Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2013-21

Union Pacific (UP)
Lawtell, LA
August 4, 2013

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.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2013-21

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Union Pacific Railroad Company	UP	0813LV003

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	0813LV003
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	8/4/2013	3:27 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
20	15	2	130	Beaumont

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Lawtell	585.2	LA	ST LANDRY

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
81 °F	Day	Cloudy	Main

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Main Line	Freight Trains-80, Passenger Trains-90	23.6	East

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	MLKL104

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
49 MPH	R	9041		N/A

6. Type of Territory

Signalization:

Signaled

Method of Operation/Authority for Movement:

Signal Indication

Supplemental/Adjunct Codes:

N/A

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.)*	TILX160891	53	yes			
(2) Causing *(if mechanical, cause reported)*	0	0		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	0	(1) Total in Equipment Consist	73	0	3	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	26	0	1	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
1646685	1207571

14. Primary Cause Code

T108 - Track alignment irregular (other than buckled/sunkink)

15. Contributing Cause Code

Number of Crew Members				Length of Time on Duty	
16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen	20. Engineer/Operator	21. Conductor
1	0	1	0	Hrs: 7 Mins: 27	Hrs: 7 Mins: 27

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others	25. EOT Device?	26. Was EOT Device Properly Armed?
				Yes	Yes
Fatal	0	0	0	27. Caboose Occupied by Crew?	
Nonfatal	0	0	1		N/A

28. Latitude	29. Longitude

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CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved
1. Type		5. Equipment
2. Vehicle Speed *(est. mph at impact)*	3. Direction *(geographical)*	6. Position of Car Unit in Train
4. Position of Involved Highway User		7. Circumstance
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? N/A		8b. Was there a hazardous materials release by N/A

8c. State here the name and quantity of the hazardous material released, if any.

9. Type of Crossing Warning	10. Signaled Crossing Warning	11. Roadway Conditions
1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other *(spec. in narr.)* 3. Standard FLS 6. Audible 9. Watchman 12. None N/A		N/A

12. Location of Warning	13. Crossing Warning Interconnected with Highway Signals	14. Crossing Illuminated by Street Lights or Special Lights
N/A	N/A	N/A

15. Highway User's Age	16. Highway User's Gender	17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train	18. Highway User

19. Driver Passed Standing Highway Vehicle	20. View of Track Obscured by *(primary obstruction)*

Casualties to:	Killed	Injured	21. Driver was	22. Was Driver in the Vehicle?
23. Highway-Rail Crossing Users	0	0	24. Highway Vehicle Property Damage *(est. dollar damage)*	25. Total Number of Vehicle Occupants *(including driver)*

26. Locomotive Auxiliary Lights?	27. Locomotive Auxiliary Lights Operational?
N/A	N/A
28. Locomotive Headlight Illuminated?	29. Locomotive Audible Warning Sounded?
N/A	N/A

SYNOPSIS

SYNOPSIS OF THE ACCIDENT

Eastbound UP freight train MLKLI04 derailed at approximately 3:27 P.M.(CST) on August 4, 2013. The derailment occurred at MP 585.2 on the Houston Service Unit Beaumont Subdivision in Lawtell, Louisiana.

There were 27 freight cars (26 1oads and one empty) railcars that derailed in this incident. 15 of the 26 loaded cars that derailed contained hazardous materials, and two of those cars leaked hazardous material during the incident. Approximately 130 people were evacuated as a result of the derailment. A minor injury was reportedly sustained by a citizen who stopped on the adjacent highway to offer assistance to the train crew. The equipment cost was $1,646,685 and the track and structures cost was $1,207,571.

The Federal Railroad Administration (FRA) investigation determined the Probable Cause as T108-Track alignment irregular (other than buckled/sunkink). Maintenance issues on Bridge 585.18 likely caused excessive track movement which served as the catalyst for this track alignment derailment.

At the time of the accident it was daylight, cloudy, and 81 degrees Fahrenheit. The derailment was caused by irregular track alignment.

