National Transportation Safety Board

Washington, D.C. 20594

Railroad Accident Brief

Accident No.:	DCA-09-FR-001
Location:	Rialto, California
Date:	November 20, 2008
Time:	11:25 a.m., Pacific standard time[1]
Railroad	Metrolink
Property Damage:	$25,000
Injuries:	4 Minor
Type of Accident:	Collision

Synopsis

On Thursday, November 20, 2008, about 11:25 a.m., eastbound Metrolink passenger train 306 failed to stop at a red signal and had a raking side collision with the last eight cars and two rear locomotives of westbound Burlington Northern Santa Fe (BNSF) freight train LCAL 011120 that was entering a siding to meet the Metrolink train. The accident occurred at control point (CP) Lilac near Rialto, California. (See figure 1.) There were 15 passengers and 3 crew members on the Metrolink train. Four passengers received minor injuries. The two crew members of the BNSF freight train were unhurt. Neither train derailed. The weather was clear with calm winds, and the temperature was 76º F.

The Metrolink train, which had one locomotive and four passenger cars, was about 400 feet long. The BNSF train, which consisted of 6 locomotives (4 at the front of the train and 2 at the rear) and 102 cars (96 loaded and 6 empty), was 6,926 feet long and weighed 12,201 tons. The left front corner of the locomotive of the Metrolink train was damaged when it scraped the BNSF train. The last eight cars and the 2 rear locomotives of the BNSF train were scraped by the Metrolink locomotive. The total damage was estimated to be $25,000.

[1] All times in this brief are Pacific Standard Time.

