



***Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch***

***Accident Investigation Report
HQ-2014-2***

***Union Pacific Railroad Company (UP)
Kosse, TX
April 6, 2014***

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

TRAIN SUMMARY

1. Name of Railroad Operating Train #1 Union Pacific Railroad Company	1a. Alphabetic Code UP	1b. Railroad Accident/Incident No. 0414FW006
2. Name of Railroad Operating Train #2 Union Pacific Railroad Company	2a. Alphabetic Code UP	2b. Railroad Accident/Incident No. 0414FW006

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance Union Pacific Railroad Company	1a. Alphabetic Code UP	1b. Railroad Accident/Incident No. 0414FW006
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 4/6/2014	4. Time of Accident/Incident 9:26 PM
5. Type of Accident/Incident Rear End Collision		
6. Cars Carrying HAZMAT 0	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0
		9. People Evacuated 0
10. Subdivision Ennis		
11. Nearest City/Town KOSSE, TX	12. Milepost (to nearest tenth) 151.2	13. State Abbr. TX
		14. County LIMESTONE
15. Temperature (F) 49 °F	16. Visibility Dark	17. Weather Clear
18. Type of Track Main		
19. Track Name/Number Main	20. FRA Track Class Freight Trains-60, Passenger Trains-80	21. Annual Track Density (gross tons in millions) 52.9
		22. Time Table Direction South

OPERATING TRAIN #1

1. Type of Equipment Consist: Freight Train				2. Was Equipment Attended? Yes		3. Train Number/Symbol OWVBT-30						
4. Speed (recorded speed, if available) R - Recorded E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 16105		6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter					Code 0		
6. Type of Territory Signalization: <u>Signaled</u> Method of Operation/Authority for Movement: <u>Signal Indication</u> Supplemental/Adjunct Codes: <u>Q</u>												
7. Principal Car/Unit (1) First Involved (derailed, struck, etc.)		a. Initial and Number UP5945	b. Position in Train 1	c. Loaded (yes/no) yes	8. If railroad employee(s) tested for drug/ alcohol use, enter the number that were positive in the appropriate box.			Alcohol 0	Drugs 0			
(2) Causing (if mechanical, cause reported)		0	0	no	9. Was this consist transporting passengers?				No			
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual c. Remote		Rear End d. Manual e. Remote		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight b. Pass.		Empty c. Freight d. Pass.		e. Caboose	
(1) Total in Train	2	0	0	2	0	(1) Total in Equipment Consist	113	0	0	0	0	
(2) Total Derailed	1	0	0	0	0	(2) Total Derailed	0	0	0	0	0	
12. Equipment Damage This Consist 800623			13. Track, Signal, Way & Structure Damage 6243									
14. Primary Cause Code H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.												
15. Contributing Cause Code												
Number of Crew Members					Length of Time on Duty							
16. Engineers/Operators	17. Firemen		18. Conductors		19. Brakemen		20. Engineer/Operator		21. Conductor			
1	0		1		0		Hrs: 11	Mins: 13	Hrs: 11	Mins: 14		
Casualties to:	22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?		26. Was EOT Device Properly Armed?			
Fatal	0		0		0		Yes		Yes			
Nonfatal	2		0		0		27. Caboose Occupied by Crew?					N/A
28. Latitude 31.000000000			29. Longitude -97.000000000									

