
***Federal Railroad Administration***
***Office of Railroad Safety***
***Accident and Analysis Branch***

# *Accident Investigation Report*
# *HQ-2015-1003*

***BNSF Railroad Co. (BNSF)***
***Larimore, ND***
***January 15, 2015***

***Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.***

U.S. Department of Transportation
Federal Railroad Administration

# FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2015-1003

## TRAIN SUMMARY

| 1. Name of Railroad Operating Train #1 | 1a. Alphabetic Code | 1b. Railroad Accident/Incident No. |
|---|---|---|
| BNSF Railway Company | BNSF | TC-0115-201 |

## GENERAL INFORMATION

| 1. Name of Railroad or Other Entity Responsible for Track Maintenance | 1a. Alphabetic Code | 1b. Railroad Accident/Incident No. |
|---|---|---|
| BNSF Railway Company | BNSF | TC-0115-201 |
| **2. U.S. DOT Grade Crossing Identification Number** | **3. Date of Accident/Incident** | **4. Time of Accident/Incident** |
| 086787N | 1/15/2015 | 3:35 PM |

5. Type of Accident/Incident
Hwy-Rail Crossing

| 6. Cars Carrying HAZMAT | 7. HAZMAT Cars Damaged/Derailed | 8. Cars Releasing HAZMAT | 9. People Evacuated | 10. Subdivision |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Devils Lake |

| 11. Nearest City/Town | 12. Milepost *(to nearest tenth)* | 13. State Abbr. | 14. County |
|---|---|---|---|
| Larimore | | ND | GRAND FORKS |

| 15. Temperature (F) | 16. Visibility | 17. Weather | 18. Type of Track |
|---|---|---|---|
| -7 ˚F | Day | Clear | Main |

| 19. Track Name/Number | 20. FRA Track Class | 21. Annual Track Density *(gross tons in millions)* | 22. Time Table Direction |
|---|---|---|---|
| Single Main | Freight Trains-60, Passenger Trains-80 | 9.53 | West |

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## OPERATING TRAIN #1

| 1. Type of Equipment Consist: | 2. Was Equipment Attended? | 3. Train Number/Symbol |
|---|---|---|
| Freight Train | Yes | B-UPIMAW5-03A |

| 4. Speed (recorded speed, if available) R - Recorded E - Estimated | Code | 5. Trailing Tons (gross exluding power units) | 6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter | Code |
|---|---|---|---|---|
| 43 MPH | R | 1476 | | 0 |

6. Type of Territory

Signalization:

Signaled

Method of Operation/Authority for Movement:

Direct Train Control

Supplemental/Adjunct Codes:

D

| 7. Principal Car/Unit | a. Initial and Number | b. Position in Train | c. Loaded (yes/no) | 8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box. | Alcohol | Drugs |
|---|---|---|---|---|---|---|
| (1) First Involved *(derailed, struck, etc.)* | UP 4119 | 1 | yes | | 0 | 0 |
| (2) Causing *(if mechanical, cause reported)* | 0 | 0 | no | 9. Was this consist transporting passengers? | | No |

| 10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.) | a. Head End | Mid Train b. Manual | Mid Train c. Remote | Rear End d. Manual | Rear End e. Remote | 11. Cars (Include EMU, DMU, and Cab Car Locomotives.) | Loaded a. Freight | Loaded b. Pass. | Empty c. Freight | Empty d. Pass. | e. Caboose |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Total in Train | 2 | 0 | 0 | 0 | 0 | (1) Total in Equipment Consist | 0 | 0 | 47 | 0 | 0 |
| (2) Total Derailed | 0 | 0 | 0 | 0 | 0 | (2) Total Derailed | 0 | 0 | 0 | 0 | 0 |

| 12. Equipment Damage This Consist | 13. Track, Signal, Way & Structure Damage |
|---|---|
| 500 | 0 |

