NATIONAL TRANSPORTATION SAFETY BOARD

OFFICE OF RAILROAD, PIPELINE AND HAZARDOUS

MATERIALS INVESTIGATIONS

WASHINGTON, D. C. 20594

Long Island Rail Road
Train Collision with end of track
Brooklyn, New York
January 4, 2017

NTSB Accident Number: DCA17FR007

Operations Group Factual Report

Tomas Torres, Group Chairman

Tomas Torres NTSB-Operations Group Chairman	Joe Meade FRA-Railroad Safety Inspector
Bret Becker Long Island Rail Road-Superintendent Engine Service	Robert Maraldo New York Department of Transportation
Robert Maraldo New York Department of Transportation	Don Hill BLET-Safety Task Force
William Bates SMART-Safety Team	

ACCIDENT SUMMARY

For a summary of the accident, refer to the *Accident Summary* in the docket for this investigation.

Accident Narrative

The Long Island Rail Road (LIRR) westbound train 2817 crew included a locomotive engineer (locomotive engineer), a conductor, and an assistant conductor.[1] According to the employees work history records the crew went on duty at 12:16 a.m. Eastern Standard Time (EST), January 4, 2017, at the LIRR Westside Storage Yard in Manhattan, New York.[2] (The locomotive engineer was unable to report at this location and this is explained later in this report.) All crewmembers received more than the statutory off-duty period prior to reporting for duty.[3] Train 2817 departed Far Rockaway at the scheduled time.

Train 2817 consisted of six M7 electrically propelled passenger cars using 750 volts electricity provided by a third rail. The train originated at the Far Rockaway terminal and operated to Atlantic Terminal in Brooklyn, New York including station stops. The train travelled 15.5 miles from Far Rockaway terminal to Atlantic terminal.[4]

[1] Directional references in this report are based upon the railroad timetable directions of east and west.
[2] All times in this report are eastern standard time.
[3] Refer to CFR 49 Part 228 for Hours of Service requirements.

As the westbound train approached the accident area, the locomotive engineer was at the controls in the leading engine.. The conductor was in the second passenger car and the assistant conductor was in the rear passenger car of the train.

While operating west, on Atlantic Track 1, Train 2817 approached Brook 2 Interlocking. Upon entering Brook 2 Interlocking, the train continued west on Track 1 into Brook 1 Interlocking. At the 1W Interlocking Signal, the train received a Restricting Signal Indication and was crossed over from Track 1 to Track 2. The train continued west on Track 2, and at 22W Interlocking Signal, the train received a Restricting Signal Indication and was routed for Atlantic Terminal Station Track 6.

As the Locomotive engineer approached the Interlocking Signals of Brook 1 Interlocking, he said he observed the aspect of the signals (both Color Light and Low Home) as Restricting ..

As per the LIRR Operating Rules, the definition of Aspect is; “the appearance of a fixed signal which conveys an indication as viewed from the direction of an approaching train; the appearance of a cab signal indicator as viewed in the engine control compartment.”

The definition of Indication is “the information conveyed by the aspect of a signal.” This information that was conveyed by the restricting signal was: “Proceed at Restricted Speed.”

