

**NATIONAL TRANSPORTATION SAFETY BOARD  
Office of Research and Engineering  
Vehicle Recorder Division  
Washington, D.C. 20594**



**GROUP CHAIRMAN'S FACTUAL REPORT OF  
INVESTIGATION**

**DCA16FR007**

**By  
Sean Payne**

**WARNING**

The reader of this report is cautioned that the transcription of an image and audio recording is not a precise science but is the best product possible from a Safety Board group investigative effort. The transcript or parts thereof, if taken out of context, could be misleading. The transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

**NATIONAL TRANSPORTATION SAFETY BOARD**  
Vehicle Recorder Division  
Washington, DC 20594

January 5, 2017

## **Onboard Image Recorder – Outward Facing**

**Factual Report  
By Sean Payne**

### **1. EVENT**

Location:	Chester, Pennsylvania
Date:	April 3, 2016
Locomotive:	ACS-64, 627
Operator:	Amtrak
NTSB Number:	DCA16FR007

### **2. SUMMARY**

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

### **3. GROUP**

A group was convened on April 20, 2016. The group consisted of the following members:

Chairman:	Charles Cates Mechanical Engineer National Transportation Safety Board (NTSB)
Member:	R.A. Hipkind Track and Engineering Group Chairman NTSB
Member:	John Hines System General Road Forman National Railroad Passenger Corporation (Amtrak)
Member:	Don Hill Party Spokesman Brotherhood of Locomotive and Train Engineers (BLET)
Member:	Lou Tomassone Party Spokesperson

Federal Railroad Administration (FRA)

Member: Willie Bates  
Party Spokesman  
(SMART)

Member: Steve Stern  
Party Spokesman  
(BMWED)

## 4. DETAILS OF INVESTIGATION

On April 4, 2016, the NTSB Vehicle Recorder Division received the following solid state hard drive associated with an outward facing image recording system:

Recorder Manufacturer/Model: **Wabtec TrainTrax**  
Recorder Serial Number: **MS1413A226**

### 4.1. Recorder Description

Amtrak locomotive #627 was equipped with a WabTec TrainTrax image recorder. The WabTec recorder is a forward/outward facing video camera that records to external storage. It records video at a resolution of 704x480 pixels at 30 frames per second in color, with external audio. The system also captures limited parametric data, such as speed and GPS position.

### 4.2. Recorder Damage

Upon arrival at the NTSB Vehicle Recorder Division, it was evident that the Wabtec TrainTrax module had not sustained any heat or structural damage. The data was extracted normally, using the manufacturer's designed procedures and hardware.

### 4.3. Video Files

Files were extracted from the recorder in .AVI format with a proprietary codec. The .AVI files are available for playback only within the manufacturer's supported software. In total, 20 .AVI files were exported from the recorder. The time frame extracted from the recorder and covered in these files contained the collision, emergency braking and stop of the locomotive as well as an unquantified amount of time prior to the locomotive entering the 6<sup>th</sup> street station.

### 4.4. Timing and Correlation

The times used in this report are expressed as local time of the accident (EDT).

Timing of the transcript was established by correlating the video events to common events on the locomotive's event recorder. For more information regarding time correlation, refer to section 4.4 of the Onboard Image Recorder – Inward Facing Factual Report which can be found in the public docket for this accident.

For the remainder of this report, all times are given in EDT. Transcript times are given in EDT in the format HH:MM:SS.D.

## **4.5. Summary of Recording Contents**

In agreement with the Investigator-In-Charge, an outward facing video group convened on April 20, 2016, and a transcript was prepared. It was determined that events would be transcribed between the time at which the locomotive was stopped at 30<sup>th</sup> Street Station in Philadelphia, PA, (07:38:23.9) and until the time the locomotive came to rest (07:50:23.3).

### **4.5.1. Video Recording:**

**07:38:23.9:** [sound similar to machine room blower on train]. Train is stopped at 30<sup>th</sup> street station on track 6.

**07:38:25.9:** [sound of bell first begins, and continues for 53 seconds.]

**07:38:29.7:** train starts moving forward.

**07:39:15.0:** Train approaches first signal outside the station. Two top lights are illuminated, similar to clear signal.

**07:39:18.0:** [sound of bell stops.]

**07:39:20.0:** Train joins the Four River track.

**07:40:13.6:** Train continues forward onto main track 3 (train does not make any turnout or crossover move; the track designation changes from Four River to main track 3).

**07:47:12.9:** Baldwin southbound home signal bridge in view. The third signal from the left (annotated in figure 1) is displaying green. The train is on main track 3.

