

Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-32

CSX Transportation (CSX)
Castleberry, Alabama
May 31, 2007

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.

DEPARTMENT C FEDERAL RAILR				FRAFA	ACTUA	L RAII	LROAD A	CCID	ENT R	EPORT		FRA F	ile# <u>I</u>	HQ-200	<u>17-32</u>
1.Name of Railroad O	perating	Train #1				$\overline{}$	1a. Alphabetic	c Code		1b	. Railroad A	Acciden	t/Incide	ent No.	
CSX Transportation								CSX				000031			
2.Name of Railroad Op N/A								N/A				N/A			
3.Name of Railroad O N/A	perating	Train #3					3a. Alphabetic	c Code N/A		3b	. Railroad A	Acciden N/A	t/Incide	ent No.	
4.Name of Railroad R CSX Transportation	n [CSX]]				4	4a. Alphabetic	c Code CSX		4b	. Railroad A	Acciden 000031		ent No.	
5. U.S. DOT_AAR G			ification N	Jumber		I .	6. Date of Acc	cident/In			Time of A	ccident/		_	
						!	Month 05		29 Ye		12:4		L	АМ	✓ PM
8. Type of Accident/In (single entry in cod			on collision	o. rumin	g collision		7. Hwy-rail c	crossing	g 11. I	Explosion-deto Fire/violent rup		Other (desc narra	ribe in		Code 01
9. Cars Carrying			nd collision		n Train col		9. Obstructio	n ——		Other impacts		12 Di.			
HAZMAT	17	10. HAZN Damaged/	MAT Cars l/Derailed	8		Cars Releas ZMAT	asing 3		12. Peopl Evacuate		455	13. Div		Atlanta	
4. Nearest City/Town Castleberry					15. Mile (to n	nearest tent	th)	16. Stat	Abbr	Code	7. County	CC	MECI	****	
	— T		··· (a	· -1 atury)	Code	579			N/A	AL			NECU)H ———	
18. Temperature (F) (specify if minus) 80	F	19. Visibi 1. Г 2. Г	Dawn 3	ingle entry) 3.Dusk 4.Dark	Code		eather (single Clear 3. Ra Cloudy 4. Fo		Sleet .Snow	Code 1	1. M	oe of Tra Iain 3 'ard 4.	. Siding		Code
22. Track Name/Nun					23. FRA Clas		Code	24. Anı	nual Track	•	ne Table			Code	
			main				4	mi	llions)	50.7		2. Sout			1
25 E SE	- 1	T 1.1.4.4		*** 1 7			ATING TRA		C- 1-	27. Was Equi	i-mont (~ 1.	I 20 T	· N	: /C11
 Type of Equipment Consist (single ent 		Freight trai Passenger			. Yard/swi	_	A. Spec. MoV	W Equip	o. Code	Attended	-	Code	28. 11	rain Nun	nber/Symbol
COMMON (. Commuter		_	. Maint./in				1	1. Yes	2. No	1		Q57	229
29. Speed (recorded s				31. Method(s)		<u> </u>	nter code(s) t	that ap	ply)		31a. Rem	notely C	ontroll	led Loco	omotive?
R - Recorded				a. ATCS	Ū	g. Automati	ic block	•	ial instruc		0 = Not a		-		
E - Estimated	49	MPH	R	b. Auto train o		n. Current o	oi traine		r than mai tive train (1 = Rem		•		
30. Trailing Tons (gross to	onnage,		c. Auto trair d. Cab	P		le/train orders			control y in narrative)	2 = Rem 3 = Rem			ver	
excluding power	_	Ç		e. Traffic			affic control	•	Code(s			itter - m		an one	
		5182		f. Interlocking		.Yard limit		e	N/A N/.	A N/A N/A	remote	control	transm	nitter	0
32. Principal Car/Unit		a. Initial a	and Numbe	er b. Positio	on in Train	ı c. Lo	oaded(yes/no)	33. If	railroad e	employee(s) tes	ted for drug	g/alcoho	ol use,		
(1) First involved		NYC	C587901		9		no	e	enter the m	umber that we		_		Alcohol	Drugs
(derailed, struck, et						+		+	he appropr					0	0
(2) Causing (if mechanisms (if mechanisms) (2) Cause reported)	hanical	NYC	2587901		9		no	34. \	Was this c		ting passengers? (Y/N)				N
35. Locomotive Units	s	a. Head End	Mic b. Manual	d Train l c. Remote		ear End	36. Cars	;		a. Freigh	Loaded nt b. Pass.	c. Fre	Empty eight d	-	e. Caboose
(1) Total in Train		3	0	0	0	0	(1) Total	in Equip	pment Coi	nsist 32	0	3	34	0	0
(2) Total Derailed		0	0	0	0	0	(2) Total	Deraile	d	10	0	1	6	0	0
37. Equipment Damag	_	803699	38. 7	Track, Signal, V	Way,	65000	39. Prima	ary Caus	se e		40. Cont	tributin	g Caus	e	
This Consist				& Structure Da	mage	05000	Code			E24C	Code				E25C
	12 E:		r of Crew N	Members Conductors	1 11 Rr	-Iraman	45 Eusi	′0		Length of	of Time on I	•			
41. Engineer/ Operators 1	42. Fire	emen 0	43.			akemen	45. Engir	neer/Ope Hrs	erator 3	Mi 28	40. Co.		Irs	3	Mi 28
•	47. Railr	-	vees 48 7	1 Frain Passenger		Other	50. EOT			20	51. Was			Properly	Armed?
Fatal	1//	0	70. 1	0	5 77. 0	0	1. Ye		. No	1		Yes		. No	1 1
					 		52. Cabo	ose Occ	cupied by	Crew?					
Nonfatal		0		0		0		1. Y	es	2. No					N/A
							NG TRAIN	í #2							
53. Type of Equipmen Consist (single ent	ry) 2. 1	Freight trai Passenger	train 5. S	Single car 8.	. Yard/swit . Light loco		A. Spec. MoV	V Equip	. Code	54. Was Equi Attended?		Code	55. Tr		nber/Symbol
		Commuter			. Maint./ins	•			N/A	1. Yes	2.1.0	N/A	<u> </u>		/A
56. Speed (recorded s	peed, if a	available)	Code 5	58. Method(s)	•	`	nter code(s) t	•			58a. Rem	-			omotive?
R - Recorded E - Estimated	N/A	MPH	N/A	a. ATCS b. Auto train of	_	g. Automati n. Current o		-	ial instruc r than mai		0 = Not a 1 = Rem				