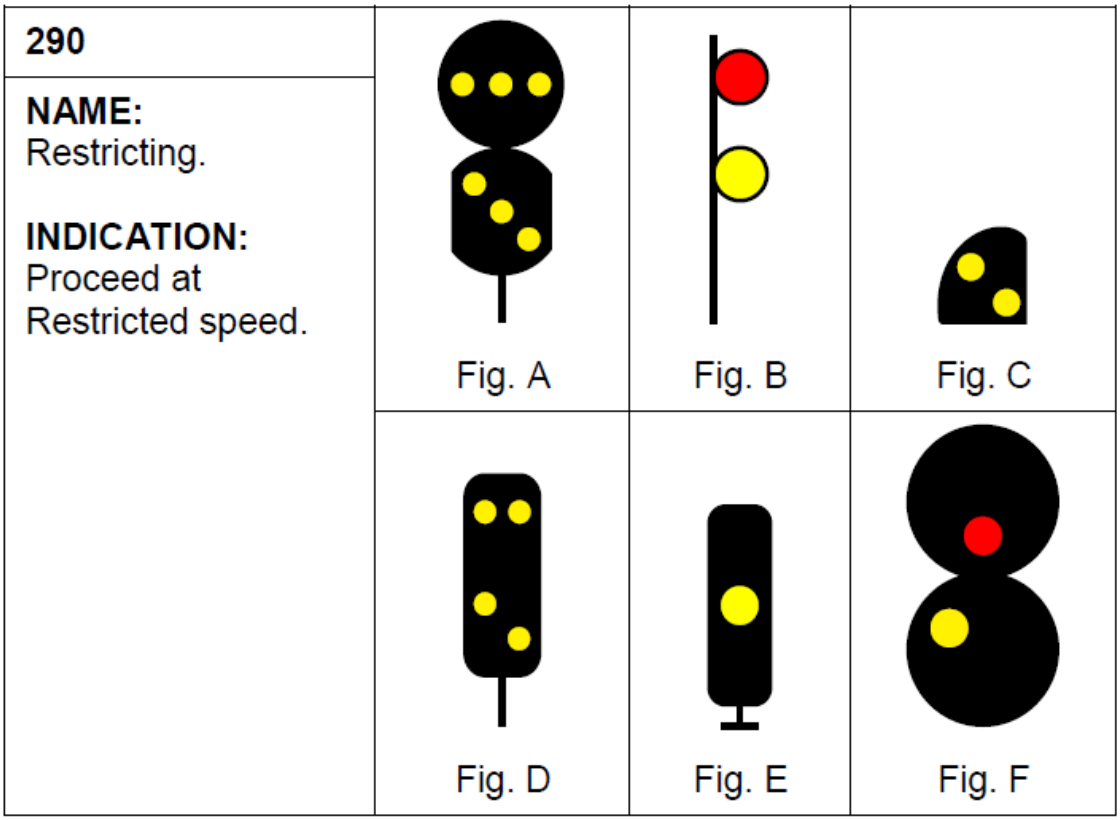

Figure 1 Diagram provided by LIRR

LIRR defines Restricted Speed as a mode of operation:

Restricted Speed is defined by the LIRR as "a mode of operation, at which a train can be stopped within one half the range of vision, short of the next signal, another train, obstruction, derail, or switch improperly lined, looking out for broken rail or crossing protection not functioning, not exceeding 15 miles per hour."

Maximum Authorized Speed (MAS) is defined as "the highest speed that is permitted over a specific portion of the railroad. It may be authorized by the special instructions of the current timetable, Rules of the Operating Department or any other publication authorized by the General Superintendent- Transportation"

LIRR Time Table Special Instruction 1038-B further restricts the Maximum Authorized Speed for all tracks in Atlantic Terminal and Brook Location 1 to 5 Miles Per Hour.

The locomotive engineer said that he passed the restricting signals at restricted speed not exceeding 5 mph.

Events Prior to the Accident

The train crew for Job 85 reports to Westside Storage Yard and the reporting time was 12:16 am. The yard crew assembled the train in the Westside Storage Yard and then departed at 12:42:07 am to Penn Station for passenger service.[5] Train 802 departed from Penn Station at 12:53:56 am to Long Beach. At Long beach, the train crew secured the train and then took charge of another set of equipment, train 805. The crew departed Long Beach on train 805 at 3:59:27 am to Atlantic terminal, and upon arrival the crew secured the train and took charge of another set of equipment, train 2806. The train crew departed Atlantic terminal at 5:16:08 am on train 2806 to Far Rockaway, upon arrival the train crew remained on the same equipment, the crew changed ends and the train designation changed to 2817.[6] The crew departed Far Rockaway on train 2817 at 7:20:35 to Atlantic terminal.[7]

[5]All train departure and arrival times are from LIRR train performance records.

[6] Changed ends refers to transferring the control from one control cab to another within the same set of equipment. CHANGE ENDS / TURNS - Crewmembers will only be required to perform an intermediate Class II (rear end) type brake test when changing ends for each subsequent run. Refer to LIRR Train Handling and Equipment Manual M7 Appendix for additional information.

[7] Refer to LIRR Timetable No.2 for arrival and departure times.

Figure 2 LIRR Train Routes Map

According to the locomotive engineer, he left his residence at approximately 10:40 pm to board an 11:14 pm. train out of Hicksville Station and travel to Westside Storage Yard to report for duty. The train out of Hicksville experienced an approximately two-hour delay because the train ahead was involved in a crossing accident. The locomotive engineer reported the delay to the Penn Station Assistant Station Master. The Assistant Station Master instructed the locomotive engineer to pick up train 805 at Jamaica Station, the second train in his assignment.

