



***Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2009-05***

***Southeastern Pennsylvania Transportation Authority (SEPTA)
Philadelphia, PA
January 27, 2009***

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.

1. Name of Railroad Operating Train #1 Southeastern Pennsylvania Transportation Authority		1a. Alphabetic Code SEPA		1b. Railroad Accident/Incident No. 0127096168		
2. Name of Railroad Operating Train #2 Southeastern Pennsylvania Transportation Authority		2a. Alphabetic Code SEPA		2b. Railroad Accident/Incident No. 0127096168		
3. Name of Railroad Operating Train #3 N/A		3a. Alphabetic Code N/A		3b. Railroad Accident/Incident No. N/A		
4. Name of Railroad Responsible for Track Maintenance: Southern Pennsylvania Transportation Authority		4a. Alphabetic Code SEPA		4b. Railroad Accident/Incident No. 0127096168		
5. U.S. DOT_AAR Grade Crossing Identification Number		6. Date of Accident/Incident Month 01 Day 27 Year 2009		7. Time of Accident/Incident 04:44:00 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM		
8. Type of Accident/Incident (single entry in code box)						
1. Derailment		4. Side collision		7. Hwy-rail crossing		
2. Head on collision		5. Raking collision		10. Explosion-detonation		
3. Rear end collision		6. Broken Train collision		11. Fire/violent rupture		
		9. Obstruction		12. Other impacts		
				13. Other (describe in narrative)		
				Code 03		
9. Cars Carrying HAZMAT 0		10. HAZMAT Cars Damaged/Derailed N/A		11. Cars Releasing HAZMAT N/A		
				12. People Evacuated 0		
				13. Division System		
14. Nearest City/Town PHILADELPHIA		15. Milepost (to nearest tenth) 6.5		16. State Abbr Code N/A PA		
				17. County PHILADELPHIA		
18. Temperature (F) (specify if minus) 27 F		19. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 4		20. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 6		
				21. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1		
22. Track Name/Number 1		23. FRA Track Code Class (1-9, X) 3		24. Annual Track Density (gross tons in millions) 0.5		
				25. Time Table Direction Code 1. North 3. East 2. South 4. West 2		
OPERATING TRAIN #1						
26. Type of Equipment Consist (single entry)		1. Freight train 4. Work train 7. Yard/switching		A. Spec. MoW Equip. Code		
2. Passenger train 5. Single car 8. Light loco(s).		3. Commuter train 6. Cut of cars 9. Maint./inspect.car		27. Was Equipment Attended? Code 1. Yes 2. No 1		
				28. Train Number/Symbol OPS 3161		
29. Speed (recorded speed, if available) Code R - Recorded E - Estimated 25 MPH E		31. Method(s) of Operation (enter code(s) that apply) a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track c. Auto train stop i. Time table/train orders o. Positive train control d. Cab j. Track warrant control p. Other (Specify in narrative) e. Traffic k. Direct traffic control Code(s) f. Interlocking l. Yard limits j N/A N/A N/A N/A			31a. Remotely Controlled Locomotive? 0 = Not a remotely controlled 1 = Remote control portable 2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter N/A	
30. Trailing Tons (gross tonnage, excluding power units) N/A						
32. Principal Car/Unit		a. Initial and Number		b. Position in Train		
(1) First involved (derailed, struck, etc)		OTE		1		
(2) Causing (if mechanical cause reported)		0		0		
				c. Loaded (yes/no) N/A		
				33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box. Alcohol Drugs N/A N/A		
				34. Was this consist transporting passengers? (Y/N) N		
35. Locomotive Units		a. Head End		Mid Train		
		b. Manual		c. Remote		
		d. Manual		c. Remote		
(1) Total in Train		0		0		
(2) Total Derailed		0		0		
				36. Cars		
				a. Freight b. Pass. c. Freight d. Pass. e. Caboose		
				(1) Total in Equipment Consist		
				0 0 0 0 0		
				(2) Total Derailed		
				0 0 0 0 0		
37. Equipment Damage		38. Track, Signal, Way, & Structure Damage		39. Primary Cause Code		
This Consist \$600,000.00		\$0.00		H607		
				40. Contributing Cause Code H402		
Number of Crew Members				Length of Time on Duty		
41. Engineer/Operators 1		42. Firemen 0		43. Conductors 0		
				44. Brakemen 0		
				45. Engineer/Operator Hrs 5 Mi 44		
				46. Conductor Hrs 0 Mi 0		
Casualties to:		47. Railroad Employees		48. Train Passengers		
Fatal		0		0		
Nonfatal		5		0		
				49. Other		
				50. EOT Device? 1. Yes 2. No 2		
				51. Was EOT Device Properly Armed? 1. Yes 2. No N/A		
				52. Caboose Occupied by Crew? 1. Yes 2. No N/A		
OPERATING TRAIN #2						
53. Type of Equipment Consist (single entry)		1. Freight train 4. Work train 7. Yard/switching		A. Spec. MoW Equip. Code		
2. Passenger train 5. Single car 8. Light loco(s).		3. Commuter train 6. Cut of cars 9. Maint./inspect.car		54. Was Equipment Attended? Code 1. Yes 2. No 2		
				55. Train Number/Symbol 0199		
56. Speed (recorded speed, if available) Code R - Recorded E - Estimated 0 MPH R		58. Method(s) of Operation (enter code(s) that apply) a. ATCS g. Automatic block m. Special instructions b. Auto train control h. Current of traffic n. Other than main track			58a. Remotely Controlled Locomotive? 0 = Not a remotely controlled 1 = Remote control portable	

