NATIONAL TRANSPORTATION SAFETY BOARD

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

TRACK AND ENGINEERING GROUP CHAIRMAN

FACTUAL REPORT

DCA16MR004

Derailment of Amtrak's Southwest Chief Train No. 4
With Injuries at Milepost 373.07 on BNSF's La Junta Subdivision

Cimarron, Kansas
March 14, 2016

Factual Report Prepared by: Date: April 13, 2016
R. A. Hipskind,
Track and Engineering Group Chairman

Accident:

NTSB Accident Number:	DCA 16 MR 004
Date of Accident:	March 14, 2016
Time of Accident:	00:02 a.m. (CDT)
Type of Train and No:	Amtrak Passenger Train No. 4 Southwest Chief
Railroad Owner:	BNSF Railway Company
Train Operator:	National Passenger Railroad Corporation (Amtrak)
Crew Members:	1 Engineer, 1 Student Engineer, 1 Conductor, 1 Assistant conductor and 10 service attendants
Location of Accident:	Cimarron, Kansas

Synopsis:

On March 14, 2016, at 12:02am CST, Amtrak train #4 (Southwest Chief) derailed near milepost (MP) 372.9 in the vicinity of Cimarron, KS. This Los Angeles to Chicago train consisted of two locomotives and ten cars. Four cars were derailed on their sides. Two other cars derailed upright. There were approximately 130 passengers and 14 crew members on board. Initial reports indicated that between 10 and 33 passengers were transported and/or treated for injuries at two area medical centers. The American Red Cross responded to assist with passengers.

This event occurred on the ~~BNSF~~ Burlington Northern Santa Fe Railway Company (BNSF), La Junta Subdivision. The maximum allowable speed on this section of rail is 60 mph for passenger trains and 40 mph for freight trains. Estimated damages are $1,463,000.00.

Parties to the investigation were Amtrak, BNSF Railway Company (BNSF), Federal Railroad Administration (FRA), Brotherhood of Maintenance of Way Employes Division (BMWED), Sheet Metal and Railroad Transportation (SMART), Brotherhood of Locomotive Engineers and Trainmen (BLET), and the Gray County Sheriff's Office.

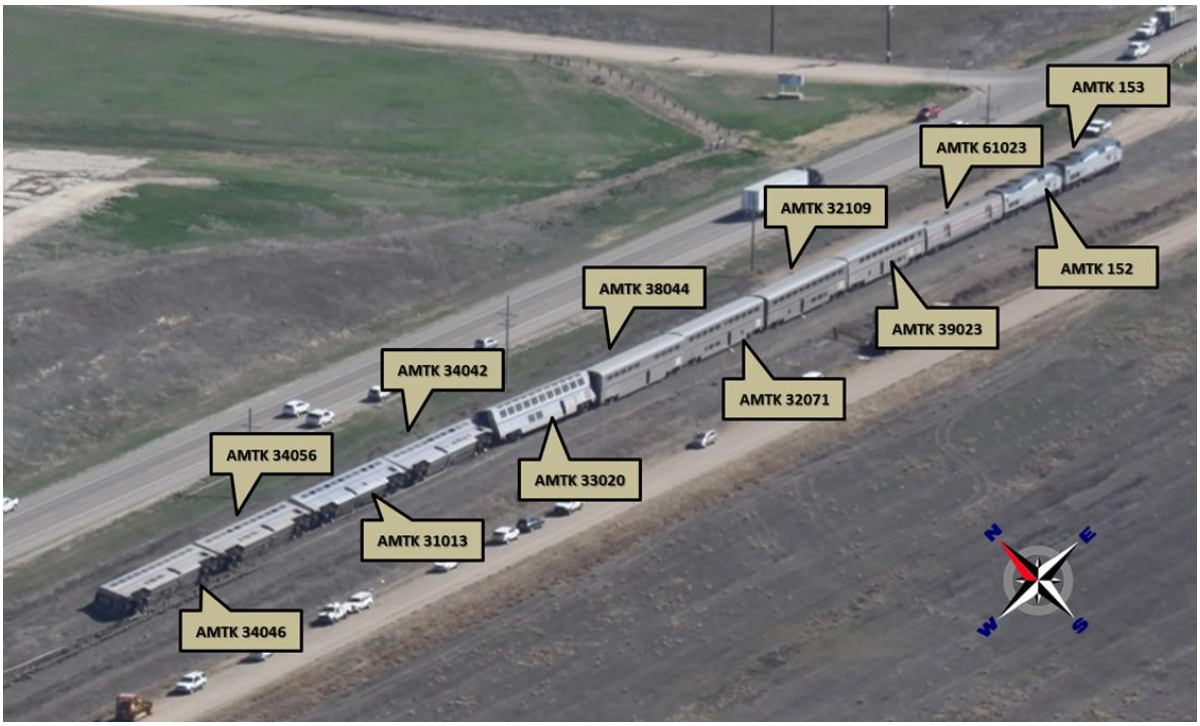

Figure 1. Aerial view of derailed Amtrak train ~~55~~4. The point of impact and point of derailment is to the left of the rear car of the train appearing in the lower left hand portion of the photo.

