



NATIONAL TRANSPORTATION SAFETY BOARD

**Office of Aviation Safety
Washington, D.C. 20594**

October 17, 2012

Group Chairman's Factual Report

WEATHER

DCA12FR007

A. ACCIDENT

Location: near Arcadia, Kansas
Date: July 12, 2012
Time: 1640 central daylight time (2140 UTC¹)
Train: collision between Kansas City Southern Railroad freight train and BNSF Railway freight train

B. METEOROLOGIST SPECIALIST

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C. SUMMARY

At about 1640 central daylight time on July 21, 2012 a Kansas City Southern Railroad freight train No. QSHKC20, consisting of 5 locomotives and 81 cars of mixed freight, collided with the side of BNSF Railway freight train No. EMHSEBM088 consisting of 2 locomotives (one was a DPL) and 124 freight cars (all empty coal cars) at a diamond crossing near Arcadia, Kansas. The BNSF train was operating westbound on the BNSF main track under CTC signal indication. It had previously received a clear signal from the BNSF train dispatcher (located in Ft. Worth, TX), to proceed west through the crossing. The BNSF train was estimated to be moving at a speed of 45 miles per hour at the time of the collision. The KCS train was operating northbound on the KCS main track of the Pittsburg Subdivision. The KCS train was operating under automatic block signal indication. The KCS train had just recently changed train crews at Pittsburg, KS, located approximately 15 miles south of the location of the collision. The KCS train approached the crossing at an estimated speed of 40 miles per hour. The collision occurred at milepost 118 of the Pittsburg Subdivision. The diamond is known as the BNSF / KCS crossing.

There were two KCS employee injuries as a result of the collision. Both KCS employees jumped from the lead locomotive prior to the collision. One employee was treated and released from the hospital. The second was kept in the hospital under observation as a result of a broken jaw and possible head injuries. The second employee was released the following day.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's (NTSB) Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation from the Washington D.C. office, collecting data from official National Weather Service (NWS) sources

¹ UTC.– is an abbreviation for Coordinated Universal Time.

including the National Climatic Data Center (NCDC). All times are central daylight time (CDT) based upon the 24 hour clock, local time is +5 hours to UTC, and UTC=Z. Directions are referenced to true north and distances are in statute miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles.

E. FACTUAL INFORMATION

1.0 Surface Analysis Chart

The National Weather Service (NWS) Surface Analysis Chart for 1600 CDT on July 21, 2012 centered over the region is included as figure 1. The chart depicted a low pressure system to the south of the accident site over northern Texas at 1009-hPa and another low to the west over eastern Colorado at 1010-hPa with a trough of low pressure between the two systems. High pressure system at 1018-hPa was over central Illinois. The resultant pressure systems resulted in a weak pressure gradient across Kansas with light east to southeasterly winds.

The closest station models to the accident site indicated light easterly winds of 10 knots or less, clear skies, and a temperature of 100° Fahrenheit (F).

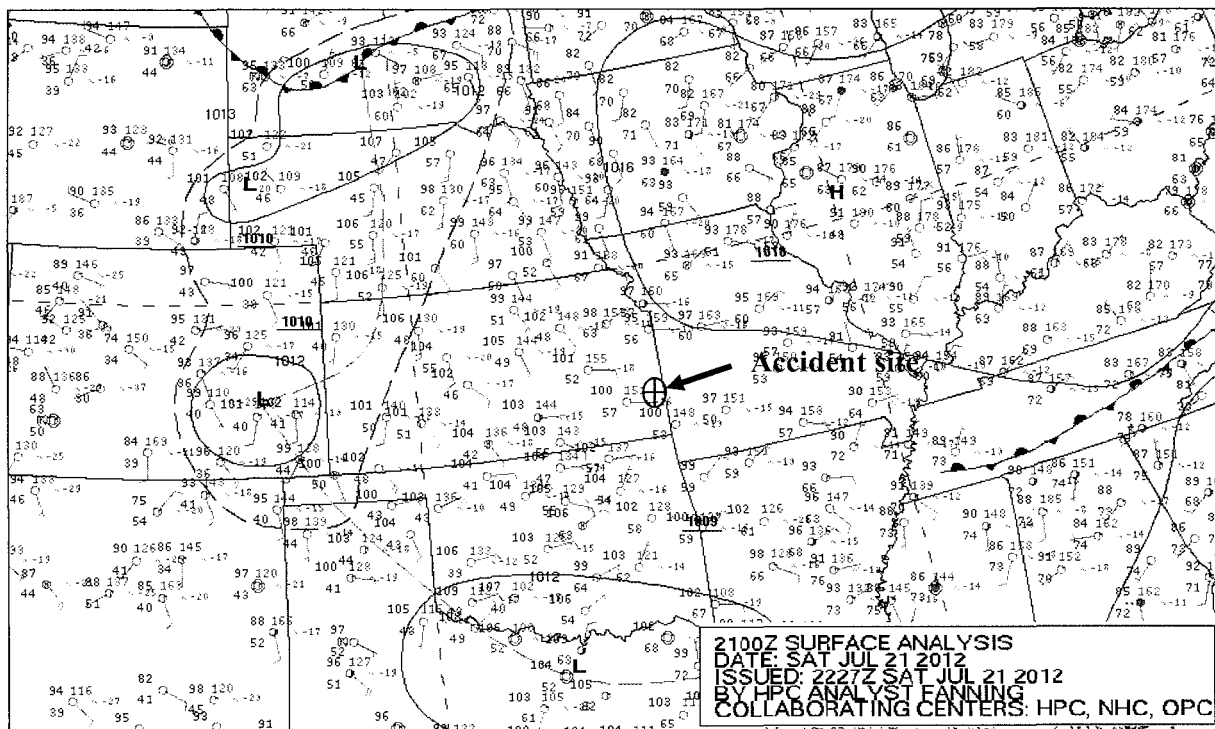


Figure 1- NWS Surface Analysis Chart for 1600 CDT

The NWS National NEXRAD radar mosaic for 1640 CDT on July 21, 2012 depicted no significant meteorological echoes over the region.

