Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-33

Union Pacific (UP)
Blairstown, Iowa
April 13, 2005

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-2005-33

1.Name of Railroad Operating Train #1 UNION PACIFIC RAILROAD COMPANY	1a. Alphabetic Code UP	1b. Railroad Accident/Incident No. 0405CB009
2.Name of Railroad Operating Train #2 Union Pacific RR Co. [UP]	2a. Alphabetic Code UP	2b. Railroad Accident/Incident 0405CB009
3.Name of Railroad Responsible for Track Maintenance: N/A	3a. Alphabetic Code N/A	3b. Railroad Accident/Incident No. N/A
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident Month 04 | Day 13 | Year 2005	6. Time of Accident/Incident 01:45: ☐ AM ☑ PM

7. 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

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
17	0	0	0	Council Bluffs

13. Nearest City/Town	14. Milepost (to nearest tenth)	15. State Abbr	15. State Code	16. County
Blairstown	107.8	N/A	IA	BENTON

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

21. Track Name/Number	22. FRA Track Class (1-9, X) — Code	23. Annual Track Density (gross tons in millions)	24. Time Table Direction 1. North 3. East — Code
Track No. 1	5	112.38	3

OPERATING TRAIN #1

25. 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: 1

26. Was Equipment Attended? 1. Yes 2. No — Code: 1

27. Train Number/Symbol: QNPC H-12

28. Speed (recorded speed, if available) — Code
R - Recorded
E - Estimated 28 MPH — Code: R

29. Trailing Tons (gross tonnage, excluding power units): 11803

30. 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)				
b	N/A	N/A	N/A	N/A

30a. 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
2. South 4. West
0

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	N/A	1	N/A
(2) Causing (if mechanical cause reported)	UP 9458	1	N/A

32. 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

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

34. 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	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

35. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	0	0	0	0	0
(2) Total Derailed	0	0	0	0	0

36. Equipment Damage This Consist: 0

37. Track, Signal, Way, & Structure Damage: 0

38. Primary Cause Code: N/A

39. Contributing Cause Code: N/A

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
N/A	N/A	N/A	N/A

Length of Time on Duty

44. Engineer/Operator: Hrs 0 Mi 0

45. Conductor: Hrs 0 Mi 0

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	0

49. EOT Device? 1. Yes 2. No: N/A

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

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

OPERATING TRAIN #2

52. 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: 1

53. Was Equipment Attended? 1. Yes 2. No — Code: 1

54. Train Number/Symbol: CNAP W11

55. Speed (recorded speed, if available) — Code
R - Recorded
E - Estimated 0 MPH — Code: R

57. Method(s) of Operation (enter code(s) that apply)
a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

57a. Remotely Controlled Locomotive?
0 = Not a remotely controlled; 1 = Remote control portable

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56. Trailing Tons (gross tonnage, excluding power units)	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)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
18909			b N/A N/A N/A N/A	0

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	59. 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 5591	138	no		0	0
(2) Causing (if mechanical cause reported)	0	0	N/A	60. Was this consist transporting passengers? (Y/N)	N	

61. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote	62. Cars	Loade a. Freight	Loade b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	1	(1) Total in Equipment Consist	135	0	0	0	0
(2) Total Derailed	0	0	0	0	1	(2) Total Derailed	1	0	0	0	0

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
229558	0	H605	E04L

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen	71. Engineer/Operator	72. Conductor
1	1	1	0	Hrs 5 Mi 45	Hrs 5 Mi 45

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	0	0	0

76. EOT Device? 1. Yes 2. No | 1

77. Was EOT Device Properly Armed? 1. Yes 2. No | 1

78. Caboose Occupied by Crew? 1. Yes 2. No | 2

Highway User Involved

79. Type — 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)

80. Vehicle Speed (est. MPH at impact): 0

81. Direction geographical) — Code: N/A
1.North 2.South 3.East 4.West

82. Position — Code: N/A
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

83. 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)

84. Position of Car Unit in Train: 0

85. Circumstance — Code: N/A
1. Rail Equipment Struck Highway User
2. Rail Equipment Struck by Highway User

86b. Was there a hazardous materials release by — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