Train 802 departed Penn Station at 12:53:32 am to Long Beach Station with a YE-14 yard locomotive engineer, the extra list conductor, and extra list assistant conductor. Train 802 arrived at Long Beach station at 1:50:45 am. After the train crew arrived at Long Beach they took charge of another set of equipment which would be train 805. While at Long Beach the train crew had a 2 hour and 9-minute delay before departing to Atlantic terminal at 3:59:27 am.

Train 805 arrived Jamaica Station at 4:27:12AM, where the Locomotive engineer and the Yard Locomotive engineer of the YE14 had a crew change. They discussed the number of cars in the consist. The YE14 Locomotive engineer informed the Locomotive engineer that Train 805 was good on the brakes, slips, and that the equipment was certified for service. Prior to departure, the Locomotive engineer and the extra list Assistant Conductor assigned to job 85, had a job briefing to discuss the operation of Train 805. The Locomotive engineer performed a 30 mph running brake test enroute, which is required by the LIRR Operating Rules.[8]

When train 805 arrived into Atlantic Terminal at 4:51:06 am, the train pulled into track no. 1. The crew secured the train in track no. 1, walked over to track no. 3, and took charge of train 2806. The crew performed a Class II and Running Brake Test, departed Atlantic terminal at 5:16:08 am for the Far Rockaway terminal with station stops in between.[9]

After train 2806 arrived at Far Rockaway Terminal at 6:10:25 am, the locomotive engineer changed ends and the train was now designated the 2817, and then performed Class II Brake Test. Train 2817 departed Far Rockaway terminal at 7:20:35 am and continued towards Atlantic Terminal with stations stops in between.

[8] A Running Brake Test must be made by applying train air brakes with sufficient force to ascertain whether or not brakes are operating properly. When a train departs a yard, a running test of train brakes must be made at 5 mph. In addition, another running brake test must be made at 30 mph or as soon as conditions permit. All running brake tests must be performed by use of the ABV or master controller handle. Refer to LIRR Train Handling and Equipment Manual M7 Appendix for additional information.

[9] Class II Brake Test must be performed to determine that brakes apply and release on rear car or locomotive: A. Prior to the departure of a passenger train from an initial station where a Class I or IA Brake Test remains valid. Refer to LIRR Train Handling and Equipment Manual M7 Appendix for additional information.

The Accident

According to the locomotive engineer, as the train approached the accident area the train was traversing on Atlantic 1 and encountered a restricting signal (signal aspect is red over yellow).[10] The train then crossed over from Brook track 1 to Brook track 2 at restricted speed, not exceeding 5 mph. As the train continued to traverse on Brook track 2, the train encountered another restricting signal that required to train to continue at restricted speed not to exceed 5 miles per hour. According to the locomotive engineer, he remembered approaching the platform in track 6 and nothing after that. The locomotive engineer said that he was not aware of the impending collision.

The lead transportation manager for the Atlantic terminal was in his office at the time of the accident. According to him, he grabbed his radio and went to the scene to assess the accident. He ascertained the condition of the train and track structure. He notified the Movement Bureau, told them about the accident, requested the third rail power to be removed, and stated that there were numerous injuries. He received confirmation that the third rail power was removed and relayed the information to the Fire Department of New York City.

The lead transportation manager noticed that much of the first car was empty and that there was a person lying on the floor. He saw that the locomotive engineer was standing in the vestibule. He asked the locomotive engineer if he was okay, he said the locomotive engineer had a glazed

[10] LIRR Signal Rule 290- Restricting, action required proceed at restricted speed. Restricted speed means a mode of operation, at which a train can be stopped within one half the range of vision, short of the next signal, another train, obstruction, derail, or switch improperly lined, looking out for broken rail or crossing protection not functioning, not exceeding 15 miles per hour.

look and responded that he was okay. According to the lead transportation manager, after MTA police completed their interview of the locomotive engineer, a LIRR Road Foreman of Engines transported the locomotive engineer for drug and alcohol testing.[11]

The locomotive engineer of train 904 was on the platform and his train on track 5 witnessed the accident. According to him, he heard a loud screeching noise as accident train 2817 entered track 6. The locomotive engineer said:

> And then as I'm watching the train, I'm just standing there, the first car went past me and I thought to myself that's pretty fast for Track 6, because 6 is on a curve and it's 5 miles an hour.

The locomotive engineer said he heard a loud explosion and saw a lot of smoke.