**Figure 1. A still image from the recorder at 07:47:12.9**



**07:49:12.2:** Train entering right-hand curve as it passes Flower Street undergrade, MP 14.8. (see figure 2).

**Figure 2. A still image from the recorder at 07:49:12.2**



**07:49:18.4:** Train is moving forward on straight track. Clear route ahead. (see figure 3).

**Figure 3. A still image from the recorder at 07:49:18.4**



**07:49:25.9:** Indiscernible object is first visible ahead. (see figure 4)

**Figure 4. A still image from the recorder at 07:49:25.9**





**07:49:30.8:** Train is just north of Wilson street undergrade (MP 15.36). Previously indiscernible object now appears yellow and is on a track to the left of main track 3. (see figure 5).

**Figure 5. A still image from the recorder at 07:49:30.8**



**07:49:33.4:** This screen capture was taken at the time the sound of horn was audible on the inward facing recording. Due to microphone placement and other external noises present, the horn was not audible on the outward facing recording, instead, the time the horn became audible was referenced from the inward facing recorder.<sup>1</sup> That moment is captured below in figure 6 at the time listed above. (see figure 6)

**Figure 6. A still image from the recorder at 07:49:33.4**



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<sup>1</sup> Reference the Onboard Image Recorder – Inward Facing Factual report for additional information about the locomotive’s horn. That report can be found in the public docket for this accident.

**07:49:35.4:** Train is just north of Highland Avenue undergrade (MP 15.5). Details of the previously identified yellow object are more defined. The Highland Avenue through-plate girders are casting shadows to the right of the structure. No watchman lookouts or hand-held whistleboards (also called paddles) are visible. (see figure 7)

**Figure 7. A still image from the recorder at 07:49:35.4**



**07:49:38.1:** Train is just north of the dragging equipment detector (MP 15.7). Yellow equipment is visible on main track 2 and main track 3. No personnel are discernable on any track or equipment.

**07:49:38.7:** The watchman is first discernable to the right of main track 4. The watchman appears to be in a partial shadow. (see figure 8)

**Figure 8. A still image from the recorder at 07:49:38.7**



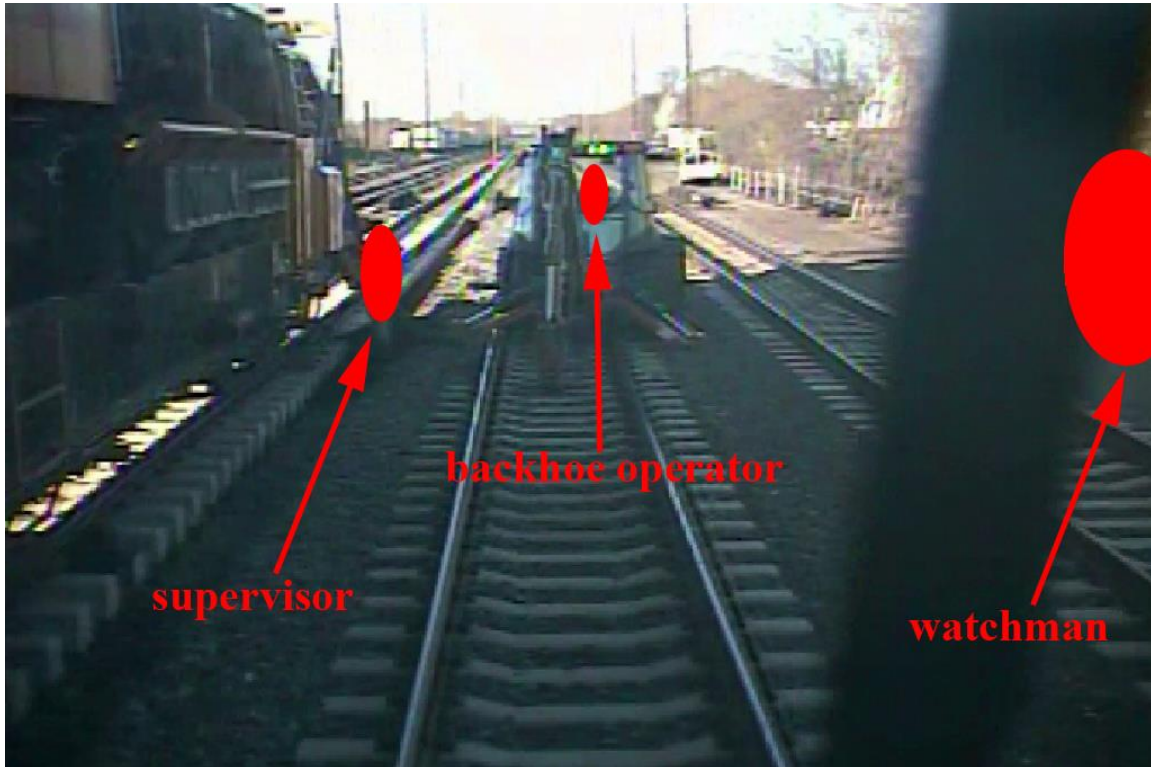
**07:49:40.1:** The yellow Loram Vacuum Train is clearly visible on main track 2 with a rear end marker. The Loram is casting a shadow extending over main track 3 and main track 4. Equipment/obstruction is apparent on main track 3 ahead of the train, in the shadow cast by the Loram. An arrow indicates the position of the watchman in red. (see figure 9)