FRA FACTUAL RAILROAD ACCIDENT REPORT

OPERATING TRAIN #2

1. Type of Equipment Consist: Freight Train		2. Was Equipment Attended? Yes		3. Train Number/Symbol ZYCLD-05										
4. Speed (recorded speed, if available) R - Recorded E - Estimated 0 MPH		Code R	5. Trailing Tons (gross excluding power units) 5500		6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter Code 0									
6. Type of Territory Signalization: <u>Signaled</u> Method of Operation/Authority for Movement: <u>Signal Indication</u> Supplemental/Adjunct Codes: <u>Q, N/A</u>														
7. Principal Car/Unit (1) First Involved (derailed, struck, etc.) DTTA765174		a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	8. If railroad employee(s) tested for drug/ alcohol use, enter the number that were positive in the appropriate box.									
(2) Causing (if mechanical, cause reported)		0	0	no	9. Was this consist transporting passengers? No									
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)		a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)		Loaded		Empty			
(1) Total in Train		2	b. Manual	c. Remote	d. Manual	e. Remote	(1) Total in Equipment Consist	a. Freight	b. Pass.	c. Freight	d. Pass.	e. Caboose		
(2) Total Derailed		0	0	0	0	0	(2) Total Derailed	13	0	0	0	0		
12. Equipment Damage This Consist 783376			13. Track, Signal, Way & Structure Damage 0											
14. Primary Cause Code H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.														
15. Contributing Cause Code														
Number of Crew Members						Length of Time on Duty								
16. Engineers/Operators		17. Firemen		18. Conductors		19. Brakemen		20. Engineer/Operator		21. Conductor				
1		0		1		0		Hrs: 9 Mins: 4		Hrs: 9 Mins: 4				
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?		26. Was EOT Device Properly Armed?				
Fatal		0		0		0		Yes		Yes				
Nonfatal		2		0		0		27. Caboose Occupied by Crew?		N/A				
28. Latitude 31.000000000			29. Longitude -97.000000000											

CROSSING INFORMATION

Highway User Involved		Rail Equipment Involved	
1. Type N/A		5. Equipment N/A	
2. Vehicle Speed (<i>est. mph at impact</i>)	3. Direction (<i>geographical</i>) N/A	6. Position of Car Unit in Train	
4. Position of Involved Highway User		7. Circumstance N/A	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? N/A		8b. Was there a hazardous materials release by N/A	
8c. State here the name and quantity of the hazardous material released, if any.			
9. Type of Crossing Warning 1. Gates 4. Wig wags 7. Crossbucks 10. Flagged by crew 2. Cantilever FLS 5. Hwy. traffic signals 8. Stop signs 11. Other (<i>spec. in narr.</i>) 3. Standard FLS 6. Audible 9. Watchman 12. None N/A		10. Signaled Crossing Warning	
12. Location of Warning N/A		13. Crossing Warning Interconnected with Highway Signals N/A	
15. Highway User's Age		16. Highway User's Gender	
17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train		18. Highway User	
19. Driver Passed Standing Highway Vehicle		20. View of Track Obscured by (<i>primary obstruction</i>)	
Casualties to:		Killed	Injured
23. Highway-Rail Crossing Users 0		24. Highway Vehicle Property Damage (<i>est. dollar damage</i>) 0	
26. Locomotive Auxiliary Lights? N/A		27. Locomotive Auxiliary Lights Operational? N/A	
28. Locomotive Headlight Illuminated? N/A		29. Locomotive Audible Warning Sounded? N/A	
25. Total Number of Vehicle Occupants (<i>including driver</i>)		21. Driver was	
22. Was Driver in the Vehicle?		25. Total Number of Vehicle Occupants (<i>including driver</i>)	

10. Signaled Crossing Warning

- 1 - Provided minimum 20-second warning
- 2 - Alleged warning time greater than 60 seconds
- 3 - Alleged warning time less than 20 seconds
- 4 - Alleged no warning
- 5 - Confirmed warning time greater than 60 seconds
- 6 - Confirmed warning time less than 20 seconds
- 7 - Confirmed no warning
- N/A - N/A

Explanation Code

- A - Insulated rail vehicle
- B - Storm/lightning damage
- C - Vandalism
- D - No power/batteries dead
- E - Devices down for repair
- F - Devices out of service
- G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present
- H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)
- J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits
- K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit
- L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction
- M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed
- N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach
- O - Warning time less than 20 seconds attributed to violation of special train operating instructions
- P - No warning attributed to signal systems failure to detect the train
- R - Other cause(s). Explain in Narrative Description

SYNOPSIS

Synopsis

On April 6, 2014, at approximately 9:27 PM CDT, southbound UP freight train OWVBT-30 collided with the rear of stopped southbound UP intermodal train ZYCLD-05 at a recorded speed of 18 mph. The collision occurred at MP 151.2 on the UP DFW Service Unit Ennis Subdivision near Kosse, Texas.

