NATIONAL TRANSPORTATION SAFETY BOARD

Office of Railroad, Pipeline and Hazardous Materials Investigations

Washington, DC

BNSF Railway
Roadway Worker Fatalities
Edgemont, South Dakota
January 17, 2017

NTSB Accident No. DCA17FR004

Operations Factual Report
Ryan Frigo – Group Chairman

Accident

NTSB Accident Number:	DCA17FR004
Date of Accident:	January 17, 2017
Time of Accident:	10:09 (MST)
Type of Train and No:	Empty Unit Coal Train, E-DOLEBM0-01E
Railroad Owner:	BNSF Railway (BNSF)
Train Operator:	BNSF
Crew Members:	1 Engineer, 1 Conductor
Location of Accident:	Edgemont, SD

Operations Group Members

Ryan Frigo
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National Transportation Safety Board

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Sheet Metal, Air, Rail, and Transportation (SMART)

Accident Summary

For a summary of the accident, refer to the *Accident Summary Report* in the docket for this investigation.

Train Consist

The Train E-DOLEBM0-01E consist included two locomotives on the head end (BNSF 8489 and BNSF 9826) and two distributive power units (BNSF 8537 and BNSF 8400) on the rear of the train. The train consist included 135 empty coal cars totaling 2849 tons and 7167 feet[1].

Chronology of Events

Table 1. EDOLEBM001E Chronology.

TIME (MST)*	EVENT
9:39:36	EDOLEBM001E arrived Edgemont - MP 475.3 crossing for crew swap on Main Track 1
10:04:31	EDOLEBM001E departed Edgemont
10:08:45	Crew begins sounding horn for roadway worker crew – 35 MPH *(677 feet from accident)*
10:08:53	Engineer and Conductor induced emergency occurs – 35 MPH *(255 feet from accident*
10:08:58	Accident occurs – train speed 34 MPH
10:09:00	Radio tapes with crew broadcasting, *"Emergency, Emergency, Emergency."*
10:09:18	EDOLEBM001E comes to stop

*All times were provided by BNSF, please refer to the *Locomotive Event Recorder Factual Report* in the docket for additional information.

[1] Footage does not include locomotives.

Operating Crew Information

Table 2. BNSF EDOLEBM001E Crewmembers.

Crew	Train	Hire Date	Current Date of Certification
Engineer	EDOLEBM001E	8/16/10	8/29/14
Conductor	EDOLEBM001E	1/27/14	5/12/14

Crew On-Duty Times

Table 3. BNSF EDOLEBM001E Crewmember On-Duty Times.

Crew	Train	Date	Time	Location
Engineer	EDOLEBM001E	1/17/17	9:15 AM	Edgemont, SD
Conductor	EDOLEBM001E	1/17/17	9:15 AM	Edgemont, SD

Method of Operation and Location

The BNSF Powder River Division Black Hills Subdivision included Edgemont, South Dakota located at MP 476.1. Edgemont was an intermediate crew change point where Alliance West crews changed with Edgemont West crews.

The method of operation on the Black Hills subdivision was a centralized traffic control system controlled by the Alliance north train dispatcher located in Ft. Worth, Texas. The Black Hills subdivision is a combination of multiple main track and short segments of single track. There were two main tracks between Edgemont, MP 476.1 and Marietta, MP 483.3. The maximum authorized speed at the accident site and between Edgemont, MP 476.1 to 477, just east of Deadwood Junction was 35 mph.

Edgemont had a small switching yard that was primarily used for storage. The yard consisted of nine yard tracks with a switching lead that included the Deadwood spur.

There were 165 active train and enginemen (engineers, conductors, and brakemen) that worked in the Edgemont West Pool as well as a conductor and engineer extra boards. These crews operated trains from Edgemont to Gillette, Wyoming, including taking coal trains into and out of the mines located on the Campbell and Orin Subdivisions in the Powder River Coal Basin. There are also two mechanical employees as well as a small engineering (maintenance of way) presence at the Edgemont switching yard.

About 34 freight trains operated through Edgemont daily, with a normal operating pattern of half operating eastward and half operating westward. The trains were primarily loaded and empty coal unit trains with other types of freight trains on occasion.

