



# National Transportation Safety Board

Washington, D.C. 20594

## Railroad Accident Brief

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Accident No.:	DCA-05-FR-012
Location:	Shepherd, Texas
Date:	September 15, 2005
Time:	12:07 a.m. central daylight time <sup>1</sup>
Railroad:	Union Pacific Railroad
Property Damage:	\$1,514,000
Fatalities:	1
Injuries:	2 minor
Type of Accident:	Collision

### Synopsis

About 12:07 a.m. on September 15, 2005, Union Pacific Railroad (UP) train MPBSR 13, entered the siding at Shepherd, Texas, at approximately 37 mph and struck UP train LEF52 14. The engineer of the standing train, train LEF52 14, was killed. The lead locomotive of the striking train, train MPBSR 13, rolled onto its side, and the engineer and conductor sustained minor injuries. The temperature was approximately 78° F; and, other than darkness, visibility was clear. The estimated property damage was about \$1,514,000.

The collision occurred on the UP's Lufkin Subdivision, approximately 50 miles north of Houston, Texas. Train movements were authorized by track warrants issued by the train dispatcher in Omaha, Nebraska. The maximum authorized speed was 49 mph. There were no wayside signals to govern the train movements or protect the train from an interruption in the continuity of the track, such as an open switch. Consequently, strict compliance with the operating rules was necessary to protect one train from another.

### Events Preceding Accident

About 10:30 p.m. on September 14 (approximately 1 hour 30 minutes before the accident), train LEF52 14 was waiting on the main track at Shepherd for train MPBPT 14 (a southbound freight train) to pass through the siding. The conductor had lined the north siding switch so the train could pass through the siding. Once train MPBPT 14 had passed train LEF52 14, the conductor re-lined the switch so that train LEF52 14 could proceed northward on

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<sup>1</sup> All times in this brief are central daylight time.

the main track. When the rear car of train LEF52 14 passed the switch, the conductor re-lined it so that train LEF52 14 could back into the siding southward.

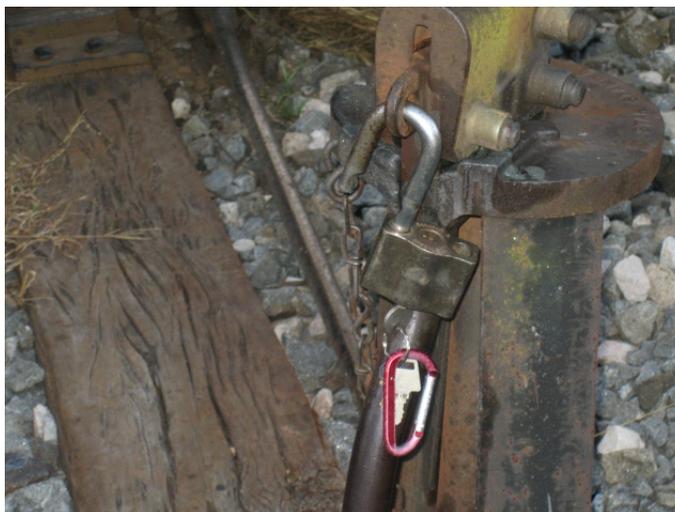
The conductor rode the rear car of the train into the siding. When the entire train was on the siding and about 500 feet south of the switch, the engineer stopped the train. She and the conductor secured the handbrakes on three freight cars and the two engines. (The train consisted of 2 locomotives and 16 cars.) She returned to the cab of the lead engine and called the train dispatcher, as the conductor had asked her. She reported that the train was clear of the main track and released the track warrant authority. When she had finished, she waited for the conductor in the limousine that had been sent to take them to Lufkin, Texas. The conductor arrived at the vehicle, and they left Shepherd about 11:20 p.m.

About 20 minutes later, when the limousine was about 20 miles from Shepherd, the conductor realized that he had left his keys in the switch lock. He insisted that the driver return to the siding.

