

SUMMARY FOR FE-22-06
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Union Pacific Railroad (UP)

Location: Carson, California

Region: 7

Month: December

Date: Dec. 4, 2006

Time: 9:40 a.m., PST

Data for Fatally Injured Employee(s)

Brakeman

35 years old

8 years, 11 months of service

Last rules training: Oct. 14, 2005

Last safety training: Nov. 2, 2006

Last physical: Nov. 10, 2005

Last relevant efficiency test: Oct. 7, 2006

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation and Engine

Positions:

Train LOI-16R-04 (Remote Control Operation)

Brakeman

Conductor

Yard Master

Tractor-trailer Driver

Activity

Switching

EVENT

A Brakeman was fatally injured during a collision with a delivery truck at a highway-rail grade crossing, during a switching operation.

SUMMARY FOR FE-22-06 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

PCF No. 1

The Conductor failed to comply with the railroad's operating rules requiring rail movements, in Southern Pacific territory track, to stop where a STOP sign is located next to a highway-rail grade crossing.

PCF No. 2

The Conductor collided with a truck at a highway-rail grade crossing, pinning the Brakeman between the truck and the rail car.

PCF. No. 3

The Wilmington Avenue crossing had a high volume of truck traffic exiting the freeway en route to the port facility and nearby industrial buildings, increasing the likelihood of a highway-rail collision.

PCF No. 4

The close proximity of the STOP sign to the grade crossing left little margin for error. The California Public Utilities Commission has been exploring this issue to determine what measures should be taken.

PCF No. 5

The two communication losses between the Brakeman and Conductor within 1,200 feet of track indicated to investigators a problem with the employees' attention and situational awareness.

REPORT: FE-22-2006

RAILROAD: Union Pacific Railroad (UP)

LOCATION: Carson, California

DATE & TIME: Dec. 4, 2006, 9:40 a.m., PST

EVENT¹: A Brakeman was fatally injured during a collision with a delivery truck at a highway-rail grade crossing, during a switching operation.

EMPLOYEE:

Craft:	Transportation and Engine
Occupation:	Brakeman
Age:	35
Length of Service:	8 years, 11 months
Last Rules Training:	Oct. 14, 2005
Last Safety Training:	Nov. 2, 2006
Last Physical:	Nov. 10, 2005
Last Relevant Efficiency Test:	Oct. 7, 2006

CIRCUMSTANCES PRIOR TO THE ACCIDENT

At 6:30 am., PST, on Dec. 4, 2006, two operating crew members, a Conductor and Brakeman, reported for duty at UP's Delores Yard in Carson, California, Los Angeles County. They were assigned to operate Train LOI-16R-04 in Remote Control Operation (RCO) with locomotives UP 639 and UPY 660. Their duties were to switch or separate cars needed for industries located on the Carson Industrial Lead (also known as 7400 zone) from yard tracks located in Delores Yard. Upon completion, the crew was to transport loads to the Carson Industrial Lead where loaded cars were to be placed at industries and empty cars, if any, were to be removed from the industries. LOI-16R-04 was the crew members' regular assignment, which they normally worked Monday through Sunday, beginning at 6:30 a.m. daily. The Conductor had just recently bid the job in but had worked it on past occasions. The Brakeman had been on the assignment since March 2006. The Conductor had been off for 36 hours and the Brakeman for 84 hours prior to Dec. 4, 2006.

¹ "Event" is defined as "occurrence that immediately precedes and directly results in the fatality." Possible contributing factors are identified in the following report and attached summary.

Delores Yard is a typical switching yard with leads located at both ends. Other than transfer jobs, the majority of the switching assignments at Delores Yard are RCO assignments.

Carson Industrial Lead is an industrial lead containing approximately 16 industries, as well as an additional lead and storage tracks. The lead is approximately one mile in length and crosses three public crossings from its origin at Delores Yard (Track No. 850) until it dead ends at Bonito Street. It is located in the Alameda Corridor Subdivision, Los Angeles Service Unit.

Proceeding in a railroad eastward direction toward Wilmington Avenue, the site of the accident, the track is a slight right-hand curve, relatively flat and level. The track is designated as an industrial lead, and Other Than Main Track rules apply to the lead. No remote control video cameras are located on the Carson Industrial Lead.

Wilmington Avenue is a paved, 2-lane road, approximately 41 feet wide, that crosses one FRA excepted track at a 90-degree angle. Highway vehicles travel in a north/south direction. The maximum authorized speed for train movement is 10 mph. For each direction of vehicular traffic, the warning system consists of two standard 5-inch masts. One mast is near the edge of the roadway, and the other is in the center island. Attached to each mast near the edge of the roadway are a cross buck, a 12-inch flashing light unit, and an audible warning bell. Attached to each island mast is a cross buck and a 12-inch flashing light unit. A direct current island track circuit provides train detection. A simultaneous preemption circuit is provided for the vehicular traffic.

