Testimony of the Honorable Christopher A. Hart
Chairman
National Transportation Safety Board
Before the
Committee on Transportation and Infrastructure
United States House of Representatives
on
Oversight of the Amtrak Accident in Philadelphia
Washington, DC
June 2, 2015

Good morning Chairman Shuster, Ranking Member DeFazio, and the Members of the Committee. Thank you for inviting the National Transportation Safety Board (NTSB) to testify before you today.

The NTSB is an independent Federal agency charged by Congress with investigating every civil aviation accident and significant incidents in the United States and significant accidents and incidents in other modes of transportation – railroad, highway, marine and pipeline. The NTSB determines the probable cause of accidents and other transportation events and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the Federal Government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.

Since its inception, the NTSB has investigated more than 140,500 aviation accidents and thousands of surface transportation accidents. In addition, the NTSB has completed 553 major investigative reports in the areas of railroad, pipeline, and hazardous materials safety, including 150 accidents involving Amtrak. On call 24 hours a day, 365 days a year, NTSB investigators travel throughout the country and internationally to investigate significant accidents and develop factual records and safety recommendations with one aim—to ensure that such accidents never happen again.

To date, we have issued over 14,000 safety recommendations to nearly 2,300 recipients. Because we have no authority to regulate the transportation industry, our effectiveness depends on our reputation for conducting thorough, accurate, and independent investigations and for producing timely, well-considered recommendations to enhance transportation safety.

The NTSB's annual Most Wanted List highlights safety-critical actions that the US Department of Transportation (DOT), United States Coast Guard, other Federal entities, states, and organizations need to take to help prevent accidents and save lives. In January, the NTSB released its Most Wanted List of Transportation Safety Improvements for 2015. Each year, we develop our Most Wanted List based on safety issues we identify as a result of our accident investigations. This year's Most Wanted List includes "Implement Positive Train Control in 2015." As we pointed out:

> Without Positive Train Control (PTC), real-world results have been tragic. PTC is a system of functional requirements for monitoring and controlling train movements to provide increased safety. While the NTSB has called for a system like this for over 45 years, it still has not been fully implemented in our commuter, intercity, and freight trains. Without it, everybody on a train is one human error away from an accident.
>
> Congress enacted the Rail Safety Improvement Act of 2008 [RSIA]. The Act requires each Class 1 rail carrier and each provider of regularly-scheduled intercity or commuter rail passenger service to implement a PTC system by December 31, 2015. Progress is being made toward this lifesaving goal. Metrolink became the first commuter rail system to implement PTC, when it began a revenue service demonstration on the BNSF Railway. This demonstration project is a step in the

right direction, and Metrolink reports it will implement PTC fully throughout its entire system before the Congressionally mandated deadline.

It has been more than 45 years since the NTSB first recommended the forerunner to PTC. In the meantime, more PTC-preventable collisions and derailments occur, more lives are lost, and more people sustain injuries that change their lives forever.

Yet there is still doubt when PTC systems will be implemented nationwide as required by law.

Each death, each injury, and each accident that PTC could have prevented, testifies to the vital importance of implementing PTC now.

Positive train control would have prevented the May 12 accident.

Amtrak Northeast Regional Train 188 Derailment: Background

On May 12, 2015, Amtrak Northeast Regional Train 188, operating northbound from Washington to New York, departed Philadelphia's 30th Street Station on time at 9:10 p.m. bound for New York's Penn Station. At 9:21 p.m. the entire train derailed while traveling through a four-degree left curve at Frankford Junction. Maximum speed through the curve is 50 miles-per-hour (mph), but NTSB's preliminary data analysis determined that moments before the derailment, the train was traveling at 106 mph when the engineer applied the emergency brake system. Three seconds later, when the data to the recorders terminated, the train's speed was approximately 102 mph. The train consisted of one electrically powered locomotive and seven passenger cars. There were 238 passengers and 5 crewmembers on board. Eight people were killed and more than 200 were injured.

Parties to the Investigation

As is the case with every event the NTSB investigates, the agency grants party status to those entities that can provide technical expertise. Parties and party participants may not withhold any information pertaining to either an accident or an incident from the NTSB. The NTSB designated the following organizations as parties to this investigation:

- Federal Railroad Administration (FRA)
- Amtrak
- Philadelphia Police Department
- Philadelphia Office of Emergency Services
- Philadelphia Fire Department
- Brotherhood of Locomotive Engineers and Trainmen (BLET)
- International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART)
- Brotherhood of Maintenance of Way Employes Division of the Teamsters Rail Conference (BMWED)

Investigative Activities

The locomotive and passenger cars have been moved to Amtrak facilities in Wilmington and Bear, Delaware, for detailed examination and documentation. Investigators tested the air brakes on six of the passenger cars and found no anomalies or malfunctions. Passenger car #1 in the trainset was too badly damaged for brake testing at the Amtrak facility; therefore, components will be bench tested. Detailed inspection of the locomotive continues. Three-dimensional laser scanning of the locomotive, passenger cars, and an exemplar passenger car will be completed in the coming weeks.

