Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2007-53

Iowa Chicago & Eastern Railroad Company
Manona, Iowa
September 26, 2007

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report 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.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2007-53

1.Name of Railroad Operating Train #1: Iowa Chicago and Eastern RR Corp. [ICE]	1a. Alphabetic Code: ICE	1b. Railroad Accident/Incident No.: 2007273
2.Name of Railroad Operating Train #2: N/A	2a. Alphabetic Code: N/A	2b. Railroad Accident/Incident No.: N/A
3.Name of Railroad Operating Train #3: N/A	3a. Alphabetic Code: N/A	3b. Railroad Accident/Incident No.: N/A
4.Name of Railroad Responsible for Track Maintenance: Iowa Chicago and Eastern RR Corp. [ICE]	4a. Alphabetic Code: ICE	4b. Railroad Accident/Incident No.: 2007273
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 09 | Day 25 | Year 2007	7. Time of Accident/Incident: 07:15: ☐ AM ☑ PM

8. Type of Accident/Indicent (single entry in code box): 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other (describe in narrative) — Code: 01

9. Cars Carrying HAZMAT	10. HAZMAT Cars Damaged/Derailed	11. Cars Releasing HAZMAT	12. People Evacuated	13. Division
0	N/A	N/A	0	System

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Monona	10.7	N/A	IA	CLAYTON

18. Temperature (F) (specify if minus)	19. Visibility (single entry) 1. Dawn 2. Day 3.Dusk 4.Dark — Code	20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code	21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code
57 F	4	2	1

22. Track Name/Number	23. FRA Track Class (1-9, X) — Code	24. Annual Track Density (gross tons in millions)	25. Time Table Direction 1. North 2. South 3. East 4. West — Code
Single Main	2	10.1	3

OPERATING TRAIN #1

26. Type of Equipment Consist (single entry) 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car	A. Spec. MoW Equip. — Code	27. Was Equipment Attended? 1. Yes 2. No — Code	28. Train Number/Symbol
	1	1	MMCMQ-25

29. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	31. Method(s) of Operation (enter code(s) that apply)	31a. Remotely Controlled Locomotive?
20 MPH	R	a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other (Specify in narrative)	0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter
30. Trailing Tons (gross tonnage, excluding power units): 10514		Code(s): j | N/A | N/A | N/A | N/A	0

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	ICE 50015	31	yes
(2) Causing (if mechanical cause reported)	ICE 50015	31	yes

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

34. Was this consist transporting passengers? (Y/N): N

35. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	4	0	0	0	0
(2) Total Derailed	0	0	0	0	0

36. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	72	0	36	0	0
(2) Total Derailed	27	0	0	0	0

37. Equipment Damage This Consist	38. Track, Signal, Way, & Structure Damage	39. Primary Cause Code	40. Contributing Cause Code
$627,131.00	$771,633.00	E47C	E40C

Number of Crew Members

41. Engineer/ Operators	42. Firemen	43. Conductors	44. Brakemen
1	0	1	0

Length of Time on Duty

45. Engineer/Operator	46. Conductor
Hrs 8 Mi 32	Hrs 8 Mi 32

Casualties to:	47. Railroad Employees	48. Train Passengers	49. Other
Fatal	0	0	0
Nonfatal	0	0	0

50. EOT Device? 1. Yes 2. No	51. Was EOT Device Properly Armed? 1. Yes 2. No
1	1

52. Caboose Occupied by Crew? 1. Yes 2. No: N/A

OPERATING TRAIN #2

53. Type of Equipment Consist (single entry) 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car	A. Spec. MoW Equip. — Code	54. Was Equipment Attended? 1. Yes 2. No — Code	55. Train Number/Symbol
	N/A	N/A	N/A

56. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	58. Method(s) of Operation (enter code(s) that apply)	58a. Remotely Controlled Locomotive?
N/A MPH	N/A	a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track	0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons (gross tonnage, excluding power units) N/A

c. Auto train stop
d. Cab
e. Traffic
f. Interlocking
i. Time table/train orders
j.Track warrant control
k. Direct traffic control
l.Yard limits
o. Positive train control
p. Other (Specify in narrative)
Code(s) N/A N/A N/A N/A N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter N/A

