



U.S. Department  
of Transportation  
**Federal Railroad  
Administration**

# **ENGINEERING DEPARTMENT FATALITIES RESULTING FROM THE OPERATION OR MAINTENANCE OF ON-TRACK EQUIPMENT CALENDAR YEARS 1989-1993**

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Background Information**



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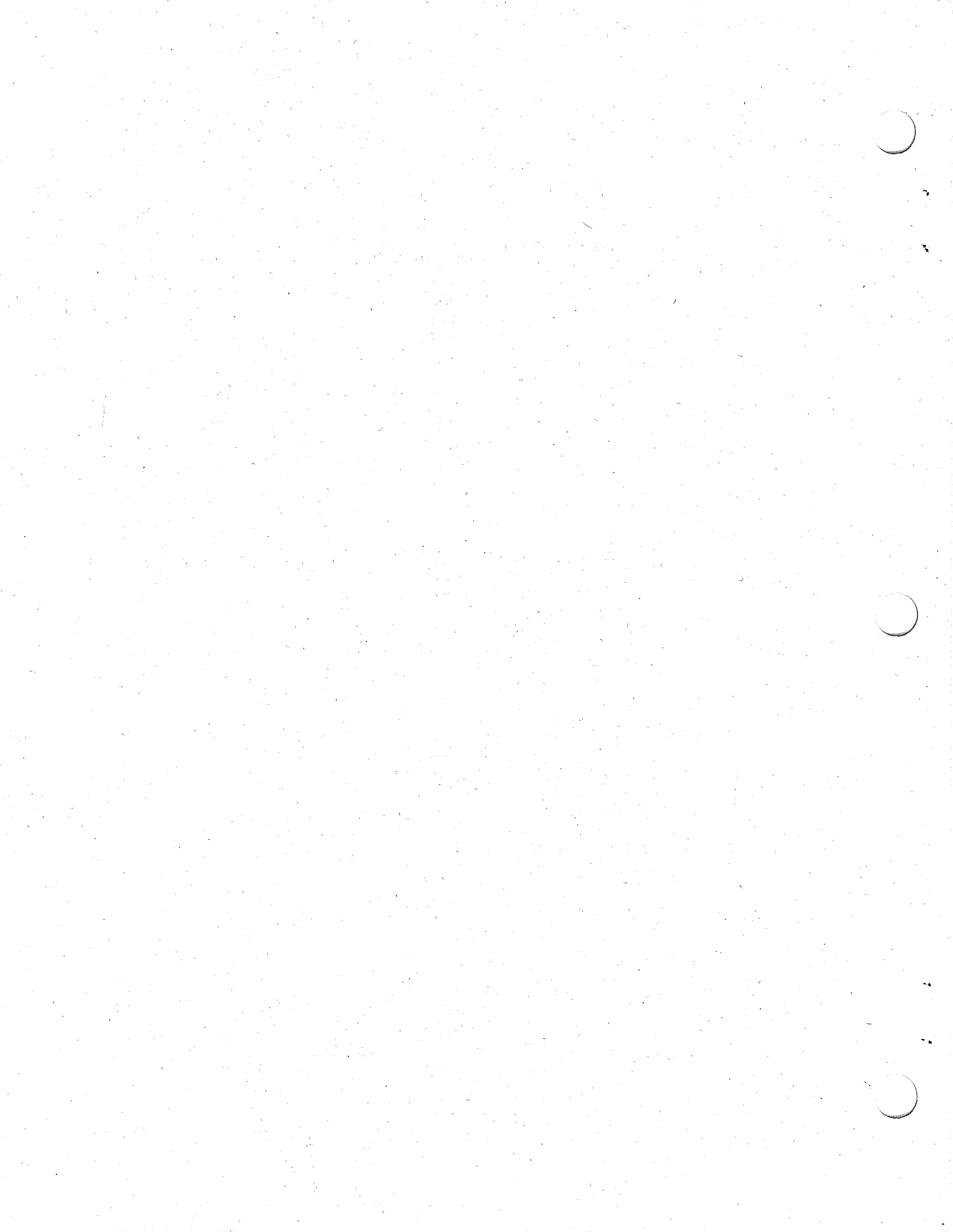
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**ENGINEERING DEPARTMENT FATALITIES**  
**RESULTING FROM THE OPERATION OR MAINTENANCE**  
**OF ON-TRACK EQUIPMENT**  
**1989 - 1993**