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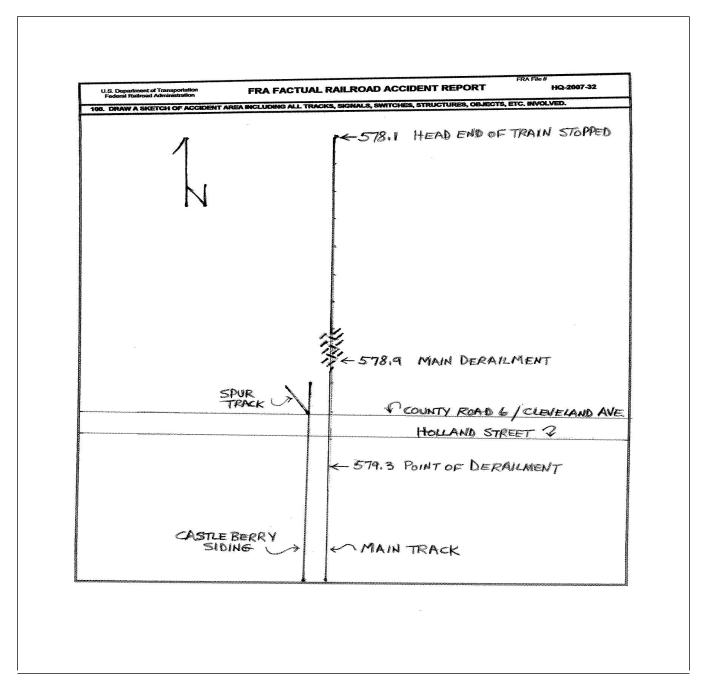
FEDERAL RAILR					FRA FA	ACTUAI	RAILR	OAD AC	CIDENT RE	PORT	F	RA File #	HQ-200	<u>7-32</u>	
57. Trailing Tons (gro		ge,		d. e. '	Auto train Cab Traffic Interlocking	j.T k.	Time table/tr rack warran Direct traffic ard limits	t control p	D. Positive train con D. Other (Specify in Code(s) N/A N/A N/A	narrative)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter N/				
59. Principal Car/Uni	t	a. Initial	and N	umber	b. Posit	ion in Train	c. Load	led(yes/no)	60. If railroad en	ployee(s) tes	ested for drug/alcohol use,				
(1) First involved (derailed, struck,	etc)		N/A		N	//A	N	J/A	enter the nur the appropri	nber that were te box.	Alcohol Drugs N/A N/A				
(2) Causing (if medicause reported		11	N/A		N	//A	1	N/A	61. Was this co	nsist transpor	ting passen	gers? (Y/N)	N/A	
62. Locomotive Unit	ts	a. Head End	b. Ma	Mid Ti			r End c. Remote	63. Cars		a. Freight			pty d. Pass.	e. Caboose	
(1) Total in Trair	ı	N/A		N/A	N/A	N/A	N/A	(1) Total in	Equipment Consi	N/A	N/A	N/A	N/A		
(2) Total Deraile	d	N/A	N	/A	N/A	N/A	N/A	(2) Total D	erailed	N/A	N/A	N/A	N/A		
64. Equipment Dama	ige	N/A			k, Signal,		N/A	66. Primar Code	y Cause		67. Contr	ributing Ca	use		
This Consist		Number of Crew Mem			tructure Da	amage	N/A	Code		N/A Length of	Time on D	uty		N/A	
68. Engineer/	69. Firemen 70			70. Co	nductors	71. Bral	kemen	72. Engine	eer/Operator		73. Con				
Operators N/	N/A			1	N/A	1	N/A	_	-	Mi N/A		Hrs	N/A	Mi _{N/A}	
Casualties to:	74. Rail	road Emplo	oyees ?	75. Traii	n Passenge							EOT Devic			
Fatal		N/A			N/A	1	N/A	1. Y		N/A	1.	Yes	2. No	N/A	
Nonfatal		N/A N/A N/A						79. Caboo	se Occupied by Cr 1. Yes	ew? 2. No				N/A	
		- 1111						G TRAIN							
80. Type of Equipment Consist (single en	try) 2.	Freight tra	train	-	le car 8.	Yard/switc	s).	Spec. MoW	Equip. Code 81	. Was Equips Attended? 1. Yes	Lx	ode 82.	Train Nun N/A	ber/Symbol	
83. Speed (recorded)		Commuter				Maint./insp of Operation		r code(s) th		1. 168	l l	otely Contr	olled Loco	motive?	
R - Recorded	эрсса, п	avanaoic)	Code		ATCS	-	Automatic b	olock n	.Special instruction		0 = Not a	remotely c	ontrolled		
E - Estimated	N/A	MPH	N/A		Auto train Auto traii		Current of to	rame	Other than main to Positive train cor			te control p			
	gross to	nnage,			Cab		rack warran		Other (Specify is			te control			
excluding power	units)	N/A			Traffic Interlocking		Direct trafficard limits	c control	Code(s)			ter - more t ontrol trans		N/A	
96 Dainainal Can/Uni			and N		,			lade ()		N/A N/A	16 1	/1 1 1		14/1	
86. Principal Car/Uni (1) First involved	t	a. Initial		umber		ion in Train		led(yes/no)	87. If railroad em enter the nur	ployee(s) test aber that wer	_	Drugs			
(derailed, struck,	etc)		N/A]	N/A		N/A	the appropris	ite box.		N/A			
(2) Causing (if mediates cause reported		11	N/A		1	N/A]	N/A	88. Was this co	nsist transpor	ting passengers? (Y/N) N/A				
89. Locomotive Unit	ts	a. Head End	b. Ma	Mid Ti anual		Rea d. Manual	r End c. Remote	90. Cars		Lo a. Freight	b. Pass.	Em c. Freight	d. Pass.	e. Caboose	
(1) Total in Trair	ı	N/A	N	I/A	N/A	N/A	N/A	(1) Total in	Equipment Consis	t N/A	N/A	N/A	N/A	N/A	
(2) Total Deraile	d	N/A	N	/A	N/A	N/A	N/A	(2) Total D	erailed	N/A	N/A	N/A	N/A	N/A	
91. Equipment Dama	ige	27/4			k, Signal,		NY/A	93. Primary	Cause Code		l .	ributing Ca	use		
This Consist		N/A Numbe	r of Cr	& S rew Mer	tructure Da	mage	N/A			N/A Length of	Code Time on D	ntv		N/A	
95. Engineer/	96. Fir		1 01 01		onductors	98. Bral	cemen	99 Engine	eer/Operator	Length of	100. Cor				
Operators N/A	70.111	N/A			N/A		N/A		•	Mi N/A	100. Col	Hrs	N/A	Mi N/A	
Casualties to:	101. Ra	Railroad Employees 102. Train				103. Otl	her	104. EOT				EOT Dev	-	у	
Fatal		N/A]	N/A	1	N/A	1. Y 106. Cabo	es 2. No ose Occupied by O	N/A rew?	1.	Yes	2. No	N/A	
Nonfatal		N/A			N/A]	N/A		1. Yes	2. No				N/A	
		Highwa	ay Us	er Invo	lved					l Equipmen	t Involved	i			
107. C. Truck-T	railer.	F. Bus			Motor Veh	icle	Code	111. Equip	3.Tra	n (standing)	6.Light	Loco(s) (m	noving)	Code	
A. Auto D. Pick-Up	Truck	G. School l	Bus 1	K. Pedes	trian		N/A		ts pulling) 4.Car	s) (moving)	7.Light(s	s) (standing	g)	N/A	
B. Truck E. Van 108. Vehicle Speed		H. Motorcy	109.	vi. Other	geograph		Code		ts pushing) 5.Car on of Car Unit in	्र (standing)	o.Otner	(specify in	narrative)	- " - " - " - " - " - " - " - " - " - "	
(est MPH at in	mact)	N/A		th 2.So	geograph 11th 3 East		N/A	112.105/10	or car chirth		N/A				

