Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-61

Southeastern PA Transportation Authority
Crestmont, PA
July 1, 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-2006-61

1.Name of Railroad Operating Train #1 Southeastern Pennsylvania Transportation Authority	1a. Alphabetic Code SEPA	1b. Railroad Accident/Incident No. 070106R004
2.Name of Railroad Operating Train #2 Southeastern Pennsylvania Transportation Authority	2a. Alphabetic Code SEPA	2b. Railroad Accident/Incident 070106R004
3.Name of Railroad Responsible for Track Maintenance: Southeastern Pennsylvania Transportation Authority	3a. Alphabetic Code SEPA	3b. Railroad Accident/Incident No. 070106R004
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident Month 07 / Day 01 / Year 2006	6. Time of Accident/Incident 02:54:00 ☐ AM ☑ PM

7. Type of Accident/Indicent *(single entry in code box)*: 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other *(describe in narrative)* — **02**

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

13. Nearest City/Town	14. Milepost *(to nearest tenth)*	15. State Abbr / Code	16. County
CRESTMONT	2.80	N/A / N	N

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
84 F	2	1	1

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 2. South 3. East 4. West — Code
WARMINSTER/SINGLE	3	.5	1

OPERATING TRAIN #1

25. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip. — Code	26. Was Equipment Attended? 1. Yes 2. No — Code	27. Train Number/Symbol
2	1	1143

28. Speed *(recorded speed, if available)* R - Recorded E - Estimated — Code	29. Trailing Tons *(gross tonnage, excluding power units)*	30. Method(s) of Operation *(enter code(s) that apply)*	30a. Remotely Controlled Locomotive?
11 MPH — R	0	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)* Code(s): e N/A N/A N/A N/A	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter — 0

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	N/A	1	yes
(2) Causing *(if mechanical cause reported)*	0	0	N/A

32. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box. Alcohol: 0 Drugs: 0

33. Was this consist transporting passengers? (Y/N) Y

34. 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	4	0	0	0	0
(2) Total Derailed	3	0	0	0	0

35. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
$141,000.00	$2,500.00	H221	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
1	0	1	1	Hrs 0 Mi 33	Hrs 1 Mi 18

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	23	0

49. EOT Device? 1. Yes 2. No	50. Was EOT Device Properly Armed? 1. Yes 2. No	51. Caboose Occupied by Crew? 1. Yes 2. No
2	N/A	2

OPERATING TRAIN #2

52. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip. — Code	53. Was Equipment Attended? 1. Yes 2. No — Code	54. Train Number/Symbol
3	1	1134

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
0			e	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)*	SEPTA 407	1	yes		0	0
(2) Causing *(if mechanical cause reported)*	N/A	0	N/A	60. Was this consist transporting passengers? (Y/N)		Y

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	4	0	0	0	0
(2) Total Derailed	1	0	0	0	0

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

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
$36,200.00	$0.00	H221	N/A

Number of Crew Members

67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen
1	0	1	1

Length of Time on Duty

71. Engineer/Operator	72. Conductor
Hrs 2 Mi 7	Hrs 2 Mi 2

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	3	15	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)
2	N/A	2

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
0		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
0

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
Code(s)	N/A	N/A		N/A	N/A		N/A	N/A		N/A	N/A	

88. Signaled Crossing Warning *(See instructions for codes)*	Code
	N/A

89. Whistle Ban (1. Yes 2. No 3. Unknown)	Code
	N/A

90. Location of Warning (1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach)	Code
	N/A

91. Crossing Warning Interconnected with Highway Signals (1. Yes 2. No 3. Unknown)	Code
	N/A

92. Crossing Illuminated by Street Lights or Special Lights (1. Yes 2. No 3. Unknown)	Code
	N/A

93. Driver's Age	94. Driver's Gender (1. Male 2. Female)	Code
0		N/A

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train (1. Yes 2. No 3. Unknown)	Code
	N/A

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

97. Driver Passed Standing Highway Vehicle (1. Yes 2. No 3. Unknown)	Code
	N/A

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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	0	0

