

Federal Railroad Administration Office of Safety Headquarters Assigned Accident Investigation Report HQ-2005-99

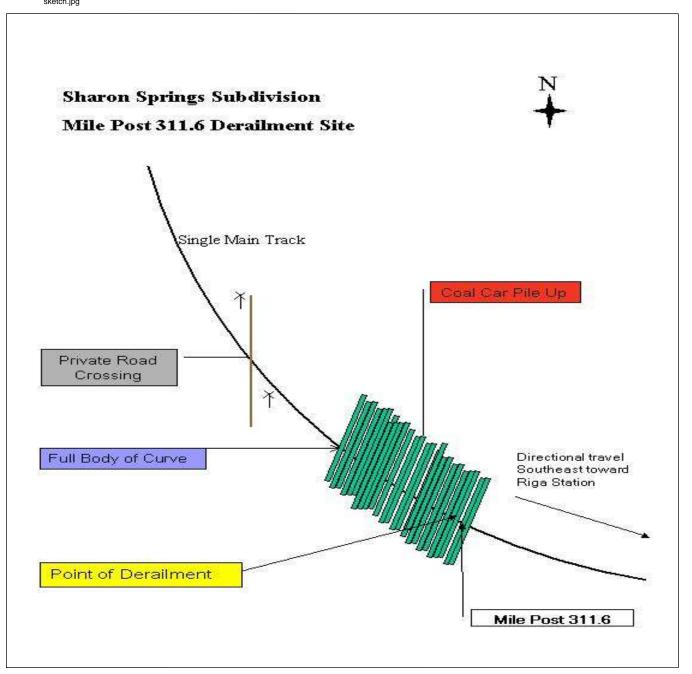
> Union Pacific (UP) Riga, Kansas November 4, 2005

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report 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.

