

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

October 2, 2017

Onboard Image Recorder

Group Chairman's Factual Report
By Bill Tuccio, Ph.D.

1. EVENT

Location: Biloxi, Mississippi
Date: March 7, 2013
Locomotive: CSX230 (Lead)
CSX7870 (2nd Locomotive)
CSX7805 (3rd Locomotive)
Operator: CSX
NTSB Number: HWY17MH010

For a description of this event, see the public docket for this investigation.

2. GROUP

An onboard image recorder group convened on August 30, 2017:¹

Chairman: Dr. Bill Tuccio
Aerospace Engineer
National Transportation Safety Board (NTSB)

Member: Steven Prouty, P.E.
Senior Investigator
NTSB

Member: Dennis Collins
Senior Accident Investigator
NTSB

Member: Gregory Drakulic
Railroad Safety Inspector
Federal Railroad Administration

¹ A representative from TBL Group/Echo Tours & Charters was invited to participate, but due to Hurricane Harvey was not able to attend.

Member: Christopher DeBack
Lieutenant Police Officer
Biloxi Police Department

Member: Steve Ammons
System Road Foreman of Engines
CSX

3. DETAILS OF INVESTIGATION

On March 16, 2017, the NTSB Vehicle Recorder Division received the following onboard image recorders:

Recorder Manufacturer/Model: **GE LocoCAM**
Recorder Serial Number: **CSX#10000433**
Locomotive: **CSX230**

Recorder Manufacturer/Model: **GE LocoCAM**
Recorder Serial Number: **CSX#10000435**
Locomotive: **CSX7870**

Recorder Manufacturer/Model: **GE LocoCAM**
Recorder Serial Number: **CSX#10000434**
Locomotive: **CSX7805**

3.1. Recorder Description

The GE Lococam Onboard Image recorder is a forward facing video camera that records to external solid-state storage. It records color video at a resolution of 720x480 pixels at 15 frames per second with external audio.

3.2. Recorder Damage

Upon arrival at the NTSB Vehicle Recorder Division, it was evident that the recorders had not sustained any heat or structural damage and the video and audio information were extracted from the devices normally, without difficulty.

3.3. Video Files

Video from all three locomotives captured the collision. CSX7870 and CSX7805 were facing opposite the direction of travel of the train. CSX7870's camera was blocked by the adjacent locomotive, CSX7805. CSX7805's camera was blocked by the first rail car behind the locomotive consist. The Group reviewed the obstructed content from CSX7870 and CSX7805 and determined the content did not further inform the investigation because the view from CSX230 was unobstructed. Therefore, the remainder of this report only describes recorded content from CSX230's forward-facing onboard image recorder.

3.4. Timing and Correlation

The times used in this report are expressed as local time of the accident (central standard time (CST)). In agreement with the Investigator-in-Charge, the time as recorded by CSX230 was considered authoritative CST time for this investigation.

3.5. Summary of Recording Contents

The Group documented recorded content starting at 14:08:25 CST until CSX230 stopped after the collision with the motorcoach.

Throughout the documented time period in this report, weather was fair visibility, no precipitation, and overcast skies; the track was straight (tangent) from 14:08:25 CST until the point of impact with the motorcoach. Horn blasts were not documented (for horn blasts and other parametric data, see the Event Recorder Factual Report in public docket for this accident).

At 14:08:30 CST, CSX230 crossed White Avenue.

At 14:08:33 CST, the I-110 highway overpass was first visible to the Group (at this time, the overpass was about 1 statute mile ahead) (see figure 1); for this particular detail, the purpose is to help inform an objective measure of weather/atmospheric visibility.²

Figure 1. Image at 14:08:33 CST.



At 14:09:17 CST, as CSX230 was approaching Gill Avenue (about 100 yards prior to Gill Avenue), a light-colored vehicle was visible crossing Porter Avenue from left to right.

At 14:09:26 CST, CSX230 crossed Gill Avenue.

At 14:09:39 CST, CSX230 crossed Porter Avenue.

At 14:09:45 CST, CSX230 crossed Querens Avenue.

At 14:09:51 CST, CSX230 crossed Benachi Avenue.

At 14:10:05 CST, CSX230 crossed Iroquis Avenue; workers in yellow vests were visible to the left of the tracks.