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A

60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

61. Was this consist transporting passengers? (Y/N) N/A

62. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

64. Equipment Damage This Consist N/A

65. Track, Signal, Way, & Structure Damage N/A

66. Primary Cause Code N/A

67. Contributing Cause Code N/A

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

72. Engineer/Operator Hrs N/A Mi N/A

73. Conductor Hrs N/A Mi N/A

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

77. EOT Device? 1. Yes 2. No N/A

78. Was EOT Device Properly Armed? 1. Yes 2. No N/A

79. Caboose Occupied by Crew? 1. Yes 2. No N/A

OPERATING TRAIN #3

80. Type of Equipment Consist (single entry)
1. Freight train
2. Passenger train
3. Commuter train
4. Work train
5. Single car
6. Cut of cars
7. Yard/switching
8. Light loco(s).
9. Maint./inspect.car
A. Spec. MoW Equip. Code N/A

81. Was Equipment Attended? 1. Yes 2. No Code N/A

82. Train Number/Symbol N/A

83. Speed (recorded speed, if available) Code
R - Recorded
E - Estimated N/A MPH N/A

84. Trailing Tons (gross tonnage, excluding power units) N/A

85. Method(s) of Operation (enter code(s) that apply)
a. ATCS
b. Auto train control
c. Auto train stop
d. Cab
e. Traffic
f. Interlocking
g. Automatic block
h. Current of traffic
i. Time table/train orders
j.Track warrant control
k. Direct traffic control
l.Yard limits
m.Special instructions
n. Other than main track
o. Positive train control
p. Other (Specify in narrative)
Code(s) N/A N/A N/A N/A N/A

85a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable
2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter N/A

86. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	N/A	N/A
(2) Causing (if mechanical cause reported)	N/A	N/A	N/A

87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
N/A	N/A

88. Was this consist transporting passengers? (Y/N) N/A

89. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

90. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	N/A	N/A	N/A	N/A	N/A
(2) Total Derailed	N/A	N/A	N/A	N/A	N/A

91. Equipment Damage This Consist N/A

92. Track, Signal, Way, & Structure Damage N/A

93. Primary Cause Code N/A

94. Contributing Cause Code N/A

Number of Crew Members

95. Engineer/ Operators	96. Firemen	97. Conductors	98. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

99. Engineer/Operator Hrs N/A Mi N/A

100. Conductor Hrs N/A Mi N/A

Casualties to:	101. Railroad Employees	102. Train	103. Other
Fatal	N/A	N/A	N/A
Nonfatal	N/A	N/A	N/A

104. EOT 1. Yes 2. No N/A

105. Was EOT Device Properly 1. Yes 2. No N/A

106. Caboose Occupied by Crew? 1. Yes 2. No N/A

Highway User Involved

107. Code N/A
A. Auto
B. Truck
C. Truck-Trailer.
D. Pick-Up Truck
E. Van
F. Bus
G. School Bus
H. Motorcycle
J. Other Motor Vehicle
K. Pedestrian
M. Other (spec. in narrative)

108. Vehicle Speed (est. MPH at impact) N/A

109. geographical) Code N/A
1.North 2.South 3.East 4.West

Rail Equipment Involved

111. Equipment Code N/A
1.Train(units pulling)
2.Train(units pushing)
3.Train (standing)
4.Car(s) (moving)
5.Car(s) (standing)
6.Light Loco(s) (moving)
7.Light(s) (standing)
8.Other (specify in narrative)

112. Position of Car Unit in N/A

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110. Position	Code	113. Circumstance	Code
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	N/A	1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	N/A
114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	N/A

114c. State here the name and quantity of the hazardous materials released, if any.
N/A

115. Type Crossing Warning	1.Gates	4.Wig Wags	7.Crossbucks	10.Flagged by crew	116. Signaled Crossing (See instructions for codes)	Code	117. Whistle 1. Yes 2. No 3. Unknown	Code
	2.Cantilever FLS	5.Hwy. traffic signals	8.Stop signs	11.Other (spec. in narr.)				
	3.Standard FLS	6.Audible	9.Watchman	12.None				
Code(s)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach	Code	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code
	N/A		N/A		N/A