86c. State here the name and quantity of the hazardous materials released, if any.
N/A

87. Type of Crossing Warning — Code(s): N/A N/A N/A N/A N/A N/A N/A
1.Gates 2.Cantilever FLS 3.Standard FLS 4.Wig Wags 5.Hwy. traffic signals 6.Audible 7.Crossbucks 8.Stop signs 9.Watchman 10.Flagged by crew 11.Other (spec. in narr.) 12.None

88. Signaled Crossing Warning Code (See instructions for codes)

89. Whistle Ban — Code: N/A
1. Yes 2. No 3. Unknown

90. Location of Warning — Code: N/A
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach

91. Crossing Warning Interconnected with Highway Signals — Code: N/A
1. Yes 2. No 3. Unknown

92. Crossing Illuminated by Street Lights or Special Lights — Code: N/A
1. Yes 2. No 3. Unknown

93. Driver's Age: 0

94. Driver's Gender — Code: N/A
1. Male 2. Female

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code: N/A
1. Yes 2. No 3. Unknown

96. Driver — Code: N/A
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)

97. Driver Passed Standing Highway Vehicle — Code: N/A
1. Yes 2. No 3. Unknown

98. View of Track Obscured by (primary obstruction) — Code: N/A
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

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	0	0

99. Driver Was — Code: N/A
1. Killed 2.Injured 3. Uninjured

100. Was Driver in the Vehicle? — Code: N/A
1. Yes 2. No

102. Highway Vehicle Property Damage (est. dollar damage): 0

103. Total Number of Highway-Rail Crossing Users (include driver): 0

104. Locomotive Auxiliary Lights? — Code: N/A
1. Yes 2. No

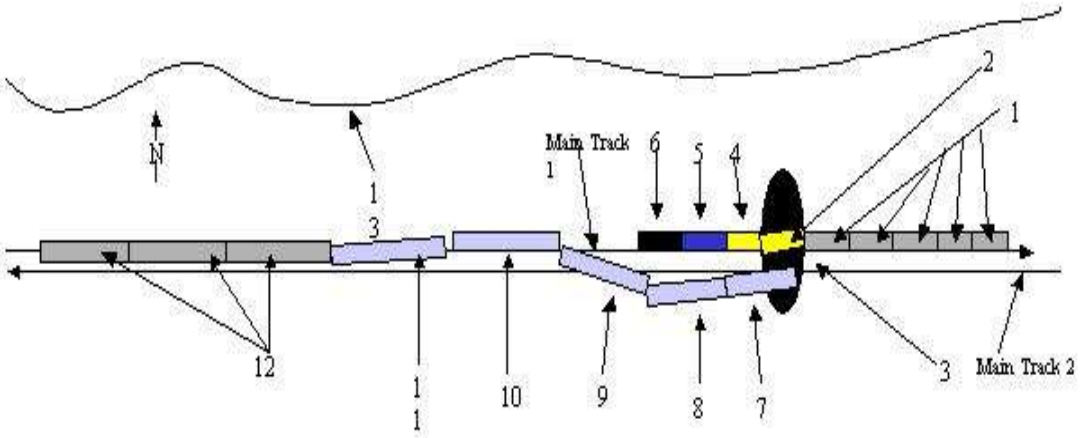
105. Locomotive Auxiliary Lights Operational? — Code: N/A
1. Yes 2. No

106. Locomotive Headlight Illuminated? — Code: N/A
1. Yes 2. No

107. Locomotive Audible Warning Sounded? — Code: N/A
1. Yes 2. No

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

HQ-33
Sketch.jpg



#1 - cars on CNAPW-11 NOT derailed.

#2 - DPU on CNAPW-11(UP 5591)

#3 - Pile of coal and remains of CWEX 2202.

#4 - Lead unit on QNPCH-12 (UP 9458)

#5 - Second Unit on QNPCH-12 (GCFX 3095)

#6 - Trailing unit on QNPCH-12 (NS 9170)

#7 - First Car in consist of QNPCH-12 (ETTX 904224 laying on side)

#8 - Second car in consist of QNPCH-12 (ETTX 902475 laying on side)

#9 - Third car in consist of QNPCH-12 (ETTX 851058 laying on side)

#10 - Fourth car in Consist of QNPCH-12 (ETTX 860268 derailed upright)

#11 - Fifth car in consist of QNPCH-12 (TTGX 99337) east truck only derailed

#12 - Cars in consist of QNPCH that did NOT derail.