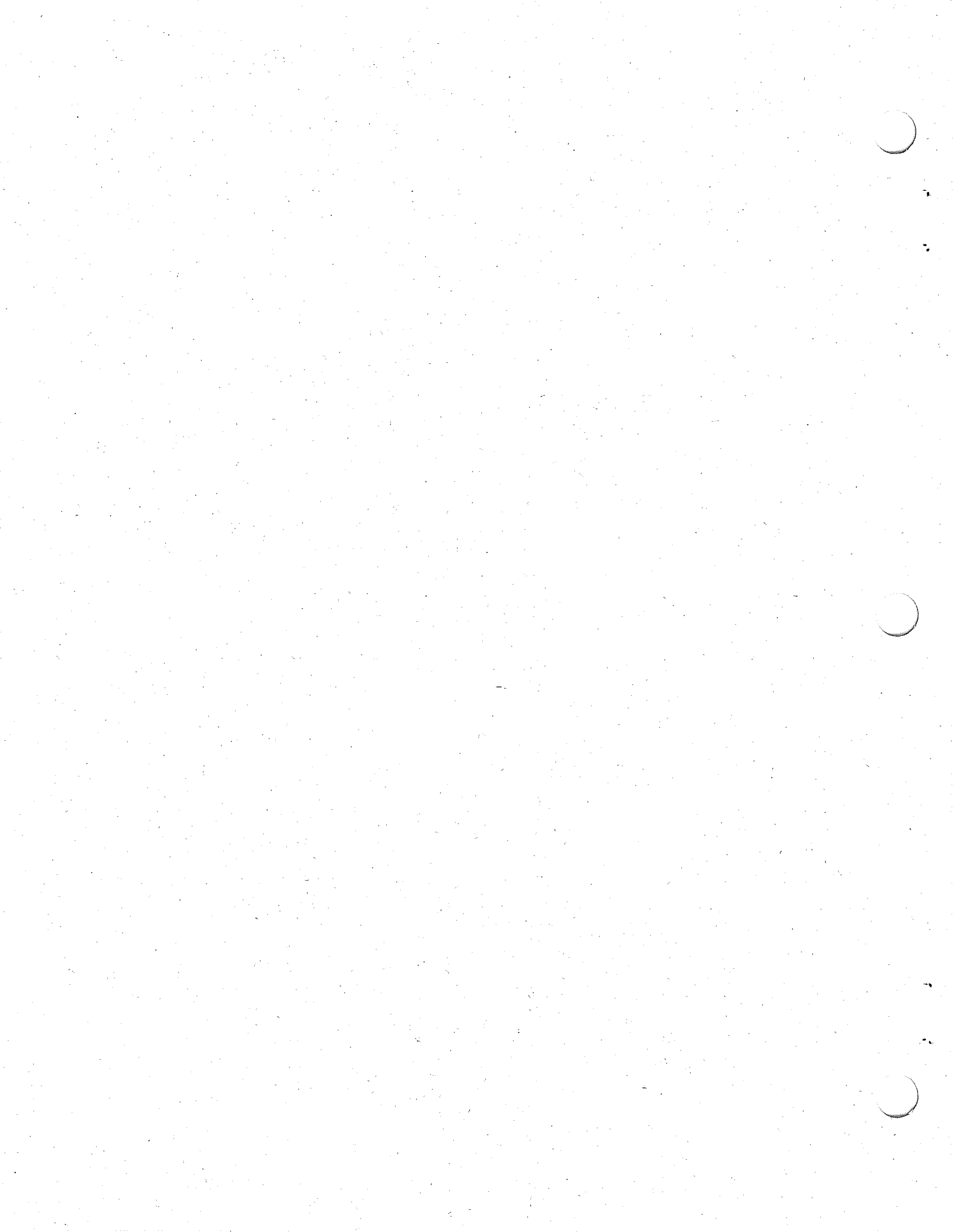
