NATIONAL TRANSPORTATION SAFETY BOARD

Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, DC

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

DCA17FR004

TRACK AND ENGINEERING GROUP FACTUAL REPORT

Track & Engineering Group Members

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Brotherhood of Maintenance of Way Employes Division

Summary

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

The Accident

Supervision

The roadway workers involved in this accident worked under the supervision of a roadmaster headquartered in Newcastle, Wyoming. The day before the accident, the roadmaster traveled to Scotts Bluff, Nebraska to attend BNSF meetings for two days. On the day of the accident, about 6:45 a.m., the roadmaster assigned the track inspector from Newcastle some of his duties, including contacting a train dispatcher for some track time to protect workers that were going to do some track-welding work.

The track inspector contacted the train dispatcher about 7:20 a.m. concerning the necessary track time needed for the welding. During this conversation, he found out about locomotives coming out of Edgemont Yard and going to the Deadwood Wye for a test train that would come out onto the main track and begin brake testing later that day. He knew that the Deadwood Wye had not been used for some time, so he decided to tell the Edgemont section foreman that they may be needed at the Deadwood Wye to clean snow and ice from the highway-rail grade crossings so that the train could be coupled together.

About 7:35 a.m., the track inspector briefed the section foreman that there would be a test

train bringing locomotives from the Edgemont Yard and going to the Deadwood Wye track to couple to and bring out the cut of auto rack railroad cars (auto racks) onto the main track No. 1. The track inspector advised the section foreman that they might be needed to help clear snow and ice from the crossings so that the train crew could couple the auto racks.

Roadway Worker Crew

The Edgemont section crew, consisting of a section foreman, a truck driver, and a trackman, went on duty at 7:30 a.m. at Edgemont Yard. The foreman and the truck driver took the section truck down to the 18 Cutacross Road crossing, Department of Transportation (DOT) crossing number 088754H, on the west leg of the Deadwood Wye track. The trackman operated a frontend loader to assist in the snow removal. While the frontend loader worked between the cut of cars, the track foreman and truck driver worked with the test train foreman and trainmaster cleaning snow and ice from the inside of the rails so that the car wheel flanges would stay on the rail as the train was coupled together. The trackman, operating the frontend loader, cleaned the piled up snow from the ends of the crossings. While they were working at 18 Cutacross Road, the trainmaster told the section foreman that the train crew for the test train had difficulty operating the west leg wye switch and that switch would need cleaning (snow and ice removal). He also told the section foreman about an industry switch that needed cleaning.

Accident Narrative

After the section crew finished at 18 Cutacross Road, they returned to the section building

to pick up the frontend loader operator. Upon returning, all reunited in the section truck and proceeded to the west leg of the Deadwood Wye switch on main track No. 1, the location the trainmaster told them about where the test train crew had difficulty operating the switch.

Upon arrival at the west leg of the Deadwood Wye switch, the truck driver was designated as a watchman/lookout. It was decided they would use train approach warning for their "on track safety" while cleaning the switch. The truck driver was a qualified watchman/lookout, and completed a BNSF *Statement of On-Track Safety* (statement). See Figure 2 for the completed *Statement of On-Track Safety*. On that statement and while still in the crew truck, he indicated at 10:03 a.m. that there was a minimum of 770 feet of sight distance available to clear the track 15 seconds prior to the arrival of approaching train. The statement also indicated that the method of warning of an approaching train would be verbal, and that the designated place of safety was the crew truck.

The section crew walked from the crew truck in the snow/ice conditions to the west leg of the wye switch, and started cleaning the snow and ice from the switch points. The crew truck was approximately 191 feet away from the west leg of the wye switch. While doing this task, the truck driver (watchman/lookout) held a long handle tool in both hands, the section foreman used a Tanaka Model TBL7800R backpack blower, and the trackman had a short handled tool.1 At the time of the accident, the watchman/lookout was positioned near the north rail between the running

1 The lead locomotive unit of the striking train frontend camera recorded long handled tool in the hands of the watchman/lookout, and a short handled tool with the trackman. Postaccident investigation showed a broken long handled shovel on the ground, and a short handled shovel on the ground near the switch.

rails and east of the other two workers. The section foreman was using the backpack blower to remove snow, and was just west of the watchman/lookout between the running rails. The trackman, the furthest west person, had stepped out of the gage of the track and started removing ice and snow from the long rods using a short handled shovel at the switch stand outside of the north rail. The trackman said an eastbound train was occupying main track No. 2 when they were working on the west leg of the Deadwood Wye switch on main track No 1. Figure 1 is an eastward view photograph of the switch the track crew was cleaning at the west leg of the Deadwood Wye and a piece of the long handled shovel.

Figure 1. Switch at west leg of Deadwood Wye.

The westbound train, E DOLEBM0 01E, came around the 2 degree left hand curve when the train crewmembers noticed the section crew working on the switch. See Attachment 1 for the relationship of the curve to the switch location. The engineer began sounding the horn and bell, but saw no response from the work group. Both train crewmembers applied the emergency brakes, but the train was unable to stop and struck the section foreman and the watchman/lookout about 10:09 a.m. Only about six minutes had elapsed after the *Statement of On-Track Safety* form was completed. The surviving trackman said that he did not hear the train approaching.