#13 - Stream approximately 30 feet from tracks.

NOTE: There was rail damage between TTGX 993375 and coal pile on Main Track No 1 and between EETX 851058 and ETTX 902475 on Main Track No 2.

109. SYNOPSIS OF THE ACCIDENT

An eastbound UP freight train collided with a stopped eastbound UP freight train on April 13, 2005, at 1:45 p.m. The accident occurred near Blairstown, Iowa, at UP milepost (MP) 107.8 on the UP Council Bluffs Service Unit, Clinton Subdivision.

The fireman in training (FIT), of the striking train was injured when he jumped from the locomotive prior to the collision. The three locomotives and first five cars of the striking train were derailed as a result of the collision; four of the five cars came to rest fouling the other main track. The rear distributed power unit (DPU) UP 5591 and last rear car of the standing train were derailed. Total reportable damages for this accident were $1,278,813.

At the time of the accident, it was daylight and clear with a temperature of 57°F.

The accident was caused by the crew of the striking train failing to comply with General Code of Operating Rules (GCOR) 17.5.1 - ATC Rule - Over 40 mph; 17.5.2 - ATC Rule - Under 40 mph; and 6.27 Movement at Restricted Speed (see attachment # 43) .

Contributing factor was a faulty check valve within the locomotive air brake system which prevented the train brakes from applying when the main brake handle was positioned to the suppression position.

110. NARRATIVE

Circumstances Prior to the Accident

Train Symbol UP QNPCH-12
The crew of Train Symbol QNPCH-12 included a locomotive engineer, a fireman in training (FIT) to become an engineer, and a conductor. They went on duty at 9 a.m., CDT, April 13, 2005, at Boone, Iowa. This was the home terminal for all crew members, and all received at least the statutory off-duty period prior to reporting for duty.

Their assigned freight train consisted of three locomotives, 104 loaded, and 11 empty cars. It was 8,114 feet long and weighed 11,803 tons. The crew was scheduled to operate the train from Boone to Clinton, Iowa, a distance of approximately 200 miles. The train had received a Class 1 initial terminal air brake test at North Platte, Nebraska, on April 12, 2005, at 5:25 p.m., the day prior to the accident.

Train Symbol UP CNAPW-11
The crew of Train Symbol CNAPW-11 included a fireman in training (FIT), locomotive engineer, and a conductor. They went on duty at 8 a.m., CDT, April 13, 2005, at Boone. This was the home terminal for all crew members, and all received more than the statutory off duty period prior to reporting for duty.

Their assigned freight train consisted of two locomotives, 135 loaded, and 0 empty cars, with a DPU locomotive on the rear of the train (UP 5591). The train was 7,512 feet long and weighed 18,909 gross tons. The crew was scheduled to operate the train between Boone and Clinton, Iowa, a distance of approximately 200 miles.

Events prior to Accident

The method of operation in this area is by signal indications of an Automatic Train Control System (ATC) which is arranged to govern movements with the current of traffic. There are no wayside signals in this area, and the current of traffic direction is to the left. Through this area, the UP operates on two main tracks, with a east/west timetable direction, with main Track No. 1 to the North, and main Track No. 2 to the South. The maximum authorized timetable speed across this subdivision is 70 mph with various speed restrictions in effect.

In this area of the railroad, the track is tangent to MP 109.8 where there is a 2-degree 7-minute curve to the right to MP 109.4, followed by a tangent to MP 107.9, where there is a 1-degree curve to the left to the point of the accident. There is a .57-percent-descending grade approaching the accident site which gradually levels and then rises to a .16-percent ascending grade at the point of collision.

The crew of Train Symbol CNAPW-11 reported nothing unusual occurred prior to the restricted signal they received at approximately MP 108. They contacted the Train Dispatcher at the Harriman Dispatching Center in Omaha, Nebraska, and were told that they would be stopping at the next hold point for about 20 minutes for some maintenance-of-way work being preformed ahead of them. They stopped approximately one-half mile west of the hold point so the train would not block any grade crossings.

