



***Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2006-49***

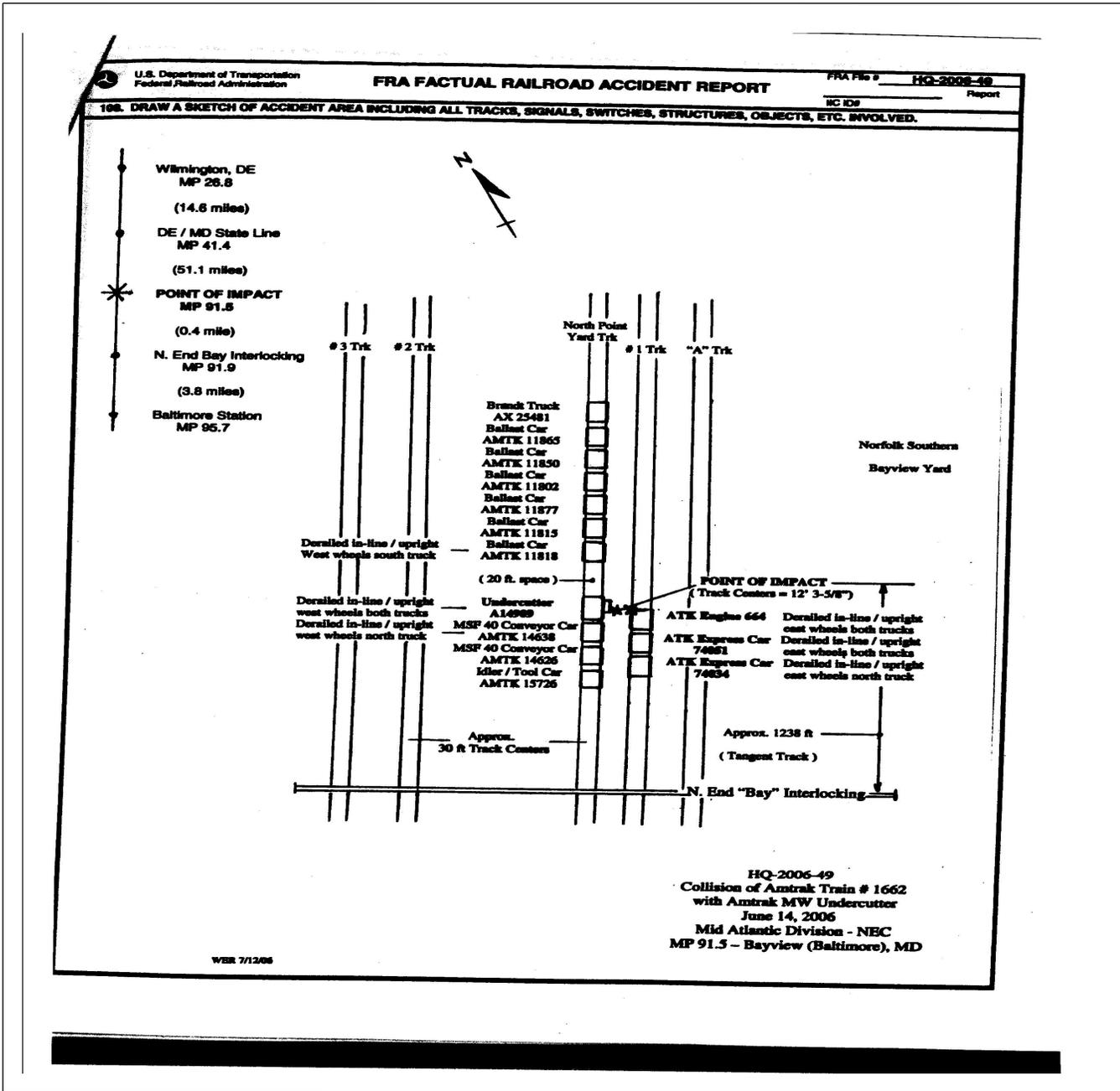
***Amtrak
Bayview, MD
June 14, 2006***

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.