FEDERAL RAILROAD	ANSPORT		FRA FA	ACTUA	L RAIL	ROAD A	CCIDENT I	REPOR	Т	I	FRA Fil	e# <u>HQ-2</u>	005-9	<u>99</u>
1.Name of Railroad Operatir Union Pacific RR Co. [UP	0			1	a. Alphabetic	1b. I	b. Railroad Accident/Incident No. 1105DV005							
2.Name of Railroad Operatin	-			2	a. Alphabetic	2b. R	b. Railroad Accident/Incident							
N/A				N/A										
3.Name of Railroad Response	3	8a. Alphabetic	3b. I	b. Railroad Accident/Incident No.										
Union Pacific RR Co. [UP		D	UP				1105DV							
4. U.S. DOT_AAR Grade Cr	5	. Date of Acc Month	ident/Incident	6. T	Time of Accident/Incident									
		11	04		10:07: AM 🖌 PM									
7. Type of Accident/Indicent	nent	4. Side c	ollision	I	7. Hwy-rail d	crossing 10.	. Explosio	n-deton	ation 13.	Other			1	
(single entry in code box)	2. Head or	n collision	1 5. Raking	g collision		8. RR grade	crossing 11.	Fire/viole	ent rupti	pture (describe in narrative)				
	3. Rear en	d collisio	n 6. Broke	n Train col	lision	9. Obstructio	on 12.	. Other imp	pacts	nurruite)				01
8. Cars Carrying HAZMAT	Demograd/Dereilad						 People Evacuated 		0	12. Division				
0	Jeraneu	0	HAZMAT	L	0	Evacuated	Evacuated			Denver				
13. Nearest City/Town			14. Milepost				15. State Abbr	5. State Abbr Code						
-	Ogallah		(to nearest to			h) 1.6	N/A	KS			TREGO			
17. Temperature (F)	18. Visibi	ility (s	single entry) Code 19. V			ther (single	e entry)	Code	<u> </u>	20. Typ	e of Trac	ck		Code
(specify if minus)	1. E	-				lear 3. Ra		5.Sleet			Iain 3. Siding			
43 F	2. [Day	4.Dark			loudy 4. Fo	8		1		Yard 4. Industry			1
21. Track Name/Number				22. FRA Class	Track s (1-9, X)	Code	23. Annual Tra		/	24. Time Table Direction 1. North 3. Ea				Code
	Si	ngle Mai	n	Class (1-9, X) (gross tons in millions)							1.1.0101	5. East		3
					OPERA	TING TRA	IN #1			!				
25. Type of Equipment	1. Freight trai	in 4.	Work train 7.	Yard/swit	ching	A. Spec. Mo	W Equip. Code	26. Wa	s Equip	ment C	Code	27. Train N	Jumbe	er/Symbol
	2. Passenger		0	Light loco										
			Cut of cars 9.				1	. Yes		1		LMH		
28. Speed (recorded speed, a R - Recorded	if available)	on (<i>en</i> Automati	ter code(s)	that apply) m.Special instru				ontrolled Lo		otive?				
E - Estimated 50	MPH	R	a. ATCS b. Auto train o	0			n. Other than ma		0 = Not a 4 control y 40 Mested 1 = Remote control portable					
	Time table	e/train orders	o. Positive train		2 = Remote control tower									
29. Trailing Tons (gross t	i '	Froal worr		n Other										
			d. Cab	-		ant control		ify in narr	anve)					
excluding power units)			e. Traffic	k.	Direct tra	ffic control	Code	(s)	,	transmi	tter - mo	ore than one ransmitter	e I	
	11350		e. Traffic f. Interlocking	k. g 1.`	Direct tra Yard limits	ffic control	j N/A N	(s) J/A N/A	N/A	transmi remote o	tter - mo control ti	ore than one ransmitter		0
31. Principal Car/Unit		ind Numb	e. Traffic f. Interlocking	k.	Direct tra Yard limits	ffic control	j N/A N 32. If railroad	(s) V/A N/A employee	N/A (s) teste	transmi remote o ed for drug	tter - mo control ti /alcohol	ore than one ransmitter use,		-
31. Principal Car/Unit (1) First involved	11350 a. Initial a	nd Numb	e. Traffic f. Interlocking er b. Positic	k. g 1.`	Direct tra Yard limits	ffic control	j N/A N 32. If railroad enter the	(s) J/A N/A	N/A (s) teste at were	transmi remote o ed for drug	tter - mo control ti /alcohol	re than one ransmitter use, Alcoh		Drugs
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31. Principal Car/Unit (1) First involved	11350 a. Initial a		e. Traffic f. Interlocking er b. Positio	k. g l.` on in Train 41	Direct tra Yard limits	ffic control s aded(yes/no)	j N/A N 32. If railroad enter the	(s) J/A N/A employee number th priate box	N/A (s) teste at were	transmi remote o ed for drug positive in	tter - mo control ti t/alcohol n gers? (Y	use, Alcoh 0		Drugs
