



NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF RAILROAD, PIPELINE AND HAZARDOUS
MATERIALS INVESTIGATIONS
WASHINGTON, D. C. 20594

Track & Engineering Factual Report

Railroad: Union Pacific Railroad (UP)

Location: Texarkana, Texas

Accident No.: DCA15FR014

Accident Type: Side collision between two UP trains at an interlocking

Train #1: (striking train) UP train AMNML-07, a westbound train

Train #2: (struck train) UP train ALDAS-06, a northbound train

Date and Time of the Accident: September 8, 2015 at 00:34 a.m.

Keys #: 91935

Group Members

Cyril E. Gura, Safety Engineer [Railroad]
National Transportation Safety Board

Andrew Bokenkamp – Director of Track
Union Pacific Railroad

Synopsis

On September 8, 2015 at 12:34 a.m. central daylight time, Union Pacific Railroad (UP) train AMNML-07 (train #1) traveling west on the Pine Bluff Subdivision, main track, collided into the side of UP train ALDAS-06 (train #2) traveling north on Little Rock Subdivision, main track one, at Texarkana, Texas. The collision occurred at a railroad crossing at grade located at the intersection of the Pine Bluff Subdivision, Control Point (CP) CB418, Mile Post (MP) 419.1 and the Little Rock Subdivision, CP R001, MP .5.

As a result of the collision, two locomotives of the westbound train UP AMNML-7 along with the thirteenth through the nineteenth cars of the north bound train UP ALDAS-06 derailed. Both engineer and conductor of the westbound train sustained minor injuries. The lead locomotive of the westbound train AMNML-07 UP 2542 derailed on its side resulting in a release of approximately 4,000 gallons of diesel fuel. The fuel spill was contained, afterwards the soil and debris was removed for proper disposal. The event recorder data indicated train #1 traveling at 19 mph before the train was placed into emergency brake application by the engineer and an impact speed of 6 MPH. The estimated damage is estimated at \$4,664,073.00.

The parties to the investigation include Union Pacific Railroad, the Federal Railroad Administration (FRA), the Brotherhood of Locomotive Engineers and Trainmen (BLET), the Sheet Metal, Air, Rail and Transportation (SMART)¹ and the Brotherhood of Railroad Signalmen (BRS).

Location of the Accident

The geographic location of the accident is within Bowie County in Texarkana, Texas. The side collision occurred at a railroad crossing diamond located at the intersection of the UP Pine Bluff Subdivision, and the UP Little Rock Subdivision.² The crossing diamond intersection angle was 59°36'28".

The UP Pine Bluff Subdivision single main track and siding track crosses with the Little Rock Subdivision two main tracks at Texarkana Interlocking located in Texarkana, Texas. The Texarkana Interlocking is at milepost (MP) 419.1 on the Pine Bluff Subdivision and at MP 0.54 on the Little Rock Subdivision. The point of collision (POC) was located at 33°24'55.83' latitude and -94°3'3.14' longitude at MP 419.1 on the Pine Bluff Subdivision. See figure 1 for a depiction of the postaccident site survey.

¹ Formally the United Transportation Union (UTU)

² A crossing diamond is a structure used where one track crosses another at grade, and consisting of four connected frogs.