Meanwhile, train LEF52 14 had acquired a new crew, consisting of an engineer, a pilot engineer, and a conductor. Shortly after midnight, train MPBSR 13, which was southbound, approached Shepherd. The pilot engineer of train LEF52 14 left the cab so he could inspect the passing of train MPBSR 13 from the ground. The conductor was exiting the cab to do the same and saw that train MPBSR 13 was entering the siding. He yelled at his engineer, who was still in the cab, to get out. The pilot engineer and conductor escaped on the ground to the west of the pending collision. The engineer of train LE F52 14 was unable to exit in time and was killed.

Right before the collision, the crewmembers on train MPBSR 13, realizing that their train was entering the siding, applied the brakes in emergency at approximately 37 mph. Following the impact, the engine rolled onto its side, and the two crewmembers sustained minor injuries. During the postaccident inspection, investigators found that the switch was still lined for the siding and that although the lock had been applied to the switch, it was still unlocked and held the keys belonging to the original conductor of train LEF52 14. (See figure 1.)

Based on the position of the switch and the presence of the keys, it is likely that the original conductor of train LEF52 14 had not re-lined the switch, thus making it impossible for train MPBSR 13 to stay on the main track.



**Figure 1.** Conductor's key in switch lock.

## Rules Compliance

The investigation identified a number of procedural infractions that preceded the accident. According to Rule 8.3,<sup>2</sup> “The normal position of a main track switch is for main track movement, and it must be lined and locked in that position.” The rule has seven exceptions; however, none of them applied to this situation. According to Rule 14.7, “Reporting Clear of Limits,” “In addition, ...a train clearing in a siding or other track must comply with requirements outlined in Rule 8.3 (‘Main Track Switches’) before reporting clear of the limits.” In other words, the switch should have been lined for main track movement before the original engineer of train LEF52 14 released the track warrant authority for the main track to the train dispatcher and reported the train clear of the limits. Instead, when she released the track warrant, she assumed that the conductor had either re-lined or was in the process of re-lining the switch. When he joined her in the limousine, she did not confirm the position of the switch.

The UP’s operating rules<sup>3</sup> required the conductor to comment about delays and other events during the tour of duty on a preprinted form, Conductor Report Form 20849 (Form 20849). The last entry that the conductor had made was about 9:21 p.m., when the train had passed a defect detector at MP 48.5. He had written that no defect was found and that the detector announced the train’s speed as 42 mph.

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<sup>2</sup> “Main Track Switches,” from the *General Code of Operating Rules* (Fifth Edition).

<sup>3</sup> Union Pacific Rules, System Special Instructions, Item 10: Rules Supplements and Amendments, Rule 1.47 “Duties of Crew Members,” Item A. Conductor Responsibilities, 5. Conductor Report Form.

According to the operating rules, when main track switches are restored to normal in non-signaled territory, the following items must be entered on Form 20849:

The location and time each main track switch is returned to normal when operating in non-signaled track warrant control (TWC) territory, except within Yard Limits. However, when departing, if main track movement is made over the switch operated, entry is not required (i.e., following a head end set-out or pick-up).

‘Switch restored’ entries must be initialed by both the conductor and engineer....

During the postaccident interview, the engineer said that she had not known that she was supposed to initial Form 20849 when the position of a main track switch was restored to normal. Further, she added, “I don’t think I’ve ever signed for a switch.”

Form 20849 was incomplete. The last entry on it should have said that the switch had been re-lined. The entry should have given a time and should have been initialed by both the conductor and the engineer.

## Oversight

To monitor its employees’ compliance with its operating rules, the UP conducts compliance field audits (commonly referred to as “efficiency tests”). According to 49 *Code of Federal Regulations* Part 217, the Federal Railroad Administration (FRA) can review the auditing.

In the 365 days before the accident, railroad supervisors had observed the engineer on 21 separate occasions. The supervisors had noted 58 individual operating or safety rules that she had followed. They had noted three minor infractions and handled them immediately with oral admonishments. On three specific occasions she was observed properly following the procedures involved in the use of hand-thrown switches; she was never observed using a switch improperly.

During the same period, supervisors had observed the conductor on 21 separate occasions. They had noted 69 individual operating or safety rules that he had followed. Of the 69, the supervisors had orally admonished him for the following 3 minor infractions:

- March 10, 2005: Not complying with the procedure for getting off equipment.
- May 15, 2005: Not complying with the procedures for position of switches.<sup>4</sup>
- June 18, 2005: Not complying with the procedures for handling cars ahead of engines.

