Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-74

Florida East Coast Railway Company
Ft. Lauderdale, FL
August 22, 2006

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 OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2006-74

1.Name of Railroad Operating Train #1 Florida East Coast Rwy Co. [FEC]	1a. Alphabetic Code FEC	1b. Railroad Accident/Incident No. D116082206
2.Name of Railroad Operating Train #2 Florida East Coast Rwy Co. [FEC]	2a. Alphabetic Code FEC	2b. Railroad Accident/Incident D116082206
3.Name of Railroad Responsible for Track Maintenance: Florida East Coast Rwy Co. [FEC]	3a. Alphabetic Code FEC	3b. Railroad Accident/Incident No. N/A
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident Month 08 | Day 22 | Year 2006	6. Time of Accident/Incident 12:01: ☐ AM ☑ PM

7. Type of Accident/Indicent (single entry in code box)	1. Derailment	4. Side collision	7. Hwy-rail crossing	10. Explosion-detonation	13. Other (describe in narrative)
	2. Head on collision	5. Raking collision	8. RR grade crossing	11. Fire/violent rupture	05
	3. Rear end collision	6. Broken Train collision	9. Obstruction	12. Other impacts	

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
4	1	0	0	System

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Ft. Lauderdale	344.7	N/A	FL	BROWARD

17. Temperature (F) (specify if minus)	18. Visibility (single entry) 1. Dawn 2. Day 3.Dusk 4.Dark	Code	19. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow	Code	20. Type of Track 1. Main 2. Yard 3. Siding 4. Industry	Code
89 F		2		1		3

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density (gross tons in millions)	24. Time Table Direction 1. North 3. East	Code
airport siding		3	50		1

OPERATING TRAIN #1

25. Type of Equipment Consist (single entry)				A. Spec. MoW Equip.	Code	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
	1. Freight train	4. Work train	7. Yard/switching					
	2. Passenger train	5. Single car	8. Light loco(s).		1	1	1	FEC208
	3. Commuter train	6. Cut of cars	9. Maint./inspect.car					22

28. Speed (recorded speed, if available) R - Recorded E - Estimated			Code	30. Method(s) of Operation (enter code(s) that apply)			30a. Remotely Controlled Locomotive?
	37	MPH	R	a. ATCS b. Auto train control c. Auto train stop d. Cab e. Traffic f. Interlocking	g. Automatic block h. Current of traffic i. Time table/train orders j.Track warrant control k. Direct traffic control l.Yard limits	m.Special instructions n. Other than main track o. Positive train control p. Other (Specify in narrative)	0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter

29. Trailing Tons (gross tonnage, excluding power units)	Code(s)				
16567	a	N/A	N/A	N/A	N/A

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	32. 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)	N/A	81	yes		N/A	N/A
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A	33. Was this consist transporting passengers? (Y/N)	N	

34. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote	35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	3	0	0	0	0	(1) Total in Equipment Consist	131	0	5	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	31	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
801883	172960	T111	N/A

Number of Crew Members				Length of Time on Duty	
40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen	44. Engineer/Operator	45. Conductor
N/A	N/A	1	N/A	Hrs 2 Mi 31	Hrs 2 Mi 31

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other	49. EOT Device? 1. Yes 2. No	50. Was EOT Device Properly Armed? 1. Yes 2. No
				1	1
Fatal	0	0	0	51. Caboose Occupied by Crew? 1. Yes 2. No	
Nonfatal	N/A	0	0		2

OPERATING TRAIN #2

52. Type of Equipment Consist (single entry)				A. Spec. MoW Equip.	Code	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
	1. Freight train	4. Work train	7. Yard/switching					
	2. Passenger train	5. Single car	8. Light loco(s).		1	1	1	FEC141
	3. Commuter train	6. Cut of cars	9. Maint./inspect.car					21

55. Speed (recorded speed, if available) R - Recorded E - Estimated			Code	57. Method(s) of Operation (enter code(s) that apply)			57a. Remotely Controlled Locomotive?
	0	MPH	R	a. ATCS b. Auto train control	g. Automatic block h. Current of traffic	m.Special instructions n. Other than main track	0 = Not a remotely controlled 1 = Remote control portable