| | | | | | | | | | | | | | |
|---|--|--|---|---|---|---|--|--|--|---|--|----------|--|
| 1. Name of Railroad Operating Train #1 Amtrak [ATK] | | | 1a. Alphabetic Code ATK | | | 1b. Railroad Accident/Incident No. 101029 | | | | | | | |
| 2. Name of Railroad Operating Train #2 N/A | | | 2a. Alphabetic Code N/A | | | 2b. Railroad Accident/Incident N/A | | | | | | | |
| 3. Name of Railroad Responsible for Track Maintenance: Amtrak [ATK] | | | 3a. Alphabetic Code ATK | | | 3b. Railroad Accident/Incident No. N/A | | | | | | | |
| 4. U.S. DOT_AAR Grade Crossing Identification Number | | | 5. Date of Accident/Incident Month: 06 Day: 14 Year: 2006 | | | 6. Time of Accident/Incident 09:30:00 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM | | | | | | | |
| 7. Type of Accident/Incident (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) | | | 12 | | | | | | | |
| 8. Cars Carrying HAZMAT 0 | | 9. HAZMAT Cars Damaged/Derailed 0 | | 10. Cars Releasing HAZMAT 0 | | 11. People Evacuated 0 | | 12. Division MID ATLANTIC | | | | | |
| 13. Nearest City/Town BALTIMORE | | | 14. Milepost (to nearest tenth) 91.50 | | 15. State Abbr Code N/A MD | | 16. County BALTIMORE | | | | | | |
| 17. Temperature (F) (specify if minus) 65 F | | 18. Visibility (single entry) Code 1. Dawn 3. Dusk 2. Day 4. Dark 4 | | 19. Weather (single entry) Code 1. Clear 3. Rain 5. Sleet 2. Cloudy 4. Fog 6. Snow 1 | | 20. Type of Track Code 1. Main 3. Siding 2. Yard 4. Industry 1 | | | | | | | |
| 21. Track Name/Number MAIN TRACK NO. #1 | | | 22. FRA Track Code Class (1-9, X) 6 | | 23. Annual Track Density (gross tons in millions) 21 | | 24. Time Table Direction Code 1. North 3. East 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 1 | | | 26. Was Equipment Attended? 1. Yes 2. No 1 | | | 27. Train Number/Symbol ATK 1662 | | | | |
| 28. Speed (recorded speed, if available) Code R - Recorded E - Estimated 37 MPH R | | | 30. 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) Code(s) e. Traffic k. Direct traffic control f. Interlocking l. Yard limits | | | | | | 30a. 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 0 | | | | |
| 29. Trailing Tons (gross tonnage, excluding power units) 123 | | | 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. | | | | |
| | | | N/A | | 1 | | N/A | | Alcohol N/A | | | | |
| | | | N/A | | N/A | | N/A | | Drugs N/A | | | | |
| | | | N/A | | N/A | | N/A | | 33. Was this consist transporting passengers? (Y/N) N/A | | | | |
| 34. Locomotive Units | | a. Head End | | Mid Train | | Rear End | | 35. Cars | | Loade | | Empty | |
| | | b. Manual | | c. Remote | | d. Manual | | c. Remote | | a. Freight | | b. Pass. | |
| (1) Total in Train | | 1 | | 0 | | 0 | | 0 | | (1) Total in Equipment Consist | | 2 | |
| (2) Total Derailed | | 1 | | 0 | | 0 | | 0 | | (2) Total Derailed | | 2 | |
| | | 0 | | 0 | | 0 | | 0 | | | | 0 | |
| | | 0 | | 0 | | 0 | | 0 | | | | 0 | |
| 36. Equipment Damage This Consist | | | 37. Track, Signal, Way, & Structure Damage 100000 | | | 38. Primary Cause Code H302 | | | 39. Contributing Cause Code N/A | | | | |
| Number of Crew Members | | | | | Length of Time on Duty | | | | | | | | |
| 40. Engineer/Operators N/A | | 41. Firemen N/A | | 42. Conductors 2 | | 43. Brakemen 0 | | 44. Engineer/Operator Hrs 10 Mi 0 | | 45. Conductor Hrs 10 Mi 0 | | | |
| Casualties to: | | 46. Railroad Employees | | 47. Train Passengers | | 48. Other | | 49. EOT Device? 1. Yes 2. No 1 | | 50. Was EOT Device Properly Armed? 1. Yes 2. No 1 | | | |
| Fatal | | 0 | | 0 | | 0 | | | | | | | |
| Nonfatal | | N/A | | 0 | | 0 | | 51. Caboose Occupied by Crew? 1. Yes 2. No 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 A | | | 53. Was Equipment Attended? 1. Yes 2. No 2 | | | 54. Train Number/Symbol ATK 14909 | | | | |
| 55. Speed (recorded speed, if available) Code R - Recorded E - Estimated 0 MPH N/A | | | 57. 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 | | | | | | 57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled 1 = Remote control portable | | | | |

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

SKETCH
HQ-2006-
49.jpg



109. SYNOPSIS OF THE ACCIDENT

A northbound Amtrak freight train collided with a piece of Amtrak Maintenance of Way equipment (Track Undercutter # 14909), on June 14, 2006, at 9:30 p.m. The accident occurred in the Bayview section of Baltimore City, Maryland, at Amtrak Milepost 91.5, on the Amtrak Baltimore Subdivision of the Mid-Atlantic Division.

