



***Federal Railroad Administration  
Office of Railroad Safety  
Accident and Analysis Branch***

***Accident Investigation Report  
HQ-2013-08***

***New Jersey Transit Rail Operations (NJTR)  
Hoboken, NJ  
April 6, 2013***

***Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, 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.***

**TRAIN SUMMARY**

1. Name of Railroad Operating Train #1 New Jersey Transit Rail Operations	1a. Alphabetic Code NJTR	1b. Railroad Accident/Incident No. 201304180
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**GENERAL INFORMATION**

1. Name of Railroad or Other Entity Responsible for Track Maintenance New Jersey Transit Rail Operations		1a. Alphabetic Code NJTR	1b. Railroad Accident/Incident No. 201304180	
2. U.S. DOT Grade Crossing Identification Number		3. Date of Accident/Incident 4/6/2013	4. Time of Accident/Incident 2:34 PM	
5. Type of Accident/Incident Head On Collision				
6. Cars Carrying HAZMAT 0	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0	9. People Evacuated 0	10. Subdivision Hoboken
11. Nearest City/Town Hoboken		12. Milepost (to nearest tenth) 0	13. State Abbr. NJ	14. County HUDSON
15. Temperature (F) 38 °F	16. Visibility Dark	17. Weather Clear		18. Type of Track Main
19. Track Name/Number No. 5		20. FRA Track Class Freight Trains-25, Passenger Trains-30		21. Annual Track Density (gross tons in millions) 22. Time Table Direction East

## OPERATING TRAIN #1

1. Type of Equipment Consist: Passenger Train-Pulling		2. Was Equipment Attended? Yes		3. Train Number/Symbol X166								
4. Speed (recorded speed, if available) R - Recorded E - Estimated 8 MPH		Code R	5. Trailing Tons (gross excluding power units)		6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter							
					Code 0							
6. Type of Territory Signalization: N/A Method of Operation/Authority for Movement: N/A Supplemental/Adjunct Codes: G, L, N/A												
7. Principal Car/Unit (1) First Involved (derailed, struck, etc.)		a. Initial and Number NJTR6705	b. Position in Train 1	c. Loaded (yes/no) no	8. If railroad employee(s) tested for drug/ alcohol use, enter the number that were positive in the appropriate box.							
					Alcohol 0							
					Drugs 0							
(2) Causing (if mechanical, cause reported)		0	0		9. Was this consist transporting passengers? No							
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)		a. Head End	Mid Train		Rear End	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty			
			b. Manual	c. Remote	d. Manual	e. Remote	a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose	
(1) Total in Train		0	0	0	1	0	(1) Total in Equipment Consist	0	0	0	5	0
(2) Total Derailed		0	0	0	0	0	(2) Total Derailed	0	0	0	3	0
12. Equipment Damage This Consist 8433			13. Track, Signal, Way & Structure Damage 2037									
14. Primary Cause Code H221 - Automatic block or interlocking signal displaying a stop indication - failure to comply.*												
15. Contributing Cause Code H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.												
Number of Crew Members			Length of Time on Duty									
16. Engineers/Operators 1	17. Firemen 0	18. Conductors 1	19. Brakemen 0	20. Engineer/Operator Hrs: 7 Mins: 37		21. Conductor Hrs: 7 Mins: 37						
Casualties to:		22. Railroad Employees	23. Train Passengers	24. Others	25. EOT Device? N/A	26. Was EOT Device Properly Armed? N/A						
Fatal		0	0	0	27. Caboose Occupied by Crew? N/A							
Nonfatal		1	0	0								
28. Latitude			29. Longitude									

## CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved	
1. Type		5. Equipment	
2. Vehicle Speed ( <i>est. mph at impact</i> )	3. Direction ( <i>geographical</i> )	6. Position of Car Unit in Train	
4. Position of Involved Highway User		7. Circumstance	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? N/A		8b. Was there a hazardous materials release by N/A	
8c. State here the name and quantity of the hazardous material released, if any.			
9. Type of Crossing Warning 1. Gates      4. Wig wags      7. Crossbucks      10. Flagged by crew 2. Cantilever FLS      5. Hwy. traffic signals      8. Stop signs      11. Other ( <i>spec. in narr.</i> ) 3. Standard FLS      6. Audible      9. Watchman      12. None N/A		10. Signaled Crossing Warning	
12. Location of Warning N/A		13. Crossing Warning Interconnected with Highway Signals N/A	
15. Highway User's Age		16. Highway User's Gender	
17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train		18. Highway User	
19. Driver Passed Standing Highway Vehicle		20. View of Track Obscured by ( <i>primary obstruction</i> )	
Casualties to:		Killed	
Injured		21. Driver was	
23. Highway-Rail Crossing Users 0		24. Highway Vehicle Property Damage ( <i>est. dollar damage</i> ) 0	
26. Locomotive Auxiliary Lights? N/A		27. Locomotive Auxiliary Lights Operational? N/A	
28. Locomotive Headlight Illuminated? N/A		29. Locomotive Audible Warning Sounded? N/A	
22. Was Driver in the Vehicle?		25. Total Number of Vehicle Occupants ( <i>including driver</i> )	

### 10. Signaled Crossing Warning

- 1 - Provided minimum 20-second warning
- 2 - Alleged warning time greater than 60 seconds
- 3 - Alleged warning time less than 20 seconds
- 4 - Alleged no warning
- 5 - Confirmed warning time greater than 60 seconds
- 6 - Confirmed warning time less than 20 seconds
- 7 - Confirmed no warning
- N/A - N/A

### Explanation Code

- A - Insulated rail vehicle
- B - Storm/lightning damage
- C - Vandalism
- D - No power/batteries dead
- E - Devices down for repair
- F - Devices out of service
- G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present
- H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)
- J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits
- K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit
- L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction
- M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed
- N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach
- O - Warning time less than 20 seconds attributed to violation of special train operating instructions
- P - No warning attributed to signal systems failure to detect the train
- R - Other cause(s). Explain in Narrative Description

**SYNOPSIS**

On April 6, 2013, at 1:35 a.m., on a clear night with the temperature at 38 degrees F, there was a head-on collision between two NJ Transit (NJT) trains in Hoboken Terminal, Hoboken, New Jersey. NJT Train X166, a non-revenue passenger train in "Push mode," was returning from the fuel pad shoving eastward. The Conductor was in the lead-end controlling the movement when they passed an interlocking red Stop signal. After NJT X166 went past the Stop signal, they ran through a trailing point interlocking switch and collided with the locomotive of NJT Train 1701, which was a revenue passenger train standing on Track Number 5 in the station with 87 passengers ready to depart. The recorded speed of impact was 8 mph resulting in the derailment of the head three passenger cars of Train X166. Equipment damage to Train X166 was \$8,433 and track damage was \$2,037. Train 1701's damage was estimated at \$10,000. The Conductor injured her neck and back in the collision.

The probable cause of this accident was the inability of the Conductor, who was on the lead-end of Train X166, to stop the train before it passed the Stop signal or at any time prior to impact with Train 1701. The Conductor could have alerted the Engineer operating from the trailing-end of the train to stop via the radio, intercom, or communicating buzzer, all of which were operational. The Conductor could also have pulled the emergency brake handle which was located adjacent to where the Conductor was seated. The Conductor took no action and this resulted in the head-on collision with Train 1701.

A contributing factor was the failure of the Engineer to comply with Northeast Operating Rules Advisory Committee Operating Rule 711, providing that if the Conductor is not in continual communication with the Engineer, the Engineer must stop the movement. The Engineer did not take any action to stop the train because there were no communicating signals or any information from the Conductor concerning the aspect of signal 30E.