57. Trailing Tons (gross tonnage, excluding power units)	N/A	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
				d N/A N/A N/A N/A	0

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol N/A	Drugs N/A
(1) First involved (derailed, struck, etc)	371	3	N/A			
(2) Causing (if mechanical cause reported)	0	0	N/A	61. Was this consist transporting passengers? (Y/N)		Y

62. Locomotive Units	a. Head End	Mid Train b. Manual c. Remote	Rear End d. Manual c. Remote	63. Cars	Loaded a. Freight b. Pass.	Empty c. Freight d. Pass.	e. Caboose
(1) Total in Train	3	0 0	0 0	(1) Total in Equipment Consist	0 3	0 0	0
(2) Total Derailed	0	0 0	0 0	(2) Total Derailed	0 0	0 0	0

64. Equipment Damage This Consist	\$100,000.00	65. Track, Signal, Way, & Structure Damage	\$0.00	66. Primary Cause Code	H607	67. Contributing Cause Code	H402
Number of Crew Members				Length of Time on Duty			

68. Engineer/Operators	69. Firemen	70. Conductors	71. Brakemen	72. Engineer/Operator	73. Conductor
1	0	1	0	Hrs 1 Mi 2	Hrs 1 Mi 2
Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other	77. EOT Device?	78. Was EOT Device Properly Armed?
Fatal	0	0	0	1. Yes 2. No 2	1. Yes 2. No N/A
Nonfatal	3	9	0	79. Caboose Occupied by Crew?	
				1. Yes 2. No	N/A

OPERATING TRAIN #3

80. Type of Equipment Consist (single entry)	1. Freight train	4. Work train	7. Yard/switching	A. Spec. MoW Equip.	Code	81. Was Equipment Attended?	Code	82. Train Number/Symbol
	2. Passenger train	5. Single car	8. Light loco(s).		N/A	1. Yes 2. No	N/A	N/A
	3. Commuter train	6. Cut of cars	9. Maint./inspect.car					

83. Speed (recorded speed, if available)	Code	85. Method(s) of Operation (enter code(s) that apply)	85a. Remotely Controlled Locomotive?
R - Recorded		a. ATCS g. Automatic block m. Special instructions	0 = Not a remotely controlled
E - Estimated	N/A MPH N/A	b. Auto train control h. Current of traffic n. Other than main track	1 = Remote control portable
84. Trailing Tons (gross tonnage, excluding power units)	N/A	c. Auto train stop i. Time table/train orders o. Positive train control	2 = Remote control tower
		d. Cab j. Track warrant control p. Other (Specify in narrative)	3 = Remote control transmitter - more than one remote control transmitter
		e. Traffic k. Direct traffic control	
		f. Interlocking l. Yard limits	
			N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded(yes/no)	87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol N/A	Drugs N/A
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A			
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A	88. Was this consist transporting passengers? (Y/N)		N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual c. Remote	Rear End d. Manual c. Remote	90. Cars	Loaded a. Freight b. Pass.	Empty c. Freight d. Pass.	e. Caboose
(1) Total in Train	N/A	N/A N/A	N/A N/A	(1) Total in Equipment Consist	N/A N/A	N/A N/A	N/A
(2) Total Derailed	N/A	N/A N/A	N/A N/A	(2) Total Derailed	N/A N/A	N/A N/A	N/A

