

BROTHERHOOD OF LOCOMOTIVE ENGINEERS AND TRAINMEN

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WILLIAM C. WALPERT
National Secretary-Treasurer

March 31, 2014

Mr. David Bucher
Investigator In Charge
National Transportation Safety Board
490 L'Enfant Plaza
Washington, DC 20594

Sent via UPS Overnight Mail

Re: NTSB Accident No. DCA-12-FR-007

Dear Mr. Hiller:

Enclosed please find the Brotherhood of Locomotive Engineers and Trainmen's Final Submission regarding the above-captioned incident.

If you have any questions regarding same, please do not hesitate to contact my office.

Very truly yours,

National Secretary-Treasurer
National Chairman – Safety Task Force

Enclosure

cc: M. Corum, Operating Practices Specialist – FRA
C. Devenney, Assistant Vice President-Midwest Division – KCS
R. Randle, General Manager-Springfield Division - BNSF
W. Bates, UTU/SMART Safety Team Member
D. R. Pierce, BLET National President
E. L. Pruitt, BLET First Vice President
S. J. Bruno, BLET Vice President
K. Jackson, BLET STF – Party Spokesman
C. W. Fields, BLET STF Coordinator

A Division of the Rail Conference—International Brotherhood of Teamsters

Brotherhood of Locomotive Engineers and Trainmen

*A Division of the Rail Conference
International Brotherhood of Teamsters*

Safety Task Force

Cleveland, Ohio

Before the National Transportation Safety Board

NTSB Accident Number: DCA-12-FR-007

July 21, 2012

Proposed findings, probable cause, and safety recommendations, in connection with the collision and derailment of freight trains Kansas City Southern (KCS) train No. QSHKC20 and Burlington Northern Santa Fe (BNSF) train No. EMHSEBM088 at a railroad diamond interlocking located near Arcadia, Kansas.

FINAL SUBMISSION

William C. Walpert, BLET-Safety Task Force, National Chairman
Kimble L. Jackson, BLET-Safety Task Force, Party Spokesman

ACCIDENT SYNOPSIS

On July 21, 2012, at about 3:30 p.m. Central Daylight Time (CDT), a Kansas City Southern (KCS) freight train, No. QSHKC20, consisting of five (5) locomotives (KCS 4667 lead) and eighty-one (81) cars of mixed freight, collided into the side of Burlington Northern Santa Fe (BNSF) Railway freight train No. EMHSEBM088 consisting of one (1) lead locomotive (BNSF 9797), and one (1) Distributed Power locomotive (BNSF 6187) on the rear of the train, and one-hundred and twenty-four (124) empty coal cars, at a railroad diamond in Missouri near the Kansas/Missouri state line, approximately ten (10) miles north-northeast of Pittsburg, Kansas.^{1 2}

At the time of the collision the BNSF train was operating northbound at thirty-one (31) miles per hour (MPH) on the BNSF Main track under signal indications in Centralized Traffic Control Territory (CTC). The KCS train was operating northbound at thirty (30) MPH on the KCS Main track of the Pittsburg Subdivision under signal indications of a CTC system at the time of impact.^{3 4}

The KCS train had recently changed train crews at Pittsburg, Kansas, approximately fifteen (15) miles south of the location of the collision. The KCS train approached the interlocking diamond at a recorded speed of forty-five (45) miles per hour.

The collision occurred at MP 114.6 of the KCS Pittsburg Subdivision and MP 118.4 of the BNSF Fort Scott Subdivision. The interlocking diamond where this accident occurred is identified as the BNSF/ KCS crossing. There were two (2) KCS employee injuries as a result of the collision when both employees jumped from the lead locomotive prior to the collision.

Weather at the time of the incident was clear and the temperature was 92° Fahrenheit.

KCS Train No. QSHKC20:

Locomotives: KCS 4667, KCS 3913, KCS 4581, KCS 4580 (isolated), and TFM 1609 (isolated)
61 Loads, 20 Empties, 8,024 tons and 7,012 feet.

BNSF Train No. EMHSEBM088:

Locomotives: BNSF 9797, BNSF 6187 (Distributed Power unit on rear of train)
0 Loads, 124 Empties, 3,085 tons and 6,971 feet.