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	ENT OF TRAN RAILROAD AD			FRAF	ACTU	AL RAILR	OAD AC	CCII	DENT F	REPO	RT	F	RA File # <u>H</u>	IQ-2007-	32
110. Position						Code	113. Circu	ımstar	nce						Code
1.Stalled o 4. Trapped	on Crossing 2.Sto	opped o	n Crossing	3.Moving Ov	er Crossir	ng N/A			nent Strucl nent Strucl	_	yay User ghway User	r			N/A
114a. Was the	highway user ar	nd/or ra	il equipment	involved		Code	114b W	ac tha	ra a hazar	done me	nterials rele	1969			Code
in the im	pact transporting	hazard	ous material	s?			1140. W	as the	ic a nazar	uous iii	ucriais icic	asc			L
1. Highway User 2. Rail Equipment 3. Both 4. Neither N/A 1. Highway User 2. Rail Equipment 3. Both 4. Neither												N/A			
114c. State he	ere the name and	quantit	y of the haza	rdous materia	ıls release	d, if any. N/A									
115. Type	1.Gates		ig Wags		ssbucks	10.Flagged by		116.	Signaled	Crossin	g	Code	117. Whistl	e	Code
Crossing 2.Cantilever FLS 5.Hwy. traffic signals 8.Stop signs 11.Other (spec. in narr.) (See instructions for codes) 1. Yes															
Warning	3 Unknown										own	1			
Code(s)	N/A N	N/A	N/A	N/A	N/A	N/A	N/A			N/A 3. Chkhown					N/A
118. Location of Warning Code 119. Crossing Warning Code 120. Crossing Illuminated by Street												Code			
1. Both Sid	des				wi	th Highway Sig	gnals			L	ights or Sp	ecial Ligl	hts		
	Vehicle Approac					1. Yes					1. Yes 2. No				
Opposit	e Side of Vehicle	Appro	ach	N/A		2. No 3. Unknown		N/A 3. Unknown						N/A	
121.	122. Driver's G	ender	Code 123	. Driver Drov	e Behind	or in Front of	Code	e 1	124. Drive	r					Code
Age	1. Male			and Struck o	r was Stru	ick by Second	Гrain	-			or thru the		4. Stopped on	Crossing	
N/A	2. Female	1		1. Yes	2. No	3. Unknown					hen Procee	eded 5	5. Other (spec	_	I.
IV/A			N/A				N/A	N/A 3. Did not Stop narrative)						itive)	N/A
125. Driver Pa		Code	126. Vie	w of Track O	bscured b	y (primary ob	struction)								Code
Highway V	ehicle			ermanent Str			ng Train 5.	_			Other (sp	pecify in n	narrative)		ı
1. Yes 2. No	3. Unknown	N/A	2. S	tanding Railr	oad Equip	pment 4. Topo	graphy 6.	High	way Vehic	le 8. l	Not obstruc	cted			N/A
Casualties	to:		Killed	Injured	127. Dr	river			Code	1 -	28. Was D	river in th	ne Vehicle?		Code
Casuattics	10.		Kilicu	Injuica	1	ed 2.Injured 3.			N/A		1. Yes		2. No		N/A
129. Highway-Rail Crossing Users N/A N/A						ghway Vehicle t. dollar damag		amage	N/A	1		Number of e driver)	f Highway-Ra	il Crossina N/A	g Users
132. Locomot	ive Auxiliary Lig	thts?				Code	133. Locoi	motiv	e Auxiliar	y Light	s Operation	nal?			Code
1. Y	es	2. 1	No			N/A	1.	Yes			2. No				N/A
134. Locomot	ive Headlight Illu	ıminate	d?			Code	135. Locoi	motiv	e Audible	Warnin	g Sounded	1?			Code
1. Y	es	2. 1	No			N/A	1.	Yes			2. No				N/A

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136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



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137. SYNOPSIS OF THE ACCIDENT

Synopsis of the Accident

On May 29, 2007, at 12:43 p.m. Eastern Standard Time (EST) a CSX Transportation (CSX) northbound freight Train Q57229 derailed 26 cars. The main derailment occurred at milepost (MP) 578.9 on the M&M Subdivision of the Atlanta Division near Castleberry, Alabama (AL). Involved in the derailment were eight loaded tank cars with hazardous material of Phenol and Acetone. During the derailment, three of the tank cars were damaged resulting in a release of their product. The hazardous material release caused an evacuation of 75 residents from Castleberry and 380 persons in surrounding businesses.

The initial point of derailment occurred at MP 579.3 with wheel marks on the crossties. These wheel marks continued to MP 578.9 where the main derailment occurred. After the uninitiated emergency application of the train's air brakes, the first derailed car (NYC 587901) separated from the trailing derailed cars and remained coupled to the head eight cars and locomotives coming to rest at MP 578.1.

There were no casualties or injuries of railroad personnel as a result of the derailment. An unauthorized Alabama Highway Department employee who entered the restricted area was sprayed with Phenol and during the re-railing operations an environmental recovery employee was sprayed with Phenol. They were taken to a local hospital for chemical burns and released. The estimated damage for the track is \$65,000 and the equipment is \$803,699.

At the time of the derailment, it was daylight, clear, and 80 ̊F.

The probable cause of the derailment was the car body center plate disengaged from the truck bolster on the 9th car, NYC 587901. This resulted in the car being off-center with the car body riding on the truck bolster causing uneven weight distribution to the wheels which caused wheel lift.

A contributing factor may have been the possibility of the absence of the center pin, which would have helped in keeping the car body center plate in its proper position.

138. NARRATIVE

Circumstances Prior to the Accident

The crew of Train Q57229 included a locomotive engineer and a conductor. They first went on duty at 9:15 a.m., May 29, 2007, at the Sibert Yard in Mobile, AL. This was their away terminal and both crew members were off duty more than ten hours prior to reporting for duty.