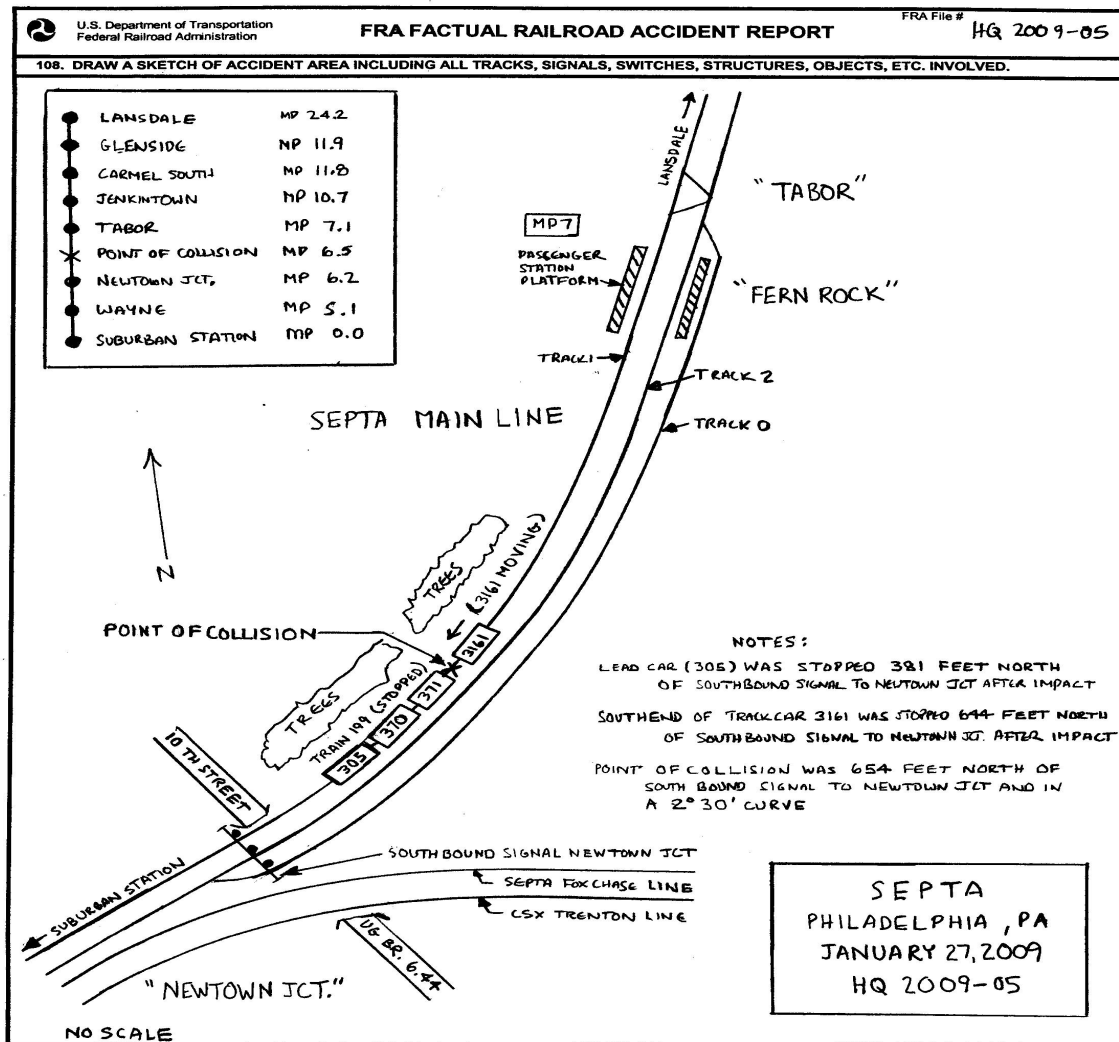
91. Equipment Damage This Consist	N/A	92. Track, Signal, Way, & Structure Damage	N/A	93. Primary Cause Code	N/A	94. Contributing Cause Code	N/A
Number of Crew Members				Length of Time on Duty			