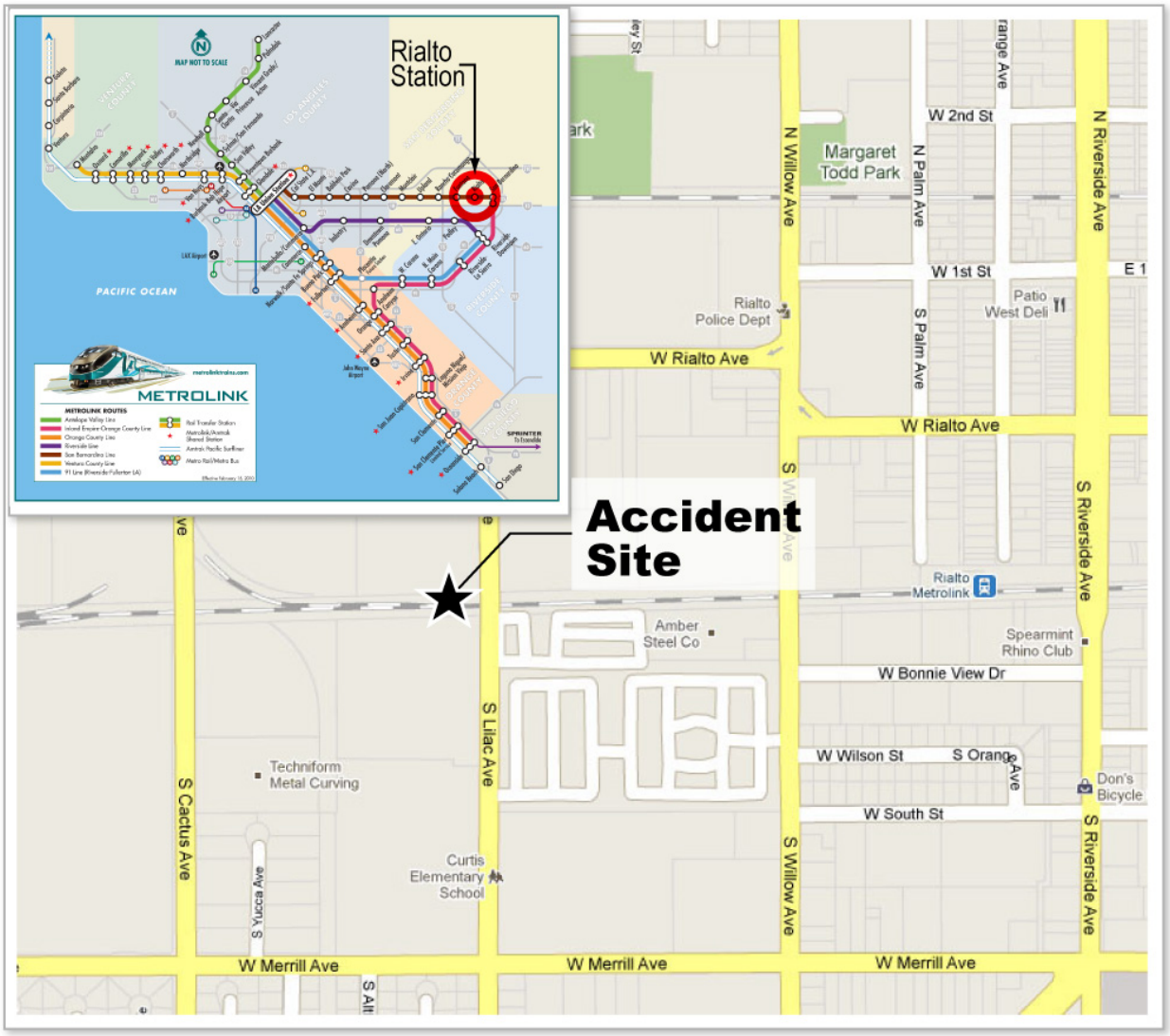

Figure 1. Map showing accident site with inset Metrolink system map.

The Accident

Metrolink train 306 left Los Angeles Union Station at 10:11 a.m. It made stops at 10 stations before reaching Fontana station. At Fontana, the last station before the collision, the train was operating on schedule and left the station about 11:21 a.m. The engineer notified the conductor by radio that the signal leaving Fontana had a flashing yellow aspect, which required the train to stop at the second signal after the flashing yellow signal. The next signal reported by the engineer had a yellow aspect, which required the train's speed to be reduced to 40 mph after passing the signal and the engineer to be prepared to stop at the next signal. The engineer told investigators that he was fully aware of the signal aspects and their requirements. When approaching the red signal at CP Lilac, the engineer said, he could see that the freight train had not entered the siding completely and was still on the main track beyond the signal. When the engineer applied the brakes, he said that the train did not slow down immediately as he had expected it would. The assistant engineer (who was also a qualified locomotive engineer) said that he also had noticed a delay in the deceleration and that he had asked the engineer if he

should make an emergency brake application. He said that the engineer had responded that he had already made an emergency brake application. Both employees went to the rear of the cab, passed through the center door, and stood behind a bulkhead expecting a collision.

The Metrolink train slid past the red signal, and the left front corner of the Metrolink locomotive came into contact with the moving freight train. Because of the length of the freight train, its locomotive was almost a mile away from the collision at the rear of the train, and the BNSF engineer was unaware that the Metrolink train had passed the red signal. (See figure 2.) The freight train continued moving into the siding and the sides of the rear eight cars and two remotely controlled locomotives at the rear of the train scraped against the Metrolink locomotive. (See figure 3.) The physical contact with the Metrolink equipment caused the freight train to uncouple, and this automatically activated an emergency application of the brakes and stopped the freight train. Neither train derailed.