**Figure 9. A still image from the recorder at 07:49:40.1**



**07:49:41.5:** Watchman visible to the right of main track 4. Watchman is facing north (facing the oncoming train) and his hard hat is discernable. The handheld whistleboard is not raised or discernable (further, whistleboard is not discernable in the half second before the figure included in this report). (see figure 10)

**Figure 10. A still image from the recorder at 07:49:41.5. The image of the individuals has been redacted with red circles**



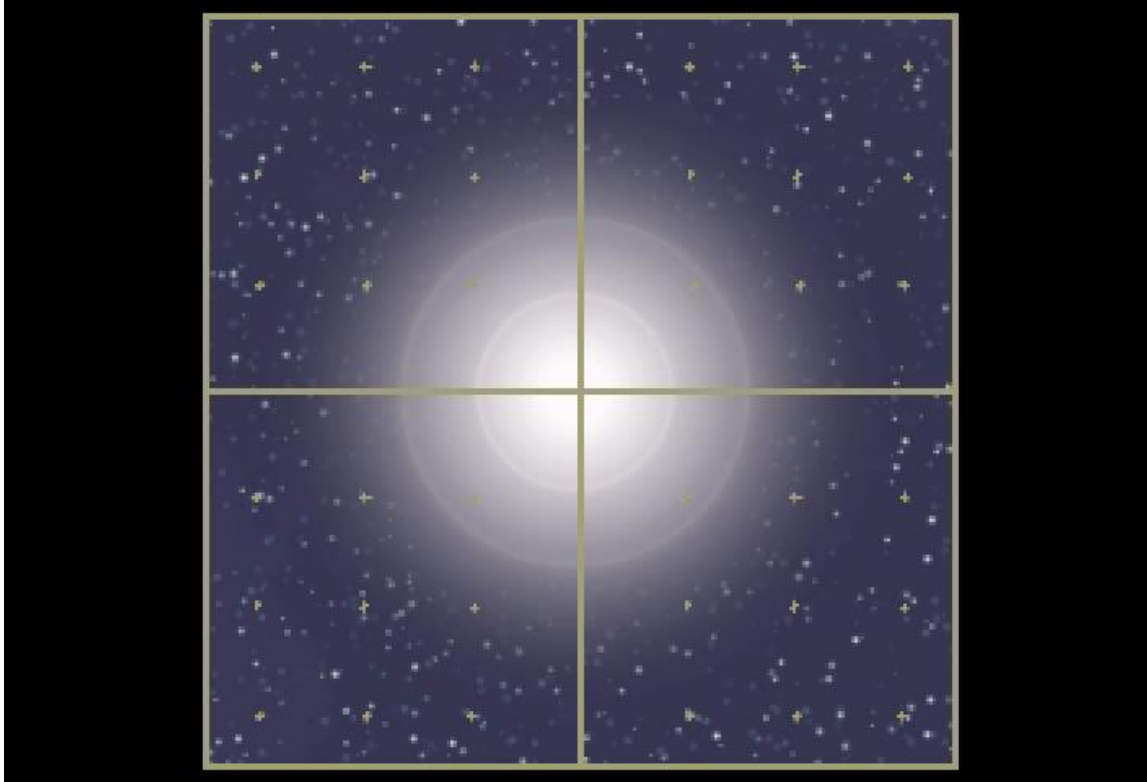
**07:49:41.8:** Supervisor is standing, facing south (away from the train) on the west field side of main track 2. A trackman is standing to the east field side of main track 2. The backhoe operator is sitting in the cab of the backhoe. The worklights on the top of the backhoe are on. The backhoe outriggers are extended and the cribbing bucket is anchored in the ballast between the two concrete ties, touching the track bed. (see figure 11)

**Figure 11. A still image from the recorder at 07:49:41.8. The image of the individuals has been redacted with red circles**



**07:49:41.8:** The video recording fails to produce usable imagery but continues recording sound. The sound of impact is heard as well as the sound of the train's continued motion. (see figure 12)

**Figure 12. The recording showing a loss of imagery data at approximately 07:49:41.9.**



**07:50:23.3:** Only sound continued to be recorded. The sound of impact and the sound of the train's motion became significantly diminished, consistent with the train coming to a complete stop.