National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Human Performance and Survival Factors Division
Washington, D.C. 20594

Survival Factors Group Chairman's Factual Report

April 10, 2017

A. Accident Information

Railroad:	New Jersey Transit
Train	No. 1614
Location:	Hoboken, New Jersey
Date:	September 29, 2016
Time:	0838 am EDT[1]
Number:	DCA16MR011

B. Group Members

Dana Sanzo
National Transportation Safety Board

Dr. Mary Pat McKay
National Transportation Safety Board

Captain Robert Noble
New Jersey Transit Police

Ray Tyrrell
Federal Railroad Administration

Peter Lapré
Federal Railroad Administration

Jerry D'Andrea
New Jersey Transit

Frank D'Angelo
New Jersey Transit

[1] Times in this report are Eastern Daylight Time.

C. On Scene Group Participants

Larry Day
Federal Railroad Administration

Christopher Echols
Federal Railroad Administration

David Tyrell
Volpe National Transportation Systems Center

Shaun Eshraghi
Volpe National Transportation Systems Center

D. Synopsis

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

E. Details of the Investigation

1. Train Configuration

The following table shows the type and placement of the equipment in train 1614.

	Type	Number
1	Cab car	6036
2	Trailer car	6577
3	Trailer car	6575
4	Trailer car	6521
5	EMD GP-40 Locomotive	4214

Table 1- The consist for train 1614

The cab and trailer cars were the Comet V series manufactured by Alstom Transportation between 2002 and 2004. The length of the cars is 85 feet, the width is 10 ½ feet, and the height is about 13 feet. The weight of cab cars is about 107,140 pounds, and the weight of trailer cars is about 101, 640 pounds. Cab cars have seats for 109 passengers, and the trailer cars have 111 or 117 seats.

Figure 1- Exemplar Comet V cars

There are eight emergency egress windows in each car. For the trailer cars, there are 10 windows with emergency access signage on the exteriors of the cars. For the cab cars, there are nine windows on the cab cars with emergency access signage on the exterior of the cars. The trailer cars have side vestibule doors on each end of the car that are configured for use at high and low

height platforms. The cab cars have one side entry door on the left side of the cab. The center vestibule doors are configured for use at high height platforms.

2. Damage Description

Train 1614 was examined at the site before the train was removed from the terminal.[2] For this report, the equipment is described with respect to the direction of travel of the eastbound train. The south side of the train is referred to as the right side, and the north side of the train is referred to as the left side.

Overview

The train struck the bumping post at the end of the track. The cab car, including its front truck, rode up onto the terminal platform and struck a wall between the station and ticket office. Underneath the rear of the cab car, the bumping post was pivoted forward into the concrete platform. Inside of the ticket office, the office ceiling and wall were damaged, and components from these structures fell into the ticket office. A picture of an exemplar bumping post on an adjacent track is shown in figure 3 below.

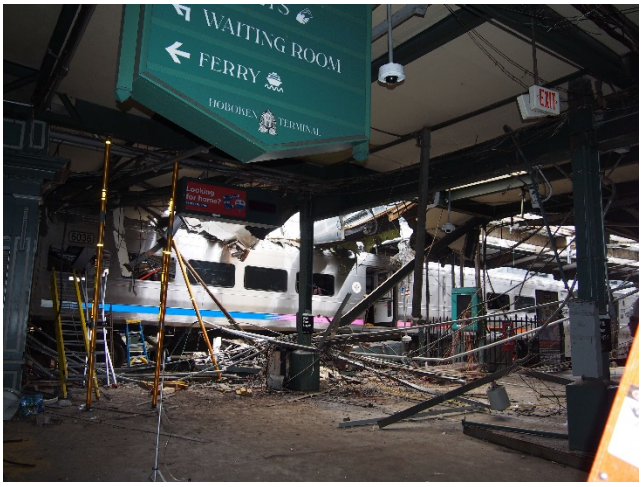

Figure 2- A view of the left side of the accident site and cab car

Figure 3- A view of the left side of the cab car and an exemplar bumping post on an adjacent track

[2] FRA and Volpe Center group members conducted a follow-up examination in March 2017.