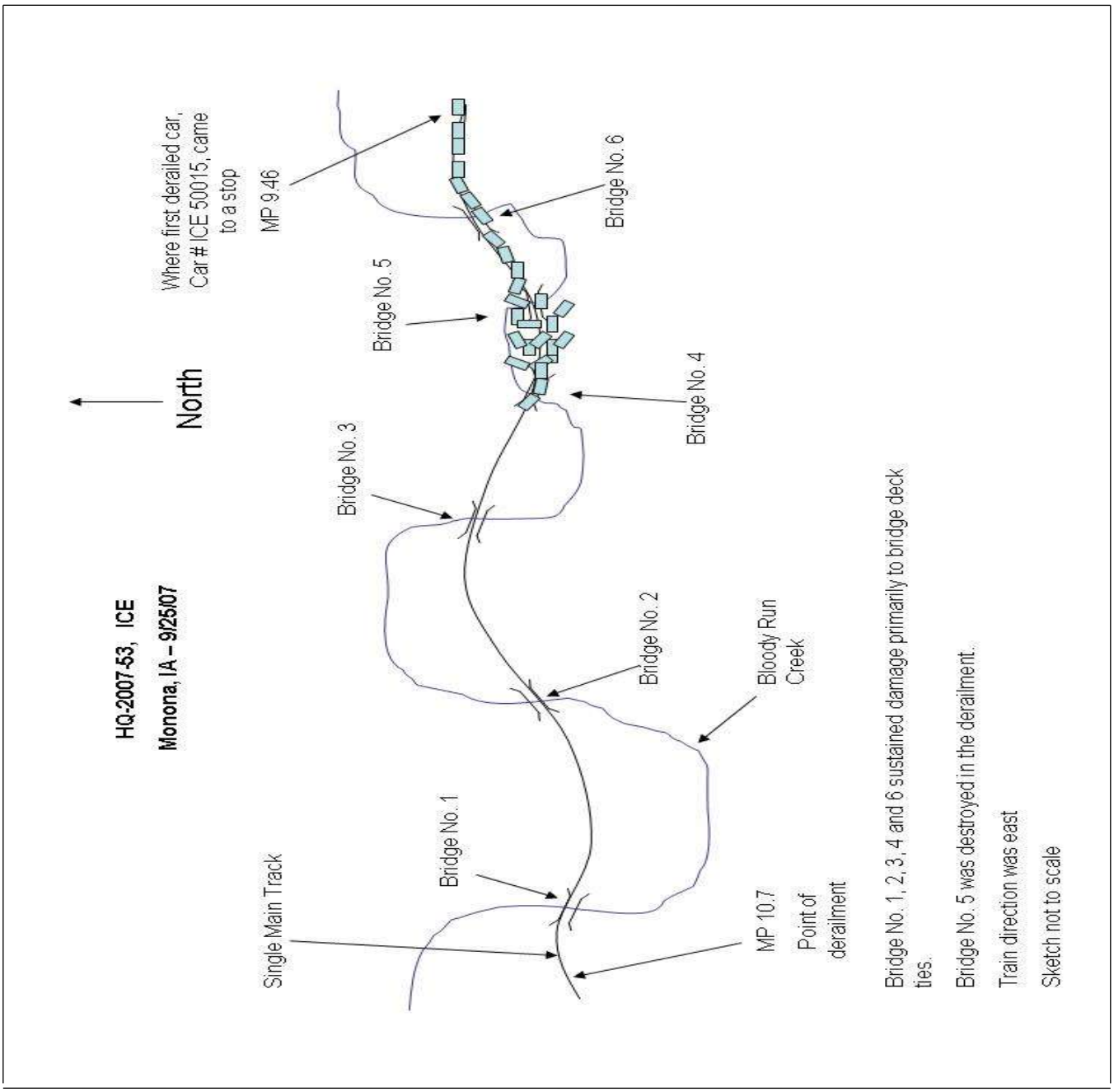
121. Age	122. Driver's Gender 1. Male 2. Female	Code	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other (specify in narrative)	Code
N/A		N/A		N/A		N/A

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code	126. View of Track Obscured by (primary obstruction) 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other (specify in narrative) 8. Not obstructed	Code
	N/A		N/A

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code	128. Was Driver in the Vehicle? 1. Yes 2. No	Code
				N/A		N/A
129. Highway-Rail Crossing Users	N/A	N/A	130. Highway Vehicle Property Damage (est. dollar damage)	N/A	131. Total Number of Highway-Rail Crossing Users (include driver)	N/A

132. Locomotive Auxiliary Lights? 1. Yes 2. No	Code	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code
	N/A		N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code
	N/A		N/A

136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



137. SYNOPSIS OF THE ACCIDENT

On September 25, 2007, at 7:15 p.m., CDT, an eastbound Iowa Chicago & Eastern (ICE) manifest freight train, Train Symbol MMCMQ-25, operating at a recorded speed of 20 mph, derailed 27 cars, the 27th through 53rd from the head-end. The derailment occurred on the ICE Rail System, Mason City Subdivision at milepost (MP) 10.7, which is 3.6 miles east of Monona, Iowa, in Clayton County. Train Symbol MMCMQ-25 consisted of 4 locomotives, all on the head-end, 108 cars (72 loads and 36 empties), was 6,532 feet in length, and 10,514 tons. The train was being operating by a two person crew (engineer and conductor).