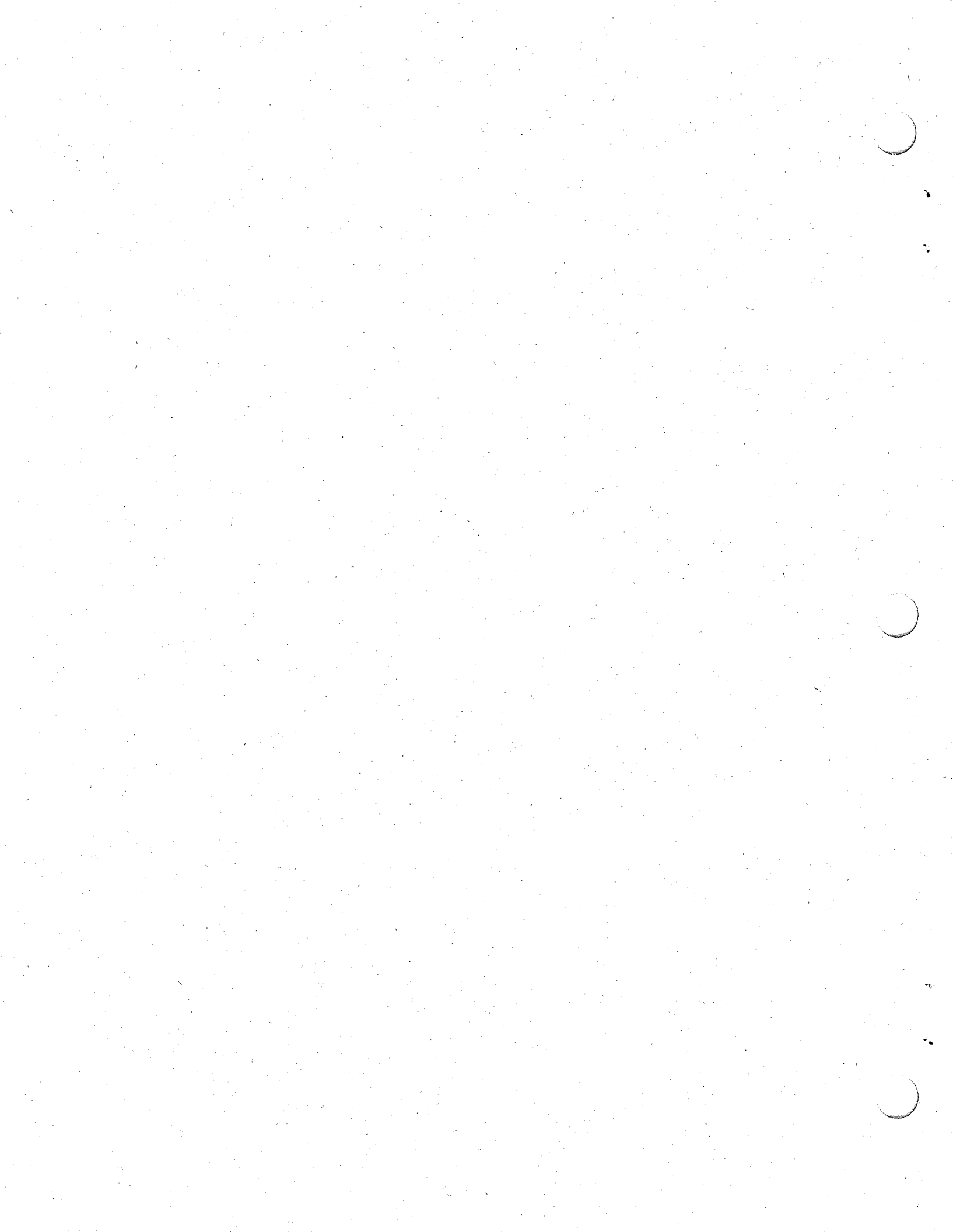