The terminal canopy and its support beams collapsed onto the cab car and the station floor. On the right side of the cab car, a vertical canopy beam had fallen onto the platform, and the concrete base of the beam was fractured. A horizontal canopy beam perpendicular to the track and above the station platform fell onto the platform. On the left side of the cab car, a canopy structural beam was lodged in between the cab and the station wall. The right side of the accident site and an undamaged section of the terminal are shown in the pictures below.

Figure 4- A view of the right side of the cab car

Figure 5- A view of an undamaged section of the terminal

On the top of the cab car, the leading HVAC unit was sheared from the roof of the car and was wedged up against a horizontal canopy beam above and perpendicular to the track. On the front end of the cab car, the anti-telescoping plate was bent inward. (See figure 6.) The collision posts, corner posts, and side roof rails were undamaged. Inside of the cab car, a horizontal canopy beam parallel to the track pierced through the interior of the car up to the center vestibule doors. Components from the roof of the cab car and the station canopy collapsed into the forward passenger seating area.

Figure 6- The front of the first car (Credit: Volpe Center)

Because of the structural damage to the cab car and the station canopy, entry into this car was limited to the cab and trailing end of the car. A picture of the interior of the cab car as viewed from the cab compartment is shown below.

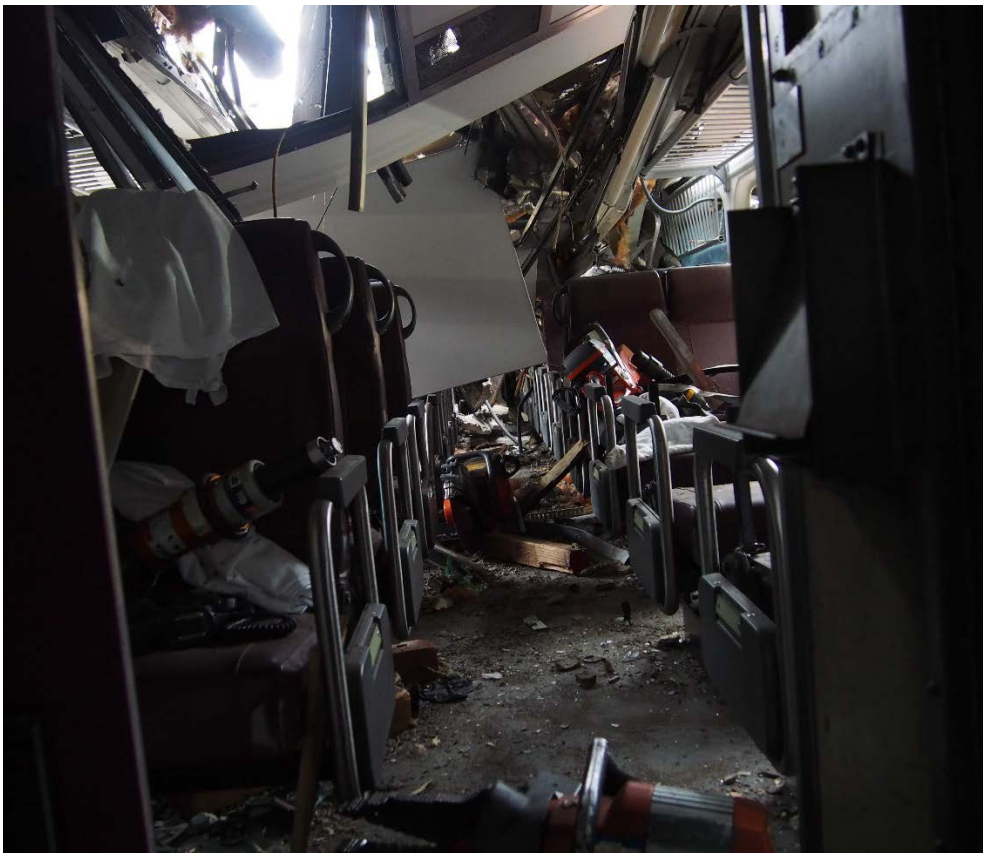

Figure 7- The front seating area of the cab car

In the leading section of the cab car, three windows on each side of the car were removed. In the rear section, two left-side windows and one right-side window were removed. In the trailing section, one emergency exit window was missing; a standard window was in its place. The left-side center doors were open, and the right-side doors were closed. Both side doors at the end of the car were open. The exterior door release covers were removed, and the right-side door signage next to the covers was faded.