The three crew members of the Amtrak freight train were taken to the hospital with minor injuries, and were treated and released. There were no Amtrak Maintenance of Way employee's involved. The Amtrak Track Undercutter # 14909 sustained approximately \$900,000.00 in damages. The locomotive (west side front) sustained extensive damage of about \$300,000.00. The Amtrak locomotive and two freight cars derailed, causing extensive damage to three hundred feet of track at a cost of \$100,000.00.

At the time of the accident it was dark and clear, with a westerly wind of 12 mi/h. The temperature was 65 deg. F.

As a result of the investigation, it was determined that the accident was caused by the failure of Amtrak personnel to properly retract, stow and secure the Undercutter cutting wheel assembly clear of Mainline No. #1 track. Amtrak was found to be in violation of FRA 49 CFR, Part 214, Section 214.341- (C)

110. NARRATIVE

Circumstances Prior to the Accident

The crew of train ATK 1662 North included a locomotive engineer, a conductor, and an assistant conductor. They first went on duty at 12:20 p.m., EST, June 14, 2006, at Amtrak 30th Street Station in Philadelphia, Pennsylvania. This was the home terminal for all crew members, and all received more than the statutory of duty period, prior to reporting for duty.

Their first assignment for the day was to bring a train south from Philadelphia, Pennsylvania, to Washington, District of Columbia. Their second assignment of the day was to bring train ATK 1662 north, from Washington, District of Columbia, to Philadelphia, Pennsylvania. Their assigned freight train consisted of one locomotive, and two loaded refrigerated box cars. It was 310 feet long, with 123 trailing tons. The train was to travel non-stop to its destination. The train received an initial terminal train air brake test, and departed Washington D.C. at 08:36 p.m.

As the northbound train approached the accident area, the locomotive engineer was seated at the controls on the east side of the locomotive. The conductor was seated on the west side, and the assistant conductor was seated in the center of the locomotive cab.

In this area of the railroad there are, in succession, a tangent of 1800 feet, a 2-degree curve to the right of about 2100 feet, a tangent of about 300 feet, a left hand curve of about 350 feet, followed by a tangent of about 2200 feet to the point of the accident, and 1100 feet beyond. There is a 0.36-percent descending grade.

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

The Accident

Train ATK 1662 North

The train was being operated at 40 mph on mainline No.1 approaching the accident area. The crew observed a approach medium signal in the cab and passing wayside signal at Bay interlocking. The view of the engineer and conductor was restricted by the dark of night and limited to only what the locomotive headlight illuminated ahead of the train. The view of the assistant conductor was restricted by his seated position in the cab of the locomotive. The engineer said he became aware of the impending collision about four or five seconds in advance, at which time he told the other crew members to brace themselves. He simultaneously initiated an emergency train air brake application. The train had slowed to 37 mph when the collision occurred. Both speeds were recorded by the event recorder in the locomotive. The timetable maximum authorized speed for this train is 100 mph, as designated in the current Amtrak Timetable No. 1. The maximum authorized speed for this train was a slow order of 60 mph issued on a Form D, between Bay (Milepost 91.9) and Point (Milepost 90.0).

Undercutter #14909

The undercutter gang reported for work at 06:00 a.m., at the Edgewood M/W headquarters. The gang traveled by highway to the tie up site at Bayview, on North Point yard track and arrived at 08:00 a.m. The gang foreman held a job briefing, after which the machine was inspected and readied to be moved.

At 09:39 a.m., the foreman of the gang received a out-of service Form D, for Mainline track no.1 between Bay (Milepost 91.9) and Gunpow (Milepost 79.3), at which time they started moving the undercutter from North Point yard track to the work site on mainline track no.1. The machine arrived at work site (Mainline no. 1-Milepost 87.05) at 10:00 a.m., and the machine started to work.

At 01:15 p.m., the undercutter stopped work and was being moved to the dump site (Milepost 88.5) to unload ballast spoils at 02:30 p.m., and then move back to

clear up on North Point yard track.

At 03:00 p.m., the undercutter machine was cleared up on North Point yard track, at which time the Amtrak personnel started to clean the machine of dirt and ballast. The cutting wheel head of the machine was extended out towards mainline no.1 track, which is on the east side of the machine and west side of track #1.

At 04:00 p.m., the remainder of the undercutter gang work equipment was put in the clear on North point yard track.

At 04:13 p.m., the Foreman holding the out-of-service Form D, contacted the CTEC 2 Train Dispatcher and returned mainline no.1 track back to in-service status. At this time the Amtrak personnel started to cease cleaning the machine and started putting the machine into it's safe, locked up mode. The cutting wheel head was retracted back into the machine and the undercutter machine operator used the touch screen in the cab of the machine to engage the locking pins that secure the cutting wheel head into a cleared, non-foul, and locked position. The machine operator looked to see if the cutting wheel was fully retracted and made a determination that it was.