99. Driver Was (1. Killed 2.Injured 3. Uninjured)	Code
	N/A

100. Was Driver in the Vehicle? (1. Yes 2. No)	Code
	N/A

102. Highway Vehicle Property Damage *(est. dollar damage)*
0

103. Total Number of Highway-Rail Crossing Users *(include driver)*
0

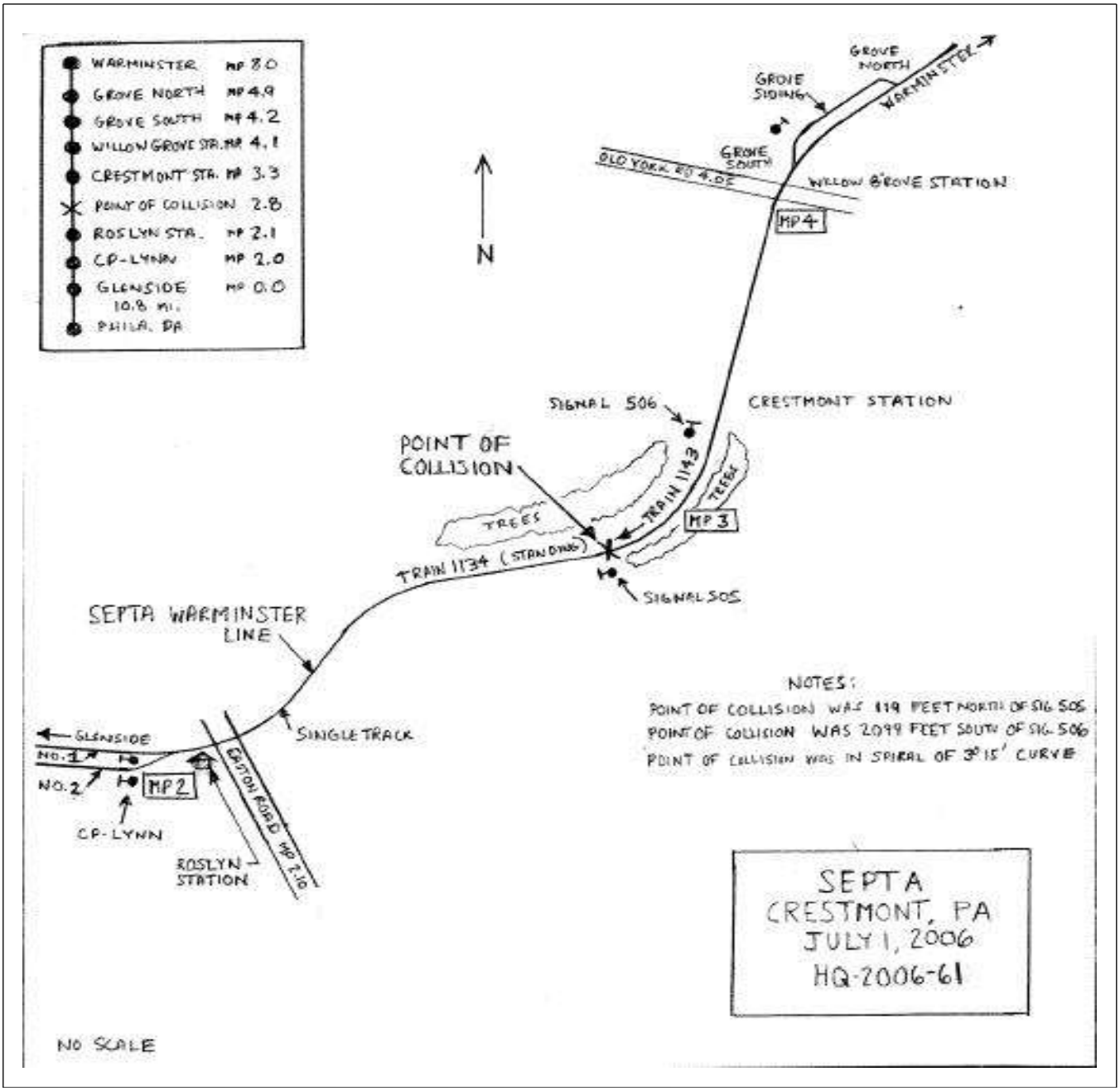
104. Locomotive Auxiliary Lights? (1. Yes 2. No)	Code
	N/A

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

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

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

108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.
hq-2006-61.JPG



109. SYNOPSIS OF THE ACCIDENT

SYNOPSIS OF THE ACCIDENT

All trains referred to in this synopsis are MU Commuter Trains.