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56. Trailing Tons (gross tonnage, excluding power units)	c. Auto train stop d. Cab e. Traffic f. Interlocking	i. Time table/train orders j.Track warrant control k. Direct traffic control l.Yard limits	o. Positive train control p. Other (Specify in narrative) Code(s)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
3878			a N/A N/A N/A N/A	0

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	59. 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)	TTAX5 53600	10	yes		N/A	N/A
(2) Causing (if mechanical cause reported)	0	N/A	N/A	60. Was this consist transporting passengers? (Y/N)		N

61. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	3	0	0	0	0
(2) Total Derailed	0	0	0	0	0

62. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	7	0	85	0	0
(2) Total Derailed	3	0	0	0	0

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
190723	18400	T111	N/A

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen	71. Engineer/Operator	72. Conductor
1	N/A	1	N/A	Hrs 6 Mi 1	Hrs 6 Mi 1

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

76. EOT Device? (1. Yes 2. No)	77. Was EOT Device Properly Armed? (1. Yes 2. No)	78. Caboose Occupied by Crew? (1. Yes 2. No)
1	1	N/A

Highway User Involved

79. Type	Code
A. Auto B. Truck C. Truck-Trailer. D. Pick-Up Truck E. Van F. Bus G. School Bus H. Motorcycle J. Other Motor Vehicle K. Pedestrian M. Other (spec. in narrative)	N/A

80. Vehicle Speed (est. MPH at impact)	81. Direction geographical) 1.North 2.South 3.East 4.West	Code
N/A		N/A

82. Position	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? (1. Highway User 2. Rail Equipment 3. Both 4. Neither)	Code
	N/A

Rail Equipment Involved

83. Equipment	Code
1.Train(units pulling) 2.Train(units pushing) 3.Train (standing) 4.Car(s) (moving) 5.Car(s) (standing) 6.Light Loco(s) (moving) 7.Light(s) (standing) 8.Other (specify in narrative)	N/A

84. Position of Car Unit in Train
N/A

85. Circumstance	Code
1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	N/A

86b. Was there a hazardous materials release by (1. Highway User 2. Rail Equipment 3. Both 4. Neither)	Code
	N/A

86c. State here the name and quantity of the hazardous materials released, if any.
N/A

87. Type of Crossing Warning (1.Gates 2.Cantilever FLS 3.Standard FLS 4.Wig Wags 5.Hwy. traffic signals 6.Audible 7.Crossbucks 8.Stop signs 9.Watchman 10.Flagged by crew 11.Other (spec. in narr.) 12.None)	88. Signaled Crossing Warning (See instructions for codes)	Code	89. Whistle Ban (1. Yes 2. No 3. Unknown)	Code
Code(s) N/A N/A N/A N/A N/A N/A N/A		N/A		N/A

90. Location of Warning (1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach)	Code	91. Crossing Warning Interconnected with Highway Signals (1. Yes 2. No 3. Unknown)	Code	92. Crossing Illuminated by Street Lights or Special Lights (1. Yes 2. No 3. Unknown)	Code
	N/A		N/A		N/A

93. Driver's Age	94. Driver's Gender (1. Male 2. Female)	Code	95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train (1. Yes 2. No 3. Unknown)	Code	96. Driver (1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative))	Code
N/A		N/A		N/A		N/A

97. Driver Passed Standing Highway Vehicle (1. Yes 2. No 3. Unknown)	Code	98. View of Track Obscured by (primary obstruction) (1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed)	Code
	N/A		N/A

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	N/A	N/A

99. Driver Was (1. Killed 2.Injured 3. Uninjured)	Code
	N/A
102. Highway Vehicle Property Damage (est. dollar damage)	N/A

