



National Transportation Safety Board

Railroad Accident Brief

Southeastern Pennsylvania Transportation Authority Light Rail Collisions

Upper Darby, Pennsylvania

The Accident

On February 21, 2017, at 8:03 a.m. eastern standard time, Southeastern Pennsylvania Transportation Authority (SEPTA) light-rail passenger train 57 (train 57), traveling westbound on the Market-Frankford Line, entered the number 2 loop track at the 69th Street Transportation Center located in Upper Darby, Pennsylvania, and struck stopped SEPTA light-rail passenger train 67 (train 67) on the number 2 loop track. The collision and associated derailment also caused train 67 to strike SEPTA light-rail train 51 (train 51), which was operating in the opposite direction on the adjacent number 1 loop track. (See figure 1.) Train 57 was traveling about 14 mph at the time of the collision. Four people were injured (two passengers and two car operators) and transported by emergency responders to local medical facilities for treatment. The total estimated equipment damage to all involved light-rail equipment was \$1.6 million. At the time of the accident, the sky was clear, the wind was from the northeast at 6 mph, the visibility was 10 miles, and the temperature was 37° F.



Figure 1. This postaccident photograph shows the three trains involved in the accident. (Photo courtesy of SEPTA).

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Prior to the arrival of train 57, two other SEPTA trains were already at the 69th Street station. Train 67, which had arrived several minutes before train 57, unloaded passengers, transited the number 2 loop track, and was waiting at a red signal for permission to enter the 69th Street loading platforms in preparation for a return trip to downtown Philadelphia. Also located at the 69th Street station was train 51. Train 51 had also made a trip from Center City, Philadelphia, and was located on the loading platform, but was being lined by the SEPTA train dispatcher to operate around the number 3 loop track to enter the 69th Street maintenance facility.¹

SEPTA trains operating on the Market-Frankford Line are governed and authorized by trackside signals and controlled from a centralized dispatching center located in Philadelphia, Pennsylvania. Trackside signal indications are also displayed in advance for each car operator inside the car control compartment. SEPTA Operating Rules, in effect on the day of the accident, restricted trains to a maximum of 10 mph on the loop tracks at the 69th Street station.

Train 57, on the morning of February 21, 2017, consisted of six electrically powered multiple-unit passenger cars. It was manned by a single car operator located in the lead car control compartment when it arrived on the single track inbound platform (track number 1). Normal procedure was for the inbound train to take the first clear loop track and proceed to the outbound departure platform in preparation for the next trip back to downtown Philadelphia. However, because the train dispatcher had requested a move for train 51 on the number 1 loop track, the car operator of train 57 received a “Proceed Cab” signal in his control compartment. This cab signal indication required the car operator of train 57 to acknowledge the “Proceed Cab” signal and proceed at no more than 10 mph. Train 57 then departed the arrival platform at 69th Street and proceeded into the number 2 loop track. Recording devices on train 57 indicated that the train reached a speed of about 14 mph when the emergency brake system was applied. Train 57 struck the stopped train 67 at 8:10 a.m., derailing four cars of train 57 and three cars of the stopped train 67. The derailed lead car of train 57 also struck the lead car of train 51, operating on the number 1 loop track.

SEPTA car operators have the sole responsibility for the safe operation of his or her train. Based on railroad records and interviews conducted by the National Transportation Safety Board (NTSB) investigators, the car operators of trains 67 and 51 were in compliance with all federal regulations and railroad operating rules while operating their trains at 69th Street station on the day of the accident. However, the car operator of train 57 failed to control the speed of his train while approaching the stopped train 67 on the number 2 loop track. Also, recording devices retrieved from train 57, recorded that train 57 exceeded the 10-mph speed limit on the number 2 loop track by about 4 mph.

Operator of Striking Train 57

The operator of the striking train 57 was qualified and went on duty at 5:17 a.m., after a required off-duty rest period on the day of the accident. He stated that he had made two previous round trips prior to arriving at the 69th Street station and that the trip prior to the accident was a normal trip. He stated that he thought he had followed his normal routine in proceeding around the

¹ Train 51 had earlier been involved in a rules violation and the train’s equipment was being returned to the 69th Street maintenance yard for inspection.

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loop tracks at 69th Street but could not remember any details just prior to and immediately following the accident.

Medical Review and Toxicology

The 69-year-old male car operator of striking train 57 had a history of glaucoma and hypertension and was being treated for these conditions. Also, according to his occupational health records, he had some hearing loss.