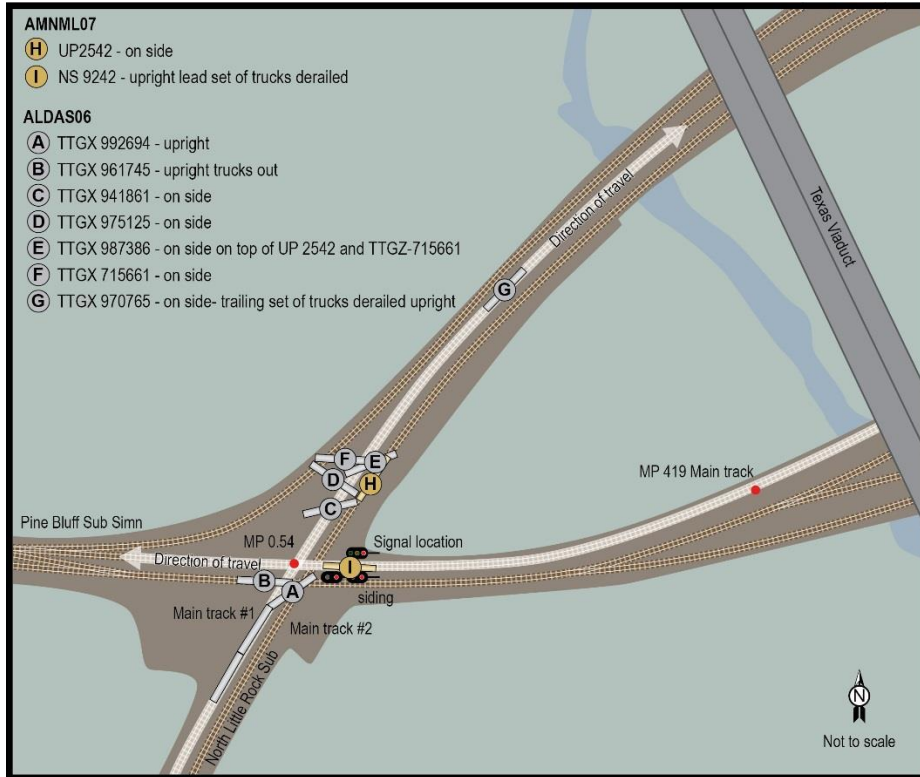


Figure 1 - post accident site survey

The Pine Bluff Subdivision of the UP North Little Rock Area Timetable extends from MP 266.4 in Pine Bluff, Arkansas to MP 525.1 in Big Sandy, Texas in a timetable east-west direction. The maximum authorized timetable speed on the subdivision is 70 mph for freight trains with permanent speed restrictions between posted timetable mileposts. The track milepost numberings increase in the westward direction. Approximately, 17 trains are operated daily which equates to 37 million gross tons annually.

The Little Rock Subdivision of the UP North Little Rock Area extends from MP 343.6 in North Little Rock, Arkansas to MP 89.6 in Longview, Texas in a timetable north-south direction. The maximum authorized timetable speed on the subdivision is 70 mph for freight trains and 75 mph for passenger trains with permanent speed restrictions between posted timetable mileposts. The track milepost numberings decrease in the northward direction. Approximately 36 trains, of which 2 are Amtrak trains, are operated daily which equates to 63 million gross tons annually.

Maximum authorized timetable speed through the Texarkana Interlocking for trains operating on the Pine Bluff Subdivision is 20 mph. Maximum authorized timetable speed through the Texarkana Interlocking for trains operating on the Little Rock Subdivision are 30 mph for both freight and passenger trains.

Track Description

The UP acquired the Pine Bluff Subdivision from the St. Louis Southwestern Railway on September 11, 1996. The track investigation concentrated on the Pine Bluff Subdivision and began at Control Point (CP) 416 (Gertrude); where the striking train engineer said that after seeing a green (proceed) signal aspect at CP 416, he became “incoherent”.

In the westward direction and between CP 416 and east end of the Texarkana Yard at MP 418.1, the main track is on an average descending grade of 0.71 percent. The grade is then becomes level to about MP 418.6. Between MP 418.6 and MP 419.05 the track grade descends an average 0.34 percent. Between MP 419.05 and through the POC to MP 419.12 the track grade ascends 0.59 percent.

