Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2008-73

Union Pacific (UP)
Tucson, AZ
September 6, 2008

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-2008-73

1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP]	1a. Alphabetic Code: UP	1b. Railroad Accident/Incident No.: 0908TS002
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: Union Pacific RR Co. [UP]	4a. Alphabetic Code: UP	4b. Railroad Accident/Incident No.: 0908TS002
5. U.S. DOT_AAR Grade Crossing Identification Number:	6. Date of Accident/Incident: Month 09 | Day 06 | Year 2008	7. Time of Accident/Incident: 10:25: ☑ AM ☐ PM

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

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

14. Nearest City/Town	15. Milepost (to nearest tenth)	16. State Abbr	16. State Code	17. County
Tucson	986.6	N/A	AZ	PIMA

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
90 F		2		1		2

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
Track 18		1	N/A		N/A

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
	6	1. Yes	2	LLKP36-05

29. Speed (recorded speed, if available) R - Recorded E - Estimated			Code
	16	MPH	E

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

31. 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	N/A	N/A	N/A	N/A

31a. 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: 3

32. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)
(1) First involved (derailed, struck, etc)	TTAX654105	1	yes
(2) Causing (if mechanical cause reported)	0	0	N/A

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	0	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	5	0	13	0	0
(2) Total Derailed	0	0	0	0	0

37. Equipment Damage This Consist		38. Track, Signal, Way, & Structure Damage	
	$0.00		$0.00

39. Primary Cause Code		40. Contributing Cause Code	
	H018		N/A

Number of Crew Members

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

Length of Time on Duty

45. Engineer/Operator				46. Conductor			
Hrs	0	Mi	0	Hrs	0	Mi	0

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: 2

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
	7	1. Yes	1	YTU10R-06

56. Speed (recorded speed, if available) R - Recorded E - Estimated			Code
	7	MPH	R

58. 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

58a. Remotely Controlled Locomotive?
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 | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: 3

59. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	RBOX32750	11	yes
(2) Causing *(if mechanical cause reported)*	0	0	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	2	0	0	0	0
(2) Total Derailed	0	0	0	0	0

63. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	11	0	0	0	0
(2) Total Derailed	0	0	0	0	0

64. Equipment Damage This Consist: $0.00

65. Track, Signal, Way, & Structure Damage: $0.00

66. Primary Cause Code: H008

67. Contributing Cause Code: H018

Number of Crew Members

68. Engineer/ Operators	69. Firemen	70. Conductors	71. Brakemen
2	0	0	0

Length of Time on Duty

72. Engineer/Operator: Hrs 3 Mi 25

73. Conductor: Hrs 0 Mi 0

Casualties to:	74. Railroad Employees	75. Train Passengers	76. Other
Fatal	0	0	0
Nonfatal	2	0	0

77. EOT Device? 1. Yes 2. No: 2

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

79. Caboose Occupied by Crew? 1. Yes 2. No: 2

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: 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 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped	Code N/A	113. Circumstance 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User	Code 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	Code N/A	114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither	Code N/A
114c. State here the name and quantity of the hazardous materials released, if any. N/A			

115. Type Crossing Warning 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	116. Signaled Crossing *(See instructions for codes)*	Code	117. Whistle Ban 1. Yes 2. No 3. Unknown	Code
Code(s) N/A 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 N/A	119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown	Code N/A	120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown	Code N/A

