



National Transportation Safety Board
Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, D.C.

Operations Group Factual Report
Union Pacific Railroad
Derailment with Employee Fatality – RCL Operations
Arlington, Texas
September 22, 2017

NTSB Accident Number DCA17FR013
Keys Number 96057

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The Accident

NTSB Accident Number:	DCA17FR013
Date of Accident:	September 22, 2017
Railroad Owner:	Union Pacific Railroad
Railroad Operator:	Union Pacific Railroad
Type of Train and ID:	Y-GW51R-22, Remote Control Operation
Crew Members:	1 Footboard Yardmaster, 1 Helper
Location of Accident:	Arlington, Texas, Union Pacific Railroad Great Southwestern Yard
Injuries / Fatalities:	0 / 1

Accident Synopsis

Refer to the *Accident Summary* report within the docket for this accident for a summary of the accident.

Parties to the Investigation

Parties to this investigation included the Federal Railroad Administration (FRA), the Union Pacific Railroad (UP), and the International Association of Sheet Metal, Air, Rail, and Transportation Workers (SMART).

Events Prior to the Accident

The Y-GW51R-22 crewmembers went on duty at 6:01 a.m. central standard time at the Union Pacific Railroad (UP) Garrett Yard office on September 22, 2017.¹ The Y-GW51R-22 was designated as remote control operation and was assigned three locomotives on the day of the accident with the UPY 2618 in the lead and setup as the controlling locomotive facing forward, the UPY 2614 facing forward, and the UP 840 facing backward.² The crew consisted of a 61-year-old footboard yardmaster with 39 years railroad experience and a 48-year-old helper with 19 years of railroad experience.

During an interview with investigators, the footboard yardmaster (foreman) described the day as normal up to the time of the accident.³ He said that the helper was in good spirits that morning and that he noted nothing out of the ordinary in his behavior.⁴ They had conversation

¹ All times in this report are central standard time unless otherwise noted.

² Locomotive UP 840 was not a remote operation locomotive.

³ A *footboard yardmaster* is the foreman of a remote control train with added responsibilities for gathering train paperwork and designing work for the day. This report will refer to the footboard yardmaster as the foreman of the job (Y-GW51R-22).

⁴ *Helper* means the trainman assigned to a remote control job to assist the footboard yardmaster or foreman.

with the night shift manager on duty. Then the crew planned their work for the day. He said that they conducted a job briefing before leaving the yard office, including review of bulletins and cars in the yard. Another crew told them the delivery was in track 2.⁵ The foreman said that they went through the job briefing book, bulletins, and safety briefing for the week and there were no changes. The foreman ran the list for the day's work, they reviewed it, and marked it up.⁶ Their work for the day included digging (switching) salt cars out and taking those to spot and pulling five empty cars from the Packaging Corporation of America. There were two cars for International Paper, but the foreman said he decided not to spot them as there were already two cars on spot and International Paper would likely have blue flags up, preventing them from going in there.⁷

Once they completed the job briefing, they drove their personal automobiles, as was the practice, from the UP Garrett Yard to the UP Great Southwestern Yard. As they were getting their work equipment out of the car, the helper told the foreman he had received zone authority and that he had talked with the manager of yard operations on duty.⁸ They headed over to the locomotives about 8:00 a.m.

The foreman said that the helper got on locomotive UPY 2628, fired it up (started it), and iced it down (supplied it with ice and water for the day) while he got on locomotive UP 840 and iced it down. They began the locomotive inspections. The foreman said he signed the inspection card on the UP 840 and the helper signed the other cards.⁹ They linked (link up) the remote control boxes (remote control transmitters, also referred to as beltacks) and went through the required remote control train (RCT) testing.¹⁰

The foreman said that the helper lined the train into track 2 to couple to and pull out the two salt cars for spotting. He said he told the foreman to stay in track 2 and that he would kick the

⁵ *Delivery* means the railcars scheduled for delivery to customer facilities.

⁶ *List* means the switch list for the train that included the location, track and line number, of the cars located in the UP Great Southwestern Yard for switching and spotting at customer facilities and the location of railcars scheduled for pulling from customer facilities. A *list* serves as the train consist and includes any hazardous materials information.

