National Transportation Safety Board
Washington, D.C. 20594

Railroad Accident Brief

Accident No.:	DCA-08-FR-002
Location:	Bertram, California
Date:	November 10, 2007
Time:	12:03 p.m., Pacific standard time[1]
Railroad:	Union Pacific Railroad
Property Damage:	$2 million
Injuries:	0
Fatalities:	2
Type of Accident:	Rear-end collision

Synopsis

On Saturday, November 10, 2007, about 12:03 p.m., eastbound Union Pacific Railroad (UP) freight train RVVCGC-07 struck the rear end of stopped eastbound UP freight train IGSMN-10 in Bertram, California. The striking train consisted of 6 locomotives and 60 loaded cars and was traveling about 28 mph when it collided with the stopped train, which consisted of 5 locomotives and 111 loaded cars. The stopped train was awaiting a scheduled meet with a westbound UP freight train when the accident occurred. As a result of the collision, the striking train's three lead locomotives derailed; they also caught fire due to a fuel tank that ruptured on impact. The local fire department extinguished the fire. The two crewmembers on board the striking train were killed. The weather was clear, and the temperature was about 74° F. Total estimated damage was $2 million.

The Accident

The accident occurred on the UP's Los Angeles Service Unit, Yuma Subdivision, at milepost (MP) 646.3, in Bertram, California. Train movements were governed by wayside signal indications of a traffic control system controlled by a UP train dispatcher located at the BNSF Railway/UP joint train dispatcher's office in San Bernardino, California.

[1] All times in this brief are Pacific standard time.

UP train IGSMN-10 was stopped on the main track for a *stop* signal indication at the east end of Bertram siding control point to meet a westbound UP train entering into the siding at Bertram. Before the striking train struck the stopped train, it traveled past a mainline *advanced approach* signal, an *approach* signal, and a *stop* signal. The maximum authorized speed near the accident was 65 mph for freight trains. The train failed to comply with the *approach* signals and passed the *stop* signal at 37 mph. The striking train was about 1,037 feet beyond the *stop* signal, traveling about 28 mph, when it struck the stopped train. (See figure 1.)

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 either caused or contributed to the accident. In addition, postaccident sight-distance tests, weather records, interviews with local witnesses, and train crew statements showed that weather and sight distance to the signals were not factors. Postaccident equipment inspections and airbrake tests did not indicate any defects that would have caused or contributed to the collision.

Figure 1. Lead locomotive of striking train.

Both train crews were properly trained to perform their duties. They were qualified, and they had been tested on carrier rules in 2007. The crewmembers of the stopped train stated that their trip was routine before the collision.

The crew of the striking train had been conversing with the train dispatcher and taking operating orders, with clear radio communication. They had not reported any problems to the train dispatcher. The traffic control system signal records, wayside defect detector, and the event recorder data showed that they had experienced neither equipment failure nor unusual operating conditions before the accident.

The leading locomotive had an alerter that requires an engineer to reset an alert by pushing a button on the control panel. This type of alerter is not connected to the locomotive event recorder. No evidence was found to indicate that the alerter was not working properly before the accident.

While traveling from Mecca to the point of the collision, the conductor did not contact anyone or record any information. At Mecca, MP 627, the conductor made his last signal log entry for a defect detector. Subsequently, the conductor failed to make four required log entries, which included not noting an additional defect detector and three separate signal restrictions.

The train passed an *advanced approach* signal at MP 643.4. The operating rules for an *advanced approach* signal required that the engineer proceed prepared to stop at the second signal and that freight trains exceeding 40 mph immediately reduce their speed to 40 mph. However, the event recorder indicated that the train was traveling about 47 mph. After passing the *advanced approach* signal, the train's lead locomotive passed a wayside defect detector at MP 643.8.

As the train proceeded, it passed an *approach* signal at MP 644.8. The operating rules for an *approach* signal required that the engineer immediately reduce the train speed to 30 mph and be prepared to stop the train before the next signal. However, the event recorder indicated that no control inputs were made to reduce the train's speed.

The train's lead locomotive had passed the *approach* signal when the rear of the train, traveling at 47 mph, cleared the wayside defect detector. At that time, the defect detector made an audible radio announcement, and the event recorder data showed that the locomotive engineer made his first throttle movement, after 10 minutes 49 seconds of inactivity, by reducing the locomotive throttle from position 3 to position 2. Four seconds later, the engineer moved the throttle to position 0. Eight seconds later, the engineer placed the train into emergency braking.

The train had slowed to about 37 mph as it passed a *stop* signal at MP 646.1, and it was still moving about 28 mph when it struck the stopped train at MP 646.3. (See figures 2 and 3.) The striking train was placed into emergency braking about 32 seconds before the collision.

Train Crew Performance

Postaccident toxicological test samples were taken from the striking train's crewmembers. The results were negative for drugs and alcohol.

According to an interview with a family member of the deceased engineer, the engineer went to bed about 7:00 p.m. on November 9, 2007. He stayed in bed until he received a call for duty about 12:30 a.m. on November 10, 2007. He then arose, prepared for work, and departed his home. He reported on duty at 2:45 a.m. on November 10, 2007.

Figure 2. Collision of freight trains.

According to an interview with a family member of the deceased conductor, the family member called the conductor about 4:30 p.m. on November 9, 2007. During that conversation, the conductor said that he knew he was going to work early the next morning and mentioned that he was going to get some more rest before going to work. It could not be determined how much sleep the conductor may have obtained before receiving his call for duty at 12:44 a.m. and reporting on duty at 2:45 a.m. on November 10, 2007. At the time of the accident, the crewmembers had been on duty for 9 hours 18 minutes.

Figure 3. Wreckage of freight trains.

The UP rules require a conductor to record in a logbook the defect detector information and all signals other than *clear*. Postaccident examination of the conductor's logbook revealed that he made his last entry for the defect detector at Mecca, MP 627. The striking train passed Mecca about 27 minutes before the collision. Although required to do so by rules, the conductor did not record the following information in his logbook as his train approached Bertram: the status of a defect detector, an *advanced approach* signal, an *approach* signal, and a *stop* signal.

The UP operating rules require the conductor to be alert and to supervise the operation and administration of the train. UP rules also require that when an engineer does not respond appropriately to signal indications, others in the cab must immediately take action to ensure safety (that is, using the emergency brake valve to stop the train, if necessary). Crewmembers in the cab must communicate clearly to each other the speed of the train as it passes a signal with an indication other than *clear*; they must immediately remind the engineer of the rule if the engineer does not comply with a signal.

The train crew's lack of activity before the collision suggests that as the train approached the accident site, the crew had diminished alertness and was not complying with applicable carrier operating rules. Both crewmembers had failed to comply with the *advanced approach* signal and the *approach* signal instructions. The conductor failed to

enter the required signal log information and failed to alert the engineer of restricting operating conditions. The locomotive event recorder indicated that when the train passed the audible defect detector, the engineer responded after more than 10 minutes of inactivity by making an emergency brake application at which point the *stop* signal at MP 646.1 and the stopped train would have been clearly visible. The emergency braking slowed the train to 28 mph, and the collision occurred at MP 646.3. The multiple failures of both crewmembers, combined with the engineer's limited sleep (that is, 5 1/2 hours) and the conductor's indeterminate amount of sleep during the previous night, provide strong evidence that they were likely asleep.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the November 10, 2007, collision of two Union Pacific Railroad freight trains in Bertram, California, was the failure of the train crewmembers on eastbound train RVVCGC-07 to comply with wayside signal indications because they were likely asleep. Contributing to the accident was the lack of a positive train control system.

Adopted: September 8, 2008