The NTSB conducted an interview with the Amtrak engineer. The engineer reported that he recalled ringing the train bell as the train passed through the North Philadelphia Station Stop but he did not recall anything that transpired after that point in time, including the events surrounding the derailment. He stated he felt qualified and comfortable with the equipment, and he did not report fatigue or illness. Amtrak has provided the NTSB with the engineer's training and employment records. He had been operating trains in the Washington-Boston Northeast Corridor for about three years, and had been specifically assigned the Washington-New York segment of the corridor for several weeks.

The NTSB also has possession of the Amtrak engineer's cell phone. Under its enforcement authority, the FRA subpoenaed and obtained the engineer's cell phone records and has shared that data with NTSB forensic experts. Although the records appear to indicate that calls were made, text messages sent, and data used on the day of the accident, investigators have not yet made a determination if there was any phone activity during the time the train was being operated. In order to make that assessment, investigators have started the process of correlating the time stamps in the engineer's cell phone records with multiple data sources including the locomotive event recorder, the locomotive outward facing video, recorded radio communications, and surveillance video. The processes involved in correlating time stamps for all these devices are detailed and lengthy. Because of variations in time stamps for each data source, each one must be correlated to the same time zone so that a factual timeline of events can be developed that will allow investigators to understand if phone activity has any relevance to the accident.

The NTSB also interviewed two of the Amtrak conductors. One conductor aboard the accident train told investigators that she heard the Amtrak engineer talking over the radio with the engineer of the Southeastern Pennsylvania Transportation Authority (SEPTA) train that had stopped after being struck by an object that had shattered the windshield of the locomotive. The conductor reported hearing the SEPTA engineer, who was in the same area as the Amtrak train, say his train had been hit by a rock or some other projectile. The conductor then told investigators that she believed that she heard the Amtrak engineer say his train also had been struck by an object. The NTSB examined the dispatch tapes between dispatch and the trains, and indeed the SEPTA engineer did report to dispatch that his train had been struck by something. However, there was no recording from the Amtrak engineer reporting that his train had been struck by a projectile.

The windshield of the accident train was shattered and one area of glass had a breakage pattern that could be consistent with being hit by an object. The NTSB asked the Federal Bureau

of Investigation (FBI) to examine the fracture pattern of the accident train's windshield and determine if a bullet or other object had been fired at the accident train. FBI experts found no evidence of damage caused by a firearm. The NTSB is working to determine if another object or projectile hit the accident train's windshield, but we may never know if the windshield was shattered before or after the derailment.

Investigative specialists in crashworthiness and survival factors have interviewed passengers in order to understand the circumstances of the evacuation as well as how injuries correlated with train car and seating positions. Interviews with passengers and emergency responders will continue over the coming weeks. More interviews with the crew may be conducted, if necessary.

The accident train was equipped with an electronic alertness device (also known as an alerter or dead man's switch). The alerter is designed to monitor engineer activity and applies the train brakes should the device fail to detect activity for a predetermined period of time. The alerter receives inputs from various locomotive systems used to determine engineer activity, and, if required, provides visual and audible alarms, and a penalty brake initiation.[1] The alerter time out period is variable, based on locomotive speed and initial reset time cycle. When the alerter reset timing cycle has been exceeded without a reset action occurring, then its alarm cycle begins. The NTSB will determine if this system was operational and if it was activated.

While the NTSB investigators have completed their on-scene documentation work, additional investigation, analysis, and testing will continue over the coming months. The NTSB formed investigative groups in the following areas: operations, track, mechanical, signals, human performance, survival factors, medical, phone data, and recorders. These investigative groups will be examining the train's operation; the track; the train's mechanical condition, including the brake system; the train control signal systems; recorders; train car performance; survival factors; and emergency response. A preliminary examination of the signals systems has revealed no anomalies or malfunctions. An extensive review of phone data provided by the engineer's phone carrier is ongoing to determine if his cell phone was used while operating the train. The NTSB is also awaiting the results of the FRA mandated post-accident drug and alcohol testing of the accident train's crew. We are also performing toxicology testing, which is far more extensive than that required by the FRA. We will update you, as well as the general public, as the investigation moves forward.