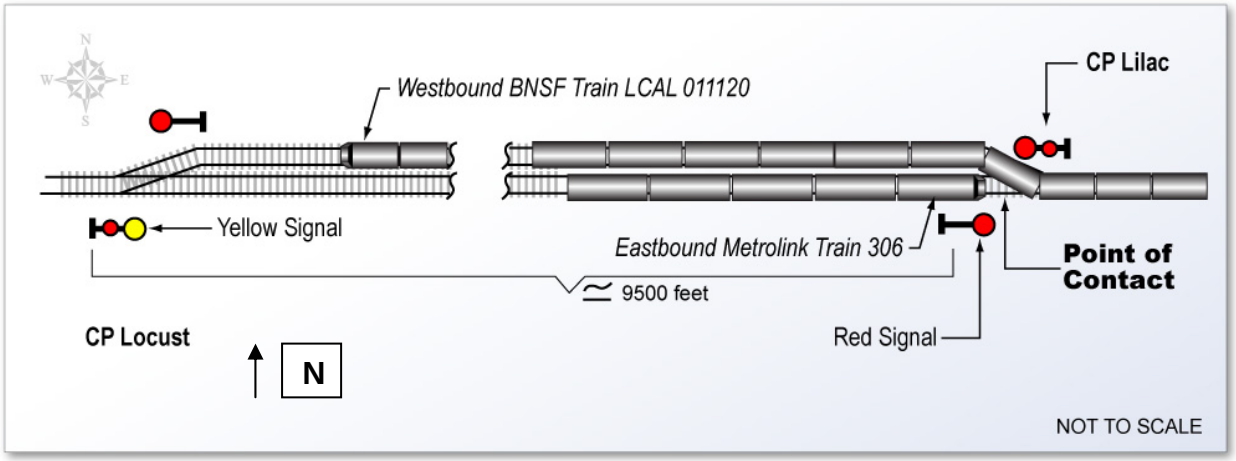

Figure 2. Diagram of accident showing BNSF freight train entering siding and Metrolink train beyond red signal making contact with freight train.

Investigation

The investigation revealed that the signal system was functioning properly at the time of the accident. No evidence was found to indicate that the track structure caused or contributed to the accident. Weather records and crew statements showed that weather and sight distance to the signals were not factors in the collision.

Postaccident toxicological test samples were taken from the three crewmembers of the striking train. The results were negative for drugs and alcohol. Cellular telephone records were obtained for the crewmembers of the striking train. None of their phones were in use during the operation of the train. The crewmembers of the striking train were interviewed several hours after the collision occurred. The two crew members on the locomotive said that they thought the brakes did not apply normally and the train did not decelerate the way they expected.

Investigators conducted mechanical inspections of the equipment, including the train and locomotive brake systems, before the train was moved. More complex testing was performed

when the train was taken to Metrolink's mechanical facilities. The postaccident equipment inspections and airbrake tests did not indicate any defects that would have caused or contributed to the collision.

Figure 3. Metrolink employees making minor repairs to damaged side of Metrolink locomotive.

Stopping Tests

Three days after the accident, the Metrolink train was returned to service after minor repairs were made and investigators conducted stopping tests at the accident site. Three tests were performed, and during all three tests the train was accelerated from a station stop at Fontana, the same as the accident train.[2] The event recorder data storage devices were removed from the locomotive and cab car of Metrolink train 306 after the stop tests were performed. The event recorders contained the data from the accident day and the data from the stopping tests.

On the first test, the train's air brakes were applied after the train had reached 73 mph. The brakes were applied in increments that matched those shown on the event recorder from the

[2] The maximum track speed was 79 mph. Neither the accident train nor the test train reached this speed because the brakes were applied in response to the restrictive signal indications before the train could accelerate to 79 mph.

accident train. The blended braking[3] was allowed to apply, and after 11 seconds the air brakes were placed in the emergency position. The total stopping distance was about 2,301 feet.

For the second test, the dynamic brake was nullified on the locomotive. The brakes were first applied when the train reached 75 mph. The emergency application was made after 17 seconds. The total stopping distance was about 2,757 feet.

The third test used the service air brake and dynamic braking but did not use the emergency brake. The brakes were first applied when the train reached 74 mph. In this test, the brakes were applied in increments, as in the first test; however, there was less time between brake applications. The total stopping distance was about 2,490 feet.

In all three tests, the train stopped short of the signal that was red on the day of the accident. The air brake system and the dynamic brake system worked as designed during the train's movement to and from the testing site as well as during the stopping tests.