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## INTRODUCTION

This report represents the Federal Railroad Administration's findings in its investigation of 22 Engineering Department railroad employee fatalities suffered during calendar years 1989 through 1993. Not included are the employee fatalities that occurred as a result of train derailments or collisions; these are reported in the Summary of Accidents Investigated by the Federal Railroad Administration for the individual years 1989-1993.

The purpose of this report is to direct public attention to hazards that exist in the day-to-day operation and maintenance of railroads, to guide the overall federal program to promote the safety of railroad employees, and to supply rail management, rail labor, and all other interested parties with information and analysis for use in training and other action to prevent similar accidents.

Bruce M. Fine  
Acting Associate Administrator  
for Safety

CAUSE DIGEST

REPORT  
NUMBER

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INVOLVING ONE OR MORE FATALITIES PER CARRIER

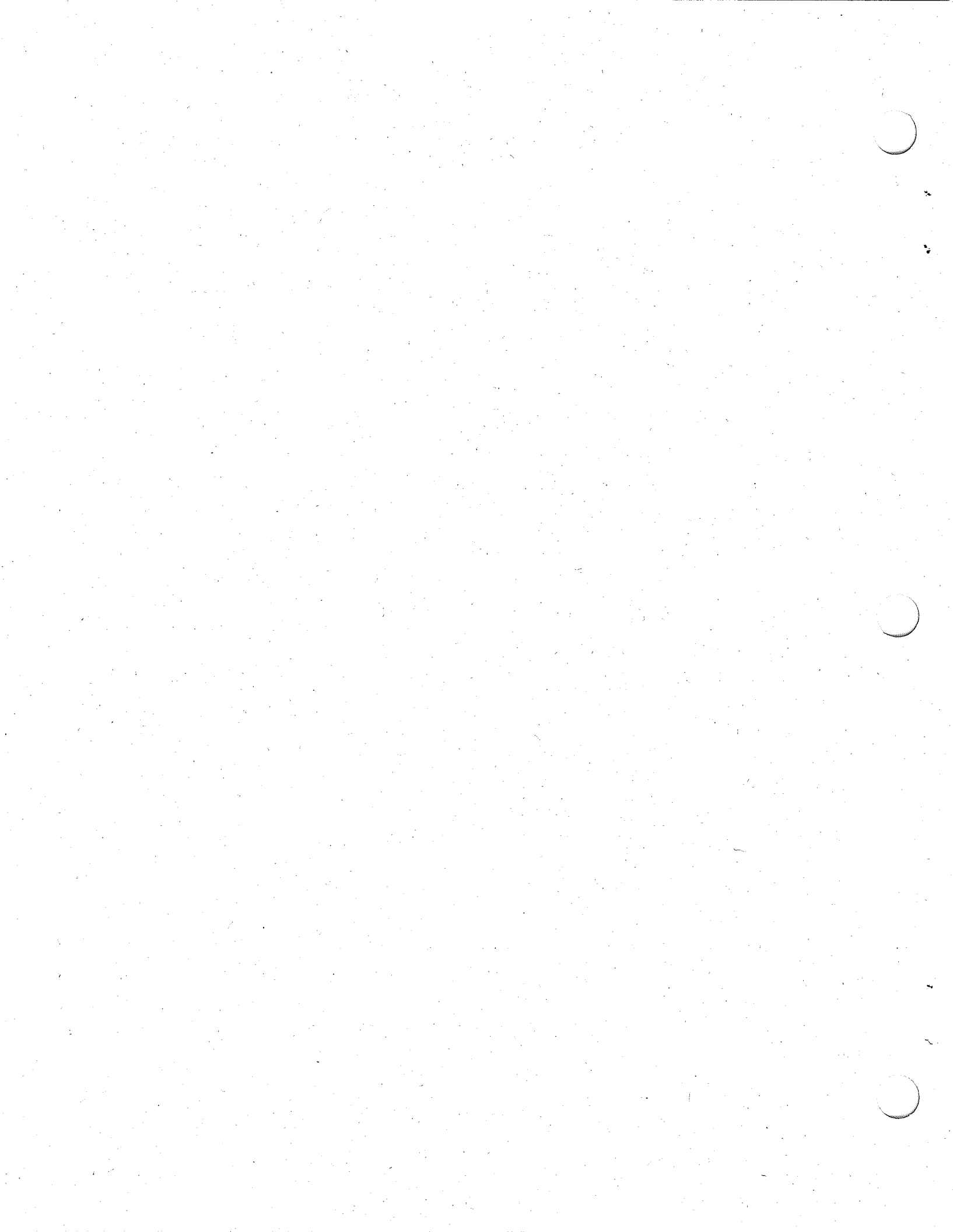
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REPORT: 1 (FE-01-89)

RAILROAD: National Railroad Passenger Corporation, (Amtrak) (ATK)

LOCATION: North Kingstown, Rhode Island

DATE, TIME: January 4, 1989, 1:35 p.m.

PROBABLE CAUSE: The signal maintainer failed to clear the track for an approaching train.

Possible contributing factors: Use of a noisy power tool in the absence of a gang watchman, and a blood alcohol content of 0.073 percent.

EMPLOYEE: Occupation . . . . . Signal Maintainer

Age. . . . . 42 years

Length of Service. . . . . 18 years

Last Rules Training. . . . August 5, 1988

Last Safety Training . . . November 2, 1988

Last Physical Examination. January 21, 1986

Circumstances Prior to the Accident

At 7 a.m. on the day of the accident, a signal maintainer reported for duty at Amtrak's Davisville Interlocking (milepost 168) at North Kingstown, RI. At approximately 12:30 p.m., the signal maintainer met with his signal supervisor at the interlocking station and discussed problems with a track circuit and a switch rod on Track No. 1 east of the interlocking. Shortly after 1 p.m., the signal supervisor departed the interlocking and drove to the railroad right-of-way east of Davisville Interlocking. Shortly thereafter, the signal maintainer also departed the interlocking and drove a company vehicle to the railroad right-of-way east of Davisville Interlocking. The signal maintainer passed the signal supervisor, who had stepped out of his vehicle at the entrance to the railroad right-of-way, and continued driving east along the north side of Track No. 1. The signal supervisor walked west along the north side of Track No. 1 toward the interlocking.