The trackman said that neither he nor the other two workers were wearing hearing protection. He also said they were not wearing hoods or helmet liners.

Postaccident Sight Distance Simulation

During the investigation, the track group conducted a sight distance simulation using an on track high-rail vehicle on main track No. 1. The vehicle approached the west leg of the Deadwood Wye switch from the east. The simulation showed that when a watchman/lookout stood at the #2-switch rod and with an eastbound train on main track No. 2, there was 621 feet of sight distance when the high-rail vehicle became visible in the curve. A watchman/lookout standing at a watchman/lookout position north of the switch and east of the workers with a train on main track No. 2, there was 705 feet of sight distance. A watchman/lookout standing at a watchman/lookout position north of the switch and east of the workers and no train on main track N0. 2, there was 1031 feet of sight distance. See Attachment 1 for the track configuration and the data from the sight distance simulation.

Federal Regulations -- Train Approach Warning Watchman/Lookout

The preamble of the Federal Railroad Administration's (FRA), revised June 10, 2016, Roadway Worker Protection regulation, 49 *Code of Federal Regulations* (CFR) 214, included comments from the Brotherhood of Maintenance of Way Employes Division's (BMWED) expressing concern that some railroads did not provide watchmen/lookouts with any audible or visual warning devices to provide appropriate train approach warning.[2] The comment pointed out the existing definition of the term ''watchman/lookout'' in Part 214.7 that requires, in part, that roadway workers acting as watchmen/lookouts be properly equipped to provide visual and auditory warning, such as whistle, air horn, white disk, red flag, lantern, and fusee. The comment urged the FRA to clarify in the final rule that the use of such audible and/or visible warning devices are mandatory to provide train approach warning under Part 214.329. The FRA concurred with the BMWED. Both the definition of watchman/lookout and the operative train approach warning regulation at Part 214.329(c) and (g) provides that watchmen/lookouts must be properly equipped to provide train approach warning.

49 CFR 214.7: Definitions states:

> *Watchman/lookout* means an employee who has been annually trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment. Watchmen/lookouts shall be properly equipped to provide visual and auditory warning such as whistle, air horn, white disk, red flag, lantern, and fusee. A watchman/lookout's sole duty is to look out for approaching trains/on-track equipment and provide at least fifteen

2 49CFR214 (FRA Docket NO. RSOR 13, Notice No. 9) RIN 2130-AA86 Roadway Worker Protection Final Rule. Federal Register / Vol. 61, No. 242 / Monday, December 16, 1996 / Rules and Regulations 65959.

seconds advanced warning to employees before arrival of trains/on-track equipment.

The track group inspected the crew truck used by the Edgemont section and this watchman/lookout "kit" was not found. However, it was later discovered that the BNSF does not provide visual and auditory warning devices such as whistle, air horn, white disk, red flag, lantern, and/or fuse for their watchman/lookout.

49 CFR 214.329, amended and published on June 10, 2016, states:

> Roadway workers in a roadway work group who foul any track outside of working limits shall be given warning of approaching trains by one or more watchmen/lookouts in accordance with the following provisions:
>
> **(a)** Train approach warning shall be given in sufficient time to enable each roadway worker to move to and occupy a previously arranged place of safety not less than 15 seconds before a train moving at the maximum speed authorized on that track can pass the location of the roadway worker.
>
> **(b)** Watchmen/lookouts assigned to provide train approach warning shall devote full attention to detecting the approach of trains and communicating a warning thereof, and shall not be assigned any other duties while functioning as watchmen/lookouts.
>
> **(c)** The means used by a watchman/lookout to communicate a train approach warning shall be distinctive and shall clearly signify to all recipients of the warning that a train or other on-track equipment is approaching.
>
> **(d)** Every roadway worker who depends upon train approach warning for on-track safety shall maintain a position that will enable him or her to receive a train approach warning communicated by a watchman/lookout at any time while on-track safety is provided by train approach warning.
>
> **(e)** Watchmen/lookouts shall communicate train approach warnings by a means that does not require a warned employee to be looking in any particular direction at the time of the warning, and that can be detected by the warned employee regardless of noise or distraction of work.