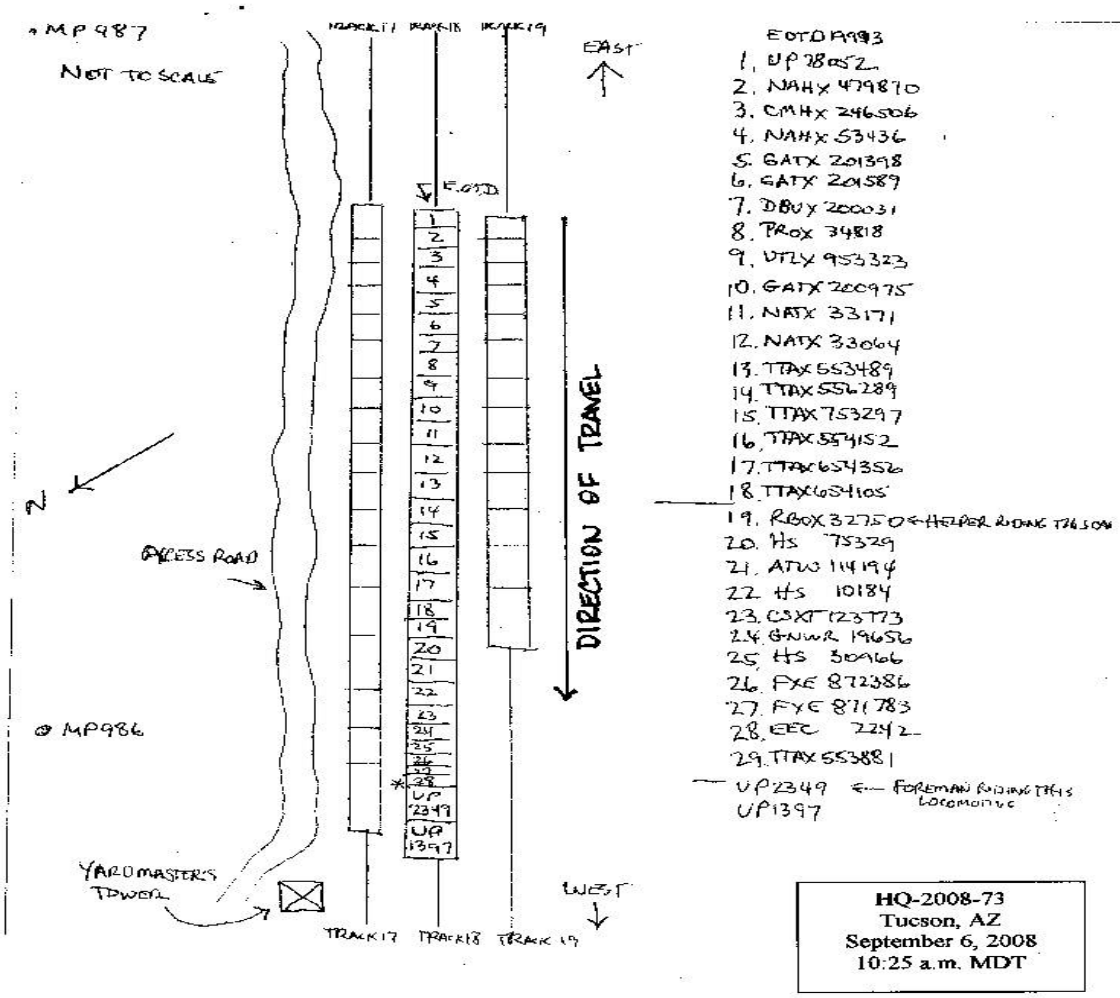
121. Age N/A	122. Driver's Gender 1. Male 2. Female	Code N/A	123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown	Code N/A	124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify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

125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown	Code N/A	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

Casualties to:	Killed	Injured	127. Driver 1. Killed 2.Injured 3. Uninjured	Code N/A	128. Was Driver in the Vehicle? 1. Yes 2. No	Code 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 N/A	133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No	Code N/A
134. Locomotive Headlight Illuminated? 1. Yes 2. No	Code N/A	135. Locomotive Audible Warning Sounded? 1. Yes 2. No	Code 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 6, 2008 at approximately 10:25 a.m. MDT, 18 unattended freight cars rolled west out of Track 18 in Union Pacific's (UP) Tucson, Arizona rail yard. The 18 cars struck the rear car of an 11-car switching movement of UP Switching Job YTU10R-06, an Remote Control Operator (RCO) assignment, which had just cut away from the 18 unattended freight cars, and was making a westward movement in the same track.

Tucson yard is located at MP 986.6 on UP's Tucson Service Unit, Gila Subdivision in Mericopa County.

Two crew members of UP Switching Job YTU10R-06 were injured when they were thrown from the equipment on which they were riding. Both sustained multiple cuts, abrasions, and contusions due to the accident and both lost time from work as a result of their injuries. No cars derailed and there was no track, signal or equipment damage as a result of the accident.

At the time of the accident it was daylight, the weather was clear with a temperature of 90 degrees Fahrenheit.

The probable cause of the accident was failure of the RCO crew to properly secure a sufficient number of hand brakes on the standing rail cars.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

A switch foreman and helper reported for duty in the Union Pacific Tucson, Arizona rail yard at 7:00 a.m. MDT, September 6, 2008, for UP Switch Job YTU10R-06. The Switch Job is a Remote Control Operator (RCO)assignment that switches the west end of Tucson yard and was working with UP locomotives (UP 1397), a Remote Control-equipped Locomotive (RCL), and UP locomotive 2349.

