

# National Transportation Safety Board

Office of Railroad, Pipeline and Hazardous Materials

Washington, DC 20594



HWY22MH009

## **RAIL HUMAN PERFORMANCE GROUP**

Group Chair's Factual Report

September 1, 2022

## **A. CRASH INFORMATION**

Location: Clarendon Hills, IL  
Date: May 11, 2022  
Time: 8:16 a.m. CDT

## **B. RAIL HUMAN PERFORMANCE GROUP**

Group Chair	Dr. Anne Garcia NTSB, RPH-40
Group Member	Brandon Webb FRA
Group Member	Hillary Konczal METRA
Group Member	Ryan Ringelman BNSF Railway
Group Member	Shawn Lawton Brotherhood of Locomotive Engineers & Trainmen (BLET)
Group Member	Joseph Ciemny Sheet Metal Air Rail Transportation Workers (SMART)

## **C. ACCIDENT SUMMARY**

Refer to the Crash Information and Crash Summary Report in the docket for this investigation.

## **D. DETAILS OF THE INVESTIGATION**

### **1.0 Overview**

The crew of the Metra train consisted of four BNSF employees; a Locomotive

Engineer, a Conductor, a Middle Brakeman and a Rear Brakeman. Their assigned train consisted of one locomotive and six passenger cars, which included a cab car. At the time of accident, the Metra train was operating on BNSF main track 3 in a push-pull configuration with the Engineer operating from the cab car in the lead position. The train was traveling at a speed of 60.9 mph when it struck the box truck. A review of video footage obtained revealed that before the collision three occupants from the box truck exited the truck after it stalled on the crossing. This is a public crossing (Crossing ID: 079529S) with active warning lights and gates and is in a quiet Zone (Chicago exempt - no horn) crossing.

## **2.0 Description of the Incident Location**

A description of the accident location, including the highway-rail grade crossing warning system, is included in the Signal and Highway Factors Group Chairs' Factual Report.

### **2.1 Description of METRA passenger car configuration**

The Metra commuter rail system serves the Chicago metropolitan area. The accident occurred on the BNSF line from Chicago to Aurora, which is owned by BNSF Railway. BNSF operates the commuter rail service with its own crews under a purchase-of-service agreement with Metra. On the day of the accident, the accident train operated on the BNSF Chicago Subdivision track controlled by the BNSF East End Dispatcher, located in Ft. Worth, TX. Following the collision, the train came to rest approximately 1,000 feet east of Prospect Avenue by the Metra station platform.

The train consisted five two-level passenger cars and a trailing locomotive. The forward passenger car contained the locomotive engineer's cab control area in the forward, upper right corner of the car.

### **2.2 Cab Car Configuration**

**Figure 1** provides schematic diagrams of the upper and lower levels of the lead passenger cab control car<sup>1</sup>. The yellow area indicates the engineer's position in the forward right upper section of the passenger car. The red lines indicate walls that prevent movement between the forward and rear sections of the car's upper level. The circled letters indicate locations of the Conductor

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<sup>1</sup> Provided by Metra.



On Thursday, May 12 and Friday, May 13, the investigative group reviewed the locomotive's event recorder data and observed the locomotive's outward facing video. The investigative group reconvened on Friday, May 13 with Metra's Senior Manager Reliability Program, Senior Director Mechanical, and Chief Mechanical Officer to continue observing the event recorder data and locomotive's outward facing video.

A tabular view of event recorder download from the station stop prior to the grade crossing incident on 5/11/2022 at approximately 8:15 am and continuing to final stop of equipment after incident was reviewed. Below is the timeline of tabular data from Cab car 8473, synchronized with video of the front facing camera from Cab car 8473. Pertinent events and corresponding data are listed. Note the emergency application of brakes after the full-service application of brakes was not heard on the video due to the depletion of air from the reservoir system. Normally, with 90 psi, the sudden exhausting of air is heard, however due to only 65 psi this pressure is low, and it was not heard. The download shows the time that engineer initiated emergency brake - listed below. Also of note, the cause of the air brake control being put into trail position is unknown. Normally, an operator (crew) needs to initiate this by placing a valve into the cutout position at the Automatic Brake valve; this is also shown on the timeline below.

Note that the video's microphones are outside of the cab car, so no interior noises or voices were recorded. The train's speed did not exceed the limit of 70 mph during the events listed on the timeline.

The following timeline was developed based on the observations:<sup>2</sup>

### **BNSF Train 1242, Car 8473 Tabular Data from Event Recorder, 5/11/2022**

<b>Time</b>	<b>Speed</b>	<b>Distance</b>	<b>Item</b>
08:15:53	69.8	Zero (0) feet	Truck in view
08:15:55	69.8	328	1 <sup>st</sup> Horn (on)
08:15:55	69.8	400	Auto brake applied
08:16:02	70	963	1 <sup>st</sup> Horn (off)
08:16:03	67.7	1081	2 <sup>nd</sup> Horn (on)
			Driver exit's truck

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<sup>2</sup> Additional information is provided in the RE Event Data Recorder report.

