



National Transportation Safety Board

Washington, D.C. 20594

Railroad Accident Brief

Accident Number:	DCA-03-FR-005
Location:	City of Commerce, California
Date and Time:	June 20, 2003, 11:58 a.m. ¹
Accident Type:	Derailment
Company:	Union Pacific Railroad
Injuries:	13
Fatalities:	None

Synopsis

In the late morning of June 20, 2003, a string of 31 freight cars that had been part of a Union Pacific Railroad (UP) freight train were cut from their locomotives at a UP siding in Montclair, California. After crewmembers released the cars' air brakes in preparation for switching the cars in Montclair yard, the cars began rolling. The runaway cars rolled downgrade for about 28 miles and reached a calculated maximum speed of 95 mph before derailing in City of Commerce, California, at 11:58 a.m. (See figure 1.) Some of the derailed cars struck nearby residences. (See figure 2.) Three residences were destroyed, and five others were damaged. Thirteen people suffered minor injuries and were transported to local hospitals. About 150 people were evacuated from the area because of broken natural gas and water lines. At the time of the derailment, the sky was overcast; there was no wind; and the temperature was 70° F. Estimated damages were \$2.4 million.

The Accident

The crew for train QRVML-19,² a mixed freight train with 3 locomotives and 69 cars, began their tour of duty in Long Beach, California, at 5:45 a.m. on the day of the accident. After a job briefing, they boarded their train, performed an air brake test, and departed the yard in East Los Angeles eastward toward Montclair Yard, about 31 miles away. The accident occurred on the Los Angeles Subdivision, which is controlled from UP's train dispatching office in San Bernardino, California. The main track(s) on this subdivision are operated by centralized traffic control (a system that allows the train dispatcher to line switches and display signals from the dispatcher's control station) and

¹ All time referred to in this report is Pacific daylight time.

² QRVML-19 was a through freight train that originated in UP's Roseville, California, yard and is referred to as the "inbound" train for the remainder of the report. The two-person crew consisted of an engineer and a conductor.

varies between one and three main tracks. The maximum timetable speed for trains on the Los Angeles Subdivision is 79 mph for passenger trains and 65 mph for freight trains.



Figure 1. A portion of the derailment area.

The engineer told investigators that the train handled normally and that he had not experienced any delays. After setting out 38 cars in UP's City of Industry Yard, the crew continued on to Montclair Yard with the 31 remaining cars. Of the 31 cars, all but one car were loaded. Twenty-eight cars (flatcars and boxcars) contained lumber or lumber products, and two cars contained paper. None of the cars contained hazardous materials. The 31 cars weighed 3,881 tons and had a total length of 2,281 feet. After delivering the 31 cars to Montclair Yard, the crew was to leave one locomotive on a storage track in the yard and continue eastward with the two remaining locomotives for about 20 miles to UP's West Colton Yard, where the crew was to go off duty.

As the inbound train approached Montclair Yard, the train dispatcher issued instructions to the conductor for the train to enter the siding and instructed him to communicate with road switch train LOB32-20³ for permission to jointly occupy the

³ LOB32-20 switched cars in the yard and traveled on the main track to service industries, and its crew will be referred to as the "switching crew" for the remainder of the report. This was a three-person crew, consisting of an engineer, a conductor, and a trainman. In switching operations, the trainman assists the conductor.

siding at Montclair. The conductor of the switching crew told the inbound train that they had permission and told them to “hi-ball”⁴ the brakes because “We’re going to be coming up against the rear of your train.” In this communication, the switching crew informed the crew of the inbound train not to set hand brakes on their train because the switching crew would couple their engine to the opposite end of the cars.



Figure 2. One of the eight residences struck by derailed equipment.

After the last car of the inbound train cleared the west switch into the siding at the west end of Montclair Yard, the conductor and brakeman of the switching crew were standing near the track and were preparing to assume responsibility for the train from the inbound crew. The switching crew engineer was with his locomotive in a yard track, making his way through several yard tracks to the west switch, preparing to enter the siding and approach the rear of the inbound train.