UP's Tucson yard is located on the Tucson Service Unit, Gila Subdivision in the middle of the City of Tucson, Arizona. The yard is identified on pages 2 through 5 in the UP Sunset Area Timetable # 2 dated October 31, 2007. There are two Main Lines with approximately 50 yard tracks and is on a 0.87% descending grade to the west. The maximum authorized speed is 10 mph classified as FRA Class 1 track.

The crew performed other switching duties earlier in the shift prior to a subsequent job briefing with the yardmaster conducted via telephone at approximately 9:45 a.m. that discussed switching cars in Track 18. The cars had arrived earlier in the day from UP Freight Train LKP36-05. The instructions to the foreman were to couple into the track and take the west two cars from the track and set them over to Track 17. After making the first move, five loaded cars and 24 empty cars remained in the track.

The crew was then instructed to couple to the next 11 cars in Track 18 and move them into another track for future switching. The yardmaster instructed the crew to apply only one hand brake on the west car of the 18 remaining cut of cars and to close the angle cock on that same car. The yardmaster told the crew the angle cock on the east car of the cut was closed and that the crew of another UP Switching job (YTU11R-06) would switch out the remaining 18 cars in the track from the east end of the yard after UP Job YTU10R-06 was finished. The foreman repeated these instructions to his helper who then acknowledged the task to be performed. The crew of UP Job YTU11R-06 was in the shanty at 36th Street in Tucson waiting for a switch list for Track 18.

The first move in Track 18 was completed and at approximately 10:15 a.m., the crew members started to

make the second move by coupling into the 11 west cars of the track. The crew of UP Job YTU10R-06 operated their locomotives east on Track 18 and coupled into the equipment. The primary RCO was the foreman of the job and he called for a "RED ZONE" to couple to the equipment. The foreman then placed the remote controls in neutral, which is the position that meets rule requirements for set and centered. The foreman coupled the air hoses between UP Locomotive 2349 and rail car TTAX 553881, the west car in the cut of cars in the track. He also opened the angle cocks on UP locomotive 2349 and rail car TTAX 553882 to allow the brake line to charge with air. The locomotives then began charging the train line.

The helper began releasing hand brakes on the cars and ensuring all air hoses were coupled and the angle cocks opened. When the helper reached the point where the cut would be made, he closed the angle cock on the last car in their train, RBOX 32750, and closed the angle cock on the west car of the cut that would remain in the track, TTAX 654105. At this point the train line had been charging for approximately 7 minutes, 40 seconds when the angle cock was closed on the cut to remain in the track. The helper pulled the uncoupling lever on each car at the cut and secured one hand brake on rail car TTAX 654105.

The helper had positioned himself on the northeast side or rear ladder of the rear car, RBOX 32750. The foreman was positioned on the northeast or rear steps of Locomotive UP 2349 to protect the shove into Remote Control Zone Number 7, which was previously activated by the crew. The crew of UP Switching Job YTU10R-06 cut away from the 18 cars and pulled the remainder of the train west in the track. As the train passed Track 17, the foreman, who was in control of the movement, slowed the train down to observe the two cars they had placed on Track 17 earlier to determine they were properly secured. When the foreman was satisfied the cars on Track 17 were secured, he placed the throttle on the remote control device in coast as the train neared the west end of the track. The train was traveling at 7.6 MPH.

THE ACCIDENT

Shortly after UP Switching Job YTU10R-06 pulled away from the remaining 18 cars in the track, the cars began to roll west because the single hand brake that had been applied was not sufficient enough to hold the cut of rail cars. After rolling for approximately 1,000 feet, the cars struck the rear car, RBOX 32750, and caused a hard coupling into the car. The impact forced the train to be pushed westward approximately 277 feet in 22 seconds, accelerating it to a speed of 16 mph before it came to stop. The train came to a stop when the "man down" feature of the remote control device was activated when both crew members were thrown to the ground. The tilt mechanism functioned as intended and an emergency application of the emergency air brakes occurred. The crew members sustained multiple cuts, abrasions, and contusions due to the fall.

The yardmaster on duty heard the noise of the impact and immediately called 911 for an ambulance. The yardmaster was the first to arrive on the scene. He made a quick assessment of the crew's condition. He then ordered another switch crew to remove equipment located on Track 17 so that emergency responders could reach the two injured crew members.

Next to arrive on the scene was the UP Director of Road Operations, followed shortly by the Tucson Fire Department with Emergency Medical Technicians (EMT). The EMT's attended to the injured crew and transported them to University Medical Center Hospital in Tucson. The foreman was treated and released and the helper remained hospitalized for observation and testing for three days. Both crew members lost time from work due to injuries.