Their assigned Train Q57229 originated in New Orleans, Louisiana (LA) where the required pre-departure car inspection and Class I air brake tests were performed. The train departed New Orleans at 2:25 a.m. on May 29, 2007, with three locomotives and 34 cars, 3,062 trailing tons, and a total length of 2,429 feet. It arrived in Mobile at 7:30 a.m. where a block of 32 cars were added to the train and a Class III air brake test was performed by the car inspectors. At 9:55 a.m. Train Q57229 departed Mobile with three locomotives and 66 cars (32 loads and 34 empties), 5,182 trailing tons, and a total length of 4,257 feet. The train's consist included 17 hazardous material cars, which included 16 loads and one residue car. The train traveled northward along the single main track of the M&M Subdivision on the Atlanta Division and enroute the trip was uneventful prior to the accident.

As the northbound train approached the accident area, the engineer was seated in the cab at the locomotive controls on the east side of the leading locomotive, CSXT 7862. The conductor was seated at the west side of the leading locomotive. Beginning at MP 582, the main line track is at a .35 percent average ascending grade. The track is tangent for a considerable distance before and beyond the accident area. Trains operate under a Traffic Control System with a maximum speed of 60 miles per hours (mph) as designated in the current CSX Atlanta Division Timetable No. 3 dated January 1, 2005.

The railroad timetable direction of the train was north and the geographic direction is the same. Timetable directions are used throughout this report.

The Accident

The engineer was operating Train Q57229 in throttle position three, traveling at 49 mph approaching the accident area, MP 579. As the train was passing through Castleberry, AL, the engineer felt the locomotive dip to the right. He glanced at the locomotive side mirror and could see a large dust cloud and informed the conductor that a gondola railcar was on the ground. Before he could initiate an emergency air brake application, an uninitiated emergency brake application occurred. The throttle position and speed were recorded by the event recorder on the lead locomotive, CSXT 7862.

After Train Q57229 stopped, the conductor walked back and discovered only nine cars were coupled to the last locomotive. The conductor radioed the dispatcher of the derailment and continued walking alongside the derailed cars. He observed the 10th through the 34th cars were derailed and of these the 27th through the 34th were tank cars loaded with hazardous materials. He could smell a strong odor and assumed one of the tank cars was leaking. The 26 derailed cars were stacked upon one another and badly damaged. He radioed the dispatcher again and informed him that one or more of the tank cars containing hazardous materials were leaking. The dispatcher instructed the conductor to leave the area and return to the

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locomotives. After securing the head portion of the train, the conductor uncoupled the locomotives and moved to the next siding at Evergreen, MP 568.8.

The Castleberry Fire Department arrived at the derailment site about 1 p.m. where they issued an emergency evacuation order for a two mile radius of the accident area. Seventy five residents of Castleberry and another 380 persons from surrounding businesses were moved. Emergency responders constructed a plastic lined hole to collect the spilled hazardous liquids and lessen the contamination of the soil. Two persons received minor injuries from the leaking chemicals. An unauthorized Alabama Highway Department employee who entered the restricted area was sprayed with Phenol, and during the re-railing operations an environmental recovery employee was sprayed with Phenol. Both were taken to a local hospital for chemical burns and released.

Analysis and Conclusion

Analysis

Three of the tank cars had received heavy damage to their shell resulting in a release of the products that they were carrying. The 27th car, WCHX 30221, contained 188,500 pounds of Acetone and lost 33,840 pounds of product. The 31st car, GATX 72220, contained 188,500 pounds of Phenol, and the 32nd car, GATX 665841, contained 188,200 pounds of Phenol. Each car lost a combined total of 200,150 pounds of product.

Wheel action revealed that the point of derailment was at MP 579.3. An empty gondola car (NYC 587901), the ninth car in the train, was the first car to derail. The No. 3 wheel located on the "A" end of the car's trailing truck was lifted onto the east rail and traveled 78 inches on the ball of the rail before dropping to the field side of the main track. The car continued to run in a derailed position about 2,000 feet before the general pile-up occurred.

Inspection of the track at the point of derailment showed no defects that contributed to the derailment. The rail, crossties, and rail anchors were in good condition with the gage and cross level measurements, each within federal standards.

Inspection of Car NYC 587901 showed severe rub marks on the car body center plate. This indicated it had been disengaged from the bowl on the truck bolster and was riding on the lip of the bowl. There were signs that the center pin may have been missing, because there was little wear on the inside of the pin hole on the center plate. There were wheel rub marks underneath on the floor and on the end sill, but these were caused after the car derailed and traveled on the ground for a considerable distance.

Inspection of the truck bolster from the "A" end of Car NYC 587901 showed severe rub marks on the lip of the center bowl indicating the car body center plate had been riding on it. There was little wear on the inside of the pin hole of the truck bolster further indicating that the center pin may have been missing. The truck bolster center bowl had another defect of about 10 inches of the back portion of the rim. The bowl had been cracked and during the derailment this 10 inches of crack pulled away from the rim and was protruding out from the bowl. This was evident by a fresh break along the cracked section. This defective condition did not contribute to the derailment in anyway as the circumference of the bowl and the integrity of it would have kept the car body center plate in place.

Car NYC 587901 was placed in Train Q57229 at Mobile where it had been received in interchange from Norfolk Southern (NS). The car was used to haul scrap metal and was interchanged as a load. NS moved the car to a steel processing plant to be unloaded, then hauled the empty car back and interchanged it to CSX on May 28, 2007, at 11:45 p.m.

At Mobile, CSX carmen inspect the interchange trains on the inbound movements and any defective cars are switched out. Car NYC 587901, over the next 6 hours, was switched into two different tracks before departing. The inbound inspection is the pre-departure inspection and after the cars are classified and put into their outbound blocks, the car inspectors will perform a Class I air brake test and later a Class III air brake test to the departing train.

The railroad conducted a computer simulation of the train profile and conditions and the results were negative as to any train handling situations that caused any excess draft or buff conditions in the train that could have contributed to the accident.

Post-accident forensic toxicological testing of the train crew was performed in accordance with Federal regulations. Report of the testing indicates that the two employees had negative test results.

Conclusion

The evidence points to Car NYC 587901, an empty gondola, as being off center which led to the derailment as evidenced by the severe rub marks on the car body center plate and on the truck bolster bowl. The severity of these marks showed they were formed previous to the derailment and not during it. Where the car became off-center is unknown, since the car was inspected prior to being placed in the train at Mobile. This type of defect is very noticeable and should have been detected. Also, there is no evidence that train handling could have caused the defective condition.

Probable Cause & Contributing Factors

The probable cause of the derailment was the car body center plate disengaged from the truck bolster on the 9th car, NYC 587901. This resulted in the car being off-center with the car body riding on the truck bolster causing uneven weight distribution to the wheels which caused wheel lift.

A contributing factor may have been the possibility of the absence of the center pin, which would have helped in keeping the car body center plate in its proper position.

Fatigue Analysis

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to a 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 employee involved in this derailment.

