foreman signaled a train was approaching.

Key factors in this accident were the work crew’s assessment of adjacent track protection as it related to their specific activities and whether or not they had a requirement to obtain adjacent track protection. The assessment did not become a factor in that when the locomotive movement on the adjacent track became a critical safety factor, the foreman made that timely observation; another employee, seeing the foreman’s signal, notified the unloading machine operator of the train’s approach. The disconnect that ensued was the failure of the team to have previously discussed what they would do when there was movement on the adjacent track. Because the group had not specifically discussed the strict adherence to stopping work, the unloading machine operator continued to lift the panels because he thought he had time to finish.

Peer-to-peer Safety Culture

The special investigation report further stressed the importance of establishing and encouraging peer-to-peer responsibility to enhance the safety culture among roadway workers. The special investigation report findings included the following:

In several accidents discussed in this [s]pecial [i]nvestigation [r]eport, had members of the work crew questioned the safety of assigned work and made appropriate adjustments, the accidents may not have occurred. To safeguard against these failures, workers should be encouraged to share responsibility for safety assurance throughout the entire work activity. As will be discussed, the circumstances of these accidents suggest failures in peer support for safety.

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Peer support can be defined as employee perceptions and opinions regarding how strongly they believe their coworkers support safety. In other words, it is a gauge of the level of ‘Actively Caring’ among coworkers. Peer support is critical to establishing and maintaining safe operations throughout the entire work project, and therefore must be embraced and internalized by all members of a work crew.

Not all workplace dangers are associated with on-track safety issues. Such potential dangers include falls, electrocution, natural hazards, obstacles/equipment on railroad bridges, and highway vehicles encroaching onto tracks and track^oright-of-ways. Therefore, the NTSB concludes that every railroad and rail transit work site contains risks beyond those associated with on-track protection, and that those risks should be managed. The NTSB also concludes that to recognize dangerous tasks and activities, roadway workers need to know what to look for to identify workplace dangers.

These excerpts from the special investigation report point to the need for greater involvement of all employees within a work group to communicate and actively participate in all job briefing activities. The risk assessments discussed at a job briefing can prepare a work group with an assessment of the work to be completed, but the unforeseen combination of events that can unfold in the work environment nearly always requires continuous teamwork to ensure the highest level of safety. In his closing remarks at the NTSB board meeting at which the *Special^oInvestigation Report on Railroad and Rail Transit Roadway Worker Protection* was adopted, NTSB Chairman Christopher Hart said: [selected excerpts]

But in addition to all of the recommendations we adopted today that are directed at organizations, I would like to direct a plea drawn from this report's findings to any roadway worker who hears my voice or reads these words:

Be your brother's and sister's keeper. Be their reminder. Have their backs. It might mean saving their lives, and it might mean that they can help save yours.

Identify a hazard even if it slows down a job. Talk over hazards persistently until you work out the ways to reduce your risk on the job.

But at the end of the day, it is the individual roadway worker who has to make it back home.

At the end of the day, if you're a roadway worker, your safety, and your coworker's safety, will always be in your hands.

Your railroads, regulators and unions – working together – can provide better rules, training, and inspections. But they cannot replace your vigilance or your watchful eye on the tracks.

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Postaccident Actions

The BNSF conducted a “safety stand down” with engineering personnel in the Minneapolis area on May 26, 2015, to discuss the accident and emphasize safety and safe work practices.

On May 27, 2015, the BNSF issued a systemwide safety bulletin (SB-2015-05E) detailing general aspects of the accident and included a question-and-answer section about adjacent track protection with reference to existing rules.

The NTSB was notified on November 2, 2015, that the BNSF had formalized a training process specifically focused on the safe operation and machine limitations for heavy equipment operators on construction crews and advising that all operators would receive a third-party evaluation. The BNSF also created a formal briefing document that was shared with engineering employees regarding track panel loading and unloading to focus on best practices on handling specific kinds of material in different situations. In addition, BNSF clarified their adjacent track rules to ensure better understanding; those discussions are now a required part of the daily job safety briefing for construction crews.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident was the locomotive on an adjacent track striking track panels being unloaded and causing them to dislodge and fall on the foreman. Contributing to the accident was (1) a job briefing that did not address the risks associated with the work; (2) the continuation of unloading activities despite being alerted to an approaching train on the adjacent main track; and (3) unclear guidance on adjacent track protection.

For more details about this accident, visit www.nts.gov/investigations/dms.html and search for NTSB accident identification number DCA15FR011

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The NTSB has authority to investigate and establish the facts, circumstances, and cause or probable cause of a railroad accident in which there is a fatality or substantial property damage, or that involves a passenger train. (Title 49 *United States Code (USC)* Section 1131 - *General authority*)

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

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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. 49°USC°1154(b).