As a result of the collision the crew members of both trains sustained minor injuries. The lead locomotive of the striking train, OWVBT-30, derailed along with the rear 13 cars of the stopped train, ZYCLD-05. The equipment cost was \$1,583,999 and the cost of damage to track and structures was \$6,243 for a total of \$1,590,242.

At the time of the accident the weather was dark and clear with a temperature of 49 degrees F.

The collision was the failure of the crew of OWVBT-30 to comply with restricted speed in connection with the restrictive indication of a block signal. The probable cause for this accident is human error, Accident Cause Code H605, "Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal".

NARRATIVE

Narrative

Circumstances Prior to the Accident

The crew of the standing train, ZYCLD-05, consisted of a locomotive engineer and a conductor. They first went on duty at 1455 on April 6, 2014, at Longview, Texas. This was the home terminal for both crew members, and they both received more than the statutory off duty period prior to reporting for duty.

Their assigned intermodal train consisted of two locomotives and 65 loaded intermodal cars. It was 7277 feet long and weighed 5550 tons.

The crew of the striking train, OWVBT-30, consisted of a locomotive engineer and a conductor. They first went on duty at 1316 on April 6, 2014, at Fort Worth, Texas. This was the home terminal for both crew members, and they both received more than the statutory off duty period prior to reporting for duty.

Their assigned freight train consisted of four locomotives, two on the head end and two distributed power (DP), and 113 loaded ore cars. It was 6,387 feet long and weighed 16,105 tons.

OWBVT-30

The maximum authorized speed on the Ennis Subdivision is 60 mph, and the maximum speed for the OWVBT-30 was 50 mph. The track approaching the collision location is downgrade from about MP 152.85 with a maximum grade of .88 at the point of impact (MP 151.2). The collision location was immediately south of a 2 degree 15 minute curve that begins at approximately MP 151.33.

The engineer was seated at the controls on the right (west) side and the conductor was seated on the left (east) side of lead locomotive UP 5945.

The railroad timetable direction is North/South as is the general geographic direction.

The Accident

ZYCLD-05

The intermodal train was stopped with the head end at MP 149.4 and the rear of the train about 150 feet south of MP 151.2.

OWVBT-30

The event recorder on the second locomotive, UP 6565, showed this loaded ore train proceeded by an approach signal at Control Point HL 153, the south end of Kosse siding, at 24 mph (the event recorder in the lead unit, UP 5945, was destroyed in the collision). The engineer implemented dynamic braking at MP 153.1 with speed at 32 mph. At MP 152.6, while traveling at 28 mph, the conductor saw a restricted proceed signal at MP 151.2 and placed the train in emergency. At MP 151.2 the OWVBT-30 struck the rear of ZYCLD-05 at 18 mph.

The conductor, seated on the left side of the lead locomotive, had more sight distance than the engineer as the train travelled south towards the right hand curve and that is why he saw the restricted proceed signal at MP 151.2 and the EOT device on the rear of the ZYCLD-05 first and put his train into emergency.

Analysis and Conclusions

Analysis - Toxicological Testing - This accident met the criteria for 49 CFR Part 219 Subpart C Post Accident Toxicological Testing. UP had all four crew members tested.

Conclusion - Drug or alcohol use was not a factor in this rear end collision.

Analysis - Evaluation and Testing of Equipment Involved

A Class 1 Air Brake Test was performed on OWVBT-30 on April 4, 2014 at 0531 with no exceptions. OWVBT-30 was an extended haul train. Daily and periodic inspections of all four locomotives in OWVBT-30 were performed and recorded with no exceptions.

Conclusion - Class 1 Air Brake Test and periodic inspections were in compliance.

