



National Transportation Safety Board

Washington, D.C. 20594

Railroad Accident Brief

Accident No.: DCA-03-FR-003
Location: Scottsbluff, Nebraska
Date of Accident: February 13, 2003
Time: 12:25 p.m. mountain standard time¹
Railroad: Burlington Northern Santa Fe Railway
Fatalities: 1
Injuries: 2
Property Damage: \$2.4 million
Type of Accident: Collision

Synopsis

On February 13, 2003, about 12:25 p.m., an eastbound Burlington Northern Santa Fe Railway (BNSF) unit coal train collided with a BNSF yard train on the main track in Scottsbluff, Nebraska. The coal train consisted of 2 locomotives and 124 loaded cars; the yard train² consisted of 1 locomotive and 16 freight cars. Both locomotives of the coal train and 28 cars of coal derailed; the locomotive and 3 cars of the yard train derailed. The crew of the coal train consisted of an engineer and a conductor. The engineer received minor injuries, and the conductor sustained fatal injuries. The crew of the yard train consisted of an engineer, a conductor, and a brakeman. The yard train engineer received minor injuries.

The Accident

The yard train crew went on duty at the Scottsbluff yard at 6:00 a.m. on February 13, 2003. After obtaining the information for their day's switching assignments, the crewmembers held a job safety briefing and then boarded the locomotive. Initially, they switched cars within the Scottsbluff yard. Later in the morning, they obtained the proper authority from the BNSF dispatcher to occupy the main track and went via the main track to Mitchell, Nebraska, where they performed switching activities. After returning to Scottsbluff from Mitchell, they contacted the train dispatcher, reported their train clear of the main track, and resumed switching in the Scottsbluff yard.

¹ All times used in this brief are mountain standard time.

² The yard train was a "road switcher," which switched cars in the yard and traveled on the main track to service industries. The symbol for the yard train was R-PWR8941-13A. The symbol for the coal train was C-NRMCNMO-01A.

About 12:25 p.m., the yard train crew was performing a switching maneuver that involved the brakeman's positioning himself at various locations within the yard to couple the cars, the conductor lining the switches at the east end of the yard, and the engineer operating the locomotive. The conductor was in control of the movement and was relaying signals by radio. According to the *General Code of Operating Rules* (GCOR), the person handling the switches must make sure that the switches are properly lined for the intended route.

The conductor instructed the engineer to move the locomotive eastward. The planned movement was for the yard train to move eastward down the straight track, referred to as the "lead track," which was parallel and adjacent to the main track. The conductor said that he planned to tell the engineer to stop once the rear car of the yard train had cleared the appropriate switch. He then planned, once the switches were lined for the appropriate track, to tell the engineer to shove the cars in the reverse direction back into another yard track.

The locomotive of the yard train was "backing up" as it pulled the cars out of one yard track in order to switch them to another. As the locomotive backed eastward, the front of the locomotive, which had the cab windows affording the best visibility, was facing west. While moving eastward, the engineer in the locomotive had limited visibility due to the engine's configuration.³ The engineer was responsible for operating the train at a speed that would allow stopping within one-half the range of vision, short of an improperly lined switch or obstruction on the track.

The engineer said that he could see the switch banners⁴ but not the switch points.⁵ According to the engineer, the switch banners were "all green" as he proceeded eastward. He mistakenly thought that this indicated that the route was lined for a straight movement in the direction of the lead track. Although the display indicated that the yard switches were lined for movement down the lead track, the green switch banner on the inside switch indicated that this switch was lined for a diverging movement onto the main track. Had this switch been lined for movement on the lead track, as the engineer intended, its switch banner would have been yellow.⁶ The inside switch was equipped with a lock that should have been used to lock the switch in a position lined for the lead track. After the collision, the switch was found unlocked, and the lock was found lying on the ground.

The engineer said that the first indication he had that the yard train was diverging from his intended route was when he felt the lateral motion associated with a locomotive

³ In railroad vernacular, this is known as having the "long hood forward."

⁴ A *switch banner*, sometimes termed a switch indicator or switch target, is typically a reflectorized metal flag-like device connected to the switch stand. It consists of one or two flags of different colors that indicate the position of the switch to the crew of an approaching train.

⁵ A *switch point* is the end of a switch rail formed into a sharp point for diverting the wheels of rolling stock and equipment from one track to another. The entire switch rail is often called the switch point.

⁶ The yard train engineer had 23 years of railroad operating experience but was relatively unfamiliar with practices at the Scottsbluff yard. His understanding, based on experience at other locations, was that "all green" aspects indicated the route was lined for a straight movement in the direction of the lead track.

going through a crossover or turnout. Event recorder data indicated the locomotive was moving about 5 mph at the time. The engineer initiated an emergency brake application and unsuccessfully attempted to reverse direction.