Derailed equipment included five (5) locomotives and five (5) cars on the head end of the KCS

¹ Unless otherwise noted, all times herein are expressed in CDT.

² The Distributed Power Unit (DPU) - was a locomotive coupled to the rear of the train to provide additional tractive effort. The DPU is controlled by the locomotive engineer on the lead locomotive of the train.

³ BNSF timetable direction is north, geographic direction is northwest.

⁴ KCS timetable direction is north, geographic direction is north.

train. Fifteen (15) cars of the BNSF train were derailed. Total damage was estimated to be \$7.75 million dollars.

ACCIDENT LOCATION:

The accident occurred on the BNSF Fort Scott Subdivision at MP 118.4, and on the KCS Pittsburg Subdivision MP 114.6. Geographically, the accident location is in Missouri, approximately ten (10) miles north-northeast of Pittsburg, Kansas, eighty (80) miles south of Kansas City, MO, and sixty (60) miles west of Springfield, MO. The accident location is less than one mile (1) from the Kansas/Missouri state border at a location where the KCS main line crosses from Barton County, Missouri into Crawford County, Kansas.

BNSF/ KCS DIAMOND INTERLOCKING:

Track Geometry at the location of the derailment consists of a diamond crossing of fifty-eight degrees (58°). The diamond is maintained by KCS. Maximum Authorized Speed at that location varies slightly with a MAS of forty-five (45) MPH for BNSF trains, and a MAS of forty (40) MPH for KCS trains.

BNSF \ KCS INTERLOCKING -METHODS OF OPERATION

BURLINGTON NORTHERN SANTA FE OPERATIONS:

BNSF train No. EMHSEBM088 was operating on the Springfield Division, Fort Scott Subdivision, which runs in a timetable north/south direction. The Subdivision begins at Kansas City, Missouri, MP 0.0, and continues south to Nichols, MO, MP 198.6.

The BNSF track structure in the vicinity of the interlocking consists of a Main track and Arcadia siding converging within the limits of the absolute signals, west of the interlocking diamond, and a single Main track crossing the KCS and continuing east to Springfield, Missouri. The MAS approaching the interlocking for BNSF trains is forty-five (45) MPH.

The BNSF method of operation in the area of the accident is a CTC system controlled by BNSF dispatchers in Ft. Worth, Texas. The interlocking diamond itself is remotely controlled by the BNSF dispatcher requesting a desired route through the railroad crossing. The route is stored and only executed once a BNSF train occupies the approach circuit. The approach circuit extends out from the crossing to the intermediate signal located at MP 116.9.

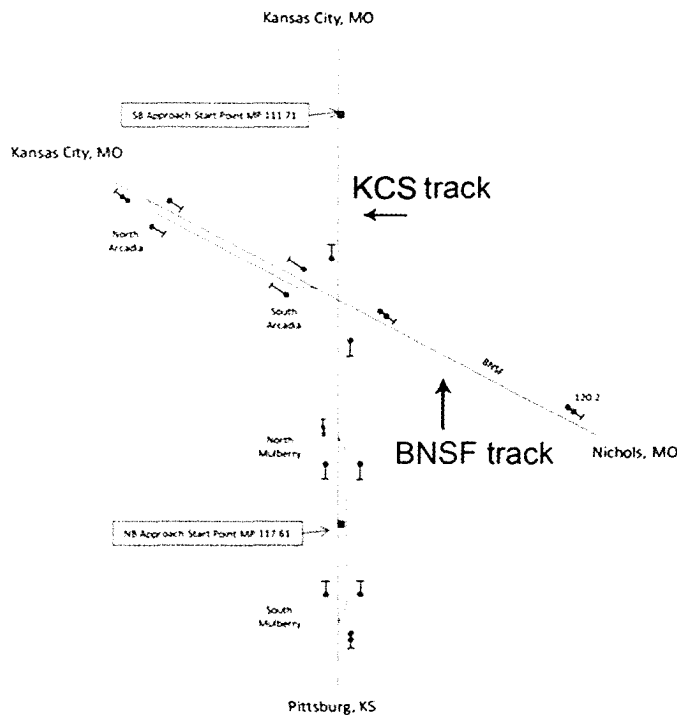
KANSAS CITY SOUTHERN OPERATIONS:

KCS train No. QSHKC20 was operating on the Midwest Division, Pittsburg Subdivision, which runs in a timetable north/south direction. The Pittsburg Subdivision begins in Pittsburg, Kansas, MP 128.2 and continues north to Kansas City, MO., MP 3.7. The KCS denotes the accident location as "*Arcadia Automatic Interlocking*" at MP 114.6. The KCS track structure in the vicinity of the interlocking consists of a single Main track. The MAS on the Subdivision is fifty-five (55) MPH, with a permanent forty (40) MPH speed restriction through the interlocking.

The KCS method of operation on the Pittsburg Subdivision is a CTC system controlled by the KCS dispatchers in Kansas City, Missouri. The Arcadia railroad crossing is automatically controlled on the KCS route. The KCS signal equipment at the interlocking diamond consists of a searchlight-type home signal, electronically controlled track circuits, and a relay based control system. The signal equipment at North Mulberry, which is the location of the northbound approach signal, consists of color light type signals and electronically controlled track circuits.

Authority logic is activated when a KCS train occupies the approach circuit. The approach circuits extend to MP 117.61 on the south side and MP 111.71 on the north side. Once a train enters the approach circuit, authority is granted for their movement by signal indication if no conflicting routes have been established.

Figure 1: BNSF/KCS interlocking diamond of accident area below:



TRAIN CREW OPERATIONS AND HOURS OF SERVICE:

The BNSF train crew was called for duty in Springfield, Missouri at 11:25 a.m. The crew consisted of a locomotive engineer and a conductor. The crew was instructed to operate their train from Springfield, Missouri, to Fort Scott, Kansas, at which point the crew would be relieved by another BNSF train crew. The BNSF engineer and conductor were properly rested under Federal Railroad Administration (FRA) hours of service (HOS) law, and departed Springfield at about 12:45 p.m.

The KCS train crew was called for duty in Pittsburg, Kansas, at 1:40 p.m. The train crew consisted of a locomotive engineer and conductor. The crew was instructed to operate their train from Pittsburg, Kansas, to Kansas City, Missouri, where the train would terminate. The KCS locomotive engineer and conductor were fully rested under the FRA HOS law and departed Pittsburg at about 3:10 p.m.

STRIKING TRAIN (KCS QSHKC20):

Shortly after departing the yard, the KCS train dispatcher communicated to the crew via radio that they would probably meet a train in Hume (about 55 miles from Pittsburg). The MAS for the train was fifty-five (55) MPH. Early in the trip the conductor realized that the operating compartment radio did not have a microphone which precluded him from announcing signal indications over the radio.

The KCS train arrived at South Mulberry and observed a Medium Approach Proceed signal (flashing yellow). The crew continued to operate their train to North Mulberry Street. Both crewmembers told investigators that they each observed a Clear (green) signal indication at North Mulberry. Post-accident testing indicated that the signal at North Mulberry was an Approach Proceed (yellow) signal.^{5 6}

After passing the signal at North Mulberry the train entered a curve. According to the crew, at a distance of approximately twenty-five (25) car lengths, they observed a Stop (red) signal at the diamond. Immediately afterwards, the crew saw the BNSF train entering, and crossing over, the railroad diamond. The crew told investigators that the engineer immediately applied emergency braking. Impact speed was estimated at approximately thirty (30) MPH.⁷

The crew then made the decision to evacuate the operating compartment and jump off the train. The engineer and the conductor exited the rear door of the cab and ran to the rear steps of the lead locomotive. Both jumped from the bottom step about seventy to eighty feet (70-80) before collision, each sustaining non-life threatening injuries. The engineer was sent to the hospital for

⁵ See Attachment A for signal indication and definition for a Medium Approach Proceed signal.

⁶ See Attachment A for signal indication and definition for an Approach Proceed signal.

⁷ See Attachment A for signal indication and definition for a Stop signal.