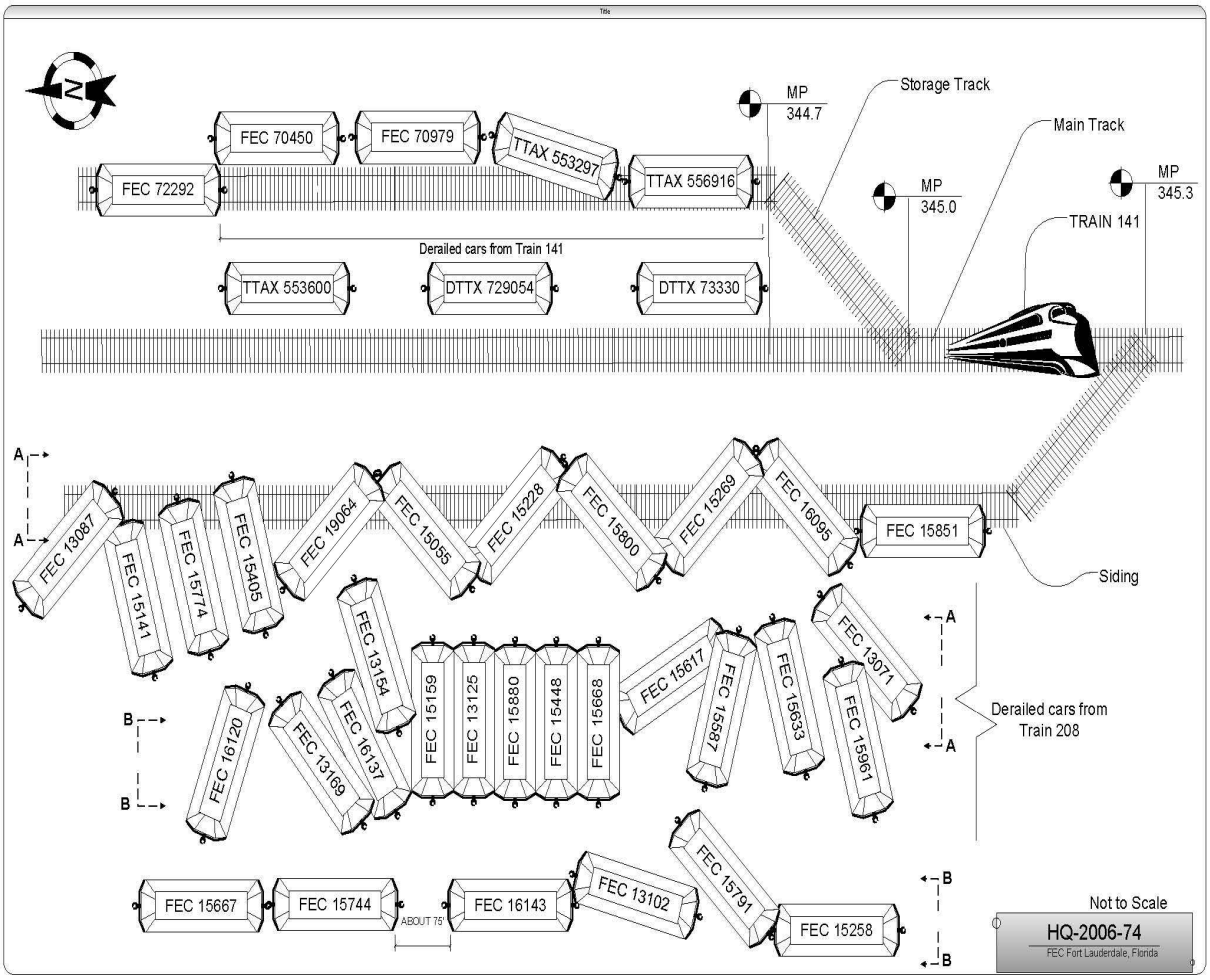
100. Was Driver in the Vehicle? (1. Yes 2. No)	Code
	N/A
103. Total Number of Highway-Rail Crossing Users (include driver)	N/A

104. Locomotive Auxiliary Lights? (1. Yes 2. No)	Code	105. Locomotive Auxiliary Lights Operational? (1. Yes 2. No)	Code
	N/A		N/A

106. Locomotive Headlight Illuminated? (1. Yes 2. No)	Code	107. Locomotive Audible Warning Sounded? (1. Yes 2. No)	Code
	N/A		N/A