The signal maintainer drove to a signal case located on the north side of Track No. 1, 68 feet east of milepost 169. There the signal maintainer took a Safetran model SL-6 gas-powered portable rail grinder, and started to grind the south railhead of Track No. 1 in preparation for applying a bond wire. After grinding the south railhead, the signal maintainer moved to the opposite rail of Track No. 1 and commenced grinding the north railhead.

Amtrak Train No. 175, a revenue passenger train, consisting of Locomotive No. 215 and six cars, was operating in a westward direction en route from Boston, MA to Washington, DC. The train was operating at 90 mph, 4 minutes behind schedule as it approached Davisville Interlocking on Track No. 1.

In the accident area, there are two main tracks extending east to west, and numbered from the north as Track Nos. 1 and 2. The automatic block signal system is supplemented by an automatic cab signal and train control system arranged for movement with the current of traffic, westward on Track No. 1 and eastward on Track No. 2. The maximum authorized speed for passenger trains on Track No. 1 is 90 mph. The accident occurred 68 feet east of milepost 169 on Track No. 1. From the east to the accident point, there is a tangent 8,200 feet in length. The railroad grade is level with a wooded area on both sides of the railroad right-of-way.

The weather was sunny with a temperature of about 20 °F. Wind gusts were estimated at 35 mph, with a wind chill factor of minus 13 °F.

#### The Accident

As the train approached the accident site, the Amtrak locomotive engineer sighted an obstruction on Track No. 1 near milepost 169. The engineer sounded the locomotive horn, and as the train approached, he realized the obstruction was an individual. The signal maintainer was straddling the north rail, facing west with his back to the train. The engineer continued to sound the locomotive horn, and made an emergency application of the train air brakes. The signal maintainer, who was grinding the north railhead, did not respond, and was struck by the train.

The signal supervisor, who was walking west alongside Track No. 1, overheard, "I hit someone," on his portable radio. He immediately turned and started running back to his vehicle as Train No. 175 passed. The signal supervisor drove east alongside Track No. 1 whereupon he found the body of the signal maintainer, located on the north side of Track No. 1, 237 feet west of the point of impact.



The signal maintainer was pronounced dead at the scene of the accident by the Rhode Island Deputy Chief Medical Examiner.

### Post-accident Investigation

The signal maintainer notified neither the Davisville operator nor the train dispatcher of his intentions to grind railheads on Track No. 1. The signal maintainer did not request fouling time nor did he question the locations or times of any approaching trains.

On January 5, Amtrak reenacted the accident using Train No. 175. At approximately 1:30 p.m., an Amtrak employee stood on the north side of Track No. 1, adjacent to the point of impact, and operated a gas-powered portable rail grinder, similar in design to the one used by the signal maintainer on the day of the accident. As Train No. 175 approached the accident site, the engineer first sighted the employee about 1,321 feet east of the point of impact. The engineer immediately sounded the locomotive horn and continued sounding the horn until passing the point of impact. A total of 16 seconds elapsed from the time the engineer first sighted the Amtrak official to the time the locomotive passed the point of impact. The noise generated by the grinder made hearing the approaching train difficult.

Using a General Radio sound level meter, FRA conducted a sound level test of the portable rail grinder. At low speed, the portable rail grinder produced noise registering 92 to 96 decibels (dBA). At high speed, the speed used when grinding, the portable rail grinder produced noise registering 101 to 105 dBA.

Shortly after the accident occurred, a safety vest approved by Amtrak was found draped across the north rail of Track No. 1, a few feet west of the point of impact. Examination by local police disclosed no evidence that the safety vest had been worn by the signal maintainer at the time of impact.

An Amtrak interoffice memo, dated August 30, 1985, stated that use of the Safetran model SL-6 portable rail grinder on main line track should be restricted to those occasions when, "...the track is out of service, the employee obtains fouling time, or someone is posted and watching for trains close enough to the maintainer to touch him."

Amtrak police recovered seven empty and six full 12 oz. beer cans from the signal maintainer's personal automobile, which was parked adjacent to Davisville Interlocking Station. Examination of the signal maintainer's personnel file disclosed a Rule G infraction for alcohol which occurred December 3, 1985. This infraction resulted in the signal maintainer's removal from service.

He was returned to service after completing a counseling program and agreeing to quarterly urinalysis for the presence of alcohol. Quarterly urinalysis was conducted on two occasions: March 31, 1986 and September 23, 1986. Both tests were negative. There is no record of further urinalysis testing.