Operating Rules

- **Powder River Division Timetable No. 1** (effective at 0700 Mountain Continental Time October 5, 2016 including updates through January 17, 2017)
- **BNSF Air Brake & Train Handling No. 6** (effective April 1, 2015 with updates through December 1, 2016)
- **General Code of Operating Rules 7th Addition** (effective April 1, 2015 with updates through July 1, 2016)
- **System Special Instructions No. 7** (effective October 5, 2016 with updates through January 2, 2017)
- **T&E Safety Rules** (effective January 1, 2015 with updates through January 3, 2017)
- **Signal Aspects & Indications** (effective October 5, 2016)
- **General Orders & General Notices Specific to Edgemont Terminal and the Black Hills Subdivision**
  - General Order No. 15 (effective October 17, 2016)
  - General Notice No. 310 (effective August 31, 2016)

Federal Oversight

Federal oversight of the BNSF was provided by the Federal Railroad Administration (FRA), that resided in the U.S. Federal Department of Transportation (DOT). The FRA has multiple field inspectors which conduct field inspections on BNSF property on a scheduled and random basis. FRA operational field inspectors monitor the railroad's compliance with Federal Department of Transpiration regulations per 49 CFR Parts 200 to 299. FRA also conducts periodic records reviews on BNSF for various federal record keeping requirements.

Personal Electronic Devices

Please refer to the *Human Performance Factual Report* in the docket.

Drug and Alcohol Testing of Crew

The Engineer and Conductor were not tested post-accident in accordance with BNSF's Post Accident Testing Policy and federal requirements.

BNSF Test Train

A BNSF Test Train was located on the Deadwood spur track at the time of the accident. The planned test included moving the train from the spur track onto the main line at MP 478 and performing a static test (testing air brake propagation signals throughout the train set). For interviews of the BNSF Test Train Crew please refer to the *Human*

Performance Factual Report in the docket.

Audio Communications

Edgemont 085 Radio Black Hills Sub 01-17-17

Table 4. Transcription of Radio Communications 11:04:50 CST. – Time of Accident*.

TIME	IDENTIFICATION	CONVERSATION
11:04:50 a.m.	DS**	BNSF Alliance North Dispatch Edgemont radio
	9180***	BNSF 9180 North dispatcher over
	DS	9180 go ahead over
	9180	Yea we're ready to come out whenever you can take over
	DS	Come out where over
	9180	Yea we're ready to come out when between East Edgemont and 4788 and uh we're going to need a signal at 4788 and we'll clear 4788 and stop there over
	DS	Ok roger that call me after the BNSF 8489 west gets by you over
	9180	When the BNSF 8489 west gets by us call you over
	DS	Ok thanks over
	9180	Thank you out
11:08:36 a.m.	8489****	Hello Dave Clyde
	9180	Go ahead over
	8489	That's us 8489 just going by you now uh I don't know too far back can't see there over
	9180	Yea I can't see you thanks a lot Tyler
11:09:00 a.m.	8489	Emergency Emergency Emergency BNSF 8489 west Emergency Emergency MP 477

*Audio communication was transcribed by the Operations Group
**DS -- Alliance North Train Dispatcher
***9180 – BNSF Test Train on Deadwood Wye
****8489 – BNSF EDOLEBM001E

Interviews:

The Operations Group conducted three interviews during the on-scene phase of the investigation. A summary of the interviews conducted are described in the following subsections.

Engineer

The engineer stated that he received a call for a 9:15 a.m. on duty time. When he arrived at the depot, he met with his conductor and they reviewed their paperwork. He stated that their train had not arrived yet so they discussed the day's work and their train and slow orders. He said when their train arrived they briefed with the inbound crew and got on their train. The engineer said he had an approach aspect[2] when he was ready to depart so he waited to get an approach medium[3]. He said when they got the approach medium they started to pull.

As he departed the Edgemont yard, he said he saw a test train sitting in the wye. He said that he knew the test train had authority to enter the main track behind them, so he called

[2] An approach aspect is a visual indication to the engineer to proceed and be prepared to stop at the next signal, trains exceeding 30 mph need to immediately reduce to that speed.

[3] An approach medium aspect is a visual indication to the engineer to proceed prepared to pass next signal not exceeding 40 mph and be prepared to enter diverging route at prescribed speed.

them to tell them they were passing. (See Table 4.) The engineer then stated that as his train was moving around the "blind curve"[4] he saw the rear end of a maintenance of way truck and started hitting the horn, and as he continued around the curve he saw two guys on the track and never stopped hitting the horn, he stated that one guy tried to jump out of the way.

The engineer stated that he had about 30 hours off prior to this duty assignment and that he was happy to get that call, he said it was great getting a call to work days and excited to work with his friend that was called as the conductor.

Conductor

The conductor stated that he got a 6:45 a.m. call for a 9:15a.m. on duty, so he got ready, had some coffee and headed into the depot. When he got to the depot he saw that his train wasn't there yet, he got all of his paperwork and he and the engineer briefed on the train and the day's work, and they talked about the train on the wye. Their train arrived they and they got on. The conductor stated that they only had an approach aspect so they waited. The conductor stated that the engineer called the train ahead and found out they were stopped at MP 478. The conductor then heard the dispatcher over the radio talk to the train ahead of us past the signal at MP 478. The conductor then stated that the signal aspect changed to approach medium. They pulled out and then the engineer called the train on the wye and told them that we were coming by them.