Without setting handbrakes, the crew of the inbound train uncoupled their locomotives from the train. As intended, the separation of the cars from the locomotives caused the car’s air brakes to apply in an emergency application. The crews were aware that the grade of the siding would cause cars without brakes to move downgrade. Both crews told investigators that they expected the emergency application of the air brakes to hold the cars stationary and that because the switching crew’s locomotive would quickly

⁴ As used in this communication, “hi-ball” is analogous to “disregard” or “skip.”

be attached to the opposite end of the cars, the cars would not be left standing for very long without a locomotive attached. Crews had done this before at this location, and UP supervisors acknowledged being aware of this method of exchanging cars from one crew to the other.

However, UP's operating rules prohibit crews from relying on air brakes to secure cars when locomotives are detached.⁵ The rules require that a sufficient number of handbrakes be applied on the cars before detaching a locomotive. UP's *Air Brake and Train Handling Rules* also require that handbrakes be used to secure equipment.

After uncoupling the 3 locomotives and moving a short distance from the 31 cars, the inbound crew separated the lead locomotive from the other 2 locomotives, which remained on the siding a short distance from the cars of the inbound train. The crew then took the lead locomotive to the storage track, as instructed. After securing the locomotive on the storage track, the crew walked back to the two remaining locomotives as they prepared to depart the yard.

The conductor of the switching crew told investigators that he began bleeding the brakes⁶ on the cars, starting in the middle of the 31 cars and walking to the west, releasing the air brakes on each car as he walked by. As the trainman approached the middle of the train, the conductor said that he instructed the trainman to "start there [in the middle] and bleed the train eastward." When the conductor finished releasing the airbrakes of the cars on the west end, he returned to the yard to assist the engineer in bringing the locomotive from the yard track to the west end of the siding so that they could couple to the rear car and begin switching.

Meanwhile, the trainman completed his task of bleeding the cars and walked in the direction of the crew of the inbound train, who had placed the one locomotive on the storage track and were returning to their two remaining locomotives. As the trainman approached the other crew, the inbound crew noticed that the 31 cars were moving westward, downgrade, toward the switch at the west end of the siding.

The trainman ran after the cars in an attempt to climb aboard the moving cars and set handbrakes. However, the cars gained speed, and the trainman could not catch them. The conductor of the switching crew also noticed that the cars were moving, and he too began running toward the cars. The conductor also used his handheld radio to have the switching engineer alert the train dispatcher that the cars were rolling downgrade toward

⁵ UP uses the *General Code of Operating Rules*, Fourth Edition, as its operating rulebook. Securing equipment is addressed in Rule 7.6, "Securing Cars or Engines." The first paragraph of this rule reads: "Do not depend on air brakes to hold a train, engine, or cars in place when left unattended. Apply a sufficient number of handbrakes to prevent movement. If handbrakes are not adequate, block the wheels."

⁶ *Bleeding the brakes* is the practice of venting air from the airbrake system of a railcar in order to release the car's brakes before the cars are switched to other tracks or trains. This is accomplished by manipulating the brake release lever, or "bleed rod," on each individual car. Normally, the bleeding is done after handbrakes on a number of the cars have been set or after a locomotive has been coupled to the string of cars.

the main track. At other, similar, locations, a derail⁷ is in place to prevent equipment from entering the main track. At the time of this accident, no derail was in place at the end of Montclair Siding.

About 11:33 a.m., the switching engineer used his cell phone to contact the train dispatcher but was connected to voice mail. He then used the locomotive radio, selected “9” for an emergency radio contact with the dispatcher, and was immediately connected. His first communication with the train dispatcher was “We have cars moving west at Montclair.”⁸ The dispatcher later told investigators that upon further questioning of the engineer, she determined that the cars were running away toward the main track. She said she immediately removed her headset and turned to the corridor manager to notify him of the runaway cars.

After rolling downgrade on the Montclair Siding, the 31 cars entered the main track at milepost 35.1. The main track signal system recorded the runaway cars passing the west switch at Montclair and onto the main track of the Los Angeles Subdivision at 11:34 a.m. The main track was mostly on a descending grade ranging from 0.24 percent to 1.01 percent⁹ with short level sections between Montclair and Los Angeles.

At the time of the initial notification about the runaway cars, personnel in the dispatcher’s office were unaware of the grade of the main track. They also did not know the number of cars that were running away.¹⁰ Personnel in the dispatching office told investigators that they expected the cars to slowly come to a stop on the main track.