The crew members' first activity of the day was to retrieve their power from Track No. 906 and perform switching operations to retrieve 16 cars from Tracks Nos. 910, 911, and 912. When they finished putting their train together and coupling the air brake hoses, the Conductor performed a yard transfer air brake test. After performing the air brake test and conducting a job briefing, the Conductor shoved the 16 cars from Track No. 850 to Track No. 855 where the crew set out 10 of the 16 cars on the Lead and Storage Track No. 855. The Conductor then pulled the remaining six cars out onto Track No. 853 and ran around the cars, leaving the Brakeman at the railroad east end of the cars, in position to take the shove after he completed the runaround movement. The Conductor was in control of the RCO movements, and his transmitter controlled all movements until completion of the runaround movement.

The weather was clear and cool, and the temperature was approximately 56° F.

THE ACCIDENT

The Conductor stated during an interview that after completion of the runaround movement, he coupled the air into the remaining six cars and pitched control of the RCO to the Brakeman. He said he was unsure if another air brake test was performed on the cars at that time. The Conductor went aboard UP unit UPY66O in anticipation of moving the remaining six rail cars to the industries for placement on their unloading tracks. Shortly after beginning movement in an eastward direction, train movement came to a stop, and the Brakeman called the Conductor and requested that he reset his remote control transmitter due to a communication loss. The Conductor did so and after a short period of time, movement commenced in an eastward

direction again. Shortly after movement commenced, a second communication loss occurred, causing the movement to come to a stop. The Conductor stated that after resetting the remote control equipment a second time, they commenced movement toward the industries and approximately six to eight cars later came to a stop.

The Brakeman's remote control transmitter began broadcasting a tilt/man down message at this time. The Conductor stated he tried three times to contact the Trainman via radio, and he did not answer. Fearing problems, the Conductor came off the locomotive and ran to the crossing where he found the Brakeman pinned between the lead car TG CX 1454 and a delivery truck that had been struck on the passenger's side. After being struck, the truck was shoved approximately 25 feet, causing the rear of the truck to spin in toward the rail car and pin the employee between the rail car and the truck. The Conductor contacted the Yard Master at Delores Yard who then contacted emergency response personnel.

The employee was removed from the scene with no vital signs and transported to Long Beach Memorial Hospital. The employee was revived at the hospital and placed on life support equipment. On Dec. 10, 2006 at 12:00 p.m., the employee's family made the decision to remove him from life support equipment, and he subsequently passed away. The time of death as noted on the certificate of death is 1:40 p.m. on Dec. 10, 2006.

POST-ACCIDENT INVESTIGATION

When the Conductor realized that the Brakeman was injured, he contacted the Delores General Yard Master by cell phone, and the Yard Master contacted the Emergency responders. Emergency response crews arrived on the scene shortly after the 911 call. Upon arrival of the Los Angeles County Sheriff's Department, the streets were closed off to vehicular traffic, and the injured employee was removed from between the truck and the rail car. The employee was then transported to Long Beach Memorial Hospital where he was placed on life support.

The Conductor was kept at the site until the injured Brakeman was removed and was briefly questioned by railroad officials. He left the scene prior to the arrival of FRA and California Public Utility Commission (CPUC) investigators.

FRA and CPUC inspectors arrived on the scene approximately 1.5 hours after the accident and began the investigation shortly after the injured employee was removed.

Post-accident investigation was conducted by FRA; CPUC; UP's signal, operating, and claims departments; and the Los Angeles Sheriff's Department.

The initial investigation of the accident scene and downloads of the locomotive's event recorder revealed that the Brakeman, who was riding the point and in control of the shoving move, had not stopped at a STOP sign located 40 feet prior to the Wilmington Avenue grade crossing. The rail cars had likely entered the grade crossing without activating the warning lights and struck the truck that was occupying the grade crossing. A re-enactment of the incident was performed approximately three hours after the incident. The re-enactment and a review of the downloaded

recorder data tended to reinforce the initial conclusion that the operator had passed a STOP sign without stopping and struck the truck on the crossing.

Prior to reopening the crossing to vehicular traffic, tests were conducted by the UP signal department to ascertain if the crossing equipment had functioned as designed. The initial tests and those conducted during the subsequent re-enactment revealed that the equipment had functioned as intended.

UP requested that the remote control equipment manufacturer, Cattron-Theimeg, review the download obtained from the RCL event recorder. Cattron-Theimeg's review concluded that the RCL equipment on the UPY 660 had functioned properly.

The deceased employee had not performed service for 3.5 days prior to the incident. The Conductor had not performed service for 1.5 days prior to the incident.

Post-accident toxicological fatality tests were not administered to either the Conductor or the then-injured Brakeman either immediately following the accident or following the Brakeman's death. The reason cited was that the Brakeman died six days after sustaining his injuries.