At 04:20 p.m., the Amtrak personnel shut the running machine off, locked up the operating cab and battery box. He then dismantled the machine on the west side, walked across mainline no. 2 and 3, entered the gang's vehicles and returned to headquarters.

The left (west) side of the locomotive, struck the undercutter cutting wheel assembly which is on the east side of the machine, causing the locomotive and the two cars in the train to derail. The train traveled approximately another 250 feet to the north before coming to a stop. Due to the impact, the cutting wheel assembly was torn from it's mounting on the west side of the machine, and was forced to the north and east into the machine, which resulted in extensive damage and derailling of the undercutter, and two adjacent M/W cars.

After the train stopped, all three crew members stayed on the locomotive. The locomotive engineer contacted the CTEC 2 Amtrak train dispatcher and informed the dispatcher of the collision and resulting derailment, and requested medical attention for the three crew members. When Amtrak supervision and EMT personnel arrived, the three crew members were taken to the John Hopkins Medical Center, where they were treated for minor injuries and released.

Analysis and Conclusions

Analysis

The investigation started on June 15, the day after the collision. Due to the extensive damage to the undercutter machine, a re-creation of any type could not be done. The investigation was conducted by inspecting the undercutter the following day at the collision site, and later at the Amtrak work equipment shop at Wilmington, DE. Discussions of the undercutter machine operations and maintenance were held with the Amtrak Director of Work Equipment, and the Amtrak Director of Production Equipment.

Photos taken of the damaged undercutter machine by Amtrak and FRA personnel were used.

Also used in the investigation were written statements collected by FRA operating practice inspectors from the three train crew members and a written statement collected by Amtrak personnel from the undercutter machine operator and several other Amtrak employees. The FRA track inspector doing the investigation could not conduct an interview with the undercutter operator due to his refusal while being held out-of-service pending an Amtrak/BMWE hearing and his subsequent discipline of being fired from Amtrak.

The locomotive was equipped with a speed indicator and an event recorder as required. The relevant event recorder data was downloaded by Amtrak personnel and analyzed at Amtrak Washington, DC headquarters. The analysis disclosed that the locomotive engineer was in compliance with all applicable railroad operating and train handling requirements. FRA reviewed the results of this analysis, and concurred with the conclusions.

The train crew members were the only witnesses to the collision, and they had no information that could be used to determine why the undercutter wheel assembly was afoul of mainline no.1 track.

Conclusions

This investigation revealed that at the point of the collision, the track center between North Point yard track and mainline no.1 track, was 12 feet 3 5/8 inches. When the undercutter wheel assembly is not fully retracted and the locking pins are not engaged properly, the cutting wheel assembly is out of proper lock-up position by 14 inches. The investigation found that when the machine operator retracted the cutting wheel assembly, he used the touch screen to activate the locking pins prematurely. The touch screen does not give an indication of the locking pins being in the proper position, only that they have been activated. When the end of the cutting wheel assembly slide rails came into contact with the extended locking pins, the inward movement of the cutting wheel assembly stopped, giving the machine operator a false indication that the wheel assembly was in a locked position. While this was taking place, other members of the gang were sitting on an Amtrak vehicle waiting for him, so they could return to their headquarters, and were yelling at him to hurry up and get done, and get on the bus. In the machine operators written statement, he states that once the cutting wheel was retracted and locking pins activated, he looked twice from inside the machines cab to see if it had retracted all the way. The machine operator stated that he shut the machine off, locked the cab, dismantled the machine on the west side, which is the opposite side of the machine, from where the cutting wheel is located. He did not look the machine over a second time to make sure everything was in the clear. The machine operator walked away from the machine to the west, crossed 2 sets of tracks and got on the bus.

Probable Cause and Contributing Factors

The FRA determined that the probable cause to this accident was the failure by the machine operator, to ensure that the cutting wheel was clear of mainline no.1 track and properly secured in place. He relied solely on the indication given to him by the "touch screen" control panel in the operating cab, that the locking pins were activated.

The contributing factors to this accident are two-fold.

One being the failure by Amtrak managers to ensure that this operator worked in compliance with the applicable FRA RWP rules, thus being in violation of FRA Railroad Workplace Safety Rules per 49 CFR, Part 214, Subsection 214.341, Subpart (C).

The second being a failure by Amtrak managers to recognize the potential hazard present when the indication on the "touch screen" control of the undercutter indicates only that the locking pins for the cutting (digging) wheel are "activated". There is no indication that the wheel is retracted completely or that the locking pins are secured in the appropriate locking position on the cutting wheel assembly, which can result in a false indication of safety.