National Transportation Safety Board
Office of Research and Engineering
Washington, DC 20594

RRD23LR003

RAILVIEW VIDEO RECORDER

Specialist's Factual Report

July 18, 2023

TABLE OF CONTENTS

A. ACCIDENT

Location: Bessemer Alabama
Date: December 13, 2022
Time: 0001 Central Standard Time (CST)
0601 Coordinated Universal Time (UTC)
Locomotive: Norfolk Southern 6301, Train A55

B. RAILVIEW VIDEO RECORDER SPECIALIST

Specialist David Case
Computer Engineer / Vehicle Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

In agreement with the Investigator-In-Charge, an onboard video group was not convened, and a summary was prepared.

The NTSB Vehicle Recorder Division received the following onboard recorder:

Device Manufacturer/Model: Leidos RV-2014A
Part Number: RV-2014A
Device Serial Number: 99120268

1.0 Device Condition

The device was in good condition (figure 1) and the data were downloaded using Norfolk Southern' s equipment in Atlanta Georgia.

Figure 1. Railview Recorder.

1.1 Device Recording Description

The Railview recorder is a cab mounted video recorder with a non-volatile memory (NVM) storage device capable of storing several hours of video. It records video with a resolution of 700x480 pixels at a rate of 5 frames per second (fps). An associated audio track is also recorded from a microphone outside the train's cab. The camera was mounted inside the cab, facing forward, directly behind a window and did not include the interior of the cab. The field of view of the accident recording is illustrated in figure 2, and an image showing a typical camera installation is shown in figure 3.

The Railview recorder also recorded a few data parameters alongside the video. Speed, direction of travel, horn use, and braking were displayed next to the video in the player software and were examined in the context of this report.

2.0 Image/Video File(s) Information

The Railview recorder contained recordings from October 21, 2022 to the day of the accident (December 13, 2023). Two of the recordings were downloaded. One recording was from the day before the accident, and one recorded on the day of the accident. The recording for the day before the accident was timestamped as December 12, 2022. The second recording was timestamped with December 13,

2022, the accident date. The first recording was unremarkable. The second recording was of the accident.

Figure 2. Image showing typical camera field of view.

Figure 3. Image showing Railview camera installation in a different locomotive.

3.0 Timing and Correlation

The Railview recorder used a battery backed clock to keep track of the current time. The time of the accident recorded by the system was December 13, 2022 at 01:20 (approximately an hour and twenty minutes after the reported time of the accident), and there was no other clock source recorded to determine the actual time of the accident. Consequently, timing of the transcript is expressed as Video Elapsed Time, which is time from the beginning of the recording. The format is presented as MM:SS, where MM stands for the number of elapsed minutes, and SS, the number of elapsed seconds.

4.0 Summary of Recording Contents

Time	Event
00:00	Video recording began. The accident locomotive was halted before a grade crossing at night. Atmospheric conditions were clear. The following video stamped data parameters are noted after each entry, where appropriate: • Speed: 0.0 miles per hour (mph) • Horn: No • Braking: No
01:22	Accident locomotive began moving. • Speed: 3.0 mph
02:18	Accident locomotive passed through a grade crossing. • Speed: 6.8 mph
27:37	Accident locomotive passed the corner of Carolina & 19th St. in Bessemer, Alabama. Just past the intersection, the rear end of a parked train was visible on the left. A single locomotive was on the end of this parked train. The engine number could not be deciphered on the stopped train due to motion blur of the camera. (Figure 4) • Speed: 58.0 mph • Horn: Yes
27:53	The accident locomotive crossed a bridge over 22nd St. (Near Pistolero and Alabama Riders Clubhouse). • Speed: 55.8 mph

28:23	The accident locomotive passed a building at 2600 Carolina Ave. (figure 5)
28:30	The accident locomotive continued to pass the parked train on the left. A gondola car in the parked train with 2 long objects hanging from the top sill became visible. One was pointed away and down from the camera, the other towards the camera. (figure 6) • Speed: 53.4 mph • Horn: No • Braking: No
28:32	The accident locomotive was abreast the gondola car. As the train approached, the object that was pointed toward the accident locomotive and was hanging from the gondola car lined up with the camera of the accident locomotive. The accident locomotive rocked back and forth. After a few frames, a rectangular object was seen falling into the camera view on the far left. It's size and shape were consistent with the object seen hanging from the gondola car. The object remained in view at the same angle and position through the rest of the recording. • Speed: 53.4 mph • Horn: No • Braking: No
28:34	The horn sounded. • Speed: 53.4 mph • Horn: Yes • Braking: No
28:39	The recorded data reported brake application. The accident locomotive started to decelerate. • Speed: 53.1 mph • Horn: Yes • Braking: Yes

28:44	The front of the stopped train on the left came into view. The lead locomotive was now visible. Number 4809 was illuminated on the lead locomotive. The locomotive appeared to have a Kansas City Southern (KCS) livery. • Speed: 52.6 mph • Horn: Intermittent • Braking: Yes
28:55	The accident locomotive crossed 32nd St. N. • Speed: 52.6 mph • Horn: Yes • Braking: Yes
29:07	Ambient locomotive noise significantly reduced • Speed: 21.1 mph • Horn: Yes • Braking: Yes
29:14	Conversation was audible but unintelligible due to ambient noise and microphone placement. The conversation continued for four minutes.
29:20	The accident locomotive came to a halt.
29:44	A short "beep-beep-beep" sound was heard.
32:16	Sounds similar to telephonic tone pulse dialing were noted.
33:07	The accident locomotive started to reverse.

33:25	The recording ended.

Figure 4. Stopped train at Carolina & 19th street in Bessemer.

Figure 5. Building at 2600 Carolina Ave.

Figure 6. Gondola car came into view.

Submitted by:

David L Case
Computer Engineer / Vehicle Recorder Specialist