**NARRATIVE**

**Circumstances Prior to the Accident:**

The crew of New Jersey Transit (NJT) Passenger Train Number X166 consisted of a conductor and engineer. They were properly rested prior to coming on duty and this yard movement would have been the last move of their regular assignment. After fueling their engine on the fuel pad, the Engineer was on the locomotive located on the west-end of the push pull equipment. The Conductor was located in the control compartment of the control car at the east-end of Train X166. They were to operate on to Track Number 2 in the depot and reverse to the New Drive Track in the yard. The Engineer was operating from other than the lead-end of the movement to facilitate the final movement on to the New Drive Track. The Conductor was on the leading-end of the movement to protect the shove.

The crew of NJT Passenger Train Number 1701 was properly rested and the crew consisted of an Engineer located on the engine at the west-end of the push pull train. The Conductor was located on the platform assisting passengers and the Assistant Conductor was on the train. Train 1701 had just completed its Class 2 brake test prior to departure and was boarding passengers. The brakes were applied with a hand brake applied on the cab car at the east-end of the train.

**The Accident:**

The accident occurred within Hoboken Terminal, an Interlocking with Interlocking Rules in effect and a maximum speed of 15 mph. Operating Train Number 1 (X166), with the locomotive on the west-end and five passenger coaches (east 6705; -6575; -6585; -6568; -6553; -eng 4108 west), was to operate from Hoboken Station west to the fuel pad to fuel the locomotive. After fueling, the crew was to operate east to Track Number 2 in the station and then operate west again to the New Drive Track in the yard to store the train. The decision was made to have the Engineer operate from other than the lead-end to facilitate the last move westward to the New Drive Track. The Engineer and Conductor agreed to use the communicating buzzer to relay information because there was a lot of traffic on the radio. It was also agreed that the Conductor, who would be on the lead-end of the movement, would sound three sounds on the buzzer when they got the signal (28E) off the fuel pad. There was no further discussion on how the rest of the move would be controlled. The Engineer could see signal 28E displaying a "Restricting" aspect and the Conductor sounded three sounds on the communicating buzzer to "back up." They proceeded east towards signal 30E at approximately 5 mph. The Conductor did not use the communicating buzzer every two car-lengths as required by the Northeast Operating Rules Advisory Committee's (NORAC) Rule 21. The train passed signal 30E while it was in a stop position, the Conductor only said "we ain't got the signal" over the radio. The train continued to travel east and ran through a trailing point switch. The train then took the route established for Train 1701, which led it to Track Number 5, which was occupied by Train 1701. The Conductor saw Train 1701 ahead but still did nothing to stop Train X166. The Conductor remained seated in the operating control compartment of Cab Car 6705 up to impact.

Standing Train Number 2 (1701), with Locomotive 4212 and 6 passenger cars, was on Track Number 5 in Hoboken Terminal receiving passengers. The Engineer was on the locomotive with brakes applied and a hand brake applied on the east passenger car. The Conductor was on the platform collecting tickets while the brakeman was in the train helping passengers. This was the last train west from Hoboken and was scheduled to leave the station at 1:32 a.m. The Engineer saw Train X166 approaching the station and thought it was routed to the adjacent track. When the Engineer realized that Train X166 was routed for Track 5, the track he was occupying, he put his headlight on bright and sounded his horn.

Car 6705 of Train X166 collided head on into Train 1701's locomotive (4212), at a recorded speed of 8 mph. The maximum authorized speed in this area is 15 mph. The impact pushed Train 1701 approximately 5 feet backward. The passengers were interviewed to determine if there were any injuries and there were none. The Conductor on Train X166 injured her back and neck as a result of the collision. The three east passenger coaches on Train X166 derailed (6705; -6575; -6585).

Analysis: NJT performed toxicology testing on the Engineer and Conductor of Train X166 under reasonable cause, and the results were negative.

Conclusion: Drugs and alcohol were not a factor in this accident.