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

HQ-2006-74 Sketch rev.jpg



109. SYNOPSIS OF THE ACCIDENT

On August 22, 2006, a Florida East Coast (FEC) Train FEC 20822 was traveling northbound on the main track from Hialeah, Florida (FL) to Jacksonville, FL. This train received a diverging signal at the airport siding, milepost (MP) 345.1, to pass southbound Train FEC 14121 that was stopped on the main track. At 12:01 p.m. Eastern Standard Time (EST), Train FEC 20822, operating on the Airport Side Track, derailed 31 freight cars at MP 344.7. As a result of the derailment, several cars collided into the Train FEC 14121 consist derailing an additional three cars. The impact from this collision struck another cut of standing cars on the No. 1 Storage Track located east and adjacent to the main track. All the derailed cars were in a general pileup.

There were no injuries to any of the crew members. There was no hazardous material spilled and no evacuation necessary. As a result of the derailment and collision, damage to the equipment was $992,606 and $191,360 to the track.

At the time of the derailment, it was daylight and clear with a recorded temperature of 89°F.

The cause of the accident is wide gage due to missing or broken fasteners.

110. NARRATIVE

Circumstances prior to the Accident
Train FEC 20822

On August 22, 2006, at 9:30 a.m., a two-man crew reported to their home terminal at Medley, FL. The crew consisted of an engineer and conductor and was assigned to operate Train FEC 20822. They were to operate Train FEC 20822 from Medley to Jacksonville, a distance of 351 miles. Both crew members had a rest period of 12 hours. Train FEC 20822 consisted of three locomotives, 131 loads, five empties, 16,567 tons and a length of 6,130 ft. The crew received documentation for their brake test, a dispatcher's bulletin, and was cleared to depart from Medley in a northward direction by the dispatcher.

Train FEC 20822 was signaled by the dispatcher for a main track route from North Ojus, MP 251.1, a diverging move onto Airport Siding, MP 345.1, then back to the main track at Wilton Manors, MP 338.8. The engineer was seated at the controls on the east side of the lead locomotive and the conductor seated on the west side of the cab observing signals. At 11:47 a.m., they had a clear indication at North Ojus and at 11:59 a.m., received a diverging clear signal indication at Control Point (CP) Airport. At 12:01, Train FEC 20822 was traversing the siding and clear of Airport switch.

Train FEC 14121

On August 21, 2006, a two man crew reported to their home team in Jacksonville at 11:45 p.m. The crew consisted of an engineer with eight hours rest and a conductor with 12 hours rest. They operated Train FEC 14121 southbound from Jacksonville to Hialeah, a distance of 357 miles. Their train consisted of three locomotives, seven loads, 85 empties, 3,906 tons and was 3,200 ft in length. The crew received their operating bulletins, orders, and an air brake test departing Jacksonville at 12:30 a.m.

Train FEC 14121 was operating southbound on the main track near the city of Fort Lauderdale and was instructed to stop at CP Airport, MP 345.1, to meet northbound Train FEC 20822 for a crew change. The relieving crew consisted of an engineer and trainmaster/conductor who went on duty at Hialeah on August 22, at 6 a.m. The crew change took place before the arrival of Train FEC 20822.

In the Fort Lauderdale area, MP 346.9, the timetable speed for the main track is 45 miles per hour (mph) and the track is tangent. Approaching the CP Airport there is a 1,690 ft, 2-degree, 12 minute right-hand curve, followed by 1.7 mile of tangent. At Airport switch, MP 345.3, there is a No. 20 left-hand turnout. After traversing the turn out there is a 2-degree, 1 minute right-hand curve that is 2,555 ft. The speed through the turnout and siding is 40 mph.

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

The Accident

Train FEC 20822 was operating at 37 mph in a No. 5 throttle position with a brake pipe pressure of 91 lbs operating on Airport Siding. The speed was recorded by the event recorder on the controlling locomotive. Both the engineer and conductor said they felt a dip in the track when the locomotive passed MP 344.7. They continued north for another 81 car lengths and felt the train jerk forward and an emergency brake application occurred. The engineer released the locomotive independent brake, which prevents a run in from the rear-end of the train to the head-end of the train, and brought the train to a controlled stop. He radioed the conductor of Train FEC 14121 that his train was in emergency. The conductor replied that Train FEC 14121 was also in emergency and departed the locomotive to see what the problem was. About 12:05 p.m., he radioed the engineer of Train FEC 20822 informing him of the derailment. He discovered that Train FEC 20822 had derailed into the side of Train FEC 14121, and two derailed cars from Train FEC 14121 struck a standing cut of cars located on the No. 1 storage track.