 31. Principal Car/Unit (1) First involved (derailed, struck, etc) (2) Causing (if mechanical) 	a. Initial a	N/A 0 Mi	e. Traffic f. Interlocking er b. Positio	k. g l.' on in Train 41 0 Rea	Direct tra Yard limits c. Loa ar End	ffic control s aded(<i>yes/no</i>) yes N/A 35. Cars	j N/A N 32. If railroad enter the the appro 33. Was this	(s) J/A N/A employee number th priate box consist tra	N/A (s) teste at were ansporti	transmi remote o ed for drug positive in ing passen aded	tter - mo control tr /alcohol n gers? (Y	use, Alcoh (N) Empty	ol	Drugs 0 N
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31. Principal Car/Unit (1) First involved (derailed, struck, etc) (2) Causing (if mechanical cause reported) 34. Locomotive Units (1) Total in Train (2) Total Derailed 36. Equipment Damage This Consist 40. Engineer/ Operators 41. F Casualties to: 46. Rai Fatal 52. Type of Equipment Consist (single entry)	11350 a. Initial a a. Initial a al al a. Head End 2 0 1990439 Number iremen 0 ilroad Employ 0 N/A 1. Freight trai 2. Passenger 3. Commuter	N/A 0 Mi b. Manua 0 0 37. ' 42. 42. yees 47. 1 42. train 5. 5 train 6. 6	e. Traffic f. Interlocking er b. Positio d Train 1 c. Remote 0 0 Frack, Signal, W & Structure Da Members Conductors 1 Frain Passenger 0 0 Work train 7. Single car 8. Cut of cars 9.	k. g l. ² on in Train 41 0 Rez d. Manual 0 0 0 Vay, mage 43. Bra s 48. O S 48. O F Yard/switt Light loco Maint./ins	Direct tra Yard limits c. Loa ur End c. Remoi 1 c. Remoi 1 24233 kemen 0 124233 kemen 0 2 2 2 2 2 4 2 3 2 4 2 3 2 4 2 3 2 4 2 3 2 4 2 3 2 4 2 3 2 4 2 3 2 4 2 3 2 4 2 4	ffic control aded(yes/no) yes N/A 35. Cars (1) Total (2) Total (2) Total 38. Prima Code 44. Engi 49. EOT 1. Y 51. Cabc NG TRAIN A. Spec. MoV	in Equipment Co ary Cause in Equipment Co Derailed ary Cause ineer/Operator Hrs 3 Device? es 2. No pose Occupied by 1. Yes I #2 W Equip. Code N/A	(s) J/A N/A employee number th priate box consist tra a. I onsist T207 Ler Mi 2 y Crew? 53. Was Atte	N/A (s) teste ansporti Lo Freight 103 43 7 ngth of 7 37 2. No 2. No s Equipmended? Yes	transmi remote of ed for drug positive in aded b. Pass. 0 39. Cont Code Time on D 45. Con 50. Was 1.	tter - mo control tr (alcohol n gers? (Y c. Freig 0 0 ributing Duty ductor Hr EOT De Yes	re than one ransmitter use, Alcoh 0 /N) Empty ght d. Pass 0 0 Cause 0 Cause 2. No 54. Train N	N/ Mi rly Ar	Drugs 0 N Caboose 0 0 (/A 37 med? N/A N/A N/A
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56. Trailing Tons (gross tonnage, excluding power units)				d.	c. Auto train stop i. Time table d. Cab j.Track warr e. Traffic k. Direct traf				c control			ify in n (s)	arrative)	transmitter - more than one					
						Interlockin	5	Yard limi				N/A		N/A N/A		N/A			
58. Principal Car/Unit a. Initial and Nu					Number	b. Posit	ion in Trai	n c. L	.oade	ed(yes/no)			•	oyee(s) teste er that were			se, Alcohol	Druge	
(1) First involved N/A (derailed, struck, etc)						N/A			N	N/A		the appr			positive i		N/A	Drugs N/A	
(2) Causing (<i>if mechanical</i> <i>cause reported</i>) N/A							N	J/A	60.	Was thi	s consi	st transport	ing passen	N/A					
61. Locomotive	Units		a. Head End b. Mar			Mid Train anual 1 c. Remote d		ear End						Lo a. Freight	aded b. Pass.	Em c. Freight	1pty d. Pass.	e. Caboose	
(1) Total in	(1) Tetel in Trein			N/A	N/A	N/A		(1) Total in Equipment Consist N/A N/A N/A				N/A	N/A						
(2) Total D	erailed		N/A N/.			N/A	A N/A N/A			(2) Total Derailed				N/A	N/A	N/A	N/A	N/A	
63. Equipment I This Consi	NT/A					ack, Signal, Structure D	N/A		65. Primary Cause 66. Contributing Cau Code N/A Code					use	N/A				