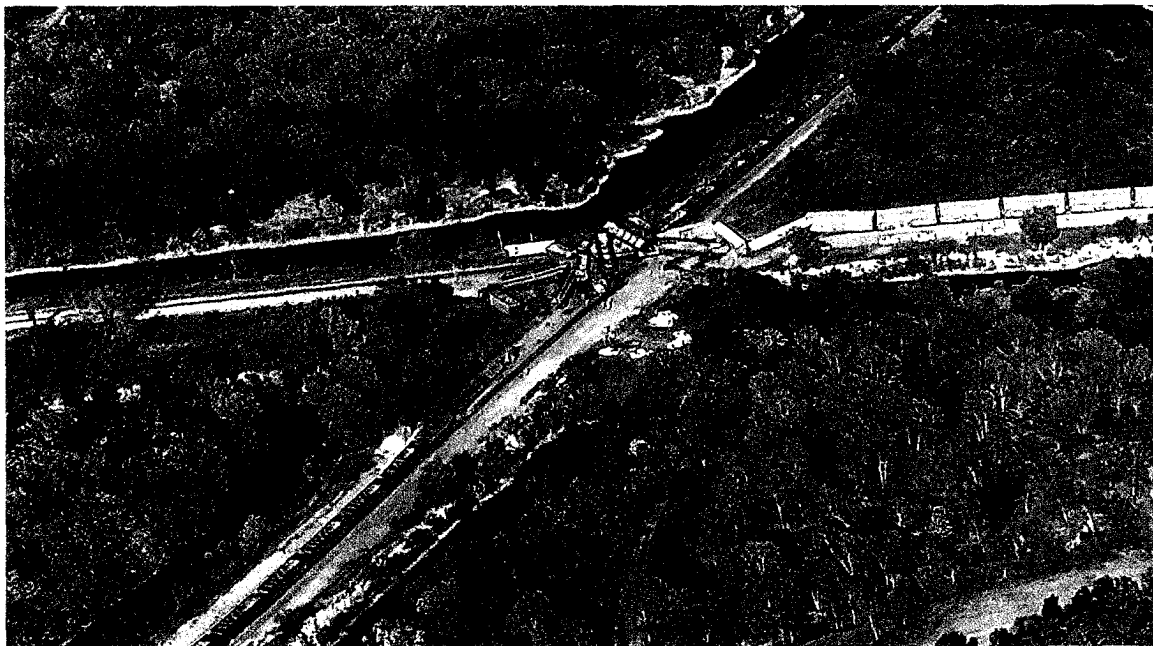
broken ribs, a broken collar bone, and a gash on his head that required staples, and he was held overnight for observation before being released the next day. The conductor hit his head and sustained other minor injuries. He was treated and released.

STRUCK TRAIN (EMHSEBM088)

The BNSF crew reported that their trip had been uneventful and the workload was normal. Immediately prior to the accident the train was operating at just under the forty-five (45) MPH, MAS for that area. The crew observed the approach signal to the south end of Arcadia displaying a Diverging Approach signal, indicating the train would be taking the siding at Arcadia. The crew continued to operate their train around a curve and then onto tangent track where they observed the signal at the Arcadia interlocking diamond.

The engineer slowed the train to about thirty-five (35) MPH and began to enter the siding near the interlocking signal. The train was approximately two (2) car lengths into the siding when there was a "jerk motion" followed immediately by an undesired emergency brake application. The conductor called out "Emergency" and identified his location via radio. The engineer pushed 911 on the radio keypad, and received a very quick response from the BNSF train dispatcher. The crew identified the other train involved as a KCS freight train and went to the point of collision to provide assistance to the KCS crewmembers, as well as guide in Emergency Responders.

Figure 2: Aerial view of Accident Scene Below



PROPOSED FINDINGS

HUMAN PERFORMANCE:

A contributing factor to the accident was the apparent failure of operating crew members on KCS train No. QSHKC20 to react appropriately to signal indications in the field. Post-accident investigation of signal functionality and event recorder data compared to the train event recorder data suggests that the two crew members reacted improperly to the Stop signal prior to the collision.