Analysis: A fatigue analysis study was conducted on the Engineer and Conductor of Train X166 covering the day of the accident and the 10 previous days.

Conclusion: Fatigue was not a factor in this accident.

Analysis: The radio, communicating buzzer, and emergency brakes on Train X166 were tested and found to be functioning as intended. The train had a proper brake test and all required inspections. The signal equipment was tested and found to be functioning as intended.

Conclusion: There were no mechanical malfunctions that would have prevented the Conductor from stopping the reverse movement when it was evident there was an impending collision.

Analysis: The Engineer and Conductor on Train X166 had a job briefing prior to making the reverse movement into the station. NORAC Operating Rule 21 states that the Conductor using the communicating buzzer for a reverse movement must sound three sounds to begin the movement and three more sounds for each two car-lengths travelled. If this is not done, the Engineer is to stop the movement. The Conductor did not use the communicator as required and the Engineer took no exception and continued the eastward movement.

Conclusion: Failure of the Engineer and Conductor to communicate contributed to this accident.

Analysis: The 30E signal and onboard communicating signal was tested by the railroad and FRA and found to be working as intended. The 30E signal, the signal that was passed, could have displayed a "Restricting," "Slow Approach," or "Stop" signal. This would necessitate a conversation between the Engineer and Conductor to relay the signal information. The Engineer indicated that he told the Conductor to give him three sounds on the communicating buzzer if they had a proceed signal at 30E. The Conductor did not sound three sounds on the communicating buzzer and still the Engineer continued the movement east.

Conclusion: The communicating buzzer cannot be used to convey signal information. The actions of the Engineer would be different for all three of the possible aspects for 30E signal. The Engineer should have stopped the movement without the sufficient signal information.

Analysis: When the train passed the Stop signal, the Conductor shouted on the radio "we ain't got the signal." The Conductor did not identify who was speaking or who the message was for so the Engineer continued to move east. The Conductor stated that she "froze" and could do nothing. She did not try to stop the train at all from this point. She saw the train ahead and knew a collision was imminent.

Conclusion: Training and supervision by the Conductor's immediate supervisor should have identified this Conductor's lack of confidence and knowledge in the procedures for reversing a train and the procedures that must be followed to stop the movement in the event something goes wrong.

**Overall Conclusion**

In reviewing the Conductor's written exams for 2012 and 2013, she continually answered questions concerning the communicating buzzer incorrectly. She has since been instructed on the use of the emergency brake valve and the proper procedures for protecting a shoving movement. The Conductor and Engineer failed to have a proper job briefing and failed to comply with the rules concerning Restricted Speed (Rule 80), Rule 21 (communicating signals), Rule 116 (Reverse movements from other than the leading end) and Special Instruction ME 116 Reversing in Hoboken Terminal). The cause of this accident was the failure of the Conductor to operate at Restricted Speed and comply with a Stop signal. Contributing to this accident was the Engineer's noncompliance with the operating rules concerning signals, restricted speed, and reverse movements.

**Probable Cause**

The probable cause of this accident was the inability of the Conductor, who was on the lead-end of Train X166, to stop the train before it passed the Stop signal or at any time prior to impact with Train 1701. The Conductor could have alerted the Engineer operating from the trailing-end of the train to stop via the radio, intercom, or communicating buzzer, all of which were operational. The Conductor could also have pulled the emergency brake handle which was located adjacent to where the Conductor was seated. The Conductor took no action and this resulted in the head-on collision with Train 1701.

The Conductor took no action and this resulted in the head-on collision with Train 1701.

A contributing factor was the failure of the Engineer to comply with Northeast Operating Rules Advisory Committee Operating Rule 711, providing that if the Conductor is not in continual communication with the Engineer, the Engineer must stop the movement. The Engineer did not take any action to stop the train because there were no communicating signals or any information from the Conductor concerning the aspect of signal 30E.