			Numbe	er of C	Crew Me		Sumage					I		Length of	Time on D	uty			
67. Engineer/	6	8. Firei	nen		69. Co	nductors	70. Bi	rakemen		71. Engin	eer/Op	erator			72. Con	ductor			
Operators					N/A		N/A		Hrs N/A Mi						Hrs	Mi N/A			
Casualties to	A 73.	Railro	ad Empl	oyees	74. Tra	in Passenge	rs 75. Ot	75. Other		76. EOT Device?					77. Was 1	Armed?			
Fatal			N/A			N/A		N/A		1. Yes 2. No N/A					1.	Yes	2. No	N/A	
Nonfatal			N/A			N/A		N/A		78. Caboose Occupied by Crew? 1. Yes 2. No						N/A			
Highway User Involved													Rail I	Equipment	t Involved	1			
79. Type	nal: Trail	lon 70						Code	e	83. Equipt	nent		т ·		6 Light			Code	
C. Truck-Trailer. F. Bus J. Other Motor Vehicle A. Auto D. Pick-Up Truck G. School Bus K. Pedestrian							ıcle		3.Train (standing) 6.Light Loco(s) (moving) 1.Train(units pulling) 4.Car(s) (moving) 7.Light(s) (standing)							10ving) g)	1		
B. Truck E. Van H. Motorcycle M. Other (spec. in narration							,		2. Hum(unus pushing) brow(b)(standing) brow(c)(standing)								N/A		
80. Vehicle Speed (est, MPH at impact) N/A 81. Direction geographical) 1.North 2.South 3.East 4.Wee								Code		84. Position of Car Unit in Train N/A									
(est. MPH at impact) IVA 1.North 2.South 3.East 4.We							4. WCSI	Code		85. Circumstance								Code	
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Cross							r Crossing	. NT/A					-	way User				N/A	
4. Trapped								N/A		2. Rail Equipment Struck by Highway User 86b. Was there a hazardous materials release by									
86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?								Code	e	865. was t	nere a	hazardo	ous mat	erials releas	se by			Code	
1. Highway User 2. Rail Equipment 3. Both 4. Neither N/A 1. Highway User 2. Rail E											quipment	3. Both	4. Neithe	r	N/A				
86c. State here t	he name a	and qua	antity of	the ha	zardous	materials r	eleased, if	any. N/A											
87. Type of	1.Gates		4 Wi	a Waa	re	7 Cross	bucks 1	0.Flagged		rew	88 Si	analed (Trossin	g Warning	Code	89. Whis	tle Ban	Code	
Crossing 2.Cantilever FLS 5.Hwy. traffic signals 8.Stop signs								1. Other (s_i)				-		for codes)	code	1. Ye	s	code	
						9.Watc	2.None	_						2. No 3. Unknown			1		
Code(s)	N/A		J/A	N/.	A	N/A	N/A	N/A		N/A	1		02.0		N/A	<u> </u>		N/A	
								ing Warni Highway	0	nterconnect	zu	Code		Crossing Illu Lights or S		-		Code	
2. Side of Vehicle Approach								l. Yes 2. No			I			1. Yes 2. No					
3. Opposite Side of Vehicle Approach						N/A	'n	N/A 3. Unknown								N/A			
						iver Drove									<i>a</i> .	Code			
Age 1. Male 2. Female						d Struck or Yes 2	nd Ti own	rain				then Proce		5. Other (sp		g			
N/A 2. remaie N/A																N/A			
97. Driver Passed Standing Highway Vehicle Code 98. View of Track Obscured by (primary obstruction) 1. Permanent Structure 3. Passing Train 5. Vegetation 7. Other (specify in narrative)											arration		Code						
1. Yes 2. No 3. Unknown N/A 2. Standing Railroad Equipment 4. Topography 6. Highway Vehicle 8. Not obstructed											urrullve)		N/A						
101. Casulties	to Highw		1	K:11-		Injured	99. Drive	- 0					100. Was E	Code					
Crossing Users	s			Kille	u	injuicu		1 2.Injured		-						N/A			
N/A N/A 102. Highway Vehicle Property Damage 103. Total Number of Highway-Rail Cross (est. dollar damage) N/A (include driver) N/A												ing Users							
104. Locomotive Auxiliary Lights? Code 105. Locomotive Auxiliary Lights Operational? Code												Code							
1. Yes 2. No								N/A		1. Yes 2. No						N/A			
106. Locomotive Headlight Illuminated?							Code N/A		107. Locomotive Audible Warning Sounded?						Code N/A				
1. Yes 2. No N										1. Yes 2. No							IN/A		