95. Engineer/Operators	96. Firemen	97. Conductors	98. Brakemen	99. Engineer/Operator	100. Conductor
N/A	N/A	N/A	N/A	Hrs N/A Mi N/A	Hrs N/A Mi N/A
Casualties to:	101. Railroad Employees	102. Train	103. Other	104. EOT	105. Was EOT Device Properly
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	106. Caboose Occupied by Crew?	
				1. Yes 2. No	N/A

Highway User Involved				Rail Equipment Involved			
107. C. Truck-Trailer. F. Bus J. Other Motor Vehicle Code	A. Auto D. Pick-Up Truck G. School Bus K. Pedestrian	B. Truck E. Van H. Motorcycle M. Other (spec. in narrative)	N/A	111. Equipment	3. Train (standing)	6. Light Loco(s) (moving)	Code
				1. Train(units pulling)	4. Car(s)(moving)	7. Light(s) (standing)	N/A
				2. Train(units pushing)	5. Car(s)(standing)	8. Other (specify in narrative)	
108. Vehicle Speed (est. MPH at impact)	N/A	109. geographical Code	N/A	112. Position of Car Unit in	N/A		
		1. North 2. South 3. East 4. West					

110. Position 1. Stalled on Crossing 2. Stopped on Crossing 3. Moving Over Crossing 4. Trapped				Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User				Code N/A		
114a. 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	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither				Code N/A		
114c. State here the name and quantity of the hazardous materials released, if any. N/A											
115. Type Crossing 1. Gates 2. Cantilever FLS 3. Standard FLS 4. Wig Wags 5. Hwy. traffic signals 6. Audible Warning 7. Crossbucks 8. Stop signs 9. Watchman 10. Flagged by crew 11. Other (spec. in narr.) 12. None				Code N/A	116. Signaled Crossing (See instructions for codes)				Code N/A	117. Whistle Ban 1. Yes 2. No 3. Unknown	
Code(s)				N/A	N/A	N/A	N/A	N/A	N/A	N/A	
118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach				Code N/A	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown				Code N/A	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	
121. Age N/A		122. Driver's Gender 1. Male 2. Female		Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown				Code N/A	124. 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)	
125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown				Code N/A	126. 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		
Casualties to:			Killed	Injured	127. Driver 1. Killed 2. Injured 3. Uninjured				Code N/A	128. Was Driver in the Vehicle? 1. Yes 2. No	
129. Highway-Rail Crossing Users			N/A	N/A	130. Highway Vehicle Property Damage (est. dollar damage)				N/A	131. Total Number of Highway-Rail Crossing Users (include driver)	
132. Locomotive Auxiliary Lights? 1. Yes 2. No				Code N/A	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No				Code N/A		
134. Locomotive Headlight Illuminated? 1. Yes 2. No				Code N/A	135. Locomotive Audible Warning Sounded? 1. Yes 2. No				Code N/A		

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



137. SYNOPSIS OF THE ACCIDENT

Southbound SEPTA self propelled Catenary Inspection Car (Cat Car) OPS 3161 collided with the rear end of a standing SEPTA Passenger Train 0199 at Newtown Junction Interlocking on January 27, 2009, at 4:44 a.m. EST. The accident occurred in the city of Philadelphia, Pennsylvania, at SEPTA milepost 6.5, on the SEPTA Main Line. The Cat Car was occupied by an operator and four employees. Each employee received minor injuries and was transported to a local hospital where they were treated and released. The standing passenger train was occupied by an engineer and conductor, one off duty engineer, and 18 passengers. All three of these employees and nine passengers received minor injuries and were also transported, treated, and released.

The rear passenger coach car No. 371 of the passenger train sustained \$100,000 damage and the Cat Car sustained \$600,000 in damage.

At the time of the collision it was dark, overcast, with light snow precipitation, and a north wind of eight mph. The temperature was 27° F.

Probable Cause:

The accident was caused by failure of the crew of Cat Car OPS 3161 to comply with restricted speed which requires the operator to stop within one half the range of vision not exceeding 20 mph.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of SEPTA Cat Car OPS 3161 consisted of an operator and four electric traction (ET) maintainers. The operator and all four maintainers went on duty at 11:00 p.m. EST, January 26, 2009, at Wayne Electric Locomotive Shop in Philadelphia, Pennsylvania. The operator of the Cat Car was off-duty for 16 hours. The operator of the Cat Car is not subject to the statutory Hours of Service requirements and has no required mandatory off-duty rest period prior to call.