⁷ *Blue Flag or blue signal* means a distinguishable blue flag or blue light meaning that Blue Signal Protection is in use to provide protection to those performing duties incidental to inspecting, testing, servicing, or repairing rolling equipment when those duties involve fouling a track. See 49 *CFR* Part 218 Subpart B – Blue Signal Protection of Workers.

⁸ *Zone Authority* means protection on a portion of track(s) within definite limits designated in the timetable special instructions.

General Code of Operations Rules (GCOR), Seventh Edition, Effective April 1, 2015.

⁹ Title 49 *Code of Federal Regulations* §229.21 required completion of a daily inspection of all locomotives at least once during each calendar day and a written report of the inspection. The *inspection card* documents the required daily inspection.

¹⁰ *Link Up* means the process for connecting the remote control transmitters with the controlling remote control locomotive. Each remote control transmitter went through the link up process. The UP publication PB-14252, *RCL II / BELTPACK II, Technical Reference Card* documented the steps for the locomotive inspection and remote control setup.

Pitch means to transfer control of the remote control train from one crewmember to the other, “pitching” control from one remote control transmitter to another.

two salt cars out and then pitch control back to the helper and for him to make sure the cars went to a joint (coupled).¹¹ Then they completed an air test and headed towards the industry track. At this point, the foreman said the day was progressing normally, “everything was normal”.

When spotting the two loaded cars at the AMC lead/Salt facility, the foreman said he got off and made cut and the helper stayed on head end. The helper pitched control to the foreman, they inspected the cars, and then headed towards the Packaging Corporation of America (Packaging). The helper controlled the train to Packaging. The foreman said he lined the switch at Packaging. They pulled the five empty cars out of Packaging, stopped for the derail, and made a transfer air test.¹²

Accident Narrative

The foreman told investigators that upon completion of the transfer air test at Packaging, they then returned westward to the Great Southwestern Yard and that he was controlling the train. He said that as they approached the yard, he told the helper they would run through track 003 [3] and double to track 001 [1] where an earlier train had left some outbound cars. (See Figure 1.) He said that they went through track 3 and stopped at the yellow mark. The helper walked to the switch, lined the switch, and signaled for the foreman to come ahead. The foreman operated the train westward around a slight curve where the helper stopped him once clear of the 1 switch. At this time, the foreman pitched control of the train back to the helper.

The helper began to move (shoving movement) the train eastward into track 1. The train traveled about 537 feet into track 1. The foreman said he heard the broadcast announcement, “Man Down, Man Down”.¹³ He said he called out to the helper on the radio, “Are you okay” but got no response. He said he got down off the locomotive and went back to check on the helper. He found the helper underneath the train, changed the radio channel to 67-67 and called out, “Emergency! Emergency! Get me some help, call 911, west end of yard, call 911.”

At the time of the accident, the only train moving in the yard was the YGW51R-22. The estimated speed at the time of the accident was 8.2 mph.

¹¹ *Kick* is railroad slang meaning the action of cutting a railcar away from a cut of cars or a locomotive while in motion, stopping the locomotive and/or cars, and allowing the uncoupled railcar to roll on its on momentum into the desired track.

¹² *Transfer train* means a train that travels between a point of origin and a point of final destination not exceeding 20 miles. Title 49 *CFR* §232.215 governs the brake test [transfer test].

¹³ The *man down* feature was a safety function of the remote control transmitter (box) that transmitted an emergency message over the radio whenever the RCL transmitter sensed tilting beyond prescribed limits. See UP *Train Handling and Air Brake Rules*, Rule 35.4.1.