Results of toxicological testing of the deceased were positive for alcohol, indicating a blood alcohol content of 0.073 percent and a liver alcohol content of 0.054 percent.

#### Applicable Rules

#### **Amtrak Safety Rules for Maintenance-of-Way and Structures Employees**

4128 When working alone on track:

(a) Assume a position and perform work in such a manner that will permit making frequent observations in both directions to see on which tracks trains approach.

(b) Upon the approach of a train on any main track, clear the train-occupied track...

(d) Clear tracks at least 15 seconds before train reaches point of work.

4133 Before starting the operation of noisy power tools, machinery or equipment, or when outside noise interferes with hearing approaching train, a gang watchman must be assigned to afford proper protection, unless:

(a) Operating machinery or equipment that must be placed on or fouls the track when in use, requires the absolute use of the track, does not FOUL ANY ADJACENT TRACK, DOES NOT REQUIRE ASSISTANCE FROM ANY PERSON ON THE GROUND, and is operated by only 1 person located thereon.

(b) Relieved of doing so by Deputy Chief Engineer or Assistant Chief Engineer. In other than High Speed Territory small one-man bonding machine is not considered as being noisy.

4120 Walk, stand or sit on track, driving lane, highway or self-propelled equipment or machinery, or vehicle parking area, only if required in the performance of duty.

NOTE: Employees working on or about the railroad right-of-way must wear approved safety vests properly fastened over outer clothing to ensure high visibility.

REPORT: 2 (FE-21-89)

RAILROAD: CSX Transportation (CSX)

LOCATION: Confluence, Pennsylvania

DATE, TIME: May 25, 1989, 5 p.m.

PROBABLE CAUSE: A roadmaster failed to maintain a lookout ahead while operating a hi-rail truck.

EMPLOYEE: Occupation . . . . . Track Inspector

Age. . . . . 41 years

Length of Service . . . . . 22 years

Last Rules Training . . . . August 16, 1988

Last Safety Training . . . . May 24, 1989

Last Physical Examination . March 7, 1989

Circumstances Prior to the Accident

On the day of the accident, the roadmaster and track inspector reported for duty at 6 a.m. at Connellsville, Pennsylvania. Later that day, after performing routine duties, the roadmaster obtained a track car movement authority from the CSX dispatcher in Jacksonville, Florida to occupy Track No. 1 and hi-rail westward from Rockwood Station, milepost 226.8, to Brook, milepost 238.7. The authority was effective at 3:39 p.m., and was to expire at 5 p.m. The roadmaster put his hi-rail truck on Track No. 1 at Rockwood Station and proceeded west.

Later, the dispatcher contacted the roadmaster by radio and extended the western limit of his track car authority to Greene Junction, milepost 268.6, and the expiration time of the track car authority to 6:30 p.m.

Meanwhile, the subject track inspector had just completed an inspection of Track No. 2 between Confluence, milepost 243.3, and Brook, and wanted to hi-rail west to Connellsville, milepost 270.3. The roadmaster contacted the track inspector by radio from milepost 239, and advised him that he had a track car authority to Greene Junction. He instructed the track inspector to set his hi-rail truck on Track No. 1 at the Boot Hill Road crossing, at Confluence, and inspect the track west ahead of him. The roadmaster was checking rail conditions and writing a list of areas where he wanted to replace the rail.

When the roadmaster arrived at the Boot Hill Road crossing, the track inspector had just finished putting his hi-rail truck on Track No. 1 and was getting ready to proceed west. As the two hi-rail vehicles left the area of the road crossing, the track inspector called the roadmaster on the radio and advised him that he would be stopping at milepost 245 to do some work on rail joints. The roadmaster also stopped at milepost 245 and helped the track inspector replace missing clips in the Pandrol tie plates at the rail joints.

When they finished the work, the roadmaster got back in his vehicle and saw the track inspector pulling away on Track No. 1 in his hi-rail truck. The roadmaster took a piece of paper from his shirt pocket, wrote a note and placed the paper in his pocket. When he looked ahead again, the track inspector's hi-rail truck was approximately 650 feet ahead of his truck and moving west. The roadmaster put his truck in gear and began writing on a pad of paper which was lying on the truck seat to his right. The roadmaster pushed on the accelerator enough to get the truck rolling and then let the truck coast as he continued to write.

The weather was clear, with a temperature of 80 °F.

#### The Accident

At about 4:55 p.m., the roadmaster's truck collided with the track inspector's truck at milepost 245.4 near the west end of a 1,200-foot segment of tangent track. The roadmaster was thrown forward, and struck the lower left side of his face against the steering wheel. When the roadmaster looked ahead, he saw the track inspector's truck rolling west and watched as it came to a stop. The roadmaster got out of his truck to locate the track inspector, and found him lying face down within the gage of the track. The track inspector's body was directly in front of the roadmaster's truck.