There are 10 curves between CP 416 and the POC. The second curve the train crewmembers would have encountered was just prior to the approach signal. The curve was a 3°20’ right hand curve that extended from MP 417.11 to MP 417.4; approximately 1,578 feet long with 2 inches of superelevation. After exiting this curve, the approach signal was located at MP 417.41, which was also the location of Pinehurst Street. The signal was located just west of Pinehurst Street which was actively protected with flashing lights and gates. From the approach signal to the POC, at MP 419.1, it was about 1.7 miles. The next signal the train crewmembers would have seen was located at MP 419.05; the interlocking home signal. Just east of the home signal a 6°56’44” right hand curve that extended from MP 418.95 to MP 419.05. It was about 264 feet between the home signal and the POC.

The ten tracks in Texarkana Yard are sandwiched between the main track on the north side and the siding track on the south side. Texarkana Yard is designated between MP 417.5 and MP 419.1. See figure 2 for a general idea of the track configuration.

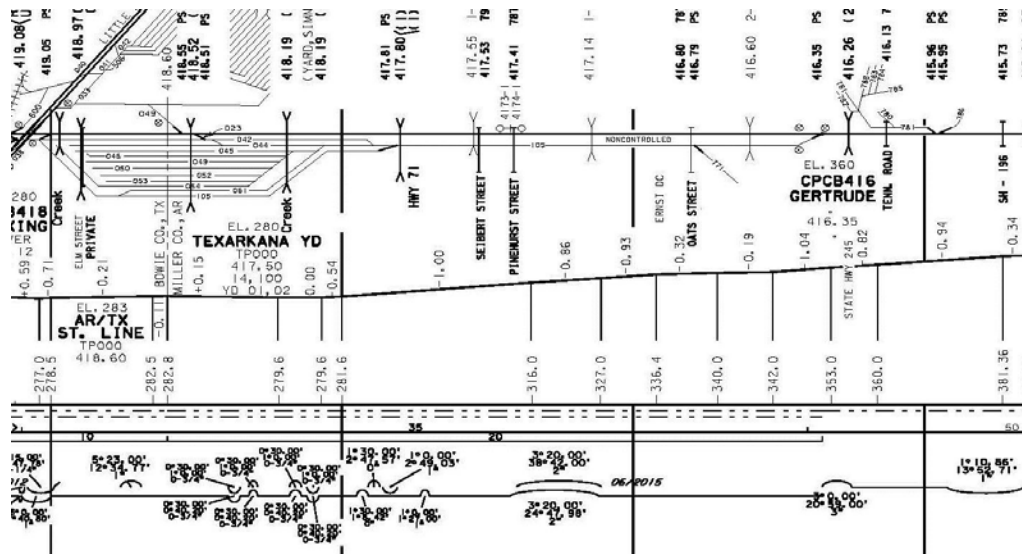


Figure 2 - track configuration leading to and through Texarkana Yard

The main track is constructed with 133 pound continuous welded rail (cwr) on wooden cross ties affixed with cut track spikes. The wooden cross ties were spaced on 22 inch centerlines. The main track cwr was solid box anchored at every tie location 500 feet in both directions of the interlocking on both subdivisions. In addition, the ties were solid box anchored through the west Texarkana siding switch and through main up to the crossing diamonds. Outside of the switch and interlocking limits the cwr was box anchored at every other tie location. The track ballast was predominately Class 1 rock.³

A left hand switch connected the east end of the Texarkana siding at MP 416.35 to the main track. The siding track continued and crossed the two main tracks on the North Little Rock Subdivision to MP 419.14. The siding track was predominately 119 pound cwr on wooden cross ties affixed with cut track spikes. The wooden cross ties were spaced on 22 inch centerlines. The cwr was box anchored at every other tie location throughout the siding track and solid box anchored every tie into the interlocking location. The ballast was predominately Class 1 rock.

Daily Track Inspection Records

Between CP 416 and the POC, the UP is required to maintain and inspect the main track to Class 3 Track Safety Standards (TSS); because of the 35 mph authorized speed.⁴ But because the track carries more than 10 mgt, the UP was required to conduct twice weekly visual track inspections with at least 3 days between inspections. The track inspections were typically conducted by a lone track inspector riding in a high rail vehicle on Tuesdays and Fridays. Both the siding track and the crossing diamond were inspected weekly.