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FRA File # HQ-2007-32

1. Engineer assigned to Train Q572-29 Sleep setting Excellent Overall Effectiveness = 92% Lapse Index = 1.1 Reaction Time = 108 Chronic Sleep Debt = 3.63 Hours of Continuous Wakefulness = 7.10 Time of Day (military) = 1241 BAC Equivalent = <0.05 Conclusion: Fatigue was not evident for this employee. 2. Conductor assigned to train Q572-29 Sleep setting Excellent Overall Effectiveness = 92% Lapse Index = 1.1 Reaction Time = 108 Chronic Sleep Debt = 3.63 Hours of Continuous Wakefulness = 3.63 Time of Day (military) = 1241 BAC Equivalent = <0.05 Conclusion: Fatigue was not evident for this employee. 1.Name of Railroad Operating Train #1 1b. Railroad Accident/Incident No. 1a. Alphabetic Code 000031840 CSX Transportation [CSX] CSX 2.Name of Railroad Operating Train #2 2a. Alphabetic Code 2b. Railroad Accident/Incident No. N/A N/A 3.Name of Railroad Operating Train #3 3a. Alphabetic Code 3b. Railroad Accident/Incident No. N/A N/A 4. Name of Railroad Responsible for Track Maintenance: 4a. Alphabetic Code 4b. Railroad Accident/Incident No. CSX Transportation [CSX] 000031840 CSX 7. Time of Accident/Incident 5. U.S. DOT_AAR Grade Crossing Identification Number 6. Date of Accident/Incident ☐ AM ✓ PM Month 05 Day 29 Year 2007 12:43: 10. Explosion-detonation 13. Other 1. Derailment 8. Type of Accident/Indicent 4. Side collision 7. Hwy-rail crossing Code (describe in (single entry in code box) 2. Head on collision 8. RR grade crossing 11. Fire/violent rupture 5. Raking collision narrative) 01 9. Obstruction 3. Rear end collision 6. Broken Train collision 12. Other impacts 9. Cars Carrying 10. HAZMAT Cars 11. Cars Releasing 12. People 13. Division HAZMAT Damaged/Derailed HAZMAT Evacuated 17 8 455 Atlanta 15. Milepost 14. Nearest City/Town 16. State 17. County Δhhr Code (to nearest tenth) Castleberry N/A CONECUH AL (single entry) Code 20. Weather (single entry) 18. Temperature (F) 19. Visibility 21. Type of Track Code Code 1. Dawn 3.Dusk 1. Clear 3. Rain 5.Sleet (specify if minus) 1. Main 3. Siding 80 F 2. Day 2 2. Cloudy 4. Fog 6.Snow 2. Yard 4. Industry 1 23. FRA Track 24. Annual Track Density 25. Time Table Direction 22. Track Name/Number Code (gross tons in 1. North 3. East Class (1-9, X) main millions) 50.7 2. South 4. OPERATING TRAIN #1 26. Type of Equipment 1. Freight train 4. Work train 7. Yard/switching A. Spec. MoW Equip. Code 27. Was Equipment Code 28. Train Number/Symbol Attended? Consist (single entry) 2. Passenger train 5. Single car 8. Light loco(s). O57229 3. Commuter train 6. Cut of cars 9. Maint./inspect.car 1. Yes 2. No 31a. Remotely Controlled Locomotive? 29. Speed (recorded speed, if available) Code 31. Method(s) of Operation (enter code(s) that apply) m.Special instructions 0 = Not a remotely controlled R - Recorded g. Automatic block a ATCS n. Other than main track R 1 = Remote control portable b. Auto train control h. Current of traffic E - Estimated 10 MPH c. Auto train stop i. Time table/train orders o. Positive train control 2 = Remote control tower Trailing Tons (gross tonnage, 3 = Remote controld. Cab excluding power units) Code(s) transmitter - more than one e. Traffic k. Direct traffic control remote control transmitter 5182 f. Interlocking 1 Yard limits N/A N/A N/A N/A 0 32. Principal Car/Unit c. Loaded(yes/no) a. Initial and Number b. Position in Train 33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in 1) First involved Alcohol Drugs NYC587901 9 (derailed, struck, etc) the appropriate box. 0 2) Causing (if mechanical 34. Was this consist transporting passengers? (Y/N) NYC587901 9 N cause reported)

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DEPARTMENT (FEDERAL RAILF			FRA FA	ACTUAI	L RAILR	OAD ACCIDENT REPO	ORT	F	FRA File #	HQ-200	<u>)7-32</u>		
35. Locomotive Unit	ts a. Head	Mid	Mid Train Rear End			36. Cars	Lo	aded	Em	Empty			
33. Edecimente Cin	End	b. Manual			c. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose		
(1) Total in Train	1 3	0	0	0	0	(1) Total in Equipment Consist	32	0	34	0	0		
(2) Total Deraile	d 0	0	0	0	0	(2) Total Derailed	10	0	16	0	0		
37. Equipment Dama This Consist	803699	&	ack, Signal, V Structure Da	•	65000		40. Contributing Cause Code E25C						
	Numbe	r of Crew M	embers	•			Length of	Time on D	uty				
41. Engineer/	1. Engineer/ 42. Firemen		onductors	44. Bral	kemen	45. Engineer/Operator		46. Con	ductor				
Operators 1	0		1	0		Hrs 3 Mi	28		Hrs	3	Mi 28		
Casualties to:	47. Railroad Emplo	yees 48. Tr	ain Passenger	s 49. O	ther	50. EOT Device?		51. Was	EOT Devic	e Properly	Armed?		
Fatal	0		0		0	1. Yes 2. No	1	1.	Yes	2. No	1		
						52. Caboose Occupied by Crew?							
Nonfatal	0		0		0	1. Yes	2. No				N/A		
	•	'		OP	ERATING	G TRAIN #2							
53. Type of Equipme Consist (single en	2.0	train 5. Si	ngle car 8.	Yard/switch Light locol Maint./insp	(s).	- Protection	Was Equipo Attended?	1 -	ode 55.		nber/Symbol		
56. Speed (recorded						1 - 7 - 7	1. 105	2.110		olled Loc	omotive?		
56. Speed (recorded speed, if available) Code R - Recorded E - Estimated N/A MPH N/A S Auto train control h. Current of traffic n. Other than main track													