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<sup>4</sup> The reference for this rule infraction was Rule 8.2 “Position of Switches.” This rule covers the use of switches in general and would most likely apply during switching operations. The next rule, Rule 8.3, “Main Track Switches,” was not referenced in the auditing and covers the proper alignment of main track switches.

## **Crew Qualifications and Rest**

The investigation determined that the crew was experienced and qualified on the territory. No impairing substances were found during the postaccident toxicological tests.

When the accident happened, the conductor and the engineer were ending their third consecutive noon-to-midnight shift. Since Sunday (the accident happened minutes after midnight Wednesday), they had had three consistent cycles of sleep and work. Both said that they had not felt fatigued at the end of the shift and always made a point of getting enough rest during their off-duty time.

## **Actions Taken Since The Accident**

Following this accident, the UP revised the procedures for operating a hand-operated switch in non-signaled territory. The new rule requires that the crewmember who is operating the switch immediately notify the engineer by radio or hand signal when the switch position is to be changed. Further, the rule now specifies that the engineer and conductor must initial Form 20849 before releasing the track warrant for the main track authority to the dispatcher.

The FRA had issued a Safety Advisory on January 10, 2005, about 8 months before the accident, warning the railroads of an increase in incidents involving hand-throw switches that had inadvertently been left open, allowing trains to enter side tracks unintentionally and resulting in collisions and injuries. The advisory said that if the number of accidents of this type did not decrease, the FRA would be required to take “additional action to address this situation.”

On October 19, 2005, about a month after the collision at Shepherd, the FRA issued Emergency Order (EO) No. 24 to address the use of hand-operated main track switches in non-signaled territory. According to its preamble, the EO had been prompted by several accidents, including the accident in Shepherd, Texas.

The EO has seven specific instructions about using hand-operated switches when the approaching train is not already prepared to slow down or when the switch is not protected by some form of switch-position indicator. One of the seven requirements is similar to the preexisting requirement connected to the Shepherd accident. The EO specifies that the conductor and engineer must initial a Switch Position Awareness Form when the switch is re-lined to the normal position. Further, the train dispatcher must be informed when the switch is in the proper position if the train crew is releasing authority to the main track at this location. The dispatcher is also required to confirm this information and make sure that the engineer and conductor have each initialed the Switch Position Awareness Form.

On November 29, 2005, the Safety Board adopted the railroad accident report titled *Collision of Norfolk Southern Freight Train 192 With Standing Norfolk Southern Local Train*

*P22 With Subsequent Hazardous Materials Release at Graniteville, South Carolina, January 6, 2005.*<sup>5</sup> In the Graniteville accident, a local crew had parked its equipment on a side track in non-signalized territory and failed to re-line the main track switch. A train had entered the side track and struck the unoccupied standing train. The subsequent derailment resulted in the release of chlorine from a tank car. Nine people were fatally injured as a result of chlorine gas inhalation.

As a result of that accident the Safety Board recommended that the FRA:

R-05-14

Require that, along main lines in non-signalized territory, railroads install an automatically activated device, independent of the switch banner that will, visually or electronically, compellingly capture the attention of employees involved with switch operations and clearly convey the status of the switch both in daylight and in darkness.

R-05-15

Require railroads, in non-signalized territory and in the absence of switch position indicator lights or other automated systems that provide train crews with advance notice of switch positions, to operate those trains at speeds that will allow them to be safely stopped in advance of misaligned switches.

## **Probable Cause**

The National Transportation Safety Board determines that the probable cause of the September 15, 2005, collision of Union Pacific Railroad trains MPBSR 13 and LEF52 14 in Shepherd, Texas, was the failure of the previous crew for train LEF52 14 to return a main track switch to the normal position after they had secured the train on the siding and departed the area.

**Adopted: May 22, 2006**

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<sup>5</sup> Railroad Accident Report NTSB/RAR-05/04 (Washington, DC: NTSB, 2005).