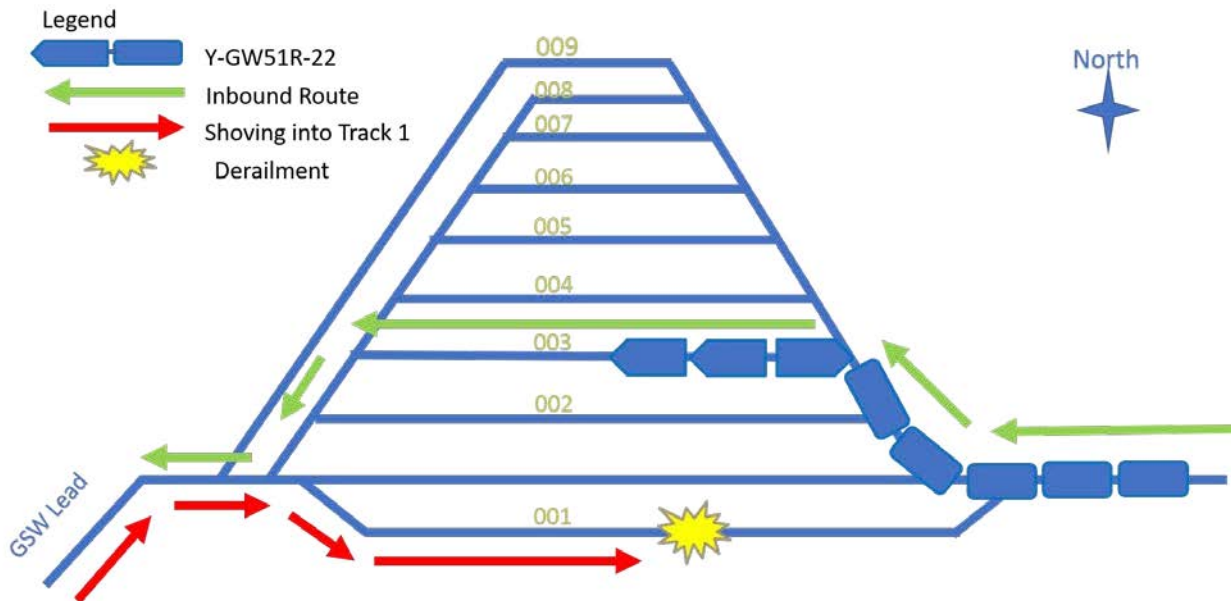


Figure 1. Y-GW51R-22 returning to the Great Southwestern Yard.

Y-GW51R-22 Train Consist

Train Y-GW51R-22 consisted of three locomotives and five empty box cars, lined up as follows:

1. UPY 2628, facing forward
2. UPY 2614, facing forward
3. UP840, facing backward
4. RBOX 32725
5. ATW 122063
6. BKTY 153765
7. BKTY 155361
8. KCS 118613

Method of Operation

RCO was the method of operation for all train movements in the UP Great Southwestern Yard and connected industry tracks.¹⁴

Rules, Policies, and Procedures

The General Code of Operating Rules, Special Instructions, UP Dallas Subdivision Timetable, System General Orders, Subdivision General Orders, Superintendent Bulletins, UP

¹⁴ See the Training Handling and Air Brakes Rules, Chapter 35, Remote Control Operations.

Safety Rules, UP Air Brake and Train Handling Rules, UP Instructions for Handling Hazardous Materials govern employees working in the UP Great Southwestern Yard.

- UPRR – General Code of Operating Rules, Seventh Edition, effective April 1, 2015, includes updates as of July 18, 2017, PB-20280
- UPRR Special Instructions, effective June 1, 2017, includes updates as of August 2, 2017, PB-27015
- UPRR Dallas/Ft. Worth Area Subdivision Timetable #5, effective 9:00 a.m. CDT, September 28, 2015
- UPRR Instructions for Handling Hazardous Materials, Form 8620, effective June 1, 2017
- UPRR Safety Rules, effective June 1, 2017, includes updates as of June 1, 2017, PB-20369
- UPRR Air Brake and Train Handling Rules, effective May 2, 2016, includes updates as of June 1, 2017, PB-20329

Crew Information

Footboard Yardmaster

The railroad hired the footboard yardmaster on August 2, 1966. He held a current certification to work as an RCO.¹⁵ Out of 206 Field Training Exercise (FTX) efficiency tests, he received coaching on four. He successfully completed 210 training and evaluations. Tables 1 through 4 provide data on his personnel information, including certification dates; 30-day work history; discipline history; decertification history; and the required RCO check rides. The footboard yardmaster had four disciplinary events and one decertification noted on his personal record.

¹⁵ See 49 *CFR* Part 240 for engineer certification.