Cat Car OPS 3161 consisted of a single inspection car traveling under its own power returning to Wayne Electric Locomotive Shop. The Cat Car was operating under a Form D track warrant authority to occupy the track, following SEPTA Commuter Train 0199. The Cat Car received a visual inspection prior to departure from Wayne Electric Locomotive Shop at 12:26 a.m. EST. The brakes of Cat Car OPS 0199 were tested after departure from the rail yard.

At the time of the collision, the operator of Cat Car 3161 was seated in the operator's seat on the south west end of the car, following SEPTA Train 0199. The four ET maintainers were seated in the rear portion of the car separate from the operator. Two were seated on benches at a table on the west side, one at a work table on the east side, and the other at the north end control station of the Cat Car.

The crew of SEPTA Passenger Train 0199 included a locomotive engineer, and a conductor. They first went on duty at 3:42 a.m. EST, January 27, 2009, at Roberts Yard in Philadelphia, Pennsylvania. This is the home terminal for both crew members, and they received more than the required statutory off-duty rest period prior to reporting for duty. On board SEPTA Train 0199 was an off duty SEPTA Engineer deadheading to his daily home terminal. The engineer of SEPTA Train 0199 was unaware his train was being followed by the Cat Car possessing a Form D Authority and operating at restricted speed.

SEPTA Commuter Train 0199 consisted of three electric multiple units (EMU) (No. 305 in the lead, 370, and 371 trailing) and was en route to the Philadelphia International Airport. The train received an initial Class II

brake test at Roberts Yard prior to departure at 4:02 a.m. EST. There were no changes to the train consist after departure.

At the time of the collision, SEPTA Train 0199 was stopped at a stop signal at Newtown Junction Interlocking. The locomotive engineer was standing at the controls on the south end and was in the process of contacting the dispatcher by radio. The dead heading engineer was standing in the control area of the EMU on the east side, across from the engineer, observing activities. The conductor was seated in the first car, first seat, on the north end filling out a fare report. There were 18 passengers on the train seated in both the second and third coach cars of the train.

In this area of the railroad, approaching the point of collision from the north, there are in succession a tangent 2,600 feet in length, a 1 degree 15 minute curve to the right for 820 feet, a 2-degree curve to the right for 1,310 feet, a 2-degree 30 minute curve to the right for 700 feet to the point of collision, and 370 feet beyond. The grade approaching the accident area is 1.2% descending southwardly for 4,100 feet to the point of collision.

The railroad timetable direction is south. The geographic direction is southwest. Timetable directions are used throughout this report.

The Accident

CAT CAR OPS 3161:

The Cat Car was being operated at approximately 30 mph approaching the accident area, as stated by the operator in an interview. The operator had approximately 600' of sight distance to the rear of SEPTA Train 0199 due to a 2°30' curve to the right. The operator observed the rear end of the stopped train seconds before impact. He applied the brakes, and bolted for the door. The other four occupants had no advance notice of the collision. The operator stated that the collision speed was approximately 25 mph. The maximum authorized speed for this vehicle was restricted speed, not exceeding 20 mph as noted in the Northeast Operating Rules Advisory Committee (NORAC) Operating Rule 80. The Cat Car is not equipped with an event recorder.

SEPTA COMMUTER TRAIN 0199:

SEPTA Train 0199 was stopped for approximately 1 ½ minutes, 397 feet north of Newtown Junction Interlocking at a stop signal. SEPTA Train 0199 was receiving no code from the cab signal system. This information was recorded by EMU 305s event recorder. The engineer was in the process of contacting the dispatcher to inform him of the stop signal aspect, as stated in an interview.

Cat Car OPS 3161 struck the rear of SEPTA Train 0199 and shoved it about 16 feet south. The engineer and conductor both transmitted an emergency call to the dispatcher. The conductor of SEPTA Train 0199 inquired the passenger's condition. All employees and passengers remained on the train until emergency services arrived. The Cat Car operator departed the car and walked to the lead EMU No. 305 and inquired if anyone was injured and then stated to the engineer and the off duty engineer, I thought you were clear. The four ET maintainers riding in the Cat Car remained with the car until help arrived. The Philadelphia Fire Department arrived and transported 17 injured people to a local hospital. Of the transported individuals, eight were employees and nine were passengers who were all were treated for minor injuries and released.

ANALYSIS AND CONCLUSIONS

ANALYSIS - TOXICOLOGICAL TESTING:

The railroad performed a test on the Dispatcher under FRA Regulations.