The crew of Train Symbol QNCPH-12 stated after reviewing their train orders and track bulletins, they departed Boone at approximately 9:50 a.m. CDT with the FIT (student engineer) operating the train, the engineer in the middle seat, and the conductor seated in the left seat of UP 9458, the lead and controlling locomotive of the train. The crew stated that the first portion of the trip was uneventful until reaching Marshalltown, Iowa, MP 150, where they received an undesired emergency application of the train's air brake system, immediately following the student engineer making approximately a 10-lb. air brake pipe reduction.

The Accident

After recovering the train's air, they continued operating eastward and reported the trip was uneventful until they experienced their first restricting cab signal of the trip at milepost MP 110.09. The train was traveling at approximately 32 mph, and the FIT reported he acknowledged the restricting aspect by depressing the train's cab signal acknowledging device. Although the FIT did not immediately make an air brake reduction of the train's air brake system at the time he received the restricting cab signal aspect to comply with restricted speed, he stated he did operate the locomotive's throttle which was in position "notch 8" at the time, a notch at a time until reaching throttle position "notch 1".

The train's speed continued to increase as they were operating in an area of descending grade (0.02 percent), until the train reached a speed of 41 mph at MP 109.40, where the on-board ATC system sounded the overspeed whistle. All three crew members reported the FIT placed the train's main air brake lever in the suppression position at this time, and further stated the sound from the venting air seemed suppressed and unlike the normal sound that they would have expected to hear. The train continued to gradually gain speed until it reached a speed of 45 mph.

GCOR's 17.5.1, and 17.5.2, both require the engineman to reduce the train's speed to restricted speed if the cab signal aspect continues to display restricting. GCOR 6.27 defines restricted speed (in part) as, prepared to stop within half range of vision looking out for train, engine, car, men working on tracks, derail or switch not properly lined, not exceeding 20 mph.

As the Train Symbol QNCPH-12 approached MP 107.8, where Train Symbol CNAPW-11 was stopped on main Track No. 1 ahead, the FIT sighted the headlight of the DPU locomotive on the rear of the train and realized a collision was imminent.

The FIT stated he shouted to the engineer and conductor there was a train on the track ahead, as he placed the main brake handle in the emergency position and quickly exited though the door behind the engineer's controls, ran to the rear of the locomotive, and jumped toward the south side of the train. The engineer and conductor remained aboard the locomotive and braced themselves for the impact.

Train Symbol QNPCH-12 impacted with the DPU (UP5591) on the rear of Train Symbol CNAPW-11 at a recorded speed of 28 mph. No injuries were received by the crew members of either train other than the FIT of the striking train received a laceration to the back of his head that required stitches and numerous abrasions to his back after jumping from the rear of the lead locomotive unit.

As a result of the impact, the three locomotive units and two of the first five cars from Train Symbol QNPCH-12 derailed. The first three cars of Train Symbol QNPCH-12 landed on their sides, blocking both mains, and the coal car from Train Symbol CNAPW-11 was completely destroyed, with the DPU resting in the upright position on top of the remains and contents of the car. There were hazardous materials in the consist of the striking train, but none involved in the derailment. The fuel tanks of the second locomotive of Train Symbol QNPCH-12 were punctured, spilling approximately 2,000 gallons of diesel fuel. FRA reportable damages are estimated to be a total of $725,813, and total cost estimated at $1,278,813 including clean-up.

Analysis

Post-accident toxicological testing was performed on all crew members of both Train Symbols QNPCH-12 and CNAPW-11. Results for all crew members were negative.

An in-depth inspection was performed to train line and braking equipment of those cars on Train Symbol QNPCH-12 which were not derailed as a result of the collision. Although there were minor defects noted during the inspection, there were no exceptions noted which would have prevented the brakes from applying at the time the crew stated they placed the train's main air brake handle in the suppression position.