Table 1. Footboard Yardmaster Personnel Information

Hire Date	08/02/1977
Last Certification Date (Class 6)	11/17/2016
Certification Expiration Date (Class 6) ¹⁶	12/17/2019
Last RCO Check Ride	08/17/2017
Last Rules Exam	01/27/2016

Table 2. Footboard Yardmaster 30-Day Work History

Date	Previous Time Off	On Duty Time	Off Duty Time	Total Time On Duty
08/21/2017		0700	1746	10'46"
08/22/2017	13'14"	0700	1404	7'04"
08/23/2017	16'56"	0700	1400	07'00"
8/24/2017	17'00"	0700	1900	12'00"
08/25/2017	12'00"	0700	1412	7'12"
08/26/2017				
08/27/2017				
08/28/2017	64'48"	0700	1409	7'09"
08/29/2017	6'51"	0700	1403	7'03"
08/30/2017	16'57"	0700	1400	7'00"
08/31/2017	17'00"	0700	1900	12'00"
09/01/2017	12'00"	0700	1410	7'10"
09/02/2017				
09/03/2017				
09/04/2017				
09/05/2017				
09/06/2017	102'50"	0700	1410	7'10"
09/07/2017	17'00"	0700	1400	7'00"
09/08/2017	12'00"	0700	1400	7'00"
09/09/2017				
09/10/2017				
09/11/2017	64'01"	0601	1331	7'30"
09/12/2017	16'30"	0601	1637	10'36"
09/13/2017	13'24"	0601	1310	7'09"
09/14/2017	16'51"	0601	1340	7'39"
09/15/2017	16'21"	0601	1325	7'24"
09/16/2017				
09/17/2017				
09/18/2017	64'36"	0601	1324	7'23"

¹⁶ The UP *Class 6 certification* is a type of locomotive engineer certification allowing an employee to operate remote control locomotives.

09/19/2017	16'37"	0601	1317	7'16"
09/20/2017	16'44"	0601	1300	6'59"
09/21/2017	17'01"	0601	1302	7'01"
09/22/2017	16'59"	0601	ACCIDENT	

Table 3. Footboard Yardmaster Discipline History

Date	Reason	Discipline/Other Action
03/30/2017	Did not provide protection while shoving protection resulting in run through switch and derailment	Conference
06/03/1994	Cars rolled out of track, swiping cards	30-day suspension
01/11/1994	Failure to ensure engineer could hear him, not spotting move before striking and damage door at industry	15-days deferred suspension
3/10/1981	Failure to protect job	10-day suspension

Table 4. Footboard Yardmaster Decertification History

Date	Reason	Comments
02/10/2009	Did not stop for red flat during efficiency testing event	Decertified

Table 5. Footboard Yardmaster Check Rides

Date	Comments	Score
11/22/2016	Reviewed Safety Rule 81.4.1, mounting equipment with both hands	96.5
2/21/2017	None	100
4/27/2017	Observed requesting "Red Zone" without RCT direction selector centered	93.0
8/17/2017	Reminded about proper position to protect shove when secondary operator requests relief from point protection to stretch joint	96.5
5/5/2017	None	100
7/28/2017	None	100

Helper

The railroad hired the helper on May 18, 1998. He held a current certification to work as an RCO and as a freight conductor.¹⁷ The helper had no certification revocations as an RCO or a freight conductor on his personal record. He had two disciplinary events that he received core training for. Out of 132 Field Training Exercise (FTX) efficiency tests, he underwent coaching on five events. He successfully completed 204 training courses and evaluations. Tables 1 through 4 provide data on his personnel information, including certification dates; 30-day work history; discipline history; decertification history; and the required RCO check rides.

Table 6. Helper Personnel Information

Hire Date	05/18/1998
Last Certification Date (Class 6)	06/26/2015
Last Certification Date (Class 8)	06/26/2015
Certification Expiration Date (Class 6)	07/26/2018
Certification Expiration Date (Class 8) ¹⁸	07/26/2018
Last RCO Check Ride	08/28/2017
Last Rules Exam	06/07/2017

Table 7. Helper 30-day Work History

Date	Previous Time Off	On Duty Time	Off Duty Time	Total Time On Duty
08/21/2017	37' 14"	0700	1745	10' 46"
08/22/2017	LAYOFF			
08/23/2017	39' 15"	0700	1401	7' 01"
08/24/2017	16' 59"	0700	1900	12' 00"
08/25/2017	12' 00"	0700	1408	7' 09"
08/26/2017				
08/27/2017				
08/28/2017	64' 52"	0700	1404	7' 04"
08/29/2017	16' 56"	0700	1400	7' 00"
08/30/2017	17' 00"	0700	1404	7' 04"
08/31/2017	16' 56"	0700	1900	12' 00"
09/01/2017	12' 00"	0700	1405	7' 05"
09/02/2017				
09/03/2017				
09/04/2017				
09/05/2017	88' 55"	0700	1400	7' 00"
09/06/2017	17' 00"	0700	1400	7' 00"

¹⁷ See Title 49 *CFR* Part 242 for conductor certification.