Meanwhile, a coal train was proceeding eastward on the BNSF main track through Scottsbluff at a recorded speed of 50 mph on a *clear* signal indication (green aspect, indicating that the train should proceed at normal speed). The coal train conductor and engineer noticed another train entering the main track ahead of them from an adjacent track. They shouted warnings to each other, and the coal train engineer immediately applied the train brakes. A wayside signal was visible to the coal train crew at that time, and the signal indication changed from *clear* to *stop* (due to the yard train's locomotive fouling the main track circuit). The coal train engineer remained in the locomotive control compartment; the conductor jumped from the moving train. Moments later, a collision occurred while the coal train was moving about 43 mph.

Nomenclature Consistency

The BNSF operating, signal, and engineering departments each used different terms to identify the system of track and switches through which the yard train locomotive had unintentionally passed. Each of the three BNSF departments fulfilled its maintenance, inspection, and operational duties in accordance with the requirements of its own terminology. Sometimes these requirements conflicted with those being used by the other departments.

According to the BNSF operating department, the system was termed a “crossover.” At the time of the accident, the GCOR defined a crossover as “A section of track that connects two adjoining tracks.” The GCOR has rules that address proper crossover operation. According to BNSF requirements for main tracks, the inside switch of a crossover must be electronically connected to the main track signal system. The inside switch through which the yard train locomotive passed onto the main track was not electronically connected to the main track signal system.

The BNSF signal department considered the track system a “turnout.” According to the signal department, the inside switch of a turnout is not required to be electronically connected to the main track signal system.

The BNSF engineering department called the track system a “yard turnout.” Under BNSF procedures, the inside switch of a yard turnout would require a monthly inspection. The inside switch of a main track crossover would require a weekly inspection.

Switch Banner Display

The switch banners at most BNSF locations display an aspect more restrictive than green when the switch is lined for movement onto the main track. However, the banner on the inside switch involved in this accident displayed a green aspect when the

switch was lined for movement from the yard onto the main track and a yellow aspect when the switch was lined for movement away from the main track. Train crews had raised the issue of the possibly misleading nature of this display to BNSF supervisors prior to the accident. Based on these concerns, BNSF had reviewed the switch banner display procedure at this location before the accident but had decided to keep the display as it was. This display arrangement had been in effect for at least 5 years on the Scottsbluff inside switch.

Entering the Main Track

Nothing prevented a yard train crew from inadvertently entering the main track from the Scottsbluff yard. The single switch displaying a green banner allowed access. At the time, there was no electronic interconnection or electric lock, there was no derail,⁷ and there was no outstanding operational requirement to stop nor was a stop indication displayed on the inside switch. As has been noted, this switch was not electrically connected to the main track signal system.

Under these conditions, the crew of a main track train would have had no indication that the inside switch was lined in a position that would allow another train to diverge toward the main track. Because this switch was not connected to the signal system, the crew of a main track train would have had no warning that a conflicting movement was occurring until the main track was actually obstructed.

Regulatory Requirements for Switches

There are no Federal regulations providing specific requirements for switch banners. Regulations governing periodic switch inspection and electronic interconnections of the signal system are dependent on the definition of a particular switch and its function.

Actions Taken Since the Accident

The inside switch at the east end of the Scottsbluff yard was replaced following the accident. The switch banner for the new switch now displays a red aspect when the switch is lined for movement to the main track and has no display when the switch is lined for movement to the lead track. Additionally, the switch is now electronically connected to the main track signal system so that a red signal is displayed in both directions when the switch is lined for movement between the yard and the main track.

BNSF officials conducted an audit of their entire system to identify other locations where track systems similar to the configuration at the Scottsbluff yard existed. BNSF subsequently identified 48 locations that had a similar switch at the inside of a

⁷ A *derail* is a safety device attached to one side of a siding or storage track that will cause a car to be derailed if it rolls free toward a main track.

crossover. In all these locations, the switch banner display practice was the same as it had been at the Scottsbluff yard, and the inside switch was not electrically connected to the main track signal system. Since the review, the inside switch banners have been adjusted at all these locations, and all these switches have been connected to the signal system that governs the use of the main track.

Since the accident, at a meeting of the GCOR Committee, BNSF proposed new language for defining a “crossover” such that the switches as well as the connecting track are included in the definition. The proposed language was adopted, and the GCOR definition of a crossover now reads: “A combination of two switches that connect two adjacent tracks.” BNSF has modified its Maintenance of Way rules to include the revised definition of a crossover.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the February 13, 2003, collision between a Burlington Northern Santa Fe Railway coal train and yard train near the Scottsbluff, Nebraska, yard was the failure of the yard train’s conductor to properly line and lock the switches for the yard train’s intended route. Contributing to the cause of the accident was the lack of an electronic connection between the inner switch and main track signal system.

Adopted: February 13, 2004