Southbound SEPTA Train 1143 collided head-on with a standing northbound SEPTA Train 1134 on single main track. The accident occurred near Crestmont, Pennsylvania on July 1, 2006 at 2:54 p.m. EDT. Trains were operating on SEPTA's, single Main Track, at milepost 2.8 on the Warminster Line.

Weather at the time of the accident was daylight and clear. The temperature was 84 degrees Fahrenheit.

There were a total of forty-four (44) non-life threatening injuries. Three train crew members and 23 passengers were injured on southbound SEPTA Train 1143. Three train crew members and 15 passengers were injured on northbound SEPTA Train 1134.

At 4:16 p.m. Abington Township police took precautionary measures and had forty people evacuated. At 4:44 p.m., a public announcement was made allowing residents to return to their homes.

The southbound SEPTA train consisted of four multiple unit locomotives (MU'S). The first three MU's in the consist derailed. The northbound SEPTA train consisted of four MU's. The lead MU in the consist derailed. Equipment damage to both trains was estimated at $177,200. Track damages were estimated at $2,500.

Probable Cause:

The primary cause of the accident is attributed to the engineer of the southbound train failing to comply with a displayed stop signal indication. The stop signal, an absolute/home signal, is located at Grove South Interlocking, at milepost 4.2 on single Main Track.

110. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

All times in the narrative are Eastern Daylight Time (EDT).

OPERATING TRAIN #1 - SEPTA TRAIN 1143 (Southbound):

The crew of Southeastern Pennsylvania Transportation Authority (SEPTA) Train 1143 South included a locomotive engineer, a conductor, and an assistant conductor. The engineer reported for duty on July 1, 2006 at the SEPTA Warminster Station located at Warminster, PA. The recorded on duty time for the engineer was 2:21 p.m.

The conductor reported for duty on July 1, 2006 at the SEPTA Suburban Station located in Philadelphia, PA. The recorded on duty time for the conductor was 1:36 p.m. After acquiring all of the necessary paper work, the conductor deadheaded to Warminster Station. The conductor arrived at Warminster Station at 2:21 p.m.

The assistant conductor reported for duty on July 1, 2006 at the SEPTA Suburban Station located in Philadelphia, PA. The recorded on duty time for the assistant conductor was 7:46 a.m. After reporting for duty, the assistant conductor prepared to work an assignment, prior to working on SEPTA Train 1143, then deadheaded to the Warminster Station. The assistant conductor arrived at Warminster, PA at 8:31 a.m. All crew members received more than the required statutory off duty rest period, prior to reporting to duty.

The assigned commuter train, SEPTA 1143, consisted of four MU Locomotives. The units were SEPTA 224, 218, 454, and 453. The train was scheduled to operate between Warminster Station and the Philadelphia International Airport. The train received a class two brake test at Warminster prior to departing.

The train crew conducted a job safety briefing prior to boarding SEPTA Train 1143. The engineer made four separate attempts to contact the train dispatcher by radio, but had no success. After the fourth attempt the

engineer called the dispatcher on the telephone.

The dispatcher asked the crew to inspect the pantographs on their train and informed the crew that there were no mandatory directives (form D Reports) and they were good to go. SEPTA Train 1143 departed Warminster station at 2:41 p.m.

At 2:43 p.m. SEPTA Train 1143 departed Hatboro station. At 2:49:05 p.m. SEPTA Train 1143 went by the stop signal indication at Grove South Interlocking, ran through a trailing point switch, and then made a station stop at Willow Grove, PA. SEPTA Train 1143 departed Willow Grove at 2:50 p.m. and made a station stop at Crestmont at 2:51 p.m. At 2:52 p.m. SEPTA Train 1143 departed Crestmont station and continued to operate in a south direction.