The readout from the event recorder from the day of the accident showed that the engineer applied the brakes at about 76 mph, and 8 seconds later the engineer applied the emergency braking. The train traveled about 2,600 feet before stopping. The braking was very similar to the first postaccident stopping test. The speed was 3 mph greater than the speed during the test, which would account for the slightly longer stopping distance of 2,600 feet instead of 2,301 feet.

The variation in the stopping distances among the tests and the data from the accident train were reasonable and reflected the minor variations in the speeds of the train when the brakes were first applied and the use of the different braking systems. On the day of the accident, the engineer did not apply the brakes until he was less than 2,600 feet from the red signal. Almost 7,000 feet before he applied the brakes, the engineer had passed a yellow signal anticipating the upcoming red signal. The yellow signal gave him a warning with almost 9,500 feet to stop the train.

Management Oversight

Connex, the subcontractor for Metrolink, was responsible for monitoring Metrolink operating crews and assuring their compliance with the operating rules. Between November 2006 and November 2008, three engineers were decertified for failing to stop for a red signal. All three incidents occurred in 2008 and included this accident.

Connex supervisors conducted observation testing of the operating crews in compliance with Title 49 *Code of Federal Regulations* 217.9, *Programs of operational tests and inspections; recordkeeping*. This auditing process is often referred to as efficiency testing in the railroad industry.

[3] On some passenger locomotives, if equipped, when the throttle is in idle and the pneumatic train brakes are applied the electrical braking on the locomotive (dynamic braking) will also apply in concert with the train brake applications.

In efficiency testing, supervisors observe employees at various times and record instances of compliance and noncompliance with the operating and safety rules. The intent of this testing is to assess an employee's overall performance by observing their performance at random times. During efficiency testing, between November 2007 and November 2008, the engineer had been observed by supervisors on 33 separate days while he was performing either operating or safety rules. There were a total of 124 specific observations recorded, some were duplicate operating and safety rules because they were observed on different days. Supervisors noted three noncompliant events: not wearing safety glasses, not signing the register, and failing to properly secure the railroad equipment. As part of the observations that showed the engineer complying with the rules, he had properly stopped at a red signal five times.

Between May 2008 and November 2008, the assistant engineer had been observed on 26 separate days. There were 230 specific observations recorded. He had one exception noted when he failed to ring the engine bell when required. No observations of compliance or noncompliance with a red signal were recorded.

The conductor had been observed on 32 separate days between November 2008 and November 2009. There were 123 specific observations recorded. Eight noncompliance events were noted: he was late for work three times, he failed to complete the conductor's train delay report twice, he failed to come to work once, he failed to properly use the terms "over" and "out" on the radio, and his name tag on his uniform was missing once. No observations of compliance or noncompliance with a red signal were noted.

Postaccident Actions

Metrolink instituted a rule change following this accident. At the time of the accident, engineers were allowed to continue to operate their train at track speed when they observed a yellow signal as long as they began a reduction to 40 mph after passing the signal and prepared to stop at the upcoming red signal. After the accident, a Track Bulletin, Form C Number 1852, required engineers to slow their trains to 40 mph immediately upon observing the yellow signal and, if possible, to not exceed 40 mph when passing the location of the yellow signal.

According to the event recorder, the accident train passed the yellow signal at CP Locust at about 72 mph. If the engineer had slowed the train to 40 mph at the yellow signal on the day of the accident, this accident may have been avoided. Had the new rule been in place on the day of the accident, it would have likely changed the decision-making process for the engineer. Even more important, it would have given the freight train more time to enter the siding completely, and it would not have been obstructing the main track when the passenger train reached CP Lilac.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the November 20, 2008, collision of Metrolink train 306 with the side of Burlington Northern Santa Fe freight train LCAL 011120 near Rialto, California, was the failure of the locomotive engineer and the assistant engineer on Metrolink train 306 to initiate the brake application sufficient to control the speed of the train that would allow the train to stop before passing the red signal. Contributing to the accident was the lack of a positive train control system.

Adopted: April 13, 2011