NARRATIVE

Circumstances Prior to the Accident

The crew of train MLKLI04 consisted of a locomotive engineer and a conductor. They first went on duty at 0800 on August 4,2013, at Beaumont, Texas. This was the home terminal for both crew members, and they both received more than the statutory off duty period prior to reporting for duty.

Their assigned freight train consisted of two locomotives, 73 loaded and 3 empty cars of mixed frieght. It was 4,756 feet long and weighed 9,041 tons.

MLKLI04 originated in Lake Charles, Louisiana, and received a completed Class 1 Air Brake test there at 9:30 A.M. (CST) on August 4, 2013. MLKLI04 was equipped with an EOT and the EOT was inspected at Lake Charles, Louisiana at 6:30 A.M. (CST) on August 4, 2013. MLKLI04 departed Lake Charles, Louisiana at approximately 12:00 P.M. (CST) and proceeded east on the UP Beaumont Subdivision.

The maximum authorized speed on the UP Beaumont Subdivision is 60 mph, and designated "Key Trains" such as the MLKLI04 have a permanent speed restriction of 50 mph. The track approaching the derailment location is constructed of continuous welded rail (CWR) and wooden crossties. The track is tangent with .14 percent grade or less for several miles to the west of the derailment location with a 1 degree, 1 minute curve, which is approximately 1,930 feet in length begins at approximately MP 585.10. There is a short wooden bridge located at MP 585.2.

The railroad timetable direction is east and the geographic direction is primarily east as well. Timetable directions are used throughout this report.

The Accident

MLKLI04

According to the downloaded event recorder, the train was being operated at a recorded speed of 49 mph at 3:18:47 P.M. (CST), which is approximately 2,534 feet west of the derailment site. The event recorder shows that the train was operating at 46 mph just after the train induced emergency brake application at 3:20:33 P.M., at MP 585.17. At 3:21:43 P.M. the engineer made an emergency brake application and the train made a complete stop with the head end located at MP 586.67.

A total of 27 railcars derailed including 26 loads and 1 empty. There were 15 hazardous material cars derailed and two of them (UTLX660753 and ACFX79536) sustained damage to valves and leaked some material until the valves were plugged. A temporary evacuation of about 130 people took place after the derailment. A passerby on U.S. Highway 190, which parallels the track in this area, stopped to render assistance to the train crew and reported inhaling some fumes. This individual was taken to an area hospital but left the hospital before receiving any diagnosis or treatment.

Both the engineer and conductor reported seeing an alignment deviation in the track just east of the small wooden bridge. The engineer stated that he attempted to let the train coast through the area but the train went into emergency. A video captured by onboard cameras on the lead locomotive clearly shows an alignment deviation just east of the wooden bridge.

Analysis and Conclusions

Analysis- Evaluation and Testing of Equipment Involved

Class 1 Air Brake Test on MLKLI04 was performed at Lake Charles, Louisiana on August 4, 2013 at 8:01 A.M. CST. Daily and periodic inspections of locomotives UP 6312 and UP 7203 were performed and recorded as required. Event recorder download showed front headlight and front ditch lights on.

Conclusion- Class 1 Air Brake Test and daily and periodic inspections were performed as required.

Analysis- FRA Tests or Inspections Performed and Results

The FRA required track inspections were shown in the records to have been performed by UP Engineering personnel. A UP geometry car test on June 19, 2013 found some deviations in the bridge area (11/4" profile, 57 1/4" gage, 11/2" crosslevel, 3/4" alignment) but none were FRA defective. A UP Rail Test Car conducted an inspection on April 9, 2013 found no defects in the immediate area.

Bridge 585.18 is a 27' long, two span, timber open deck bridge. This bridge was inspected two times in 2013 with the most recent inspection being on July 15,2013, just 20 days prior to the derailment. The record of this most recent inspection did not have any conditions noted or comments made. The repair records for Bridge 585.18 show some backwall repair at Abutment 2 on April 19, 2013 and some ballast deck repair and ballast replacement on May 23, 2013. The repair record shows repairs on August 5, 6, and 7 2013, all after the derailment. These repairs include alignment repair (said to be caused by the derailment), replacing bolts on the left side of Bent 2 (shown as Bent 2 cap disconnected), and backwall repaired by replacing top 2 boards (also shown as caused by the derailment).