As the southbound train approached the accident area, the locomotive engineer was seated at the controls on the east side of the leading MU locomotive. The conductor was located in the lead MU collecting fares from passengers. The assistant conductor was located in the second MU, also collecting fares from passengers.

Approaching the point of collision, there are in succession, tangent track for 4,300 feet, a 3-degree 15 minute curve to the right for 1,547 feet to the point of collision, and extending 36 feet beyond that point. The grade approaching the accident area is a 0.70% descending grade for 1,300 feet and a 0.45% descending grade southwardly, for 1,900 feet to the point of collision.

OPERATING Train #2 - SEPTA TRAIN 1134 (Northbound):

The crew of SEPTA Train 1134 North included a locomotive engineer, a conductor, and an assistant conductor. On July 1, 2006 the engineer reported for duty at SEPTA's Roberts Yard, located in Philadelphia, PA. The recorded on duty time for the engineer was 12:47 p.m.

The conductor also reported for duty at SEPTA's Roberts Yard located in Philadelphia, PA on July 1, 2006. The recorded on duty time for the conductor was 12:52 p.m. After a job briefing both the engineer and conductor deadheaded to Suburban Station.

On July 1, 2006 the assistant conductor reported for duty at SEPTA's Suburban Station located at Philadelphia, PA. The recorded on duty time for the assistant conductor was 8:28 a.m. as he was scheduled to work on an earlier run prior to working on SEPTA Train 1134. All crewmembers received more than the required statutory off duty rest period prior to reporting for duty.

The assigned commuter train, SEPTA Number 1134, consisted of four SEPTA MU's, 407, 371, 370, and 399. The train was scheduled to operate between Suburban Station at Philadelphia, PA to Warminster, PA. The train received a class one brake test at SEPTA's Powelton Yard at Philadelphia, PA prior to departure.

After a job safety briefing, the crew of SEPTA Train 1134 departed Suburban station at 2:04 p.m. SEPTA Train 1134 made station stops on the Main Line at the Market East, Temple University, Wayne Junction, Fern Rock, Melrose Park, Elkins Park, Jenkintown-Wyncote, and Glenside passenger stations.

At 2:44 p.m. SEPTA Train 1134 went through Carmel Interlocking, diverting from the Main Line to the Warminster Line. SEPTA Train 1134 made station stops at the Ardsley and the Roslyn Rail Stations. After departing Roslyn Station and continuing north, SEPTA Train 1134 came upon a stop and proceed signal indication displayed at Automatic Block Signal 505. Having recieved a clear signal indication at the previous signal, the engineer took action to bring the train to a controlled stop. SEPTA Train 1134 passed the stop and proceed signal at Automatic Block Signal 505 before coming to a complete stop approximately 119 feet past the signal.

The conductor came to the head end of the train to find out why the train had stopped. The engineer informed the conductor that the signal at (Control Point) CP-Lynn displayed a clear indication and the 505 Automatic Block Signal was displaying a stop and proceed indication. The crew made three attempts to contact the train dispatcher via radio. At the fourth attempt at 2:52 p.m. the train dispatcher answered the radio. The crew of SEPTA Train 1134 notified the train dispatcher about the signal indications at CP-Lynn and the 505 Automatic Block Signal. The train dispatcher acknowledged reciept of the information by saying "roger."

As norhtward SEPTA Train 1134 approached the accident area the locomotive engineer was seated at the

controls on the east side of the leading MU locomotive. The conductor was standing on the west side in the cab of the leading MU. The assistant conductor was in the lead MU taking tickets from passengers.

Nearing the point of the collision, there are in succession, a segment of tangent track for 900 feet in length, a 2 -degree curve to the right for 1,300 feet, another section of tangent track for 1,000 feet in length, and a 3-degree, 15 minute curve to the left for 36 feet to the point of the collision, and 1,547 feet beyond. The grade approaching the accident area is a 0.61% descending grade for 2,100 feet, then a 0.26% ascending grade for 900 feet and finally, a 0.45% ascending grade northwardly for 400 feet to the point of collision.