The engineer of the inbound train told investigators that he asked the dispatcher if he should take his locomotives and chase after the cars. The engineer moved his locomotives westward on the siding in pursuit of the cars but was stopped by a red signal at the west end of the siding. Between 11:40 and 11:42 a.m. the corridor manager asked the chief dispatcher if he should send an engine after the cars. The chief dispatcher instructed him to wait for the cars to come to a stop. The chief dispatcher later told investigators he feared that an attempt to catch the cars could result in a collision. Unaware of the direction of the grade of the main track in this area, he instructed the corridor manager to re-line the Montclair Siding switch to prevent the cars from coming back into the yard and causing damage or injury. The train dispatcher contacted maintenance-of-way employees in the area and instructed them to clear the track.

⁷ A *derail* is a track safety device that is designed to guide railroad equipment off the track. It can be set in the non-derailing position to allow equipment to pass the location safely. When placed in the derailing position, the derail serves to positively protect the main track from being occupied by wayward railroad equipment.

⁸ All communications to the train dispatcher are recorded.

⁹ A 1 percent grade has a vertical change of 1 foot in a horizontal distance of 100 feet.

¹⁰ Crewmembers told investigators that they had broadcast the number of cars to the train dispatcher. However, this may have occurred during the time that the dispatcher had removed her headset as she was informing the corridor manager of the situation.

During the next few minutes, a report of the movement of the runaway cars was received from the Pomona Police Department.¹¹ The corridor manager notified the assistant general yard manager in the East Los Angeles Yard that the runaway cars were headed his way and for him to alert his crews and trains in the area to stop their trains and clear the main track. At this time, dispatching office personnel were uncertain if the cars would stop, reverse direction, or derail. Dispatching center supervisors told investigators that because of these uncertainties, they decided to continue evaluating the situation and gathering information; however, they did not notify local authorities about the runaway cars.

UP's mainline between Montclair Yard and City of Commerce varies between one and two main tracks. However, closer to Los Angeles there are three main tracks. The location of the derailment in City of Commerce was at a control point that contains switches that direct trains from one track to another in an area where the railroad changes from two main tracks to three. At this location, there is also a sidetrack named House Track No. 4. The entrance to House Track No. 4 was from a main track switch, which, like other main track switches in the area, was remotely controlled by the train dispatcher.

As the cars rolled westward, they could have been, but were not, diverted from the main track to a branch line that diverges from the main track at milepost 11.4. UP dispatchers were aware that after diverging from the main track, this branch line crosses two tracks of the Burlington Northern Santa Fe Railway over which high-speed freight trains and Amtrak and Metrolink passenger trains operate.

Another option would have been to line a switch from No. 1 main track to No. 2 main track near milepost 7.1, but doing so at this time would have caused a head-on collision with a 93-car train carrying hazardous materials, including several cars of liquefied petroleum gas and chlorine residue. The head-end of this train was stopped near milepost 5. Lining the switch from No. 1 main track to No. 3 main track near milepost 7.1 would have caused a head-on collision with a UP switching crew. Had the switching crew not been occupying track 3, the runaway cars would have posed a risk to a fuel storage facility in Los Angeles near track 3.

Allowing the cars to continue rolling on No. 1 main track beyond milepost 7.1 would have directed the cars to roll toward Los Angeles and UP's Los Angeles Yard. UP managers were aware that a Metrolink passenger train was on this track beyond City of Commerce.¹²

The managers considered lining the switch from No. 1 main track to House Track No. 4. Because the maximum speed of the turnout from the main track to House Track

¹¹ Pomona police officers were stopped at a grade crossing and noticed that cars passed over the crossing without an engine attached. They called the 800 number posted at the crossing to reach UP's Response Management Communications Center in St. Louis, Missouri. The center then contacted the train dispatching center in San Bernardino, California.

¹² This passenger train was believed to be about 2 miles from City of Commerce; later, it was determined that it was about 13 miles away at the time that the decision was made.

No. 4 was 15 mph, the managers knew that the speed of the cars would likely cause them to derail as they passed over the turnout.