Trailer Car 6577

The leading end buffer plate climbed up onto the rear end buffer plate of car 6036. The coupler was pushed inward and aligned toward the right side of the car. The rear coupler was pushed inward.

At the rear right-side door, there were scrape marks on the leading and trailing skirts. The door was bent inward and could not be opened after pulling an emergency release. All of the exterior door release covers were intact. The exterior door release signage at all right-side doors was faded.

Inside of the car, one left side emergency exit window release was partially pulled, but the window was not removed. There were four seat backs (left seating rows 18, 19, and 21; right

seating row 12) were partially lifted from the mounting supports. There were a few blood drops near the right-side seat row 13.

Figure 8- The interior of car 6577

Trailer Car 6575

The leading end buffer plate and coupler were pushed inward and aligned toward the right side of the car.

On the right side of the car, there were scrape marks on the leading skirt at the forward door. At the rear door, there were scrape marks on the leading and trailing skirts. The door itself was bent inward, open about 14 inches, and could not be moved after pulling an emergency release. The door release covers from the leading and rear doors on the right side were removed; the release covers for the center doors were in place. The exterior right side door-release signage was faded.

On the left side of the car, the forward door was slightly open, and it did not appear to be bent. The door release cover was removed. The door could not be moved after pulling an emergency release.[3] The remaining door-release covers on the left side of the car were in place. The exterior door release signage at all right-side doors was faded.

[3] An FRA follow-up examination found that a metal piece of debris was preventing movement of the door.

Trailer Car 6521

The leading end buffer plate was pushed inward and aligned toward the right side of the car. The rear coupler appeared to be centered with locomotive 4214.

Inside of the car, the right-side row 16 seat cushion was out of place. The left side row 21 seat back moved forward and was fixed over the center of the seat. On the exterior of the car, all the door release covers were in place, and the signage appeared in standard condition.

3. Emergency Response

A NJ Transit police lieutenant was in his office working, when he heard a loud bang that he said sounded like an explosion and felt the building shake like an earthquake. He looked outside, heard people yelling, and saw people evacuating the terminal. NJ Transit police officers, who have offices in the terminal, responded to the platform area, requested that the train dispatcher remove power from the tracks, and assisted passengers.[4] An NJ Transit electrician, who was assigned to work at the terminal that morning, confirmed that power was grounded.

The Hoboken Fire Department was dispatched at about 0846. They began to arrive on scene at about 0851. A battalion chief took command of the incident and requested a second alarm and mutual aid resources from nearby jurisdictions. The battalion chief assigned a ladder company to assess conditions in the station and an engine company to coordinate triage and treatment. The battalion chief requested that a perimeter be established around the site and that all nonessential personnel be removed from the building.

The battalion chief organized the rescue response with the following assignments: incident safety officer, USAR[5] branch director, search group supervisor, accountability officer, rescue group supervisor, rescue group safety officer, resource unit, staging/rehab supervisor. The Hoboken fire chief was the liaison to responding police departments and other government agencies.

Inside of the terminal, a ladder company coordinated with police officers to shore and stabilize the terminal canopy and the cab car to prevent any further collapse. A ladder company, a rescue company, and an engine company worked in the cab car to extricate one injured person from that car. The last patient was evacuated from the terminal at 0938. After the last patient was removed, the terminal was fully evacuated.

-- End of Report --

[4] The terminal is equipped with catenary power.
[5] Urban search and rescue