A FRA track inspector was able to get into the derailment location on August 6, 2013. He observed and made a video recording of the first train that was allowed over Bridge after the derailment. The video showed a very significant deflection of the northeast corner of the bridge as the train moved over it at 5 mph. The deflection was estimated at 11/2" or more, and the limit for difference in crosslevel in the FRA Track Safety Standards for Class 4 track is 13/4".

Union Pacific Engineering personnel that investigated this derailment assigned the cause as T109 Track alignment irregular(buckled/sunkink).

Conclusion- The temperature at the time of this derailment, approximately 3:27 P.M., was 81 degrees Fahrenheit. The derailment occurred on August 4, 2013, the middle of the summer for Louisiana. T-109 Track alignment irregular (buckled/ sunkink) type derailments are associated with high thermal stresses that the track structure cannot contain. The result is a gradual or sudden misalignment of the track that results in a derailment. It is highly unlikely that an afternoon temperature of 81 degrees Fahrenheit in August would cause high thermal stresses in an overall well maintained main track like the Beaumont Subdivision in the derailment area. Track may buckle under more modest temperatures when it is disturbed, either due to track work being performed or problems with the track (undercutting, tie replacements, surface deviations, or ballast washed out). There was no track work performed in this area for months, and no evidence of washouts. There was, however, evidence of some surface and alignment issues. The geometry car test on June 19, 2013, recorded profile, and alignment deviations of 50% or more of the FRA defect thresholds for these conditions. These measurements are made under load and may be difficult for a track inspector to see during a normal inspection, but if they are present in open track and reach a defective level they are often found by inspectors.

The observation and video an FRA track inspector made of the first post-derailment train traversing Bridge showed very significant vertical deflection at the northeast corner of the bridge, perhaps 11/2" or more. The MLKLI04 was traveling in an eastward direction and the first car derailed at approximately 585.20, or about 100 feet east of Bridge 585.18. The lead locomotive camera recorded a visible track misalignment that appears to start on top of the bridge and be evident for about 20-25 feet more to the east.

It is likely that the vertical deflection of the northeast corner (low or north rail in the curve) of Bridge 585.18 either caused or accelerated the development of the track misalignment that caused this derailment.

Analysis- Train Handling

FRA conducted an analysis of the event recorder information on train operation. The analysis included train speed, brake applications, and other operating and mechanical functions. The train speed just after the train induced emergency brake application, (3:20:33 PM, about 2,654 feet from resting place of the first car derailed) was 46 mph. The train speed at the time of the engineer induced emergency brake application, 3:21:43 P.M., was 50 mph. The maximum authorized speed at this location is 60 mph, and key trains such as MLKLI04 are limited to 50 mph.

Conclusion- Train handling did not contribute to this derailment.

Fatigue Analysis- 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 one employee involved in this accident including the Engineer and Conductor assigned to MLKLI04.

Information for this employee follows:

Fatigue Conclusions:

1. Engineer assigned to: Train 1
Sleep setting - Good to Excellent,
Chronic Sleep Debt= 3.96
Hours of Continuous Wakefulness= 9.35
Time of Day= 3:20 PM. BAC Equivalent =<.05

Finding: Fatigue was not probable for this employee.

2. Conductor assigned to: Train 1
Sleep setting - Good to Excellent, Chronic Sleep Debt = 4.20
Hours of Continuous Wakefulness= 9.35
Time of Day= 3:20 PM. BAC Equivalent =<.05

Finding: Fatigue was not probable for this employee.

Probable Cause & Contributing Factors

The Federal Railroad Administration (FRA) investigation determined the Probable Cause as T108-Track alignment irregular (other than buckled/sunkink). Maintenance issues on Bridge 585.18 likely caused excessive track movement which served as the catalyst for this track alignment derailment.