14. Primary Cause Code

M302 - Highway user inattentiveness

15. Contributing Cause Code

| Number of Crew Members | | | | Length of Time on Duty | |
|---|---|---|---|---|---|
| 16. Engineers/Operators | 17. Firemen | 18. Conductors | 19. Brakemen | 20. Engineer/Operator | 21. Conductor |
| 1 | 0 | 1 | 0 | Hrs: 7 Mins: 35 | Hrs: 7 Mins: 35 |

| Casualties to: | 22. Railroad Employees | 23. Train Passengers | 24. Others | 25. EOT Device? | 26. Was EOT Device Properly Armed? |
|---|---|---|---|---|---|
| | | | | Yes | Yes |
| Fatal | 0 | 0 | 0 | 27. Caboose Occupied by Crew? | |
| Nonfatal | 0 | 0 | 0 | | No |

| 28. Latitude | 29. Longitude |
|---|---|
| 47.903664000 | -97.608010000 |

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## CROSSING INFORMATION

| Highway User Involved | Rail Equipment Involved |
|---|---|
| 1. Type: School Bus | 5. Equipment: Train (Units Pulling) |
| 2. Vehicle Speed *(est. mph at impact)*: 0 | 3. Direction *(geographical)*: North |
| | 6. Position of Car Unit in Train: 1 |
| 4. Position of Involved Highway User: Stopped on Crossing | 7. Circumstance: Rail Equipment Struck Highway User |
| 8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?: Neither | 8b. Was there a hazardous materials release by: Neither |

8c. State here the name and quantity of the hazardous material released, if any.

N/A

| 9. Type of Crossing Warning | 10. Signaled Crossing Warning | 11. Roadway Conditions |
|---|---|---|
| 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew<br>2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other *(spec. in narr.)*<br>3. Standard FLS 6. Audible 9. Watchman 12. None<br>7, 8 | | Dry |

| 12. Location of Warning | 13. Crossing Warning Interconnected with Highway Signals | 14. Crossing Illuminated by Street Lights or Special Lights |
|---|---|---|
| Both Sides | No | No |

| 15. Highway User's Age | 16. Highway User's Gender | 17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train | 18. Highway User |
|---|---|---|---|
| 62 | Male | Yes | Stopped on crossing |

| 19. Driver Passed Standing Highway Vehicle | 20. View of Track Obscured by *(primary obstruction)* |
|---|---|
| No | Not Obstructed |

| Casualties to: | Killed | Injured | 21. Driver was | 22. Was Driver in the Vehicle? |
|---|---|---|---|---|
| | | | Killed | Yes |
| 23. Highway-Rail Crossing Users | 2 | 12 | 24. Highway Vehicle Property Damage *(est. dollar damage)*: 2000 | 25. Total Number of Vehicle Occupants *(including driver)*: 14 |

| 26. Locomotive Auxiliary Lights? | 27. Locomotive Auxiliary Lights Operational? |
|---|---|
| Yes | Yes |
| 28. Locomotive Headlight Illuminated? | 29. Locomotive Audible Warning Sounded? |
| Yes | Yes |