Transportation Disaster Assistance

This accident triggered the Rail Passenger Disaster Family Assistance Act of 2008 (49 U.S.C. §§ 1139 and 24316). The law requires the NTSB to coordinate the response efforts of Amtrak (and future high speed passenger rail operators), local/state/federal agencies, and the American Red Cross to address the needs of the family members of those killed and those otherwise impacted by a major passenger rail accident. The NTSB's Transportation Disaster Assistance

[1] Penalty braking is a brake application that is initiated after the train engineer fails to comply with a signal or to acknowledge an alerter alarm.

(TDA) division takes on this responsibility, and they have been working closely with Amtrak over the past several years to develop a family assistance plan.

In the aftermath of this accident, there was close coordination between TDA, Amtrak, the American Red Cross, and Philadelphia emergency response agencies to ensure an effective response. While on-scene, the TDA staff was involved in several critical activities, including traveling to hospitals to provide information to those who were injured and facilitating several briefings for family members and survivors. The briefings provided information about the accident investigation before this information was briefed to the media, in addition to presentations by Amtrak and the American Red Cross. TDA also worked with Philadelphia agencies and Amtrak to ensure all victims of the accident were accounted for and provided guidance on the management of personal effects. Amtrak provided a Family Assistance Center for provision of services and information and assisted with any immediate needs of those affected by this accident.

TDA will continue to serve as a point of contact and provide investigative information to family members and passengers throughout the course of the NTSB investigation. They will also continue to interact with Amtrak to ensure the provisions of the statute are met.

Positive Train Control

Amtrak's PTC system in the Northeast Corridor is called the Advanced Civil Speed Enforcement System (ACSES). ACSES, a transponder-based system approved by FRA, enforces maximum track speed limits, permanent and temporary speed limits, and positive stop at interlocking and controlled point signals displaying stop. While ACSES is installed and operational in portions of the Northeast Corridor that are owned by Amtrak, the area of track where the derailment occurred is not yet equipped with ACSES.

This area is equipped with automatic train control (ATC), an older automatic braking system. ATC is designed to enforce restrictive and stop signals by applying a penalty brake application to slow or stop the train to prevent or mitigate the results of a train-to-train collisions. The system can be configured to permanently display a restrictive signal that would apply a penalty brake application if the train exceeds a preset speed limit. This particular ATC system configuration was in place on the *southbound* tracks where a greater speed reduction was required; there were no automatic systems in place to enforce the 50 MPH permanent speed restriction at the curve on the *northbound* tracks where the accident occurred. Amtrak has indicated it hopes to have ACSES operational in this area by the end of 2015, if possible.

This unfortunate accident is one of many accidents that would have been prevented by PTC. For over 40 years, the NTSB has investigated numerous train collisions and over-speed derailments caused by operational errors involving human performance failures. The NTSB attributed these human performance failures to a variety of factors, including fatigue, sleep disorders, medications, loss of situational awareness, reduced visibility, and distractions in the operating cab such as the use of cell phones. Many of these accidents occurred after train crews failed to comply with train control signals, follow operating procedures in non-signaled or "dark" territories, or adhere to other specific operating rules such as returning track switches to normal position after completing their work at railroad sidings.

PTC systems are designed to prevent derailments caused by over-speeding and train-to-train collisions by slowing or stopping trains that are not complying with the signal systems, track authorities and speed limits. They are also designed to protect track workers from being struck by trains by preventing train incursions into designated work zones. The first NTSB-investigated accident that train control technology would have prevented occurred in 1969, when four people died and 43 were injured in the collision of two Penn Central commuter trains in Darien, Connecticut.[2] The NTSB recommended, in response to that accident, that the FRA study the feasibility of requiring railroads to install an automatic train control system, the precursor to today's PTC systems.[3]

In 2008, the NTSB investigated a PTC-preventable accident when a Metrolink commuter train and a Union Pacific freight train collided head-on in Chatsworth, California, killing 25 people and injuring 102 others.[4] The NTSB concluded that the Metrolink engineer's use of a cell phone to send text messages distracted him from his duties. In the aftermath of the Chatsworth accident, Congress enacted RSIA to require implementation of a PTC system on each line over which intercity passenger or commuter service is operated or over which poison- or toxic-by-inhalation hazardous materials are transported.[5] We know that several rail carriers have stated that they will not meet the 2015 deadline. This is disappointing.