At 11:47 a.m., the chief dispatcher inquired as to whether there were cars on House Track No. 4 and was informed that House Track No. 4 was clear of locomotives and cars. At 11:50 a.m., after considering all of the information that was available at the time, the chief dispatcher decided to have the dispatcher line the main track switch to direct the cars in the direction of House Track No. 4, saying, "We're gonna go into Track 4, there's no place else to go." The chief dispatcher told Safety Board investigators that during the discussions, House Track No. 4 was considered to be the best option because the four tracks in the area presented a wide section of railroad right-of-way within which the cars could derail.

At 11:51 a.m., the chief dispatcher called the general superintendent of the territory and informed him of the situation. The superintendent, after being briefed by the chief dispatcher, agreed to route the cars toward House Track No. 4.

At 11:52 a.m., a maintenance-of-way employee who had been earlier instructed to clear the main track because of the runaway cars called the dispatcher's office and reported that the cars had been observed. When asked about the speed of the cars, the employee estimated that the cars were moving at "50 or 60" mph.

During this time, a 53-car train was moving eastward as it crossed over from No. 1 main track to No. 2 main track at milepost 7.4. The crew of this train was informed of the runaway cars and directed to clear the crossovers as quickly as possible. After the rear cars of this train cleared the crossover, the crew advised the dispatcher that they had stopped and would get off the train and away from the track. With the rear of this train clear of the control point, the dispatcher lined the main track switches at milepost 7.4 to direct the runaway cars toward House Track No. 4.

At 11:54 a.m., a voice radio transmission was broadcast from a wayside defect detector at milepost 14.8. The defect detector monitors the mechanical condition of passing cars and also records such parameters as speed and number of axles. This detector broadcast the speed of the cars as 86 mph.¹³ Because the defect detector only broadcasts information after the rear car of the train has passed its location, and after performing the required calculations, the leading end of the runaway cars was well past the location of the defect detector when the voice message was transmitted.

At 11:58 a.m., 28 of the 31 cars derailed due to excessive speed as they passed over the turnout into House Track No. 4. Cars 1 through 6 derailed but stayed on the right-of-way. Cars 7, 8, 11, and 13 departed the right-of-way and struck neighborhood residences. Cars 29, 30, and 31, the rearmost cars as the 31 cars rolled downgrade, did not derail. The runaway cars had traveled about 28 miles from Montclair Yard to the switch at House Track No. 4 in City of Commerce. Before derailing, the cars had

¹³ Based on time and distance measurements between control points, the runaway cars reached a calculated maximum speed of 95 mph.

traversed 25 highway rail crossings, 24 of which were equipped with active warning devices.

Following the accident, UP reviewed operating practices and emphasized the proper procedures for securing equipment. UP also reissued instructions detailing the methods that are required to secure trains, locomotives, and railcars when they are left unattended on the mainline, in yards, and when delivered to other facilities. In addition to local supervision, UP's Omaha Safety and Operating Practices Compliance Committee performed field observations of crews and supervisory audits to assess performance.

UP has identified switches, such as the west switch at Montclair, which allow downgrade access to mainline tracks. To protect the main track from runaway equipment, split-point derails (devices similar to a track switch but without running rails) have been installed at Montclair Siding and on all such sidings on the UP that may be used for the storage of cars and that have a grade of 0.5 percent or greater.

UP officials told Safety Board investigators that since the accident they have published a track chart that shows the direction and magnitude of the grades of the main track for use by the train dispatchers in the San Bernardino train dispatching office. UP has trained the dispatchers to read the chart and placed a copy on each train dispatcher's desk. In addition, UP initiated a system-wide drill program that addresses runaway cars. Each train dispatcher and member of the UP Response Management Communications Center has been issued a flowchart and written procedures that describe the steps to be taken when notified of a runaway situation. These procedures require prompt notification of local emergency response agencies in the event of runaway cars.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the derailment of the runaway cars in City of Commerce, California, was the failure of both the inbound train crew and the switching crew to properly secure the railcars as required by Union Pacific operating rules before the airbrakes were released on the cars. Contributing to the accident was the failure of the Union Pacific Railroad to enforce the application of its operating rules for securing freight equipment before locomotives are uncoupled.

Adopted: April 7, 2004