SUMMARY FOR FE-20-03
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Lancaster and Chester Railway Company
Location: Chester, South Carolina
Region: Region 3

Month: August
Date: Aug. 26, 2003
Time: 12:30 p.m., EST

Data for Fatally Injured Employee(s)

Conductor
29 years old
2 years of service
Last rules training: Dec. 18, 2002
Last safety training: Aug. 26, 2003
Last physical: None (not required by FRA regulation)

Data for All Employees (Craft, Position, Activity)

Craft: Transportation and Engine

Positions:

Switching Job L&C-16/17
Engineer
Conductor
Brakeman Trainee

Car Inspector
Train Dispatcher

Activity: Switching

EVENT

A Conductor was fatally injured when crushed between two rail cars during a switching movement.

SUMMARY FOR FE-20-03 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

PCF No. 1

Investigators concluded it was likely that the Conductor became pinned between the train's rear car and a covered hopper car because he was attempting to adjust the couplers, which had failed to couple.

PCF No. 2

The couplers in question were misaligned about seven inches (coupler mismatch, high/low). (During a post-accident re-enactment, investigators found that the two freight cars would not couple when an attempt was made.)

PCF No. 3

Investigators concluded that the Conductor had failed to use proper radio communication, and that the Engineer had erred by acting on the improper instruction.

PCF No. 4

Investigators concluded that the Conductor had failed to protect himself properly before going between the rail cars, in non-compliance with railroad operating rules, which prohibited employees from stepping between standing cars or engines without first arranging for members of their crew to protect against coupling to or moving the equipment.

PCF No. 5

Investigators determined that the railroad's efficiency testing program was inadequate in the areas of proper radio procedures and employees working around and between equipment.

REPORT: **FE-20-2003**

RAILROAD: Lancaster and Chester Railway Company (L&C)

LOCATION: Chester, South Carolina

DATE& TIME: Aug. 26, 2003; 12:30 p.m., EST

EVENT[1]: A Conductor was fatally injured when crushed between two rail cars during a switching movement.

EMPLOYEE:	Craft:	Transportation and Engine (T&E)
	Activity:	Switching
	Occupation:	Conductor
	Age:	29 years
	Length of Service:	2 years
	Last Rules Training:	Dec. 18, 2002
	Last Safety Training:	Aug. 26, 2003
	Last Physical:	None (Not required by FRA Regulation)

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On Aug. 26, 2003, the crew of Switching Job L&C-16/17 went on duty at 7:30 a.m. at the L&C headquarters in Lancaster, South Carolina. The crew comprised an Engineer, Conductor, and Brakeman Trainee. All crew members received a statutory off-duty period of more than 12 hours at their home terminal prior to reporting for duty. The crew members discussed the safety rule of the day, received work instructions, and then drove a company vehicle to their train located on the rock track, milepost 0.0, in Chester, South Carolina. They arrived at their train about 9:30 a.m.

L&C 16/17 departed Chester and proceeded east to the Cortex Company at milepost 5.0, with two locomotives and 14 cars. From Cortex, the L&C 16/17 crew continued east with four cars to the east leg of the Wye track, milepost 5.5, where it reversed movement and shoved north onto the CSX Transportation, Incorporated (CSX) lead track to the GAF track (formerly used to service GAF Industries, no longer in existence). L&C 16/17 pulled eight CSX and three Norfolk Southern Railroad (NS) cars from the GAF track, then continued shoving north to the PPG Industries (PPG) switch. The Engineer was seated on the right side of the lead locomotive, HLCX 3821, with the short hood

[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.

forward, the Brakeman was located on the left side, and the Conductor was on the ground controlling the train movement.

The Conductor instructed the Engineer to shove the NS cars clear of the PPG switch, then pull ahead to clear the PPG switch. He lined the switch for the PPG spur track and unlocked the steel gate which blocked the track. This was the last time the Conductor was seen by the Engineer and Brakeman prior to the accident.

At the time of the accident, the sky was sunny, and the temperature was 89° F.