108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED. HQ-2005-99 sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

An eastbound Union Pacific Railroad Company (UP) loaded coal train derailed on November 4, 2005, at 10:07 p.m.(CST). The derailment occurred at milepost (MP) 311.60, on the Sharon Springs Subdivision, 2 miles west of UP railroad station named Riga, and east of the City of Ogallah, Kansas. The crew consisted of an engineer and a conductor. The derailment happened on single main track. Train Symbol CBRLMH01 consisted of 2 lead locomotives pulling 103 cars and a DPU unit trailing. Cars 39 through 81 derailed, totaling 43 cars. No injuries or hazardous materials were involved. Substantial damage was incurred to the track and mechanical equipment at an estimated cost of \$2,114,672. At the time of the accident, it was dark with clear skies and an estimated temperature of 43 °F. The cause is a broken rail. Two sections of rail were sent for analysis to Rail Sciences, Inc., in Omaha, Nebraska.

110. NARRATIVE

The following information was obtained from an investigation that was performed by the Federal Railroad Administration.

Circumstances Prior to the Accident

The operating crew of the eastbound loaded coal train, Train Symbol CBRLMH-01, consisted of a locomotive engineer and a conductor. The crew had gone on duty at 5:30 p.m. (MST) on November 4, 2005, at Sharon Springs, Kansas. The crew members' home terminal is Salina, Kansas, and all had received more than the statutory off-duty period at their away-from-home terminal, prior to reporting for duty.

Their assigned freight train consisted of three locomotives, two on the head end and one DPU unit facing west. It consisted of 103 loads with a tonnage of 11,350 and a total length of 5,784 feet. The operating crew boarded, conducted an inspection of their train, and departed from Sharon Springs heading east, for the next crew change point in Salina. No air brake test was required. The last class one required air brake test was preformed by the car department personnel in Grand Junction, Colorado.

The engineer was sitting at the control panel monitoring the locomotives controls, while the conductor was in his seat reviewing the paperwork as they approached the accident site. The railroad timetable direction of the train was east. The geographic direction is southeast. Timetable directions and milepost locations are used throughout this report. As the eastbound coal train approached the accident area, the train crew reported that their trip had been uneventful and the consist was operating normally.

In the approaching area, and the area of the accident, the track has a 1-degree left-hand curve, making a transition into the full body of a 2-degree right-hand curve, which had an inch and a half of elevation. The grade starting at +1 descending to +0.45 into tangent track. The single main was made up of wood ties and a secondhand 132-lb standard strength continuous-welded rail (CWR) dated 1953 to 1957, laid in 1998. The Accident

At the time of the accident, the train was traveling on single main track at a recorded speed of 50 mph. The maximum authorized speed on the main track through the derailment area is 50 mph in accordance with Salina Area Timetable No. 2, effective September 15, 2002.

At approximately 10 p.m. (CST), the train went into a train-induced undesired emergency stop. The train then traveled past the west switch at Riga siding coming to a stop. The crew reported to the dispatcher that the train had separated. The crew began shoving back until they reached the westbound signal at the west end of Riga siding. The crew then requested permission from the dispatcher to travel back past the west switch to find the rest of their train. Upon inspection, the conductor reported to the engineer that he thought there were approximately 41cars derailed accordion style.

Approximately 1,000 feet of wood panels were replaced on the single main track with an approximate cost of \$124,233 and it was back in service by 1:30 p.m., November 6, 2005.

Analysis and Conclusions

The track had been inspected by a UP track inspector on November 4, 2005, with no defects reported. UP rail detector car DC28 conducted its last inspection before the derailment on August 25, 2005, and no defects were detected in the area of the derailment site. The last geometry car inspection was made on July 21, 2005, and no defects recorded.

The train crew was sent for post-accident toxicological testing. The Federal Railroad Administration (FRA) Post-Accident Forensic Toxicology Report indicated that the employees had negative test results. The event recorder indicates proper train handling and compliance with the operating rules.

Two suspected pieces of rail were removed from the point of derailment and sent for analysis to Rail Sciences Inc., in Omaha, Nebraska. One section of rail was determined to be the one which failed under the train. The secondhand standard strength 132-lb rail rolled in Illinois in 1957, failed due to detail initiated fatigue fractures, originating from head checking on the gage side of the rail. With the comparisons of the location of the undesirable stop and the location of derailed cars, all indications lead to the point of derailment having occurred in the full body of the curve where the rail was recovered. The evidence compiled in the rail analysis of the broken rail tested, agrees with the preliminary findings.

Probable Cause and Contributing Factors

Probable Cause was determined by the FRA to be, Cause Code T207 Broken Rail - Detail fracture from shelling or head check. This was confirmed by laboratory analysis completed at the Rail Sciences, Inc., in Omaha, Nebraska.