NATIONAL TRANSPORTATION SAFETY BOARD

Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, DC

TRACK & ENGINEERING GROUP FACTUAL REPORT

DCA16MR011

New Jersey Transit Passenger Train Accident, Hoboken Station

Accident of
Eastbound Passenger Train ID: 1614

Hoboken, New Jersey
September 29, 2016

Accident

NTSB Accident Number:	DCA16MR011
Date of Accident:	September 29, 2016
Time of Accident:	8:38 a.m. (EDT)
Railroad Owner:	NJT
Train Operator:	NJT
Type of Train and No:	Passenger Train ID: 1614
Crew Members:	1 Engineer, 1 Conductor, 1 Brakeman
Fatalities:	1
Location of Accident:	Hoboken, NJ

Track Group

Robert Joe Gordon
Group Chairman/Railroad Accident Investigator
National Transportation Safety Board
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Mr. Ronald Marx
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Federal Railroad Administration—Region 1
[redacted]

Mr. Robert Sweet
New Jersey Transit
Assistant Chief Engineer Track
[redacted]

Synopsis

For a summary of the accident, refer to the *Accident Summary* report, within this docket.

Figure 1. Controlling cab car of accident train shown beyond the end of the track and at rest against the station wall. Damage to the station structure also shown, with a portion of the canopy resting on the accident train (Photo NTSB)

Train Movement

New Jersey Transit (NJT) Train 1614 consisting of one locomotive and four passenger cars, traveled in an east direction through the Bergen tunnel on main track 3 in approach to the

Hoboken station. Approaching the station, Train 1614 was moving at an unknown speed. The train was routed from main track 3, through a series of switches, destined for terminal track 5 in the Hoboken station. This routing was verified by the train dispatcher and signal route information. The train proceeded into track 5 and impacted a bumping post at the end of the track. Upon impact, the lead car rode up and over the post, coming to rest about 40 feet beyond the end of the track. The ends of the terminal tracks are considered milepost (MP) zero on the NJT Morristown line.

Track Description

The NJT Morristown Line, in the accident area, consist primarily of four main tracks leading through the Bergen Tunnels and into Hoboken East End Interlocking, they are designated as tracks 1 through 4. Between East End Interlocking and Terminal Interlocking on the NJT Morristown Line, there are 6 main tracks. They are designated as tracks 1, 2, 3, 4-main, 6-main, and 122. Tracks 1, 2, and 3 are between the NJT's Hill Yard and B Yard and extend from East End Interlocking (MP 0.56) to Terminal Interlocking (MP 0.3). Tracks 4-main, 6-main, and 122 are on the south side of Hoboken Terminal between East End Interlocking and Terminal Interlocking. Approaching the terminal, main tracks 1 through 3 are adjacent, and the other main tracks diverge to the south. In addition to the main tracks, there are 19 yard tracks that originate at various locations throughout the terminal.

Maximum train speeds for the Hoboken Terminal are designated in the NJT Timetable. NJT inspects and maintains the main track on this portion of the Morristown Line to Federal Railroad Administration (FRA) Track Safety Standards (TSS) for Class 2 track, which allows for a maximum operating speed of 30 mph for passenger trains. Entering the terminal, at milepost 0.39 the track is designated as FRA Class 1 track, which allows for a maximum operating speed of 15 mph for passenger trains. The timetable further restricts speeds to 10 miles per hour for all trains inside the train shed. The train shed starts approximately 600 feet before the end of the tracks.

Figure 2. Photo taken from Hoboken Terminal tower facing east toward the station. Depot tracks and canopy shown (Photo NTSB)

In direction of travel, the accident train traversed a descending grade. NJT reports a grade of 0.27% from milepost 1.0 to milepost 0.66, 0.39% from milepost 0.66 to milepost 0.2, and zero grade from milepost 0.2 to the end of the tracks. From milepost 1.0 to 0.5 the train traversed tangent track, at milepost 0.5 the train entered a 5° 30′ left hand curve. After traversing the curve, the train negotiated thirteen switches before entering terminal track 5.