10. Signaled Crossing Warning

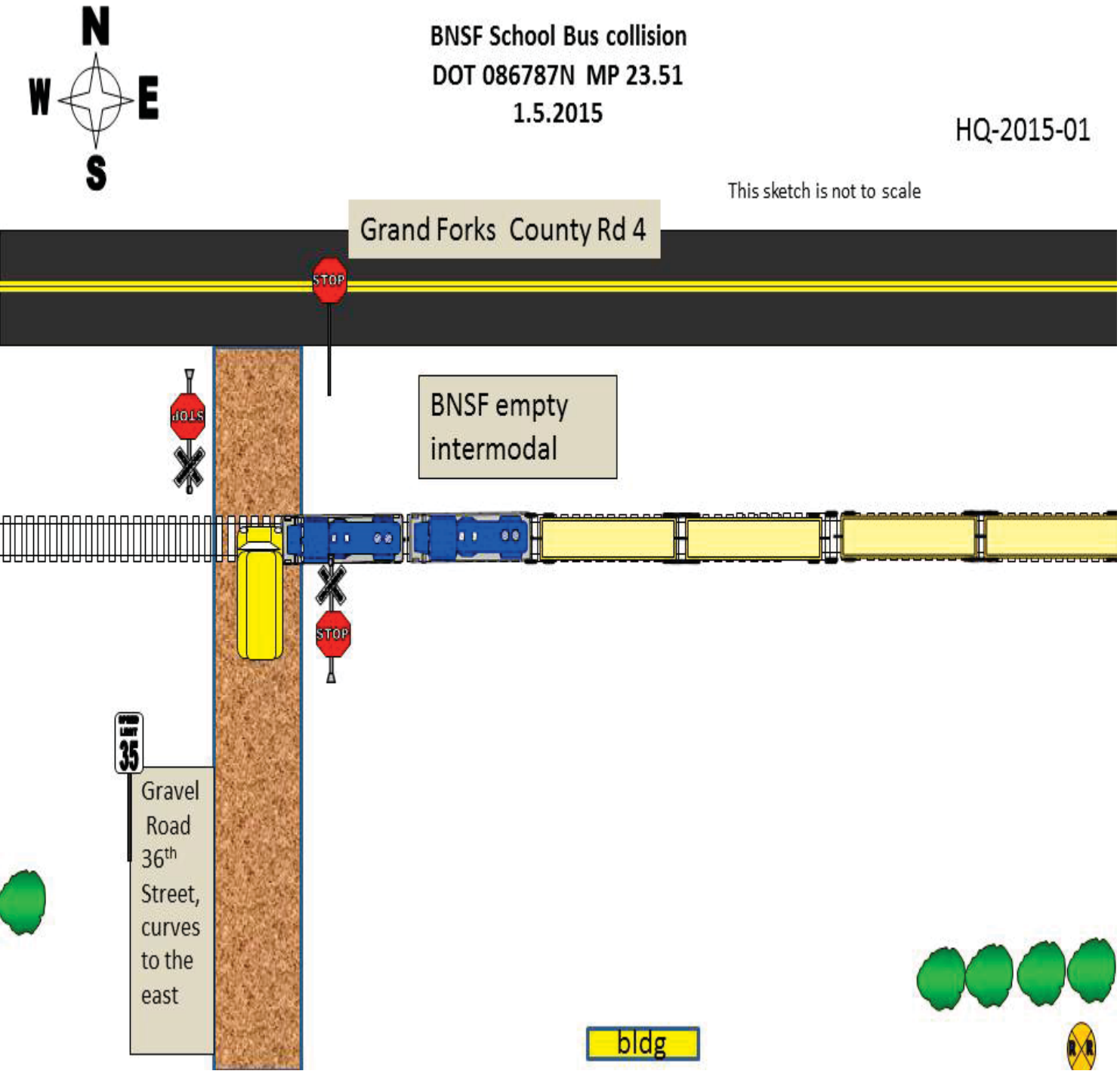
1 - Provided minimum 20-second warning
2 - Alleged warning time greater than 60 seconds
3 - Alleged warning time less than 20 seconds
4 - Alleged no warning
5 - Confirmed warning time greater than 60 seconds
6 - Confirmed warning time less than 20 seconds
7 - Confirmed no warning
N/A - N/A

Explanation Code

A - Insulated rail vehicle
B - Storm/lightning damage
C - Vandalism
D - No power/batteries dead
E - Devices down for repair
F - Devices out of service
G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present
H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)
J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits
K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/ island circuit
L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction
M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed
N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach
O - Warning time less than 20 seconds attributed to violation of special train operating instructions
P - No warning attributed to signal systems failure to detect the train
R - Other cause(s). Explain in Narrative Description

## SKETCHES

Sketch



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## SYNOPSIS

A westbound BNSF Railway (BNSF) freight train (B-UPIMAW5-03A) collided with a school bus on January 5, 2015, at approximately 3:35 p.m. CST. The accident occurred just east of Larimore, North Dakota, on the Devils Lake Subdivision, Twin Cities Division, at Milepost 23.5. Larimore is located about 37 miles west of Grand Forks. The school bus driver and one passenger in the school bus were killed. The school bus sustained about $2,000 in damage. There were no injuries to the train crew. The leading locomotive sustained minor damage of about $500. There was no derailment and no release of hazardous materials. This was an Amtrak route and this was not PTC-preventable.