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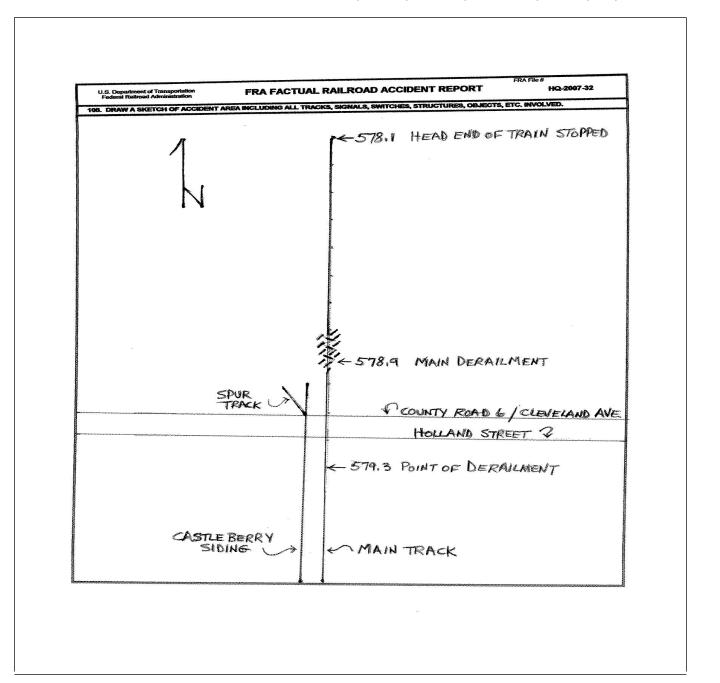
DEPARTMENT (FEDERAL RAILR					FRAFA	ACTUAI	L RAILR	OAD AC	CIDENT R	REPC	ORT	F	RA File #	HQ-200	7-32	
57. Trailing Tons (gro		ge, N/A		d. 0 e. 7	Auto trair Cab Fraffic Interlocking	j.T k.	Γime table/tr rack warran Direct traffic ard limits	t control p	o. Positive train o. Other (Special Code) N/A N/A N	fy in na (s)	arrative)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter N/A				
59. Principal Car/Uni	t	a. Initial	and Nu	ımber	b. Positi	on in Train	c. Load	ed(yes/no)	60. If railroad					ise,		
(1) First involved (derailed, struck,	etc)		N/A		N	/A	N	N/A	enter the the appro		er that were box.	positive i	n	Alcohol N/A	Drugs N/A	
(2) Causing (if me cause reported			N/A		N	/A	1	N/A 61. Was this consist transport				ing passen	gers? (Y/N)	N/A	
62. Locomotive Uni		a. Head End	b. Ma	Mid Tr	ain		r End c. Remote	os. Cars			Lo a. Freight	b. Pass. c. Freight d. Pass.			e. Caboose	
(1) Total in Train	ı	N/A		J/A	N/A	N/A	N/A	(1) Total in	Equipment Co	onsist	N/A	N/A	N/A	N/A	N/A	
(2) Total Deraile	d	N/A	N/	'A	N/A	N/A	N/A	(2) Total D	erailed		N/A	N/A	N/A	N/A	N/A	
64. Equipment Dama This Consist	ige 	N/A	. 6		k, Signal, ' tructure Da		N/A	66. Primar Code	y Cause	N	J/A	67. Contr Code	ributing Ca	use	N/A	
	<u> </u>	Number of Crew Mem				inage			I		Length of	Time on D	uty		1,111	
68. Engineer/				70. Cor	nductors	71. Bra	kemen	72. Engine	eer/Operator			73. Con	ductor			
Operators N/	N/A				N/A		N/A		Hrs N/A	Mi	N/A		Hrs	14/21	Mi N/A	
Casualties to:	74. Rail	road Emplo	oyees 7	5. Trair	n Passenger	rs 76. Oth	er ———	77. EOT D					EOT Devid			
Fatal		N/A			N/A		N/A	1. Y			N/A	1.	Yes	2. No	N/A	
Nonfatal		NY/A			NT / A		NT/A	79. Caboo	se Occupied by	/ Crew						
rvoinatai	N/A N/A N/A							G TRAIN	1. Yes		2. No				N/A	
80. Type of Equipmen	nt 1	Freight tra	in	4. Worl	k train 7	Yard/switc			Equip. Code	81. W	Vas Equipn	nent Co	ode 82.	Train Nun	nber/Symbol	
Consist (single en	try) 2.	Passenger Commuter	train	5. Sing	le car 8.	Light loco	(s).	~ F ~~~~~	N/A	A	Attended?	LN	I/A	N/A	•	
83. Speed (recorded)						Maint./insp of Operation		r code(s) th	at apply)			l l	tely Contr	olled Loco	motive?	
R - Recorded	,	,			ATCS	-	Automatic b	olock n	n.Special instruc			0 = Not a	remotely c	ontrolled		
E - Estimated	N/A	MPH	N/A		Auto train		Current of to	rarric	. Other than ma				ote control	•		
84. Trailing Tons (gross to	nnage,			Auto trair Cab		i ime table/ti 'rack warran	t control P	o. Positive train o. Other (Special	fy in na	arrative)		te control to te control	ower		
excluding power	units)			1	Fraffic		Direct traffi		Code(,		ter - more			
		N/A		f. I	nterlocking	g 1.Y	ard limits		N/A N/A N	I/A N	J/A N/A	remote c	ontrol tran	smitter	N/A	
86. Principal Car/Uni	t	a. Initial	and Nu	ımber	b. Positi	on in Train	c. Load	ed(yes/no)	87. If railroad	emplo	yee(s) teste	ed for drug	/alcohol us	se,		
(1) First involved (derailed, struck,	etc)		N/A		1	N/A		N/A	enter the the appro	er that were box.	positive i	Drugs N/A				
(2) Causing (if me		1	N/A		N	J/A	1	N/A 88. Was this consist transport								
		- 114	ı) (: 1 m	<u>. l</u>	Rea	r End			Lo	oaded Empty					
89. Locomotive Uni	is	a. Head End	b. Ma	Mid Tr nual 1			c. Remote	90. Cars			a. Freight		c. Freight		e. Caboose	
(1) Total in Train	ı	N/A	N/	/A	N/A	N/A	N/A	(1) Total in	Equipment Co	nsist	N/A	N/A	N/A	N/A	N/A	
(2) Total Deraile	d	N/A	N/	A	N/A	N/A	N/A	(2) Total D	erailed		N/A	N/A	N/A	N/A	N/A	
91. Equipment Dama This Consist	ige I	N/A	g		k, Signal,		N/A	93. Primary	y Cause Code	N	J/A	94. Contr	ributing Ca	use	N/A	
This Consist		Numbe	r of Cre		tructure Da	mage	14/21				Length of		utv		IV/A	
95. Engineer/	96. Fir				onductors	98. Bra	kemen	99. Engine	eer/Operator			100. Cor				
Operators N/A		N/A		1	N/A	1	N/A	_	Hrs N/A	Mi	N/A		Hrs	N/A	Mi N/A	
Casualties to:	101. Rai	ilroad Employees 102. Train			rain	103. Ot	her	104. EOT					EOT Dev			
Fatal		N/A		1	N/A	1	N/A	1. Y 106. Cabo	ose Occupied b		N/A w?	1.	Yes	2. No	N/A	
Nonfatal		N/A		N	V/A		N/A		1. Yes		2. No				N/A	
		Highw	ay Use	r Invo	lved					Rail E	quipmen	t Involved	i			
107. C. Truck-T	railer.	F. Bus	1	Other 1	Motor Veh	icle	Code	111. Equip		Train ((standing)	6.Light	Loco(s) (n	noving)	Code	
A. Auto D. Pick-Up	Truck	G. School	Bus K	. Pedes	trian		I NI/A		its pulling) 4.0	Car(s)	(moving)	7.Light(s	s) (standin	g)	NT/A	
B. Truck E. Van		H. Motorcy		Other			N/A Code		its pushing) 5.0		(standing)	8.Other	(specify in	narrative)	N/A	
108. Vehicle Speed (est. MPH at in	npact)	N/A	109. 1.Nort	h 2.So	geographi uth 3.East		N/A	112. Positio	on of Car Unit i	ΙΠ		N/A				