Preliminary tests were also performed to the ATC equipment aboard UP 9458, the lead and controlling of Train Symbol QNPCH-12. Although no exceptions were taken during these preliminary tests, it should be noted the locomotive sustained significant damage and not all tests could be performed as a result of the damage. The ATC equipment box was secured and the locomotive was moved to the locomotive shop in Little Rock, Arkansas, for further testing and repairs.

Due to substantial damage sustained in the collision, the locomotive required a "one-time-move" waiver from FRA prior to being transported to Little Rock "Jenks" locomotive shop. After the waiver was granted on April 21, the locomotive was transported to Little Rock and arrived on April 25, 2005. Some repairs were required before further testing could be initiated such as replacement of the ATC receiver bars and portions of the locomotive's air line, which were damaged on the underside of the locomotive in the collision.

After initial repairs were completed, an FRA team arrived on April 26, 2005, and along with UP managers, began in-depth testing of the locomotives air brake system and on-board ATC system. It was quickly discovered a one-way check valve within the number 8 pipe of the locomotive's air brake system was defective. The defective valve allowed air to pass in the wrong direction when the main brake handle was placed in the suppression position. This allowed air pressure to drive the release control valve up in its cylinder and prevented air from reducing in the equalizing reservoir, thereby circumventing the full service brake application of the train's air brakes.

Due to the fact the restricting aspect of the on-board ATC system occurred while the train was traveling at less than medium speed (40 mph), the system only required the crewman operate the acknowledging device. An on-board ATC restricting cab signal by rule requires the crew to reduce the train's speed to 20 mph and operate in accordance with the requirements of restricted speed as defined within the General Code of Operating Rules (GCOR). When the crew failed to comply with the requirements of restricted cab signal and allowed the train's speed to exceed 40 mph, this constitutes an overspeed condition causing the overspeed whistle to sound and requiring the automatic brakes be applied at the full service rate within 8 seconds, or a penalty brake application will be initiated by the ATC system. Since the FIT placed the locomotive's automatic brake handle in the suppression position within 8 seconds, this satisfied the requirements of the ATC system. The ATC system recognized the action taken by the FIT when he placed the automatic brake handle in the suppression position and had the number 8 pipe check valve not failed, the train would have stopped prior to colliding with Train Symbol CNAPW-11.

The defective check valve was removed from UP 9458 and disassembled to determine what caused the valve to fail. It was readily evident the internal spring which returns the shuttle to the "check" position was folded within the cylinder and binding with the shuttle. This binding action combined with the reduced spring action caused by the folded spring allowed the shuttle to not return to the "check" position on an intermittent basis.

Conclusions

Several immediate actions were recommended by FRA to determine the extent of the problem related to the number 8 pipe check valve as it relates to other locomotives so equipped. The following initiatives have been implemented by the Union Pacific Railroad Company (UP):

Operating Practices

- System General Order # 5 with changes to rules 9.8, 17.3, 17.5.1, 17.5.2, and 17.5.3.
- 72-hour Safety Stand-down.
- Simulator training to include the collision scenario.
- Crew contacts at on-duty points.
- Deployment of FTX testing teams.

Mechanical

- On locomotives equipped with the 30ACDW Air Brake System, a task has been issued to qualify the Number 8 check valve.
- Changed Outbound Consist Departure Test to include testing of the No. 8 Check Valve.

- Purchase the No. 8 Check Valve from vendor which is refurbished and tested versus rebuilding in-house.

An additional recommendation was made to address the operating requirements should a crew experience a similar situation where placing the automatic brake in suppression fails to slow the train.

All recommendations were well received by UP and have since been implemented. A locomotive maintenance instruction (LMI) has been issued along with instructions on how to test for a defective number 8 pipe check valve. This test is currently being performed during the initial terminal air brake test for the train.

An operating rule change was issued requiring the crew to initiate an emergency application of the train's braking system should a suppression application fail to slow the train.

The actions taken by UP should detect a similar defective number 8 pipe check valve prior to the train being dispatched its initial terminal. Should an intermittent failure escape detection at the time of the initial terminal air brake test, the operating rule change addresses the action required to be taken by the crew.

Probable Cause & Contributing Factors

The primary cause was determined to be H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.

The secondary cause was determined to be E04L -Other brake components damaged, worn, broken, or disconnected (LOCOMOTIVE).