Meanwhile, we continue to see accidents that could be prevented by PTC:

- In September 2010, near Two Harbors, Minnesota, human error and fatigue contributed to the collision of two freight trains, injuring five crewmembers.
- In April 2011, near Red Oak, Iowa, fatigue contributed to the rear-end collision of a coal train with a standing maintenance-of-way equipment train, killing two crewmembers.
- In May 2011, in Mineral Springs, North Carolina, human error contributed to the rear-end collision of two freight trains, killing two crewmembers and injuring two more.
- In May 2011, in Hoboken, New Jersey, human error contributed to the collision of a train with the bumping post at the end of the track.
- In January 2012, near Westville, Indiana, inattentiveness contributed to the collision of three trains, injuring two crewmembers.
- In June 2012, near Goodwell, Oklahoma, human inattentiveness contributed to the collision of two freight trains, killing three crewmembers.
- In July 2012, near Barton County, Missouri, human error contributed to the collision of two freight trains, injuring two crewmembers.
- In May 2013, near Chaffee, Missouri, inattentiveness and fatigue contributed to the collision of two freight trains, injuring two crewmembers and causing the collapse of a highway bridge.

---

[2] NTSB, *Penn Central Company, Collision of Trains N-48 and N-49 on August 20, 1969*, Rpt. No. RAR-70-03 (October 14, 1970).
[3] R-70-020.
[4] NTSB, *Collision of Metrolink Train 111 With Union Pacific Train LOF65-12 Chatsworth, California September 12, 2008*, Rpt. No. NTSB/RAR-10/01 (Jan. 21, 2010).
[5] Rail Safety Improvement Act of 2008, Pub. L. No. 110-432, § 104 (2008).

- In December 2013, near Keithville, Louisiana, human error contributed to the collision of two freight trains, injuring four crewmembers.
- In December 2013, in the Bronx, New York, four people lost their lives and 61 others were injured when a Metro-North commuter train derailed after entering a curve with a 30 mph speed limit at 82 mph.

Since 2004, in the 30 PTC-preventable freight and passenger rail accidents that the NTSB investigated, 69 people died, more than 1,200 were injured, and damages totaled millions of dollars. The NTSB files are filled with accidents that could have been prevented by PTC, and for each and every day that PTC implementation is delayed, the risk of an accident remains.

There is much debate by policymakers on extending the 2015 deadline established by the RSIA. Some railroads may meet this deadline. For those railroads that have made the difficult decisions and invested millions of dollars, they have demonstrated leadership. For those railroads that will not meet the deadline, there should be a transparent accounting for actions taken – and not taken – to meet the deadline so that regulators and policymakers can make informed decisions.[6]

Audio and Image Recorders Inside Locomotive Cabs

The accident train was equipped with recorders: forward-facing image recorders and an event data recorder. The recorders have been sent to NTSB's lab for analysis. However, the accident train was not equipped with audio and image recorders inside the locomotive cab. Audio and image recorders in locomotives and cab car operating compartments are critically important because they could assist NTSB investigators and others with understanding what happened in a train before an accident. Indeed, inward facing recorders could have provided valuable information as NTSB determines the probable cause of this accident. Significantly, these recordings could also help railroad management *prevent* accidents by identifying safety issues before they lead to injuries and loss of life by developing valuable training and coaching tools.

The NTSB recognizes the significant privacy concerns regarding the public disclosure of audio and image recorders. Congress also has been sensitive to the premature public disclosure of these sensitive data and information after transportation accidents. For this reason, in 1990, it enacted confidentiality protections against the premature disclosure of aviation cockpit voice or video recordings or transcripts of oral communications by flight crewmembers,[7] and in 2000, it enacted similar confidentiality protections against the premature disclosure of surface vehicle voice or video recordings or transcripts of oral communications of train employees or other surface transportation operating employees.[8] Congress also precluded litigants from using discovery to obtain cockpit and surface vehicle recordings and transcripts in any judicial proceeding.[9]

[6] R-13-23 and R-13-27.
[7] Independent Safety Board Act Amendments of 1990, Pub. L. 101-641, § 3(b), codified at 49 U.S.C. § 1114(c).
[8] National Transportation Safety Board Amendments Act of 2000, Pub. L. 106-424, § 5, codified at 49 U.S. C. § 1114(d).
[9] 49 U.S. C. § 1154.

