



***Federal Railroad Administration  
Office of Railroad Safety  
Accident and Analysis Branch***

***Accident Investigation Report  
HQ-2021-1428***

***Union Pacific Railway  
Separ, New Mexico  
May 24, 2021***

***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 May 24, 2021, at approximately 2:56 a.m., MDT, the Union Pacific Railroad (UP) intermodal train ZMQLC-23 (Train 1) handling 166 loads, 0 empties, at 9,895 feet and 6,766 trailing tons, derailed 38 intermodal cars (53 units) while moving west (timetable direction) along the Lordsburg Subdivision at an estimated speed of 65 mph at Milepost (MP) 1170.1, approximately 22 miles east of Lordsburg, New Mexico within Grant County. The derailment involved consist lines 18-55 with most of the cars coming to rest accordioned and on their side. Five of the derailed cars were 3-pack spine cars, which consist of 15 individual cars. Therefore, counting the five 3-pack cars with the individual well cars, there were a total of 38 cars. There were 3 derailed intermodal cars transporting HAZMAT listed as cars EMUHU 270174 (UN 19), UMXU 895951 (UN 1993), and UMXU 236896 (UN 1133; UN2796), but none were found to be compromised.

The method of operation for the Lordsburg Subdivision is by Traffic Control System, Centralized Traffic Control with Positive Train Control (PTC) overlay. The maximum authorized speed is 70 mph per the Lordsburg Subdivision Timetable effective May 10, 2019 – unless otherwise restricted. Train 1 had no speed restrictions according to Track Warrant 1820 issued on May 23, 2021 at Santa Teresa, New Mexico.

There were no injuries to the public nor the crew.

Amtrak's Sunset Limited 1 & 2 were impacted due to the derailment. Amtrak #2 was turned back west at Tucson, Arizona, becoming Amtrak Sunset Limited #1. In San Antonio, Texas, Amtrak #1 was turned back east, becoming Amtrak Sunset Limited #2. All other train schedules were terminated. Passengers were instead bussed between Tucson, AZ and San Antonio, TX.

The accident was not PTC preventable.

Weather at the time of the derailment was described as dark, clear and 52° F.

Total estimated damages were \$6,274,171 (Track: \$4,142,345 / Equipment: \$2,131,826).

The Federal Railroad Administration (FRA) determined the probable cause to be: E60C broken flange.

**TRAIN SUMMARY**

1. Name of Railroad Operating Train #1 Union Pacific Railroad Company	1a. Alphabetic Code UP	1b. Railroad Accident/Incident No. 0521LA042
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**GENERAL INFORMATION**

1. Name of Railroad or Other Entity Responsible for Track Maintenance Union Pacific Railroad Company		1a. Alphabetic Code UP	1b. Railroad Accident/Incident No. 0521LA042	
2. U.S. DOT Grade Crossing Identification Number		3. Date of Accident/Incident 5/24/2021	4. Time of Accident/Incident 2:56 AM	
5. Type of Accident/Incident Derailment				
6. Cars Carrying HAZMAT 3	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0	9. People Evacuated 0	
10. Subdivision -				
11. Nearest City/Town LORDSBURG		12. Milepost (to nearest tenth) 1170.10	13. State Abbr. NM	14. County HIDALGO
15. Temperature (F) 52 °F	16. Visibility Dark	17. Weather Clear		18. Type of Track Main
19. Track Name/Number SIMN		20. FRA Track Class Freight Trains-80, Passenger Trains-90		21. Annual Track Density (gross tons in millions) 15
		22. Time Table Direction West		
23. PTC Preventable No		24. Primary Cause Code [E60C] Broken flange		25. Contributing Cause Code(s)

**OPERATING TRAIN #1**

1. Type of Equipment Consist: Freight Train					2. Was Equipment Attended? Yes			3. Train Number/Symbol ZMQLC-23			
4. Speed (recorded speed, if available) R - Recorded 65.0 MPH E - Estimated		Code E	5. Trailing Tons (gross excluding power units) 6766		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 0	
6. Type of Territory Signalization: <u>Signaled</u> Method of Operation/Authority for Movement: <u>Direct Train Control</u> Supplemental/Adjunct Codes: <u>Q, J</u>											
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.)		DTTB 888683	62	yes				0	0		
(2) Causing (if mechanical, cause reported)		DTTB 888683	62	yes	9. Was this consist transporting passengers?			N/A			
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty		e. Caboose
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	
(1) Total in Train	2	0	0	0	2	(1) Total in Equipment Consist	116	0	0	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	38	0	0	0	0
12. Equipment Damage This Consist 2131826			13. Track, Signal, Way & Structure Damage 4142345								
Number of Crew Members						Length of Time on Duty					
14. Engineers/Operators 1	15. Firemen 0		16. Conductors 1		17. Brakemen 0	18. Engineer/Operator Hrs: 3 Mins: 26		19. Conductor Hrs: 3 Mins: 26			
Casualties to:	20. Railroad Employees		21. Train Passengers		22. Others	23. EOT Device? Yes		24. Was EOT Device Properly Armed? Yes			
Fatal	0		0		0	25. Caboose Occupied by Crew?		N/A			
Nonfatal	0		0		0						
26. Latitude 32.185058000			27. Longitude -108.392619000								