² Camera resolution quality may not adequately represent the exact visual conditions experienced by the actual train crew.

At 14:10:12 CST, CSX230 crossed Seal Avenue.

At 14:10:22 CST, as CSX 230 was approaching Hopkins Boulevard (about 100 yards prior to Hopkins Boulevard), a dark-colored car and then a light-colored car were visible crossing Caillavet Street.

At 14:10:27 CST, CSX230 crossed Hopkins Boulevard.

At 14:10:30 CST, CSX230 crossed under the I-110 overpass.

At 14:10:36 CST, CSX230 crossed Bohn Street; three dark vehicles were parked parallel to the track, about 10 feet to left of the rail.

At 14:10:39 CST, a dark-colored and a light-colored vehicle were stopped at the right side of the railroad-highway grade crossing on Caillavet Street (waiting to cross).

At 14:10:46 CST, CSX230 (about 200 feet from Caillavet Street), passed several vehicles parked perpendicular to the track, about 10-20 feet to the left of the rail. A blinking red light from the railroad-highway grade crossing at Caillavet Street was visible.

At 14:10:50 CST, CSX230 crossed Caillavet Street.

At 14:10:55 CST, a light-colored vehicle was visible stopped to the right of the railroad-highway grade crossing on Reynoir Street (waiting to cross); the vantage point of the CSX230 camera was obstructed prior to this point due to a passenger platform to the right of the tracks.

At 14:11:04 CST, CSX230 crossed Reynoir Street.

At 14:11:15 CST, CSX230 crossed Magnolia Street. At this time, 14:11:15 CST, the motorcoach that was ultimately struck was first visible to the group as an unidentifiable object when viewing CSX230's forward-facing camera (see figure 2); for this particular detail, the purpose is to help inform an objective measure of weather/atmospheric visibility.

Figure 2. Image at 14:11:15 CST.



At 14:11:21 CST, CSX230 crossed Delauney Street. The forward-facing video image at this time is shown in figure 3; the group identified the object on the tracks as a motorcoach.

Figure 3. Image at 14:11:21 CST.



At 14:11:26 CST, just before CSX230 crossed Lameuse Street, the sound of high-pressure air, similar to the train initiating emergency airbrakes was recorded; figure 4 shows the forward-facing image at this time.

Figure 4. Image at 14:11:26 CST.



At 14:11:28 CST, CSX230 crossed Lameuse Street; the forward-facing video image at this time is shown in figure 5. The motorcoach that was struck was observably stationary although its directional orientation was unclear (that is, whether the front of the motorcoach was to the right or the left). There was vehicular traffic operating on Esters Boulevard to the right of the track.

Figure 5. Image at 14:11:28 CST.



Between 14:11:26 and 14:11:42 CST, the group observed six people moving away from the motorcoach.

At 14:11:29 CST, the CSX230's forward-facing parametric data recorded PCS³ transition from closed to open; figure 6 shows the forward-facing image at this time.

Figure 6. Image at 14:11:29 CST.



At 14:11:35 CST, the activated railroad-highway grade crossing warning lights were visible to the left of the track. At this time, the group was able to first identify that the motorcoach was grounded on the crossing.

³ PCS stands for Pneumatic Control Switch.

At 14:11:41 CST, the reflection of three lights from CSX230 were visible on the bus; these lights were the forward headlight and two auxiliary lights (ditch lights). The auxiliary lights were oscillating. At this time, the right railroad-highway grade crossing gate arm was touching the rear end of the motorcoach. Figure 7 shows the motorcoach at this time, including the center of the motorcoach touching the crossing.

Figure 7. Image at 14:11:41 CST.



At 14:11:43 CST, CSX230 struck the motorcoach.

By 14:11:45 CST, the motorcoach had rotated laterally (yawed) clockwise about 45 degrees, such that the front of the bus rotated from the 9 o'clock position to about the 10 o'clock position. The motorcoach rolled about 15 degrees from vertical (such that the top of the motorcoach was farther away from the train than the bottom of the motorcoach).

From 14:11:45 until 14:12:00 CST, a person was intermittently visible in the motorcoach's driver area.

At 14:12:00 CST, CSX230 came to a stop.