Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2016-1152

Union Pacific (UP)
Lewisville, AR
August 14, 2016

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

SYNOPSIS

Synopsis

On Sunday, August 14, 2016, at 1:00 p.m., CDT, Union Pacific Railroad (UP) westbound Manifest Train MPBMX-14, operating with 2 lead locomotives, 3 rear locomotives, 113 loaded rail cars, and 11 empty rail cars, derailed 31 rail cars at a recorded speed of 42 mph.

The derailment occurred approximately 3.25 miles west of Lewisville, Arkansas, on UP's Pine Bluff Subdivision at Milepost 392.95 on a single main track owned and maintained by UP. Movements on this part of the railroad are governed by centralized traffic control, with a maximum authorized speed of 70 mph.

Derailed equipment from MPBMX-14 included line number 75 and item numbers 92 through 121 from the head-end. Track damage was estimated at $821,740. There was no signal damage and the equipment damages were estimated at $2,175,237. There were no reported injuries to the crew members. There was no release of hazardous materials.

At the time of the derailment, the temperature was 80º F with cloudy skies.

FRA was unable to determine the probable cause for this accident, and will list the probable cause as cause code M507, Investigation complete, cause could not be determined due to a lack of supporting evidence.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2016-1152

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Union Pacific Railroad Company	UP	0816LK010

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Union Pacific Railroad Company	UP	0816LK010

2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	8/14/2016	1:00 PM

5. Type of Accident/Incident
Derailment

6. Cars Carrying HAZMAT	7. HAZMAT Cars Damaged/Derailed	8. Cars Releasing HAZMAT	9. People Evacuated	10. Subdivision
2	0	0	0	Pine Bluff

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Lewisville	392.950	AR	LAFAYETTE

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
80 ˚F	Day	Cloudy	Main

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Pine Bluff Main	Freight Trains-60, Passenger Trains-80	42.8	West

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2016-1152

OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	MPBMX 14

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross exluding power units)	6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter	Code
42 MPH	R	13653		0

6. Type of Territory

Signalization:
Signaled

Method of Operation/Authority for Movement:
Signal Indication

Supplemental/Adjunct Codes:
Q

7. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box	Alcohol	Drugs
(1) First Involved *(derailed, struck, etc.)*	WRWK 873629	73	yes		0	0
(2) Causing *(if mechanical, cause reported)*	WRWK 873629	73	yes	9. Was this consist transporting passengers?		No

10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End e. Remote	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	3	(1) Total in Equipment Consist	113	0	11	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	31	0	0	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
2175237	821740

14. Primary Cause Code
M507 - Investigation complete, cause could not be determined (When using this code, the narrative must include the reason(s) why the cause

15. Contributing Cause Code

Number of Crew Members

16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen
1	0	1	0

Length of Time on Duty

20. Engineer/Operator	21. Conductor
Hrs: 9 Mins: 0	Hrs: 9 Mins: 0

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others
Fatal	0	0	0
Nonfatal	0	0	0

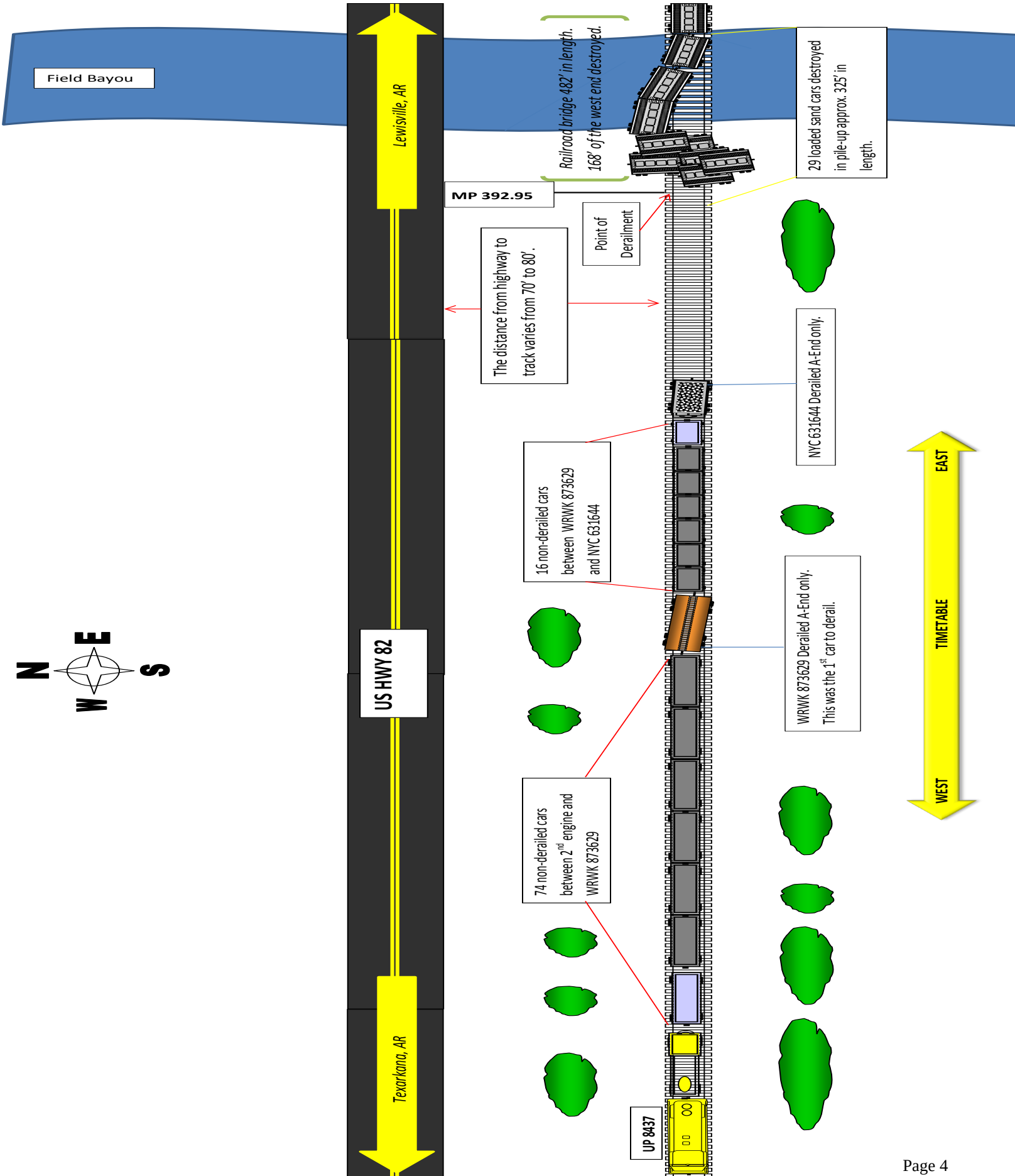
25. EOT Device?	26. Was EOT Device Properly Armed?
N/A	N/A