At the time of the accident, it was daylight and clear. The temperature was -8 degree F.

The Federal Railroad Administration's (FRA) investigation determined the probable cause of the accident was due to the school bus driver's failure to stop at the stop sign and yield to the train, FRA Accident/Incident code (M302) Highway user inattentiveness.

## NARRATIVE

Circumstances Prior to the Accident

The crew of Freight Train B-UPIMAW5-03A, with Leading Locomotive UP 4119, included a Locomotive Engineer and a Conductor. They went on-duty at 8:00 a.m. CST on January 5, 2015, at the BNSF Dilworth Yard in Dilworth, Minnesota. This is the home terminal for all crew members, and all received more than the statutory off duty period prior to reporting for duty.

The crew's assigned freight train, B-UPIMAW5-03A, consisted of 2 locomotives, no loaded rail cars, and 19 empty containers and trailers on flat cars (47 platforms). It was 4,512 feet in length, and weighed 1,476 tons. At Middle Dilworth, the train crew noted the air flow exceeded 60 cubic feet per minute (CFM) on their train. The Engineer said the Conductor walked back and found some obvious leaks which she attempted to fix. They eventually cut the rear two cars off the train and moved the end-of-train device up to the last car of the train. He said the airflow then came down to under 60 CFM. They departed Dilworth approximately 5 hours after they were on duty and were scheduled to travel to Minot, North Dakota, with no work planned en route.

As the westbound train approached the accident area, the Locomotive Engineer was seated at the controls on the north side of the lead locomotive and the Conductor was seated on the south side of the lead locomotive.

According to the images viewed by an FRA Grade Crossing Manager from the on-board video camera of the leading locomotive, a school bus, with a driver and 14 passengers, was travelling north on 36th Street NE, a gravel road, over a public highway-rail grade crossing (DOT Crossing Number 086787N). The school bus driver drove past the crossbuck and stop signs and stopped on the tracks with the front end of the bus fouling the north rail of the track a couple seconds prior to the train impacting the bus. The bus driver was visible through the door's window, sitting in an upright position in the driver's seat. When the bus stopped, the bus driver's head moved forward and came back a little and the door was closed. The train hit the front of the bus.

When approaching by rail from the east, there are, in succession, a 1 degree 42 minute curve to the right for 1,765 feet followed by a tangent of 6,221 feet to the point of the accident and 5,084 feet beyond. There is a 0.28 percent ascending grade when travelling east to west by rail in this area. When travelling north toward the point of accident on 36th Street NE the road routes at a north/west angle before turning to a 90 degree approach 50 feet before crossing the east/west railroad tracks. The 36th North East crossing approaches are relatively level in both directions with unrestricted visibility.

This is single main track with automatic block signal, track warrant control territory as indicated by the railroad timetable. The railroad timetable direction of the freight train was west. Timetable directions are used throughout this report when describing the train's movement. Geographic directions are used when describing the movement of the school bus and the orientation of the public highway-grade crossing and 36th Street NE.

The Accident

Train B-UPIMAW5-03A

The train was being operated at 43 mph approaching the accident location. The train crew's view of the crossing was unobstructed. The Locomotive Engineer recalled blowing the horn when he noticed the bus approaching the crossing slowly. He stated multiple times that he never thought the bus was not going to stop in time. At some point while blowing the whistle, he realized the bus was coming to a stop on the tracks. He doesn't recall when he put the train in emergency but felt it was either right before or at the time of impact. The speed was recorded by the event recorder of the controlling locomotive. The maximum authorized speed for this train was 50 mph, as designated in the current BNSF Twin Cities Timetable Number 5.

Highway Vehicle

The school bus was traveling north on 36th Street NE. According to the Locomotive Engineer, the school bus driver failed to stop for the stop sign and slid to a stop on top of the public crossing (DOT Crossing Number 086787N). A report filed by the North Dakota Highway Patrol's Crash Reconstruction Team estimated the driver was traveling between 19 mph and 22 mph by analysis of skid marks and recreating the skid marks before it came to a stop on top of the crossing.