The UP daily track inspection records were examined from January 2015 thru September 9, 2015. In addition to frequency, the track inspection records were examined to determine if the crossing diamond was problematic. The main track through the interlocking was inspected twice weekly. There were 25 inspections where the track inspector noted on the reports that he replaced and/or tightened bolts in the interlocking at MP 419.1 and twice a frog need to be repaired. All track defects were recorded on the inspection reports as being repaired.

The last track inspection through this area (from MP 417.48 to MP 480.25) was conducted on Friday, September 4th. During this last track inspection four track defects were noted on the inspection record. The track defects included the following: insufficient effective ties at MP 426.93 and MP 426.94 which required 40 mph speed restrictions; at MP 417.8 an object between the rail base and a tie plate; and at MP 418.55 a cotter pin was missing in a switch.

On the day after the collision, September 9th, the track inspector inspected both the main track and siding between MP 417.48 and MP 419.64. No track defects were noted.

³ UP Standard Drawing 0010E depicts stone gradation size.

⁴ The Track Safety Standards are in 49 Code of Federal Regulations (CFR) 213 Subpart A to F.

Rail Inspection for Internal Defects

TSS 213.237 requires a continuous search for internal rail defects. The UP scheduled the main track every 91 days for internal rail defect inspection. The most recent internal rail defect inspections were conducted on August 26, and June 22, 2015. No rail defects were detected on main track between CP 416 and MP 420.0. The most recent internal rail defect inspection on the siding track occurred on May 12, 2015 between the limits of MP 417.5 and MP 419.16. The following rail defects were detected on the siding; a 50% detail fracture at MP 417.80, a defective field weld at 418.47, and a 5 inch bolt whole crack at MP 418.96.

Track Geometry Car Measurements/Inspection

To supplement the requirements of TSS 213.233(b), the UP conducted an automated geometry car measurements/inspection twice yearly on the main track and once per year on the siding. The most recent geometry car measurements/inspection on the main track was conducted on August 27, 2015 between MP 390.5 and MP 452.0. The most recent geometry car measurements/inspection on the siding track was conducted on April 10, 2015 between MP 416.35 and MP 418.6 and on April 13, 2015 between MP 419.05 and MP 419.16. The track measurements that were noted as defects were first verified by field measurements and were either dismissed as a non-defective track condition or had a speed restriction placed in order to be in compliance with the specific TSS track geometry limits and then repaired.

NTSB Observations

Investigators examined the track conditions of the main and siding tracks around the collision area and for about one mile in the eastward direction. Nothing remarkable was noted with the track conditions.

Wayside Utilities

No underground utilities were located in the area where excavation was conducted to remediate the diesel fuel spill.

Track Work Summary

The following is a summary of track work performed on Pine Bluff Subdivision in the area of the accident:

- The 133 pound rail in the main track was installed in 2014.

- The main track rail was ground in June 22, 2015.
- Six year tie cycle. The last cyclic main track tie replacement was conducted in 2010 (MP363.0 to MP 418.0) and in 2012 (MP 418.0 to MP 435.0).
- The last cyclic main track out-of-face surfacing was conducted in 2012 in conjunction with tie replacement.
- The 119 pound rail was relay rail and was installed in 1978.
- The last cyclic siding track tie replacement was conducted in 2010 (MP363.0 to MP 418.0) and in 2012 (MP 418.0 to MP 435.0).
- The last cyclic siding track out-of-face surfacing was conducted in 2010 and 2102 in conjunction with tie replacement.

Damages

The UP estimated the track costs of materials and labor to be \$5.4 million for the following damages:

- Replaced four 133 pound crossing diamonds and timbers
- Installed 13 track panels on the main track
- Replaced 120 feet of siding track