The railroad timetable direction is north. The geographic direction is northeast. Timetable directions are used throughout this report.

THE ACCIDENT

OPERATING TRAIN #1 - SEPTA TRAIN 1143 (Southbound):

SEPTA Train 1143 departed Crestmont Station and proceeded South at a recorded speed of thirty-nine (39) mph. Just prior to the accident the train entered into a left-hand curve. The engineer saw the standing northbound train and initiated an emergency brake application. The engineer then left his control station and ran through the commuter car, telling the passengers to “hold on.” Shortly after, SEPTA Train 1143 collided with the standing southbound SEPTA Train 1134.

The engineer’s view, approaching the point of collision, was limited by the 3-degree 15 minute curve to the right and a dense over growth of vegetation which was present on the west side of the track. The engineer’s sight distance at this location on SEPTA Train 1143, to the head end of SEPTA Train 1134, was approximately 580 feet. At the point of the collision, SEPTA Train 1143 was still moving at eleven (11) mph. These speeds were recorded and reflected by the event recorder of the controlling MU locomotive.

OPERATING TRAIN #2 - SEPTA TRAIN 1134 (Northbound):

Operating on a clear signal indication, SEPTA Train 1134 approached the accident site. The next signal, Automatic Block Signal 505, displayed a stop and proceed signal indication. The engineer took immediate action to bring the train to a controlled stop. SEPTA Train 1134 passed the stop and proceed signal before coming to a complete stop approximately 119 feet past the signal. The conductor approached the head end of the train to determine why the train had stopped. The engineer informed the conductor that the signal at CP-Lynn displayed a clear indication and the 505 Automatic Block Signal displayed a stop and proceed indication.

The crew made three attempts to contact the train dispatcher by radio. At 2:52 p.m. while making a fourth attempt, the train dispatcher acknowledged the radio contact. The crew of SEPTA Train 1134 informed the train dispatcher about the signal indications at CP-Lynn and the 505 Automatic Block Signal.

After the dispatcher acknowledged the crew of SEPTA Train 1134, both the engineer and conductor discussed the reason why they would have a stop and proceed signal indication. Soon after, the engineer and conductor could see the southbound train approaching. They opened the vestibule door and told everyone sitting in the first couple of seats, “run forward, sit down and hold on.” As the engineer and conductor ran back using the aisle way toward the second car, their train was struck, by southbound SEPTA Train 1143. The point of collision occurred on the Warminster Line, at milepost 2.8 on single main track.

AUTHORIZED SPEED:

The maximum authorized speed for trains is forty (40) mph as designated in the current SEPTA Timetable Number 2 effective January 1, 2003.

POST COLLISION:

After the head end collision both train crews broadcast over the radio, “Emergency, Emergency, Emergency” to the SEPTA One Train Dispatcher. The crew of SEPTA Train 1134 informed the train dispatcher that they were involved in a head end collision with a southbound train and that there were several injuries. At 2:58 p.m. the train dispatcher informed the crew of SEPTA Train 1134 that local police had been notified and emergency personnel were enroute. At 3:00 p.m. SEPTA Train 1134 notified the train dispatcher that medical assistance had arrived.

The following is a list of the organizations that responded:

Police	Fire	
Cheltenham	Abington	Jenkintown - Standby
Lower Moreland	Roslyn	Hatboro Fire Police
Jenkintown	Willow Grove	Glenside - Standby
Upper Moreland	Edge Hill	North Penn Goodwill - Relief/Food
Upper Dublin	McKinley	County Dept. Of Public Safety
SEPTA	Weldon	Ft, Washington -Standby
Abington		

EMS	
Second Alarmers	Whitemarsh
Cheltenham	VMSC Narberth
Ambler	Trihampton
Springfield	VMSC Lansdale
Bryn Athyn	Burlnome
Plymouth	

FEDERAL AGENCIES:

U.S. Department of Homeland Security
Transportation Security Administration
National Transportation Safety Board
Federal Railroad Administration

Initial reports indicate that six (6) passengers were transported to Holy Redeemer Hospital, seven (7) passengers were transported to Elkins Park Hospital, and three (3) SEPTA crew members and fourteen (14) passengers were transported to Abington Memorial Hospital. At the time of the accident, injury information indicates that there were reportable injuries to two (2) employees and one (1) passenger. They all were admitted at Abington Memorial Hospital for observation:

- One employee on duty (neck sprain/strain)
- One employee on duty (fracture, lower back)
- One passenger (bruise/contusion, forehead)

All other passengers and employees were evaluated, treated and released.

There was a total of 34 reportable injuries.

At 4:16 p.m. Abington Township police evacuated 11 houses consisting of forty residents from the 1400 block of Grovonia Street. At 4:44 p.m. a public announcement was made that allowed everyone to return to their residence. The evacuation was ordered as a precautionary measure. There were no hazardous materials involved.

ANALYSIS AND CONCLUSIONS:

ANALYSIS:

Post accident toxicological tests were performed on four crew members and the dispatcher. All test results were negative.

SEPTA signal personnel, in the presence of FRA, performed post accident signal tests. There were no exceptions noted and the signal system functioned as intended. On July 3, 2006, SEPTA conducted operational testing between CP-Lynn and Grove South interlocking with a test train. No exceptions were noted during testing. Signal test records, event recorder and trouble history records were requested and reviewed. No signal defects were noted.

A playback of the Train Dispatcher Centralized Traffic Control (CTC) voice tapes, in the presence of SEPTA and FRA officials, showed eight (8) SEPTA trains, prior to SEPTA Train 1143, going through Grove South Interlocking with train symbols properly tracking, no switch out of correspondence, or signal overrun alarms indicated.

After the accident event recorder data was down loaded from the lead MU locomotive of the two (2) trains, SEPTA MU 224 and SEPTA MU 407. The event recorder data was analyzed by SEPTA Officials at Wayne Electric Shops in Philadelphia, PA. This was done in the presence of SEPTA investigators, FRA and NTSB inspectors. The three (3) investigation teams reviewed the results of the analysis and concurred with the following conclusions:
MOVING SEPTA TRAIN -1143:

According to the event recorder data from SEPTA MU locomotive 224, the train departed Warminster Station at 2:41 p.m. The time is consistent with the engineer and conductor's statements and supported by the dispatcher record of train movement.

At 2:49 p.m. SEPTA MU locomotive 224 went by the stop signal indication at Grove South Interlocking with the throttle position in idle. It continued on at twenty-six (26) mph and ran through a trailing point switch.

At 2:53 p.m. the engineer of SEPTA MU locomotive 224 placed the brake valve handle into emergency position. The train was moving at eleven (11) mph at the point of impact.

STANDING SEPTA TRAIN-1134:

According to the event recorder data from SEPTA MU Locomotive 407, the train departed Roslyn station at 2:47 p.m. and stopped 119 feet beyond the 505 Automatic Block Signal at 2:48 p.m. The train was stopped (0 mph) at the point of impact.

RECORDS INSPECTIONS:

Employee training and rules examination records for crew members of SEPTA Trains 1134 and 1143 and the train dispatcher on duty were reviewed. They disclosed no apparent indication of inadequate training or testing of the rules.

A records review of track inspections conducted over the previous 60 days revealed no significant track defects noted.

An review of equipment inspection records revealed that no mechanical defects were noted.

APPLICABLE FEDERAL REGULATIONS:

The locomotive engineer on SEPTA Train 1143 was in violation of 49 CFR Part §240.305(a)(1) "Operate a locomotive or train past a signal indication, excluding a hand or a radio signal indication or a switch, that requires a complete stop before passing it is prohibited". SEPTA held a hearing as required by 49CFR Part §240.307. The locomotive engineer on SEPTA Train 1143 was in violation of Emergency Order Number 20. The engineer failed to communicate the indication of the signals at Grove North (Approach signal), Grove South (Stop signal), and the Automatic Block Signal 506 (Stop and Proceed) to a designated crew member.