According to the available video evidence, the striking train 57 car operator was alert and up walking around his train for 7 minutes following the accident. About 7 to 8 minutes after the accident, he sat down with his hands over his face.

A US Department of Transportation-mandated postaccident urine drug test of the train 57 car operator identified no tested-for substances. More extensive testing of plasma and urine revealed dextromethorphan (and its metabolite dextrorphan), a cough suppressant commonly used in over-the-counter and prescription cough medicines. At usual doses, it is not considered impairing.² In addition, the sedating antihistamine, doxylamine was found in the train 57 car operator's urine and plasma. This drug is found in some over-the-counter cold, allergy, and sleep products. It causes significant drowsiness (it is used sometimes as a sleep aid) and carries a warning, "May cause CNS (central nervous system) depression, which may impair physical or mental abilities; patients must be cautioned about performing tasks which require mental alertness (such as operating machinery or driving)."³

Use of Portable Electronic Devices

SEPTA forbids the use of cell phones or any other portable electronic devices while operating a train. Also, while on the train, operator cell phones and other portable electronic devices must be turned off. The NTSB investigators requested and received the train 57 operator's cell phone records for the time leading up to and after the accident. These phone records show that the phone was turned on while he was at the controls of train 57, and that he received and responded to at least one call while the train was about two stations away from the 69th Street station.

Postaccident Actions

As a result of the accident, SEPTA made software updates to the computer-assisted dispatcher system that allows control of the loop tracks and enhances the protection for trains making reverse movements through the loop tracks.

² Drugs.com, Professional Information, Dextromethorphan, <https://www.drugs.com/ppa/dextromethorphan.html>. Accessed September 7, 2017.

³ Drugs.com, Professional Information, Doxylamine. <https://www.drugs.com/ppa/doxylamine.html>. Accessed September 7, 2017.

Previously Issued Safety Recommendations

As a result of this accident, the NTSB issued the following early safety recommendation to the Federal Transit Administration (FTA):⁴

Require the installation, in all controlling locomotive cabs and cab car operating compartments, of crash- and fire-protected inward- and outward-facing audio and image recorders capable of providing recordings to verify train crew actions and train operating conditions. The devices should have a minimum 12-hour continuous recording capability with recordings that are easily accessible for review, with appropriate limitations on public release, for the investigation of accidents and as a tool to improve operational safety. (R-17-13)

Although the FTA acknowledged receiving this recommendation in a November 21, 2017, letter in which the associate administrator affirmed the agency's commitment to working with the NTSB to address this and other safety issues and stated that a response to this safety recommendation would be submitted soon, the NTSB has not yet received a response.⁵ Therefore, safety recommendation R-17-13 is classified *Open—Awaiting Response*.

In addition, the NTSB issued the following two safety recommendations to SEPTA:

Install crash- and fire-protected inward- and outward-facing audio and image recorders capable of recording operator actions in all rail transit vehicle operating compartments. The devices should have a minimum 12-hour continuous recording capability with recordings that are easily accessible for review for the investigation of accidents and as a tool to improve operational safety. (R-17-14)

Publish a semiannual report detailing your progress in installing crash- and fire-protected inward- and outward-facing audio and image recorders until the installation is complete. The report should include the number of rail transit vehicle operating compartments with the recorders, and the number of compartments in your fleet that lack them. (R-17-15)

Following the issuance of the NTSB's safety recommendation, SEPTA has implemented or began the process of implementing the installation of inward-facing video cameras that show the car operator control cab in light rail vehicles. Therefore, Safety Recommendations R-17-14 and R-17-15 are classified *Open—Acceptable Response*.

Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was the temporary loss of awareness and lack of proper speed control by the train 57 operator as the train entered the 69th Street station loop track.

⁴ National Transportation Safety Board, *Inward- and Outward-facing Audio and Image Recorders as Investigative and Safety Tools*, RSR-17/02 (Washington, DC: National Transportation Safety Board, 2017).

⁵ Letter from FRA associate administrator, Office of Transit Safety and Oversight to NTSB, November 21, 2017.

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For more details about this accident, visit www.nts.gov/investigations/dms.html and search for NTSB accident identification DCA17FR006.

Adopted: August 27, 2018

The NTSB has authority to investigate and establish the facts, circumstances, and cause or probable cause of a railroad accident in which there is a fatality or substantial property damage, or that involves a passenger train. (49 U.S. Code § 1131 - General authority)

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties . . . and are not conducted for the purpose of determining the rights or liabilities of any person.” 49 Code of Federal Regulations, Section 831.4. Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. 49 United States Code, Section 1154(b).