OPERATIONS:

After examining the operating practices in the area leading up to, and at the area of the collision, the Organization suggests that these issues were causal factors to this incident. If a redundant signal system such as a proven and effective Positive Train Control (PTC) system had been installed and operating as designed in this area, this collision would have been prevented. Existing technology such as a train control or speed control systems installed in the infrastructure and the controlling locomotive would have mitigated the damage and injuries and likely prevented the collision.

Further, if both railroads had been operating on the same radio channel prior to crossing the interlocking diamond, it is likely that one train crew member would have heard the other train crew call out their signals and alerted them in the event of conflicting signal indications.

MECHANICAL:

The evidence establishes a post-accident examination of mechanical components of the lead locomotive, including the event recorder, performed as designed, suggesting that these components were not a contributing or causal factor in this accident.

SIGNAL SYSTEM:

A post-accident examination of the event recorder downloads off the existing signal system suggests that the rudimentary nature of this system was a causal factor in this accident. Available technology, such as a train control or speed control system installed in the infrastructure and the controlling locomotive, would have likely prevented the collision. A PTC system overlaid on the existing wayside signal system also would have prevented the collision.

TRACK:

A post-accident examination of the track system leading up to, and including the area of the incident, indicates that it performed as designed, and was not a contributing or causal factor in this accident.

PROBABLE CAUSE

The probable cause for this accident was the failure of Kansas City Southern train No. QSHKC20 to stop at the Stop signal located at MP 114.6 (Arcadia automatic interlocking).

Contributing factors in this accident are the FRA's failure to timely publish regulations responsive to the NTSB's 1970 recommendation for the installation of PTC, and the railroads' failure to install PTC on this territory.

PROPOSED RECOMMENDATIONS

KANSAS CITY SOUTHERN RAILROAD (KCS):

1. Install an operational 49 CFR Part 236 compliant PTC system as an overlay in the operating territory these two trains traversed.

FEDERAL RAILROAD ADMINISTRATION (FRA):

1. Enforce the Rail Safety Improvement Act (2008) mandatory deadline of December 31, 2015, for the installation of operational Part 236 compliant Positive Train Control systems.
2. Implement a regulatory requirement for all Railroads to adopt rules requiring the tenant railroad to use the same radio frequency as the host railroad that controls a diamond interlocking and to announce the intermediate, approach, and absolute blocks indications via radio.

CERTIFICATE OF MAILING

I certify that I have on this date electronically forwarded to Mr. David Bucher (David.bucher@ntsb.gov) Investigator-In-Charge (IIC), a full and complete copy of the “Proposed findings, probable cause, and safety recommendations” with regard to the freight train collision between the Kansas City Southern and Burlington Northern Santa Fe near Arcadia, KS, on July 21, 2012. NTSB Docket No.: DCA 12 FR 007, submitted by the Brotherhood of Locomotive Engineers and Trainmen’s Safety Task Force to the National Transportation Safety Board. A hard copy was also forwarded addressed to the party of interest as required by 49 CFR § 845.27 (Proposed findings).

National Transportation Safety Board
c/o Mr. David Bucher
Investigator-In-Charge, DCA12FR007
490 L’ Enfant Plaza
Washington, DC 20594

Mike Corum
Federal Railroad Administration
Operating Practices Specialist
[REDACTED]

Chad Devenney
Kansas City Southern
Assistant Vice President, Midwest Division
[REDACTED]

Rance Randle
Burlington Northern Santa Fe
General Manager, Springfield Division
[REDACTED]

Willie Bates
UTU/SMART Safety Team Member
[REDACTED]

Sincerely yours,

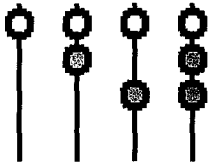


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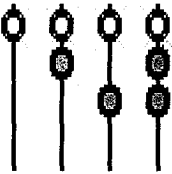


ATTACHMENT A

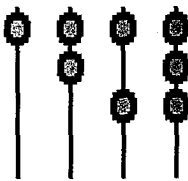
KCS APPLICABLE SIGNAL ASPECTS AND DEFINITIONS:



Approach Proceed immediately reducing speed to 35 MPH, and be prepared to stop at the next signal.



Medium Approach Proceed reducing speed to 35 MPH before passing the next signal.



Stop

Stop.