Analysis And Conclusions

Cattron Remote Control Transmitters (RCTs) have two separate air brake controls to correspond with locomotive air brake systems. The first system by which a Remote Control Operator (RCO) can stop a movement is by placing the speed selector lever to the stop position. This action causes a full independent brake application (engine brakes only) to occur. In addition, the speed selector has positions from 10 mph down to coast that use independent braking to achieve the speed selected. In the case of the coast position, speed would be allowed to build up to 10 mph and then would be maintained at that speed. Various levels of independent brake applications may also be made by using a lever called the independent brake override selector. This lever, found on the opposite side of the RCT, will apply minimum, medium, or full independent brake to the engines only. The last position found on this lever is the emergency brake position. Normally used only in an emergency, this position exhausts all air from the braking system that extends from the engine through all attached cars. Using current remote technology, this position allows for the fastest stopping possible. A second system for stopping or slowing is use of a toggle switch on top of the RCT which allows the operator to make different automatic brake applications for the engine and attached freight cars.

The RCT allows the operator to use the speed selector toggle switch on the right side of the RCT to slow or stop the train using engine brakes only, or the independent brake override toggle switch on the left side of the RCT to actuate an emergency brake pipe application. The operator can employ both of these toggle switches while riding the side of a car and still maintain 3-point contact with the car. The 3-point contact is defined as one hand and two feet being in contact with equipment.

Results of the event recorder for the remote control locomotive show that it operated for one minute and five seconds at speeds between 10 and 0 mph prior to coming to a complete stop upon impact. It indicates that just prior to the collision, the RCT was in the coast position and went directly to the STOP position. The RCT stayed in the STOP position with independent engine brakes fully applied for an additional six seconds. During this time, speed was reduced from 10 mph to 7.9 mph. At this point, the operator (Brakeman) placed the RCT in an emergency application position. The operator would have been approximately at the STOP sign when he placed the train into emergency. The event recorder tape does not indicate that a stop was made at the STOP sign. The train moved for an additional nine seconds until it came to a complete stop with rail cars occupying the grade crossing, following the collision with the delivery truck. A physical inspection of the accident scene verified that the distance between 223rd Street and Wilmington Avenue was 970 feet. Moving at 10 mph for 65 seconds would generate movement of approximately 953 feet. At 10 mph, that would equal 14.66 feet per second x 65 seconds. This shows the physical distance and the time elapsed were reasonably close. However, the event recorder does indicate that the engine moved 22,900 feet from start to stop. This is an indication that the footage counter on the event recorder was not reliably accurate, but this disparity had no effect on and did not contribute to the accident.

The post-accident investigation included a review of the rules training, efficiency training, and discipline and work history of the Brakeman. It also included a review of previous accidents at Wilmington Avenue. The decedent was trained and certified as a remote control operator with his last qualification ride being performed on Sept. 24, 2006. He had been tested a total of 39 times in the previous 365 days with a pass rate of 39 for 100 percent. His most recent STOP test had occurred on Oct. 7, 2006 with no exception noted. His fellow worker and the local chairman noted that he was a safe and conscientious worker.

The crossing at Wilmington Avenue is a busy grade crossing with a high volume of truck traffic exiting the 405 Freeway to transit to the port facility and nearby industrial buildings. FRA obtained UP reports (FRA Forms 6180.57 and 6180.97) of another accident at this crossing that had occurred on July 6, 2006 and, coincidentally, involved the decedent and another crew member. UP described the incident, as follows:

The LOI16R-06 crew shoved five cars back from International Paper and stopped at Wilmington Avenue at the stop board. The crew then proceeded upon the traffic clearing eastbound when the tractor-trailer rig fouled the track and the Driver accelerated, but was struck.

In this accident, the Driver of the tractor-trailer sustained minor injuries and was at fault. There was no allegation of wrongdoing on the decedent's part.

The close proximity of the STOP sign to the grade crossing leaves little margin for error. The two communication losses between the Operator and the locomotive within 1,200 feet of track suggests a problem with the employees' attention and situational awareness. CPUC is looking into possible changes to increase the safety for both vehicular and train traffic at the crossing.

The probable cause of the fatality is that the Brakeman stayed on rail equipment that entered a grade crossing without stopping and struck the delivery truck which pinned him between the truck and the rail car.

APPLICABLE RULES

ITEM 23. ROADWAY SIGNS, as shown in the UPRR SYSTEM SPECIAL INSTRUCTIONS, effective Sunday, June 18, 2006, shows a diagram of a STOP sign similar to the STOP sign posted 40 feet prior to entering the highway-rail grade crossing at Wilmington Avenue.

The General Code of Operating Rules, Section 6.32.2, as shown in the UPRR SYSTEM SPECIAL INSTRUCTIONS, effective Sunday, June 18, 2006, states, in part: "On prior SP (Southern Pacific) territory track where a STOP sign is located next to a grade crossing, movement must stop at the STOP sign. Movement may proceed only after automatic crossing warning devices have been operating long enough to provide warning, and crossing gates, if the crossing is so equipped, are fully lowered. If automatic crossing warning devices fail to operate, movement may enter the crossing only after a crew member is on the ground at the crossing to warn highway traffic."