Since the 1990s, the NTSB has recommended that the FRA require audio recorders inside locomotive cabs. In its investigation of the February 16, 1996, collision between a Maryland Rail Commuter train and an Amtrak train near Silver Spring, Maryland, in which no operating crewmembers survived, the NTSB was unable to determine whether crewmember activities leading up to the accident contributed to the accident.[10] In the NTSB's investigation of the Bryan, Ohio, railroad accident in 1999, with no surviving crewmembers, this safety recommendation was reiterated.[11] However, the FRA stated that no action would be taken to implement the recommendation. Since the FRA's refusal to act on the recommendation of in-cab audio recorders, the NTSB has investigated additional accidents in which audio recorders would have provided information to help determine probable cause and improve safety, and after a 2005 collision in Anding, Mississippi, the NTSB added inward facing video recorders to this recommendation.[12]

The Chatsworth tragedy again made the case crystal-clear for understanding the activities of crewmembers in the minutes and seconds leading up to accidents. Discussing the strong safety case for a requirement for inward-facing cameras in locomotives, the NTSB noted that:

> [i]n all too many accidents, the individuals directly involved are either limited in their recollection of events or, as in the case of the Chatsworth accident, are not available to be interviewed because of fatal injuries. In a number of accidents the NTSB has investigated, a better knowledge of crewmembers' actions before an accident would have helped reveal the key causal factors and would perhaps have facilitated the development of more effective safety recommendations.[13]

Accordingly, the NTSB enhanced its recommendation that the FRA require the installation, in control compartments, of "crash- and fire-protected inward- and outward-facing audio and image recorders capable of providing recordings [for at least 12 hours] to verify that train crew actions are in accordance with rules and procedures that are essential to safety as well as train operating conditions."[14] The NTSB also recommended that the FRA "[r]equire that railroads regularly review and use in-cab audio and image recordings . . . to verify that train crew actions are in accordance with rules and procedures that are essential to safety."[15]

The NTSB reiterated these important recommendations in its report on the collision of a BNSF coal train with the rear end of a standing BNSF maintenance-of- way equipment train near Red Oak, Iowa, which resulted in fatal injuries to the two crewmembers of the striking train.[16] Damage was in excess of $8.7 million. As the NTSB stated in its report, the accident again

---

[10] NTSB, *Collision and Derailment of Maryland Rail Commuter Marc Train 286 and National Railroad Passenger Corporation Amtrak Train 29 Near Silver Spring, Maryland On February 16,1996,* Rpt. No. NTSB/RAR-97/02 (July 3, 1997), R-97-9.

[11] NTSB, *Collision Involving Three Consolidated Rail Corporation Freight Trains Operating in Fog on a Double Main Track Near Bryan, Ohio on January 17, 1999,* Rpt. No. NTSB/RAR-01/01 (May 9, 2001).

[12] R-07-3

[13] NTSB, *Collision of Metrolink Train 111 With Union Pacific Train LOF65-12 Chatsworth, California September 12, 2008*, Rpt. No. NTSB/RAR-10/01 (Jan. 21, 2010), at 58.

[14] R-10-1.

[15] R-10-2.

[16] NTSB, *Collision of BNSF Coal Train With the Rear End of Standing BNSF Maintenance-of-Way Equipment Train Red Oak, Iowa on April 17, 2011),* Rpt. No. NTSB/RAR-12/02 (April 24, 2012).

demonstrated the need for in-cab audio and image recording devices to better understand (and thereby prevent) serious railroad crashes that claim the lives of crewmembers, passengers, and the public.

Subsequent to the Red Oak, Iowa, accident, the NTSB investigated the June 2012 collision of two Union Pacific freight trains near Goodwell, Oklahoma, that resulted in three crewmember fatalities and $14.8 million in estimated damage.[17] In the NTSB Accident Report, we noted that the FRA had failed to take action on the NTSB's two recommendations from the 2010 Chatsworth accident for in-cab audio and image recording devices and again reiterated these two recommendations.

We have been encouraged by the inclusion of these recommendations in rail safety legislation, and we hope this can be part of a rail safety legislative proposal that may be considered by this Congress. We are also encouraged that two Class I railroads and some commuter railroads have proceeded with installing in-cab audio and image recorder devices in their locomotives. We will continue to address the recommendation on an individual railroad basis and with the FRA.

Thank you for the opportunity to testify before you today. I look forward to responding to your questions.

[17] NTSB, *Head-On Collision of Two Union Pacific Railroad Freight Trains Near Goodwell, Oklahoma, June 24, 2012,* Rpt. No. NTSB/RAR-13/02 (June 18, 2013).