## NARRATIVE

### **Circumstances Prior to the Accident**

On May 23, 2021 Train 1 was called on duty at Santa Teresa, New Mexico at 11:30 p.m., MDT. Train 1 was comprised of 110 double-stack well cars and 10 spine cars. The train was powered with 4 locomotives (2 headend and 2 rear remote).

The train originated in Mesquite, Texas where all required mechanical (locomotive/car) inspections were completed on May 23, 2021, at 5:30 a.m., CDT before departure. Train 1's crew consisted of an Engineer and Conductor, both of whom had received the statutorily required rest prior to reporting for duty.

Train 1 departed Santa Teresa, New Mexico at midnight on May 24, 2021 with no work or change in consist scheduled. The crew did not report any train handling issues prior to the derailment.

At the time of the accident, the Engineer was seated at the controls on the forward right side of the leading locomotive, while the Conductor was seated on the left side of the lead locomotive.

### **The Accident**

At approximately 2:56 a.m., MDT, Train 1 reached MP 1170.1 at an estimated speed of 65 mph where it encountered an emergency application of train brakes. Upon inspection, the crew reported 40-50 cars derailed. The derailment involved lines 18-55, which included five 3-pack spine cars for a total of 53 cars. Most of the derailed cars were accorded and turned over.

There were no injuries to the train crew or the public, and no hazardous material involved in the accident requiring remediation.

The FRA responded to the accident along with UP personnel.

### **Post-Accident Investigation**

FRA and UP investigated the accident.

### **Analysis & Conclusions**

**Analysis – Toxicological:** This accident met the minimum requirements of 49 CFR §219 toxicological testing was accomplished. Federal Railroad Administration Post-Accident Forensic Toxicology Result Reports indicate the two employees tested each had negative test results.

**Conclusion:** FRA determined neither drugs or alcohol contributed to the cause or severity of the accident.

**Analysis – Operating Practices:** The Engineer and Conductor were found to be compliant with all applicable FRA Regulations, railroad operating rules and train handling rules and requirements. The relevant event recorder data was downloaded by UP and analyzed by UP and FRA with no exceptions noted.

**Conclusion:** FRA determined operating practices did not contribute to the cause or severity of the accident.

**Analysis Special Human Factors:** FRA obtained fatigue-related information, including work history, for all train operating employees involved in this accident. FRA uses an overall effectiveness rate of 63 as the baseline for fatigue analysis. This is the level at which the risk of a human factors related accident is calculated to be equal to chance. Any schedule that violates the overall effectiveness rate on the date of the accident or in the days leading up to the accident are considered to be at risk of fatigue contributing to the accident. The higher the FAID score, the higher the fatigue exposure. Below this baseline, fatigue is not considered as probable for an 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.

Conclusion: FRA concluded that fatigue did not contribute to the cause or severity of the accident.

Analysis Mechanical: FRA and UP Mechanical inspectors found a broken wheel on car DTTB 888683, due to an internal flange defect on wheel L-5. The defective flange was collected by UP.

Conclusion: FRA and UP determined the probable cause of the accident to be: E60C broken flange.

Analysis Track & Structures: UP's Lordsburg Subdivision consists of 309 miles of double main track. The Subdivision extends timetable west between El Paso Texas to Tucson Arizona. Trains operating on the Lordsburg Subdivision utilize a combination of Yard Limits, and Centralized Traffic Control as methods of operation.

The Lordsburg Subdivision track is constructed of a combination of both wood and concrete ties. The running rail section consisted of 136-pound RE control cooled (CC) W-P continuous welded rail manufactured in 2004 at point of derailment. The running rails were fastened to the concrete crossties with premium fasteners to secure the track gauge and longitudinal forces on track structure.

FRA investigators reviewed the technical data provided by UP Railroad and the FRA track inspection car covering the last geometry car surveys and rail detector car reports. No defective conditions were recorded within or near the limits of the derailment.

UP has not had any major capital projects in this area over the past 5 months with just routine maintenance performed.

Conclusion: FRA determined that neither track or structures contributed to the cause or severity of the derailment.

Overall Conclusion: FRA concluded the condition or functionality of the crew, locomotives, or safety appurtenances did not contribute to the cause or severity of the accident. The internal flange defect on the L-5 wheel of car DTTB 888683 was the sole cause of the accident.

Probable Cause: The FRA determined the probable cause to be: E60C broken flange.