Circumstances Prior to the Accident:

According to an interview of an employee of the nearby feed lot industry supplier~~,~~ on Sunday, March 13, 2016, the interviewed employee was assisting another employee with loading a truck~~,~~ when his unattended truck began to roll away from its position under the loading chute. The truck continued to roll south down a hill towards the highway gaining speed. The truck crossed the highway continuing towards the railroad right-of-way and struck the ballast shoulder of the track structure.[1] Investigators and local police agencies documented the continuous set of wheel marks and path of the truck from the feed lot silos to the track. The employee said ~~that~~ he tried to catch up to the truck but failed to stop it. The employee said he drove another vehicle to the south side of the railroad track, ~~and~~ walked over to the truck that was stopped and drove the truck off of and away from the railroad right-of-way. He stated ~~that~~ he later reported the incident to his supervisors.

1 A ballast shoulder consists of rock and lies on the outside of the track structure and is designed to support and hold the track structure in place.

Figure 2. This photo looking south towards the highway with vehicles in the background. The photo shows the imprints of tire marks on the hillside marked by red flags in the center of the photo.

Accident:

A review of Amtrak Train #4's forward facing digital video recorder data indicates that as the train approached milepost 373.07, an image of track misalignment (lateral shift in the track structure) was visible. Initial event recorder data indicates that the engineer placed the train into emergency. The lead portion of the train traversed the misalignment; however, cars of the rear portion of the train derailed to the north of the track east of the misalignment. When the train came to a stop, the engineer radioed the dispatcher with an emergency notification and eventually emergency responders arrived.

Figure 3. This is a view in daylight hours looking west from the point of derailment at the misalignment or lateral shift in its' "as found" condition after the train moved over the shifted track.

Damages:

BNSF determined there was about $336,000 in damage to the track and surrounding structure.

Figure 4. A view looking east at the derailed ~~equipment~~ cars and damaged track.

Track Description

BNSF's La Junta Subdivision lies in an east/west geographical direction from Ellinor (MP 124.7) to Caddoa (MP 521.5). Amtrak operates one train each way daily over this subdivision. The milepost numbering decreases in the eastward direction, the direction of travel for Amtrak ~~55~~#4.

The La Junta Subdivision consists of primarily a single main track and sidings with multiple main tracks between Control Point (CP) 1846 and CP 1900. BNSF designates and maintains the single main track in the vicinity of the derailment as FRA Class 3 track with a maximum authorized timetable operating speed of 60 mph for passenger trains.

As the train approached the accident site from the west, the train would have been on a descending grade. Prior to encountering the shifted track and in the direction of the train travel, Amtrak train No. 4 traversed a 0° 38' curve beginning at about MP 374.2 and ending at about MP 374.0. The train traversed straight track to MP 373.5 before entering another curve that ended at MP 373.4. The train continued on straight track up to the shifted track (misalignment) at MP 373.07.

Two Amtrak trains operate over this area daily; BNSF operates 1 through freight train and one local train.

Track Classification (FRA Regulations):

BNSF inspects and maintains the single main track on this portion of the La Junta Subdivision to Federal Railroad Administration (FRA) Track Safety Standards (TSS) for Class 3 track, which allows for a maximum operating speed of 40 mph for freight trains and 60 mph for passenger trains.

Track Components:

Post-accident observations by investigators disclosed that the main track construction consisted of 132-pound rail conventional jointed rail affixed to wooden crossties with conventional cut spikes patterned through double shoulder 14" by 7 ¾" crosstie plates. BNSF uses a box anchor pattern on every other crosstie.[2] The predominant rail manufacturer dates were from 1949 to 1951-Colorado Fuel and Iron (CF&I).

Point of Impact (POI) and Point of Derailment (POD):

On March 14, 2016, investigators inspected, measured and photographically documented the area of the single main track preceding the derailment footprint. The track field notes measurements were within FRA TSS for the assigned class of track.

Figure 5. Photograph of the area of track where field notes measurements were taken.