Applicable NORAC Operating Rules 8th Edition, Effective January 1, 2003:

The locomotive engineer on SEPTA Train 1143 failed to comply the following NORAC operating rules.

Rule D - Employee conduct

Rule 94(b) - Calling signals on push pull trains

Rule 244 - Signal requiring stop

Rule 285 - Approach Signal

Rule 292 - Stop Signal

Rule 291 - Stop and Proceed Signal

Rule 956 -Observing signals; Moving engines

CONCLUSIONS:

1. After a formal review, it has been concluded that neither the condition of the track, the signal system, the MU locomotives, the weather, drug or alcohol use, nor the engineer's work schedule played any significant part of this accident.

2. The train and engine crew of the standing northbound SEPTA Train 1134, complied with SEPTA's Operational Procedures and did not contribute to the cause of the accident.

3. The call for emergency response was prompt and appropriate to the accident.

4. The computer software for train dispatching, disclosed several issues:

a. The audible alarm system does not have a unique alarm for trains that overrun signals.
b. SEPTA does not have a procedure in place for audible overrun signal alarms.
c. Because the systems audible alarms sound alike, train dispatchers become complacent, and do not focus on what triggered the alarm.

d. The interlocking signal will change to the color purple when the signal is overrun and then changes back to red after the train clears the interlocking. This occurs at several different interlocking signals. At other interlocking signals the over run signal will maintain the purple color until the train dispatcher resets the alarm.

The software is not consistent throughout the train dispatching center. During the course of events in this accident the Grove South Interlocking Signal changed to purple when SEPTA Train 1143 passed the stop signal, and then was restored to the color red after SEPTA Train 1143 cleared the interlocking.

5.The engineer of southbound SEPTA Train 1143 failed to take appropriate action when approaching the stop signal indication located at Grove South Interlocking. This inaction resulted in the train passing the stop signal and then then caused it to run through a trailing point switch which resulted in the collision with SEPTA Train 1134.

PROBABLE CAUSE & CONTRIBUTING FACTORS:

The following factors may have contributed to the head end collision:

The locomotive engineer on SEPTA Train 1143 was in violation of Emergency Order Number 20. The engineer failed to communicate the indication of the signals at Grove North (Approach signal), Grove South (Stop signal), and the Automatic Block Signal 506 (Stop and Proceed) to a designated crew mamber.

The locomotive engineer on SEPTA Train 1143 failed to comply with the following NORAC operating rules:

Rule 94 b - Requirements applying to push-pull trains that do not have cab signals in service for the direction of movement, and are operating in territory where the maximum speed of trains exceeds 30 MPH:

1. When a wayside signal affecting the movement of the train displays an Approach, Medium Approach, Slow Approach, Restricting, of Stop and Proceed aspect, the engineer must verbally communicate to a qualified employee on the engine or train, the name and location of each signal, as soon as signal is clearly visible. In multiple track territory, the engineer must include the track number.

Rule 285 - Approach Signal -Trains must proceed prepared to stop at the next signal. Trains exceeding Medium Speed must begin reduction to Medium Speed as soon as the engine passes the Approach Signal.

Rule 291 - Stop and Proceed Signal - Stop, then proceed at Restricted Speed until the entire train has cleared all interlocking and spring switches

PROBABLE CAUSE:

It was determined, through an investigation by the Federal Railroad Administration, that the engineer of SEPTA Train 1143, failed to comply with NORAC Operating Rule 292, Stop Signal. The absolute stop signal was displayed on single main track, at Grove South Interlocking, on SEPTA's Warminister Line. This corresponds with H221-Fixed Signal, Interlocking signal displaying a stop indication - failure to comply.

This is also a violation of 49 CFR Part §240.305(a)(1) Operate a locomotive or train past a signal indication, excluding a hand or a radio signal indication or a switch, that requires a complete stop before passing it. SEPTA held a hearing as required by 49 CFR Part §240.307.