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	ENT OF TRA RAILROAD AI			FRAF	ACTU.	AL RAILR	OAD AC	CCIDEN	ΓRE	PORT	F	RA File # <u>HQ-2007</u>	-32
110. Position						Code	113. Circu	mstance					Code
1.Stalled o 4. Trapped	n Crossing 2.St	opped o	n Crossing	3.Moving Ov	er Crossin	g N/A				lighway User y Highway User			N/A
114a. Was the	highway user a	nd/or ra	il equipmen	t involved		Code	114b W	as there a ha	zardoi	ıs materials rele	966		Code
in the im	pact transporting	g hazard	ous material	s?									1
1. Highway	User 2. Rail I	Equipme	ent 3. Both	4. Neither		N/A	1. High	way User	2. Ra	il Equipment	3. Both	4. Neither	N/A
114c. State he	re the name and	quantit	y of the haza	ardous materia	als release	d, if any. N/A							
115. Type	1.Gates		ig Wags			10.Flagged by		116. Signal	ed Cro	ossing	Code	117. Whistle	Code
Crossing 2.Cantilever FLS 5.Hwy. traffic signals 8.Stop signs 11.Other (spec. in narr.) (See instructions for codes) 1. Yes Warning 3.Standard FLS 6.Audible 9.Watchman 12.None 2. No													
Code(s)		N/A	N/A	N/A	N/A	N/A	N/A				3. Unknown	N/A	
118. Location of Warning Code 119. Crossing Warning Code 120. Crossing Illuminated by Street												Code	
1. Both Sic	les				wi	th Highway Sig	gnals			Lights or Sp	ecial Ligh	hts	
	Vehicle Approac					1. Yes 2. No		1		1. Yes 2. No			
3. Opposite	e Side of Vehicl	e Appro	ach	N/A		3. Unknown			N/A 3. Unknown				
121.	122. Driver's C	Gender	Code 123	B. Driver Drov	e Behind	or in Front of	Code	Code 124. Driver					
Age	1. Male			and Struck o	r was Stru	ck by Second							
N/A	2. Female		N/A	1. Yes	2. No	3. Unknown	N/A		opped a d not S	and then Procee Stop	ded 5	5. Other (specify in narrative)	N/A
125. Driver Pa	ssed	Cod	126. Vie	ew of Track C	bscured b	y (primary ob	struction)						Code
Highway V	ehicle	ı		Permanent Str			ng Train 5.	Vegetation		7. Other (sp	ecify in n	arrative)	1
1. Yes 2. No	3. Unknown	N/A	2. 5	Standing Rails	oad Equip	ment 4. Topo	graphy 6.	Highway V	ehicle	8. Not obstruc	ted		N/A
Casualties	to:		Killed	Injured	127. Dr	iver		-	ode	128. Was Dr	iver in th	e Vehicle?	Code
Casuattics	ю.		Kilicu	Injurcu	1	ed 2.Injured 3.			N/A	1. Yes	;	2. No	N/A
129. Highway-Rail Crossing Users N/A N/A						ghway Vehicle t. dollar damag		mage N/A			umber of driver)	Highway-Rail Crossii N/A	ng Users
132. Locomoti	ive Auxiliary Li	ghts?				Code	133. Locoi	motive Aux	iliary I	Lights Operation	al?		Code
1. Y	es	2. 1	No			N/A	1.	Yes		2. No			N/A
134. Locomot	ive Headlight Ill	uminate	ed?			Code	135. Locomotive Audible Warning Sounded?						Code
1. Y	es	2. 1	No			N/A	1.	Yes		2. No			N/A

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136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



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137. SYNOPSIS OF THE ACCIDENT

Synopsis of the Accident

On May 29, 2007, at 12:43 p.m. Eastern Standard Time (EST) a CSX Transportation (CSX) northbound freight Train Q57229 derailed 26 cars. The main derailment occurred at milepost (MP) 578.9 on the M&M Subdivision of the Atlanta Division near Castleberry, Alabama (AL). Involved in the derailment were eight loaded tank cars with hazardous material of Phenol and Acetone. During the derailment, three of the tank cars were damaged resulting in a release of their product. The hazardous material release caused an evacuation of 75 residents from Castleberry and 380 persons in surrounding businesses.

The initial point of derailment occurred at MP 579.3 with wheel marks on the crossties. These wheel marks continued to MP 578.9 where the main derailment occurred. After the uninitiated emergency application of the train's air brakes, the first derailed car (NYC 587901) separated from the trailing derailed cars and remained coupled to the head eight cars and locomotives coming to rest at MP 578.1.

There were no casualties or injuries of railroad personnel as a result of the derailment. An unauthorized Alabama Highway Department employee who entered the restricted area was sprayed with Phenol and during the re-railing operations an environmental recovery employee was sprayed with Phenol. They were taken to a local hospital for chemical burns and released. The estimated damage for the track is \$65,000 and the equipment is \$803,699.

At the time of the derailment, it was daylight, clear, and 80 ̊F.

The probable cause of the derailment was the car body center plate disengaged from the truck bolster on the 9th car, NYC 587901. This resulted in the car being off-center with the car body riding on the truck bolster causing uneven weight distribution to the wheels which caused wheel lift.

A contributing factor may have been the possibility of the absence of the center pin, which would have helped in keeping the car body center plate in its proper position.

138. NARRATIVE

Circumstances Prior to the Accident

The crew of Train Q57229 included a locomotive engineer and a conductor. They first went on duty at 9:15 a.m., May 29, 2007, at the Sibert Yard in Mobile, AL. This was their away terminal and both crew members were off duty more than ten hours prior to reporting for duty.

Their assigned Train Q57229 originated in New Orleans, Louisiana (LA) where the required pre-departure car inspection and Class I air brake tests were performed. The train departed New Orleans at 2:25 a.m. on May 29, 2007, with three locomotives and 34 cars, 3,062 trailing tons, and a total length of 2,429 feet. It arrived in Mobile at 7:30 a.m. where a block of 32 cars were added to the train and a Class III air brake test was performed by the car inspectors. At 9:55 a.m. Train Q57229 departed Mobile with three locomotives and 66 cars (32 loads and 34 empties), 5,182 trailing tons, and a total length of 4,257 feet. The train's consist included 17 hazardous material cars, which included 16 loads and one residue car. The train traveled northward along the single main track of the M&M Subdivision on the Atlanta Division and enroute the trip was uneventful prior to the accident.