2 A box anchor pattern means that a rail anchor is applied to each rail base on both sides of a crosstie, thus the crosstie is "boxed" with rail anchors. BNSF used channel rail anchors on this portion of their single main track.

The investigators photographed and measured the "as found" condition of the track structure and lateral shift or misalignment. The amount of misalignment measured 7 inches. Investigators have termed this area as the point of impact (POI) or intrusion from an outside force acting upon the track structure.

Figure 6. This is a view looking south at the track structure. Notice the disrupted ballast shoulder section and track structure movement (see Figure 3 for different perspective).

Investigators documented where they observed the first markings at MP 373.07 on the inside gage face of the north rail approximately twenty-five feet after the POI and determined this was the point of derailment (POD).

Figure 7. This is a view of the point of derailment.

Post-Accident Investigation:

Track Inspection Records:

FRA regulations found in 49 CFR 213 require that a rail carrier's track inspection records be prepared and signed on the day of the inspection for frequency of compliance with the FRA/TSS. FRA track inspection records are required to reflect actual field conditions and deviations from the FRA/TSS. BNSF inspects their La Junta Subdivision twice weekly. In addition, FRA regulations require switches and sidings to be inspected on a monthly basis. An FRA review of BNSF track inspections records did not disclose any records deficiencies in or around the area of the derailment.

FRA Regulatory Activity:

The track in the area of the derailment was last inspected on March 10, 2016, by a FRA qualified BNSF track inspector. The track inspection record noted no defects in vicinity of the derailment, an area that includes the track preceding up to where the train derailed. In addition, investigators requested, received and reviewed BNSF track inspection records for the most recent three months (December 6, 2015 to March 12, 2016). An FRA examination of those records found that the records met the required frequency and no record deficiencies were noted.

In June of 2015, FRA Track Safety Inspectors conducted a hi-rail/walking safety audit on

BNSF's La Junta Subdivision between Garden City, Kansas, MP 400.0 to Las Animas JCT, Colorado, MP 533.6. According to FRA, the FRA inspectors had performed track safety audits of the BNSF La Junta Subdivision for the following three years, 2010, 2011, and 2015, due to the high number of track defects per mile, and a poor ride quality; and due to the hazard material hauled on an Amtrak route and through several highly populated areas.

From a historical perspective, BNSF had utilized crosstie and surfacing crews from 2013 through to 2015 to improve maintenance and be in compliance with FRA TSS. The overall conclusion by FRA for this area assessing the track compliance behind the tie gang was that the tie gang did a quality job installing crossties and surfacing the track. The major defect noted by the FRA was at the rail joints having less than two bolts per rail end in classes 3 through 5. FRA did cite BNSF for one violation of bolting requirements for conventional jointed track (Class 3—5) locations and one violation of excessive crosslevel.

BNSF made plans to install 124,000 crossties starting on September 1, 2015, from MP 400 to MP 533.6 (133 miles of the La Junta Subdivision); also ~~the~~ BNSF installed 10 miles of CWR from MP 410 to MP 420. BNSF's future plans include the installation of 55 miles of CWR in 2016 from Garden City, KS to Las Animas JCT, CO, which would eliminate the jointed rail and make that 136-mile area all CWR. The aforementioned program work is on-going.

Track Geometry Test

On October 22, 2015, FRA operated their Automated Track Inspection Program vehicle DOTX 219 (geometry car) from MP 555 to MP 353 on the La Junta Subdivision. The car did note an exception of warp that measured 2.12" near milepost 373. However, BNSF last measured the track geometry on February 1, 2016. There were no exceptions noted on the approach to or in the vicinity of the derailment.

Rail Flaw Detection Testing

BNSF last tested the La Junta Subdivision on January 27th—29th, 2016, which included the area throughout the derailment footprint. The test records did not show rail defects at or near the vicinity of the derailment.

Rail Joint Testing

BNSF last tested the La Junta Subdivision in the area of the accident (MP 355.4 to 383.9) on March 3, 2016. The area of the main track in the vicinity of the derailment is conventional jointed rail that does not require a periodic joint testing that is a requirement for joints in CWR territory.

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Parties to the Investigation - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this factual report pertaining to the Amtrak train No. 4 derailment with injuries at Cimarron, Kansas, on March 14, 2016, 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 ___4-13-16_____
Richard A. Hipskind, NTSB

_____//s//_____ Date ___4-18-16_____
Rick Bruce, FRA

_____//s//_____ Date ___4-13-16_____
Duane F. Befort, BNSF

_____//s//_____ Date ___4-15-16_____
Dave Klouda, Amtrak

_____//s//_____ Date ___4-14-16_____
Mike Gekas, BMWED