There were no injuries as a result of this derailment and no hazardous materials were involved. Cost estimates are: track $771,633, equipment $627,131. FRA mandatory required post accident drug/alcohol testing was not performed though the damage estimates far exceed the $1 million threshold.

The weather at the time of the derailment was cloudy and 57 °F.

The probable cause of the derailment was restricted snubbing on Car No. ICE 50015, which created insufficient damping, allowing load springs to be driven solid creating a condition favorable to harmonic rocking and/or poor curving. This harmonic rocking caused the B-end, L3 wheel to climb the high rail of a curve. A probable contributing factor was insufficient side bearing clearance which also created a condition favorable to harmonic rocking and/or poor curving.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The crew of Train Symbol MMCMQ-25 consisting of a locomotive engineer and conductor, went on duty in Mason City, Iowa, at 10:45 a.m. CDT, on September 25, 2007, after receiving their statutory off-duty rest period. Mason City, is the home terminal for both crew members.

Their assigned manifest freight train consisted of four locomotives, all on the head-end, along with 108 cars, 72 loads of mixed freight and 36 empties. The train was 6,532 feet in length and weighed 10,514 tons. The train was scheduled to travel from Mason City, east to Marquette, Iowa, with no other work en route. The terminal train air brake test was performed by a qualified person prior to the crew boarding with no exceptions taken.

The crew of Train Symbol MMCMQ-25 reported the trip between Mason City and MP 10.7 was uneventful. As the eastbound train approached the accident area, the engineer was seated at the controls on the south side of the lead locomotive and the conductor was seated across from the engineer on the north side of the locomotive cab.

The derailment occurred in a 7-degree right-hand curve on a descending grade of 0.67 percent. The railroad timetable direction and geographic direction are the same at this location.

THE ACCIDENT

Train Symbol MMCMQ-25 was being operated at a speed of 21 mph approaching the derailment area. At the time the derailment occurred, the train speed had been reduced to 20 mph. Both speeds were recorded by the event recorder of the lead locomotive in the train, Locomotive No. ICE 6445. The maximum operating speed for trains in this area is 25 mph, as designated in the current ICE Timetable No. 2, which was made effective, April 3, 2005.

The crew stated as they were coming down the hill from Monona, Iowa, and going around a curve, they experienced an undesired emergency application of the train's airbrake system. The train came to a stop at MP 9.1. After contacting the dispatcher to inform him that they had stopped, the conductor dismounted the locomotive, walked back to inspect the train and discovered 27 loaded hopper cars of soybean cake were derailed. The conductor also stated that there had been considerable damage to a bridge.

There were no injuries to any person as a result of this derailment. No hazardous materials were involved and no evacuation was necessary.

ANALYSIS AND CONCLUSION

ANALYSIS

The point of derailment was in a 7-degree right-hand curve with a descending grade of 0.67 percent. The trailing truck on the B-end, left side number 3 wheel (L3) of Car No. ICE 50015, the 27th car from the locomotive consist, climbed the north rail or high side of the curve. The wheel traveled 12 feet on top of the rail before falling off to the fieldside.

Rail Sciences Inc., a contract laboratory was hired to perform a mechanical evaluation of Car No. ICE 50015. Derailment damage and wear found on Car No. ICE 50015 was indicative that it was the first and only car to derail at milepost 10.7. The B-end truck was the first to derail with the L3 wheel climbing the high rail.

Rail Sciences, Inc. concluded that the following conditions lead to the derailment of Car No. ICE 50015.

1. The B-end truck was worn beyond the Association of American Railroads (AAR) condemning limits and showed indications of excessive harmonic rocking and/or poor curving. Specifically:

• Wedge rise of approximately 3 inches greatly exceeded 1 ½ inch maximum as specified in AAR Rule 46 specifications for ride control truck.

• Gib wear of 1 13/16 inch on BL side exceeded 1 ½ inch maximum as specified in AAR Rule 47 and 46.