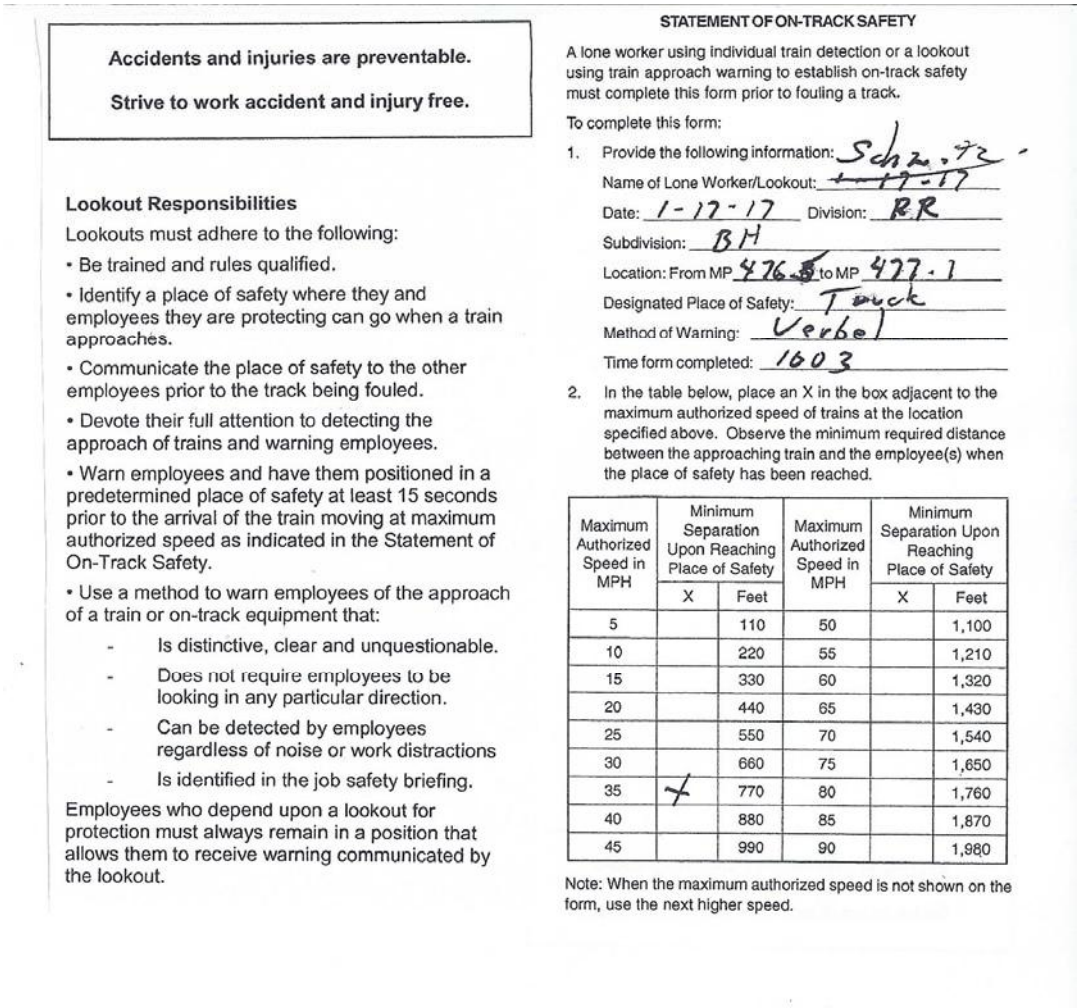
(f) Every roadway worker who is assigned the duties of a watchman/lookout shall first be trained, qualified and designated in writing by the employer to do so in accordance with the provisions of § 214.349.

(g) Every watchman/lookout shall be provided by the employer with the equipment necessary for compliance with the on-track safety duties, which the watchman/lookout will perform.

BNSF Rules

6.3.3 B. Lookouts

Lookouts must complete the form entitled "Statement of On-Track Safety" before any member of the work group fouls the track. The completed form must remain in the lookout's possession while a work group performs minor work or routine inspection and on-track safety is established using a lookout. [See Figure 2 for a copy of the double-sided Statement of On-Track Safety that the watchman/lookout had in his possession.]



Accidents and injuries are preventable.

Strive to work accident and injury free.

Lookout Responsibilities

Lookouts must adhere to the following:

- Be trained and rules qualified.
- Identify a place of safety where they and employees they are protecting can go when a train approaches.
- Communicate the place of safety to the other employees prior to the track being fouled.
- Devote their full attention to detecting the approach of trains and warning employees.
- Warn employees and have them positioned in a predetermined place of safety at least 15 seconds prior to the arrival of the train moving at maximum authorized speed as indicated in the Statement of On-Track Safety.
- Use a method to warn employees of the approach of a train or on-track equipment that:
  - Is distinctive, clear and unquestionable.
  - Does not require employees to be looking in any particular direction.
  - Can be detected by employees regardless of noise or work distractions
  - Is identified in the job safety briefing.

Employees who depend upon a lookout for protection must always remain in a position that allows them to receive warning communicated by the lookout.

STATEMENT OF ON-TRACK SAFETY

A lone worker using individual train detection or a lookout using train approach warning to establish on-track safety must complete this form prior to fouling a track.

To complete this form:

1. Provide the following information: Schw. #2
   Name of Lone Worker/Lookout: ~~[illegible]~~
   Date: 1-17-17 Division: RR
   Subdivision: BH
   Location: From MP 476.5 to MP 477.1
   Designated Place of Safety: Truck
   Method of Warning: Verbal
   Time form completed: 1603
2. In the table below, place an X in the box adjacent to the maximum authorized speed of trains at the location specified above. Observe the minimum required distance between the approaching train and the employee(s) when the place of safety has been reached.

Maximum Authorized Speed in MPH	Minimum Separation Upon Reaching Place of Safety		Maximum Authorized Speed in MPH	Minimum Separation Upon Reaching Place of Safety	
	X	Feet		X	Feet
5		110	50		1,100
10		220	55		1,210
15		330	60		1,320
20		440	65		1,430
25		550	70		1,540
30		660	75		1,650
35	X	770	80		1,760
40		880	85		1,870
45		990	90		1,980

Note: When the maximum authorized speed is not shown on the form, use the next higher speed.