The track inspector had been standing behind his truck when the collision occurred. The roadmaster contacted a track foreman working at milepost 243 by radio, and told him to send an ambulance. The roadmaster tightly wrapped a shirt around each of the injured man's legs to try to stop the bleeding. He also administered CPR until the ambulance arrived at 5:10 p.m. The ambulance took the track inspector to the Somerset Community Hospital in Somerset, Pennsylvania. He was pronounced dead at 6 p.m.

## Post-accident Investigation

Measurements taken at the scene indicate that the lead hi-rail truck was knocked west 105 feet from the point of impact. The body of the inspector was found 13 feet west of the point of impact. When the track foreman, who had been working at milepost 243, arrived to remove the track inspector's truck from the track, the truck's headlights and tail lights were on. However, the strobe light on the top of the truck (which must be manually activated via a toggle switch in the cab of the vehicle) was not flashing. Post-accident examination of the involved vehicles revealed that all of the lights on the vehicles were functional.

Results of toxicological testing of the deceased and of the roadmaster were negative.

## Applicable Rules

### CSX Transportation's Operating Rules

#### Operation of On-Track Equipment

- 720. On-track equipment must move prepared to stop within one-half the range of vision ....
- 727. The space between on-track equipment, when running, must be sufficient to avoid an accident. Operators will signal when slowing or stopping.

### CSX Transportation's Safety Handbook

#### Mechanized Equipment

- 499. Operators must not allow their attention to be distracted unless the operation is stopped.

REPORT: 3 (FE-34-89)

RAILROAD: Southern Pacific Transportation Company (SP)

LOCATION: Livingston, Texas

DATE, TIME: October 26, 1989, 10 a.m.

PROBABLE CAUSE: The machine operator failed to operate a speed-swing crane in accordance with the manufacturer's instructions.

Possible Contributing Factors: The only training the machine operator had received on the speed-swing was on-the-job. The manufacturer's instructions for operation were not on the speed-swing nor had the operator ever seen the Operation and Maintenance Manual.

EMPLOYEE: Occupation . . . . . Machine Operator

Age . . . . . 49 years

Length of Service . . . . . 7 years

Last Rules Training. . . . . July 9, 1989

Last Physical Examination. . January 20, 1982

Circumstances Prior to the Accident

Tie Cribber Operator

On the day of the accident, the subject machine operator reported for duty at 6 a.m. to operate a tie cribber as part of a mechanized rail gang. The rail gang that was assigned to lay 136 lb. continuous welded rail on the Lufkin Subdivision main track near Livingston, Texas. The main track extends eastward and westward. At about 10 a.m., the tie cribber operator was standing on the ground between the rails of the main track operating the tie cribber from the controls at the west end.

Speed-Swing Operator

At about 10 a.m. a second machine operator, assigned to operate a Pettibone Speed Swing model 360 (speed-swing), attempted to place his machine on the main track about 100 feet west of the tie cribber. The speed-swing is an on-track and off-track vehicle that utilizes rail guide wheels for on-track operation and large rubber tires for off-track operation. It features a swing boom for heavy lifting, and is used to lift the rail gang's machinery on and off the track.

The front end of the speed-swing was facing west. The operator had aligned the front end of the machine to place the rail guide wheels in position for rail travel. To prevent derailling the guide wheels from their rail position, hydraulic pressure was exerted on the front guide wheels, which lifted the front rubber tires off the ground. The operator then rotated the cab and boom partially to the rear to align the rear guide wheels onto the rails. Once the guide wheels were aligned, he engaged the hydraulic lift to raise the rear of the machine. As pressure was applied to the rear guide wheels the tires on that end lifted off the ground. The speed-swing utilizes the tires for braking purposes. When the tires are lifted completely off the ground on both ends, unless in the fully extended or retracted position, the speed-swing is without braking capacity, and is free to roll on the rail with the guide wheels providing guidance.

The speed-swing was on a 1.23 percent descending grade to the east and immediately started rolling eastward toward the tie cribber.

The weather was clear and dry with a temperature of 85 °F.

#### The Accident

Without braking capacity, the speed-swing rolled 100 feet eastward on the descending grade with the operator unable to stop or slow the machine. The speed-swing struck the tie cribber operator, who was operating the tie cribber, pinning him between the speed-swing and the tie cribber.