The depot tracks have passenger platforms that are shared by two tracks. A center track fence divided tracks 4 and 5. The platform on the south side of track 5 was about 830 feet long and was partially covered by a canopy leading into the station. The distance from the last switch and point of entry into track 5 and the bumping post at the end of the track is about 860 feet. Investigators noted that track 5 consisted primarily of 140 pound RE, jointed rail, with rail lengths of about 78 feet.

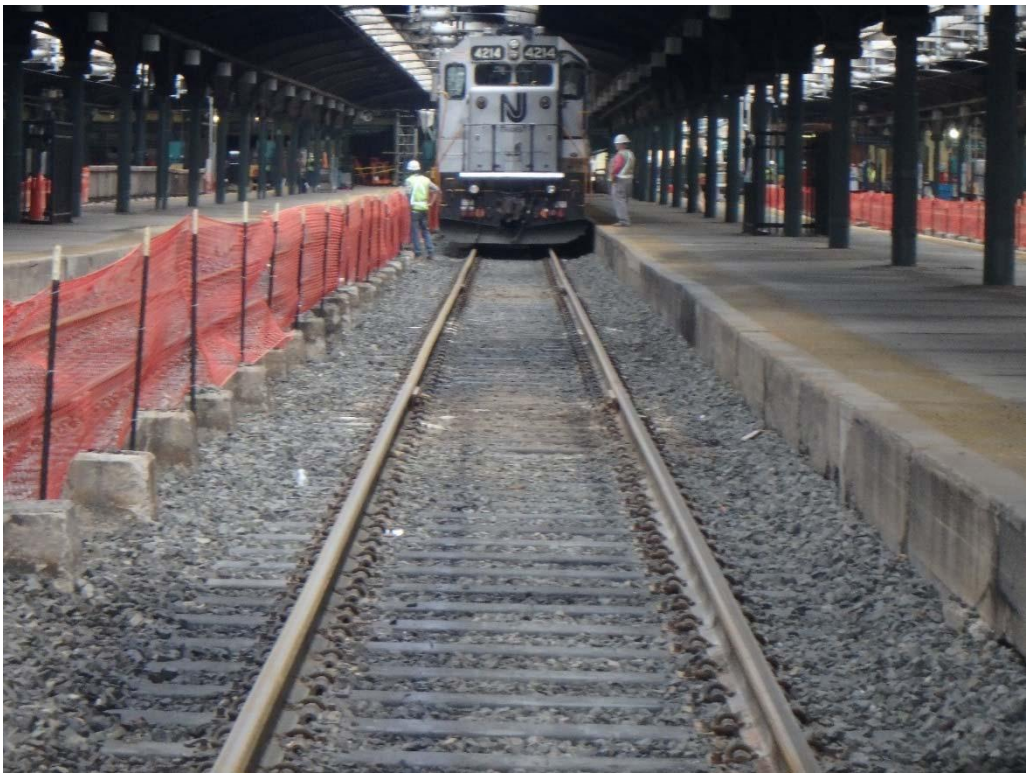

Figure 3. Track Five leading into accident area, rear end locomotive of accident train shown (Photo NTSB)

Crossties, Anchors, Ballast and CWR

In track 5 composite crossties were used to support the rails. The ties measured 9-inches by 7-inches by 8-feet 6-inch long, spaced 24 inches on center (nominal). E-clip plates and clips were used to restrain the rail laterally and longitudinally. The track was supported by granite and limestone rock ballast.

Point of Collison/Bumping Post Damage

At the end of the terminal tracks that led into the station there are bumping posts. The bumping posts are in place to help control unintended equipment movement. The bumping post at the end of track 5 was displaced. Investigators learned that to move the

controlling cab car of the accident train safely and without further damage to the station structure, crews would need to disassemble the struck bumping post. The adjacent track 4 bumping post was measured as an exemplar. The terminal bumping posts are constructed of steel with thickness ranging from ½ inch to ¾ inch. The base portion of the bumping post is set in concrete. Generally, the visible portion of the bumping post measured 60 inches high, 24 inches wide, and the depth was tapered starting at 22 inches and angling down to 60 inches at the top of the concrete slab. A 24 inch by 16-inch striking plate was mounted at about 42 inches above the running surface of the rail.

Figure 4. Exemplar bumping post from Hoboken station (Photo NTSB)

Investigators measured and photo documented the damage and displacement of the struck bumping post. After the collision, the track 5 bumping post was displaced a total of 65 inches. The concrete slab that the post superstructure was set moved 40 inches to the east. The base of the bumping post tore from the portion incased in the concrete slab, and canted eastward about 55° and an additional 25 inches. The strike plate and portion of the post to which the strike plate was affixed were found near the front truck of the accident controlling cab car.

Figure 5. Photo of track Five bumping post under the controlling cab car. The displaced bumping post and cracked/broken station floor are shown. (Photo NTSB)

Damages Estimates

NJT reported an estimate of $5000 track damage to depot track 5. This estimate does not include damage to the destroyed bumping post or terminal structure.

Post-Accident Inspection of Track

On September 30, 2016, the track group conducted a walking inspection of the track that the accident train had traversed. The inspection began at MP 1.0 in Hoboken, NJ and ended at MP 0.2 on the west end of Depot Track 5 also in Hoboken, NJ. Based on the findings of this inspection, the FRA Railroad Safety Inspector (Track) completed FRA inspection report No. 117. The report noted 14 exceptions of the TSS. Two of the exceptions required remedial action; a missing bolt in CWR track and a center cracked joint bar. Both defects were properly remediated. The remainder of the exceptions were loose and missing fasteners in the switches and one exception for fouled ballast. These exceptions are considered non-class specific by the FRA and do not require remedial action at the time of discovery. However, these exceptions must be repaired within 30 days or the track removed from service after 30 days if the exceptions are not repaired.

After the accident train was removed, investigators walked track 5 from the bumping post to the end of the passenger platform. Investigators noted that the track was severely misaligned consistent with track moved by train induced forces resulting from an emergency stop. Investigators did not detect the presence of any rail lubrication leading into track 5.

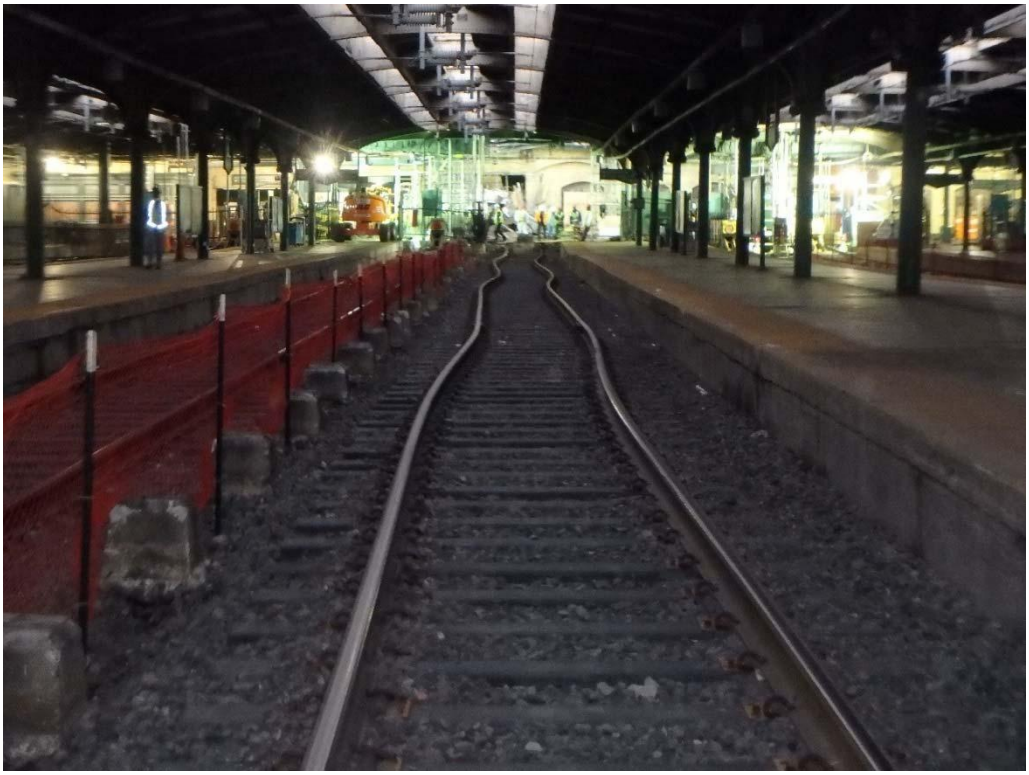

Figure 6. Photo showing Track 5 misalignment with accident train removed. The track that was laying straight prior to the accident is wavy, with several misaligned areas. (Photo NTSB)