27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
33.357943000	-93.632946000

SKETCHES

Sketch 392.95



NARRATIVE

Narrative

Circumstances Prior to the Accident

The crew of westbound Union Pacific Railroad (UP) Train MPBMX-14 (derailed train) included a locomotive engineer and a conductor. The crew first went on duty at their home terminal at 4:00 a.m., CDT, on August 14, 2016, at Pine Bluff, Arkansas. Both employees received more than the statutory off-duty period prior to reporting for duty; approximately 44 hours and 55 minutes for the Conductor and 31 hours and 37 minutes for the Engineer.

The derailed train consisted of two lead locomotives, UP 8437 and UP 7877, and three distributed power units: UP 7244, UP 4260, and UP 6793, at the rear of the train. It was comprised of 113 loads and 11 empty manifest cars. The train was 7,485 feet in length with 13,653 gross tons in weight and scheduled to travel to Big Sandy, Texas.

The derailed train had an initial Class 1 air brake test entered at 10:00 p.m., on August 13, 2016, and it was performed on 125 cars per the issued train list made available to the crew. The locomotives were up-to-date on their daily inspections. The Engineer performed a leakage and bump test prior to departing the train. The crew set one bad order car out prior to departing Pine Bluff with 124 cars at 7:44 a.m., on August 14, 2016, as listed on the dispatcher's record of movement of trains.

As the train approached the accident area, the Locomotive Engineer was seated at the controls on the north side of the leading locomotive. The Conductor was seated on the south side of the leading locomotive.

The railroad timetable direction of travel for this train is west. The geographical direction for this train is also west. In this area of the railroad, from approximately Milepost (MP) 392 to MP 393, there is a descending grade with a 1-percent maximum descent and level grade prior to the derailment location. This derailment occurred in tangent track approximately 8/10-mile from the last curve traversed and 1.75 miles to the next curve. Timetable directions are used throughout this report.

Method of Operation

At the derailment site, the trains are governed by centralized traffic control. The derailment occurred at MP 392.95, and the railroad at this location is single main track with no sidings. Trains operate mostly in a westward direction on the single main track. The maximum authorized timetable speed for trains operating on this part of the main track is 70 mph. The operating rules governing UP's employees are the General Code of Operating Rules, 7th Edition, effective April 1, 2015, which includes updates as of July 06, 2016. Also, governing train movements on UP's Pine Bluff Subdivision is North Little Rock Area Timetable No. 5, effective July 09, 2016. Track Warrant No. 9751 was issued to Lead Locomotive UP 8437 listing all track bulletins and train orders that were initially in effect the morning of August 14, 2016. This warrant is used to deliver track bulletins only and does not convey authority to occupy the main track.

The Accident

The derailed train was traveling westbound at a recorded speed of 42 mph, experienced an undesired

emergency brake application at 1:00 p.m. The undesired brake application was due to 31 cars derailing at MP 392.95. The derailment damaged the west-end of a bridge located in the accident area. The crew, after their train stopped, notified the dispatcher of the derailment. The Conductor, noticing in his mirror the dust from the derailment, made his way to the adjacent public highway. While he was walking on the highway toward the accident site, a local police officer arrived and provided him a ride to the derailment location. During this time, the Conductor used his car list and determined that no hazmat cars were involved in the derailment. During the immediate clearing and rebuilding process, the authorities closed one lane of traffic to allow crews and equipment to access the area safely. The west-end of the railroad bridge was filled-in to allow track repairs and was replaced under traffic during the following weeks. No injuries were sustained by the crew and there were no evacuations.

Analysis and Conclusions

Analysis-Toxicological Testing: The Federal Railroad Administration's (FRA) Post-Accident Toxicology Reports indicate that both crew members were properly tested. All test results were negative.

Conclusion: FRA determined toxicology did not contribute to the cause or severity of this accident.

Analysis – Fatigue: FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings.

FRA obtained fatigue-related information, including a 10-day work history, for the two UP train crew employees assigned to the derailed train. A review of the data and FAST analysis indicated fatigue was not probable for the Locomotive Engineer or Conductor.

Conclusion: FRA determined fatigue did not contribute to the cause or severity of this accident.

Analysis- Locomotive Engineer Performance, derailed train: The Engineer was a certified locomotive engineer with a certification date September 28, 2004, an expiration date of August 7, 2019, and his most recent annual train ride was May 23, 2016. He had been a qualified engineer for 12 years, with previous experience as a qualified conductor, and was hired by UP on September 9, 1996. His last rules exam was February 11, 2016. The event recorder was reviewed and no anomalies were found in the handling of the train.

Conclusion: FRA determined Engineer performance did not contribute to the cause or severity of this accident.

Analysis—Conductor Performance, derailed train: The Conductor was a certified conductor with a certification date July 11, 2012, an expiration date of January 19, 2018, and his most recent annual conductor ride was March 22, 2016. He was hired by UP on May 20, 1996. His last rules exam was June 11, 2015.

Conclusion: FRA determined Conductor performance did not contribute to the cause or severity of this accident.

Analysis- Track and Track Structures: The track where the derailment occurred was last traversed and inspected on August 11, 2016, by a qualified UP track inspector with no exceptions being noted. The rail at this location was last tested on July 5, 2016, with no exceptions noted. The bridge located at MP

392.86 was last inspected on July 26 2016, and FRA took no exceptions after reviewing the bridge inspection records.

Conclusion: FRA determined track and structures did not contribute to the cause or severity of this accident.

Analysis—Mechanical: During the investigation of the accident, loaded lumber flat car WRWK 873629, car 75 in the consist, was discovered with the A-end center plate securement bolts sheared off and the No. 3 and No. 4 axles/wheel assemblies derailed. Due to the location of the derailed car ahead of the general pile up, this car became a primary focus of the investigation into the cause of the derailment. Car WRWK 873629 is a center beam bulk head flat equipped with short travel constant contact side bearings, 6 ½ X 12-inch roller bearing wheel assemblies, and was built January 1, 1996. This car has a light weight of 63,800 lbs., a load limit 222,200 lbs., maximum load limit 286,000 lbs. and was listed at 252,000 lbs. on the train consist. These weights indicate the car was loaded within capacity. A review of the repair history revealed only minor maintenance type repairs with no indications of wheel, truck or centerplate defects on the A or B-end locations.

A comprehensive review of the available information and documentation was performed. A compliant Class 1 Initial Terminal Brake Test and pre-departure inspection was performed on the derailed train, which included Car WRWK 873629, at 11:00 p.m., at UP's Pine Bluff rail yard by UP mechanical inspectors. No defective conditions were found or reported during this inspection.

Post-accident inspections performed at the UP mechanical repair facility at Texarkana, AR. did not document any excessive wear on the truck bolster assembly consistent with indications of truck hunting or evidence of previous center plate movement. None of the sheared center plate securement bolts were inspected or lab tested to determine the metallurgic cause for failure.

Conclusion: Due to the lack of evidence and supporting information, the investigation could not verify a mechanical defective condition that would have contributed to the cause of the derailment. Additional evidence would be required to eliminate the possibility that the cause of the defective condition noted regarding the center plate securement bolts sheared off, was not a result of blunt forces generated during the accident. This type of information or evidence was not available. The sheared center plate bolts were not available for metallurgic testing; therefore, the exact cause of failure could not be determined.

Overall Conclusion

UP complied with with its own, and all applicable Federal standards. The investigations findings note that cause was not due to any impairment, fatigue or any other human factor. The track and track structure in the accident area complied with all Federal regulations with no contributing factors identified.

The focus of the investigation shifted to Car WRWK 873629 having been discovered with the A-end of the car derailed, and four center plate securement bolts sheared off. This scenario presented a strong possibility regarding the accident; however, after a comprehensive review of the available information and documentation, the specific probable cause could not be verified or supported. In addition, the accident occurred on tangent track with no indication of train handling or violent action indicated by the train crew. The investigation could not establish or confirm an event producing a force level between the truck and car body capable of shearing off all four center plate securement bolts and without a metallurgic

evaluation of the sheared bolts, the probable cause could not be factually verified.

Probable Cause

FRA was unable to determine the probable cause for this accident, and will list the probable cause as cause code M507, Investigation complete, cause could not be determined due to a lack of supporting evidence.