• Side bearing clearance of 1/16 inch on BR side was below 3/16 inch minimum as specified in AAR Rule 62.

• Column wear plate spacing likely exceeded nominal 17 ½ inch limit specified by manufacturer (Note: It was not possible to measure in the center of the column wear plate, but toe out condition of wedges is indicative of heavy dishing of wear plate.)

• Column wear plate wear likely exceeded 1/4 inch specified by AAR Rule 46.

• Center bowl liner was severely worn causing turning stiffness.

• Load springs showed evidence of repeatedly going solid which is indicative of insufficient damping and excessive rocking. Load springs should never go solid if trucks are performing properly.

2. Friction wedges were toed out against column wear plate. This limits proper contact of the friction face and degrades the damping ability of the wedge.

3. An attempt was made to correct excessive gib wear on B-end truck by welding an insert onto the gib. This type of repair is not AAR compliant and may have been performed outside AAR M214 standards.

All condemnable conditions outlined by Rail Sciences, Inc. exceed AAR specifications only. No conditions identified are condemnable under the Federal Railroad Administration's (FRA) Freight Car Safety Standards. Repair history records show the last repairs made to Car No. ICE 50015, were preformed by the Norfolk and Southern and were made in June 2007. The repairs consisted of air hoses, brake shoes, and coupler body with components.

FRA's analysis of the event recorder download from the lead Locomotive No. ICE 6445, did not reveal any operating issues that would have contributed to this accident.

A post-accident track inspection was conducted by an Iowa Department of Transportation (IDOT) Track Safety Inspector. He measured 1 1/8 inches deference in crosslevel between any 2 points less then 62 foot apart (warp) at the point of derailment, MP 10.7. This warp condition is well within the limits prescribed by the FRA's Track Safety Standards (TSS) for the class of track at which the railroad was operating. He also discovered that a gage condition had recently been repaired at MP 10.7, the point of derailment. He took no exceptions to the repairs made or to the current gage measurements. An FRA Form F 6180.97 inspection report was not completed for this inspection nor were any track notes taken.

The last hi-rail visual track inspection prior to the derailment was conducted on September 22, 2007, with no deviations noted in the derailment area. On September 14, 2007, a hi-rail visual inspection was conducted in which a wide gage condition was noted at MP 10.6. This condition was repaired and was later determined to be the same location that the IDOT had found at the point of derailment which was at MP 10.7.

The last internal rail defect inspection was conducted on August 1, 2007. This test was performed by Herzog Service Inc., test Vehicle HRZ034. No rail defects were noted in the area where the derailment occurred.

FRA reviewed the work history and noted that the engineer may have been working at a diminished level of effectiveness due to fatigue although fatigue is not believed to have been a factor in this derailment. FRA concluded that fatigue was not probable for the conductor.

Cost estimates for this derailment are: track $771,633; and equipment $627,131. FRA requires that post accident drug/alcohol testing be performed if damage estimates exceed $1 million. Considering the number of cars derailed and the obvious damage sustained to them, along with track damage and the complete destruction of one bridge and damage to five others, it was clear this derailment was going to far exceed the $1 million threshold. Due to the railroads failure to drug/alcohol test the train crew as required a recommendation for civil penalty was submitted.

Three rail cars containing soybean cake came to rest in Bloody Run Creek as a result of this derailment. Efforts were made to clean up as much of the soybean cake as possible without disturbing the creek bottom. A follow-up inspection by Iowa Department of Natural Resources personnel indicated they were satisfied with the remediation effort and no impact to the Bloody Run Creek fisheries had been noted.

CONCLUSION

The ICE contractor, Rail Science Inc., conducted an inspection and analysis of Car No. ICE 50015 and concluded the B-end truck was worn extensively, and showed indications of excessive harmonic rocking and/or poor curving. While these worn conditions did not exceed FRA Freight Car Safety Standards they did create a condition favorable to unloading the L3 wheel as it traversed a 7-degree right-hand curve at MP 10.7, allowing it to climb the rail on the high side of the curve and derail. FRA investigators concur with this conclusion. Possible human factor and track causes were eliminated by FRA's investigation.

PROBABLE CAUSE AND CONTRIBUTING FACTOR

FRA concluded that the probable cause of the derailment was restricted snubbing on Car No. ICE 50015, cause code E47C. A probable contributing factor was insufficient side bearing clearance on this car as well, cause code E40C.