Geometry Tests

NJT did not survey the track within the terminal with a geometry test car.

Internal Rail Tests Data

Main track 3 in the NJT Hoboken Terminal was ultrasonically tested for internal rail defects on May 14, 2016. Investigators reviewed data from the test conducted by Nordco on May 14, 2016. According to NJT's documentation that NTSB requested, Nordoc test vehicle DRS038 operated and tested rail on the main track 3 of the

Morristown line from MP 0.3 to MP 2.7. During the last internal rail flaw inspection, there were no defective rails identified on track 3.

Track Inspection Records

FRA regulations found in 49 CFR 213 require that a rail carrier's track inspection records be prepared and signed on the day of the inspection for frequency of compliance with the Federal Track Safety Standards (TSS). FRA track inspection records are required to reflect actual field conditions and deviations from the TSS. NJT has elected to operate at FRA Class 1 and Class 2 speeds in the terminal requiring NJT's personnel to inspect the main track at least twice per calendar week. Each track Inspection shall be made in accordance with the following schedule.

Class of track	Type of Track	Required frequency
Excepted track and Class 1, 2, and 3 track	Main Track and sidings	Weekly with at least 3 calendar days interval between inspections, or before use, if the track is used less than once a week, or twice weekly with 1 calendar day interval between inspections if the track carries passenger trains or more than 10 million gross tons of traffic during the preceding calendar year.
Excepted track and Class 1, 2, and 3 track	Other than main track and sidings	Monthly with at least 20 calendar days interval between inspections
Class 4, and 5 track	……..	Twice weekly with at least 1 calendar day interval between inspections

As part of the investigation, on October 3, 2016, an FRA Railroad Safety Inspector (Track) conducted an inspection of NJT's Track Inspection Records to determine compliance with FRA regulations. The portion of the track inspection records reviewed were for the period from January 1, 2016 to September 30, 2016, and covered the Hoboken Terminal area from Milepost 0.0 to MP 1.0. The inspection revealed that the track leading to the accident site was last inspected on September 28, 2016, by an NJT qualified FRA track inspector. The inspection record indicated that the inspector had inspected Tracks 1, 2, 3, 4 Main,6 Main, Tale Track, E-Route, 112, A Track and the Days Yard Lead from MP 0.1 to MP 1.0. The inspection record also indicates that the inspector had discovered a cracked moveable point frog in Switch No. 1B on Track 1 at Milepost 1.0. The inspection record further indicated that the inspector placed a 10-mph speed restriction on the track and that the moveable point frog was repaired on September 28, 2016. The inspection also revealed that the Depot Tracks, 1 through 17, were also last inspected on September 28, 2016, by an NJT qualified FRA Inspector. The inspection record indicated that the inspector did not discover any exceptions from the TSS for any of the 17 Depot tracks between MP 0.0 and MP 0.1.

On October 5, 2016, an FRA Railroad Safety Inspector (Track) conducted an inspection of NJT's Monthly Switch Inspection Records of the Hoboken Terminal Subdivision's East End Interlocking and Terminal Interlocking MP 0.1 to MP 1.0 from January 2016 to September, 2016. The inspection revealed that NJT was complying with all the requirements of the TSS for the inspection of the switches.

Parties to the Investigation - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this report is a factually accurate representation of the information collected during the investigation, to the extent of their best knowledge and contribution in this investigation.

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_____/s/_____ Date ___10/27/16___
Robert J. Gordon, NTSB

_____/s/_____ Date ___10/27/16___
Ronald Marx, FRA

_____/s/_____ Date ___10/27/16___
Robert Sweet, NJT