Despite the hard coupling, there was no equipment damage, no equipment derailed and no damage caused to track and signals.

POST-ACCIDENT INVESTIGATION

Following the accident, FRA conducted an investigation to determine the facts and probable cause. The investigator conducted interviews and reviewed and obtained documents.

The investigation revealed that rail car TTAX 654105 is an articulated intermodal car that is equipped with two hand brakes. The crew had applied a single hand brake on car TTAX 654105 which was the end car of the cut of 18 cars. Tonnage for the 18 cars totaled 1,499 tons. Securing only a single hand brake was contrary to UP Air Brake and Train Handling Rule 32.1.2 or the Timetable Special Instructions on the Gila Subdivision

for securing rail cars in the Tucson yard, which stipulates a minimum of five hand brakes, are to be applied to a cut of cars exceeding 1,000 tons. The one hand brake that was applied on rail car TTAX 654105 was not sufficient to hold the cut of cars with a total weight that exceeded 1,000 tons on a yard track with a descending 0.87 percent grade.

A review of the locomotive event recorder data indicates air was pumped through all cars on the track for 7 minutes and 40 seconds before the angle cocks were closed between the rear car of the 11 cars to be moved as well as on the 18 remaining cars. The single hand brake was insufficient to secure the cut against movement. Once movement commenced, the cars rolled and struck the rear of the train ahead.

A photograph taken hours after the accident of the rear car on Track 18, car UP 78052, with End of Train Device (EOTD) UPRQ 19993, indicates a reading of 56 pounds of air in the train line. Photographs of car RBOX 32750, the rear or east car of UP Job YTU10R-06, and rail car TTAX 553882 the west car of the free rolling cut of cars, show the cars coupled together, air hoses unconnected and both angle cocks in the closed position.

A review of rules testing noted both Crew members of UP Job YTU10R-06 recently passed GCOR and Air Brake and Train handling Rules.

Following the incident, UP mechanical forces inspected the locomotives and cars for damage. No defects were noted on the locomotives and, despite the hard coupling, no damages were noted on the cars.

ANALYSIS AND CONCLUSIONS

The yardmaster on duty conducted a job briefing with the foreman of UP Job YTU10R-06 that was not in compliance with Federal Regulation and UP Air Brake and Train handling Rules. The yardmaster assumed UP Job YTU11R-06 would couple into the 18 cars on Track 18 to begin switching as soon as the crew of UP Job YTU10R-06 completed their work. This did not occur because the he crew of UP Job YTU11R-06 was waiting in the east end yard shanty for the track list before they could begin switching.

The job briefing was not in compliance with 49 CFR Parts 232.103 (n) (1) and (n) (2), nor UP Air Brake and Train Handling Rules 32.1 and 32.1.2. The yardmaster instructed the crew to secure the train with an insufficient amount of hand brakes. He instructed them to apply a single hand brake to the remaining cars, when five hand brakes were required based on the amount of tonnage to be secured. UP Gila Subdivision Rule 32.1, hand brake requirements, stipulates for cuts of cars between 0 and 1999 tons, five hand brakes or half of the hand brakes in the train, whichever is the least, is required. The yardmaster's instructions allowed the crew of UP Switching Job YTU10R-06 to bottle the air on the 18 remaining cars in Track 18. The yardmaster instructed the crew of UP Switching Job YTU10R-06 to close the angle cock on the west car of the remaining equipment in Track 18. The angle cock was closed on the rear car of this same cut of cars.

Neither crew member of OP Job YTU10R-10 challenged the yardmaster's instructions. UP employees are empowered to challenge instructions if those instructions may cause an unsafe condition and the crew failed to empower themselves to challenge them.

Following the incident, the Director of Road Operations for the Tucson Service Unit conducted job briefings with all yardmasters. These briefings emphasized compliance with Federal Regulations, GCOR Rules and UP Air Brake and UP Train Handling Rules as well as consequences for non-compliance.

No alcohol or drug testing occurred as the accident did not meet criteria required for Federal Post-Accident testing.

A review of all tests, records and inspections on the equipment, track, signals and train handling excluded each as contributing to the accident.

FRA is recommending a violation for non-compliance with 49 CFR Parts 232.103(n) 1 and (n) 2, insufficient hand brakes applied and bottling the air on the 18 remaining cars.

PROBABLE CAUSE AND CONTRIBUTING FACTORS

The probable cause of the accident was the RCO crew's failure to properly secure a sufficient number of hand brakes on the rail cars.