CONCLUSION:

Intoxication was not a casual factor in the collision.

ANALYSIS - LOCOMOTIVE SAFETY DEVICES:

Rear end marker lights were properly displayed on the rear car No. 371 of the three car train set. The marker lights were damaged in the collision and could not be tested. During an interview with the operator of the Cat Car he was asked if he observed whether SEPTA Train 0199 was displaying the marker lights. He responded that the rear end marker lights were properly displayed on Septa Train 0199 prior to impact.

Conclusion:

The rear end marker devices were confirmed illuminated and were in compliance with Federal requirements.

ANALYSIS - LOCOMOTIVE ENGINEER OPERATING PERFORMANCE:

The EMU No. 305 was equipped with an event recorder. The device was downloaded and the data reviewed.

CONCLUSION:

SEPTA Commuter Train 0199 was stopped, with the throttle in the idle position, and the brakes applied. The engineer was in compliance with railroad operating rules.

ANALYSIS - CELL PHONE Usage:

The personal cell phone records of the engineer and conductor of SEPTA Train 0199 and the operator of Cat Car OPS 3161 were subpoenaed. The cell phone records revealed that the conductor of SEPTA Train 0199 did not use his cell phone during his time on duty. The engineer made one phone call about eleven minutes prior to the collision while operating the train. The operator of Cat Car OPS 3161 used his cell phone calling the SEPTA train dispatcher instead of using the radio as required by NORAC rule "E". His last call was made twenty one minutes prior to the rear end collision.

CONCLUSION:

Cell phones were not a factor in the collision.

ANALYSIS - RAILROAD OPERATING RULES TRAINING PROGRAM:

The railroad Operating Rules training and testing program was reviewed for content. The test and results for the operator of the Cat Car were reviewed for the years 2007 and 2008. The railroad trains new employees for two weeks on Operating and Safety Rules before placing them in field positions. After the initial training all employees are trained and tested annually commencing in the beginning of each calendar year. The classes consist of one day in a classroom setting. The engineering employees receive Operating Rules training combined with Roadway Worker Protection (RWP) procedures and Safety Rules training. The training program for the years 2007 and 2008 were basically the same in content. The training does cover track car rules including maximum operating speeds. The training only briefly reviews the requirements of NORAC Rule No. 80 - Restricted Speed. It refers to track cars following other movements. It instructs the operator to "Operate at a speed that allows stopping within ½ the range of vision". The Operating Rules tests taken by the operator of the Cat Car were reviewed for the years 2007 and 2008. Six ET employees were interviewed during the investigation of this accident. The operator and four ET Maintainers involved and the usual operator of Cat Car OPS 3161 that was not involved in this accident. All of them repeated a similar answer as stated in the training material when asked the definition of restricted speed. None of them new of a maximum speed related to restricted speed. The operator of OPS 3161 did not have a full understanding of what is required when operating under restricted speed and his answer was "Prepare to Stop." He did not know of a maximum authorized speed associated with restricted speed. He stated, in two different interviews, he knew he was following a train and he also stated he was operating at 30 mph. SEPTA calculated the average speeds for the return trip that morning between four different locations using time and distance. The speeds were estimated to be 28 mph, 34 mph, 31mph and just prior to impact 34 mph.

CONCLUSION:

SEPTA's Operating Rule training and testing program for operators of on track equipment is ineffective.

ANALYSIS - RAILROAD ROADWAY MAINTENANCE MACHINE TRAINING PROGRAM:

The railroad's training program for the Cat Car is Peer to Peer training. Originally, the manufacturer performed the training to a select few to qualify as operators. Any additional employees are trained by other operators. The usual operator of the Cat Car stated, in an interview, he was trained by another operator for a period lasting approximately one month. The training consisted of observing the qualified operator for a day or two, then operating the equipment himself while the trainer observed for the rest of the month. The operator involved in the accident stated, in an interview, his training was for about two weeks in duration. His training consisted of alternating train operation while the trainer observed and observing the trainer operated. Both operators stated in their interviews a very basic pre trip inspection consisting of visual observations. When the usual operator is not available another qualified operator will fill in for him. The operator involved in this accident, last operated this vehicle about a month prior. When asked basic questions pertaining to the braking system the operator was unsure of the operation or air pressure requirements. Peer to Peer training is only as good as the peer doing the training. Previously, there were no train the trainers instructions. The operator stated he felt comfortable operating but had requested further training by the manufacturer.