THE ACCIDENT

With the Conductor controlling the shoving movement via radio, he instructed L&C-16/17 to back up to the first coupling. The Conductor said the coupling did not make and told the Engineer "to get off it", (i.e., pull the train forward) then "bump it up" (i.e., back the train up a short distance). The Conductor then said, "The coupling had made" and the Engineer could hear the air flowing from the locomotive into the cars. L&C16/17 had coupled onto two empty covered hopper cars. The Engineer said he had waited 30 to 40 seconds before the Conductor said, "Come to me three feet" (i.e. back the train up three feet). As the train began to move, the Engineer and Brakeman heard the Conductor shout, "Hold it, stop, stop, hold it!" The last thing the Engineer or Brakeman heard the Conductor say was "I need help!"

The Brakeman left the locomotive and hurried to the rear of the train. He found the Conductor lying face up across both rails between the train's rear car, CSXT 242234, and a covered hopper, CSXT 242111. The Conductor's feet were over the west rail and his upper torso and head were over the east rail. The Brakeman said the coupling did not make, and there were about two feet between the last car of the train and the covered hopper car. Both coupler pins were in the up position. The Brakeman radioed the Engineer to call 911.

An L&C Car Inspector, who was just departing the CSX interchange tracks and returning to Lancaster, overheard the Conductor's call for help. He radioed the Engineer and Brakeman that he already had called 911 on his cell phone and that he was on his way to the accident scene.

The Engineer radioed the L&C Dispatcher reporting the accident and contacted via radio a CSX train crew working near the PPG track. He then proceeded to the rear of the train to see if he could provide assistance. He observed the Conductor "gasping for air" and noticed that a partially open angle cock on the last car of the train was blowing air on the Conductor. He closed the angle cock, and then knelt by the Conductor to check his pulse.

The Chester County Emergency Medical Services responded and arrived at the accident scene at 12:41 p.m. The Chester County Sheriff's office was called at 12:34 p.m. by the 911 Dispatcher. The Sheriff arrived at 12:41 p.m. The train was moved ahead about six feet so the emergency technicians could treat the Conductor at the scene. He was then transported to the Chester County Hospital Emergency Room where he was pronounced dead at 1:16 p.m.

An autopsy was performed on Aug. 27, 2003 at Newberry Pathology Associates in Newberry, South Carolina. Newberry Pathology attributed the probable cause of death to bleeding and shock from blunt force trauma to the pelvis due to being hit by a train. The anatomic diagnosis was fatal blunt

force trauma to the upper aspect of lower extremities, pelvis and lower torso with resultant fracture of the pelvis, laceration of pelvic organs, and internal bleeding.

POST-ACCIDENT INVESTIGATION

Federal Railroad Administration (FRA) investigators arrived at 2:30 p.m. on the day of the accident. The investigation began with interviews of the L&C Car Inspector and company officials. FRA inspected the two covered hopper cars involved in the accident and was informed that the train had been moved to provide access for emergency personnel, but had been returned to the original accident position prior to FRA's arrival.

At the time of the accident, the Conductor was positioned between the "B" end of CSXT 242111 and the "B" end of CSXT 242234. The Brakeman said there were no signs of blood and that the Conductor did not appear to have any serious injuries. He further stated that the Conductor was breathing abnormally with short sporadic breaths. He told the Conductor to keep breathing, that help was on the way. The Brakeman and Car Inspector stated they saw rust marks on the Conductor's shirt, in the abdominal area. They lifted the Conductor's shirt and could see severe bruising on the left side of his abdomen, but were unsure how severe his injuries were.

Inspection of covered hoppers CSXT 242111 and CSXT 242234 disclosed no apparent defects that either caused or contributed to the accident. It was observed that the couplers involved were mis-aligned about seven inches. The two freight cars would not couple when an attempt was made. L&C employees interviewed stated that this switching move was a daily occurrence; they did not remember any previous problems with misaligned couplers at this location. Investigators concluded that it was likely the Conductor became pinned between the cars because he was attempting to adjust the mis-aligned couplers.

Train L&C 16/17 was a regular job assignment for the L&C Railroad. The crews' regular work hours were Monday through Friday, from 7:30 a.m to 3:30 p.m. The Engineer had been working this job since July 2002, and his certification was current. The Conductor had been working this assignment since July 18, 2003. The Brakeman had only worked this assignment one day prior to the accident. An inspection of the L&C Hours of Service Records indicated the Engineer and Conductor were off duty 16 hours prior to the day of the accident. The Brakeman was off duty for 84 hours.

There were no witnesses to the accident, nor were there any surveillance cameras to monitor the activities at this location. The locomotives were not equipped with event recorders and the carrier's radio was not recorded, not uncommon for yard operations.