The conductor stated that as we started around the curve he saw the back end of a

[4] A blind curve is a description of limited visibility and/ or preview of objects or traffic within the curve.

maintenance of way truck so the engineer started to hit the horn and as he continued around the curve he saw two men in the tracks and a third man outside the rail he "plugged it" (applied the emergency brakes). Right before he lost sight of the men, the conductor said that he saw one man try to jump out of the way, the other man never turned around. The conductor recalled that one man had a blower and that one man had a broom or similar tool, he also recalled that all three men were looking at the switch points.

The conductor recalled that the engineer was calling "emergency" on the radio and that he went out the back door to check on the men. He recalled seeing one man under the train a couple of cars back and yelled to him but he did not respond. The conductor stated that he located another man already in the cab of the truck trying to work the radio to call 911. The conductor stated that the man in the truck was "out of it". The conductor then stated that he saw one guy face down in the snow and saw the blower in the snow near him. The conductor could not recall how long it took for the first ambulance to respond. He also could not recall any opposing train movement on main track 2.

The conductor stated that he had just come off a rest period of several days prior to this duty assignment.

General Director of Operating Practices and Rules

The general director described his role in developing locomotive technology and distributive power. Part of this duty includes testing. He described a test plan that had been set for several months that would include a cut of 10,000 feet of auto racks that were stored

on the Deadwood spur in Edgemont. He stated that preparations were made several weeks in advance of the planned test with General Electric (GE), a team from Ft. Worth and the local managers in Edgemont. Utilizing maintenance-of-way personal were not discussed as part of the test plan. The test included moving the train from the spur track onto the main line and performing a static test (testing air brake propagation signals throughout the train set) for approximately 6 hours. The general director described arriving in Edgemont and noticing that snow and ice would need to be removed from the grade crossings on the Deadwood spur before the test train would be ready (it was not yet put together and laced up). He described speaking to the Edgemont superintendent of operating practices and getting an update on prepping the test train. He then went to the depot at Edgemont so that plans could be made for the placement of electronic monitoring devices on the train for the test (this equipment had not yet been installed on the test train). The general director mentioned that a member of his team had left to go back to Hot Springs to pick up equipment for the test that the GE representative had inadvertently left behind. After an undetermined amount of time the general director recalled that the superintendent received a call on his cell phone notifying him that an incident had occurred on the Deadwood Wye. At this time, the general director left Edgemont and proceeded to the accident location. The general director described the scene as chaotic with multiple people trying to gain information on what had happened, he remembered seeing the section truck and an individual lying next to the train. He then waited for an unknown amount of time for emergency responders to arrive on scene.

Sight Distance Observations

Refer to the *Track and Engineering Factual Report* in the Docket.

Operations Group - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this Operations Group Factual Report of Two Employee Fatalities on January 17, 2017, in Edgemont, South Dakota, is a factually accurate representation of the information collected during the on-scene investigation, to the extent of their best knowledge and contribution in this investigation.

_____//s//_____ Date _____4/4/17___
Ryan J. Frigo, Group Chairman, NTSB

_____//s//_____ Date _____4/4/17___
Raymond Lindsay, FRA

_____//s//_____ Date _____4/7/17___
Mark Jones, BNSF

_____//s//_____ Date _____4/14/17__
Daniel Kenner, BLET

_____//s//_____ Date _____4/13/17_
Jim Chase, SMART/UTU

Addendum

Interview with Conductor of Test Train[5]

The conductor on the test train was hired on January 9, 2012. On the day of the accident he met a foreman in the Edgemont crew office to discuss his job for the day. They held a job briefing with the engineer and discussed more of the work with the trainmaster. They then went out to the locomotives that would be needed for the day's activities. They received authority from the train dispatcher to move from the yard to the wye. At the west leg of the Deadwood wye switch they had to chip ice to open it after the locomotive rolled through the switch. The conductor recalled that this took about 45 minutes to an hour. The conductor stated to investigators that the switch "was frozen pretty good and it was hard to throw. We actually ended up using the stand as a cheater pipe that the shovel's on for a little bit." He recalled that once they got the switch open and before they relocked it, that he threw the switch once or twice to ensure that it was functional. At that point, dispatch was contacted to relay that the locomotives were off the main track and now located on the wye track. At that point, the crew began to shove and couple cars in the train together. The conductor did not recalling seeing or having any other contact with the maintenance of way gang that morning.

[5] Interview was conducted on-scene by the Human Performance Group. A copy of the full interview transcript can be found in the docket.