Analysis - FRA Tests or Inspections Performed and Results

The signal at Control Point HL 153 displayed an approach signal to the OWVBT-30 which was acknowledged by the crew of the OWVBT-30, recorded in the conductor's log, and confirmed by screen shots of the dispatcher's monitor and signal records.

The intermediate signal at MP 151.2 displayed a restricting signal that was acknowledged by the crew of the OWVBT-30 and confirmed by screen shots of the dispatcher's monitor and signal records.

FRA personnel tested the signals at Control Point HL 153 and MP 151.2 immediately after the accident and took no exceptions at either location. FRA reviewed all signal test records from the previous year for these two signal locations and determined that the records were in compliance.

Conclusion - The signals at Control Point HL 153 and MP 151.2 were operating as intended and displayed the correct signal aspects.

Analysis - Train Handling

The engineer of OWVBT-30 was a certified locomotive engineer with 10 years of experience at that position and additional previous experience as a brakeman/conductor. The engineer was familiar with the territory and he completed his last rules examination successfully on April 10, 2012. He did not have any exceptions in his operational testing records and there was no evidence of usage of electronic devices prior to the collision.

The conductor of OWVBT-30 had 35 years of railroad experience including 10 years as a brakeman/conductor. The location of the collision was part of his regularly assigned territory and he had made numerous trips over it. He successfully completed a UP operating rules class on March 06, 2014, and no exceptions were found in his operation testing records. There was no evidence of usage of electronic devices prior to the collision.

The event recorder on the second unit of OWVBT-30, UP 6565, recorded this train proceeding past the approach signal at Control Point HL 153 (south end of Kosse siding) at 24 mph. This signal aspect on UP requires that trains proceed a maximum of 30 mph prepared to stop before any part of the train passes the next signal.

The event recorder on UP 6565 recorded this train travelling at 32 mph at MP 153.1 and the engineer implemented dynamic braking at this location.

At MP 152.6 the OWVBT-30 was recorded travelling at 28 mph and this is where the conductor placed the train in emergency.

Conclusion - The engineer of OWVBT-30 failed to comply with a fixed signal indication at Control Point HL 153. He did not proceed at a speed that allowed him to stop his train prior to any part of the train passing the next signal at MP 151.20.

Fatigue Analysis - FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At

Fatigue Analysis - FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content (BAC) of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses default software settings.

FRA obtained fatigue related information, including a 10-day work history, for all employees involved in this accident including the Engineers and Conductors assigned to both trains, the ZYCLD-05 and the OWVBT-30.

Information for these employees follows:

Fatigue Conclusions

1. Engineer assigned to ZYCLD-05
Sleep setting - Good to Excellent
Chronic Sleep Debt = 6.16
Hours of Continuous Wakefulness = 15.47
Time of Day = 21.27
BAC Equivalent = <.05

Finding: Fatigue was not probable for this employee.

2. Conductor assigned to ZYCLD-05
Sleep setting - Good to Excellent
Chronic Sleep Debt = 7.26
Hours of Continuous Wakefulness = 15.47
Time of Day = 21.27
BAC Equivalent = <.05

Finding: Fatigue was not probable for this employee.

3. Engineer assigned to OWVBT-30
Sleep setting - Good to Excellent
Chronic Sleep Debt = 5.48
Hours of Continuous Wakefulness = 15.47
Time of Day = 21.27
BAC Equivalent = <.05

Finding: Fatigue was not probable for this employee.

4. Conductor assigned to OWVBT-30
Sleep setting - Good to Excellent
Chronic Sleep Debt = 6.29
Hours of Continuous Wakefulness = 16.47
Time of Day = 21.27
BAC Equivalent = <.05

Finding: Fatigue was not probable for this employee.

Overall Conclusion

The collision was the failure of the crew of OWVBT-30 to comply with restricted speed in connection with the restrictive indication of a block signal.

Probable Cause and Contributing Factors

The probable cause for this accident is human error, Accident Cause Code H605, "Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal".