U.S. Department
of Transportation

**Federal Railroad
Administration**

1998 RAILROAD EMPLOYEE FATALITIES:

AN ANALYTICAL STUDY

Office of Safety
Washington, DC 20590

November 2003

Memorandum

U.S. Department
of Transportation

Federal Railroad Administration

Date: November 30, 2003

Subject: 1998 Railroad Employee Fatalities: An Analytical Study

From: George A. Gavalla
Associate Administrator for Safety

To: Distribution

On behalf of the Office of Safety, I am pleased to distribute this report**,** entitled "1998 Railroad Employee Fatalities: An Analytical Study," which is designed to promote and enhance awareness of many unsafe behaviors and conditions that typically contribute to railroad employee fatalities. By furthering our understanding of the causes of railroad employee fatalities, this report is intended to assist railroad industry stakeholders in their efforts to prevent similar tragedies.

This document contains the following materials:

- Narrative reports which provide in-depth coverage of 1998's 22 railroad employee fatalities, helping readers to visualize the accident scene and chain of events leading up to the fatalities, and the post-accident investigation process;
- Summaries, preceding each narrative report, which highlight important elements of each *individual* fatality, particularly the possible contributing factors (PCFs);
- *Overall* findings for the 1998 fatalities which identify *who* the majority of fatally injured employees were (i.e. craft, job position, age group, and years of service); *what* most were doing at the time of the incidents; *when* most were fatally injured (i.e. time of year and time of day); *where* most incidents occurred (i.e. type of railroad); and most importantly, *why* most fatalities occurred in terms of PCFs; and
- Bar and pie charts which illustrate the above findings.

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OVERVIEW OF 1998 RAILROAD EMPLOYEE FATALITIES

EXECUTIVE SUMMARY

This document, entitled "1998 Railroad Employee Fatalities: An Analytical Study," was developed to promote and enhance awareness of many unsafe behaviors and conditions that typically contribute to railroad employee fatalities. By furthering our understanding of the causes of railroad employee fatalities, this report is intended to assist railroad industry stakeholders in their efforts to prevent similar tragedies.

This document contains the following materials:

- Narrative reports which provide in-depth coverage of 1998's 22 railroad employee fatalities, helping readers to visualize the accident scene and chain of events leading up to the fatalities, and the post-accident investigation process;

- ***Summaries, preceding each narrative report, which highlight important elements of each individual fatality, particularly the possible contributing factors (PCFs).*** This format allows the reader to walk through and analyze each fatality scenario, identifying ways the fatalities could have been prevented. PCFs are expressed as brief narrative statements such as "The Switchman Foreman got off moving equipment, in non-compliance with the railroad's operating rules."

  The summaries also list Selected Factors which identify where and when the individual fatalities occurred, particulars about the fatally injured parties (i.e. age, years of service, training, and certification where applicable), craft and positions of the other workers, and major activities of fatally injured employees at the time of the incidents;

- ***Overall findings for the 1998 fatalities (see Pages 2-6)*** which identify ***who*** the ***majority*** of fatally injured employees were (i.e. craft, job position, age group, and years of service); ***what*** most were doing at the time of the incidents; ***when*** most were fatally injured (i.e. time of year and time of day); ***where*** most incidents occurred (i.e. type of railroad); and most importantly, ***why*** most fatalities occurred in terms of ***PCFs***; and

- Bar and pie charts ***(Appendices A through I)*** which illustrate the above findings.

COMPLEXITY OF FATALITIES

Fatalities usually resulted from a chain of events or the errors of more than one individual, as revealed by the PCFs for each fatality. ***In 1998, approximately 60 percent of all fatalities had three or more PCFs. Fatalities ranged in complexity from only one PCF to eight PCFs.***

As an example, Report FE-26-98 describes a very complex fatality which involved five Maintenance-of-Way (MOW) gangs who were working together on a main line without proper procedures and communication when one of the employees was fatally injured by a commuter train. The fatality involved the following eight PCFs:

- Gangs had overlapping track and time authorities, in non-compliance with regulations;
- Most workers received no briefing; the others received an inadequate one;
- Post-accident investigators concluded that the railroad's Roadway Worker Protection, On-Track Safety Program (RWP/OTS) had not been well monitored by railroad management;
- Radio communication was not properly relayed to all gangs;
- The train was cleared at excessive speed in multiple track territory before the work was stopped completely and all workers cleared from the area;
- Because of poor communication in clearing the track, not all workers were informed, including the fatally injured employee;
- The Engineer of an approaching commuter train stopped sounding the whistle too soon; and
- The Track Surfacing Gang Foreman was fouling the tracks when he was struck by the train, becoming fatally injured.

FINDINGS

WHO were most of the fatally injured employees?

- ***Craft: Transportation and Engine (T&E) Employees***

  In 1998, T&E employees represented approximately 54 percent of the fatalities, MOW employees approximately 32 percent, and Maintenance-of-Equipment (MOE) employees approximately 14 percent.

  (See Appendix A, 3-D pie chart entitled "1998 Railroad Employee Fatalities By Craft.")

- ***Position: Conductors***

  In 1998, approximately 23 percent of all fatally injured employees were Conductors. The next largest groups, Trackmen and Engineers each represented approximately 14 percent of all fatalities.

  (See Appendix B, stacked bar chart entitled "1998 Railroad Employee Fatalities by Craft and Position.")

- ***Experience: Very Experienced (21-35 Years of Service)***

  Most fatally injured employees in 1998 were very experienced; approximately 54 percent had served 21-35 years. The very inexperienced, who served 0-5 years, ranked second at approximately 32 percent of all fatally injured employees.

  (See Appendix C, stacked bar chart entitled "1998 Railroad Employee Fatalities: Years of Service by Craft.")

- ***Age Range: 36-55 Years***

  In 1998, approximately 54 percent of all fatally injured employees were concentrated in the 36-55 age range. Younger employees in the18-35 age range represented approximately 32 percent of all fatally injured employees. Older employees in the 56-65 age range represented 14 percent.

  (See Appendix C, cluster bar chart entitled "1998 Railroad Employee Fatalities: Age Ranges by Craft.")

WHAT were most of the fatally injured employees doing when they were fatally injured?

- ***Activity: Switching or En Route via Highway Transportation***

  In 1998, approximately 32 percent of fatally injured employees were involved in switching, and an equal percentage were fatally injured while traveling to and from the job site via highway transportation. Track maintenance ranked next, with approximately 14 percent of all fatalities in 1998. Other activities in which employees were fatally injured in 1998 included track repair, passenger service, activating switch heaters, air brake inspection, and going off-duty.

  (See Appendix D, stacked bar chart entitled "1998 Railroad Employee Fatalities by Craft and Activity.")

WHERE did most of the railroad employee fatalities occur?

- ***Type of Railroad: Class I Freight Railroads***

  In 1998, approximately 64 percent of all railroad employee fatalities occurred on Class I freight railroads, approximately 23 percent on Class II and III railroads, and approximately 13 percent on commuter/passenger railroads. These railroad categories employed approximately 78 percent, approximately 11 percent, and approximately 11 percent of the nation's total railroad employees, respectively.

  (See Appendix E, 3-D bar chart entitled "1998 Railroad Employee Fatalities by Type of Railroad.")

WHEN did most of the fatalities occur?

- ***Season(s): Fall or Winter***

  In 1998, approximately 72 percent of all fatalities occurred in the fall or winter (approximately 36 percent each), while only approximately 5 percent occurred in the summer.

  (See Appendix F, pie chart entitled "1998 Railroad Employee Fatalities by Season of Year.")

- ***Time of Day: Day***

  Data of the U.S. Naval Observatory, Astronomical Applications Department, provided the precise times for sunrise and sunset for the specific dates and locations of the fatalities. To distinguish fatalities which occurred during daylight from those which occurred during darkness, this analysis employs the definitions of "day" as at sunrise through sunset, and "night" as immediately after sunset until sunrise. In 1998, approximately 68 percent of the fatalities occurred during the day and approximately 32 percent during the night.

  (See Appendix F, pie chart entitled "1998 Railroad Employee Fatalities by Time of Day.")

WHY did most of the fatalities occur?

- ***Major PCF Categories in descending order:***

  Train Operation and Human Factors
  Miscellaneous Contributing Factors
  Mechanical and Electrical Failures
  Track, Roadbed, and Structures

- ***Most PCFs: Train Operation & Human Factors***[1]

  - In 1998, approximately 58 percent of all possible contributing factors (PCFs) to the 22 fatalities were Train Operation & Human Factors, followed by approximately 38 percent which were Miscellaneous Contributing Factors.[2]

  - In 1998, approximately 3 percent of the PCFs involved Mechanical and Electrical Failures (specifically a crane's clutch had burned out, and a coupler was defective) and approximately 1 percent involved Track, Roadbed & Structures (a large opening in a bridge's railing).

(See Appendix G, 3-D pie chart entitled "1998 Railroad Employee Fatalities: Major Possible Contributing Factor Categories.")

Break-down of Train Operation & Human Factors

- ***Of all the Train Operation & Human Factors in 1998, one specific sub-category predominated: Miscellaneous Human Factors, Track, at approximately 35 percent.*** This sub-category included non-compliance with Bridge Worker Safety requirements; no or inadequate provisions for RWP/OTS; fouling the track; unsafe crane operation; and inadequate crosswalk safety provisions.

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[1]During 1998, Train Operation & Human Factors included errors in the use of switches; improper speed; inappropriate or nonexistent hand, radio, and train signals; employee's condition; improper use of brakes; non-compliance with General Switching Rules; and miscellaneous human factors in Motive Power & Equipment (MP&E) and Track.

[2]Miscellaneous Contributing Factors, in 1998, included poorly prepared employees; highway accident factors; inexperience; environmental conditions; grade crossing accident factors; and contractual non-compliance.

- ***Next prevalent at approximately 14 percent each were the following sub-categories: Hand, Radio, and Train Signals; General Switching Rules; and Miscellaneous Human Factors, MP&E.*** The first sub-category included inappropriate or no use of radio signals or train signals such as horns, bells, ditch lights, and headlights. General Switching Rules included failure to couple, failure to avoid a close clearance structure, failure to remain clear of moving equipment, and failure to adequately separate equipment before stepping between it. Miscellaneous Human Factors, MP&E included getting on or off moving equipment, improper loading and unloading of passengers, and assuming the wrong position on the train to view the platform.

- ***The remainder of Train Operation & Human Factors comprised the following sub-categories: Improper Use of Brakes and Excessive Speed at approximately 8 percent each; Employee's Condition at approximately 5 percent; and Improper Use of Switches at approximately 3 percent.*** Together, these sub-categories comprised failure to secure hand brakes properly; failure to comply with restricted speed; operating a train inside the yard limits at excessive speed; clearing a train at excessive speed before workers had been cleared from multiple track territory; employee's impairment from fatigue or drugs; and lining switches improperly.

(See Appendix H, cluster bar chart entitled "1998 Railroad Employee Fatalities: Train Operation & Human Factors Involved.")

Break-down of Miscellaneous Contributing Factors

- ***The three sub-categories, Poorly Prepared Employees, Environmental Conditions, and Highway Accident Factors comprised approximately 71 percent of all Miscellaneous Contributing Factors (at 25 percent, 25 percent, and approximately 21 percent, respectively).*** Poorly Prepared Employees included no or inadequate training, supervision, briefing, and communication. Environmental conditions included snow on the track, darkness without sufficient artificial lighting, black ice on the road, and heavy wind and rain. Highway Accident Factors included not wearing a seatbelt, driving left of the center line into oncoming traffic, speeding, non-compliance with STOP signs and other traffic control devices, and ruptured tires.

- ***The remaining three sub-categories, Grade Crossing Accident Factors, Inexperience, and Contractual Non-Compliance, comprised approximately 29 percent of all Miscellaneous Contributing Factors (at approximately 13 percent, approximately 13 percent, and approximately 4 percent, respectively).*** Grade Crossing Accident Factors included a highway user's inattentiveness, violation of highway-rail traffic laws, and a highway user's lack of awareness due to environmental factors (i.e. no street light at a passive crossing at nighttime). Inexperience is self-explanatory. Contractual non-compliance concerned a container plant's failure to notify railroad management prior to installing a close clearance structure.

(See Appendix I, cluster bar chart entitled "1998 Railroad Employee Fatalities: Miscellaneous Contributing Factors.")

INDIVIDUAL SUMMARIES AND REPORTS

(FE-02-98 THROUGH FE-37-98)

FE-02-98 **(document link)**

SUMMARY FOR FE-02-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Burlington Northern Santa Fe Corporation
Location: Omaha, Nebraska
Region: Region 6

Month: January
Date: 01/24/98
Time: 10:15 a.m., CST

Data for Fatally Injured Employee(s)

Switchman Foreman
47 years old
26 years of service
Last rules training: March 1996
Last safety training: March 1996
Last physical: July 1988

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Job 106
Engineer
Switchman Foreman
Switchman Helper

Job 111G
Engineer
Switchman Foreman
Switchman Helper

Yardmaster

Activity: Switching

SUMMARY FOR FE-02-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Switchman Foreman of Job 106 was fatally injured when struck on the head by the handle of a hand-operated switch he attempted to operate.

PCF No. 1

The incident occurred as his locomotive trailed through improperly lined switch points. Switch points had been lined for switching crew 111G, also working in the area and headed in a different direction.

PCF No. 2

Radio communication between the two crews resulted in no absolute understanding about coordinating the lining of switches for both jobs.

PCF No. 3

The speed of the train for Assignment 106 was excessive per the railroad's operating rules, which required train speeds, except on main tracks or block signal territory, to be slow enough to allow stopping within half the range of vision for obstructions such as derails or switches lined improperly.

PCF No. 4

The Switchman Foreman of Job 106 got off moving equipment, in non-compliance with the railroad's operating rules.

PCF No. 5

Just prior to the incident, the Engineer and Switchman Helper observed the Switchman Foreman slipping as he was running in three to five inches of snow. He was properly attired for the weather.

PCF No. 6

The fatally injured employee's recent use of cocaine may have affected adversely his judgment, motor coordination, reaction time, and alertness at the time of the incident.

REPORT:	FE-02-98	
RAILROAD:	Burlington Northern Santa Fe Corporation (BNSF)	
LOCATION:	Omaha, Nebraska	
DATE & TIME:	Jan. 24, 1998 - Estimated 10:15 a.m. CST	
PROBABLE CAUSE:	The Switchman Foreman of Switching Assignment 106 was struck on the head and fatally injured by the handle of a hand-operated switch while attempting to operate the switch as his locomotive trailed through improperly lined switch points.	
EMPLOYEE:	Occupation:	Switchman Foreman
	Age:	47 Years
	Length of Service:	26 Years
	Last Rules Training:	March 15, 1996
	Last Safety Training:	March 15, 1996
	Last Physical Exam:	July 27, 1988

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On Jan. 24, 1998, a 3-person crew consisting of an Engineer, Switchman Foreman, and Switchman Helper went on duty at 7:30 a.m. at BNSF's Gibson Yard in Omaha, Nebraska, to operate Switch Assignment 106. These crew members had completed their statutory off-duty periods. The Switchman Foreman had been off duty for the previous two days.

This crew was assigned to perform switching operations at Gibson Yard, a flat switching yard with several tracks arranged to be accessible from the Freight Lead. The tasks for Assignment 106 included yard switching, arranging cars into groups and delivering these groups to the industries serviced out of the yard, and handling the switching needs of the intermodal facility at the yard.

The crew members boarded their assigned switch engine, BN 3601, which was standing on the Macks Lead track. They were performing switching moves on the north end of the yard. Switch Assignment 111G, also on duty at 7:30 a.m., was working on the south end of the yard. The 3-person crew of Assignment 111G comprised an Engineer, Switchman Foreman, and Switchman Helper. After completing work on the south end of the yard, the crew of Assignment 111G had been given a switch list to perform work on the north end of the yard. This included switching a cut of approximately 70 cars located on Track No. 3.

At approximately 10 a.m., the Engineer and Switchman Helper of Assignment 111G were transported from the yard office to the north end of the yard by highway vehicle, to pick up the locomotives on Track No. 6. These units were to be used to perform the work on the north end of the yard. The Switchman Foreman of Assignment 111G walked from the yard office to Track No. 3 and walked the length of the cut-of-cars to insure that the air hoses were coupled.

Meanwhile, the crew of Assignment 106 picked up a car on Track No. 4 to place on Track No. 1, then proceeded to Track No. 9 to pick up a cut of 29 cars. After Assignment 106 moved from Track No. 1 to Track No. 9, the Assignment 111G's crew moved its locomotives from Track No. 6 to Track No. 3 and left the hand-operated switches to Track Nos. 6 and 1 lined against the westward movement that Assignment 106 was preparing to make.

The Assignment 106 crew coupled to the cars on Track No. 9, and the Switchman Foreman contacted the Yardmaster and asked for permission to proceed to Douglas Street. At approximately 10:15 a.m., with the Yardmaster's permission, they proceeded westbound on the Freight Lead. The locomotive was headed east. The Engineer had to gradually increase the throttle to position 8 to get over an elevated area of the track. Their estimated speed was between 8 and 10 mph.

Moving westward on the Freight Lead, there was a gradual left-hand curve between Track No. 9 and Track No. 7. Tank cars on Track No. 7 obstructed the crew's view of the track ahead. As the crew of Assignment 106 approached the curve, the Switchman Helper heard the crew of Assignment 111G on the radio. Because Assignment 111G was in the area, the Switchman Helper on Assignment 106 told the Engineer to throttle down. The Engineer throttled down to the idle position and was using the independent brakes as they came around the curve and into view of the switch to Track No. 6. The Engineer observed that the switch was lined against their movement when they were about three car lengths from the switch.

Approximately two minutes before, they had made an eastward move from Track No. 1 to Track No. 9 on the Freight Lead and all of the switches, including this switch, were lined for a straight move on the Freight Lead. The two Switchmen Foremen had a radio conversation regarding their respective movements, but reached no absolute understandings.

At this point, the Switchman Foreman for Assignment 106 exited the cab of the locomotive onto the platform. He rode on the platform for a distance of about one and one half to two car lengths. The Engineer made a full application of the brakes about one car length in advance of the switch to Track No. 6, using the automatic brake valve. The Switchman Helper advised the Switchman Foreman not to attempt to line the switch, that they would just run through the switch. The Switchman Foreman got off the locomotive about one car length from the switch and ran westward ahead of the move in an effort to line the switch for their move.

Weather conditions were cloudy, with a temperature of 20º F . The ground was covered with snow.

THE ACCIDENT

There were approximately three to five inches of snow on the ground. The Switchman Foreman of Assignment 106 was wearing high-top overshoes with ice cleats. The Engineer and Switchman Helper observed the Switchman Foreman slipping as he was running. Then, the Switchman Helper lost sight of the Switchman Foreman and thought he had given up on the attempt. Afterwards, he saw a "flash of movement" out of the corner of his eye as the Assignment 106 train went through the switch and observed that the Switchman Foreman had been hurt. The engine stopped approximately 200 feet west of the switch to Track No. 6.

The Switchman Helper immediately called the Yardmaster and requested a call to 911. He ran back to the switch where the Switchman Foreman was lying on the ground and noticed the severity of his injuries. He checked the Switchman Foreman for a pulse, but did not detect one. He went back to the locomotive and got a coat to cover the victim.

An ambulance arrived at the scene, and a member of the ambulance crew checked the victim for a pulse, then covered the Switchman Foreman back up with the coat. The Switchman Foreman was pronounced dead at the scene by the Douglas County Coroner upon his arrival.

POST-ACCIDENT INVESTIGATION

There were no witnesses to the final actions of the Switchman Foreman. Based on the injuries sustained by the Switchman Foreman, he apparently reached the switch and stepped on the foot latch, releasing the switch handle as the locomotive's lead truck was passing through the switch. The force of the switch points being forced over caused the switch handle to spring upward. The handle struck the Switchman Foreman in the face, resulting in his death.

Results of toxicological testing of the deceased were positive for Benzoylecgonine with a urine concentration of 3,922 ng/ml, and a blood concentration of 113 ng/ml.

A preliminary report from the Greystone Health Sciences Corporation laboratory stated the following:

> "...He was not under the direct influence of cocaine at the time of his death (that is, he was not intoxicated). However, due to the demonstrated residual effects of cocaine that can appear after use, it is quite possible that the deceased was still impacted to some unknown degree at the time of the accident and that may have affected his judgment and/or physical performance."

The Greystone Health Sciences Corporation laboratory, in a letter of "final findings" further stated the following:

> "...Interpretation and Conclusion. In spite of the limitations and scientific concerns described above, some preliminary conclusions from the data can be provided for the purposes of the FRA's accident investigation.

Assuming the deceased was not a chronic user and had not ingested a very large amount of the drug, he likely used cocaine some time between six and 24 hours before his death. A careful investigation of the deceased's behavior and actions during the previous 24 hours would likely allow a further refinement of that time frame.

Second, based on the low levels of parent cocaine found in his urine (in comparison to the metabolite) and its absence in detectable levels in the blood, it is our opinion that the deceased had not likely used cocaine while on duty that morning.

Finally, it is also our professional opinion that the deceased was not under the direct influence of cocaine at the time of the accident. However, if later investigation reveals cocaine use in the late evening or especially in the early morning hours, it is possible that the deceased could have been impacted to some unknown degree at the time of his death due to the residual effects from his previous use of cocaine."

APPLICABLE RULES

General Code of Operating Rules
Burlington Northern and Santa Fe Railway

1.5 Drugs and Alcohol

The use or possession of intoxicants, over-the-counter or prescription drugs, narcotics, controlled substances, or medication that may adversely affect safe performance is prohibited while on duty or on company property, except medication that is permitted by a medical practitioner and used as prescribed. Employees must not have any prohibited substances in their bodily fluids when reporting for duty, while on duty, or while on company property.

6.28 Movement on Other than Main Track

Except when moving on a main track or on a track where a block system is in effect, trains or locomotives must move at a speed that allows them to stop within half the range of vision short of a:

- Train;
- Engine;
- Railroad car;
- Men or equipment fouling the track;
- Stop signal; **or**
- Derail or switch lined improperly.

7.2 Communication Between Crews Switching

To avoid injury or damage where locomotives may be working at both ends of a track or tracks, crews switching must have a clear understanding of movements to be made.

S-13.5 Getting On or Off Equipment

Do not get on or off moving equipment, except in an emergency to avoid injury.

FE-03-98 (document link)

SUMMARY FOR FE-03-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: National Railroad Passenger Corporation (Amtrak)
Location: Harrison, New Jersey
Region: Region 1

Month: February
Date: 02/04/98
Time: Between 8:15 p.m. and 8:30 p.m., EST

Data for Fatally Injured Employee(s)

Signal Trainee
20 years old
Five months of service
Last rules training: September 1997
Last safety training: September 1997
Last physical: September 1997

Data for All Employees (Craft, Positions, Activity)

Craft: MOW

Positions

Signal Trainee
Signal Maintainer

Amtrak's Trouble Desk
Block Operator (in Hudson Tower)

Engineer of eastbound train
(one of four trains traveling eastbound between 8:18 pm and 8:46 pm, time frame of accident)

Activity: Activating switch heaters at Hudson Interlocking on the main line.

SUMMARY FOR FE-03-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Signal Trainee was fatally injured when struck by an eastbound train as he was crossing the main line tracks to reach the company truck.

PCF No. 1

Neither the Signal Trainee nor the Signal Maintainer had established on-track protection prior to work in the interlocking.

PCF No. 2

Visibility was poor due to wind-driven rain. Also, looking west from the site of the accident, there were many bright external lights that were difficult to distinguish from the train's headlights.

PCF No. 3

The Signal Trainee was inexperienced with only five months on the railroad and only one month's exposure to high speed trains, as the first four months had been spent in Penn Station, New York, where track speed was only 10 mph.

PCF No. 4

The Signal Trainee did not receive training at this new location on the physical characteristics of track.

REPORT:	FE-03-98	
RAILROAD:	National Railroad Passenger Corporation (Amtrak)	
LOCATION:	Harrison, New Jersey	
DATE & TIME:	Feb. 4, 1998, Between 8:15 p.m and 8:30 p.m. EST	
PROBABLE CAUSE:	The Signal Trainee was struck by a moving train while fouling the main track within interlocking limits.	
EMPLOYEE:	Occupation:	Signal Trainee
	Age:	20 Years
	Length of Service:	Five Months
	Last Rules Training:	Sept. 11, 1997
	Last Safety Training:	Sept. 17, 1997
	Last Physical Examination:	Sept. 8, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On the day of the accident, the Trainee reported for his assigned shift at 3 p.m. at Hudson Interlocking. The Signal Maintainer, who was instructing the Trainee, reported for duty at Swift Interlocking, approximately two miles away. The Signal Maintainer called the Trainee and instructed him to drive the company truck and meet him at Swift.

The east-end limits of Hudson Interlocking were near milepost 7.3 of Amtrak's Northeast Corridor main line in Harrison, New Jersey. At this location, the railroad comprised three east/west orientated (and timetable direction) tracks identified from north to south as Tracks Nos. 1, 2, and 3. Amtrak intercity passenger trains and New Jersey Transit (NJT) commuter trains operated over this high traffic density railroad. Tracks Nos. 2 and 3 were predominately used by trains traveling to and from New York City's Penn Station. Track No. 1 was predominately used by train traffic to and from Hoboken, NJ. Trains operating over this railroad were governed by NORAC operating rules, and the method of operation was controlled by Automatic Block Signals supplemented by a Cab Signal System. The maximum authorized timetable speed was 70 mph.

The Signal Maintainer and Trainee worked at Swift until approximately 7 p.m. They were instructed by Amtrak's Trouble Desk to turn on the switch heaters at Hudson Interlocking. The Signal Maintainer told the Trainee to take the company truck to Hudson Tower and meet him there. The Signal Maintainer drove his privately owned vehicle and parked it at Hudson Tower. They then

traveled by company truck to the east end of Hudson Interlocking. At approximately 8 p.m., they parked the truck on the north side of the right-of-way and climbed up the railroad embankment to track level.

The embankment at this location was approximately 20 feet high. The switch heater control boxes were located adjacently to the Port Authority Trans Hudson (PATH) third rail on the north and south sides of Amtrak's trackage. After turning on the heaters for Power Operated Switches Nos. 65 and 61, they continued walking west. The Signal Maintainer instructed the Trainee to return to the truck and to pick him up at the west end of Hudson Interlocking. The Trainee left to get the truck while the Signal Maintainer continued walking westward to turn on the remaining switch heaters. The Trainee had to walk eastward and cross over the main line tracks to reach the truck. The Signal Maintainer completed the ignition of the remaining switch heaters at approximately 8:40 p.m.

Weather at the time of the accident was rainy and cold, with an approximate temperature of 35º F. Visibility was reported to be poor due to the wind-driven rain.

THE ACCIDENT

When the Signal Maintainer arrived at the pre-arranged meeting point, the Trainee was not there. The Signal Maintainer radioed the Block Operator in Hudson Tower to ask if he had seen the Trainee. The Block Operator informed the Signal Maintainer that he had not spoken with or seen the Trainee recently. The Signal Maintainer then walked approximately one-half mile eastward to his vehicle at Hudson Tower and drove to where the company truck was still parked. Not finding the Trainee at the truck, he climbed up the embankment and discovered the body of the Trainee lying on the north rail of Track No. 1. He notified Hudson Tower at 9:15 p.m., and emergency responders were summoned.

The Feb. 4, 1998 autopsy report completed by the New Jersey Medical Examiner indicated the cause of death as "Multiple Fractures and Internal Injuries" and the manner of death as "Accidental."

POST-ACCIDENT INVESTIGATION

Evidence at the scene indicated that the Trainee was struck by a fast moving train traveling eastbound on Track No. 2. The impact propelled the body approximately 100 feet to the southeast. A broken flashlight, work gloves, knit cap, and hard hat were found at the scene at various locations between the estimated point of impact on Track No. 2 and the location where the body was found on Track No. 1.

The investigation did not identify any witnesses to the accident. Crew members of trains operating through the area during the approximate time of the accident reported nothing unusual. The Engineer of one eastbound train reported seeing the Signal Maintainer at the west end of Hudson Interlocking at approximately 8:46 p.m. He did not report seeing the Trainee. Inspection of equipment operating eastbound during the approximate time of the accident revealed nothing to indicate which train may have struck the Trainee. Crew members on PATH trains were solicited for information, but no unusual observations were reported.

The question of compliance with Roadway Worker Protection (RWP) requirements while performing work in an interlocking were studied. The Maintainer stated that they had completed a job briefing in the company vehicle prior to entering the track area. However, there was no written evidence, and none was required, to support this briefing. In addition, the Maintainer and Trainee did not establish on-track protection while work was being performed in the interlocking.

The investigation revealed that four trains traveled eastbound on Track No. 2 between the hours of 8:18 p.m. (the approximate time the Maintainer and Trainee parted company) and 8:46 p.m. The 8:46 p.m. time was used as a cutoff because the Engineer reported seeing the Maintainer at the west end of the interlocking, but indicated he did not see the Trainee. It appears that the Trainee had already been struck by this time. In addition, the Maintainer stated that the Trainee had no work to perform other than going to the truck. Therefore, considering the weather conditions, it was extremely improbable that the Trainee would stay on the tracks any longer than absolutely necessary. Therefore, since the Maintainer and Trainee parted company at approximately 8:18 p.m., it was believed that the Trainee was struck shortly thereafter by an eastbound train. This conclusion was based on the physical evidence discovered at the scene. The Trainee's broken flashlight was found in the gage of Track No. 1 directly across from the location on Track No. 2 where it appears he was struck. His body was propelled in a southeasterly direction until landing on the north rail of Track No. 1. Work gloves, knit cap, hard hat, and work boots were all found at the scene, indicating the direction of travel. The Trainee was also wearing a reflectorized vest for visibility. N.J. Transit and Amtrak officials held eastbound trains in Penn Station to inspect them for physical evidence to determine which train had struck the Trainee. Due to the rainy weather conditions, there was no evidence found on the rolling stock. Statements were taken from the Engineers and crew members of trains that had passed Hudson Interlocking at the approximate time of the accident. There were no exceptions taken by anyone, and no one reported seeing the Trainee. Eastbound PATH train crew members were solicited for information, but nothing unusual was reported. Investigators concluded that the Maintainer was the last person to see the Trainee alive and also the person to find the body about one hour later.

Extenuating circumstances may have contributed to the fatal injuries suffered by the Signal Trainee. Visibility was poor due to the weather conditions. Also, looking west from the site of the accident, there were many bright external lights that could have been mistaken for a train headlight. Additionally, the Trainee had only five months service time on the railroad, four of which was spent at Penn Station, New York, where the track speed was approximately 10 miles per hour. He had been working on the main line for three weeks at the time of the accident; the track speed through Hudson Interlocking was 70 mph. The Trainee had completed RWP and other safety-related classes at the time he was hired in September 1997, which qualified him as a Watchman following just 60 days on the job. However, his inexperience with high speed trains and lack of training on the physical characteristics of track at his new location were severe safety impediments.

FRA Post-Accident Toxicological Tests were performed on the Trainee. The results were negative.

APPLICABLE RULES

Amtrak Safety Rules

Safety Rule 4127 of Amtrak's "Safety Rules and Instructions" for Maintenance-of-Way Employees stipulates procedures for walking on tracks and clearing the tracks for approaching trains.

Federal Regulation

49 CFR §214.313

Responsibility of Individual Roadway Workers.

(a) Each roadway worker is responsible for following the on-track safety rules of the railroad upon which the roadway worker is located.

(b) A roadway worker shall not foul a track except when necessary for the performance of duty.

(c) Each roadway worker is responsible to ascertain that on-track safety is being provided before fouling a track.

(d) Each roadway worker may refuse any directive to violate an on-track safety rule, and shall inform the employer in accordance with §214.311 whenever the roadway worker makes a good faith determination that on-track safety provisions to be applied at the job location do not comply with the rules of the operating railroad.

FE-05-98 (document link)

SUMMARY FOR FE-05-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Belt Railway Company of Chicago
Location: Bedford Park, Illinois
Region: Region 4

Month: February
Date: 02/04/98
Time: 5:33 p.m., CST

Data for Fatally Injured Employee(s)

Conductor
42 years old
23 years of service
Last rules training: November 1997
Last safety training: November 1997
Last physical: October 1991

Data for Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Job 1424
Engineer
Conductor
Switchman

East Yardmaster
Hump Yardmaster

Activity: Switching

SUMMARY FOR FE-05-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Conductor was fatally injured when struck by a single car cut while switching.

PCF No. 1

At the time of the incident, the fatally injured Conductor was fouling the track almost an hour after the Yardmaster had put it back into service. In fact, the Conductor previously had indicated to the Yardmaster that he could put the track back into service.

PCF No. 2

The incident occurred shortly after sunset, so visibility could have been a factor. Although artificial lighting on three towers illuminated all of the retarders in the yard, glare and shadows were also present at the accident site.

REPORT:	FE-05-98	
RAILROAD:	Belt Railway Company of Chicago (BRC)	
LOCATION:	Bedford Park, Illinois	
DATE & TIME:	Feb. 4, 1998, 5:33 p.m. CST	
PROBABLE CAUSE:	The Conductor was fatally injured when struck by a single car cut while he fouled Track 11 almost an hour after the Yardmaster had put Track 11 back into service, with his knowledge.	
EMPLOYEE:	Occupation:	Conductor
	Age:	42 Years
	Length of Service:	23 Years
	Last Rules Training:	Nov. 24, 1997
	Last Safety Training:	Nov. 24, 1997
	Last Physical Examination:	Oct. 14, 1991

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On the day of the accident, a yard crew went on duty at 2:30 p.m. at the East Yard office, in the Belt Railway Company of Chicago's (BRC) Clearing Yard in Bedford Park, Illinois. The crew, assigned Job 1424, comprised an Engineer, Conductor, and Switchman. The Job 1424 crew was assigned locomotives BRC 500 and 515, with the BRC 500 leading and facing east. All of the crew members had completed their statutory off-duty periods. The accident occurred in the East Classification Yard.

Clearing Yard was a double hump facility extending eastward and westward, where hump operations could be conducted simultaneously. The East Yard comprised departure, receiving, and classification yards.

The East Classification Yard had 56 tracks. From the north were Tracks Nos. 23 to 0 and 31 to 63. There were no Tracks Nos. 24 to 30 or Track No. 49. Lead tracks at the northeast end of the East Classification Yard extended respectively from the northwest to the southeast. On the southeast end of the yard, lead tracks extended from the southwest to the northeast. The west end of the yard was the bowl area of the eastward hump. The yard grade was descending from

west to east. The west end of the East Classification Yard was artificially lighted from three towers. There was one light tower at the east end of the yard situated between the East Classification Yard and the East Departure Yard. There were inert retarders on the classification tracks near the east end of the yard. The track centers at the point of impact were 13 feet, as were most of the track centers in the East Classification Yard.

The East Yardmaster first assigned to the Job 1424 crew the task of coupling the cars on Track No. 38 in the East Classification Yard and pulling them to the East Departure Yard.

Next, the Job 1424 crew was instructed by the East Yardmaster to couple the cars in the East Classification Yard Tracks Nos. 7, 11, and 9 and pull them to the East Departure Yard. At 4:34 p.m., the Conductor gave the Engineer of Job 1424 permission to proceed eastward to the departure yard with the cars from Tracks Nos. 7, 11, and 9. At 4:37 p.m., the Conductor told the East Yardmaster he was done with Track No. 11, and this was repeated by the Yardmaster. Hump computer records show Track No. 11 was returned to service at 4:43 p.m. After completing these tasks, the Conductor returned to the East Yard office for a break.

While at the yard office, the Conductor of Job 1424 received instructions from the East Yardmaster to couple the cars on Tracks Nos. 15, 17, and 12 in the East Classification Yard. The Job 1424 crew would then shove these cars west on the Track No. 1 approach in the East Receiving Yard where they would be humped westward at a later time. The Yardmaster told the Conductor that the Hump Yardmaster had taken Tracks Nos. 15 and 17 out of service at the hump end. The Job 1424 crew would have to call for permission to enter Track No. 12. When the Switchman returned to the yard office, the Conductor relayed the Yardmaster's instructions to him.

At approximately 5:05 p.m., the Conductor walked west toward Track No. 15 from the yard office, and the Switchman returned to the locomotive. At approximately 5:15 p.m., work began on Track No. 15 with the Conductor performing the ground work from east to west. At 5:22 p.m., the Conductor told the Engineer to pull the cars on Track No. 15 up to the east end of the track, and that Track No. 17 was next.

After coupling the cars on Track No. 15, working east to west, the Conductor was close to the west end of Track No. 15. At 5:26 p.m., the Job 1424 crew started coupling the cars on Track No. 17. The Conductor was executing the ground work, moving west to east. At 5:28 p.m., the Conductor told the Engineer to pull the cars on Track No. 17 to the east end.

At 5:29 p.m., the East Yardmaster called the Conductor and told him Track No. 12 was "out," which meant the Hump Yardmaster had taken it out of service. This transmission was acknowledged by the Conductor.

The locomotive pulled the cars on Track No. 17 to the east end of the track and proceeded to Track No. 12. The cars on Track No. 12 were intended to be the easternmost cut of cars of the three tracks, Nos. 15, 17, and 12, to be shoved west to be humped again. It was necessary to set the

air in the easternmost eight to10 cars of Track No. 12, as these would be the east end of the cut. The west end of the cut would be on an ascending grade when shoved westward and left to be humped.

According to the Engineer, the Conductor walked around the eastern end of the yard toward Track No. 12, where there were 26 cars. After reaching Track No. 12, he proceeded west on the south side of the track past some locations where the Switchman could make the hoses when the locomotive arrived on Track No. 12. The Conductor started making hoses approximately five cars from the east end.

The locomotive was brought onto Track No. 12 in a westward direction with the Switchman riding the west end of the locomotive on the south side and the Engineer in his seat on the south side and facing westward. The Switchman coupled the locomotive to the east car on Track No. 12 and connected the air hoses, but did not cut in the air. The Switchman proceeded along the south side of Track No. 12 and connected the hoses between the first and second car and also the second and third car. He proceeded to the location between the third and fourth car and found these hoses already connected.

While the Switchman was at this location, the Conductor called him on the radio and said "I think I got all the hoses after that next one, [Switchman's last name]." The Switchman believed this meant the Conductor knew where he was and had knowledge of the rest of the hose connections. The Switchman believed the Conductor was telling him to return to the locomotive. He proceeded back to the locomotive to cut in the air.

Because the pressure in the brake line would not build up, the Engineer and Switchman thought they possibly had an open air line. The Switchman walked westward along the south side of Track No. 12 to look for the problem as the Engineer tried to contact the Conductor by radio. The Engineer attempted to contact the Conductor six times in the next four minutes, but received no response.

Sunset the day of the accident was at 5:10 p.m. An FRA MP&E inspector was in Clearing Yard at the time of the accident. He stated the skies were clear and visibility was good with a temperature of about 35º F.

THE ACCIDENT

The Switchman worked his way west, making hose connections. Finding a broken air line on the east end of the tenth car on Track No. 12, he closed the angle cock. He then continued westward, looking for the Conductor. At a gap between the 16th and 17th cars, the Switchman crossed over to the north side of Track No. 12 and continued to walk west looking for the Conductor.

Another BRC Switchman heard the calls on the radio for the Conductor of Job 1424 and met the Switchman at the west end of Track No. 12. They agreed to walk back eastward alongside Track No. 12 with the Switchman on the north side and the second Switchman on the south side. When the second Switchman reached the east end, he asked the Engineer of Job 1424 what track they had come from and proceeded to Track No. 17 to look for the Conductor.

When the Switchman reached the east end of Track No. 12, he returned along the south side of Track No. 12 in a westward direction, but was looking south at Track No. 11. At 6:01 p.m., the Switchman found the Conductor's radio next to the gage side of the south rail of Track No. 11 and conveyed this information over his radio. Shortly after he found the radio, the Switchman found the body of the

Conductor under the west truck of the third car from the east end of Track No. 11, ATSF 524968. The Switchman said over the radio he had found the Conductor. The Engineer then initiated a call for an ambulance.

The Bedford Park, Illinois Fire and Police Departments responded to the accident scene. Their records show that a 911 call, initiated by the East Yardmaster, was received at 6 p.m.

Emergency personnel arrived on the scene and found the Conductor face down in a fetal position between the rails of Track No. 11 with his head toward the north. The Conductor's left leg had been severed, and when they turned over the body, emergency personnel found massive damage to the chest area.

The Conductor was pronounced dead at 6:31 p.m., and his body was transferred to the Cook County Medical Examiner's Office.

POST-ACCIDENT INVESTIGATION

Post-accident inspection of the cars on Track No. 11 was conducted by the BRC. No deficiencies were noted which could have caused or contributed to the accident. The BRC also conducted post-accident testing on locomotives BRC 500 & 515, which were assigned to Job 1424, with no deficiencies noted.

A track inspection of Tracks Nos. 11 and 12 was conducted by an FRA Track Safety Inspector on Feb. 9, 1998, after the cars had been removed. No deficiencies which could have contributed to or caused the accident were noted. Track No. 11 was constructed of wood crossties, continuous welded rail, and various types of ballast.

Inspection of UTLX 640477, the east car on Track No. 11, revealed blood and body parts on the second wheel of the east truck on the south side. This car had cleared the crest of the hump at 5:28 p.m. and was a single car cut. The next cut onto Track No. 11, a 2-car cut, CP 318365 and ATSF 524968, cleared the crest at 5:30 p.m.

Computer records showed that UTLX 640477 departed the group retarder at 8.76 mph, 1.72 mph below the computer requested speed. On Feb. 12, 1998, an FRA Track Safety Inspector monitored the speed of cars humped into the East Classification Yard, and compared this data with the hump computer information. No exceptions were noted.

An interview with the Engineer of Job 1424 revealed that he had seen the Conductor walk around the eastern end of Track No. 15 toward Track No. 12 when the locomotives were proceeding eastward to transfer onto Track No. 12. This was the only interview which supplied information about how the Conductor got from Track No. 17 to Track No. 11.

The radio transcript also showed the last transmission of the Conductor as "I think I got all of the hoses after that next one, [Switchman's last name]." The last word was garbled and may have been uttered when the Conductor was struck by the tank car. By saying he had gotten all the hoses except for the hoses the Switchman had made, the Conductor implied he may have walked by some, leaving them for the Switchman.

The Conductor then proceeded west where he connected some hoses and would be in place to see the progress of the Switchman. After viewing the progress of the Switchman, the Conductor could walk west to connect the final hoses and find the first location where coupling was necessary. The Switchman would be walking east towards the locomotive to open the angle cock to allow air to be set in the cars where the air hoses had been connected.

The Conductor was not wearing a hat or hood which could have obstructed visibility.

FRA toxicological testing was performed on the Conductor, Engineer, and Switchman assigned to Job 1424. The tests were all negative.

APPLICABLE RULES

General Code of Operating Rules

Third Edition
Effective--April 10,1994

1.20 Alert to train Movement (in part)

Employees must expect the movement of trains, engines, cars, or other movable equipment at any time, on any track, and in either direction.

Employees must not stand on the track in front of an approaching engine, car, or other moving equipment.

Belt Railway Company of Chicago
Safety Rules

106. Employees working or walking on or about the tracks must be alert, watchful and keep out of danger, exercising care to avoid injury to themselves and others.

109. Do not walk on the track or foul of the track when practicable to walk elsewhere.

FE-06-98 (document link)

SUMMARY FOR FE-06-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Burlington Northern Santa Fe Corporation
Location: Wright, Wyoming
Region: Region 8

Month: February
Date: 02/18/98
Time: 6:40 a.m., MST

Data for Fatally Injured Employee(s)

Engineer
41 years old
17 years of service
Last rules training: February 1997
Last safety training: June 1997

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Engineer
Conductor
Van Driver (contract carrier: Powder River Transportation)
BNSF Operator in Gillette

Activity: Crew Transport

SUMMARY FOR FE-06-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Engineer was fatally injured after being ejected from a contracted passenger van which then rolled over him during a highway accident.

PCF No. 1

The van had encountered a section of black ice as the Van Driver was ascending a hill.

PCF No. 2

The Van Driver was driving 55 mph, an "unsafe speed for conditions" according to the Wyoming Highway Patrol. A post-accident inspection revealed that the cruise control switch was in the "On" position.

PCF No. 3

The Engineer was the only occupant of the vehicle who was not wearing his seatbelt at the time of the accident. Shortly after departing the work site, the Engineer had unbuckled his seat belt, and had moved to the rear seat to lie down. This was in non-compliance with the railroad's safety rules.

REPORT:	FE-06-98	
RAILROAD:	Burlington Northern Santa Fe Corporation (BNSF)	
LOCATION:	Wright, Wyoming	
DATE & TIME:	Feb. 18, 1998, 6:40 a.m. MST	
PROBABLE CAUSE:	The Engineer was ejected from the motor vehicle during a highway accident.	
EMPLOYEE:	Occupation:	Engineer
	Age:	41 Years
	Length of Service:	17 Years
	Last Rules Training:	Feb. 6, 1997
	Last Safety Training:	June 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

Following completion of a required off-duty period, the Engineer went on duty at 9:45 p.m., on February 17, at the yard office in Guernsey, Wyoming. The Engineer was assigned as part of a 2-person train crew comprising an Engineer and a Conductor. The crew was called to operate an empty coal train, Symbol E-MLTBTM0-40, from Guernsey to Black Thunder Mine, a distance of 186 miles. The Engineer, as observed by fellow employees, appeared to be fit for duty.

The train departed Guernsey Yard at 12:50 a.m. and the trip was uneventful until the crew reached Converse Junction, Wyoming, whereupon the crew was relieved by another train crew. The crew was to be transported via highway van to Gillette, Wyoming, a distance of approximately 75 miles. The van departed Converse Junction at approximately 5:45 a.m.

The crew was being transported in a 1995 Dodge Ram 3500, a full size, 11-passenger van owned by a contract carrier (Powder River Transportation). Upon leaving Converse Junction, the Driver was seated in the Driver's seat, the Conductor was seated in the front passenger seat, and the Engineer was seated in the first of three rows of bench seats. All occupants were wearing seat belts at that time. However, shortly after departing Converse Junction, the Engineer unbuckled his seat belt, and moved to the rear seat to lie down.

At the time of the accident, it was dawn, cloudy and 27º F.

THE ACCIDENT

At approximately 6:40 a.m., the Van Driver turned north onto Wyoming State Highway 59 and accelerated to 55 mph. At highway milepost 73.6, one mile south of Wright, Wyoming, the van encountered a section of "black ice" as it was ascending a hill. The van spun counter clockwise approximately 120 degrees and crossed the southbound lane of traffic onto the shoulder of the road, then rolled four times down the roadbed embankment and across a ditch, coming to rest on its wheels.

The Conductor tried to open his door, but it was jammed. He crawled through the van to the back door where he exited through a broken window because the back door was also jammed. He found the Engineer lying face down in the ditch. He examined the Engineer and found no pulse and noticed that the Engineer was not breathing. He immediately returned to the van, retrieved his railroad radio and notified the BNSF Operator in Gillette of the accident and requested an ambulance.

According to the Sheriffs' Department dispatch log, the ambulance arrived at 6:51 a.m., five minutes after the call was received. EMS personnel immediately attended to the Engineer by performing CPR. At 8:31 a.m., the Coroner arrived at the scene and pronounced the Engineer dead.

The Van Driver and the Conductor were transported via ambulance to Campbell County Memorial Hospital in Gillette. The Conductor was treated for bruises and a laceration over his left eye, which required stitches, and then was released. The Van Driver required a 3-day hospital stay for observation of his injuries.

POST-ACCIDENT INVESTIGATION

Investigation of the accident site revealed the van had rolled four times. This was based on gouge marks created in the dirt by the wheel hubs from the deflated tires. According to markings on the van, after the Engineer's body was ejected through the Driver's side passenger window, the van rolled over him.

According to the death certificate, the cause of death was massive head and chest injuries.

Inspection of the maintenance records for the van revealed the van had received regular maintenance and repairs. At the time of the accident, the van had accumulated 324,475 miles.

An inspection of the van revealed the tires were slightly worn, but tire tread depths all exceeded the minimum state requirements. The cruise control switch was in the "On" position. However, the Driver stated he was not using the cruise control at the time.

The seat belts in the rear bench seats were noted as not being used. This information was confirmed by investigating officers first on the scene. All seat belts in the van were tested and appeared to be working properly.

Although the Driver did not come under the U.S. DOT hours of duty regulations (Title 49 Code of Federal Regulations Part 395), a Driver's hours of duty record was maintained and carried on the vehicle. According to the record, the Driver had just returned from two rest days and had marked up on the Driver's board, making himself available for duty at 6 a.m. on February 17. He did not go on duty until 5:15 p.m. that same day. During his tour of duty that night and up to the time of the accident, he had accumulated 5 ¼ hours actual driving time during a 13 ¾-hour, on-duty period. Even though not covered by DOT regulations, his on-duty time would have been within the regulation's limitations of 10 hours driving time in a 15-hour, on-duty period. The hours of duty record was not signed and no driver's name was entered on the document.

Weather conditions at the time of the accident were favorable for ice to develop on the roads. The temperature was 27º F, barometric pressure was 29.82 inches and falling, dew point was 26º F, humidity was 96%, and the wind was only 1 mph. The Conductor reported there was a light fog just beginning to burn off and the road was glistening.

According to the accident report submitted by the Wyoming Highway Patrol, in the officer's opinion, "unsafe speed for conditions" was listed as the most apparent human contributing factor.

FRA's post-accident toxicological testing of the deceased was not performed. This accident did not meet 49 CFR Subpart C's post-accident toxicological testing criteria.

APPLICABLE RULES

Burlington Northern Santa Fe Safety Rules and General Responsibilities for All Employees Effective January 31, 1996

50.4.9 Wear seat belts while operating or riding in equipment or vehicles that are equipped with them.

FE-09-98 **(document link)**

SUMMARY FOR FE-09-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: CSX Transportation, Inc.
Location: Cartersville, Georgia
Region: Region 3

Month: March
Date: 03/03/98
Time: 4:15 p.m., EST

Data for Fatally Injured Employee(s)

Bridgeman
57 years old
26 years of service
Last rules training: January 1998
Last safety training: January 1998
Last physical: August 1996

Data for All Employees (Craft, Positions, Activity)

Craft: MOW

Positions:

Bridge Gang 6A66
Foreman
Crane Operator
Truck Driver
Machine Operator
Two Bridgemen

Train Dispatcher

Activity: Removing driftwood from a creek.

SUMMARY FOR FE-09-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Bridgeman was fatally injured when struck by a tree limb that had become entangled in a crane boom.

PCF No. 1

At the time of the incident, the Bridgeman was riding on the outside of the crane, in non-compliance with a railroad operating rule prohibiting extension or suspension of any part of the body beyond the sides of on-track equipment in such a way as to expose oneself to injury.

Background: At the completion of the gang's work, removing driftwood from a creek, the Crane Operator was unable to lower the crane boom. A decision was made to take the crane back to the highway-rail grade crossing where the gang truck was waiting. On the way through a heavily wooded area, a portion of an overhanging tree limb became entangled in the crane's raised boom. When the Crane Operator continued north, the resulting tension caused the limb to break and strike the Bridgeman.

PCF No. 2

In non-compliance with the railroad's operating and safety rules, the Crane Operator transported unseated and unauthorized passengers. The truck driver left his truck on the shoulder of the highway and gained access to the trestle on foot. The rest of the gang (which was transported by the Crane Operator) could have done the same.

PCF. No. 3

The post-accident investigation disclosed that the clutch on the crane had burned out, which prevented it from being lowered.

REPORT:	FE-09-98	
RAILROAD:	CSX Transportation Inc.	
LOCATION:	Cartersville, Georgia	
DATE, TIME:	March 3, 1998, 4:15 p.m., EST	
PROBABLE CAUSE:	The Bridgeman was struck on the head by a tree limb that had become entangled in the crane boom while he was riding on the outside of a crane during a reverse move.	
EMPLOYEE:	Occupation:	Bridgeman
	Age:	57 Years
	Length of Service:	26 Years
	Last Rules Training:	Jan. 19, 1998
	Last Safety Training:	Jan. 19, 1998
	Last Physical Examination:	Aug. 6, 1996

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On March 3, 1998, CSX Transportation's (CSX) Bridge Gang 6A66 went on duty at 7 a.m. in Cartersville, Georgia. The bridge gang comprised a Foreman and five men. After a job briefing, the gang proceeded to a highway-rail grade crossing located at milepost (MP) SGC 636.9 on the Cartersville Subdivision. The Cartersville Subdivision is part of the CSX Atlanta Service Lane with the trackage extending 39.5 miles from Cartersville, Georgia MP SGC641.3 to the end of track at MP SG 635.2 near Cedartown, Georgia.

After arriving at the crossing, the gang placed a Little Giant Crane (equipped with hi-rail) on the track. The crane was facing south. Authority to occupy the track was made under the protection of a 707 Conditional Stop Order issued by the Train Dispatcher. This order was in effect from 0800 to 1700 hours between MP SGC 633.3 and MP SGC 636.9 and was issued to the Foreman, who was the Employee-in-Charge of the gang. One employee was detailed to drive the gang's truck to a private crossing located at MP 633.9. The remaining members of the bridge gang mounted the crane and proceeded south to a trestle at MP SGC 634.0, where their day's work was to remove driftwood from a creek.

At the completion of their work, the Crane Operator was unable to lower the crane boom. A decision was made to take the crane back to the highway-rail grade crossing. The Driver of the gang truck was detailed to take down the Conditional Stop Order boards and return to the

crossing. The Foreman instructed the remainder of the gang to mount the crane for the return trip to the crossing. As the crane faced south, the driver's cab was at the left front and was unoccupied. The Crane Operator's cab was at the left rear and occupied by the Crane Operator. The Foreman stood on the left (east) side in front of the Crane Operator's cab. The Bridgeman, who was subsequently injured, stood on the left (east) side behind the Truck Driver's cab. A Machine Operator stood on the left (east) side between these two men. The remaining Bridgeman stood on the right (west) side of the crane.

The crane proceeded slowly north at approximately 5 mph through terrain that was heavily wooded with branches hanging over the track. To the east, the land rose steeply. To the west, the terrain sloped down to a river.

THE ACCIDENT

At about 4:15 p.m., while proceeding northward, a portion of an overhanging tree limb became entangled in the crane's raised boom near MP SGC 634.4. As the crane continued north, it forced tension on the limb until it broke, whereupon it swung down in a counter clockwise direction. The Crane Operator shouted a warning. The Bridgeman behind the truck cab was struck on the right side of his head by the limb and knocked to the ground. Other crew members then placed him on the crane and took him by rail to the power plant, 1.1 miles south, where an ambulance met them and transported the employee to Floyd Medical Center in Rome, Georgia. The Bridgeman died at 10:25 p.m., due to multiple skull fractures and a hemorrhagic contusion within the brain.

POST-ACCIDENT INVESTIGATION

The post-accident investigation disclosed that the clutch on the crane had burned out, which prevented the boom from being lowered.

There were no unusual track, ballast, or ground conditions in the accident area. The right-of-way had been recently cleared by a brush cutter. There were overhead branches, but they were high enough that they did not interfere with the normal passage of trains. At the time of the incident, the employee was wearing the safety equipment issued to him by the carrier including hard hat, safety glasses, and work gloves.

A re-enactment of the incident was made at the scene. The crane was returned to the scene and positioned at the point of the incident, and the boom was raised to the same height and angle, as confirmed by the bridge gang. The boom was 41 plus or minus degrees in angle with the horizontal. The tip of the boom was 29 feet above the top of the rail.

The investigators measured the top of the rail to the top of the truck cab and found it to be 109 inches. They recorded a measurement of 30 3/4 inches from the top of the rail to the step on which the fatally injured Bridgeman had stood. The rear view mirror on the left side of the truck cab was in place and undisturbed. There were no scratches on the left side of the truck cab.

Each crew member assumed the position that he was in at the time of the incident. Another individual assumed the position of the fatally injured Bridgeman. All were standing except the Crane Operator, who was seated in his cab.

Two pieces of the same branch were identified as parts of the branch that had struck the fatally injured Bridgeman. The pieces were laying on the east side, 54 inches from the field side of the east rail. These two pieces, including the bushy end of the branch, measured a total of 247 inches. The large end of the entire branch had a diameter of five inches and was 39 inches long.

From the re-enactment, investigators concluded that the fatally injured Bridgeman would have had to be leaning out away from the crane to be struck by the branch.

The bridge gang's truck had been parked near MP SGC 633.9, the location of a private road crossing. Cables across the road prevented vehicles from entering. The truck driver left his truck on the shoulder of the highway and gained access to the trestle on foot. The entire gang, except for the Crane Operator, could have gained ingress and egress by this same route.

APPLICABLE RULES

CSX Safe Way
Effective May 1, 1997

E/M - 13

d. Transport passengers only in designated, permanently installed seats.

CSX Operating Rule Book
Effective May 1, 1997

719 On-track equipment ... Employees in charge must:
1. Ascertain that the occupants are properly seated.

CSX Operating Rule Book
Effective May 1, 1998

2403 Operators are responsible for seeing that unauthorized persons are not carried on equipment and must know that persons authorized to be on equipment are properly positioned before movement is made. Getting on or off equipment in motion is forbidden. Only those whose duties require it will be permitted to ride on machines or equipment. Riders must not occupy an unsafe position, nor extend or suspend any part of their body beyond the sides of the machine in such a way as to expose themselves to injury.

FE-10-98 **(document link)**

SUMMARY FOR FE-10-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Long Island Railroad
Location: Queens, New York
Region: Region 1

Month: March
Date: 03/11/98
Time: 7:40 p.m., EST

Data for Fatally Injured Employee(s)

Machinist
30 years old
87 days of service
Last safety training: daily
Last physical: November 1997

Data for all Employees (Craft, Positions, Activity)

Craft: MOE

Positions:

Off-duty Machinist

Train No. 4715
Engineer
Conductor
Brakeman

Train No. 774
Conductor

Activity: **Heading home, the Machinist took the wrong train. He de-boarded the train and was walking back to Hollis Station.**

SUMMARY FOR FE-10-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Machinist was struck by a westbound train and fatally injured.

PCF No. 1

The incident occurred when the Machinist failed to remain clear of the mainline track.

PCF No. 2

Having completed his assigned shift plus five overtime hours, the Machinist was possibly fatigued and not alert to danger on the tracks.

PCF No. 3

The Machinist was inexperienced, having completed only 87 days of service. However, he had attended on-track safety training for mechanical department employees and had received daily safety training.

PCF No. 4

It was dark when the Machinist was walking along four heavily traveled, parallel mainline tracks. Also, his vision was obstructed by another westbound train slightly ahead on an adjacent track.

REPORT:	FE-10-98	
RAILROAD:	Long Island Rail Road (LIRR)	
LOCATION:	Queens, New York	
DATE, TIME:	March 11, 1998 7:40 p.m., EST	
PROBABLE CAUSE:	Failure to remain clear of mainline track	
EMPLOYEE:	Occupation:	Machinist
	Age:	30 Years
	Length of Service:	87 Days
	Last Safety Training:	Daily
	Last Physical Examination:	Nov. 18, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On March 11, 1998, at approximately 7:40 p.m., an off-duty Long Island Railroad (LIRR) Machinist was fatally injured when he was struck by a westbound LIRR train. The accident occurred on Track No. 3 near milepost 11.6 of the railroad's mainline just west of Hollis Station in Queens, New York. At this location, the railroad comprised four heavily-used mainline tracks numbered from north to south: 3, 1, 2, and 4. The railroad was geographically oriented east and west, corresponding to timetable directions. The current of traffic on Tracks Nos. 3 and 1 was predominately westbound, and the current of traffic on Tracks Nos. 2 and 4 was predominately eastbound. The maximum authorized speed for passenger trains operating on Track No. 3 was 80 mph. The method of operation over this portion of the railroad is governed by the LIRR's Operating Rules and controlled by an automatic block signal system (ABS) and automatic speed control system (ASC).

On the day of the accident , the LIRR machinist reported for his 6 a.m. to 2 p.m. shift at the railroad's Hillside Maintenance Complex in Queens, NY. After completing his assigned shift, he continued working overtime until 7:20 p.m. (five hours). He then proceeded to Hillside Station (employee's platform) to catch a train home. He mistakenly boarded the wrong train (Train No. 774) home. After being informed by a crew member of this, he got off the train at the next scheduled stop. After getting off the train at Hollis Station, he crossed from the south side platform to the north side platform and began walking westward along the railroad right-of-way back to Hillside Station. The tracks in the area were tangent, and the grade was level. The time was approximately 7:40 p.m.

On the day of the accident, the 3-person crew (Engineer, Conductor and Brakeman) of LIRR Train No. 4715 reported for duty at Jamaica Station at 3:43 p.m. The crew was assigned to take a non-revenue train to West Side Yard at Penn Station, NY.

After arriving at Penn Station, the crew was assigned to operate express Train No. 1732 eastbound to Huntington, NY and return the same equipment to Penn Station as Train No. 4715. Train No. 4715, consisting of 12 (MU-1, electric) passenger cars departed Huntington Station westbound at 7:05 p.m., en route to Penn Station. The Engineer was seated at the controls in the control cab of the lead MU (9497). The Conductor was standing next to the Engineer's control cab door, facing forward. The train was operating on Track No. 3 and had just passed Hollis Station approaching the 190th Street bridge at 60 mph with the headlight on.

It was dark, and weather conditions were clear with light winds. The temperature was approximately 30º F.

THE ACCIDENT

The Engineer and Conductor both observed an individual running westward along the north side of Track No. 3. The Engineer activated the emergency brakes and sounded the horn. The Conductor noticed another train (symbol unknown) ahead of them on the adjacent track (Track No. 1), traveling in the same direction (west). The front of the other train had passed the individual's location when the Conductor first noticed him. The individual was struck by the right front of the lead MU (9497). The trailing unit of the train came to a halt approximately 200 feet west of the point of impact. The Conductor walked back to the point of impact and awaited the arrival of emergency response personnel. The individual was pronounced dead at the scene, and the remains were removed to the Queens mortuary at 10:30 p.m.

POST-ACCIDENT INVESTIGATION

Written witness statements of the Engineer and Conductor of Train No. 4715 were obtained by the LIRR Police Department. Interviews with the Conductor on Train No. 774 were conducted by the LIRR Police Department. The Engineer of Train No. 4715 took no exception to the condition of the equipment he was operating. The brakes, lights, and horn functioned as intended. The railroad's mechanical department personnel conducted post-accident inspections of the equipment and conducted tests of the train brakes. No exceptions were noted.

FRA reviewed LIRR's training records for employees and specifically the training received regarding on-track safety. The railroad's Safety Department conducted on-track safety training for mechanical department employees. Training records indicate that the employee had attended the training.

The Queens County Medical Examiner indicated the cause of death as "Severe Blunt Injury Trauma." The Medical Examiner's report indicated the manner of death as "accidental."

APPLICABLE RULES

LIRR Safety Rule No. 4060

"Walking on, or even being on railroad tracks, except in the direct line of duty, is prohibited. If duty makes it necessary to be on the tracks, a sharp lookout must be kept for trains approaching in either direction (at any time), even on double track. Movements may be made in either direction. Walk beside the track, clear of engines and cars, instead of on it. If it is necessary to cross railroad tracks, look in each direction, keeping a minimum of 10 feet from standing locomotives and cars. Do not pass between parts of a train or between cars standing close together without making certain that it is safe to do so."

FE-13-98 **(document link)**

SUMMARY FOR FE-13-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Union Pacific Railroad Company
Location: Small, Texas
Region: Region 5

Month: May
Date: 05/12/98
Time: 8:45 p.m. CST

Data for Fatally Injured Employee(s)

UP Freight Train MFWWC-11
Engineer
51 years old
34 years of service
Last rules training: March 1998
Last safety training: Unknown
Last physical: Unknown

Conductor
26 years old
1 year, 7 months of service
Last rules training: October 1996
Last safety training: Unknown
Last physical: September 1996

Data for all Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

UP Freight Train MFWWC-11

Engineer
Conductor

UP Freight Train LKR38-12
Engineer
Conductor
Brakeman
Contractor Van Driver

SUMMARY FOR FE-13-98 CONTINUED

SELECTED FACTORS CONTINUED

Activity: **UP's MFWWC-11 Crew was being transported by contractor van after having been relieved of duty.**

POSSIBLE CONTRIBUTING FACTORS

EVENT

An Engineer, Conductor, and Contractor Van Driver were fatally injured during a highway-rail grade crossing collision.

PCF No. 1

The incident occurred when the van, which was transporting the off-duty railroad personnel, collided with a train at a highway-rail grade crossing.

PCF No. 2

The Van Driver failed to stop at the STOP sign at the crossing. Texas law required that drivers stop no closer than 15 feet or no farther than 50 feet from the nearest rail of the railroad tracks when a STOP sign or other official traffic control device requiring a stop was present.

PCF No. 3

Visibility may have been a factor since it was dark and the grade crossing had only passive warning devices. Because adequate artificial lighting was unavailable (no street lights), the driver may not have seen the STOP sign. In addition, the investigation did not reveal whether or not the train's headlights were on at the time of the accident.

REPORT: FE-13-98

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Small, Texas

DATE & TIME: May 12, 1998, 8:45 p.m., CST

PROBABLE CAUSE: An off-duty Engineer and Conductor were being transported by a Contractor Van Driver, after having been relieved of duty, when the van collided with a train at a highway-rail grade crossing, fatally injuring all three.

EMPLOYEES:

Occupation:	Engineer	Occupation:	Conductor
Age:	51 Years	Age:	26 Years
Length of Service:	34 Years	Length of Service:	1 Year, 7 Months
Last Rules Training:	March 27, 1998	Last Rules Training:	Oct. 24, 1996
Last Safety Training:	Unknown	Last Safety Training:	Unknown
Last Physical Exam:	Unknown	Last Physical Exam:	Sept. 19, 1996

CIRCUMSTANCES PRIOR TO THE ACCIDENT

UP Freight Train MFWWC-11

A 2-person crew consisting of an Engineer and Conductor reported for duty at 9:30 a.m. on the day of the accident at Toyah, Texas to operate UP Freight Train MFWWC-11. The crew members operated their train to Small, Texas where they were instructed by signal indication to enter the siding and remain there until relieved from duty. They were instructed to remain on their train until a relief crew arrived. After a brief conversation with the crew members who were taking over control of their train, the two relieved crew members boarded the contract van and departed from Small Siding en route to El Paso, Texas.

UP Local Freight Train LKR38-12

A 3-person crew consisting of an Engineer, Conductor, and Brakeman reported for duty at 1:30 p.m. on the day of the accident at El Paso, Texas to operate UP Local Freight Train LKR38-12. Train LKR38-12 was a local freight train which provided daily service to industries on the Valentine Subdivision between El Paso and Sierra Blanca, Texas. The crew operated its train, consisting of two locomotives and six cars, to an industry track near Sierra Blanca and shoved their entire train onto it.

After changing control of the locomotives from the east unit to the west unit, the crew members proceeded with only their two locomotives to Lasca Siding where they met four trains and later continued westward. They were passing a standing train located on Small siding prior to where the collision occurred.

The single main track at the location of the collision ran east and west with a siding track beginning 700 feet east of a highway-rail grade crossing. The maximum authorized speed was 70 mph at this location. Passive warning devices at the highway-rail grade crossing comprised cross bucks and STOP signs only.

Lasca Road began north of Interstate 10 and ran north/northwest for approximately five miles. The road then made a sharp right turn and ran east approximately 150 feet from the railroad and parallel for 0.4 miles. Approximately 275 feet from the crossing, the road had a small curve to the northwest. Approximately 200 feet from the crossing, there was a cattle guard. The road continued another 35 feet from the crossing and made a sharp turn to a north/south direction, then turned to east/west about 50 feet after crossing the track.

The crossing surface was 27 feet wide and consisted of a wood plank surface. The DOT/AAR Inventory Number was 742 892A. From the south rail of the crossing, the distance to the cross buck was 59 feet. The STOP sign was 10.5 feet from the nearest point on the south rail.

At the time of the collision, weather conditions were clear with a temperature of 65° F.

THE ACCIDENT

Westward Train LKR38-12, a 2-unit light locomotive consist, was operating on the main track in partial dynamic braking at a speed of 67 mph (maximum authorized speed was 70 mph). The Engineer was sounding his whistle and the locomotive warning bell was operating when the crew members observed a passenger van approaching the Lasca Road highway-rail grade crossing at a slow rate of speed. All crew members thought the van was going to stop for the STOP sign. The van failed to stop for the sign and proceeded across the tracks in front of the train; however, the crew thought the van could still get across in time. Prior to the impending impact, the Engineer initiated full dynamic braking and leaned over beside the console to avoid injury from possible flying debris.

The van was operating west/north on Lasca Road at a speed of approximately 5 mph. It appeared that the van never attempted to stop before crossing the tracks. The van was operated by a Contract Employee of the van service, the Conductor was in the front passenger seat, and the Engineer was in the first seat behind the Driver and passenger.

The right front of the locomotive struck the right rear of the van. The side of the van separated from the top, the back of the two front seats broke off, and the Driver and Conductor were ejected through the opening of the rear side door or through the separation between the top and side of the van body. The Engineer was ejected with the seat of the van through the side door and over the van.

An Investigator from the Texas Department of Public Safety in El Paso was notified at 8:58 p.m. and arrived at the scene at 9:28 p.m. The three vehicle occupants were pronounced dead at the scene and transported to the El Paso Mortuary.

POST-ACCIDENT INVESTIGATION

The post-accident investigation did not disclose any exceptions to the condition of the highway-rail grade crossing. Also, no exceptions were taken to the locomotives involved in the collision by the Engineer or following an inspection by UP mechanical personnel in El Paso, Texas.

The van was a 1997 Dodge, owned and operated by the contracted van service. On May 12, the Driver of the van worked from 2 p.m. to 3:15 p.m. and was called on duty for this trip at 5:45 p.m. The Driver worked from 2:20 p.m. to 4:17 p.m. the day before the accident. The Driver had received Operation Lifesaver training and the contractor's training manual and course. The crew that was transported from El Paso to Small stated that the van was operating properly and took no exceptions to the actions of the Driver. The crew believed the Driver was operating safely. The Driver's side air bag deployed as intended. The radio was off and the air conditioner was on with the fan on low speed when the van was inspected after the collision. A witness to the collision stated that the tail lights illuminated on the van as it was going over the crossing. The headlights of the van were on when the two crew members of the standing train arrived at the scene.

No post-accident toxicological testing was performed on the three van occupants.

Texas Transportation Code 545.252

ALL VEHICLES TO STOP AT CERTAIN RAILROAD GRADE CROSSINGS.

107. The Texas Department of Transportation or a local authority, with respect to a highway in its jurisdiction, may:

    (1) Designate a railroad grade crossing as particularly dangerous; or
    (2) Erect a STOP sign or other official traffic-control device at the grade crossing.

108. An operator approaching a STOP sign or other official traffic-control device that requires a stop and that is erected under Subsection (a) shall stop not closer than 15 feet nor farther than 50 feet from the nearest rail of the railroad tracks and may proceed only with due care.

FE-15-98 **(document link)**

SUMMARY FOR FE-15-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Belt Railway Company of Chicago
Location: Bedford Park, Illinois
Region: Region 4

Month: May
Date: 05/26/98
Time: 7:33 a.m., CST

Data for Fatally Injured Employee(s)

Conductor
57 years old
36 years of service
Last rules training: November 1997
Last safety training: November 1997
Last physical: July 1995

Data for all Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

6:30 am Switch Crew
Engineer
Conductor
Helper

Yardmaster

Activity: Switching

SUMMARY FOR FE-15-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Conductor was struck by a 3-car cut and fatally injured during a switching operation.

PCF No. 1

The incident occurred when the Conductor failed to remain clear of moving equipment.

PCF No. 2

The crew failed to assure that standing cars were secured by setting hand brakes or blocking wheels before the Conductor attempted to adjust the coupler of another car while facing away from the 3-car cut. Consequently, he was struck from behind by the 3-car cut as it rolled toward him.

PCF No. 3

The crew did not comply with the railroad's safety rules which required that cars and engines be separated at least 50 feet and equipment be stopped before stepping between it. Based on data obtained during the re-enactment, investigators concluded that cars were separated about 20 feet prior to the incident.

REPORT:	FE-15-98	
RAILROAD:	Belt Railway Company of Chicago (BRC)	
LOCATION:	Bedford Park, Illinois	
DATE & TIME:	May 26, 1998, approx. 7:33 a.m. CST	
PROBABLE CAUSE:	The Conductor, who failed to remain clear of moving equipment, was struck by a 3-car cut and fatally injured during a switching operation.	
EMPLOYEE:	Occupation:	Conductor
	Age:	57 Years
	Length of Service:	36 Years
	Last Rules Training:	Nov. 13, 1997
	Last Safety Training:	Nov. 13, 1997
	Last Physical Examination:	July 7, 1995

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On the day of the accident, a yard crew went on duty at 6:30 a.m. at the East Yard Office, in the Belt Railway Company of Chicago's (BRC) Clearing Yard in Bedford Park, Illinois. Designated as the 6:30 a.m. Switch Crew, it comprised an Engineer, Conductor, and Helper. The switch crew was assigned locomotive BRC 525, a model SW1200 unit facing east. All of the crew members had completed their statutory, off-duty periods. The accident occurred in the East Classification Yard.

Clearing Yard was a double hump facility where hump operations were conducted in geographically east and west directions where hump operations could be conducted simultaneously. The East Yard consisted of a departure, receiving, and classification yard.

The East Classification Yard had 56 tracks. From the north, they were Tracks Nos. 23 to 0 and 31 to 63. There was no Track No. 49 or Tracks Nos. 24 to 30. Lead tracks at the end of the East Classification Yard provided access to these tracks. The west end of the East Classification Yard, the bowl area for the hump, descended from the west to the east.

The East Classification Yard was artificially lit on the west end by three light towers. On the east end, there was one light tower. The classification tracks near the east end of the yard had inert retarders. The track center where the accident occurred was 16 feet wide, as were most of the track centers in the East Classification Yard.

The first task assigned to the switch crew was to switch some incorrectly classified rehump cars from some tracks in the East Classification Yard. Next, the switch crew was instructed to couple cars on Tracks Nos. 41, 31, 33, and 0 together for an outbound train. After completing the switching of the rehumps, the crew began their next assignment of coupling cars on Tracks Nos. 41, 31, 33, and 0.

With the Conductor controlling the movements from the ground, work began on Track No. 41 where the switch crew coupled the cars and doubled to Track No. 31. When cars on Tracks Nos. 41 and 31 were coupled together, the Conductor instructed the Engineer to shove them westward into the clear.

The radio log transcript indicated that the Conductor had told the east Yardmaster that Track No. 41 was clear at 7:20 a.m., and at 7:22 a.m. had informed the crew that he was walking toward Track No. 31. At 7:22 a.m., the Helper told the Conductor that they were coming toward him on Track No. 31. The Conductor began controlling the movement by radio. The Conductor instructed the Engineer to shove the cars westward into the clear. Work was completed on Track No. 31 at about 7:28 a.m.

According to the radio log transcripts, the Conductor asked the east Yardmaster at 7:29 a.m. to let him know when Track No. 0 was out of service. At 7:29 a.m., the Conductor told the crew members that when they had shoved the cars in the clear on Track No. 31 to come to Track No. 0.

After the Engineer shoved in the clear on Track No. 31 and the locomotives were uncoupled from the cars, he proceeded to Track No. 0, stopping short of coupling to the cars. The Conductor asked the east Yardmaster about Track No. 33 and was informed that humping was still in progress. He then asked for Track No. 0. The Conductor was informed by the east Yardmaster there was one more car coming onto the track and as soon as it landed, Track No. 0 would be out of service. Hump records show that Track No. 0 was blocked at 7:28 a.m.

When the locomotive arrived, the Conductor informed them, "It looks like the [last] car [released onto Track 0] is dying; tie on and stretch." The Helper controlled the westward movement from the bottom switching step of the locomotive while making the coupling to the east car on Track No. 0. The Helper was riding on the southwest corner of the locomotive and saw the Conductor standing in the walkway on the south side of Track No. 0 adjacent to Track No. 31, about three cars west of the locomotive where he believed the first missed coupling would need to be made. After coupling to the cars and stretching them eastward about one half car length, the Conductor stopped the movement. At 7:33 a.m., the radio log transcript confirmed the Conductor telling the crew to tie on and stretch the cars. At 7:33 a.m., the Conductor said, "That will do." That was the last time the Engineer heard the Conductor on the radio. The last time the Engineer saw the Conductor was when they were making a coupling on Track No. 31 with the cars from Track No. 41.

Sunrise on the day of the accident was at 5:23 a.m. with partially cloudy skies, a slight wind, and a temperature of 8º F.

THE ACCIDENT

The Yardmaster needed to check on the progress, so he attempted to contact the Conductor on the radio and failed to do so after numerous attempts. After the Yardmaster's unsuccessful attempts, the Helper called for the Conductor on the radio numerous times, and after no response was received, started walking westward to locate the Conductor. The Helper walked westward in the walkway on the south side of Track No. 0 toward the location where he had last seen the Conductor standing when they had made the previous coupling.

Upon his arrival, the Helper found the Conductor coupled between the third and fourth cars on Track 0, west of the locomotive, and called for an ambulance. The Conductor was facing eastward, coupled about waist level, and after gasping, slumped forward over the drawbar of the eastward car.

The Bedford Park Fire and Police Departments were notified at 7:52 a.m. and responded to the accident scene immediately. Emergency personnel arriving on the scene found the Conductor's body coupled at the midriff between cars TTGX 962030 and TTGX 941112. The Conductor was slumping over the drawbar of the east car, TTGX 941112. The Conductor was pronounced dead at 8:15 a.m., and his body was transferred to the Cook County Medical Examiner's Office.

POST-ACCIDENT INVESTIGATION

Post-accident investigation of cars TTGX 962030 and TTGX 941112 was conducted by the FRA and BRC with no deficiencies noted which caused or contributed to the accident. The FRA and BRC also conducted a post-accident inspection of locomotive BRC 525, assigned to Switch Job 6:30 a.m., with no deficiencies noted.

FRA toxicological testing was performed on the Engineer and Helper of Switch Job 6:30 a.m. and the deceased Conductor. All tests were negative.

A track inspection was conducted on Track No. 0 with no deficiencies noted which contributed to or caused the accident. Track No. 0 was constructed of wood crossties, continuous welded rail, and various types of ballast.

Hump records show that car ACFX 98976, the westward car and last of the 14 cars humped onto Track No. 0, had cleared the crest at 7:26 a.m., clearing the group retarder, which was the last retarder that the car passed through at 7:27 a.m. Hump records show the speed of the car through the group retarder was 8.5 mph.

As shown by the track survey, the car had to travel a distance of 1,378.2 feet to reach the next westward car in the track. Traveling at 8.5 mph, the car would have traveled this distance in 110.6 seconds, arriving at the point of impact at 7:29 a.m. Radio log transcripts show the Conductor stating "That will do," at 7:33 a.m. The Helper's statement placed the Conductor

standing in the walkway at the same time near the location where he felt the first missed coupling was located. In that case, ACFX 98976 would have been traveling at 2.78 mph.

Radio log transcripts indicate that at 7:33 a.m., the Conductor instructed the crew to tie on and stretch the cars and that he said, "It looks like that car is dying." If car ACFX 98976 had rolled 1,378.2 feet at 2.78 mph or less, it could have impacted the cars after the Conductor stopped the movement by the crew at 7:33 a.m. and stepped between the rails of Track No. 0. The momentum of the impact would have shoved the cars in an eastward movement as the Conductor was attempting to align the couplers.

Observations at the scene and data from the track survey indicate that the front truck of car TTGX 975086, the second eastward car from the locomotive, was resting in the inert retarder and would have been holding the 14 cars on Track No. 0 to prevent any further eastward movement.

Interviews with the Engineer and Conductor and radio log transcript revealed that the Conductor had asked the crew to couple and stretch the cars. The separation of the three easternmost cars from the rest of the 11 cars, without first setting hand brakes on the standing cars, had eliminated any method of keeping the cut of cars on Track No. 0 from rolling eastward.

While an eastward movement of the cars was being accomplished, the Conductor asked for the movement to be stopped. It appears he then stepped between the rails of Track No. 0 and while facing eastward, had attempted to adjust the west coupler of TTGX 94112. He was not able to see the movement of the westward cars, and was struck from behind and coupled up by the east coupler of TTGX 962030. Based on data obtained during a re-enactment, it appears the cars were separated about 20 feet.

APPLICABLE RULES

General Code of Operating Rules
Third Edition
Effective April 10, 1994

1.20 Be Alert to Train Movement (in part)

Employees must expect the movement of trains, engines, cars, or other moveable equipment at any time, on any track, and in either direction.

Employees must not stand on the track in front of an approaching engine, car, or other moving equipment.

7.4 Precaution for Coupling or Moving Cars or Engines (in part)

Before coupling to or moving cars or engines, verify that the cars or engines are properly secured and can be coupled and moved safely.

7.6 Securing Cars or Engines (in part)

Apply a sufficient number of hand brakes to prevent movement. If hand brakes are not adequate, block the wheels.

When cars are moved from any track, apply enough hand brakes to prevent any remaining cars from moving.

Belt Railway Company of Chicago
Safety Rules

106. Employees working or walking on or about the tracks must be alert, watchful and keep out of danger, exercising care to avoid injury to themselves and others.

187. When separating equipment for any reason, make sure you separate cars and engines at least fifty (50) feet and equipment is stopped before stepping between.

FE-16-98 (document link)

SUMMARY FOR FE-16-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Burlington Northern Santa Fe Corporation
Location: Lubbock, Texas
Region: Region 5

Month: June
Date: 06/01/98
Time: 12:30 a.m., CST

Data for Fatally Injured Employee(s)

Foreman (Job 301)
24 years old
10 months of service
Last rules training: July 1997
Last safety training: July 1997
Last physical: July 1997

Data for all Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Switch Crew 201
Engineer
Foreman
Brakeman

Switch Crew 301
Engineer
Foreman
Switch Helper

Trainmaster

Activity: Switching

SUMMARY FOR FE-16-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Foreman of Crew 301 was fatally injured when crushed between the locomotive (on which he was riding point) and a railroad hopper car.

PCF No. 1

The incident occurred because the hopper car was fouling the switching lead track. The 201 crew had not properly secured standing cars on Track 0112 before continuing to pull cars from the lower yard to the upper yard. Consequently, the hopper car rolled southward, fouling the switching lead track where the 301 crew was operating.

REPORT: FE-16-98

RAILROAD: Burlington Northern Santa Fe Corporation (BNSF)

LOCATION: Lubbock, Texas

DATE & TIME: June 1, 1998; 12:30 a.m, CST

PROBABLE CAUSE: The Foreman was crushed between a locomotive and railroad hopper car that was fouling the switching lead track.

EMPLOYEE:

Occupation:	Foreman
Age:	24 Years
Length of Service:	10 Months
Last Rules Training:	July 1997
Last Safety Training:	July 1997
Last Physical:	July 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The incident occurred on the Amarillo Division, Slaton Subdivision, at milepost 674.6, in Lubbock, Texas. The BNSF Lubbock Yard comprised two yards, an upper yard and lower yard. The lower yard was south of the upper yard. The tracks within both of these yards ran geographically north and south.

YLUB201-31 (201)

Following a statutory off-duty period, a switching crew comprising an Engineer, Foreman, and Brakeman reported for duty at 2:30 p.m. on May 31, 1998 to perform local switching operations within the BNSF Lubbock yard. At approximately 6 p.m., the crew of the 201 kicked two cars independently of each other onto the north end of Track 0112 of the upper yard. There were 12 cars already on Track 0112 before the 201 crew kicked the 13th and 14th cars onto this track. Track 0112 could hold approximately 18 cars. The last car kicked onto this track was Covered Hopper No. BN 463680.

YLUB301-31 (301)

Following a statutory off-duty period, another switching crew comprising an Engineer, Foreman, and Switch Helper reported for duty at 10:30 p.m. on May 31, 1998 to perform local switching operations within the BNSF Lubbock yard. After getting their paperwork together and having a

job safety briefing, the crew members of 301 walked out of the depot to get on their locomotives which were on Track 0110. Once outside the depot, the crew members noticed a cut of cars coupled to the two locomotives they were assigned to use.

The Engineer of 301 returned to the depot to ask the Trainmaster what they were to do with these cars. He was told to place the cars in an empty track in the upper yard. The crew members decided to shove the cars southward on Track 0110 to the south end of the upper yard. They would then pull the cars northward through the south lead and onto Track 0110 of the upper yard. Afterwards, they planned to cut their locomotives away from the cars and pull out on the north lead of the upper yard. Then they would make a reverse move southward down Track 0111, which was also a clear track, and head down to the lower yard to perform their work. The Switch Helper had the taxi take him to the end of the cut of cars so he could ride the point as they shoved the cars southward down Track 0110. Once that move was completed, the Switch Helper dismounted the point and started walking toward the lower yard. He was going to be picked up by the other crew members once they had placed the cut of cars on Track 0110.

The Foreman and Engineer made the moves they had discussed earlier. Once they pulled the cars down Track 0110 and came to a stop, the Foreman uncoupled the cars from the locomotives and walked over to the Track 0111 switch and aligned it for the move they were about to make. He then walked up to the Track 0110 switch and aligned it to allow the two locomotives to come out onto the north lead of the upper yard. Once the locomotives were on the north lead, the Foreman re-aligned the Track 0110 switch to allow them to move southward on Track 0111. The Foreman stepped up on the southeast corner of the south locomotive, and they began their move southward on Track 0111. The Engineer was at the controls of the north locomotive, which was facing short hood northward.

As the two locomotives of the 301 entered the north end of Track 0111, the 201 switcher was pulling cars from the lower yard onto the upper yard.

The weather was dark, clear, and calm, with a temperature of 72º F.

THE ACCIDENT

The Engineer of the 301 heard the Foreman having a radio conversation with the 201 switcher about their location to prevent conflicting routes between the two switchers. The Engineer stated in a post-accident interview that while the Foreman was talking on the radio to the other switcher, he gave a hand signal with his lantern instructing the [301] Engineer to slow the speed of the locomotives. The [301] Engineer stated that at the same instance he applied the locomotive brakes, he collided with the standing cars on Track 0112 which were fouling Track 0111. The Engineer estimated his speed to be between 7 and 10 mph.

After coming to an abrupt stop, the Engineer stated that he could see a stationary light reflecting off of the hopper car they struck. He dismounted the locomotive and ran back to the impact point where he found the Foreman [301] pinned between the steps of the locomotive and the hopper car.

POST-ACCIDENT INVESTIGATION

In a post-accident interview with the Foreman and Brakeman of 201, both stated that hopper car BN 463680 looked to be clear of the north end of Track 0111 when they kicked it onto Track 0112.

Since the accident, information indicates several past incidents have occurred where cars have rolled out of the north end of Track Nos. 0110, 0111, and 0112. The informants stated that once cars have been spotted in these tracks, any form of vibration or movement on adjacent tracks will start cars rolling northward and onto the north lead track. The informants also advised that several train crews have been disciplined for cars rolling out of these tracks and colliding with their locomotive or other cars.

During a post-accident interview, the Engineer of 301 stated that he recalled the headlight was illuminated on the locomotive unit the Foreman was riding. He stated that after he dismounted his locomotive unit and ran back to check on the Foreman, he returned to his locomotive to call for help. He stated that at that time he extinguished the locomotive headlight because he did not want the Foreman to see the extent of his injuries.

Event recorder tapes were pulled from the locomotives of 301. The tape from the controlling locomotive (ATSF 2338) indicated a speed of 7 mph. The tape from the unit the Foreman was riding (BN 3135) indicated a speed of 8 mph.

FRA post-accident toxicological tests were performed on the Engineer and Brakeman of 301. Tests were also conducted on the remains of the deceased Foreman. All test results were negative.

Damage estimates were provided for the locomotive and hopper car by the BNSF mechanical department. The damage was estimated to be $20,000 on the locomotive (BN 3135). Damage was estimated to be $5,000 on the hopper car.

APPLICABLE RULES

General Code of Operating Rules No. 1
In effect at 12:01 a.m. Wednesday, April 01, 1998

1.1.2 **Alert and Attentive -** Employees must be careful to prevent injuring themselves or others. They must be alert and attentive when performing their duties and plan their work to avoid injury.

1.2.0 **Alert to Train Movement -** Employees must expect the movement of trains, engines, cars, or other moveable equipment at any time, on any track, and in either direction. Employees must not stand on the track in front of an approaching engine, car, or other moving equipment. *Employees must be aware of the location of structures or obstructions where clearances are close.*

7.1 **Switching Safely and Efficiently -** While switching, employees must work safely and efficiently and avoid damage to the contents of cars, equipment, structures, or other property. *Do not leave cars or engines where they will foul equipment on adjacent tracks or cause injury to employees riding on the side of a car or engine.*

7.6 **Securing Cars or Engines -** Do not depend on air brakes to hold a train, engine, or cars in place when left unattended. *The Engineer and Conductor are jointly responsible, through job briefings, to insure equipment left unattended is properly secured and a sufficient number of hand brakes are applied to prevent movement. If handbrakes are not adequate, block the wheels.*

When the engine is coupled to a train or cars standing on a grade, do not release the hand brakes until the air brake system is fully charged.

When cars are moved from any track, apply enough hand brakes to prevent any remaining cars from moving.

FE-17-98 **(document link)**

SUMMARY FOR FE-17-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Central of Georgia Railroad (merged with Norfolk Southern Railroad)
Location: Hapeville, Georgia
Region: Region 3

Month: June
Date: 06/05/98
Time: 6:40 a.m., EST

Data for Fatally Injured Employee(s)

Yard Foreman
48 years old
27 years of service
Last rules training: February 1998
Last safety training: May 1998
Last physical: October 1982

Data for all Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Job GE-44
Engineer
Switchman
Yard Foreman

Switchman working nearby

Activity: Switching

SUMMARY FOR FE-17-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Yard Foreman was fatally injured when crushed between two boxcars during a switching operation.

PCF No. 1

The incident occurred when the Yard Foreman entered between the two boxcars to adjust the couplers when it was not safe to do so. Railroad operating rules prohibited standing on the track in front of closely approaching equipment or stepping between coupled moving cars or engines for any reason.

PCF No. 2

The coupler to one of the boxcars was apparently problematic, which caused the boxcars' couplers to mismatch and the end platforms on the boxcars to close to a clearance of only 4 3/4 inches. The Yard Foreman had adjusted the coupler on two occasions prior to the incident. Right before the collision, he told the Engineer, "The Drawhead has a dip and wants to slide...ease on back...slack off, slack off."

PCF No. 3

The Crew did not comply with railroad operating rules which required crews, prior to coupling to cars on curves or in switches, to make sure that couplers matched. Rules also required carefully controlled speed and special precautions when coupling to cushion-underframe cars, as in this case.

REPORT: FE-17-98

RAILROAD: Central of Georgia Railroad (CGA)

LOCATION: Hapeville, Georgia

DATE & TIME: June 5, 1998, 6:40 a.m., EST

PROBABLE CAUSE: The Yard Foreman was fatally injured when he entered between two boxcars, attempting to adjust the couplers when it was not safe to do so.

EMPLOYEE:

Occupation:	Yard Foreman
Age:	48 Years
Length of Service:	27 Years
Last Rules Training:	Feb. 15, 1998
Last Safety Training:	May 27, 1998
Last Physical Examination:	Oct. 5, 1982

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On the day prior to the accident, the crew of Job GE-44 went on duty at 11:59 p.m. at the Central of Georgia Railroad (Norfolk Southern), Industry Yard, East Point, Georgia, after completing the required off-duty period. The 3-person crew, comprising an Engineer, Switchman and Yard Foreman, was assigned to perform switching duties at Industry Yard and Hapeville, Georgia.

At Hapeville, located 3.1 miles south of East Point, the main track extended from north to south, with a pass track and three auxiliary tracks located west of and parallel to the main track. Westward from the pass track, they were designated as the runaround, long band mill, and short band mill tracks. On the north end of the yard, a lead track extended southwest from the pass track to the short band mill track, a dead-end track. From the lead track, the long band mill track extended from a 7-degree, left-hand turnout (No. 10 switch), southward. On the south end of the yard, a lead track extended northwest from the pass track to the long band mill track.

On the day of the accident, the crew of Job GE-44 performed switching at Industry Yard and subsequently operated inbound Train 197 to Hapeville. The train contained time-sensitive cars for the Ford Motor Company Assembly Plant at Hapeville.

GE-44 arrived at Hapeville with three locomotives and 43 cars and proceeded southward through the lead track to the runaround track, where the crew set out 29 cars and held onto 14 cars. The crew then pulled southward through the runaround and lead track, cleared the south switch to the pass track, and then shoved northward on the pass track and set out five cars.

The GE-44 crew then returned to the runaround track, picked up boxcar GTW 126763, pulled southward to clear the switch, and then shoved northward on the long band mill track with ten cars. The Engineer was seated at the controls of the locomotive on the west side of the cab, with the short hood facing southward. The Switchman boarded the locomotive at the south switch to the band mill track and remained in the locomotive cab. The Yard Foreman was located on the east side of the track, about 20 feet north of the north switch to the long band mill track. He was protecting the shoving move to a coupling with boxcar NW 868497, which was standing on the lead track. The crew intended to couple the north car in the shoving movement, GTW 126763, to the standing boxcar, NW 868497, cut off from the two boxcars, and let another yard job move the cars to the Ford Motor Company Assembly Plant, adjacent to the yard.

The weather was cloudy, with a temperature of 70° F.

THE ACCIDENT

About 6:35 a.m., GE-44 shoved northward on the long band mill track, with the Yard Foreman controlling the movement via radio. The north or tenth car in the shoving move was boxcar GTW 126763, which was moving through the 7-degree turnout. The Yard Foreman stopped the movement just prior to coupling and radioed the Engineer, saying "Adjusting, hold what you got." The Yard Foreman then told the Engineer, "Bump it 44, bump it," then, "Wait a second, wait a second, that will do 44, slack off, didn't make it, wait a second." About 30 seconds later, the Engineer asked "Alright 44, you are going back that way?" and the Yard Foreman replied, "Draw head has a dip and wants to slide, ease on back, ok 44, ease on back that way, easy, ten to a coupling." About 6:40 a.m., the Engineer shoved northward and then heard the Yard Foreman say in a muffled voice over the radio, "Slack off, slack off."

A Switchman working nearby heard the Yard Foreman's distressed call over the radio and stepped around the adjacent track and saw the Yard Foreman standing upright, on the outside of the east rail, pinned between the two boxcars. The couplers had mismatched and the end platforms on the boxcars closed to a clearance of four and three fourths inches. The Switchman also radioed the Engineer to slack off. As the cars pulled apart, he saw the Yard Foreman fall to the ground on the east side of the track.

An ambulance transported the Yard Foreman to South Fulton Medical Center, East Point, Georgia, where it arrived at 7:10 a.m. The Yard Foreman was pronounced dead at 7:52 a.m.

POST-ACCIDENT INVESTIGATION

Inspection of boxcars GTW 126763 and NW 868497 disclosed no apparent defects that either caused or contributed to the accident. The center-of-car cushioning device on boxcar NW 868497 was to have been sent for testing; however, during disassembly, the hydraulic fluid was lost, which made it difficult to determine if the device had been functioning as intended.

There were no witnesses to the accident. The north car in the shoving movement, GTW 126763, was moving through the 7-degree turnout of the long band mill track during the previous unsuccessful attempts to couple the two cars. The Yard Foreman adjusted the coupler on two occasions and on one occasion told the Engineer that the "Drawhead has a dip and wants to slide...."

At the time of the accident, the Yard Foreman positioned himself between the "B" end of GTW 126763 and the "A" end of NW 868497, during an attempt to couple the two cars.

Postmortem toxicology tests were negative for drugs and alcohol.

APPLICABLE RULES

Norfolk Southern Operating 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 or immediately in front of standing cars or engines unless necessary in the performance of duty, and then only after arranging for protection against the equipment being coupled to or moved.

Employees must not go between cars and/or engines to adjust a drawbar unless the equipment is separated by at least 25 feet....

103(I) ...When necessary to couple to cars on curves or in switches, it must be known that couplers match, and coupling speed must be controlled to avoid bypassed couplers or jackknifing. Special care is needed when coupling to cushion-underframe or long cars.

FE-19-98 **(document link)**

SUMMARY FOR FE-19-98: SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Norfolk Southern Corporation
Location: Buechel, Kentucky
Region: Region 3

Month: July
Date: 7/01/98
Time: 2:50 a.m., EST

Data for Fatally Injured Employee(s)

Utility Employee
54 years old
30 years of service
Last rules training: February 1998
Last safety training: June 1998
Last physical: October 1996
Last efficiency tests: June 1998

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation

Utility Employee working with switching team

Local Switcher K39K6
Engineer
Conductor
Utility Employee

Yard
Inland Container Maintenance Employee
Clerk

Activity: Switching

SUMMARY FOR FE-19-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Utility Employee was seriously injured during switching activities. He died of complications (cardiopulmonary arrest, probable pulmonary embolus, multiple injuries) two weeks later.

PCF No. 1

The incident occurred when the Utility Employee failed to avoid a close clearance structure (handrail) while riding a rail car.

PCF No. 2

The switching agreement between the Inland Container Company and the railroad required that prior to placing any structure which would interfere with the movement of rail traffic or create a close clearance hazard for railroad personnel, the railroad must be notified and assess the structure for potential hazards to railroad equipment and personnel. This was not done. The structure, in place for four months, was familiar to the Crew Members who switched at the facility almost every night. (This was not a usual duty for Utility Workers.) However, there is no indication of formal notification or safety briefings regarding the structure.

REPORT:	FE-19-98	
RAILROAD:	Norfolk Southern Corporation (NS)	
LOCATION:	Buechel, Kentucky (suburb of Louisville)	
DATE & TIME:	July 1, 1998, 2:50 a.m., EST	
PROBABLE CAUSE:	The Utility Employee was seriously injured (later dying) when he failed to avoid a close clearance structure while riding equipment.	
EMPLOYEE:	Occupation:	Utility Employee
	Age:	54 Years
	Length of Service:	30 Years
	Last Rules Training:	Feb. 20, 1998
	Last Safety Training:	June 11, 1998
	Last Physical:	Oct. 30, 1996
	Last Efficiency Tests:	June 12, 1998

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The Utility Employee reported for duty at the Norfolk Southern Whitner Yard office facility near Buechel, Kentucky at 11:59 p.m. on June 30, 1998. He had received a statutory off-duty period of 16 hours, 55 minutes prior to reporting for duty. The Utility Employee, designated U04UK6, was assigned to work Tuesday through Saturday, with Sunday as a rest day. The Engineer and Conductor reported for duty as crew members on a local switcher designated K39K6 at the same location. This was a local switching job working the piggyback facilities and local industries in the Buechel area. Normal procedures required the utility person to attach to this local and assist in switching while the local was on duty. The employee protecting the utility position may then be called upon to assist other trains, such as through freights. A company vehicle is assigned to the utility position and is usually utilized by the crew members to move from place to place instead of riding on the rail cars or locomotive.

On the night in question, the individual assigned to the utility position was performing his normal duties. He had attached to the local switcher, and the crew had performed initial duties of switching the Buechel container facility, and had conducted a brake test on a train scheduled for subsequent pickup by another crew. At approximately 2:25 a.m., the crew arrived at the Inland Container Corporation to perform the nightly switch at that facility. Tracks leading to the facility slightly descended and curved to the right. The structure was a large, metal fabricated building with an entry way served by a large overhead garage door.

The door opening did not present a close clearance hazard, as the door was large enough to accommodate a set of steps to the right of the railroad tracks for access to the platform. The platform and tracks were constructed so that the boxcar floor was usually level with the platform deck, and the left side of the tracks was protected by the exterior wall of the building. A gate over the rails provided access through a chain-link fence, protecting the facility grounds and buildings, approximately three rail car lengths from the door. A close clearance warning sign located on the fence just to the right of the railroad gate provided notice of the gate's proximity to the tracks, and another close clearance warning sign on the building to the right of the railroad entry door provided warning of the platform's proximity to the tracks.

The interior of the facility was well lit by rows of flourescent lights suspended from the ceiling. The exterior, lit by dusk-to-dawn lights, was rather dark, and supplemental lanterns were necessary to ensure safe walking conditions. A set of five steps immediately to the right of the tracks when facing the building was used to ascend to the platform level, which comprised a poured slab of concrete providing a smooth and level walking surface. Five boxcars could be placed for loading along the dock facilities, and the floor of the facility was approximately level with the floor of the boxcar. Two dock plates, weighing approximately 600 pounds and constructed of heavy gage aluminum, were utilized to provide a safe access to the rail cars for personnel and forklift operators loading and unloading rail cars. When these dock plates were removed from their position between the rail cars and the platform, they were lifted out of position by a forklift operator and positioned back on the platform only far enough to allow clearance for the rail cars to exit the facility. A walking area along the dock between the edge of the platform and the rolls of stored paper was maintained at approximately nine feet wide to allow for easy passage of forklift traffic. Immediately to the right of the steps stood a paper shredding and bundling machine, protected by a series of upright metal posts to provide protection from forklift traffic on the adjacent platform. A handrail apparatus extended twelve feet along the platform from the north corner adjacent to the tracks. This apparatus was attached by welding it to the outside edge of the metal corner cap of the platform. A handrail was also attached to the right side of the steps for ascending.

Walking conditions outside the plant were good. The ballast connected to a gently sloping, grass-covered area extending about 10 to12 feet and then leveling off for about 20 feet, beyond which a level, asphalt parking lot extended around the side and front of the facility.

On the night of the accident, the train crew members entered the facility separately. After properly lining the switches for the Engineer, the Conductor instructed him to proceed to the Inland Container facility and stop short of coupling to the rail cars. Using the company vehicle, the Conductor and Utility Employee drove to a point just to the right of the railroad door opening and stopped the vehicle on the grassy area between the parking lot and the railroad tracks. The Engineer arrived with the locomotive, stopping short of a coupling outside the building.

Tracks in the area of the facility were oriented north to south. The Engineer was operating with the short hood end of the locomotive north. The control stand was on the east side, giving him an excellent view of the approach to the building and the five rail cars spotted inside the building due to the slight right hand curve. The Conductor and Utility Employee coupled to the rail cars after determining that the dock boards had been removed. The Conductor coupled the air hoses while the Utility Employee entered the building to check the car numbers. The Conductor joined the Utility Employee on the loading dock to determine what switching would be necessary.

While the Conductor and Utility Employee were walking along the dock checking the rail cars, the paper shredding machine malfunctioned and began spraying shredded paper along the dock area. A maintenance and cleanup crew arrived to repair the machine and clean up the dock area about 10 minutes later.

While they were cleaning up the shredded paper from the dock area, the Utility Employee continued toward the south end of the rail cars, checking car numbers and hand brakes while walking along the dock. The Conductor engaged an Inland Container Maintenance Employee in a conversation concerning the malfunctioning machine. The Utility Employee returned from checking the rail cars, and the Inland Container Maintenance Employee left to attend to his maintenance duties repairing the malfunctioning machine. Their switch list indicated that the second and fourth cars from the north end were to be pulled from the facility for shipment. The other three rail cars were to be respotted. While they were checking the rail cars, however, the Utility Employee and Conductor noted that the third car from the north end had a shipment seal in place, and the Conductor called the clerk at Whitner Yard to determine if this rail car could be pulled for shipment since it would save them a switch. The Clerk informed the Conductor that the rail car was still listed as a respot. The Conductor checked with the Utility Employee to determine if he was ready to pull the rail cars from the plant. The Utility Employee indicated he was ready to make the move. The Conductor instructed the Engineer to pull the rail cars out of the plant.

The weather at the time of the accident was clear, with a temperature of 74^0 F.

THE ACCIDENT

The Conductor indicated that he and the Utility Employee were walking out of the plant along the platform to get in the company vehicle. The Conductor was approximately six feet behind the Utility Employee when the Utility Employee tripped or stumbled on something, possibly the dock board, and fell toward the moving rail cars. The Conductor saw the Utility Employee reach

up to grab something to break his fall. Evidence indicates he grabbed the handhold on the side ladder of one of the rail cars and before he could regain control of his footing, he was pulled along by the forward movement of the rail cars until he was pulled between the rail cars and the handrail structure at the north end of the platform.

The Inland Container Maintenance Employee's story was different. He indicated that he was attending to his duties repairing the malfunctioning shredding machine after his discussions with the Conductor. He stated that after he heard the locomotive engine rev up, he looked around and saw the Utility Employee riding the rail cars which had just begun to move. He stated that the Utility Employee was riding on the south end rail car ladder of the first or second car from the locomotive, and waved to him as they had been friends for a number of years. He indicated that the Utility Employee returned the wave with his left hand. At this time, he returned to his maintenance duties.

A few seconds later, he heard a scream and immediately looked up toward the rail cars, where he saw the Utility Employee being rolled between the cars and the handrail structure at the end of the platform. He stated that he did not see the Conductor on the platform.

The Conductor stopped the movement of the train with a radio communication to the Engineer. He stated that he had waited until he thought the Utility Employee would be rolled beyond the handrail, as he thought that would be better than having him caught between the rail car and the handrail structure. The Conductor indicated that he ran down the steps and was at the bottom of the steps when the Utility Employee was ejected from between the rail car and the handrail. The Inland Container employee indicated that he immediately responded to the scene at the bottom of the platform steps, and the Conductor was already there. The Engineer indicated he was looking in the direction of movement after the Conductor told him to pull the rail cars out of the plant, but turned around when the Conductor told him to stop, as that was not a usual occurrence. The Engineer indicated that he saw the Utility Employee when he fell from between the rail cars and the handrail.

The Conductor indicated that although the Utility Employee was in a great deal of pain, he was talking and actually trying to get up. Those present convinced him to lie still. The Inland Container employee went to a phone to summon EMS. EMS personnel arrived in about 10 minutes. They arrived at the University of Louisville Hospital at approximately 3:30 a.m., and the Utility Employee was taken immediately to a treatment room.

The Utility Employee was diagnosed with a severely dislocated pelvis and two broken ribs. Subsequent examination revealed a fractured vertebrae. Initially, a non-invasive procedure was attempted to relocate the pelvis into the socket. When this failed, surgery was performed and the pelvis was relocated. Although the injuries were serious, they were not considered life-threatening. After two weeks of treatment, his injuries were healing as expected, and the Utility Employee was scheduled to be discharged from the hospital to a rehabilitation unit as soon as a room was available. At this time, he was walking without assistance for short distances. However, on July 15, 1998 at approximately 1:56 p.m., he collapsed and subsequently died. The

Jefferson County Coroner determined the cause of death to be cardiopulmonary arrest, probable pulmonary embolus, and multiple injuries.

POST-ACCIDENT INVESTIGATION

A 2-week period had elapsed between the time of the accident and the Utility Employee's death. An inspection of the area in question was conducted shortly after the accident. Interview and witness statements were solicited from all parties involved in the accident. Information gleaned by other parties involved in the investigation was also perused for any pertinent facts. The railroad performed a mechanical inspection of the rail cars involved, with no exceptions taken to the condition of the rail cars or the safety appliances. The event recorder tapes of the locomotive used during the accident were removed and found to be defective. The radio voice recording tapes were checked by the railroad, but the one frequency utilized by the switcher was not one normally recorded. There were no samples collected for toxicological testing. Immediately following the event, carrier officials returned to the site and attempted to recreate the series of events leading up to the accident. Inland Container officials forced the railroad officials to terminate their investigation and leave the property. The railroad officials then terminated switching service until they were allowed to complete their investigation. Inland Container relented and allowed the railroad to complete physical examination of the property, but would not allow questioning of any company witnesses. Questioning of the Inland Container employee by railroad officials was accomplished through the company attorney. FRA was allowed to question the Inland Container employee with the company attorney in attendance.

The handrail structure with which the Utility Employee became entangled was erected by the Inland Container Company. The switching agreement with the railroad required that prior to placing any structure which would interfere with the movement of rail traffic or create a close clearance hazard for railroad personnel, the railroad must be notified and assess the structure for potential hazards to railroad equipment and personnel. This was not done. However, the structure had been in place for approximately four months and was familiar to the crew members who switched the facility almost every night.

The Utility Employee and the Inland Container Maintenance Employee were old school buddies and had been friends for over 50 years. The Engineer repeatedly indicated he could not remember the course of events or the location of crew members on the night in question. The only thing that he could remember with any certainty was the Conductor telling him to pull the cars out of the plant, then telling him to stop. He turned around just in time to see the Utility Employee being ejected from between the rail car and the handrail. He was approximately three car lengths away on the inside of the curve at the controls of the locomotive.

Subsequent to the railroad officials' initial investigation, they investigated further the Conductor's account by recreation of the events according to the Conductor. The officials identified a number of inconsistencies in his story, as supported by physical evidence. As a result of the findings of the hearing, the Conductor was terminated from the service of the railroad. It appears there was enough evidence to convince railroad officials that the Conductor's

statement concerning the events had been modified to serve some purpose other than the truth. Also, the Inland Container employee's version of the placement of the crew members on the train more closely matched the evidence from the post-accident investigation.

The Conductor stated that he looked back to the platform after the Utility Employee had been rolled and noted that the dock plate where the Utility Employee could possibly have tripped was still tipped upright. Investigators attempted to initiate this tipping action by standing on and jumping up and down on this dock plate. During questioning of the Inland Container employee, accident investigators and the Inland Container attorney attempted to recreate the events. They attempted to instigate a tip-over of the dock plate, but they could barely get the dock plate to move, much less tip up and over. The dock plate weighed approximately 600 pounds.

The only positive conclusion which can be drawn from the evidence and the statements of the eyewitnesses is that the Utility Employee had failed to avoid the close clearance hazard between the moving rail cars and the handrail structure on the platform.

APPLICABLE RULES

Operating Rule M

Some platforms, bridges and other structures, switch stands, and tunnels will not clear a person on the top or side of a car or engine. Employees must become familiar with these and other places and protect themselves from injury.

Operating Rule GR-13(a)

Employees must not ride on the close-clearance side, between, or on the leading end of equipment moving adjacent to the platform, building, or close clearance structure."

Operating Rule 103(e)

Switching must be performed promptly and efficiently and in a manner that will avoid personal injury, damage to lading, equipment, structures, or other property.

Safety Rule 1080

Employees must not ride the sill (end) platform or brake platform of cars when it places them between moving equipment, except when it is necessary to operate the hand brake.

FE-24-98 (document link)

SUMMARY FOR FE-24-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: New Jersey Transit Rail Operations
Location: Glen Rock, New Jersey
Region: Region 1

Month: October
Date: 10/02/98
Time: 5:37 p.m., EST

Data for Fatally Injured Employee(s)

Assistant Conductor
49 years old
25 years of service
Last rules test/training: August 1998
Last safety training: August 1998
Last physical: October 1997

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation

Passenger Train No. 1612
Conductor
Assistant Conductor
Engineer

Hoboken Train Dispatcher

Activity: Railroad employees were conducting passenger service.

SUMMARY FOR FE-24-98

POSSIBLE CONTRIBUTING FACTORS

EVENT

An Assistant Conductor was seriously injured (dying four days later) when struck by a train.

PCF No. 1

The incident occurred when, in non-compliance with railroad operating rules, the Assistant Conductor attempted to board a moving train as it was leaving the station.

PCF No. 2

Interviews revealed that the Conductor and Assistant Conductor had had an arrangement for over a year in which the Conductor requested no assistance with passenger loading/unloading at three stations, one of them Glen Rock. (This was in violation of a railroad operating rule.) Therefore, he did not anticipate that the Assistant Conductor would be out on the platform, rather than on board the train when he closed the doors.

PCF No. 3

The Conductor's position on the train (leading end) was improper. He was unable to observe the platform as the train departed from the station. The Conductor's view of the platform from the front of the train was severely restricted because of track curvature.

PCF No. 4

Insufficient training of train service employees on proper door operation *on all types of NJTR's passenger equipment* was a factor. Only new, inexperienced employees received any classroom and field training on door operation.

PCF No. 5

During the post-accident investigation, the Assistant Conductor's key was found in one of the door operation stations, perhaps suggesting he thought the key would prevent the doors from closing. A test of the equipment determined that the key had no effect on the operation of the other doors when operating from the front of the train. (The Assistant Conductor had worked most of his career on the Newark Division, having transferred to the Hoboken Division 18 months prior to the accident. Passenger equipment used on the Newark Division had a feature on the door control panel that prevented the door from closing when a key was inserted in the door control panel. Also, those doors had another feature that caused the doors to stop closing when someone or something hit the rubber on the end of the door. The door would re-open if the end rubber was hit.)

REPORT: FE-24-98

RAILROAD: New Jersey Transit Rail Operations (NJTR)

LOCATION: Glen Rock, New Jersey

DATE & TIME: Oct. 2, 1998, 5:37 p.m., EST

PROBABLE CAUSE: The Assistant Conductor was seriously injured (dying four days later), when in non-compliance with railroad operating rules, he attempted to board a moving train as it was leaving the station.

EMPLOYEE:

Occupation:	Assistant Conductor
Age:	49 Years
Length of Service:	25 Years
Last Rules Test/Training:	Aug. 3, 1998
Last Safety Training:	Aug. 3, 1998
Last Physical:	Oct. 4, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The Assistant Conductor reported for work at NJTR's Woodbine Terminal on Oct. 2, 1998 at 7:10 a.m. He was working his regular assignment (SV07), and prior to reporting for duty, he had a statutory off-duty time of 10 hours and 14 minutes.

The Assignment SV07 Crew operated Passenger Train No. 1612 to Hoboken, N.J. At Hoboken, the Crew went off duty from 9:28 a.m. until 1:30 p.m., four hours and two minutes. The next train the Crew worked was Train No. 1257, leaving Hoboken at 4:58 p.m., scheduled to arrive at Waldwick, N.J. at 5:51 p.m.

The Train Crew comprised a Conductor (43 years of service), Assistant Conductor (25 years of service), and an Engineer (48 years of service). The Crew Members were regularly assigned to this job, and had statutory off-duty time of 10 hours and 14 minutes prior to the 7:10 a.m. report time.

Train No. 1257 comprised four coaches and one locomotive in push-pull operation. The Engineer operated the train westbound (timetable direction) from the controls of the cab car (5136). Locomotive 4203 was on the rear (east end) of the train and headed east. The Conductor worked the head two coaches and operated the passenger doors from the west-end of the second car. Departing stations, he communicated with the Engineer using hand signals and the train's communicating buzzer. The Assistant Conductor worked the rear two cars.

En route, the Conductor opened doors at each station and received a hand signal from the Assistant Conductor prior to closing the doors and signaling the Engineer to proceed. The Conductor and the Assistant Conductor had an agreement that at Glen Rock, Ho-Ho-Kus, and Waldwick, the Assistant Conductor would not be at the doors of the train to assist passengers and relay a hand signal. The Conductor said he had received hand signals from the Assistant Conductor at each stop until Glen Rock. At Glen Rock, the Conductor opened the doors from his position on the second coach and went to the platform to observe that all passengers were clear of the train. Approximately five or six passengers got off, and he got back on the train and closed the doors. He then used the communicating buzzer to signal the Engineer to proceed. The Conductor was not aware that the Assistant Conductor was missing until the next scheduled stop at Ridgewood. After departing Ridgewood, he radioed the Hoboken Train Dispatcher and notified him that the Assistant Conductor may have been left behind. It was then that he was informed of the accident.

THE ACCIDENT

Two individuals, who were selling raffle tickets on the station platform at Glen Rock, witnessed the accident. The witnesses reported seeing the Assistant Conductor exit the train from the third coach. They indicated they had spoken with the Assistant Conductor and asked if he wanted to purchase a raffle ticket. He declined and turned toward the train. As the doors were closing, the Assistant Conductor attempted to push the door open with his hand. The train began moving, and he pulled his hand out and ran toward the rear of the train, against the direction of movement, and attempted to board the locomotive at the left rear step. The Assistant Conductor ran along the platform and apparently lost his balance, was pulled off the platform, and rolled under the locomotive's fuel tank. The witnesses stated that they did not observe the Assistant Conductor signaling or communicating with anyone on the train prior to the accident. The Assistant Conductor was transported by ambulance to a local hospital where he died of his injuries four days later (Oct. 6, 1998).

POST-ACCIDENT INVESTIGATION

The post-accident investigation focused on:

- The en route train operation between the Conductor and Assistant Conductor to determine how they communicated with each other at station stops, specifically the application of NJTR's Operating Rules 105 and 106;
- NJTR management's enforcement of Rules 105 and 106;
- Training provided to Train Crews; and
- Testing of train doors involved in this accident and a random sample of doors on other equipment.

Application of Operating Rules 105 and 106

Rule 105 requires Train Crew Members to position themselves on the platform, at open doors, for the purpose of assisting passengers on and off the train. While not specifically stated in the rule, the practice is for Crew Members to use a hand signal to signal the Crew Member operating the doors that it is all clear at his/her position.

Rule 106 has two provisions relevant to the accident:

- The Conductor or Crew Member assigned by the Conductor must observe that no passengers are boarding or exiting and that the exterior door's indicating lights are extinguished to the front and rear of the train before activating the close door button at the specific location; and

- On all equipment, the Conductor or Crew Member assigned by the Conductor will position himself/herself in the rear vestibule of the working portion of the train when the train is ready to depart each station and will observe the platform from the open door (or window if the window can be opened) until the entire train has cleared the platform.

The interview with the Conductor revealed that the Conductor and Assistant Conductor had worked together for more than one year. During that time, the Conductor had instructed the Assistant Conductor not to assist with passenger loading/unloading at three stations. Glen Rock was one of the three stations. The Conductor's rationale was that only a few passengers get off at these stations and he did not need help.

The Conductor stated that he always worked the doors from the front of the train and that he always looked at the platform and closed all train doors including the door at his station. He then signaled the Engineer to proceed. He said he never looked out after closing the doors because, in his opinion, it was dangerous. He also stated that he never observed the platform as the train was departing because he felt it was too dangerous and not possible on this type of equipment.

NJTR Management's Enforcement of Rules 105 and 106

Discussions with NJTR's Superintendent of Rules and Operations, the Line Superintendent for Glen Rock, and the Senior Trainmaster indicated that Rule 106, requiring a Crew Member to be on look out from the rear of the train, was not consistently applied. On the Morristown, NEC, North Jersey Coast, and Boonton Lines, doors were worked from the rear, and the platform was observed, but on the Raritan, Southern Tier, Main, and Bergen County Lines, the doors were operated from the front of the train, making observation of the platform difficult for the entire time the train was departing, especially at stations with curves.

A review of NJTR's Efficiency Check System, for compliance with 49 CFR Part 217, revealed that during the previous 12 months the railroad had conducted 607 tests and observations for compliance with Rules 105 and 106 (concerning passenger loading/unloading and door operations). Records indicated there were 100 incidences of failure to comply, resulting in counseling or letters of reprimand.

Employee Training

The Conductor stated that he had never received training on the operation of doors when he entered passenger service. He stated that the only equipment training he received was when new equipment went on line, and only one hour of training at that time.

NJTR's current rules training classes did not specifically provide instructions on door operations. However, the railroad stated that a question pertaining to Operating Rule 105 or 106 was always possible on the test. New employees received formal classroom and field training on door operation and emergency trouble shooting. They also participated in on-the-job assignments that enabled them to work trains and operate doors with experienced staff. FRA investigators were concerned that "experienced staff" may not have received adequate training in this area.

Discussions with NJTR's Rules Examiner and Training Staff revealed that, in the case of "older train service" employees, their qualifications were accepted by NJTR from previous railroad employers at the time NJTR took over passenger operations. In most cases, there were no records indicating the training these employees received nor their original qualification dates.

Testing of Equipment Door Operations

Testing of equipment doors was performed to determine if the doors would open throughout the entire train from any door operating station, and whether inserting the key in another door operating station would interrupt the operation.

First, a test was made on the car involved in the incident (1704). The test was to determine if a key in the No. 3 door operating station would prevent the Conductor from closing the door from a position several cars away. This test was performed because the Assistant Conductor's key was found in this door operation station, suggesting that he perhaps thought his key would prevent the doors from closing. The key had no effect on the operation of the other doors when operated from the front of the train.

The Assistant Conductor had worked most of his career on the Newark Division, having transferred to the Hoboken Division 18 months prior to the accident. Passenger equipment used on the Newark Division had a feature on the door control panel that prevented the door from closing when a key was inserted in the door control panel. Also, those doors had another feature that caused the doors to stop closing when someone or something hit the rubber on the end of the door. The door would reopen if the end rubber was hit.

Another test was performed to open and close the doors from the cab car. Some cab car door control locations did not open the doors throughout the train and in some cases, when operating from the door control of a cab car, placing the key in another location interrupted the door operation.

Analysis

The practice of loading and unloading passengers at Glen Rock Station without the assistance of the Assistant Conductor was in violation of the railroad's Rule 105.

The practice of not observing the platform as the train departed the station was a violation of the railroad's Rule 106.

The most significant rule violated was NJTR's Safety Rule 354 which states in part "When getting on equipment, employees must be on equipment before it moves."

Insufficient training of train service employees on the proper operation of doors may have contributed to the accident. New train service employees received classroom and field training on door operation. NJTR should review training to ensure that all Conductors and Assistant Conductors, regardless of time in service, receive training on the operation of doors on all types of NJTR's passenger equipment.

Consistent application and enforcement of NJTR's Safety Rules 105 and 106 between Divisions and Branch Lines should be reviewed.

APPLICABLE RULES

NJTR's Safety Rules

When getting on equipment, employees must:

(a) Be on equipment before it moves.

NJTR's Manual of Regulations for Conductors and Assistant Conductors

Rule 105: DUTIES

Conductors and Assistant Conductors must station themselves on the station platform at doors when passengers are entering and exiting their train. Conductors and Assistant Conductors must remain in position to render assistance in the entering and exiting of passengers. Such employees must make every effort to see that passengers do not board the wrong trains and are directed to the proper cars.

Rule 106: DOOR CONTROL

A. The Conductor of passenger trains equipped with electrically operated side doors, or Assistant Conductors designated by the Conductor will, before departure from any station, visually observe that no passengers are boarding or exiting and that exterior door indicating lights are extinguished to the front and rear of the train before activating the close button at his or her local key station.

On all equipment, including Comet III and Comet IV with the end door bypass switch in the bypass position, the Conductor, or Assistant Conductor designated by the Conductor, will position himself/herself in the rear vestibule of the working portion of the train when the train is ready to leave each station and will observe the platform from his/her open door until the train has cleared the station.

FE-25-98 (document link)

SUMMARY FOR FE-25-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Iowa Interstate Railroad
Location: Rock Island, Illinois
Region: Region 4

Month: October
Date: 10/08/98
Time: 3:25 p.m., CST

Data for Fatally Injured (Employee(s)

Trackman
41 years old
Six months of total railroad service
Last rules training: None
Last safety training: None
Last physical: March 1998

Data for All Employees (Craft, Positions, Activity)

Craft: MOW

Positions:

Trackman
Bureau Section Foreman
Roadmaster (Supervisor)
Tie Gang
Operator

Activity: Tie installation on a ballast deck bridge.

SUMMARY FOR FE-25-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

While plating cross ties on a ballast deck bridge, a Trackman fell into the water and drowned.

PCF No. 1

The incident occurred when the Trackman lost his balance and fell through a large opening (two feet by 11 feet) into water with strong currents and undertows.

PCF No. 2

The height and length of the bridge qualified it to be covered under FRA's Bridge Worker Safety regulations. However, the railroad employees did not comply with these regulations. None of the employees was wearing personal fall arrest equipment. No equipment (i.e. lanyards, body harnesses, or rail sliders) was offered or distributed to any of the employees.

PCF No. 3

No qualified or competent employee was on site to supervise, plan, or evaluate the work. The Supervisor, who had been with the gang most of the day, left at 1:45 p.m. to attend to other duties. He discussed appointing an Employee-in-Charge, but apparently did not do so.

PCF No. 4

Employees received no training in the usage of fall arrest equipment, tie-off techniques, or rescue/retrieval techniques. None of the previous job briefings covered the perils of working on bridges over swiftly moving water, nor did they include discussion of a rescue plan in the event of a fall. The above are required under FRA's Bridge Worker Safety regulations.

REPORT:	FE-25-98	
RAILROAD:	Iowa Interstate Railroad (IAIS)	
LOCATION:	Rock Island, Illinois	
DATE & TIME:	Oct. 8, 1998, 3:25 p.m., CST	
PROBABLE CAUSE:	While plating crossties on a ballast deck bridge over the Sylvan Slough, the Trackman lost his balance, fell into swiftly flowing water, and drowned.	
EMPLOYEE:	Occupation:	Trackman
	Age:	41 Years
	Length of Service:	Six months total railroad experience
	Last Rules Training:	None
	Last Safety Training:	None
	Last Physical:	March 24, 1998

CIRCUMSTANCES PRIOR TO THE ACCIDENT

The Trackman regularly reported for duty at 7 a.m., Monday through Friday. On Oct. 8, 1998, he met the Bureau Section Foreman (Foreman) at the Foreman's residence and rode to Rock Island with him in a company vehicle. Upon arriving at Rock Island, the Trackman and the Foreman had a brief conversation with the Roadmaster (Supervisor) about the day's assignments and location of the Tie Gang's equipment. They proceeded to the tie-up point and assisted with the tie installation efforts throughout the day.

The Tie Gang came out of the Arsenal Switch (milepost 181.7) that morning to install ties between that switch and the west end of Rock Island Yard (milepost 181.4). The bridge over Sylvan Slough lies between those two points of the railroad (milepost 181.6). The Tie Gang was set up to work in an easterly direction. After approximately one hour, the gang cleared the single main track at the Arsenal switch.

The employees worked different jobs within the structure of assignments necessary to complete the tie installation process. Typically, employees would work the forward (lead) jobs in the tie installation and then pick up tasks behind the gang activity as it progressed eastward. It is significant to note that

the Supervisor, who had been with the gang most of the day, left the job site to attend to other responsibilities (he departed at approximately 1:45 p.m.). Before departing the work site, he discussed placing another previously designated employee as the Employee in Charge (EIC).

The Trackman was working on a single main track within yard limits (non-signal territory) near the center portion of the bridge. The accident site was 193 feet and six inches west of the east abutment; the bridge's length was 602 feet. The through plate girder structure had openings approximately 24 inches by 11 feet along both sides of the bridge. Due to the previous and ongoing tie installation, the ground was not level where the ties had been installed.

Ballast sections outside the rails were uneven because the ballast had not been regulated. Uneven footing in conjunction with tie installation was a normal condition.

The weather was clear, sunny, and warm, with a temperature of 70º F. The wind was calm.

THE ACCIDENT

The Operator, who was the only eyewitness to the accident, was working next to the Trackman installing plates on crossties prior to returning to his responsibilities on a tamper. The Operator asked the Trackman, who acknowledged the request, to continue installing the plates on the crossties while he caught up with tamping the ties.

Prior to the accident, the Trackman was in a standing position straddling the south rail, in the vicinity of a rail lifter machine (plater). The Trackman was facing eastward (in the direction of the work), and as he turned to look behind him (westward), he lost his balance and fell southward, with the back of his legs and back hitting first, contacting the outside ballast section between the outer edge of the south rail and the retaining plate.

The Trackman's momentum during the fall carried him into an opening (approximately 24 inches wide by 11 feet long) between the ballast deck's retaining plate and the through plate girder structure (the inside vertical face of the girder).

The Trackman fell into the opening in a folded position with his feet and legs pointing upward; then he disappeared from view. After shutting off his tamper and moving to the opening, the Operator observed the Trackman holding onto the edge of one of the bridge's lower structural beams. The Operator talked with the Trackman very briefly and ran eastward for help by shouting and waving his arms to attract attention. As soon as other employees responded, the Operator returned to the point of the accident. Upon arriving at the opening, he observed the water swirling where the Trackman had entered. The time was 3:25 p.m.

After becoming aware of the accident, several co-workers descended on foot from the east end of the bridge to the shoreline. Several accounts indicated the Trackman surfaced after initial entry into the river. He was struggling, went under, and resurfaced. One of the employees entered the river in a rescue attempt. After this employee swam 30 to 40 feet from shore, the Trackman sank out of sight.

Swift currents and cold water (65ºF) forced him to turn back, for fear that he would suffer the same fate. A second employee waded into the water, but was warned by the first employee that a rescue was not safe.

Multiple rescue requests were made by Tie Gang Employees (by calling "911" via cellular telephone or radio). Rock Island Police Department (RIPD) personnel responded to one of the emergency calls. Upon the RIPDs' arrival at the Arsenal Railroad Bridge, members of the Railroad Crew indicated that the Trackman had not been seen for five to 10 minutes. An RIPD officer requested that the Rock Island Communication Center (RI-COMM) contact the Arsenal Police, Davenport Fire Department, Bettendorf Dive Team, and Search and Rescue.

The Davenport Fire Department (DFD) personnel received a telephone call at 3:37 p.m. alerting them that a construction worker had fallen from a bridge. Initially, DFD believed that the fall had occurred at the Crescent Bridge (Highway 92). DFD was redirected to the correct accident site, and proceeded upriver from Marquette Ramp. An Arsenal Rescue boat and personnel responded, as well. Both teams worked the area to retrieve the Trackman. The body was recovered at 5:30 p.m., 200 yards down river, according to reports. Attempts to revive the Trackman proved unsuccessful. The Trackman had been submerged for approximately two hours.

A Rock Island Emergency Response ambulance transported the Trackman's body to Trinity Medical Center West; however, that hospital's cooler was inoperable, so the deceased was taken to Wheelan's Funeral Home pending an autopsy. The employee was pronounced "dead on arrival."

POST-ACCIDENT INVESTIGATION

On Oct. 9, 1998, FRA began its investigation into the fatality. FRA did not take any exceptions to the equipment used. Investigators concluded that the Tie Gang's equipment did not contribute to the accident. The Operator's account details that the Trackman was partially outside the limits of the outer rails of the track on the bridge just prior to falling.

Initial interviews with Maintenance-of-Way (MOW) employees and supervisors resulted in conflicting reports about the quality and content of job briefings and the participation of MOW and contractor employees at these briefings. Subsequent interviews confirmed that adequate job briefings on Bridge Worker Safety regulations did not take place. Interviews also revealed a general lack of knowledge by some engineering personnel relative to hazard recognition and preventative measures required while working on a railroad bridge. In addition, the investigation revealed that the railroad's prompt rescue efforts, except for the one employee's failed attempt, seemed ill conceived or non-existent.

After observing the general layout of the work site and point of the accident, investigators measured the distance from the outer edge of the south rail, over which the Trackman was standing, to the edge of the opening at 56 ½ inches. The opening measured 24 inches wide and approximately 11 feet long. The opening was obviously large enough for a body to pass through. The water below the bridge exhibited swift currents. Reportedly, undertow currents were common knowledge for the area, as several accidents had occurred on that portion of the river annually.

The distance from the top of the retaining plate to the top surface of the lower edge (the flange/tee portion) of the beam directly below was 53 inches. (This was the edge the employee was holding onto prior to falling.) The distance from the top of the retaining plate to the top of the edge of the outer girder beam (lower portion) was approximately 62 inches. The distance from the top edge of the retaining plate to the surface of the water was approximately 28 feet and two inches.

The distance of the Trackman's fall was 17 feet (as calculated by the overall distance of 28 feet and two inches minus the distance from the edge of the beam underneath the retaining plate and the height of the Trackman, approximately six feet and two inches). The height and length of the bridge qualified the bridge under FRA's Bridge Worker Protection regulations.

The Arsenal Police (AP), Rock Island City Police Department (RIPD), local Coroner's office, and the Iowa Interstate Railroad (IAIS) conducted investigations into circumstances surrounding the employee's death. IAIS officials telephoned the National Transportation Safety Board (NTSB) personnel on Oct. 9, 1998, to advise them of the known details surrounding the accident. NTSB did not investigate.

Toxicological testing was ordered by the Coroner's office. The toxicology tests were negative. The Rock Island County Department of Public Health listed asphyxia due to drowning as the cause of death.

APPLICABLE RULES

Interviews revealed that none of the employees was wearing personal fall arrest equipment. FRA regulations required that fall arrest equipment be worn, that employees be trained in their usage and tie-off techniques, and that the railroad provide for a prompt rescue after a fall.

In addition, interviews revealed that employees were not sufficiently trained in hazard recognition, equipment usage, tie-off techniques, or rescue/retrieval techniques. No qualified or competent employee was on site to supervise, plan, or evaluate the work. None of the employees indicated that any discussion took place relative to the hazards while working on the bridge. None of the previous job briefings covered the perils associated with working on the bridge over swift water. No rescue plan or discussion took place as a preventative measure in the event of a fall. No equipment (i.e. lanyards, body harnesses, or rail sliders) was offered or distributed to employees while working on the bridge for their use or protection.

Non-compliance with FRA regulations seriously compromised the employees' safety and rescue attempts. Lack of training and poor communication have been determined to be root causes contributing to an overall lack of recognition of the hazardous conditions associated with work performed on the Sylvan Slough bridge.

FE-26-98 (document link)

SUMMARY FOR FE-26-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Union Pacific Railroad Company
Location: Chicago, Illinois
Region: Region 4

Month: October
Date: 10/11/98
Time: 10:17 a.m., CST

Data for Fatally Injured Employee(s)

Track Surfacing Gang Foreman
44 years old
23 years of service
Last rules training: April 1998
Last safety training: March 1998
Last Roadway Worker Class: March 1998
Last physical: April 1997

Data for All Employees (Craft, Positions, Activity)

Craft: MOW

Positions:

Track Surfacing Gang
Foreman
Three Machine Operators (Mark III Tamper, Helper Tamper, Ballast Regulator)

Track Department Welders
Welder
Welder's Helper

Bridge Construction Group
Engineering Supervisor
Assistant Bridge Foreman

SUMMARY FOR FE-26-98 CONTINUED

SELECTED FACTORS CONTINUED

Gang 3655 (from Crystal Lake, Jefferson Park, Chicago)
included the Jefferson Park Bridge Foreman
Two Assistant Foremen
(Not indicated how many others or their titles)

Gang 3656 (Highland Park)
included the Highland Park Bridge Foreman
Assistant Foreman
Three Carpenters
(Not indicated how many others or their titles)

Bridge Department Crane Group
Burro Crane Operator
Ground Man
Ohio Crane Operator

Metra Commuter Train No. 330
Locomotive Engineer

Activities: Track panel replacement, and surfacing and lining track on bridge.

SUMMARY FOR FE-26-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

The Surfacing Gang Foreman was fatally injured when struck by a commuter train.

PCF No. 1

The incident occurred when the Surfacing Gang Foreman was fouling the adjacent track. He had not been informed about the approaching train and instructed to clear the tracks, as had other employees.

PCF No. 2

The Surfacing Gang and Bridge Foremen had overlapping Track and Time Authorities in non-compliance with 49 CFR Part 214's regulations concerning Roadway Worker Protection/On-Track Safety (RWP/OTS). This contributed to the confusion and poor communication which resulted in the fatality.

PCF No. 3

The Supervisor only briefed the Bridge Workers, with four Bridge Workers absent. (Two of the absentees were placing south red and red/yellow boards for the Form B at the time of the briefing. The two other absentees were unloading tools, preparing an air compressor, and placing hose for the track panel replacement.) His briefing was inadequate as it did not specify the RWP-OTS guidelines in place (which had been established the previous day when not all employees had worked), nor did it include designation of an Employee-in-Charge. The Track Gang, Surfacing Gang, and Crane Group failed to receive briefings. No employees challenged the lack of a proper OTS job briefing.

PCF No. 4

Improper radio procedures prevented the Surfacing Gang Foreman from receiving vital information about train movements. The Bridge Foremen used the train channel 3 for communication, while other crews used channel 2. The Employee-in-Charge had a responsibility to relay train movement information immediately so all workers could clear the tracks.

SUMMARY FOR FE-26-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS CONTINUED

PCF No. 5

Poor communication occurred while attempting to clear the track. After the Engineer of the Metra Commuter Train contacted the Highland Park Bridge Foreman to request permission to enter the "Form B" limits, the Foreman told him to stand by. The Assistant Foreman, using a handset radio, attempted to clear the workers from the tracks, then informed the Highland Park Bridge Foreman that everyone was in the clear. Statements from other employees, however, conflicted about whether the Highland Park Bridge Foreman had waited for the Assistant Foreman's message before clearing the train into the "Form B" area.

Neither the Surfacing Gang Foreman nor the Mark III Tamper Operator was notified about the approaching commuter train. It is likely that the Surfacing Gang Foreman was in the bridge area behind the Mark III tamper in a crouched position which was not visible, while he was checking the line and surface of the track.

PCF No. 6

Railroad operating rules state that in multiple track territory, when trains are cleared through a Form B area at greater than 40 mph, all work must stop and operators must exit their machines. Investigators determined that this did not happen. Nevertheless, Commuter Train No. 330 was cleared at the maximum authorized speed of 59 mph, and was operating at 37 mph at the time of the incident.

PCF No. 7

The commuter train Engineer stopped sounding his whistle a considerable distance from the Roadway Workers, in non-compliance with railroad operating rules.

PCF No. 8

Analysis of UP's internal monitoring of RWP/OTS compliance revealed a surprising lack of failures, calling into question the program's credibility. For Gangs Nos. 3655 and 3656 (and other gangs working with them) during the period Jan. 1, 1998 through Oct. 8, 1998, UP did 92 audits, 23 comprehensive audits, and made 264 specific observations of which 61 involved RWP/OTS and 25 included safety activities which involved job briefings. Only three exceptions were taken, all for vehicle condition.

REPORT:	FE-26-98	
RAILROAD:	Union Pacific Railroad Company (UP)	
LOCATION:	Chicago, Illinois	
DATE & TIME:	Oct. 11, 1998, 10:17 a.m., CST	
PROBABLE CAUSE:	The Surfacing Gang Foreman was fatally injured when struck by a Metra Commuter train while fouling the adjacent track. (He had not been informed about the approaching train and instructed to clear the tracks, as had other employees.)	
EMPLOYEE:	Occupation:	Track Surfacing Gang Foreman
	Age:	44 Years
	Length of Service:	23 Years
	Last Rules Training:	April 15, 1998
	Last Safety Training:	March 26, 1998
	Last Physical:	April 1, 1997
	Last Roadway Worker Class:	March 26, 1998

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On Oct. 11, 1998, a Union Pacific Railroad (UP) Track Surfacing Gang reported for duty in Waukegan, Illinois at 6:00 a.m. The Track Surfacing Gang comprised a Foreman and three Machine Operators. They drove to Clybourne Tower, milepost 2.9, where their Mark III tamper, helper tamper, and ballast regulator were located. The machines were positioned south to north and facing south. They remained in that order and direction for the duration of the day.

A UP Bridge Construction Group had built a replacement track panel to be used on the Roscoe Street Bridge on Track No. 2 in the Kenosha Subdivision of UP's Suburban Division. Roscoe Street, located at milepost 4.75, passed under the double main track in Chicago, IL. The track panel was built on the "dead track" west of Track No. 1. From west to east, the structure was in the "dead track" area, Tracks Nos. 1 and 2. The track center line distance between Tracks Nos. 1 and 2 was 13 feet.

On Oct. 10, 1998, the Bridge Group, with assistance from UP Track Department Welders, removed the rail, ties, and ballast from the Roscoe Street Bridge on Track No. 2 . The Bridge Group then prepared the bridge for the placement of the new track panel, which was planned for the next day. A Form B, with limits from milepost 4.5 to 5, was in effect on both main tracks during the work period.

The Bridge Group comprised UP Bridge Gangs from Crystal Lake, Jefferson Park, and Chicago, Illinois (Gang No. 3655), and Highland Park, Illinois (Gang No. 3656). A Supervisor was also present at the bridge. Additionally, a Bridge Department Burro Crane Operator**,** who assisted in removing the rails, ties, and ballast from Track No. 2 at Roscoe Street, was at the location.

On Oct. 11, 1998**,** the Bridge Group returned to Roscoe Street to install the new track panel. The same Bridge Gangs which worked on Oct. 10, 1998, started at their headquarters at 6 a.m. and arrived at the Roscoe Street job site prior to 7:30 a.m. The Supervisor conducted a job briefing for the three Bridge Gangs to explain the work to be performed. The Supervisor stated the On-Track-Safety (OTS) guidelines for the group would remain the same as the previous day.

A Form B was in effect on both main tracks from mileposts 4.5 to 5.0, and was issued under the name of the Highland Park (HP) Bridge Foreman. The HP Bridge Foreman also had a Track and Time Authority for the work area with the limits being Control Point Deering, milepost 3.3, to Control Point RP (Roscoe Street location), milepost 10.6 on Track No. 2.

Also present at the Roscoe Street job site was a Track Gang, who would help the Bridge Group connect the rail ends of the replacement track panel to the existing track. The Track Gang arrived after the Bridge Group had received its job briefing.

The Bridge Group had a back wall timber to install prior to the placing of the new panel. The group was installing the timber when a Bridge Department Crane Group entered the limits of the Form B from the south on Track No. 1. The Crane Group had contacted the HP Bridge Foreman on radio channel # 3 for permission to enter the Form B area. The Crane Group comprised a Burro Crane Operator and Ground Man to the north and an Ohio Crane Operator. The Crane Operators sat on Track No. 1 and lifted the replacement track panel from the dead track area to Track No. 2. The Bridge Gang finished installing the back wall timber and most of the Bridge Gang moved to the dead track area while the replacement track panel was moved to Track No. 2. After the panel was moved to Track No. 2, the Ohio Crane Operator departed the work site in a southward direction towards Control Point Clybourne and transferred to the Harvard Subdivision.

The Surfacing Group had a job briefing at Clybourne which consisted of the work to be done, and how they would proceed from their present location, on Yard Track No. 5 north to Track No. 2 north of Clybourne and toward the Roscoe Street job site up to the south red board of the Form B area. The Surfacing Gang Foreman had a Track and Time Authority on Track No. 2 with the limits being the same as the HP Bridge Foreman's Track and Time Authority. These Track and Time Authorities were issued jointly, not consistent with the Part 214 Roadway Workplace Safety Regulation in effect at the time of the incident.

After the replacement track panel was in place, the Track Gang and the Bridge Group connected the rail ends to the existing track. The Burro Crane Operator and the Ground Man hooked up the clam shell bucket to place new ballast on the Track No. 2 new track panel. While the above tasks were being accomplished, the Surfacing Gang Foreman walked toward the Roscoe Street job site from the south. His machines were at milepost 4.5 on Track No. 2. He had attempted to contact the HP Bridge Foreman on UP radio channel # 2, which the surfacing group normally monitored. However, the HP Bridge Foreman was on UP channel # 3, which was the radio channel trains on the Kenosha Subdivision used.

The Surfacing Gang Foreman had used a radio in the Mark III tamper in his initial attempts to contact the HP Bridge Foreman. He also had a handset radio. The HP Bridge Foreman saw the Surfacing Gang Foreman walking toward the site and went to meet him. The HP Bridge Foreman verbally gave the Surfacing Gang Foreman permission to have his machines enter the Form B limits. The two Foremen then walked towards the job site. When they arrived, the Burro Crane Operator asked the Surfacing Gang Foreman if he needed any more ballast placed on the new panel. The Foreman noted some locations where he felt more ballast was needed. When this was accomplished, the Burro Crane Operator left the job site and proceeded in a southward direction towards Control Point Clybourne. The HP Bridge Foreman went to the location of his company vehicle, under the bridge on Roscoe Street, as he had heard radio conversations concerning the movement of a south bound commuter train, and he preferred to use the higher powered truck radio to communicate with trains.

When the Surfacing Gang's machines arrived at the job site, the Surfacing Gang Foreman gave instructions to the Ballast Regulator Operator to regulate the piles of ballast placed on the new track panel. When this was accomplished, the Ballast Regulator Operator and the Helper Tamper Operator moved north to a location about 200 feet north of Roscoe Street. The Mark III Tamper Operator then made an initial run, north to south, through the bridge area to check the line of the track. The Mark III Tamper Operator returned north of the bridge and then made a run through the bridge just lining the track. After the lining run, the Operator started north of the bridge, surfacing and lining the track. After the Mark III Tamper Operator passed the north end of the bridge, the Supervisor took a measurement at the north end of the bridge and calculated the track still had to be moved one inch to the east. The Supervisor talked to the Surfacing Gang Foreman and told him of his calculations.

Sometime during this period, the Engineer of Metra Commuter Train No. 330, operating on Track No. 1, contacted the HP Bridge Foreman and asked for permission to enter the Form B limits. The HP Bridge Foreman was in his company truck with the Jefferson Park (JP) Bridge Foreman. The HP Bridge Foreman told the train to stand by.

The Supervisor and an Assistant Bridge Foreman, who were standing together, had seen a headlight approaching from the north. The Assistant Foreman walked to the dead track area above the location of the Bridge Foremen in the company vehicle on Roscoe Avenue. The JP Bridge Foreman had the only hand set radio among the Bridge Group and the Assistant Foreman wanted to use it to clear workers at the job site. The Assistant Foreman returned to the job site with the handset radio and informed the workers to clear. The Assistant Foreman called the HP Bridge Foreman and informed him everyone was in the clear. Sometime after the Assistant Foreman received the handset radio, the HP Bridge Foreman cleared Commuter Train No. 330 to enter his Form B limits at milepost 5.0 on Track No. 1, at maximum authorized speed.

The weather at the time of the incident was clear, and the temperature was approximately 70° F.

THE ACCIDENT

The Mark III Tamper Operator had surfaced and lined through the bridge area. When the Mark III Tamper Operator had cleared the south end of the bridge, the Surfacing Gang Foreman walked southward from behind the tamper to a location between Tracks Nos. 1 and 2. He was standing on the east tie end of Track No. 1 when he was struck by southbound Train No. 330. When struck, the Foreman was approximately 11 feet south of the bridge and adjacent to the Operator's compartment of the Mark III tamper.

Chicago Fire Department Paramedics responded to the scene. The Foreman was pronounced dead at the scene by the Cook County Medical Examiner's Office. Additionally, the Chicago Police Department and officers from the UP and Metra Railroad Police Departments responded to investigate.

POST-ACCIDENT INVESTIGATION

Radio tapes of the conversations between the HP Bridge Foreman and the commuter train were not recorded. The Kenosha Dispatcher also controls the UP Harvard and Milwaukee Subdivisions which have different radio channels.

All of the Roadway Workers present had received RWP/OTS annual training during 1998 and were qualified Roadway Workers. However, the investigation revealed that numerous job briefings were not performed, or that job briefings were incomplete, during the day of the accident. Details follow:

- The initial job briefing given by the Supervisor did not specify the OTS guidelines in place that day. The Supervisor stated the OTS would be the same as the previous day. There was at least one employee present who had not worked the previous day. This job briefing also did not designate the Employee in Charge (EIC).

- There were Bridge Employees who were not present at the job briefing given by the Supervisor. Two Bridge Employees were placing the south red and red/yellow boards for the Form B at the time of this job briefing. Two other Bridge Employees, who were unloading tools, preparing an air compressor, and placing hose for the track panel replacement, were not present at the job briefing. These employees were not offered a job briefing when they did enter the work area.

- The Track Gang, comprising a Foreman and two Trackmen, arrived after the Supervisor gave his briefing, and they were not briefed concerning the OTS in effect at the job site by anyone else.

- The Crane Group entered the Form B limits and was not briefed concerning OTS by the Bridge Foreman who held the Form B or by anyone else. The Surfacing Group also entered the Form B limits and was not briefed concerning OTS by the Bridge Foreman or anyone else.

- None of the members of the above groups challenged the lack of a proper OTS job briefing.

- Some of the members of the groups working at the bridge stated they were not told of the approach of the crane and/or surfacing group. They stated that the machines approached very close to the bridge location before they were notified of them.

- The HP Bridge Foreman, who held the Form B, appeared to be considered the EIC by most of the group, but he had not been so designated in a job briefing. In similar bridge jobs, the JP Bridge Foreman**,** who was in the company truck on Roscoe Street, had been the employee whose responsibility was to be at the job site notifying employees of the approach of a train and then notifying the Form B Foreman that all employees were notified and cleared. This designation was not mentioned in any of the job briefings the day of the incident.

The investigation also revealed the following events associated with the fatality:

- The locomotive event recorder showed a series of six whistles by the Engineer of Commuter Train No. 330 which ended approximately 22 seconds before the incident. The event recorder showed the bell was ringing up to the time of the incident. The Engineer stated in an interview that his last whistle was approximately 1/4 mile to 1/8 mile from the work site.

- Statements made after the incident conflicted regarding whether the Assistant Foreman had contacted the HP Bridge Foreman to notify him of all employees being in the clear before or after the HP Bridge Foreman had cleared the train into the Form B limits.

- The Mark III Tamper Operator stated he was not notified of the approaching commuter train.

- The Surfacing Gang Foreman was not notified about the approaching commuter train. It is likely that when the Assistant Foreman was notifying employees, the Surfacing Gang Foreman was in the bridge area, behind the Mark III tamper in a crouched position (not visible), checking the line and surface of the track. The girders were 3' 11" above the top of the tie.

- UP rules state that in multiple track territory, when trains are cleared through a Form B at greater than 40 mph, all work must stop and Operators must exit their machines. Commuter Train No. 330 was cleared at the maximum authorized speed. Maximum authorized speed on the Kenosha Subdivision for the commuter train was 59 mph. The event recorder indicated the train was operating at 37 mph at the time of the incident.

UP conducted a hearing to determine the facts concerning the incident. The Supervisor, the HP and JP Bridge Foremen, and the Assistant Bridge Foreman were charged and removed from service by UP prior to the hearing. The four charged Bridge Employees claimed they had attended a Foreman's overlap meeting with the Bridge Department Manager in September 1998, in which it had been determined that when other crafts entered their Form B limits to perform specific tasks, the other groups could supply their own OTS. The charged employees stated that is what they thought was in effect that day for groups other than the Bridge Group.

Interviews with other Bridge Employees who also attended the overlap meeting did not substantiate the claim of the charged employees. The other employees stated that the situation mentioned at the meeting was one where another gang entered a location within the Form B, but possibly not in sight of the Foreman in charge of the Form B. They gave as an example that a Signal Maintainer checking an insulated joint a mile away could provide his own protection.

The Bridge Department Manager gave this explanation: UP's OTS rules required large groups, similar to the Surfacing Gang, to have Form B protection in multiple track territory. UP rules also prohibited overlapping Form Bs. This rule, which also applied to the Crane Group, would have required the HP Bridge Foreman to provide Form B protection to both the Surfacing and Crane Groups.

After the hearing, UP dismissed the Supervisor and the Bridge Foremen of Gangs Nos. 3655 and 3656. The Assistant Foreman was given a lesser discipline.

The remains of the Surfacing Gang Foreman were drug tested under FRA authority. FRA's toxicological results revealed the presence of cocaine and cocaine metabolites (benzoylecgonine) in his urine and blood. The concentration of the drug found indicated that it was not likely that he had used cocaine after he came on duty. Recent use of cocaine can result in residual effects that can degrade judgment, motor coordination, reaction time, and alertness. However, given the facts determined in this investigation, it is not clear whether the prior cocaine use played a role in the fatal injury. The Supervisor, the HP Bridge Foreman, and the Assistant Foreman were drug tested under UP's reasonable cause, and UP has elected not to reveal the results of these tests.

Analysis of UP's required internal monitoring of RWP/OTS compliance revealed a lack of failures, calling into question the credibility of UP's monitoring program. The internal monitoring records for Gangs Nos. 3655 and 3656 from Jan. 1, 1998 to Oct. 8, 1998 (including activities of other gangs at the same job sites with Gangs Nos. 3655 and 3656) were reviewed. The monitoring included 92 Audits, 23 Comprehensive Audits, and 264 Specific Observations of which 61 involved On-Track-Safety, and 25 Safety Activities which involved job briefings. During this 1998 monitoring activity, only three exceptions were taken, all for vehicle condition.

A 1997 audit of internal monitoring noted six UP Engineering Managers performing 141 separate monitoring functions with no exceptions taken.

APPLICABLE RULES

Excerpts of FRA regulations in CFR 49, Part 214 follow. UP's similar operating rules are also listed.

§ 214.313 Responsibility of Individual Roadway Workers.

(a) Each roadway worker is responsible for following the on-track safety rules of the railroad upon which the roadway worker is located.

(b) A roadway worker shall not foul a track except when necessary for the performance of duty.

(c) Each roadway worker is responsible for ascertaining that on-track safety is being provided before fouling a track.

(d) Each roadway worker may refuse any directive to violate an on-track safety rule, and shall inform the employer in accordance with § 214.311 when the roadway worker makes a good faith determination that on-track safety provisions to be applied at the job location do not comply with the rules of the operating railroad.

§ 214.315 Supervision and Communication.

(a) When an employer assigns duties to a roadway worker that call for that employee to foul a track, the employer shall provide the employee with a job briefing that includes information on the means by which on-track safety is to be provided, and instruction on the on-track safety procedures to be followed.

(b) A job briefing for on-track safety shall be deemed complete only after the roadway worker has acknowledged understanding of the on-track safety procedures and instructions presented.

(c) Every roadway work group whose duties require fouling a track shall have one roadway worker designated by the employer to provide on-track safety for all members of the group.

(d) Before any member of a roadway work group fouls a track, the designated person providing on-track safety for the group under paragraph (c) of this section shall inform each roadway worker of the on-track safety procedures of the work at that time and location. Each roadway worker shall again be so informed at any time the on-track safety procedures change during the work period.

§ 214.335 On-track Safety Procedures for Roadway Work Groups.

(b) No roadway worker who is a member of a roadway work group shall foul a track without having been informed by the roadway worker responsible for the on-track safety of the roadway work group that on-track safety has been provided.

§ 214.339 Audible Warning from Trains.

Each railroad shall require that the locomotive whistle be sounded and the locomotive bell be rung, by trains approaching roadway workers on or about the track.

§ 214.303 Railroad On-track Safety Programs, Generally.

Each on-track safety program adopted to comply with this part shall include procedures to be used by each railroad for monitoring the effectiveness of and compliance with the program.

UP's Discipline

UP managers disciplined the discharged employees, citing the following UP rules:

1.6(1)	Careless of the Safety of Themselves or Others
121.2.1 (b)	Maximum Speed of Trains Passing Gangs
121.5.3	Small Gangs
136.3-	Job Briefings
136.3.1	Job Briefing for Roadway Work Groups

FE-27-98 (document link)

SUMMARY FOR FE-27-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Willamette & Pacific Railroad, Inc.
Location: Monmouth, Oregon
Region: Region 8

Month: October
Date: 10/13/98
Time: 9:40 a.m., PST

Data for Fatally Injured Employee(s)

Carman
35 years old
45 days of service
Last rules training: August 1998
Last safety training: August 1998
Last physical: Not available

Data for All Employees (Craft, Positions, Activity)

Craft: MOE

Positions:

Carman
Foreman
Chief Mechanical Officer

Activity: **The Carman was traveling (in his own pickup truck) from one job site in Independence, Oregon, 28 miles to his normal duty station, McMinnville, Oregon, for the rest of his assignments.**

SUMMARY FOR FE-27-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

En route to his normal duty station, a Carman was fatally injured in a highway vehicle collision.

PCF No. 1

The incident occurred when the Carman's pickup truck collided with the passenger side of another vehicle at an intersection two miles north of Monmouth, Oregon. He died at the scene about 10 minutes later. The Carman failed to obey the traffic control devices (STOP sign and flashing red lights) at the intersection. The other driver had the right-of-way.

REPORT:	FE-27-98	
RAILROAD:	Willamette & Pacific Railroad, Inc. (WPRR)	
LOCATION:	Monmouth, Oregon	
DATE & TIME:	Oct. 13, 1998, 9:40 a.m., PST	
PROBABLE CAUSE:	The Carman was fatally injured in an automobile accident when he failed to obey traffic control devices (STOP sign and flashing red lights).	
EMPLOYEE:	Occupation:	Carman
	Age:	35 Years
	Length of Service:	45 Days
	Last Rules Training:	Aug. 28, 1998
	Last Safety Training:	Aug. 28, 1998
	Last Physical Exam:	Not Available

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On Oct. 13, 1998 at 7:00 a.m., following completion of an off-duty period of 21 hours, the employee went on duty at his residence. The employee, a Carman, was assigned to travel to the Sumotomo Rail welding facility in Independence, Oregon. He drove his private vehicle, a 1978 Chevrolet pickup truck, to the rail plant to inspect some welded rail that the WPRR was purchasing. After completing his inspection of the rail, he called his Foreman at 9:10 a.m. for the next assignments he was to complete at his normal duty station, McMinnville, Oregon, 28 miles northwest of lndependence.

After leaving Independence, the Carman traveled west on Hoffman Road for approximately two miles to the intersection of Hoffman Road and State Highway 99W. The intersection of Hoffman Road and State Highway 99W was two miles north of Monmouth, Oregon and was equipped with flashing red signals and STOP signs for traffic traveling west and east on Hoffman Road, and flashing yellow lights for traffic traveling north and south on Highway 99W. Traffic traversing the intersection on Highway 99W was not required to stop and had the right-of-way. At the intersection, visibility of traffic traveling on Highway 99W was unrestricted.

At the time of the accident, it was daylight, the sky was overcast, and the temperature was 55^{o} F.

THE ACCIDENT

At 9:40 a.m., the Carman's vehicle, heading west on Hoffman Road, approached the intersection of Highway 99W. According to a witness interviewed by the Oregon State Police, the Carman failed to obey the traffic control device (STOP sign and flashing red lights) located at the intersection. The Carman's vehicle collided with the passenger side of a vehicle heading north on Highway 99W. Polk County Fire and Rescue responded to the crash scene at 9:48 a.m. Shortly thereafter, a Polk County Deputy Sheriff arrived at the scene. They found the Carman positioned in the driver seat of his vehicle, slumped over and leaning towards the passenger door. Emergency medical technicians tried to resuscitate the employee, without success. At 9:53 a.m., the Carman died at the scene. At 10:27 a.m., members of the Oregon State Police, including one Crash Reconstruction Technician, arrived to assist with the investigation.

At approximately 11:30 a.m., the Carman's body was removed from the scene by mortuary technicians.

POST-ACCIDENT INVESTIGATION

Post-accident toxicological testing was not required under the provisions of 49 CFR Part 219.201. However, a blood alcohol test was performed by the Oregon State Medical Examiner. The results were negative.

According to the Polk County Deputy Sheriff, the Carman had a seat belt on at the time of the accident and was alone in the vehicle. The person (non-railroad employee) operating the other vehicle was taken to the hospital, treated for minor injuries, and released on the day of the accident.

During an interview with the deceased Carman's wife, she stated that “he [the Carman] had had a good night's rest and was fully rested before going on duty the morning of Oct. 13, 1998."

The cause of death was head and abdominal injuries.

The Chief Mechanical Officer for the Willamette Pacific Railroad was contacted and presented with an article from the American Automobile Association. The article stated that lack of attention while driving a highway vehicle contributes to many automobile accidents and that 37 percent of drivers involved in accidents take no evasive action. The Chief Mechanical Officer said he would address this issue at future safety meetings with all his employees.

APPLICABLE RULES

Willamette & Pacific Railroad Safety Rules

General Safety Rule L-3. Operating Highway Vehicles - Drivers of motor vehicles must obey Local, State, and/or Federal motor vehicle codes.

Oregon Vehicle Code

ORS. 811.265(1) (b).- Fails to obey any specific traffic control device described in ORS 811.260 in the manner required by that section.

FE-28-98 (document link)

SUMMARY FOR FE-28-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Chicago Central & Pacific Railroad Company (CCP)
Location: Cicero, Illinois
Region: Region 4

Month: October
Date: 10/26/98
Time: 8:55 a.m., CST

Data for Fatally Injured Employee(s)

Locomotive Engineer
42 years old
18 years of service
Last rules training: May 1998
Last safety training: June 1997
Last physical: June 1997
Re-certification date: July 1997

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Train GCG1CH-25
Locomotive Engineer
Conductor

Yard Employees
Carman/Hostler
Director of Rules & Operating Practices for CCP and Illinois Central Railroad Company (IC)
IC Supervisor of Locomotive Engineers

Train Dispatcher

Activity: **The Locomotive Engineer and Conductor were going off duty, while the Carman resumed switching.**

SUMMARY FOR FE-28-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Locomotive Engineer was fatally injured when struck by a 3-unit locomotive consist being switched by the Carman.

PCF No. 1

The incident occurred as the Locomotive Engineer, who was going off duty, walked across the tracks from the yard office to the parking lot. Distracted by waving to a company official, she failed to maintain vigilance on the tracks.

PCF No. 2

The Carman sounded the horn twice and rang the bell continuously on the controlling locomotive GTW 6222 (in compliance with railroad operating rules), but failed to ring the bell or display the headlights and ditch lights on the leading locomotive GTW 6202 on the point of the shoving movement (in non-compliance with railroad operating rules).

PCF No. 3

The railroad failed to establish procedures to provide protection for employees traversing the crosswalk between the yard office and parking lot.

REPORT: FE-28-98

RAILROAD: Chicago Central and Pacific Railroad Company (CCP)

LOCATION: Cicero, Illinois

DATE & TIME: Oct. 26, 1998, 8:55 a.m., CST

PROBABLE CAUSE:

The Engineer, momentarily distracted by waving to a company official while fouling the track, failed to maintain proper alertness of her surroundings and was fatally injured when struck by a 3-unit locomotive consist in a switching move.

EMPLOYEE:		
	Occupation:	Locomotive Engineer
	Age:	42 years
	Length of Service:	18 years
	Last Rules Training:	May 23, 1998
	Last Safety Training:	June 24, 1997
	Last Physical Exam:	June 25, 1997
	Re-certification Date:	July 21, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

All times listed in this report are Central Standard Time (CST). The Locomotive Engineer and Conductor, assigned to Chicago Central and Pacific (CCP) Train GCG1CH-25, reported for duty in Waterloo, Iowa, at 9:30 p.m., Oct. 25, 1998. Both employees completed their statutory off-duty periods. Train GCG1CH-25, comprising five locomotives and 75 hopper cars loaded with grain, departed Waterloo, Iowa at 10 p.m., and was destined for Hawthorne Yard (milepost 8.9) in Cicero, Illinois in the Freeport District.

The Carman, assigned to the CCP mechanical department, reported for duty at Hawthorne Yard at 7 a.m., Oct. 26, 1998. His first assignment was to bleed the air reservoirs of the rail cars on Tracks Nos. 1 and 3. The Carman then walked to the lead track to air test a train. After he completed this task, he returned to the yard office at approximately 8:30 a.m.

Train GCG1CH-25 arrived at milepost 10, just west of the Hawthorne Yard at 8 a.m., Oct. 26, 1998. The Crew was instructed by the Train Dispatcher to cut off three locomotives, leave the two trailing locomotives (GTW 6010 and GTW 6018) attached to the 75-car grain train at milepost 10, and operate

locomotives GTW 6222 (lead), GTW 6209 (middle), and GTW 6202 (trailing) into the Hawthorne Yard. Additionally, the Crew was also instructed by the Train Dispatcher to wait for CC Train I-12 to clear its location before entering Hawthorne Yard.

The accident occurred in a section of Hawthorne Yard designated as a locomotive servicing area. The servicing area comprised three tracks: the middle track from the yard lead to the end of the track; the fuel track from the switch off Track No. 2 to the end of the track; and the stub track from the switch off the fuel track to the end of the track. The tracks in the locomotive servicing area were tangent and under the exclusive control of the mechanical department. The Hawthorne Yard office was located north of the fuel, middle, and lead tracks, and south of the two main line tracks.

According to the Conductor, the Crew moved the three locomotives through Hawthorne Yard and left them unattended on the middle track in the locomotive servicing area, just outside the yard office. As the Crew was pulling into the middle track, they coupled onto GTW 6802 and GTW 5804. The Conductor got off of the 3-unit consist and released the locomotive independent brakes on the two locomotives (GTW 6802 and GTW 5804) before the Crew shoved the entire consist in the clear. The two locomotives were to be used for yard switching later. The Crew detrained, and, at approximately 8:30 a.m., entered the yard office. The Engineer was to return to Waterloo, Iowa by van, and the Conductor was scheduled to remain in town. The Carman left the yard office at 8:40 a.m. and walked eastward to the 5-locomotive consist on the middle track. The Carman boarded GTW 6222 (the middle unit of the five) and moved the consist further east on the middle track to clear the crossover switch. He then got off GTW 6222, walked back to align the two switches, and returned to uncouple GTW 6222 from GTW 6802. He re-boarded GTW 6222. Additionally, while the Carman was performing these movements, CCP Train I-12 was moving east on the lead track, and transportation had arrived for the Engineer and Conductor.

GTW 6222 was on the east end of a 3-unit locomotive consist, with the Carman occupying the Engineer's seat on the south side of the middle track. The Carman positioned the seat to enable him to preview his movement in a westward direction out the rear window of the locomotive. At 8:54 a.m., the Carman initiated a reverse movement, shoving GTW 6209 and GTW 6202 from controlling locomotive GTW 6222. During this shoving movement, GTW 6202 was in the lead and unoccupied. The consist traversed west to northwest to west again and through the crossover switches toward the yard office. The Carman stated that he sounded the horn twice and rang the bell continuously on the controlling locomotive, GTW 6222, but did not ring the bell nor display the headlights or ditch lights on the leading locomotive (GTW 6202) on the point of the shoving movement.

The weather was sunny and calm, and the temperature was 60^{o} F.

THE ACCIDENT

The Engineer exited the yard office and stepped directly across the fuel track on her way to the parking lot, where she stopped to wait for the eastbound freight train to pass on the lead track. She was wearing prescription eye glasses and carrying a duffel bag over her left shoulder and another bag in her left hand. The Engineer briefly stood between the middle track and just south of the fuel track, facing south towards the parking lot. She made eye contact with the Director of Rules and Operating Practices for the CCP and Illinois Central Railroad Company (IC), who was standing in the parking lot at the bottom of the crosswalk, through the various car configurations that passed between them. The Engineer leaned over slightly and waved with her right hand at the Director. The snow plow on GTW 6202 struck the Engineer and dragged her along the outside of the south rail of the fuel track, crushing her between the snow plow and the outer portion of the locomotive's fuel tank.

The Carman stopped the locomotive consist when he observed what he thought was a grip (duffel bag) falling from the leading locomotive in the shove, GTW 6202. When the movement came to a stop, the consist had traveled 90 feet beyond the point of impact. The Engineer's body was lying 36 feet from the point of impact, face down on its right side, against the outside of the south rail of the fuel track and between locomotives GTW 6202 and GTW 6209. The Director stated that the sound of the bell ringing on the approaching locomotives could be distinguished clearly over the noise of the passing train just prior to the Engineer being struck. Because the Director was prevented from providing immediate assistance to the Engineer by the movement of the eastbound train, he ran back to his car and attempted to call for help. The Conductor, who was standing in the yard office, saw the Engineer being struck and requested that the IC Supervisor of Locomotive Engineers (SLE) call 911. The SLE immediately called 911 from the yard office. After stopping the movement, the Carman got off the controlling locomotive and went to the rear of the consist. He was followed by the Conductor who ran outside and around the now stopped locomotive consist to the body. The Cicero Fire Department Paramedics were first to respond, followed by the Cicero Police Department. The Paramedics examined the Engineer for vital signs and confirmed there were none. Cicero Police Department records indicated they had received the 911 call at 8:56 a.m. The Cook County Medical Examiner arrived on the scene and pronounced the Engineer dead at 10:45 a.m.

POST-ACCIDENT INVESTIGATION

The Carman stated that he was moving the locomotive consist to the fuel track solely to provide access to GTW 6802 and GTW 5804 for a Yard Switching Crew. The Carman stated that he never saw the Engineer standing near the track as he moved the consist through the crossover switches.

Since the movement was within the confines of a locomotive servicing area, the Carman was not required to possess a Locomotive Engineer's certificate. However, the railroad was required to provide training for the operation of locomotives. The Carman stated that he received two weeks of training three years ago when he entered service for the CCP. The Carman also stated that when he routinely operated locomotives from the middle track to the fuel track, they were previously set up as the controlling locomotive. This routine resulted in a reverse movement and/or a leading end movement. The Carman's Federally mandated post-accident toxicological testing was negative. The

Cook County Medical Examiner's office lists the cause of death as multiple internal injuries. It was determined that the 3-locomotive consist was operating at a recorded speed of 5 mph at impact.

APPLICABLE RULES

Illinois Central/Chicago Central & Pacific
Operating Rules

First Edition
Effective Date Not Shown

Rule 409: RINGING ENGINE BELL. Ring the engine bell before moving, except when part of momentary stop and start switching movements. Bell must be rung while approaching and passing roadway workers, tunnels, and highway/rail grade crossings.

410 (5): SOUNDING WHISTLE. ooo When stopped, back up. Acknowledgment of hand or radio signal to back up.

HEADLIGHT DISPLAY. Turn the headlight on bright at the front of every train. Ditch lights, if available, must be on whenever the headlight is on bright. Engines working in yards will have headlight displayed at all times; however, the light may be extinguished on the end coupled to cars.

HANDLING CARS AHEAD OF ENGINE. When cars or engines are shoved and conditions require, a Crew Member must take an easily seen position on the leading cars or engine, or be ahead to direct the movement. Cars or engines must not be shoved to block other tracks until it is safe to do so.

Maintenance of Equipment
Safety Rules
Effective Date Not Shown

ME-840: Display headlights in the direction of movement when proceeding in the Locomotive Servicing Area.

General Transportation Department
Safety Rules
Effective Date Not Shown

T-60: Employees must:

(a) Expect the movement of trains, locomotives, or cars at any time, on any track, and in either direction.

b) Keep a sharp lookout in both directions for approaching equipment, when it is necessary to walk or work on track.

c) Look in both directions to make sure that a locomotive, car, or train is not approaching before stepping onto or crossing tracks.

d) Allow trains, locomotives, or cars to pass a safe distance before crossing tracks.

e) Keep a safe distance from the ends of standing cars or locomotives when going around them to cross the tracks.

f) Make sure that the way is clear when walking out of doorways, around corners, or around obstructions that require you to go on or across the tracks.

g) Keep a careful lookout for obstructions, holes, openings, ground irregularities, etc., to prevent tripping, slipping, falling, or turning an ankle.

h) Keep a safe distance from passing cars or locomotives to avoid falling objects and projections on trains.

T-70: Employees must not:

Walk, stand, or be foul of tracks, except when required in the performance of their duties.

b) Walk or step on the rail, frog, switch, guard rail, interlocking machinery, or connections.

c) Walk or stand between the rails of a track except when required in the performance of their duties.

d) Cross tracks immediately in front of moving equipment.

e) Sit on rails, the end of ties, bridge railings, or any part of the track structure.

FE-30-98 (document link)

SUMMARY FOR FE-30-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: CSX Transportation, Inc.
Location: Boligee, Alabama
Region: Region 3

Month: November
Date: 11/10/98
Time: 2:50 p.m., CST

Data for Fatally Injured Employee(s)

Welder/Helper
42 years old
20 years of service
Last rules training: February 1998
Last safety training: September 1998
Last physical: September 1997

Data for Employees (Craft, Positions, Activity)

Craft: MOW

Positions:

Welder/Helper

Activity: **The Welder/Helper was traveling from New Orleans to Knoxville, where he planned to stay for a few days prior to proceeding to his next assignment in Michigan. He was driving a 2 ½ -ton, 66,000 GVW (gross vehicle weight) welding vehicle at the time of the incident.**

SUMMARY FOR FE-30-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Welder/Helper was en route to his next assignment when he lost control of his vehicle which crashed through the railing and went over a bridge, struck the ground below, rolled 25 feet, and fatally crushed him on impact.

PCF No. 1

The post-accident investigation revealed that just prior to the incident, the right front tire of the welding vehicle had ruptured, causing the driver to lose control. The investigation disclosed no evidence that the tire might have struck a foreign object prior to rupturing.

REPORT: FE-30-98

RAILROAD: CSX Transportation, Inc. (CSX)

LOCATION: Boligee, Alabama

DATE & TIME: Nov. 10, 1998, 2:50 p.m., CST

PROBABLE CAUSE: The Welder/Helper was en route to his next assignment, when the right front tire of the welding vehicle he was driving ruptured, causing the driver to lose control of the vehicle. The vehicle subsequently crashed through the railing, went over a bridge, struck the ground below, rolled 25 feet, and fatally crushed the driver on impact.

EMPLOYEE:

Occupation:	Welder/Helper
Age:	42 Years
Length of Service:	20 Years
Last Rules Training:	Feb. 3, 1998
Last Safety Training:	Sept. 30, 1998
Last Physical Examination:	Sept. 30, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On the morning of Nov. 10, 1998, the Welder/Helper (CSX Welding Gang 5X09) left New Orleans, Louisiana, driving the welding vehicle. At the weigh station near Picayune, Mississippi, he was delayed because the permits had him traveling the wrong direction. This problem was resolved, and he proceeded northward on I-59 to Knoxville, Tennessee. The Welder/Helper planned to stop over in Knoxville for a few days prior to proceeding on to Michigan for his next assignment.

The vehicle was a 2 2-ton, 1993 Ford 9000 series, 66,000 GVW (gross vehicle weight), and was specially made by Chemetron ATV(all terrain vehicle).

At the time of the accident, the sky was overcast with a visibility of 7.2 miles, and the temperature was 69" F, with 8.3 mph winds.

THE ACCIDENT

On Nov. 10, 1998, at about 2:50 p.m., CST, (now on I-59/20) near Boligee, Alabama, the eastbound vehicle was traveling about 70 mph, according to the Alabama State Trooper's report of the accident. As the welding vehicle approached the first bridge east of Tombigbee River Bridge, the right front tire ruptured and the vehicle veered to the right and subsequently struck the metal guard rail on the right side, then struck the concrete railing of the west end of the bridge.

After crashing through and knocking out about 10 feet of the railing, the vehicle went over the edge of the bridge, struck the ground below, and rolled over for about 25 feet, coming to rest on its left side. The driver was fatally crushed in the cab of the truck.

POST-ACCIDENT INVESTIGATION

The post-accident investigation disclosed that the tire had apparently ruptured, because there were pieces of the tire and also pieces of the fiberglass fender scattered along the highway about 150 feet preceding the bridge. There was no evidence on the roadway preceding the accident site that the vehicle may have struck a foreign object to cause the tire to fail.

The Alabama State Trooper's "Opinion of what Happened" stated "VI was traveling eastbound when the right front tire failed. The blowout caused the VI to run through the guard rail on the right side of the road, and VI dropped into a ravine, rolling over several times."

REMEDIAL ACTION

The carrier's Engineering Department managers related the accident to their subordinates the next morning. Safety and defensive driving rules were also reviewed.

FE-31-98 (document link)

SUMMARY FOR FE-31-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Illinois Central Railroad Company
Location: Baton Rouge, Louisiana
Region: Region 5

Month: November
Date: 11/18/98
Time: 12:15 p.m., CST

Data for Fatally Injured Employee(s)

Carman
56 years old
31 years of service
Last rules training: November 1998
Last safety training: Weekly Meetings
Last physical: September 1997

Data for All Employees (Craft, Positions, Activity)

Craft: MOE

Positions:

Yard Crew
Two Carmen
Conductor
Brakeman
Yardmaster

UP Crew for Train LLL 44-18 (Local Livonia, Louisiana)

Crew for outbound Train LBRGE (Local Baton Rouge to Geisner, Louisiana)

Activities which occurred (in the order they were mentioned):

Outbound inspection; initial terminal train air brake test; EOT test; roll-by inspection of a train air brake release; switching.

SUMMARY FOR FE-31-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Carman was fatally injured when struck by two rail cars rolling free during a switching operation.

PCF No. 1

The fatally injured Carman was crossing the tracks to board auto transportation to the north end of the yard where he would perform a roll-by train air brake release inspection of an outbound train. While walking perpendicular to the Yard Crew's switching movements which he could observe, the Carman stepped in front of two cars being switched, was struck by two rail cars rolling free, and was fatally injured.

PCF No. 2

The Yard Crew did not properly secure rail cars during switching operations.

REPORT:	FE-31-98	
RAILROAD:	Illinois Central Railroad Company (IC)	
LOCATION:	Baton Rouge, Louisiana	
DATE & TIME:	Nov. 18, 1998, 12:15 p.m., CST	
PROBABLE CAUSE:	The Carman was fatally injured when he stepped in front of two cars being switched and was struck by two other rail cars rolling free.	
EMPLOYEE:	Occupation:	Carman
	Age:	56 Years
	Length of Service:	31 Years
	Last Rules Training:	Nov. 8, 1998
	Last Safety Training:	Weekly Meetings
	Last Physical Examination:	Sept. 10, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On Nov. 18, 1998, a Carman reported for a scheduled 8-hour shift at the Baton Rouge Yard. This work shift was scheduled for 7 a.m. - 3 p.m., his regular shift. The Carman had performed an outbound inspection and initial terminal train air brake test on LLL 44-18, a local Union Pacific train to be operated to Livonia, Louisiana. He had conducted the initial terminal train air brake test on Tracks Nos. 5 and 14. The UP Crew had doubled the train from Track No. 5 to Track No. 14. Then the Carman performed an end-of train device (EOT) test.

The EOT was armed, and the Carman was en route to the north end of the yard to perform a roll-by inspection of the train air brake release. He and the other Carman working with him in the yard were to board auto transportation, provided by the Yardmaster, to the north end of the yard. The Carman was proceeding on foot in a generally east-northeast direction across the yard to meet the other Carman and board their transportation. During this time, the other Carman, who was performing a roll-by inspection of the train air brake release for outbound train LBRGE (Local Baton Rouge to Geisner, Louisiana), was standing between the main track and the road, north of the Yard Office and south of the Allied lead. Train LBRGE was proceeding southbound on Track No. 1A.

A Yard Crew was switching cars from the switching lead onto various tracks as dictated by its switch list. This was a south-to-north movement with approximately six cars remaining to be switched. The Carman was walking perpendicular to their switching movements and could clearly observe the Crew's activity.

The weather at the time of the accident was fair, with a temperature in the low 80's.

THE ACCIDENT

The Carman stepped into the gage of the lead track, between switches for Tracks Nos. 2 and 3, was struck by two rail cars rolling free on the lead track on his right rear side, and was knocked face down between the rails. His left arm and shoulder apparently were positioned on the rail as the first of two loaded covered hopper cars that had been switched onto Track No. 1 struck him and the L4 wheel ran over his body, severing his left arm and shoulder. The force of the impact caused his hard hat to land on the end deck of the car, beneath the slope sheet. The Carman stood up and walked approximately 40 feet southward after the accident and then collapsed. The Yard Conductor saw him at this location as he fell down. The Conductor and Brakeman attempted to aid the Carman and summoned help using their radio. There were no witnesses to the actual impact and amputation.

A call was made to 911 at approximately 12:15 p.m., and emergency medical services arrived at the scene a short time later. The Carman was transported by ambulance to Baton Rouge General Hospital where he was pronounced dead at 1 p.m.

POST-ACCIDENT INVESTIGATION

FRA's Mandatory Post-accident Toxicological Testing was conducted on the deceased; the results of this test were negative.

An autopsy was performed, and the immediate cause of death, as indicated in the death certificate, was determined to be exsanguination from a lacerated left axillary artery.

The employees in the vicinity of the accident reported no unusual circumstances preceding the accident.

Post-accident investigation and interviews with employees in the vicinity at the time of the accident indicate the accident occurred when the Carman apparently stepped in front of two cars which were being switched, resulting in the Carman's death.

APPLICABLE RULES

The Illinois Central Railroad Transportation Safety Rules T-60 and T-70 apply.

T-60: Employees must:

1) Expect the movement of trains, locomotives, or cars at any time, on any track in either direction; and

c) Look in both directions to make sure that a locomotive, car or train is not approaching before stepping onto or crossing tracks.

T-70 Employees must not:

d) Cross tracks immediately in front of moving equipment.

The Carman had received training and was qualified as a Utility Employee under Illinois Central rules, which includes training on these rules.

FE-32-98 (document link)

SUMMARY FOR FE-32-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: CSX Transportation, Inc.
Location: Perrysburg, Ohio
Region: Region 2

Month: November
Date: 11/23/98
Time: 11:30 a.m., EST

Data for Fatally Injured Employee(s)

Track Inspector
43 years old
24 years of service
Last rules training: August 1998

Data for All Employees (Craft, Positions, Activity)

Craft: MOW

Positions:

Track Inspector

Track Foreman

Private Highway Vehicle

Four male passengers and one male driver returning home
from a funeral where they had served as pallbearers.

Activity: **The Trackmen had completed their track inspection using a hi-rail vehicle from Deshler to Perrysburg, Ohio. They were making their return trip on an adjacent highway in the same hi-rail vehicle.**

SUMMARY FOR FE-32-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

Traveling in a hi-rail vehicle, a Trackman was fatally injured and a Track Foreman was seriously injured during a highway collision with a van whose five occupants were seriously injured; one of the passengers died the next day.

PCF No. 1

Two Trackmen were making their return trip from Perrysburg to Deshler, Ohio, when the driver of a sport van with four passengers traveled left of center and struck the CSX hi-rail vehicle head-on, resulting in a fatal collision.

REPORT: FE 32-98

RAILROAD: CSX Transportation, Inc. (CSX)

LOCATION: Perrysburg, Ohio

DATE & TIME: Nov. 23, 1998, 11:30 a.m., EST

PROBABLE CAUSE: The driver of a sports van traveled left of center, striking a CSX hi-rail vehicle head-on, fatally injuring the Track Inspector and one of the van's five occupants, and seriously injuring the Track Foreman and the rest of the van's occupants.

EMPLOYEE:

Occupation:	Track Inspector
Age:	43 Years
Length of Service:	24 Years
Last Rules Training:	Aug. 4, 1998

CIRCUMSTANCES PRIOR TO THE ACCIDENT

A CSX Track Inspector reported for duty at 7:30 a.m. on Nov. 23, 1998 at CSX Transportation's Ottawa Depot, in Ottawa, Ohio. His assignment for the day was to inspect the CSX Detroit Division's main track from Deshler northward to Perrysburg, Ohio using a CSX hi-rail vehicle, and return to Deshler by public highway. The hi-rail vehicle was a 1993 Chevrolet Model 2500 Cheyenne pickup truck.

On this assignment, the Track Inspector was being assisted by a CSX Track Foreman. The two employees completed their inspection of the main track and upon arrival at Perrysburg, removed their hi-rail vehicle from the track. They entered the public highway and began their return trip to Deshler, Ohio.

The employees were proceeding southward toward Deshler on Ohio State Route 65 in compliance with all applicable railroad rules and state and local highway laws. They were both using the lap/shoulder belts provided in the CSX hi-rail vehicle. The Track Inspector was driving the hi-rail vehicle, and the Track Foreman was riding in the front passenger seat. After departing Perrysburg, they passed Roachton Road in Middleton Township, Wood County, and were traveling within the posted speed limit of 55 mph.

Also at this time, a privately-owned 1988 Chevrolet Model G-10 Sport Van, with four male passengers and a male driver, was proceeding northbound on Ohio State Route 65. The five occupants were returning home from a funeral where they had served as pallbearers. They had just passed Five Point Road in Middleton Township, Wood County, and were traveling toward Roachton Road within the posted speed limit of 55 mph.

Ohio State Route 65 was dry, straight, and level, with clear and visible pavement markings. Ohio State Route 65 was a 2-lane asphalt highway approximately 19 feet in width. This highway roughly paralleled the main track of the CSX Detroit Division between Perrysburg and Lima, Ohio. CSX employees normally used this highway in the course of their assigned duties.

At the time of this accident, it was daylight, the sky was clear, and the temperature was 58º F. The wind speed was 37 to 43 mph.

THE ACCIDENT

At approximately 11:30 a.m., the northbound privately-owned van traveled left of center on Ohio State Route 65 and struck the CSX hi-rail vehicle head-on. The CSX Track Inspector was pronounced dead at the scene, and the CSX Track Foreman was in serious condition. All five occupants of the privately owned van were seriously injured. Three of the injured people were taken to the Medical College of Ohio Hospital in Toledo, Ohio by helicopter, one to the Medical College of Ohio by ambulance, and the other two to St. Lukes Hospital in Maumee, Ohio.

POST-ACCIDENT INVESTIGATION

No alcohol or drug use was detected at the scene of the accident, and both drivers were found to be in apparently normal condition. There were no mechanical defects detected on either vehicle that could have contributed to or caused the accident.

The evidence at the scene of the accident indicated that the privately owned van traveled left of center to strike the CSX hi-rail vehicle. This evidence was in the form of gouge marks in the roadway to indicate that the point of impact occurred in the CSX hi-rail vehicle's lane of travel.

The Wood County Sheriff's Department had not been able to determine why the privately owned van had traveled left of center to strike the CSX hi-rail vehicle. Wood County laws required that when traffic accidents resulted in fatalities, the matters were to be presented to the Grand Jury for disposition. The Wood County Grand Jury voted and decided to pursue a misdemeanor vehicular homicide charge. The case was then sent to the Municipal Prosecutor.

A blood sample was drawn from the CSX Track Inspector and transported to a laboratory for analysis. The result was "none detected."

On Nov. 24, 1998, one of the passengers from the privately owned van died of injuries received in the collision.

APPLICABLE RULES

All applicable CSX rules were being followed at the time of the accident.

The 1998 Ohio Traffic Code Handbook for the Operation of Motor Vehicles states in part:

4511.29 Driving to the Left of Center Line

Elements:

1. Driving
2. A vehicle or trackless trolley
3. To the left of the center on the roadway

Penalty:

A minor misdemeanor.

FE-36-98 (document link)

SUMMARY FOR FE-36-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Union Pacific Railroad Company
Location: Gothenburg, Nebraska
Region: Region 6

Month: December
Date: 12/22/98
Time: 9:20 p.m., CST

Data for Fatally Injured Employee(s)

Assistant Track Foreman
44 years old
24 years of service
Last rules training: January 1998
Last safety training: January 1998
Last physical: December 1997

Data for All Employees (Craft, Positions, Activity)

Craft: MOW

Positions:

Track Gang
Track Foreman
Assistant Track Foreman
Tamper Operator
Tamper Operator's Helper
Ballast Regulator Operator

Contracted Crew Van Driver

Work Train
Locomotive Engineer
Conductor
Brakeman

Activity: Track repair following a 27-car derailment the day before.

SUMMARY FOR FE-36-98 CONTINUED

POSSIBLE CONTRIBUTING FACTORS

EVENT

An Assistant Track Foreman was fatally injured when struck by a tamper coming toward him.

PCF No. 1

The Assistant Track Foreman was on his way along a maintenance service road to shut the doors on the ballast train. Abruptly and without looking both ways and otherwise exercising due diligence on the tracks, he turned and stepped up onto Track No. 1 in front of a tamper coming toward him at 5 mph.

PCF No. 2

The area where the ballast was unloaded had temporary lighting, provided by portable power plants, while the area west of there, including the accident site, was dark. Nevertheless, the Assistant Track Foreman declined the offer of the Conductor's lantern and removed his reflective striped vest, leaving it in the center of Track No. 1. The only light was provided by the Crew Van Driver who followed 100 feet behind him to assist with his headlights.

REPORT:	FE-36-98	
RAILROAD:	Union Pacific Railroad Company (UP)	
LOCATION:	Gothenburg, Nebraska	
DATE & TIME:	Dec. 22, 1998, 9:20 p.m., CST	
PROBABLE CAUSE:	The Assistant Track Foreman was fatally injured when struck by a tamper as he stepped onto the track without ensuring it was clear.	
EMPLOYEE:	Occupation:	Assistant Track Foreman
	Age:	44 Years
	Length of Service:	24 Years
	Last Rules Training:	Jan. 13, 1998
	Last Safety Training:	Jan. 12, 1998
	Last Physical:	Dec. 23, 1997

CIRCUMSTANCES PRIOR TO THE ACCIDENT

At approximately 9:30 a.m. on the day of the accident, an Assistant Foreman reported for duty at Willow Island, Nebraska to assist in repairing the track at milepost 245.1 after a 27-car derailment had destroyed parts of three main lines on Dec. 21, 1998. Milepost 245.1 was located approximately three miles east of Gothenburg, Nebraska.

The Assistant Foreman was with a work group unloading ballast at the derailment site on Track No. 2 from a 45-car work train. After unloading three cars of ballast from the middle of the ballast train, the train pulled approximately one-quarter mile west. The movement was necessary to clear the area where the ballast had been dumped to allow surfacing to begin. After a short job briefing, the Assistant Foreman began walking west on the north side of the ballast train between Tracks Nos. 1 and 2.

At about the same time, a work train, tamper, and ballast regulator were preparing to move west on Track No. 1. The work crews had just completed surfacing on Track No. 1 and were heading to the crossover switches at CPB 254. The work train, tamper, and ballast regulator were lined up east to west, respectively.

Also at this time, a Crew Van Driver contracted by the railroad had just picked up the Conductor and Brakeman who had been working on the same ballast train with the Assistant Foreman. They were on

the maintenance road that ran parallel to the main lines and lay to the north of all three tracks. The van was heading west to pick up the Locomotive Engineer of their crew.

After the equipment on Track No. 1 had moved approximately 700 feet west, the Regulator Operator saw a reflective striped vest in the center of Track No. 1. The Regulator Operator sounded his horn, and the Assistant Foreman stepped off the track to the north side. As he continued walking west on the maintenance road, the Crew Van Driver was approximately 100 feet behind him on the same road assisting him with his headlights.

The distance from where the ballast was unloaded to where the accident occurred was approximately 1,400 feet. The area where the ballast was unloaded had temporary lighting, provided by portable power plants, while the area west of there, including the accident site, was dark.

The weather at the time of the accident was clear and cold, with a temperature of -5□F.

THE ACCIDENT

The Assistant Foreman had walked approximately 700 feet after clearing Track No. 1 for the regulator, when he abruptly turned and stepped up onto Track No. 1 in front of the tamper. The Tamper Operator=s Helper saw the Assistant Foreman=s hard hat and called out for the Tamper Operator to stop. The Operator sounded his horn and applied the brakes immediately, but was unable to avoid striking the Assistant Foreman who was standing in between the rails of Track No. 1. The tamper was approximately one-half mile behind the regulator and estimated to have been traveling 5 mph at the time of the accident. The tamper was traveling in the forward direction.

When the tamper came to a complete stop, the Assistant Foreman was under the machine between the rails with no part of the machine touching his body. The three witnesses in the crew van and the two Tamper Operators immediately ran to the Assistant Foreman=s aid, but upon reaching him, they determined the injuries to be fatal and notified the Engineer on the ballast train to call for help.

The Gothenburg Rescue Unit was called and responded within 10 minutes of the accident. After viewing the scene, the unit called the Dawson County Sheriff=s Department, who arrived a short time later. The Dawson County Deputy Attorney pronounced the Assistant Foreman dead at the scene from a massive head injury.

POST-ACCIDENT INVESTIGATION

In interviews conducted by UP and FRA, investigators determined that a job briefing had been conducted after the ballast was unloaded and before the Assistant Foreman left to check the doors. During the job briefing, the Foreman said that he Atold the Assistant Foreman and the guys that were dumping rock to go down and shut the doors on the ballast train.@ Other employees interviewed indicated they did not know why the Assistant Foreman decided to go alone, although it was not uncommon for one person to perform this routine task. The Conductor was also present during the job briefing and offered the Assistant Foreman the use of his lantern and the headlights of the crew van since it was dark. The Assistant Foreman declined the lantern, but agreed to the headlights. It was also determined through interviews that an updated job briefing was provided when instructions were

given to move the equipment to Track No. 1. This information was relayed to the Assistant Foreman via radio from a Supervisor at the derailment site and acknowledged.

Investigators determined that all lights on the tamper were functioning properly at the time of the incident. The Operator had inspected and performed routine maintenance on the machine that morning and took no exceptions to the machine=s performance or safety appliances.

The three witnesses in the crew van, who had viewed the final actions of the Assistant Foreman, all agreed that he had failed to look in either direction before crossing the tracks.

No autopsy was performed on the Assistant Foreman. However, the Federally required post-accident toxicological testing was performed on the Assistant Foreman. The test results were negative. The railroad also erroneously collected urine specimens under FRA authority for the Tamper Operator and his Helper. These two sets of specimens were not tested since these personnel were not subject to testing under FRA=s regulation found in Title 49 CFR Part 219. This discrepancy in testing has been forwarded to the Operating Practices Specialist in Region 6 for appropriate investigation.

APPLICABLE RULES

General Code of Operating Rules
Union Pacific Railroad Company

1.1.2 Alert and Attentive

Employees must be careful to prevent injuring themselves and others. They must be alert and attentive when performing their duties and plan their work to avoid injury.

1.20 Alert to Train Movement

Employees must expect the movement of trains, engines, cars, or other movable equipment at any time, on any track, and in any direction.

Employees must not stand on the track in front of an approaching engine, car, or other moving equipment.

Employees must be aware of the location of structures or obstructions where clearances are close.

81.1.1 Walking On or Near Tracks

Do not stand or sit on, walk fouling of, or walk between rails of track unless required by assigned duties.

When standing, walking, or working between or near tracks, keep a careful lookout in both directions for trains, locomotives, cars or other moving equipment and expect

movement at any time, on any track, in any direction. Do not rely on hearing the approach of a train or equipment.

Foremen or others in charge of employees working on or about the tracks must require the employees to be alert and watchful and to keep out of danger.

81.1.2 Precautions Near Passing Trains or Equipment

When near passing trains or equipment:

- Move away from the track to avoid being struck by car doors, protruding or falling articles.
- Stand clear of all tracks when trains are approaching or passing in either direction. Do not stand on one track while trains are passing on an adjacent track.
- Do not allow yourself or others to be next to or between equipment while a train or equipment is closely passing on the adjacent track.
- Do not rely on others to notify you of an approaching train, engine or other equipment unless that person=s duties include providing warnings.

Code of Federal Regulations
Title 49, Part 214, Railroad Workplace Safety
Subpart C - Roadway Worker Protection

214.313.01 Roadway worker fouling track when not necessary in the performance of duty.*

*Investigators concluded that if the Assistant Foreman was only crossing the track on which he was struck, then he was not in violation since protection was not needed to only cross a track, as opposed to walking down the tracks or working on them. They established through interviews that he broke this rule earlier when walking down the middle of the track on his way to check the doors, since the maintenance road on the north side provided a safe place to walk.

FE-37-98 **(document link)**

SUMMARY FOR FE-37-98:
SELECTED AND POSSIBLE CONTRIBUTING FACTORS

SELECTED FACTORS

Railroad: Illinois Central Railroad Company
Location: Durant, Mississippi
Region: Region 3

Month: December
Date: 12/28/98
Time: 4:32 p.m., CST

Data for Fatally Injured Employee(s)

Conductor
55 years old
26 years of service
Last rules training: May 1997
Last safety training: November 1998
Last physical: August 1998

Data for All Employees (Craft, Positions, Activity)

Craft: Transportation

Positions:

Crew of Road Assignment L-DUGR-28
Locomotive Engineer
Trainman
Conductor

Train Dispatcher

Activity: Switching

SUMMARY FOR FE-37-98

POSSIBLE CONTRIBUTING FACTORS

EVENT

A Conductor, who was riding behind the bulkhead of the lead flat car in a shoving movement, was fatally injured when the lead car struck fallen trees on the track and derailed.

PCF No. 1

The Conductor did not comply with railroad operating rules requiring him to take an easily seen position on the lead car while directing the movement.

PCF No. 2

The Engineer did not comply with the restricted speed requirements, making it impossible to stop the train in time, or for the Conductor himself to get off before the car struck the trees.

PCF No. 3

In non-compliance with Federal regulations, the Crew did not maintain continuous radio communications while switching, and did not provide to one another necessary information such as the precise distance of the movement.

REPORT: FE-37-98

RAILROAD: Illinois Central Railroad Company (IC)

LOCATION: Durant, Mississippi

DATE & TIME: Dec. 28, 1998, 4:32 p.m., CST

PROBABLE CAUSE: The Conductor, who was riding behind the bulkhead of the lead flat car in a shoving movement, was fatally injured when the lead car struck fallen trees on the track and derailed.

EMPLOYEE:

Occupation:	Conductor
Age:	55 years
Length of Service:	26 years
Last Rules Training:	May 30, 1997
Last Safety Training:	Nov. 11, 1998
Last Physical Examination:	Aug. 4, 1998

CIRCUMSTANCES PRIOR TO THE ACCIDENT

On the day of the accident, the Crew of Road Assignment L-DUGR-28 went on duty at 4 p.m. at the Illinois Central (IC) Yard, in Durant, Mississippi, after completing the statutory off-duty period. The Crew, comprising an Engineer, Trainman, and Conductor were assigned to perform local switching service at various locations between Durant and Grenda, Mississippi.

The Crew Members' first assignment was to perform several short switching moves in Durant Yard to assemble their train. Following these moves, the train was ready to depart Durant Yard for their first customer, International Paper. The train consisted of 22 empty bulkhead flat cars, two loaded bulkhead flat cars, and two locomotives (IC-8722 and IC-9618). The loaded bulkhead flat cars were positioned next to the locomotives.

A Track Warrant was issued to L-DUGR-28 which authorized the Crew to operate from Durant to Grenada. Train movements were authorized by Track Warrant Authority and supplemented by an Automatic Block Signal System (ABS). The Conductor boarded the northern most car in the consist (or last car in the consist, lead car in the shoving movement), which comprised empty bulkhead flat cars, and instructed the Engineer to shove northward to International Paper (IP). The Engineer complied with the instruction and started to shove northward toward IP, 6,650 feet north of the yard at Durant. The Trainman, after aligning switches behind their move, boarded the northern most locomotive and joined the Engineer who was controlling the train from this unit. After clearing a highway-rail grade crossing, the Conductor radioed the Engineer, “The crossing is clear, let's go to IP.”

In the accident area, the track was tangent for about 15 miles and ran geographically north and south with no extreme grade percentages. In the accident area, the point of derailment was in the middle of a 139-foot long, open deck trestle. The trestle crossed the Little Indian Creek with the top of the trestle located approximately 12 feet above the water line. At the time of the accident, the water in the creek had risen approximately three feet due to run-off from a rain storm from the previous two days.

At the time of the accident, the weather was cold with a light breeze, and the sky was overcast with a visibility of about three miles. The temperature was 36º F.

THE ACCIDENT

At approximately 4:32 p.m., while L-DUGR-28 was operating at a speed of 22 mph, the Conductor advised the Engineer by radio, "Stop H.C., we are going to hit a tree; I did not see it in time." The Engineer placed the automatic brake valve in the service position, and then the air brake system went into emergency. After stopping, the Engineer tried to contact the Conductor by radio, but he did not answer. The Engineer opened his window and looked out around the car of pulpwood next to his locomotive and discovered that the lead (north) car that the Conductor was riding was derailed to the east side of the track.

The Engineer instructed the Trainman to go to the north end of the train and check on the Conductor. The Engineer ran to an adjacent wood yard office that was close by and called for an ambulance. After the Engineer had returned to the locomotive, the Trainman contacted him by radio and advised him that he was at the north end of their train. The Trainman advised that he had found the Conductor under the third car from the north end and that he was dead. The Engineer then contacted the Train Dispatcher by radio and apprised him of the situation.

Emergency response from the town of Durant, Mississippi arrived at approximately 4:45 p.m., and the Coroner from Lexington, Mississippi arrived at 5:30 p.m. The Conductor was pronounced dead at the scene by the Holmes County Coroner at 6 p.m.

POST-ACCIDENT INVESTIGATION

An IC Track Inspector had hi-railed the line prior to the accident. This was in fact the last movement over the line prior to the accident. The Track Inspector reported that he took no exception to the accident area and did not observe trees either leaning or close to the track. A measurement was taken of the right-of-way, and the subject tree was not located on railroad property. The tree was located 53 feet from the center line of the track.

The Engineer and Trainman were interviewed by FRA personnel after the accident. The Trainman indicated that it was standard practice for the Crew to shove north to IP and that it was also standard practice for the Conductor and sometimes even himself to ride the deck of a bulkhead flat car instead of the side of the car. During the course of his statement, the Trainman indicated that they had been doing this for years and he didn't think anything was wrong with it,

except he thought the speed was too much. He stated he felt that it did not make any difference where the Conductor was riding. At that speed, you could not get off the car or protect yourself if a derailment occurred. The Trainman further stated that he never cautioned the Engineer to slow down.

Train L-DUGR-28 had travelled north from Durant Yard 5,220 feet, during which minimal radio communications were made between the Conductor and the Engineer. The shoving move was conducted without continuous radio contact, so there was no way to determine when the trees actually fell across the track.

The investigation disclosed that no one actually observed the Conductor riding behind the bulkhead of the flatcar on the day of the accident. Statements from the Brakeman and a Civilian Witness both indicated that the bulkhead was the normal position for the Crew Members to ride. Since carrier officials stated they did not take exception to employees riding in this position on the car body, it appears that the Conductor was riding behind the bulkhead on the day of the accident.

The investigation also disclosed that the Train Crew Members failed to perform a transfer air brake test as required by 49 CFR 232 prior to their departure from Durant. A mechanical inspection of the equipment involved was conducted, and no defects were noted. The failure to conduct a transfer brake test did not contribute to the accident.

Toxicological tests were conducted as required by 49 CFR §219 on all the Crew Members. All test results were negative.

An autopsy conducted by the State of Mississippi did not indicate any contributing factors to the accident.

APPLICABLE RULES

Code of Federal Regulations

The provisions of 49 CFR Part 220, Subpart 220.49 require that when radio communications are used in lieu of hand signals in connection with the switching, backing, or pushing of a train, engine, or car, the employee directing the movement shall give complete instructions or keep in continuous radio contact with the employee receiving the instructions. When backing, or pushing a train, engine, or cars, the distance of the movement must be specified and the movement must stop in one-half of the remaining distance unless additional instructions are received.

The provisions of 49 CFR Part 232.13 (e) (1) require that for transfer train and yard movements not exceeding 20 miles, the air brake hose must be coupled between all cars, and after the brake system is charged to not less than 60 pounds, a 15-pound brake service application must be made to determine that the brakes are applied on each car before releasing and proceeding.

The provisions of 49 CFR Part 240.117 (e) (3) require that a review of an existing certification shall be initiated promptly upon the occurrence and documentation of any conduct described in this paragraph with "failure to adhere to procedures for the safe use of train or engine brakes when the procedures are required for the compliance of a transfer brake test according to provisions of 49 CFR, Part 232."

Illinois Central Operating Rules, First Edition

IC Operating Rule No. 503 reads in part, when handling cars ahead of the engine, when cars or engines are shoved and conditions require, a Crew Member must take an easily seen position on the leading car or engine or be ahead to direct the movement....

IC Operating Rule No. 518 reads in part, when a train or engine is required to move at restricted speed, it must proceed prepared to stop within one half the range of vision short of train, engine, railroad car, roadway workers, or equipment fouling the track, stop signal, or derail or switch lined improperly. The Crew must keep a lookout for broken rail and not exceed 20 miles per hour.

Corrective Action

The IC conducted safety meetings with their employees at outlying points concerning this accident and covered the violations that related to the subject accident. The railroad has taken action via efficiency testing with Crews at outlying points to enforce compliance with the rules.

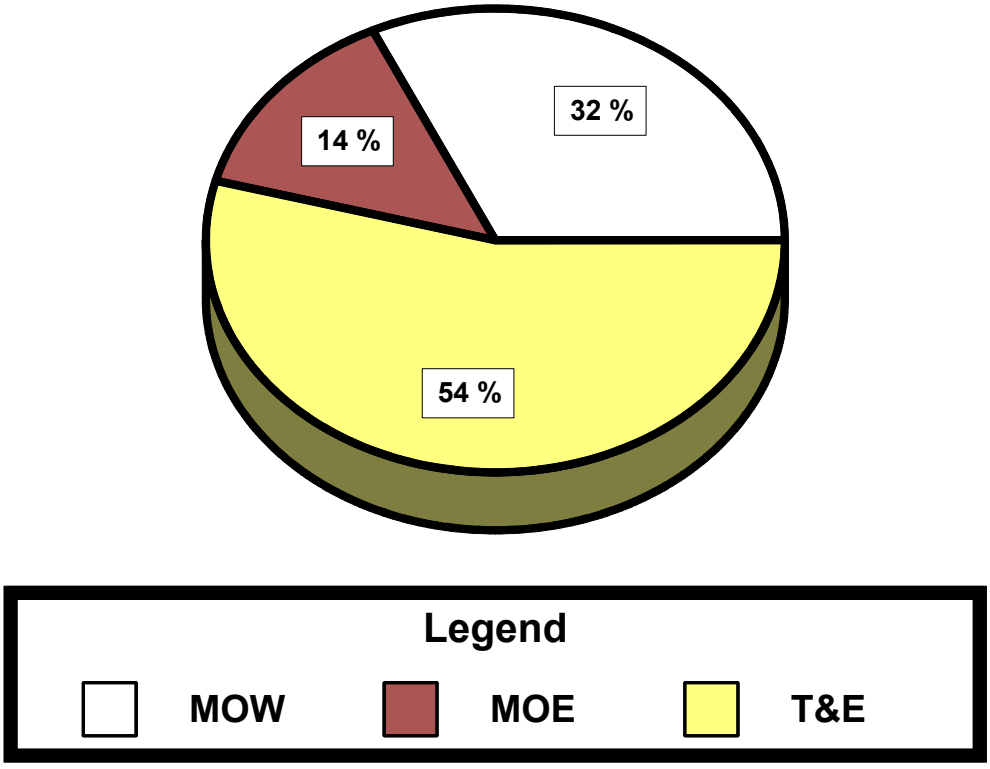
The railroad is taking the position that the employees are in compliance with operating and safety rules when riding behind the bulkhead on a flat car.

FRA performed follow-up efficiency testing with railroad officials during the week of Feb. 22, 1999, to determine the level of employee compliance with the operating and safety rules. Additional joint efficiency testing will be conducted during the month of April as part of the region's review of the Memphis Terminal.

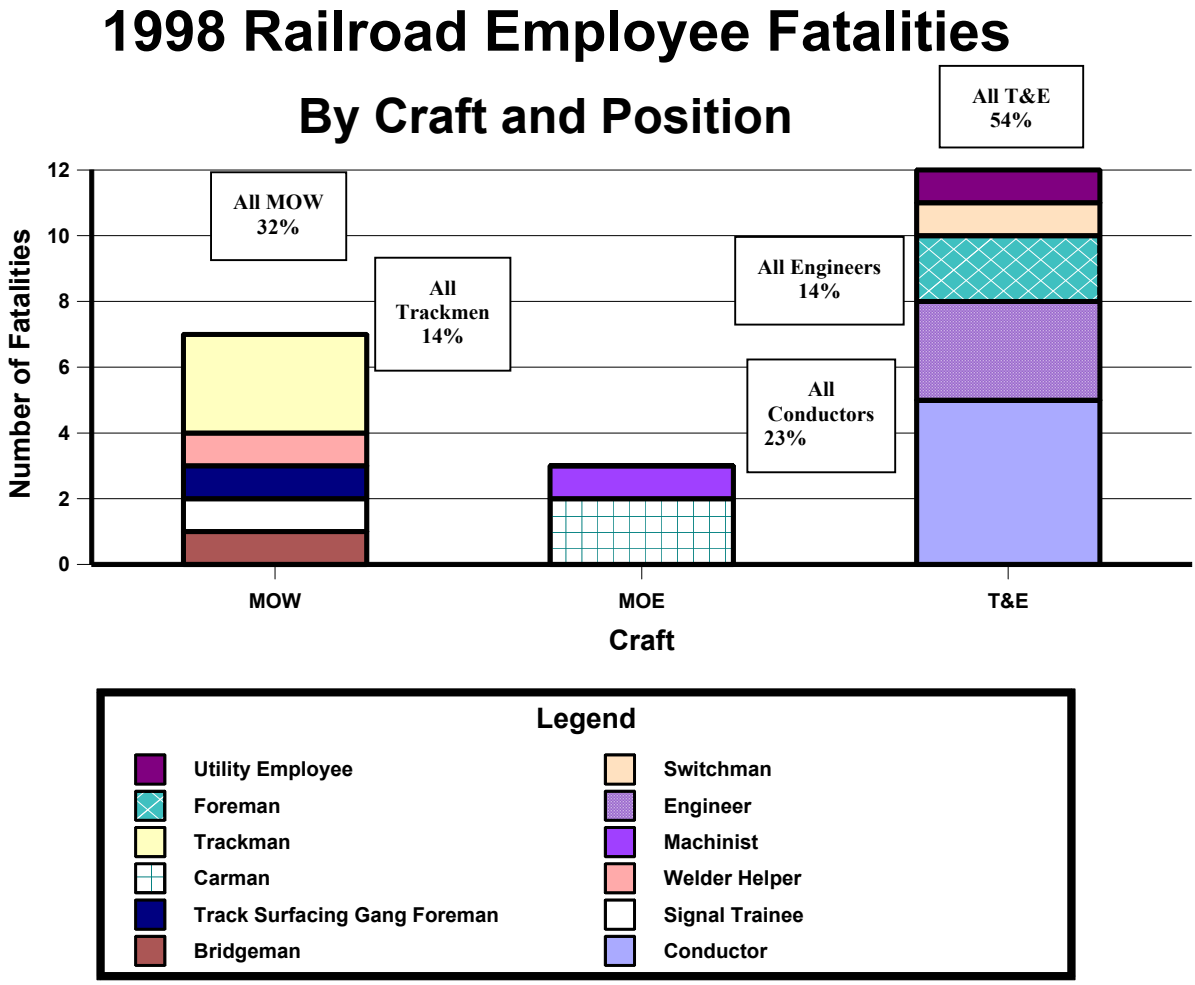
APPENDIX A

1998 Railroad Employee Fatalities

By Craft



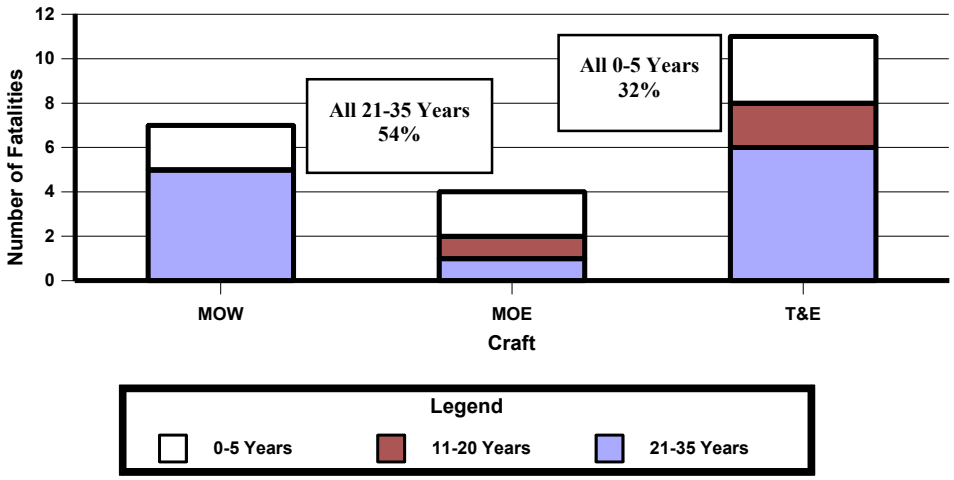
APPENDIX B


1998 Railroad Employee Fatalities
By Craft and Position
All T&E
54%
All MOW
32%
All
Trackmen
14%
All Engineers
14%
All
Conductors
23%
Number of Fatalities
12
10
8
6
4
2
0
MOW
MOE
T&E
Craft
Legend
Utility Employee
Foreman
Trackman
Carman
Track Surfacing Gang Foreman
Bridgeman
Switchman
Engineer
Machinist
Welder Helper
Signal Trainee
Conductor

APPENDIX C

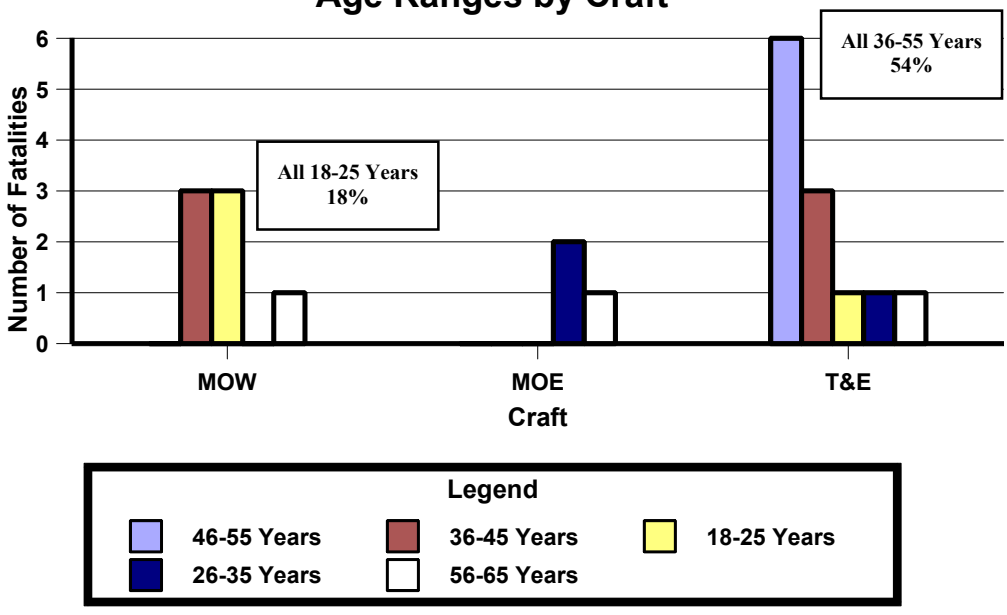
1998 Railroad Employee Fatalities

Years of Service by Craft

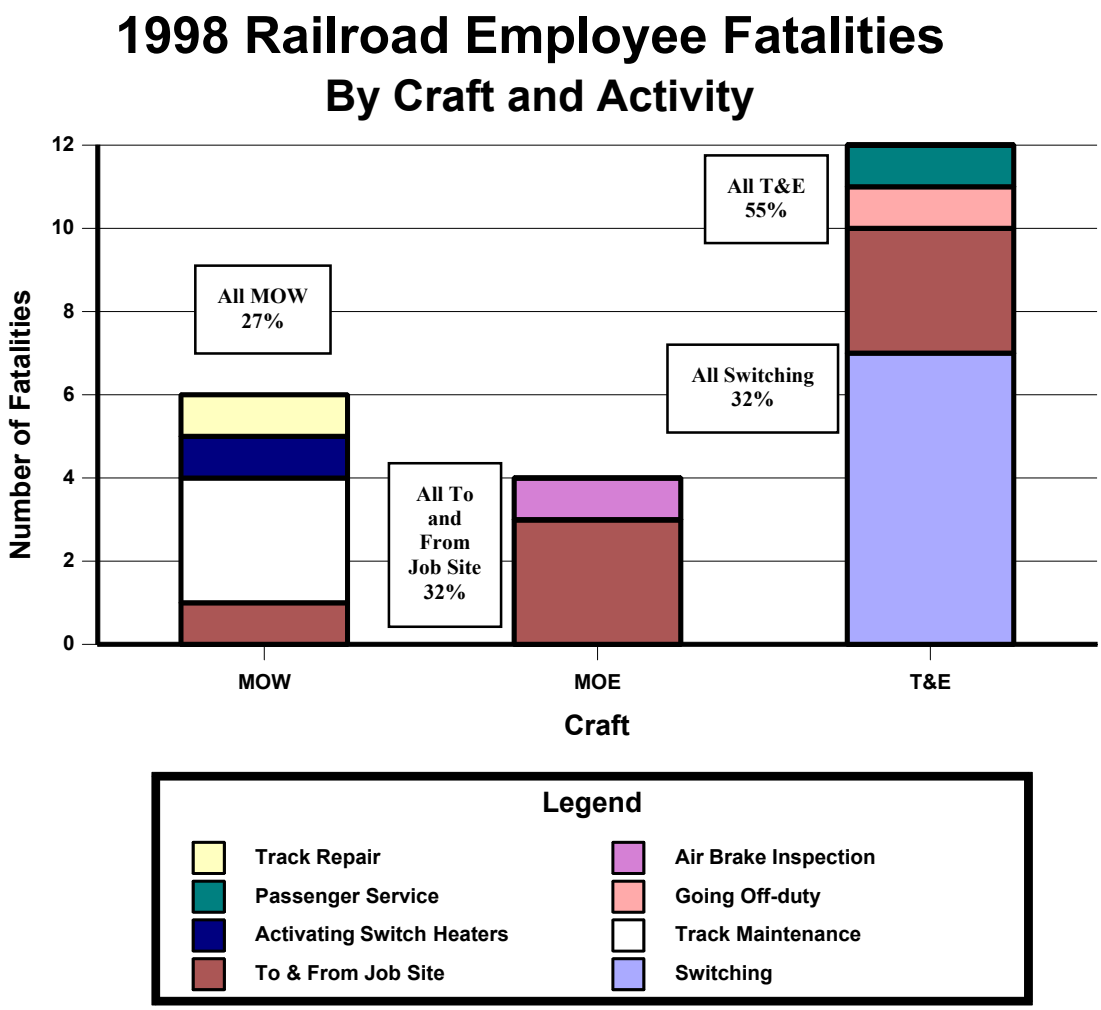


1998 Railroad Employee Fatalities

Age Ranges by Craft



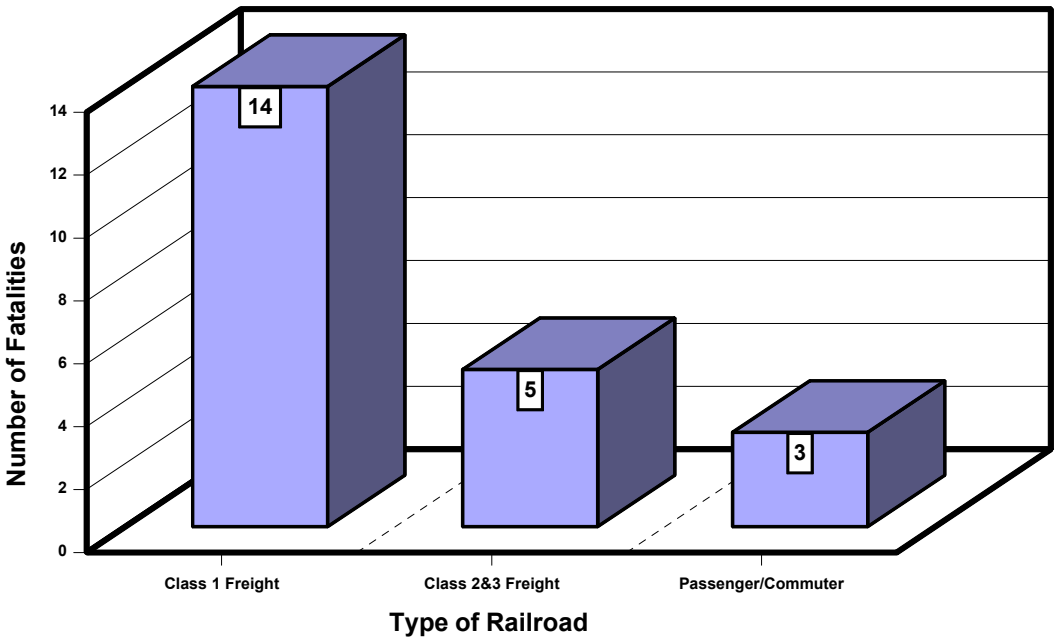
APPENDIX D


1998 Railroad Employee Fatalities
By Craft and Activity
Number of Fatalities
0
2
4
6
8
10
12
All MOW
27%
All To
and
From
Job Site
32%
All Switching
32%
All T&E
55%
MOW
MOE
T&E
Craft
Legend
Track Repair
Passenger Service
Activating Switch Heaters
To & From Job Site
Air Brake Inspection
Going Off-duty
Track Maintenance
Switching

APPENDIX E

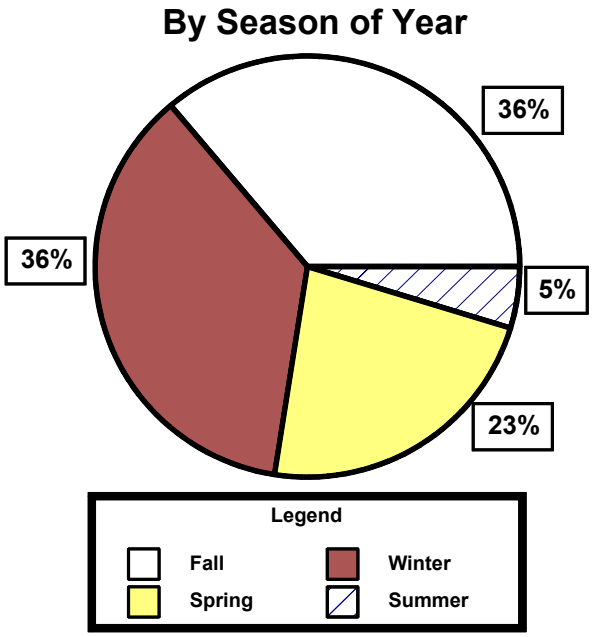
1998 Railroad Employee Fatalities

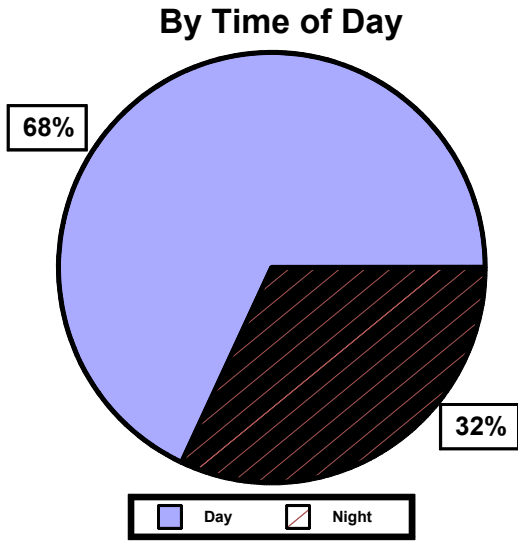
By Type of Railroad



APPENDIX F

1998 RAILROAD EMPLOYEE FATALITIES

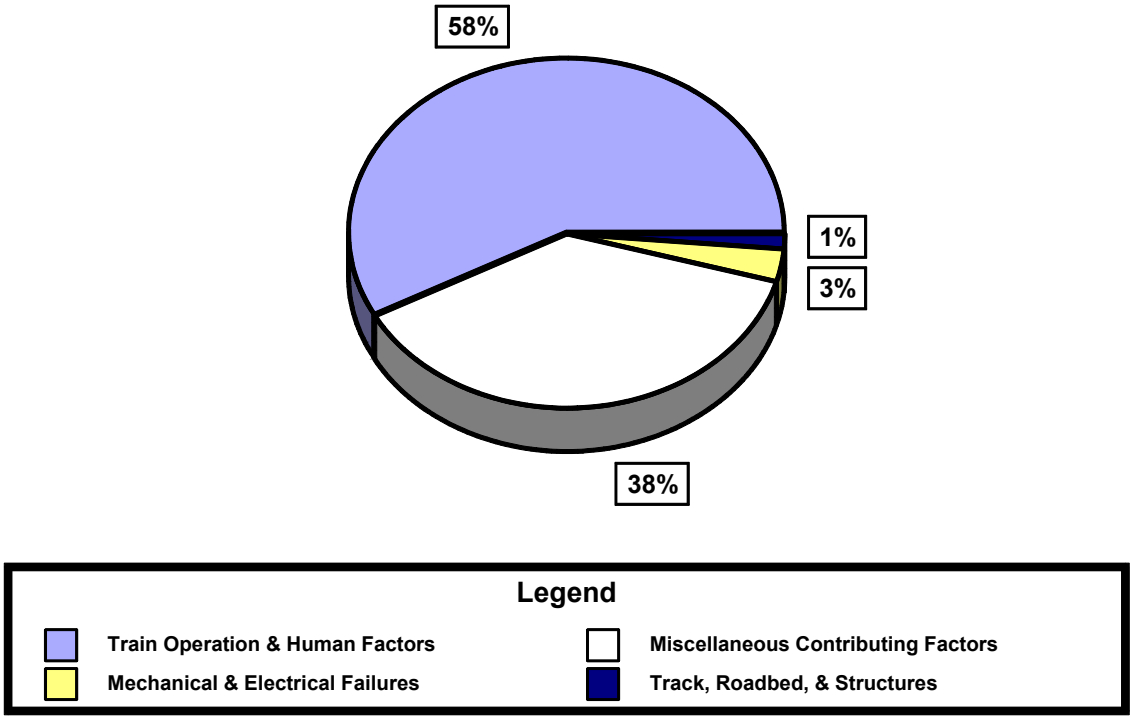




APPENDIX G

1998 Railroad Employee Fatalities

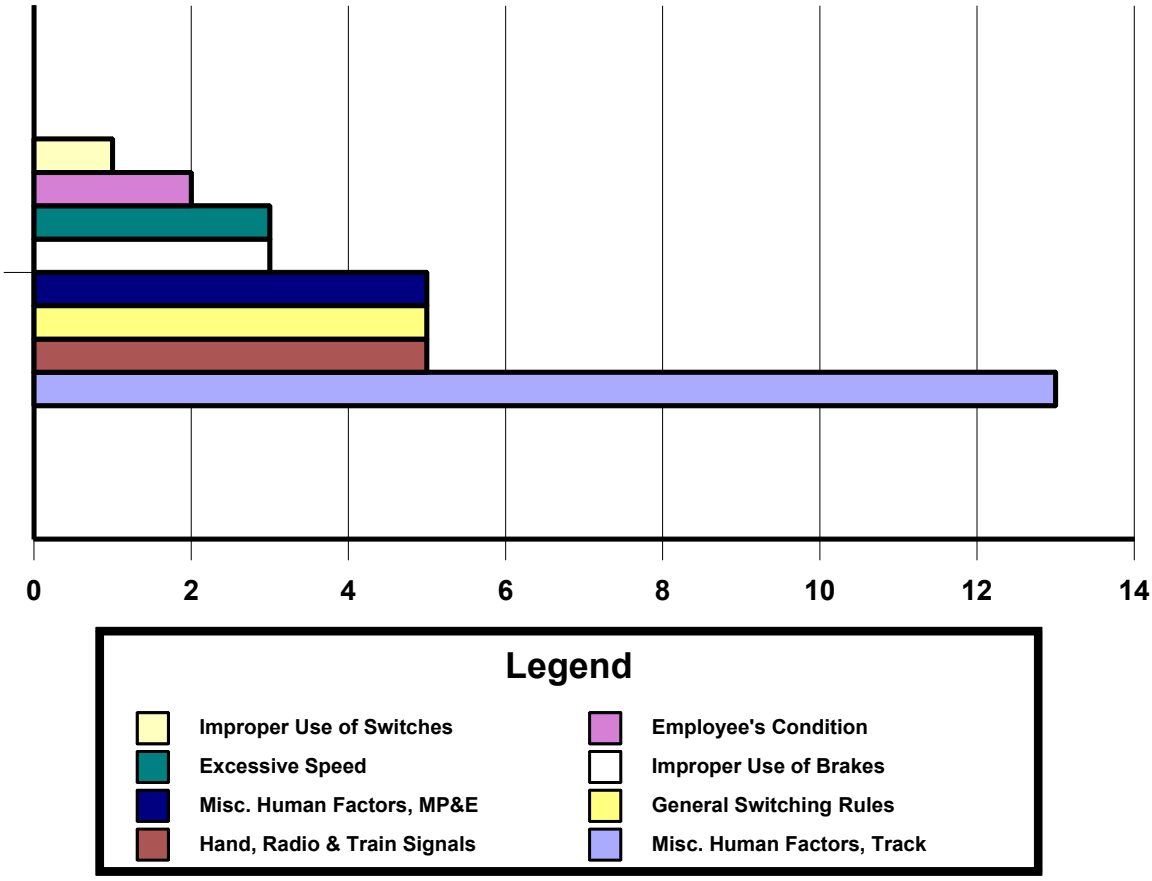
Major Possible Contributing Factor Categories



APPENDIX H

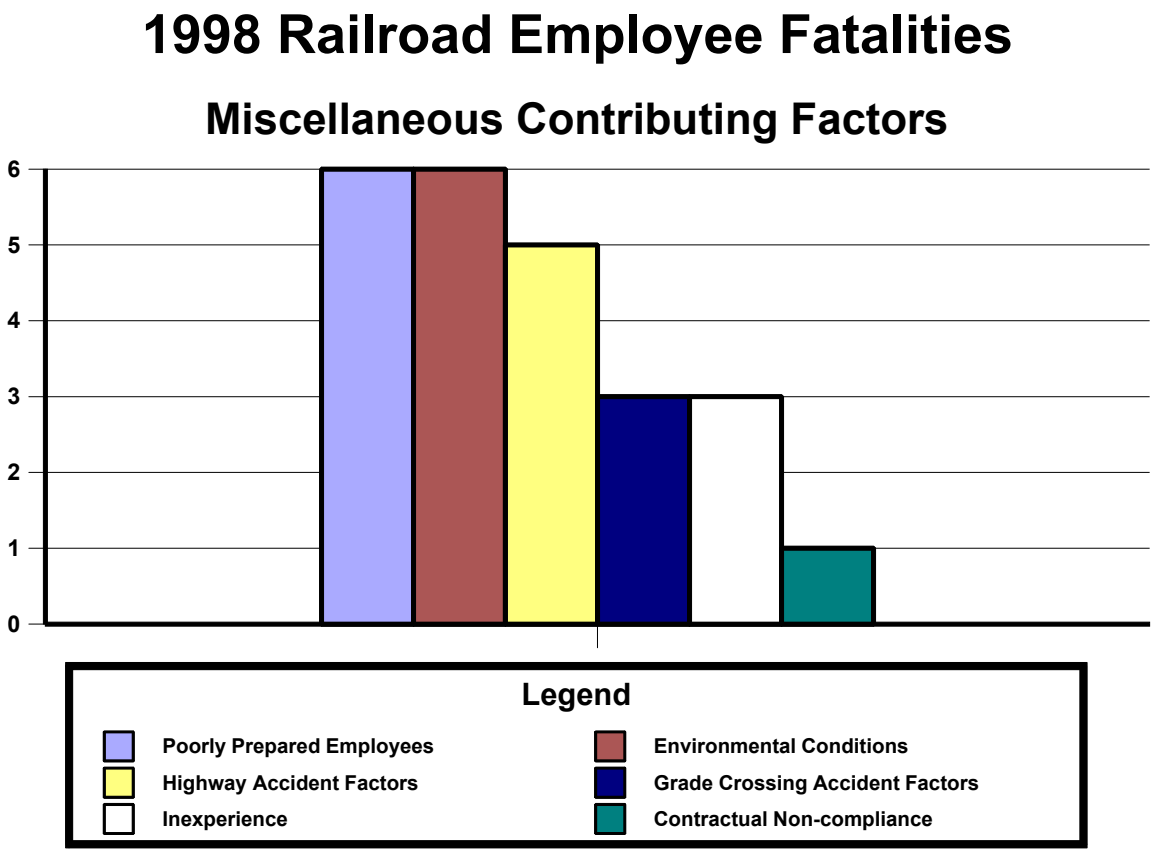
1998 Railroad Employee Fatalities

Train Operation & Human Factors Involved



See the Executive Summary (Pages 5-6) for ***specific PCFs*** included in each of the above sub-categories. For example, "Hand, Radio & Train Signals" includes inappropriate or no use of radio signals and train signals such as horns, bells, ditch lights, and headlights. "Miscellaneous Human Factors, Track" includes non-compliance with Bridge Worker Safety requirements; no or inadequate provisions for Roadway Worker Protection, On-Track Safety; fouling the track; unsafe crane operation; and inadequate crosswalk safety provisions.

APPENDIX I



See the Executive Summary (Page 6) for ***specific PCFs*** included in each of the above sub-categories. For example, "Poorly Prepared Employees" includes inadequate training, supervision, briefing, and communication. "Highway Accident Factors" includes not wearing a seatbelt, speeding, non-compliance with STOP signs and other traffic control devices, driving left of the center line into oncoming traffic, and ruptured tires.