

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



RRD23FR011

ONBOARD IMAGE RECORDERS

Specialist's Factual Report

December 6, 2023

A. ACCIDENT

Location: New Castle, Pennsylvania
Date: May 10, 2023
Time: 2257 eastern daylight time (EDT)
0257 May 11, 2023, coordinated universal time (UTC)
Train: Norfolk Southern (NS) 14M

B. ONBOARD IMAGE RECORDERS SPECIALIST

Specialist: Michael Portman
Aerospace Engineer - Recorder Specialist
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

In agreement with the Investigator-In-Charge, an Onboard Image Recorders group was not convened, and a summary was prepared.

The NTSB Vehicle Recorder Division received the onboard image recorders for the following locomotives:

Locomotive 1 (lead): NS4342
Locomotive 2 (126th in consist): NS3632
Locomotive 3 (127th in consist): NS4689

1.0 Video Files Information

The videos downloaded from the non-lead locomotives were reviewed and determined to be not pertinent to the investigation and are therefore not discussed further in this report.

The lead locomotive was equipped with three cameras, one forward facing head-end camera, one forward facing in-cab camera, and one rear facing in-cab camera. In excess of 17 hours of video were recorded for each camera.

The videos had an image resolution of 1980x1020 pixels and were recorded at a sample rate of approximately 10 frames per second. The videos contained an overlay which included camera number, locomotive number, and date and time. Each video had an associated audio track which contained in-cab audio. No external audio was recorded on any video.

2.0 Timing and Correlation

During the time surrounding the event, the onboard image recorder was not displaying the correct locomotive number, instead showing a default locomotive number of NS9999. Additionally, the system lost correlation to local time and began displaying elapsed time since power on, starting with a value of 00:00:00 on January 1, 1970.

Therefore, the timing of the summary was established by correlating video events to common events on the locomotive event data recorder, specifically the beginning of the emergency and the stopping of the locomotive.¹ Therefore, for the remainder of this report, all times are presented in local EDT.

3.0 Summary of Recording Contents

The following table contains a summary of the videos between 2205 and 2312. Additionally, section 4.0 shows a screenshot taken from the head-end video at the time the locomotive passed the alerting hot box detector.

Table 1. Summary of recording contents between 2205 and 2312.

Time EDT (hh:mm:ss)	Observation
22:05:00	Beginning of summary. The train was travelling along a main track. Radio static was heard periodically.
22:12:39	While radio static was heard, the engineer placed his hand on the radio and the static noises ceased.
22:12:49	A no defects message was heard on the radio, (Beaver Falls, MP-PC30.5, FTW Line).
22:13:11	The locomotive passed over the hot box detector, as seen in Figure 1. As the train passed through the urbanized area, the ditch light and horn were noted periodically.
22:13:16	A second no defects message was heard on the radio, (Beaver Falls, MP-PC30.5, FTW Line).
22:15:21	Unintelligible radio chatter was noted overlapping with non-pertinent crew conversation.
22:18:24	The engineer was observed imitating a hot box detector message, calling out "axle ten thousand two hundred fifty six."
22:20:29	The engineer manipulated several controls, then stated that the auto control had been engaged and "limited to thirty."
22:24:18	Sounds possibly consistent with radio static were noted.
22:39:35	Sounds possibly consistent with radio static and chatter were noted.
22:43:04	Sounds possibly consistent with radio static were noted.

¹ For more information, see the Locomotive Event Recorder - Specialist's Factual Report in the docket.

22:57:38	Sounds of multiple simultaneous alerts, a mechanical bell, and a pneumatic whooshing sound were noted. The in-cab lights turned on. The crew reacted immediately and began manipulating several controls and radios as the locomotive slowed.
22:58:15	The locomotive stopped. It remained at this location throughout the remainder of the video summarized. The conductor stood up and began dressing in high visibility gear. He then interacted with a mobile device.
22:58:33	The mechanical bell stopped.
22:59:25	The engineer manipulated a control.
22:59:29	The in-cab lights turned off.
23:00:06	The crew discussed the event happening when they were travelling at 28 mph, with a 7-8 throttle position.
23:00:44	The conductor began toning the radio.
23:01:11	The radio call was returned. The conductor responded with their location.
23:01:44	The conductor exited the cab.
23:02:12	The conductor re-entered the cab.
23:02:57	The conductor exited the cab.
23:03:38	The conductor and engineer performed a radio check.
23:04:26	Sounds of multiple simultaneous alerts, a mechanical bell, and a pneumatic whooshing sound were again noted. The engineer manipulated several controls and called the conductor, telling him that the "flow's starting to drop" from "one sixty nine down to one forty one and then it dumped again."
23:06:31	The engineer called the conductor to inform him that he "reset it" and that the "flow's down to one forty four."
23:07:10	The engineer toned the radio.
23:07:58	The radio call was returned. The engineer responded with a status update and asked for additional troubleshooting advice.
23:10:37	As the previously mentioned conversation was taking place, sounds of multiple simultaneous alerts, a mechanical bell, and a pneumatic whooshing sound were again noted. The engineer mentioned on the radio that "it just dumped again." The engineer continued troubleshooting over the radio.
23:12:00	End of summary.

4.0 Screenshot



Figure 1. View from the head-end camera as the locomotive approached the alerting hot box detector with the equipment shed visible to the right.

Submitted by:

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