The conductor of train 904 was on the train in 5 track said he heard a screeching sound that caught his attention and he then looked in the direction of track 6. The conductor said:

> I looked up, and I first thought that he -- maybe he was hitting the platform, with the train swaying. But maybe like a couple of seconds later a loud noise, a loud crash.

Both the locomotive engineer and conductor of train 904 aided in evacuating passengers.

Track Side Signal Indications

Westbound train 2817 received two restricting signal indications prior to the accident.

[11] For additional information of drug and alcohol refer to 49 CFR Part 219.

At 1W on Atlantic track no. one, train 2817 received a restricting signal (signal aspect is red over yellow, as described by the locomotive engineer). Per LIRR operating rule 290, *Signal Indication*, the train was required to operate at restricted speed.[12]

At 22W on Atlantic track no. 2, train 2817 received a restricting signal (signal aspect was white over white, as describe by the locomotive engineer). Per LIRR operating rule 290 *Signal Indication*, the train was required to operate at restricted speed. Timetable Special Instructions 1038-B further restricts the speed in Atlantic Terminal Brook 1 location to 5 mph.

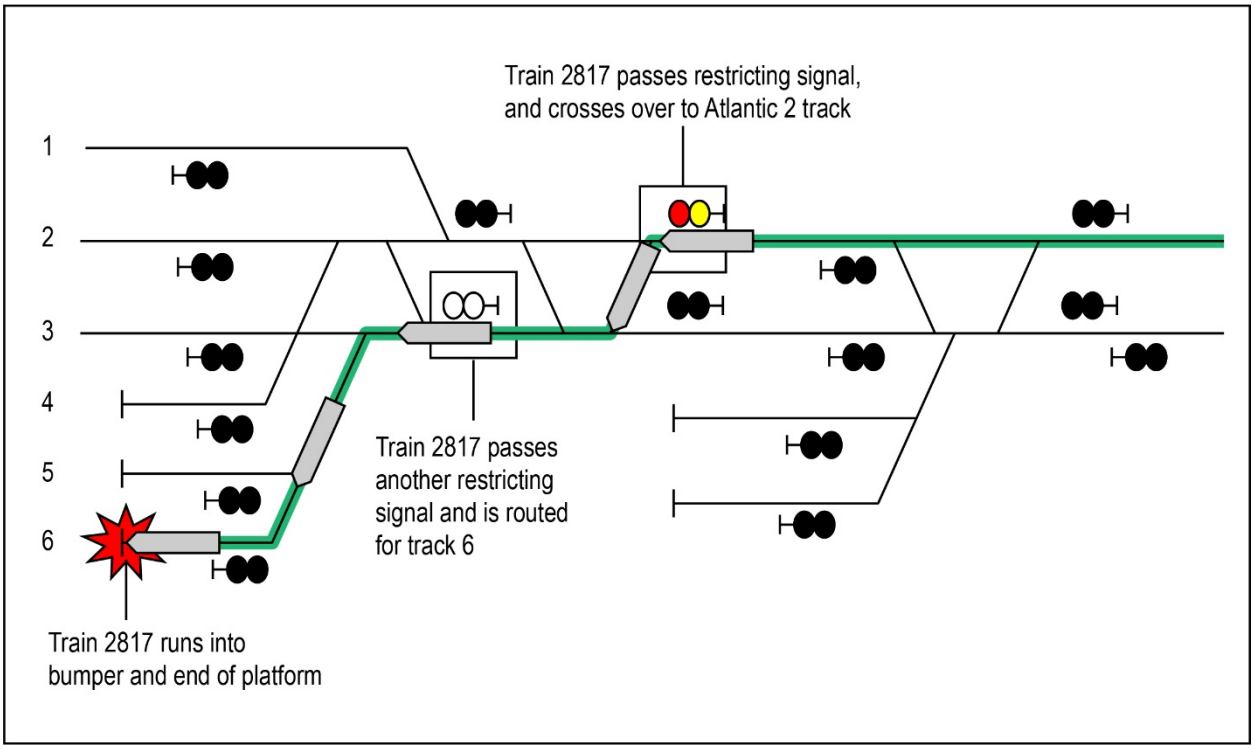

Figure 2. Accident site, diagram provided by NTSB.

[12] Restricted speed means a mode of operation, at which a train can be stopped within one half the range of vision, short of the next signal, another train, obstruction, derail, or switch improperly lined, looking out for broken rail or crossing protection not functioning, not exceeding 15 miles per hour.