Figure 2. Accident work group Statement of On-Track Safety

Lookouts must adhere to the following:

- Be trained and rules qualified
- Identify a place of safety where they and employees in their work group can go when a train or engine approaches.
- Communicate the place of safety to all employees in the work group before fouling the track.
- Devote their full attention to detecting the approach of trains and engines and warning employees.

- Warn employees and have them positioned in a predetermined place of safety at least 15 seconds before the arrival of the train or engine moving at maximum authorized speed as indicated on the Statement of On-Track Safety.
- Use a method to warn employees of the approach of a train, engine or on-track equipment that:
  - Is distinctive, clear and unquestionable.
  - Does not require employees to be looking in any particular direction.
  - Can be detected by employees regardless of noise or work distractions.
  - Is identified in job safety briefing
  - Employees who depend upon a lookout for on-track safety must always remain in a position that allows them to receive warnings communicated by the lookout.

Conditions for Use

A work group may perform minor work or routine inspection while on-track safety is established using a lookout when they meet all of the following conditions:

- The work will not affect the movement of trains or engines.
- Lookouts must be able to visually detect the approach of trains or engines moving at maximum authorized speed. They must position themselves and the members of the work group in a predetermined place of safety at least 15 seconds before the arrival of the train or engine as indicated by the Statement of On-Track Safety.
- Visibility is sufficient to observe the entire track segment at the minimum separation distance specified by the “Statement of On-Track Safety”.
- The ability to communicate a warning to all members of the work group upon the approach of trains, engines or other on-track equipment is not impaired by background noise, lights, precipitation, fog, a passing train or other physical condition.
- Natural or artificial light and conditions are sufficient to observe approaching trains, engines, or on-track equipment at the minimum separation distance as specified by the “Statement of On-Track Safety”. Train approach warning is prohibited based solely upon the observation of headlights, ditch lights, or markers, such as during conditions of insufficient visibility as affected by darkness or inclement weather.

Track Description

A survey team documented and measured data points of the tracks and other pertinent features and fixtures. The track and engineering group supervised the BNSF contractor surveyors who used the data to complete a plan view drawing. See Attachment 1 for the drawing of the track configuration.

The maximum authorized speed on the Black Hills Subdivision between MP 476.1 and MP 477.0 was 35 mph on both main tracks. Approximately 20 eastbound and 20 westbound trains operate through the Deadwood Wye area on the main tracks per day. There are multiple main tracks in this area with eastbound trains typically operating on main track No. 2 and westbound trains operating on main track No. 1. Usually, no local freight trains operated through that area.

The track structure near the location of the accident consisted of wooden crossties with spiked tie plates with Pandrol clips or screwed down tie plates with Pandrol clips. The rail in this area was a combination of 141 lb., 132 lb., and 136 lb.

The west leg of the Deadwood Wye is a left hand switch and consisted of 136 lb. rail with a No. 11 spring rail frog. The switch points were 19 feet 6 inches long. The switch for the west leg of the wye was a hand throw switch equipped with an electric lock.

A rail lubricator was located at MP 477.028 immediately to the west of the west leg of the Deadwood Wye switch and on the same side of the track as the switch stand. The rail lubricator was functioning and applying grease on the flange side of the rail.

Westbound train E DOLEBM0 01E (striking train) conducted a crew change at MP 475.1 on the Butte Subdivision main track No. 1. The grade at the crew change location was .75 percent descending and within the main body of a left hand 1 degree curve with the end of curve at approximately MP 475.6.

- At MP 475.240, train traversed the public highway-rail grade crossing DOT #064881R (HWY SD 471).
- At MP 475.269, train traversed the straight side of a #11 turnout with asset ID #0501E (Edgemont east yard switch).
- At MP 475.6, train traversed tangent track for approximately 8 tenths of a mile on descending grade .04 percent, and the curve ending at approximately MP 476.4
- At MP 476.4, train traversed a left hand 2 degree curve approximately 6 tenths of a mile on descending grade .65 percent, with the curve ending at approximately MP 476.95.
- At MP 476.515, train traversed a public crossing DOT #064884L (HWY SD 18 P).
- At MP 476.546, train traversed trailing point move straight side of a #11 turnout with asset ID #0510W (west Edgemont Yard switch).
- At MP 476.698, train traversed facing point move straight side of a #11 turnout with asset ID # 0570 (east Deadwood Wye switch).
- At MP 476.993, train struck section employees cleaning snow on switch with asset ID # 0571E a trailing point move side of a #11 turnout (west Deadwood Wye switch).
- At MP 477.0, train traversed tangent track with ascending grade of 0.1 percent, tangent

track continued towards the next curve at MP 479.1, 2.1 miles from accident location.

- Tangent track continued with an ascending grade from MP 477.0 to beyond MP 478.0. Between MP 477.0 and MP 478.0, the grade ascended 0.1 percent.

Pre-Accident Track Maintenance and Inspections

Typically, weather, track inspector reports, train crew reports, track geometry reports, and defective rail detections determined the daily track maintenance schedule and activities.

Program maintenance activities performed on Black Hills Subdivision between July 17, 2016 and January 17, 2017 on main track No. 1 and between MP 476 and MP 479 and included the following:

- Tie Replacement – August 10, 2016, mechanized tie gang installed 550 ties per mile average between MP 476 and MP 478.
- Tamp Track – August 14, 2016, surface repair in association with mechanized tie gang.
- Adjust Rail Lengths – August 10, 2016, distressing of rail ahead of tie gang, 10 welds made within this segment of track.
- Replace Crossing Panels – full crossing rehab with new panels installed and joints from panels eliminated October 8, 2016 through October 11, 2016 at MP 475.2.

The BNSF designated main track No. 1 as Class 3 track, with a 35 mph maximum authorized speed between MP476.1 and MP477.0. The accumulated tonnage over the area of the accident was 88.4 million gross tons (mgt). Because 10 mgt was exceeded, the BNSF was required to visually inspect the track twice weekly (instead of once weekly) with three calendar days between inspections. Inspection records showed that the BNSF met or exceeded the requirements

in 49 CFR 213.233.

Track maintenance regulations at 49 CFR 213.235 required inspection of the west leg of the Deadwood Wye switch once per month. The BNSF met that requirement.

The last visual inspection of main track No. 1 was on January 16, 2017. There were no records of any exceptions to the FRA standards.

The BNSF frequency is three geometry inspections within 12 months with no less than 60 days between inspections. The last geometry car inspection on main track No. 1 occurred on January 7, 2017. During that inspection, a yellow tag maintenance advisory was detected at MP 476.72 for wide gage for a distance of 2-feet.

In addition to the inspections required by Part 213.233,

> …each track owner shall conduct internal rail inspections sufficient to maintain service failure rates per rail inspection segment in accordance with this paragraph (a) for a 12-month period, as determined by the track owner and calculated within 45 days of the end of the period. Internal rail inspections on Class 4 and 5 track, or Class 3 track with regularly scheduled passenger trains or that is a hazardous materials route, shall not exceed a time interval of 370 days between inspections or a tonnage interval of 30 million gross tons (mgt) between inspections, whichever is shorter. Internal rail inspections on Class 3 track that is without regularly-scheduled passenger trains and not a hazardous materials route must be inspected at least once each calendar year, with no more than 18 months between inspections, or at least once every 30 mgt, whichever interval is longer, but in no case may inspections be more than 5 years apart.3

3 Reference TSS 213.237

The BNSF inspects the rail for internal rail defects every 23 days, with the last inspection for internal rail defects on January 3, 2017, with no rail flaws detected in that area of the accident.

Operation Testing Summary of Accident Employees

The roadmaster said that he did not like using the watchman/lookout as a form of on track safety while working on the track. His preference was the use of "track and time" or "Form B". In both those methods of on track safety, the track is out of service with the train dispatcher. The roadmaster said that track and time was used about 90 percent of the time. In addition, the surviving trackman said that this crew used the watchman/lookout only once before during the two to three weeks he was with them.

The following is the Operations Testing Summary for the period of January 17, 2016 to January 17, 2017:

- The foreman had 24 observations recorded, with 0 failures. Of the 24 observations, three tests (350-1) were associated with Main Track Authorization MWOR 6.3.1, no tests associated with MWOR 6.3.3 Visual detection of trains (350-3).
- The truck driver had 24 observations recorded, with 0 failures. Of the 24 observations, three tests (350-1) were associated with Main Track Authorization MWOR 6.3.1, no tests associated with MWOR 6.3.3 Visual detection of trains (350-3).
- The trackman had four observations recorded, with no failures. Of the four observations, no tests were associated with Main Track Authorization MWOR 6.3.1, and no tests associated with MWOR 6.3.3 Visual detection of trains.

Post-Accident Inspection of Track and Track Inspection Records

On January 19, 2017, the track group conducted a high-rail visual inspection/examination of main track No. 1 from MP 476.5 to MP 477.0. Based on the findings of this inspection, the FRA railroad safety inspector (Track) completed an FRA inspection report. The report noted no exceptions of the track safety standards (TSS).

Also on January 19, 2017, the track group conducted a visual switch inspection/examination of the west leg of the Deadwood Wye switch. Based on the findings of this inspection, the FRA Railroad Safety Inspector (Track) completed an FRA inspection report. The report noted that due to snow and/or ice between the wing rail and frog point, it did not allow the wing rail to close creating a 3/8 inch gap. The BNSF repaired this track defect on the same day before returning the track to service.

The FRA railroad safety inspector (Track) conducted an inspection of the BNSF's *Track Inspection Records* to determine compliance with the FRA regulations. The portion of the track inspection records reviewed were for the period from July 2, 2016 to January 16, 2017. The twice-weekly inspection records were complete, and there were no deficiencies noted.

The FRA railroad safety inspector (Track) conducted an inspection of the BNSF's *Switch Inspection Records* to determine compliance with the FRA regulations. The portion of the track inspection records reviewed were for the period from July 2016 to December 2016. The monthly inspection records were complete, and there were no deficiencies noted.

The FRA railroad safety inspector (Track) inspected records for the following Subparts of Part 213, *Track Safety Standards* for compliance. There were no exceptions noted in any of the following records inspected:

- 213.53 -- Gage
- 213.55 -- Alinement
- 213.63 -- Track Surface
- 213.233 -- Track Inspections
- 213.235 -- Inspection of Switches
- 213.237 -- Inspection of rail
- 213.241 -- Inspection Records

Regulatory Track Inspection History

A Region 8 FRA track safety inspector performed a routine track inspection on December 21, 2016, on the BNSF track on the Black Hills Subdivision in South Dakota. The inspection encompassed the track between the South Dakota and Wyoming State Lines, MP 498.0 and MP 478.0. The inspection did not reach the location of the Deadwood Wye switch due to the volume of trains operating or needing to operate into and out of Edgemont. The FRA track safety inspector observed one Roadway Maintenance Machine/Roadway Worker Protection inspection. This inspection was on the BNSF Track Inspector's vehicle. This would include the lights, hi-rail gear assembly, and availability of Rule Books, Timetables and track authority granted, as well as, a job briefing with the FRA Inspector on the track authority granted.

On March 22, 2016, the Region 8 FRA track inspector performed a routine track inspection on the BNSF Black Hills Subdivision in South Dakota. This track inspection encompassed the track between the South Dakota and Wyoming State Lines (MP 498.0) and Edgemont (MP475.25).

Once again, the only Roadway Maintenance Machine/Roadway Worker Protection inspection performed was on the hi-rail vehicle, rulebooks on hand, and track authority granted for the inspection and subsequent job briefing. The inspector traversed and inspected the track area encompassing the location of the accident. He did not note any non-compliant conditions.

Damages Estimates:

There was no track damage.

Other Information:

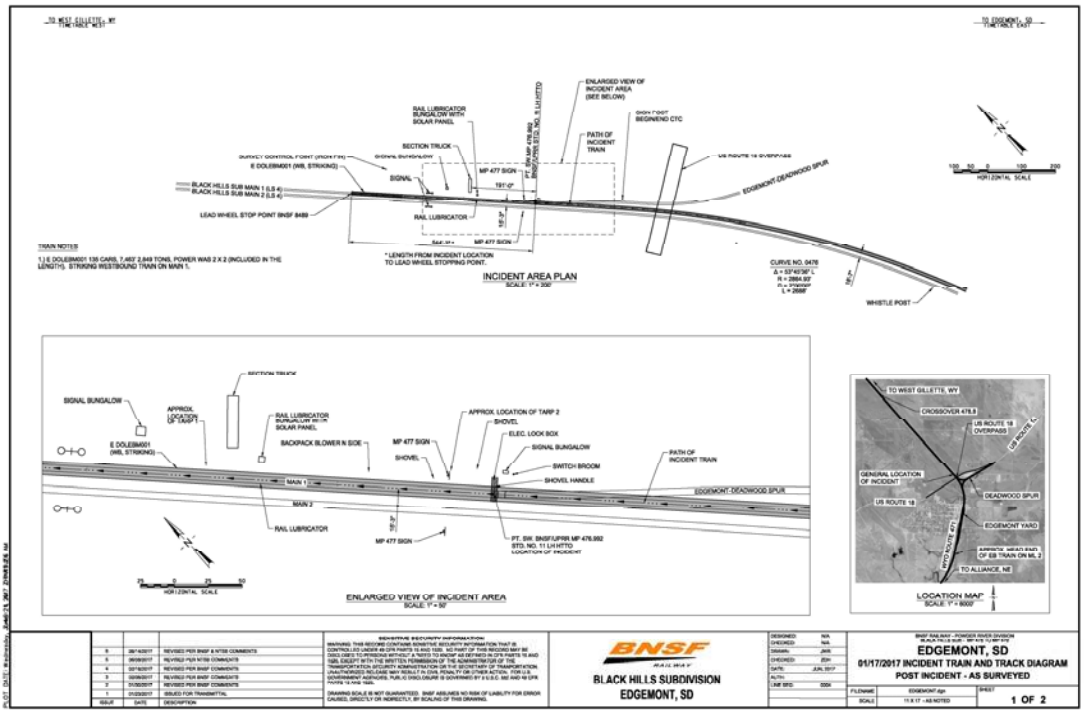
FAMES: Fatal Accidents Under Train Approach Warning (Watchman/Lookout)

Following the implementation of the Roadway Worker Protection (RWP) Rule in 1997 and as of January 1, 2012, there have been 42 RWP accidents, in which 44 roadway workers perished. The FAMES Committee obtained data to analyze 39 RWP accidents, which accounted for 41 of the 44 fatalities. The FAMES Committee based its analysis on the available data. One form of On-Track Safety for Roadway Work Groups is "Train Approach Warning" (TAW) provided by Watchmen/Lookouts. See Attachment 2 for the entire Fames Report.

- TAW (often referred to as Watchman/Lookout) does not require trains to get authorization from the Roadway Worker in Charge (RWIC) to move on any track(s).
- When using TAW, a warning must be given in sufficient time to enable each Roadway Worker to occupy a previously arranged place of safety at least 15 seconds prior to a train passing the Roadway Worker's location.

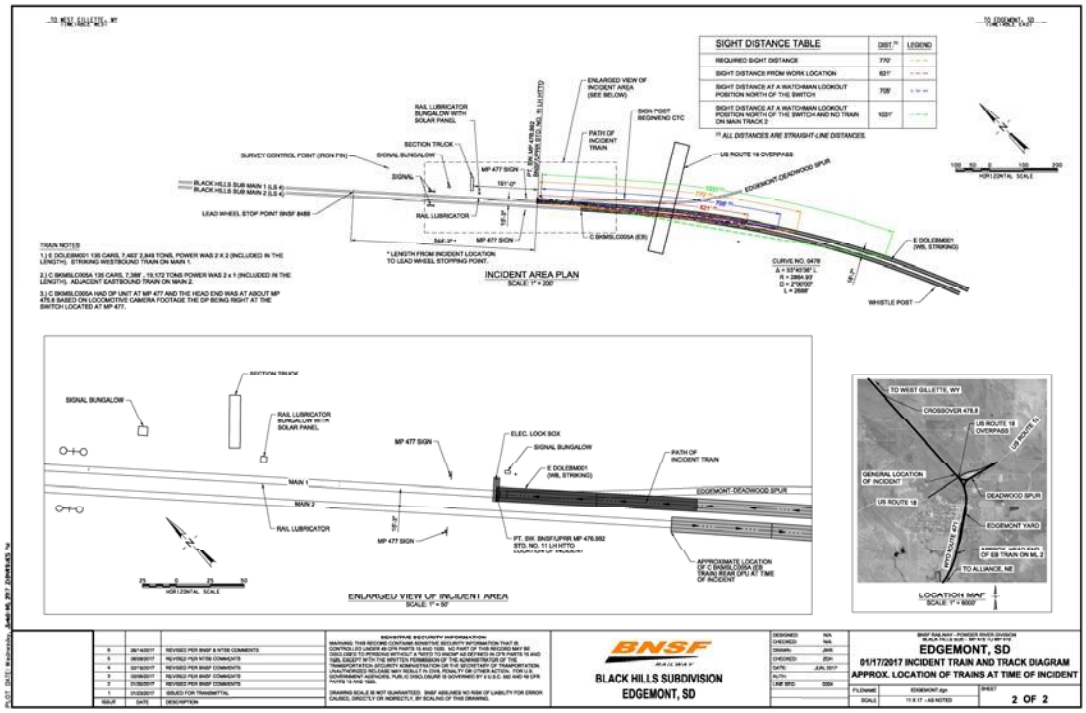
- Watchmen/Lookouts must be trained, qualified, and properly equipped to provide warning to Roadway Workers of approaching trains or on track equipment.
- Of the 41 Roadway Worker fatalities analyzed by FAMES, 10 accidents resulting in 11 fatalities occurred where TAW was in use.

Attachment 1



Sheet 1 of 2

Attachment 1



Sheet 2 of 2

Attachment 2

Fatality Analysis of Maintenance-of-way Employees and Signalmen

FAMES

January 6, 2014

Dedication:

The FAMES Committee dedicates its efforts to all roadway workers who have lost their lives in the performance of duty and to the families, loved ones, and coworkers they have left behind.

Fatal Accidents

Under

Train Approach Warning

(Watchman/Lookout)

Mission Statement:

The Mission of the Fatality Analysis of Maintenance-of-way Employees and Signalmen (FAMES) Committee is to analyze all fatalities and selected related incidents in order to make recommendations to reduce the risk of future occurrences and eliminate fatalities to roadway workers.

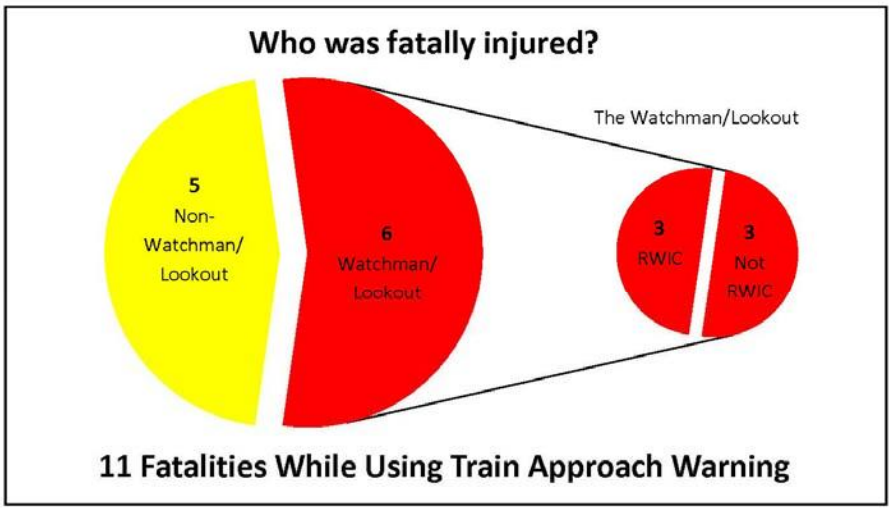
Fatal Accidents Under Train Approach Warning (Watchman/Lookout)

Following the implementation of the Roadway Worker Protection (RWP) Rule in 1997, there have been a total of 42 fatal RWP accidents, in which 44 roadway workers have perished, as of January 1, 2012. The FAMES Committee was able to obtain data to analyze 39 fatal RWP accidents, which accounted for 41 of the 44 fatalities. The FAMES Committee analysis is based on the available data.

One form of On-Track Safety for Roadway Work Groups is "Train Approach Warning" (TAW) provided by Watchmen/Lookouts.

- TAW (often referred to as Watchman/Lookout) does not require trains to get authorization from the Roadway Worker in Charge (RWIC) to move on any track(s).
- When using TAW, a warning must be given in sufficient time to enable each Roadway Worker to occupy a previously arranged place of safety at least 15 seconds prior to a train passing the Roadway Worker's location.
- Watchmen/Lookouts must be trained, qualified, and properly equipped to provide warning to Roadway Workers of approaching trains or on track equipment.

Of the 41 Roadway Worker fatalities analyzed by FAMES, 10 accidents resulting in 11 fatalities occurred where TAW was being used.



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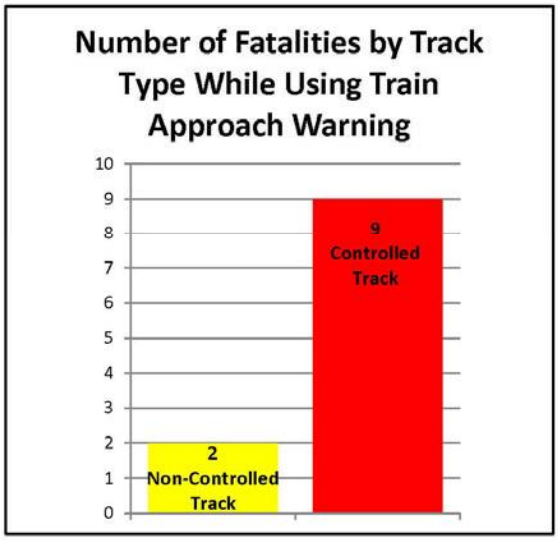

In 4 of the 10 fatal accidents, the Watchmen/Lookouts were not using prescribed warning devices, such as a whistle, air horn, white disk, red flag, lantern, or fusee. In one fatal accident under TAW, FAMES was unable to determine if the Watchman/Lookout was equipped with such devices. In the other five fatal accidents, the Watchmen/Lookouts were equipped with the prescribed warning devices.

Findings:

- **In 6 of the 10 fatal accidents,** ***the Watchman/Lookout was the fatally injured employee.***
- 9 of the fatal accidents occurred on controlled track.
- In 3 of the fatal accidents, the Watchman/Lookout was performing other duties or not focused solely on the detection of approaching trains when the fatality occurred.
- In 1 accident, the fatally injured Roadway Worker was not in a position that allowed him to receive the TAW.
- In 4 of the fatal accidents, trains were running against the anticipated flow of traffic.
- In 2 of the fatal accidents, two trains passed in close succession and a Roadway Worker was struck by the second train.

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Recommendations:

- **Watchmen/Lookouts must focus their sole attention to the detection of approaching trains and equipment.**
- Watchmen/Lookouts should position themselves outside the foul of any track whenever possible. Each Roadway Worker must maintain a position so he or she can receive a warning from a Watchman/Lookout at all times.
- Whenever environmental or working conditions change that could interfere with a Watchman/Lookout's ability to detect the approach of a train or provide appropriate warning, the Watchman/Lookout must immediately clear Roadway Workers from the tracks until proper protection can be established.
- Watchmen/Lookouts should take into consideration that passenger trains are generally quieter and faster than freight trains.
- **If the work requires oversight and supervision from an RWIC, the RWIC must not perform the duties of a Watchman/Lookout.**
- The RWIC must communicate precise instructions and expectations to Watchmen/Lookouts during the on-track safety briefings and ensure that Watchmen/Lookouts have a clear understanding of their responsibilities and duties.
- The RWIC should consider rotating Watchman/Lookout assignments periodically.
- During the on-track safety briefing, the RWIC must identify the method that the Watchman/Lookout will use to indicate when it is safe for Roadway Workers to re-enter the foul of the track.
- Roadway Workers must not be in the foul of the track anytime they believe that TAW protection is insufficient or no longer appropriate. Roadway Workers have the right and responsibility to initiate a good faith challenge when necessary.

NEVER ANTICIPATE THE DIRECTION OR TRACK FROM WHICH THE NEXT TRAIN MAY APPROACH.

The FAMES Committee consists of safety representatives from a cross section of rail labor, railroad management, and federal regulators. FAMES is a continuous improvement process that relies on the candid sharing of available data and the views of its participants. To enable the process, FAMES explicitly refrains from making any findings regarding whether any past or present practice or protocol satisfies any legal duty or standard of care.

The views, opinions, and recommendations contained in this report are those of the FAMES Committee and do not necessarily represent the views, opinions, or recommendations of any specific railroad, labor organization, or governmental agency.

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