FRA's post-accident toxicology tests were negative for drugs and alcohol.

Description of Accident Area

The L&C Main Track between Lancaster and Chester ran geographically east and west with PPG Industries located about one half mile north of the main track at milepost 5. The CSX lead track came

off the Wye and extended south to north, intersecting with State Highway 9. The CSX lead track connected to the L&C main track just north of PPG Industries, which connected to the CSX main track. Two auxiliary tracks, one east of the main track, the other west of it, paralleled the main track and were used for storing CSX interchange cars.

To the west of the CSX lead track and north of State Highway 9 was the PPG Spur Track, used to place covered hoppers cars for unloading by PPG Industries. The PPG Spur Track extended northward to the PPG unloading track where it dead-ended north of the plant.

The operating speed where the accident occurred was 10 mph. Trains operated under authority of the Lancaster & Chester Timetable No. 83, dated Sept. 23, 2003, and NS Operating Rule 105.

Analysis and Conclusions

FRA's investigation revealed that neither the L&C Conductor nor Engineer had complied with the railroad's safety rules, operating rules, or Federal radio communication regulations. The Conductor failed to use proper radio communication, and the Engineer acted on his improper instruction. The Conductor failed to properly protect himself before going between the cars when he coupled the air hoses. The Engineer failed to advise the Conductor that he had not protected himself prior to going between the cars. The Conductor also failed to remain clear of the approaching equipment (stepping between the moving cars) on the last coupling.

FRA's investigation determined that L&C's efficiency testing program concerning proper radio procedure and employees working around and between equipment was inadequate. An inspection of the Lancaster and Chester records from Jan. 1 through Aug. 25, 2003, indicated that L&C managers had conducted only three radio efficiency tests on the Engineer and Conductor. No efficiency tests were made on them concerning working around or between equipment. The total number of efficiency tests for all L&C operating employees during this time frame was 46, eight for radio procedures and three for working around or between equipment. No tests were conducted on the Brakeman since his employment began in July 2003.

L&C had not adopted FRA's Switching Operations Fatality Analysis (SOFA) recommendations. The L&C efficiency testing program mirrored tests recommended by SOFA, but the railroad's program did not emphasize the life critical rules identified by SOFA. FRA's investigator suggested that life critical rules be incorporated in future efficiency testing, to include safety procedures prior to going between rail equipment with locomotives attached.

Since this accident, L&C has increased efficiency testing efforts with emphasis placed on the life critical rules and radio procedures. From Aug. 27 through Dec. 1, 2003, L&C conducted 18 efficiency tests relative to radio rules and 15 efficiency tests concerning employees working around or between equipment. On December 25, L&C also hired a consultant agency to structure its operating rules and efficiency testing programs.

FRA will continue to monitor the L&C for safety rules, operating rules, and efficiency testing compliance.

APPLICABLE RULES

L&C used Norfolk Southern Railroad's operating rules, and its own safety and general conduct rules.

Lancaster & Chester Railway Company Safety and General Conduct Rules

GR-14 Employees must not stand on the track in front of closely approaching equipment, or step between coupled moving cars or engines, for any reason. They must not step between standing cars or engines until they have arranged for members of their crew to protect against coupling to or moving the equipment.

Employees must neither walk around the end of a standing car, nor adjust a draw-bar or knuckle, without a half car length of open space, and they must expect sudden spring action from cushion underframe draft gear. To adjust a coupler or knuckle, an employee must stand to the side with feet clear of a falling knuckle.

GR-14 was last discussed with all crews at the morning safety briefing held on June 27, 2003.

49 Code of Federal Regulations, Part 220

49 CFR Part 220.43 Radio communications consistent with Federal regulations and railroad operating rules. Radio communications shall not be used in connection with a railroad operation in a manner which conflicts with the requirements of this part, Federal Communication Commission regulations, or the railroad's operating rules.

Norfolk Southern Railway Company Operating Rules

(504.3) Identify each mobile station by (a) the name or initial letters of the railroad, (b) the train name or number, if one has been assigned, or (c) other appropriate unit designation.

(505.1) Employees will promptly acknowledge the receipt of a radio call, identifying the receiving station according to **(504.2)** and **(504.3).**

(508.) Shoving, Backing, or Pushing Movements.