Method of Operations

LIRR train movements on the Far Rockaway branch were governed by operating rules, general orders, timetable instructions, and the signal indications of a traffic control system (TCS) supplemented with an automatic speed control.[13] Alternating current track circuits provided train occupancy detection. Wayside position light and color light signals were used by the TCS to display movement authority.

The maximum authorized speed for trains in Atlantic Terminal track 6 is 5 mph at the accident location as designated in the LIRR Timetable Special Instructions.

Operating Rules and Instructions

- Long Island Rail Road Operating Safety Rules, effective January 15, 2015
- Long Island Rail Road Rules of the Operating Manual, Transportation Department, second edition, effective September 4, 2012
- General Order No.203 Timetable No.2 with Special Instructions effective November 14, 2016

[13] Automatic speed control/automatic train control means a system, which provides a penalty application of the air brakes upon failure to acknowledge a change of cab signal aspect to an aspect conveying a more restrictive indication.

Crew Information

Locomotive engineer:

Hire Date	04/26/1999
Last Certification Date	11/18/2016
Certification Expiration Date	11/17/2019
Last Efficiency Test- Restricted Speed	03/23/2016

Conductor:

Hire Date	09/28/1998
Last Certification Date	09/16/2016
Certification Expiration Date	09/16/2019
Last Efficiency Test- Restricted Speed	09/30/2016

Assistant Conductor:

Hire Date	07/11/2007
Last Certification Date	04/30/2015
Certification Expiration Date	04/29/2018
Last Efficiency Test- Restricted Speed	None on record

Crewmember Work/Rest History

The 10-day work schedules for all crew members are illustrated below in Tables 1, 2, and 3.

Table 1. Train 2817 Locomotive engineer 10-Day Work Schedule

Date	Previous Time Off	On Duty Time	Off Duty Time	Total Time On Duty
12/24/2016	14’21 “	12:36 am.	08:34 am.	7”58 “
12/25/2016	Rest Day			
12/26/2016	Rest Day			
12/27/2016	88’12”	12:16 am.	10:15 am.	10’1”
12/28/2016	14’ 1”	12:16 am.	10:15 am.	10’1’
12/29/2016	14’1’	12:16 am.	10:15 am.	10’1’
12/30/2016	14’1”	12:16 am.	10:15 am.	10’1”
12/31/2016	14’21”	12:36 am.	08:34 am.	7’58”
01/01/2017	Rest Day			

01/02/2017	Rest Day			
01/03/2017	88’12” “	12:16 am.	10:15 am.	10’1”
01/04/2017	14’1”	12:16 am.	Day of accident	

Table 2. Train 2817 Conductor 10-Day Work Schedule.

Date	Previous Time Off	On Duty Time	Off Duty Time	Total Time On Duty
12/24/2016	Rest Day			
12/25/2016	Rest Day			
12/26/2016	89’7”	02:45 am.	09:56 am.	7’11”
12/27/2016	16’49”	02:45 am.	09:57 am.	7’12”
12/28/2016	16’48”	02:45 am.	09:57 am.	7’12”
12/29/2016	16’48”	02:45 am.	09:56 am.	7’11”
12/30/2016	18’14”	04:11 am.	11:59 am.	7’48”
12/31/2016	Rest Day			
01/01/2017	Rest Day			
01/02/2017	87’37”	02:36 am.	10:21 am.	8’15”
01/03/2017	16’ 24”	02:45 am.	09:58 am.	7’11”
01/04/2017	14’18”	00:16 am.	Day of accident	

Table 3. Train 2817 Assistant Conductor 10-Day Work Schedule.

Date	Previous Time Off	On Duty Time	Off Duty Time	Total Time On Duty
12/24/2016	Rest Day			
12/25/2016	Rest Day			
12/26/2016	86’42”	02:36 am.	10:21 am.	7’15”
12/27/2016	Off Day			
12/28/2016	63’42”	02:03 am.	11:33 am.	9’30”
12/29/2016	13’10”	12:43 am.	10:33 am.	10’30”
12/30/2016	13’43”	00:16 am.	10:15 am.	9’59”
12/31/2016	Rest Day			
01/01/2017	Rest Day			
01/02/2017	86’53”	01:08 am.	08:46 am.	7’37”
01/03/2017	17’50”	02:36 am.	10:21 am	7’45”
01//4/2017	13’55”	12:16 am.	Day of accident	

Locomotive Safety Devices:

The leading locomotive was equipped with an Automatic Speed Control System, an Alerter and the audible warning device as required by federal regulations.