The conductor of Train FEC 20822 was instructed to install an end of train device (EOT) on the rear of the remaining portion of the train and proceed on to Jacksonville.

Analysis and Conclusion

Analysis - Mechanical

On October 5, 2006, a post accident inspection was conducted by the Federal Railroad Administration (FRA) Motor Power and Equipment (MP&E) and FEC mechanical inspectors on Train FEC 20822. The 77th and 78th cars in the train consist were taken to FEC's Madden Car Shop in Jacksonville. The 77th car, FEC 13034, was the last car in the head section of the train that did not derail. The 78th car, FEC 15667, was the first car in the train's consist that was derailed. These two cars were suspect as a contributing causal factor to the derailment.

FEC 13034 is a hopper car of special construction used for hauling stone. The car was built 10/72 and rebuilt 05/04. This car was in the train with the A-end of the car facing the direction of movement. An inspection of the side bearings, ride control, wheels, roller bearing adapters, truck side frames, truck bolsters, center plates, and truck springs was made with no FRA defects noted.

FEC 15667 is a hopper car of special construction used for hauling stone. The car was built 12/87 and rebuilt 06/99. This car was in the train with the B-end of the car facing the direction of movement. An inspection of the side bearings, ride control, wheels, roller bearing adapters, truck side frames, truck bolsters, center plates, and truck springs was made with no FRA defects noted. After completing the mechanical inspection it was determined that neither FEC 13034 nor FEC 15667 hopper cars contributed to the accident.

Analysis - Track

On August 23, FRA conducted a hi-rail and track walking inspection between MP 347.5 and MP 342.5 with two defects noted at MP 345.1. The point of derailment (POD) was located between MP 344.4 and MP 344.7. This section of track was destroyed and no geometry measurements could be taken.

FRA conducted a track records inspection on FEC main track and sidings. The inspection revealed that on August 11, 2006 through August 16, 2006, the main track and siding had been inspected by a Herzog Rail Detector Car with no defects found between MP 344.3 and MP 344.7 on Airport Siding. On August 2, 2006, the main track and siding between MP 245.0 and MP 370.0 were inspected by a Norfolk Southern (NS) 33 geometry car. The NS car listed two locations on Airport Siding indicating gage widening at MP 344 + 3102 ft showed 1.08 inches, 14 ft. long and MP 344 + 4694 ft showed 0.91 inches gage widening for 20 ft. These defects were shown as a priority defect on their inspection report, but were still within FRA standards for Class 3 track.

On August 8, 11, 15, and 18, 2006, an FEC track inspector conducted a hi-rail inspection between MP 344.5 and MP 344.3 and listed no defects.

The Freight Train FEC 20822 had the event recorder downloaded by FEC road foreman of engines and the analysis disclosed that the train was traveling at 37 mph and in the 5th throttle position, 91 lbs of brake pipe pressure. The download indicated no unusual operating errors or train handling irregularities.

Conclusion

The Airport passing siding is comprised of 132 lbs RE continuous welded rail re-laid in the year 2000. The rail is attached to concrete ties with bolted compression clips and is supported by limestone ballast. The gage widening noted by the NS Geometry Car NS-33 at MP 344 + 3102 ft of 1.08 inches for 14 ft and MP 344 + 4694 ft with 0.91 inches for 20 ft was never repaired by FEC maintenance of way. Although this condition is still within FRA for compliance, at the time of the test the fastener system had began to fail. The length of 14 ft and 20 ft are significant. The lateral force exerted on the rail by constant train traffic causes the existing compression clips to break. As the clips break, the length of detached rail increases and the gage continues to widen resulting in a derailment. The statements of the engineer and conductor that they "felt an unusual dip in the track at MP 344.7" supports this event's occurrence.

An investigation by the Federal Railroad Administration found that the probable cause was a wide gage due to defective or missing or broken rail fasteners.