08:16:03.3	67.7	1091	Full-service Brake
08:16:04	66.4	1120	EIE (Emergency brake)
			1 <sup>st</sup> passenger exits truck
08:16:06	62.3	1427	2 <sup>nd</sup> Horn (off)
08:16:11	55	1490	Train struck truck
08:16:14	55	1856	Lost power Door, HEP, ADA
08:16:16	52.7	1925	Park brake initiated
08:16:18	51.3	2007	Full Park brake/ Emergency
08:16:26	36.1	2562	Trail (air brake initiated)
08:16:40	Zero	2998	Train stopped

The investigative group interviewed the locomotive engineer<sup>3</sup>, who provided the following timeline of his events leading up to the time of the accident:

- The train left the Fairview Avenue station and reached the 70-mph track speed.
- On approaching Clarendon Hills, there is a curve in the track.
- As the train came around the curve, the Locomotive Engineer saw a truck on the track and people around the truck. He did not realize these people had gotten out of the truck.
- He put the train in emergency [braking] and blew the horn more than once.
- He realized the train would impact the truck,
- He opened the cab door and exited the cab.
- He called out to the Conductor (who was on the lower level) to call emergency and to hold on as they were going to hit a truck.
- He held onto a stanchion and braced for impact. He did not see any passengers in the upper level.

The investigative group interviewed the conductor, who provided the following timeline of her events leading up to the time of the accident:

- Immediately prior to the accident, the Conductor was in the restroom and heard the train's horn blowing.
- She heard the Engineer call out and stepped out of the restroom to hear what he was saying.

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<sup>3</sup> Full transcripts of interviews are in the docket.

- The engineer told her to get on the radio and do an emergency call, that a truck was on the tracks and not moving.
- She looked out the window and saw people exiting the truck, so she knew it was not moving.
- She got on her radio and called emergency.
- There was one customer seated in the first floor of the forward section of the cab car, where she was standing. They each flipped one of the seatbacks, so there was a larger area between the two seats that were now facing each other. This provided enough room to get down on all four (hands and knees) between the seats.
- She told the customer to get down between the two seats on all four.
- The Conductor took the same position across the aisle from the passenger.

The Middle Brakeman was in the car second from the engine (rear) and the Rear Brakeman was in the car next to the engine) at the time of the crash. They did not hear the locomotive engineer’s verbal warning; however, they did hear the locomotive horn blowing prior to the crash.

#### **4.0 Behavioral and Operational Factors**

The Rail Human Performance investigative activities focused on the BNSF train crew.

The following behavioral and operational factor information was obtained regarding the BNSF train crew; the Engineer, Conductor, Middle Brakeman and Rear (Extra) Brakeman.

#### **4.1 Work History and Training**

**Locomotive Engineer:** BNSF records provided the following information. The locomotive Engineer began working for BNSF on May 24, 1976, in train service and received his training and qualified as an Engineer. His most recent re-certification was completed January 20, 2021, comprised of hearing and vision, motor vehicle review, rules exam and Train Network Simulator exam. This re-certification will expire on January 31, 2024. There were no

operating rules related disciplinary actions in the last five years of records provided by BNSF for the locomotive Engineer.<sup>4</sup>

**Conductor:** BNSF records provided the following information. The train Conductor was hired on at BNSF February 3, 1997 and received her training and qualified as a Conductor. She completed her Transportation Rules Training and re-certification on March 23, 2022, comprised of hearing and vision, motor vehicle review and rules exam. This recertification will expire March 23, 2025. There were no operating rules related disciplinary actions in the last five years of records provided by BNSF for the Conductor.

**Middle Brakeman:** BNSF records provided the following information. The Middle Brakeman was hired on at BNSF July 20, 1998, as an engineering employee. November 1, 1998, he transferred to transportation as a conductor.<sup>5</sup> His most recent re-certification on October 20, 2020, comprised of hearing and vision, motor vehicle review and rules exam. This re-certification will expire October 20, 2023. There were no operating rules related disciplinary actions in the last five years of records provided by BNSF for the Middle Brakeman.

**Rear (Extra) Brakeman:** The Rear Brakeman began working for BNSF on May 27, 2002, as a conductor. His most recent re-certification was February 20, 2022, comprised of hearing and vision, motor vehicle review and rules exam. This re-certification will expire February 20, 2025. There were no operating rules related disciplinary actions in the last five years of records provided by BNSF for the Rear Brakeman.