CONCLUSION:

SEPTA's roadway maintenance machine training program is inconsistent and ineffective.

ANALYSIS - FATIGUE:

FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings. FRA obtained fatigue related information including a 10-day work history for four employees involved in this accident, including the locomotive engineer and conductor on the SEPTA Train, a SEPTA train dispatcher and the Cat Car operator. Software sleep settings varied according to information obtained from each employee.

CONCLUSION:

Fatigue was not evident for the engineer or conductor of SEPTA Train 0199. Fatigue was evident for the operator of Cat Car OPS 3161 and for the SEPTA Dispatcher.

ANALYSIS - CAT CAR OPS 3161:

Cat Car OPS 3161 was inspected primarily for headlights, and the braking system. The operators' statements during interviews conducted immediately after the accident and again on April 6, 2009 contained contradictions regarding the braking ability of the vehicle the morning of the accident. The inspection was conducted with representatives of the manufacturer of the vehicle. The Cat Car was damaged in the collision and was not safe to operate to recreate braking ability or stopping distances. After the air leaks caused by the collision were repaired, the brakes were found to be functional. There were deficiencies that would inhibit braking ability and possibly stopping distances were increased. These deficiencies were the installation of improper fitting brake shoes and brake linkage adjustments. The improper brake shoes were not of the same contour for the wheel size and did not make full contact. Minimum adjustments were made to the brake linkage; however the air cylinders had a three-inch stroke near full extension. The measurements were 2 3/4", 2 7/8", 2 5/8", and 2 5/8". The headlights were damaged in the collision and could not be tested. The operator stated in an interview that the headlights were on high beam and were working at the time of the collision.

CONCLUSION:

The braking ability of the vehicle was probably less than the manufactures recommended specifications but did not contribute a significant factor in this accident.

ANALYSIS - RAILROAD EFFECIENCY TESTING PROGRAM:

The railroad efficiency testing program for the ET Power Department was reviewed for compliance with 49 CFR Part 217. The railroad requires each Foreman to perform ten compliance tests per month. The ten compliance tests required each month will be concentrated around the core efficiency testing rules, two operating rules and seven safety rules. Tests may be conducted on additional rules not subject to a monthly goal. There are eight foremen required to perform these tests with monthly goals of ten each. That equates to 80 per month and 960 annually. According to the documents received for the 2008 year, a total of twenty compliance tests were conducted by three foremen.

CONCLUSION:

SEPTA Rail Corporation was not in compliance with its own Efficiency Testing Program and was not in compliance with the Federal Regulations for compliance testing.

OVERALL CONCLUSION:

SEPTA Train 0199 was standing at a stop signal indication. The crew members were not aware Cat Car 3161 was following the train. The operator of Cat Car 3161 was returning to his home terminal. The operator of Cat Car 3161 was operating under the authority of Form D Number S0106 containing information on Line 3 which reflected, "Trains or track cars ahead SEPTA 0199 eng 305". The crew had full written knowledge they were following another train. The operator has been employed by SEPTA for 21 years. He has attended an Operating Rules class at least once every year and passed the written test each time. He trained and qualified as an operator for the Cat Car. He has been operating this car for five years as a relief operator. He stated in an interview he has operated this particular car at least 100 times in the past. SEPTA Rail Corporation has a "Good Faith Challenge" clause with any safety sensitive task. If you do not feel a task is safe you can refuse without retribution until the situation is rectified. This applies to operating equipment, physical characteristics qualifications, and operating rules. When asked to operate on the day of the accident, he accepted the assignment.

The Efficiency Testing and Compliance Program when followed is a tool used to ensure employees are complying with the railroad rules and Federal Regulations. When not followed it doesn't ensure anything. The SEPTA ET Department is following approximately 2% of the program.

The braking system on the Cat Car did not meet manufacturer's specifications and the stopping distance was probably increased. This played an insignificant role after the initial impact. If the brake system was properly maintained, it may have mitigated the damage slightly. The collision was imminent. The operator stated in an interview, by the time he saw SEPTA Train 0199, he only had time to apply the brakes and run for the door. He stated he almost made it. The door was about eight feet away. He didn't even have time to shout to the other occupants to brace for impact.

PROBABLE CAUSE & CONTRIBUTING FACTORS:

The accident occurred because the operator of Cat Car OPS 3161 failed to comply with restricted speed indication.