2.0 Surface Observations

The closest official weather reporting location to the rail collision was from Atkinson Municipal Airport (KPTS), Pittsburg, Kansas, located approximately 15 statute miles south of the accident site at an elevation of 950 feet. The airport had an Automated Weather Observation System (AWOS) and reported the following weather conditions near the time of the accident:

Atkinson (KPTS) weather at 1655 CDT, automated, wind from 090° at 8 knots, visibility unrestricted at 10 statute miles, skies clear, temperature 37° Celsius (C) (or 99° F), dew point temperature 16° C (61° F), altimeter 29.91 inches of mercury. Remarks: automated observation system, temperature 37.0° C, dew point 15.9° C.

Based on the 1655 CDT observations the relative humidity was 29 percent, with a heat index of 100° F or in the extreme caution range. A review of the 24-hour period prior to the accident indicated clear skies prevailed during the period with no rainfall. General dry conditions prevailed during the month of July 2012, with the entire month over 90° F, and with 8 days of temperatures of 100° F or warmer prior to the accident. Heat advisories were being issued from the NWS during the period and severe drought conditions existed across eastern Kansas during the period.

3.0 MesoWest Plot

Figure 2 is a plot of wind and temperature over eastern Kansas and western Missouri at the time of the accident obtained from the MesoWest data base from the University of Utah, with the approximate accident site is marked. The image depicts temperatures ranging from 99° to 103° F being reported near the accident.

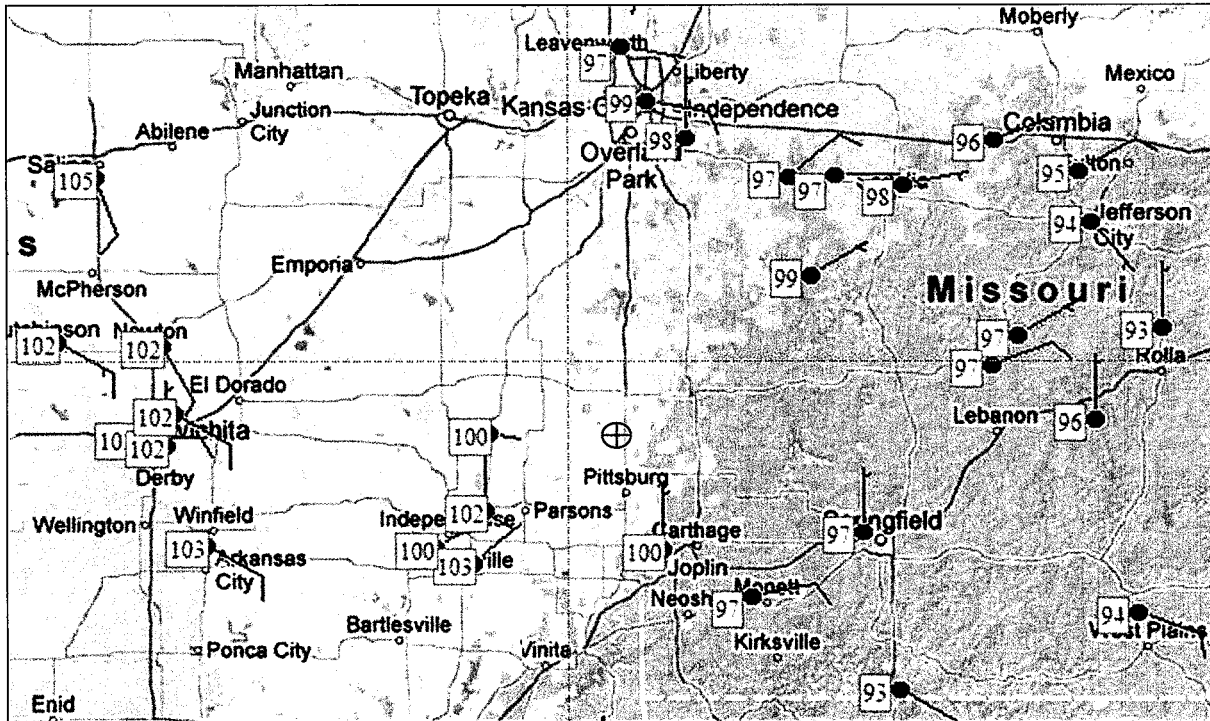


Figure 2- MesoWest plot at 1640 CDT

4.0 Astronomical Conditions

The United States Naval Observatory's website provided the following astronomical conditions for July 21, 2012 for Arcadia, Crawford County, Kansas:

<u>Sun</u>	
Beginning of civil twilight	0544 CDT
Sunrise	0613 CDT
Sun transit	1325 CDT
Accident	1640 CDT
Sunset	2036 CDT
End of civil twilight	2106 CDT

At the time of the accident the Sun was 44° above the horizon at an azimuth of 248°.

Donald Eick
NTSB Senior Meteorologist