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<sup>4</sup> BNSF policy distinguishes between operating rules, which involve train movement, and conduct disciplinary actions, which do not.

<sup>5</sup> Conductors were not placed in the certification category by the FRA until 2012. All BNSF train yard and engine (TY&E) employees are hired and certified as conductors however their role on the train may be either Brakeman or Conductor. At the time of the event this person was working as a



## 4.2 Toxicology and Medical

Post-accident toxicology testing of the train crew was not conducted by BNSF and was not required by the Federal Railroad Administration (FRA).<sup>6</sup>

The Locomotive Engineer stated that he sleeps well and is in good health. On the day of the accident, he felt rested and normal. He also stated that he knows all the crew members and they all appeared normal on the day of the accident. The Conductor stated she is healthy and takes vitamins.

## 4.3 Work/Rest History

**Locomotive Engineer:** His normal work schedule is 4:02 a.m. – 6:00 p.m., Monday through Friday. His typical workday schedule is to get up at 3 a.m., have coffee and take cereal with him to work. He leaves his house about 3:30 a.m. and has about a 30-minute commute to work. After work, he leaves at 6 p.m. and has about a 34-minute commute home. He greets his wife, has dinner, and goes to bed between 8:00 and 8:30 p.m. He is off work on weekends. He gets up between 6 a.m. and 6:30 a.m. on Saturdays and Sundays. He goes to bed at 10 p.m. on Friday and Saturday nights.

**Conductor:** The Conductor's regular work schedule is Monday through Friday, 4:02 a.m. – 6:00 p.m. and every other Sunday from 7:00 a.m. to 4 p.m. In addition, she has a Respite break time from 9 a.m. to 3:30 p.m. which is off time. On the Tuesday evening prior to the accident, the Conductor arrived home about 7:10 p.m., took her dogs out, had dinner, and went to bed at 8:10 p.m. The Wednesday morning of the accident, she was awake at 2:00 a.m. and left home at 3 a.m. She did not have breakfast. Her commute was about 51 minutes with no traffic. She was on duty at 4:02 a.m. On her days off, she is up at 6 a.m. and goes to bed no later than 9 p.m. the night before.

**Middle Brakeman:** His normal work schedule is identical to the Conductor's schedule.

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<sup>6</sup> FRA 49 CFR Part 219, Subpart C.

**Rear Brakeman:** His normal work schedule is also identical to the Conductor's schedule.

### **5.0 Cell phone usage**

The cell phone usage for the train crew was examined and determined not to be a factor in this crash.

### **6.0 Grade Crossing Emergency Notification System Usage**

The Rail Human Performance Group Chair participated in the Highway Human Performance interviews of the truck driver and truck passenger. These interviews were conducted at the carrier base in La Grange Park, IL on the morning of May 13, 2022. Full summaries of these interviews are provided in the Highway Human Performance Group Chair's Field Notes. The Truck Driver and Truck Passenger were asked during the interviews, who they would call if their personal vehicle became stuck on a train track at a grade crossing. They both responded initially that they did not know, and then that they would call 9-1-1. Neither the Truck Driver nor the Truck Passenger were aware of the blue and white Emergency Notification System signs that provide the toll-free phone number to call and the grade crossing number of the location, which are posted at grade crossings.

### **7.0 Post-Accident Task Factors**

After impact, the Locomotive Engineer returned to the controls and backed the controls out of emergency. He observed that glass had come in all over the controls through his side window that was open about four inches. After impact he also called emergency. He attempted to jog to the middle of the car, but a window was knocked inward, on the floor, in his way. He stepped around it and went to assist the Conductor with the passengers. Additional information on the Locomotive Engineer's post-crash actions is provided in the transcript of his interview.

The Conductor stated she felt the impact of the crash and smelled fuel. The train car was still bouncing then finally stopped. The Conductor then opened the vestibule doors to the rear part of the car. She observed a female passenger on the top level with a window on top of her. She took the window off her and another passenger offered to stay with her as she was injured and upset. The Conductor called on the radio to the Brakemen that she needed help.

The Conductor saw shoes and a bag, went to hand them to the female passenger nearby, however that passenger stated they were not hers. She searched through the car for the woman who owned the bag and shoes and could not locate

her, so she called it in. It was determined that the items belonged to the passenger who was later identified as deceased, and outside of the train.

The Conductor stated there were a total of four passengers in the lead car; one was in the lower front part with her and three had been in the back part (only two remained there). She believed the fatally injured passenger had been sitting in the third seat back from the front, on the Locomotive Engineer's side of the train. Two other passengers were in the upper level of that part of the car, one on each side.

Additional information on the post-crash actions of the Conductor and the two Brakemen are provided in the transcripts of their interviews.

Submitted by:

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Chair, Rail Human Performance Group