¹⁸ The UP *Class 8 certification* means that an employee received certification to work as a freight conductor.

09/07/2017	17'00"	0700	1900	12'00"
09/08/2017	12'00"	0700	1405	7'05"
09/09/2017	LAYOFF			
09/10/2017				
09/11/2017	64'55"	0700	1315	6'15"
09/12/2017	17'45"	0700	1200	5'00"
09/13/2017	20'00"	0800	1844	10'44"
09/14/2017	13'16"	0601	18-4	10'04"
09/15/2017	11'57"	0601	1302	7'01"
09/16/2017				
09/17/2017				
09/18/2017	64'59"	0601	1319	7'18"
9/19/2017	16'42"	0601	1320	7'19"
9/20/2017	16'41"	0601	1303	7'02"
09/21/2017	16'58"	0601	1309	7'08"
09/22/2017	16'52"	0601	--	Accident at 11:06 a.m.

Table 8. Helper Discipline History

Date	Reason	Discipline/Other Action
3/21/2006	Did not comply with 10 mph slow order	Core training
5/2/2001	Failure to protect shove	Core Training/mutual consent

Table 9. Helper Check Ride History

Date	Comments	Score
07/31/2017	None	100
08/28/2017	Did not blow the horn until the crossing was completely occupied	95.0
5/5/2017	Did not put train into "coast" during running air brake test; must not couple during running air brake test	94
07/28/2017	None	100

Accident Reenactment

The UP conducted a reenactment of the accident on September 24, 2017, using the same equipment from the accident train with investigators observing. The first move across the identified point of derailment was at walking speed and the speed increased gradually in subsequent movements until reaching the approximate speed of 4 mph. The reenactment train did not derail, therefore, the UP positioned its unmanned aviation vehicle (UAV), also known as a drone, on the field side of the tracks about 24 inches above ground to video the wheel/rail

interaction as the train traversed the point of derailment. The UP positioned two Go Pro cameras at strategic locations within the gage of the rail to capture the wheel/rail interaction on video as the train moved across the point of derailment. Investigators observed a vertical mismatch of about $\frac{3}{4}$ inch on the field side rail (south rail) as the train traversed over the joint near the point of derailment.

See the Track and Engineering Factual Report in the docket of this accident for more information.

Documents and Information Requested

The NTSB requested the following documents/items from the UP:

- Last two FRA track inspection reports for subject area
- Efficiency testing records for the past 2 years for both crew members
- Copies of any audio recordings between crew and train dispatcher or yardmaster
- All Current rule books
- Applicable timetable(s) and Special Instructions
- General Orders in effect
- Any yard notices or bulletins in effect
- Any Division Superintendent Notices in effect
- Track Bulletins, if applicable
- All written instructions to crew at time of accident, including any switch lists
- 72-hour work/rest history for both crew members
- Statements made by any witnesses, yardmaster, train dispatcher, etc.
- Estimate of damages to equipment and track
- Most recent car inspections for the cars involved and the remote control transmitters (boxes)
- Track chart of accident area and yard
- Any accident reports completed by railroad and/or FRA
- Description of locomotive(s) in use
- Description of RCL equipment (manufacturer, manufacture date, etc.)
- SIM cards (or copy) from Go-Pro and Drone used for all reenactments
- Remote control transmitters (boxes) (2)
- Both crewmember radios
- Track image recorder from locomotive UP 840
- DVD from track image recorders from UPY 2628 and UPY 2614
- CTS books for industry tracks connected to UPRR Great Southwestern Yard
- Track Charts/Yard Drawing
- Track Inspection Records August 2016-through accident
- Last two Geometry Car Surveys of the Area
- Last two Internal Rail Test Reports

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- Track Disturbance Reports for the area
- Manpower Roster for the territory