The train struck the front right side of the bus near the service door. The bus rotated counterclockwise and again made contact with the south side of the locomotive. The bus slid approximately 75 feet into the southwest ditch of the intersection facing north on its wheels. The lead locomotive came to a stop about 1,378 feet west of the point of collision.

The school bus did not stop at the crossbuck and stop sign and continued onto the tracks and skidded to a stop with the front of the bus on top of the north rail. According to the North Dakota Highway Patrol report, the bus did not display its amber lights or red lights, and the service door remained closed the entire time while approaching the crossing and when the school bus stopped on the crossing. After the train stopped the Conductor went back to the scene and assisted the crash victims and proceeded to cut the crossing.

Emergency Services personnel arrived on the scene at approximately 3:41 p.m. from the North Dakota Highway Patrol, Grand Forks Sheriff's Office, U.S. Border Patrol, Larimore Ambulance, Northwood Ambulance, and Altru Ambulance. The emergency responders treated 2 victims and transported 10 victims to the hospital. The school bus driver and one female student were fatally injured. The Grand Forks Coroner's Office personnel arrived at the scene at approximately 4:15 p.m. Larimore Ambulance transported the bodies of the fatality victims to the County Coroner's Building in Grand Forks.

A BNSF Trainmaster and Claims Agent arrived at the scene and interviewed the train crew. The crew said a while later a relief crew from Grand Forks showed up and relieved them of their duties. They were transported by van back to Dilworth, Minnesota, where they tied-up their working ticket and went home.

There were no hazardous materials involved, no derailment, and $500.00 damage to the lead locomotive.

The bus driver and one passenger in the school bus were pronounced dead on the scene.

Analysis and Conclusions

Analysis- Toxicological Testing: FRA post-accident toxicological testing was not performed on the train crew.

Conclusion: FRA determined that impairment was not a factor.

Analysis- The lead locomotive was equipped with locomotive safety devices, including a headlight, auxiliary lights, and an audible warning device required by Federal regulations.

Conclusion: Locomotive safety devices were in full compliance and working per Federal requirements.

Analysis- Locomotive Engineer Operating Performance: The locomotive was equipped with a speed indicator and an event recorder, as required. The event recorder data was downloaded by a BNSF road foreman at the site, and data was analyzed by FRA personnel.

Conclusion: The Locomotive Engineer was in compliance with all applicable railroad operating and train handling rules.

Analysis- Public highway-rail grade crossing: DOT Crossing Number 087678N

The last collision at this location occurred on October 11, 2009 (BNSF Report TC1009200)

Amtrak is the only regularly scheduled passenger service that operates over this crossing.

There are numerous types of hazardous materials shipments made by BNSF on a daily basis.

The crossing is a 32-foot wood plank. There are crossbucks and stop signs on each side of the crossing. The north crossbuck/stop sign is 15 feet from the nearest rail. The south crossbuck/stop sign is 15 feet from the nearest rail. Emergency Notification System (ENS) signs are posted on the crossbuck signs. 36th Street NE is a gravel road which curves east after traveling south over the crossing and is in good condition. There is a 35 mph speed sign on west side of 36th Street NE facing south. All the signs are in good condition and standard sizes.

Conclusion: The North Dakota Department of Transportation, BNSF, Arvilla Township, and Grand Forks County Sheriff's Office (diagnostic team) conducted a diagnostic review of this crossing. Although the diagnostic team determined that the crossing did not meet applicable North Dakota standards for installing active warning devices, the diagnostic team determined because of driver behavior patterns, active warning devices will be requested to be installed at this location.

Analysis- According to the on-board video camera from Locomotive UP 4119, a Bluebird school bus with a driver and 13 passengers was traveling north on 36th Street NE, approached the crossing, and failed stop and yield to the train.

Conclusion- FRA's investigators viewed the on-board camera from UP 4119 and noted the school bus driver did not stop at the crossbuck/stop sign on the south side of the crossing.

Probable Cause:

FRA investigation determined the probable cause of the accident was due to the school bus driver's failure to stop at the stop sign and yield to the train, FRA Accident/Incident code (M302) Highway user inattentiveness.