As the northbound train approached the accident area, the engineer was seated in the cab at the locomotive controls on the east side of the leading locomotive, CSXT 7862. The conductor was seated at the west side of the leading locomotive. Beginning at MP 582, the main line track is at a .35 percent average ascending grade. The track is tangent for a considerable distance before and beyond the accident area. Trains operate under a Traffic Control System with a maximum speed of 60 miles per hours (mph) as designated in the current CSX Atlanta Division Timetable No. 3 dated January 1, 2005.

The railroad timetable direction of the train was north and the geographic direction is the same. Timetable directions are used throughout this report.

The Accident

The engineer was operating Train Q57229 in throttle position three, traveling at 49 mph approaching the accident area, MP 579. As the train was passing through Castleberry, AL, the engineer felt the locomotive dip to the right. He glanced at the locomotive side mirror and could see a large dust cloud and informed the conductor that a gondola railcar was on the ground. Before he could initiate an emergency air brake application, an uninitiated emergency brake application occurred. The throttle position and speed were recorded by the event recorder on the lead locomotive, CSXT 7862.

After Train Q57229 stopped, the conductor walked back and discovered only nine cars were coupled to the last locomotive. The conductor radioed the dispatcher of the derailment and continued walking alongside the derailed cars. He observed the 10th through the 34th cars were derailed and of these the 27th through the 34th were tank cars loaded with hazardous materials. He could smell a strong odor and assumed one of the tank cars was leaking. The 26 derailed cars were stacked upon one another and badly damaged. He radioed the dispatcher again and informed him that one or more of the tank cars containing hazardous materials were leaking. The dispatcher instructed the conductor to leave the area and return to the

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locomotives. After securing the head portion of the train, the conductor uncoupled the locomotives and moved to the next siding at Evergreen, MP 568.8.

The Castleberry Fire Department arrived at the derailment site about 1 p.m. where they issued an emergency evacuation order for a two mile radius of the accident area. Seventy five residents of Castleberry and another 380 persons from surrounding businesses were moved. Emergency responders constructed a plastic lined hole to collect the spilled hazardous liquids and lessen the contamination of the soil. Two persons received minor injuries from the leaking chemicals. An unauthorized Alabama Highway Department employee who entered the restricted area was sprayed with Phenol, and during the re-railing operations an environmental recovery employee was sprayed with Phenol. Both were taken to a local hospital for chemical burns and released.

Analysis and Conclusion

Analysis

Three of the tank cars had received heavy damage to their shell resulting in a release of the products that they were carrying. The 27th car, WCHX 30221, contained 188,500 pounds of Acetone and lost 33,840 pounds of product. The 31st car, GATX 72220, contained 188,500 pounds of Phenol, and the 32nd car, GATX 665841, contained 188,200 pounds of Phenol. Each car lost a combined total of 200,150 pounds of product.

Wheel action revealed that the point of derailment was at MP 579.3. An empty gondola car (NYC 587901), the ninth car in the train, was the first car to derail. The No. 3 wheel located on the "A" end of the car's trailing truck was lifted onto the east rail and traveled 78 inches on the ball of the rail before dropping to the field side of the main track. The car continued to run in a derailed position about 2,000 feet before the general pile-up occurred.

Inspection of the track at the point of derailment showed no defects that contributed to the derailment. The rail, crossties, and rail anchors were in good condition with the gage and cross level measurements, each within federal standards.

Inspection of Car NYC 587901 showed severe rub marks on the car body center plate. This indicated it had been disengaged from the bowl on the truck bolster and was riding on the lip of the bowl. There were signs that the center pin may have been missing, because there was little wear on the inside of the pin hole on the center plate. There were wheel rub marks underneath on the floor and on the end sill, but these were caused after the car derailed and traveled on the ground for a considerable distance.

Inspection of the truck bolster from the "A" end of Car NYC 587901 showed severe rub marks on the lip of the center bowl indicating the car body center plate had been riding on it. There was little wear on the inside of the pin hole of the truck bolster further indicating that the center pin may have been missing. The truck bolster center bowl had another defect of about 10 inches of the back portion of the rim. The bowl had been cracked and during the derailment this 10 inches of crack pulled away from the rim and was protruding out from the bowl. This was evident by a fresh break along the cracked section. This defective condition did not contribute to the derailment in anyway as the circumference of the bowl and the integrity of it would have kept the car body center plate in place.

Car NYC 587901 was placed in Train Q57229 at Mobile where it had been received in interchange from Norfolk Southern (NS). The car was used to haul scrap metal and was interchanged as a load. NS moved the car to a steel processing plant to be unloaded, then hauled the empty car back and interchanged it to CSX on May 28, 2007, at 11:45 p.m.

At Mobile, CSX carmen inspect the interchange trains on the inbound movements and any defective cars are switched out. Car NYC 587901, over the next 6 hours, was switched into two different tracks before departing. The inbound inspection is the pre-departure inspection and after the cars are classified and put into their outbound blocks, the car inspectors will perform a Class I air brake test and later a Class III air brake test to the departing train.

The railroad conducted a computer simulation of the train profile and conditions and the results were negative as to any train handling situations that caused any excess draft or buff conditions in the train that could have contributed to the accident.

Post-accident forensic toxicological testing of the train crew was performed in accordance with Federal regulations. Report of the testing indicates that the two employees had negative test results.

Conclusion

The evidence points to Car NYC 587901, an empty gondola, as being off center which led to the derailment as evidenced by the severe rub marks on the car body center plate and on the truck bolster bowl. The severity of these marks showed they were formed previous to the derailment and not during it. Where the car became off-center is unknown, since the car was inspected prior to being placed in the train at Mobile. This type of defect is very noticeable and should have been detected. Also, there is no evidence that train handling could have caused the defective condition.

Probable Cause & Contributing Factors

The probable cause of the derailment was the car body center plate disengaged from the truck bolster on the 9th car, NYC 587901. This resulted in the car being off-center with the car body riding on the truck bolster causing uneven weight distribution to the wheels which caused wheel lift.

A contributing factor may have been the possibility of the absence of the center pin, which would have helped in keeping the car body center plate in its proper position.

Fatigue Analysis

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to a 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 employee involved in this derailment.

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1. Engineer assigned to Train Q572-29
Sleep setting Excellent
Overall Effectiveness = 92%
Lapse Index = 1.1
Reaction Time = 108
Chronic Sleep Debt = 3.63
Hours of Continuous Wakefulness = 7.10
Time of Day (military) = 1241
BAC Equivalent = <0.05
Conclusion: Fatigue was not evident for this employee.

2. Conductor assigned to train Q572-29
Sleep setting Excellent
Overall Effectiveness = 92%
Lapse Index = 1.1
Reaction Time = 108
Chronic Sleep Debt = 3.63
Hours of Continuous Wakefulness = 3.63
Time of Day (military) = 1241
BAC Equivalent = <0.05
Conclusion: Fatigue was not evident for this employee.

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