The speed-swing operator immediately got off his machine and rushed to the side of the injured tie cribber operator. Emergency medical personnel were called to the scene. A local justice of the peace pronounced the employee dead at the scene.

#### Post-accident Investigation

The speed-swing, Serial Number 2984, was placed in service new on October 24, 1989. The speed-swing was inspected by an employee of the SP railroad after the accident. No defects were found. All equipment was functioning as designed.

A re-creation of how the speed-swing was set on the track was performed. Only partial pressure was applied to the front end. As the operator of the speed-swing began extending the rear or east end of the hi-rails to the fully extended position, it began rolling down the descending grade because neither of the hi-rails were in the fully extended or retracted position. When the brakes were applied, they could not function as designed.

The operator of the speed-swing stated that he had been operating speed-swings for the Southern Pacific for about six years. The only training he had received was on-the-job training. The operator also stated that there was not a manufacturer's Operation and Maintenance Manual on the speed-swing at the time of the accident and that he had never seen one. However, he said that he was familiar with all the controls regarding operation of the speed-swing.

#### Applicable Rules

##### Southern Pacific Transportation Company Rules Maintenance of Way and Structures, Dated November 1, 1985

Rule I. Employees must exercise care to prevent injury to themselves or others.

##### Southern Pacific Transportation Company Chief Engineer's Instructions

Rule 213.3 Equipment shall not be operated in a manner to endanger life, limb or property.

Rule 213.32 Track machines must be operated at a safe speed at all times, subject to conditions, especially on grades.

Rule 213.33 Copy of instruction for the safe operation and care of track machines and work equipment must be provided in each unit.

##### Operation and Maintenance Manual Pettibone Speed Swing - Model 360

Pages 2-8, 2-13 and 2-20

Always operate high rail (hi-rail) one at a time to the fully extended or fully retracted position. Operating both high rails at the same time can cause a free wheeling condition.



REPORT: 4 (FE-38-89)

RAILROAD: Long Island Rail Road (LI)

LOCATION: Queens Village, New York

DATE, TIME: November 22, 1989, between 8-9:30 p.m.

PROBABLE CAUSE: The signal maintainer failed to clear the main track for an approaching train.

EMPLOYEE: Occupation . . . . . Signal Maintainer  
 Age . . . . . 29 years  
 Length of Service . . . . . 3 years 5 months  
 Last Rules Training . . . . . April 21, 1989  
 Last Safety Training . . . . . July 31, 1989  
 Last Physical Examination . April 10, 1986

Circumstances Prior to the Accident

On the day of the accident, the signal maintainer reported for duty at 2:15 p.m. at the LI's Queens Tower (tower). The signal maintainer had completed his statutory off duty period. The signal maintainer's duties required him to remain available at the tower building to protect the interlocking during the evening commuter rush hour, and to examine the switch point heaters during an expected snow storm.

The accident site is within the limits of Queens Interlocking, milepost 13.3, in Queens Village, New York. The signal installation consists of an electro-pneumatic interlocking on four main tracks having position light signals supplemented by an automatic cab signal system. The maximum authorized speed is 80 mph for passenger trains and 45 mph for freight trains on all four main tracks.

The block operator at the tower received a call from the signal maintainer at Nassau, New York who asked to speak to the maintainer at Queens. The block operator understood that the signal maintainer at Queens was to check the electric switch heaters for operation due to an expected snow storm that evening. The block operator observed the signal maintainer calling the Signal Department trouble desk, and heard the signal maintainer explain that he was going to check the switch heaters, but that he was going to take his time and do it cautiously.

The block operator then advised the signal maintainer to request a backup man to help act as a lookout because he was going to be working with many trains operating in the area. However, the signal maintainer responded by saying he would be cautious, and felt safe enough to work alone.

The block operator observed the signal maintainer leaving the tower at approximately 7:10 p.m. He last observed the signal maintainer walking past the tower on the catwalk in an easterly direction at approximately 8 p.m. As a matter of practice, when signal maintainers are working in the field they usually contact the tower every hour or hour and a half. At 9:30 p.m. the block operator had not heard from the signal maintainer so he tried to reach him by blowing the tower whistle four times. When the block operator did not receive a response he reported the incident to the Signal Department trouble desk. The trouble desk was unable to communicate with the maintainer, and sent the Nassau maintainer to search for the signal maintainer. The trouble desk also notified the Long Island Rail Road Police.

#### The Accident

At approximately 11:29 p.m., the Nassau signal maintainer found the body of the missing signal maintainer. The body was found face down north of Track No. 3 near the west end of crossover No. 15 between the second and third signal cases. The time of death could only be determined to be between 8 p.m., when last seen, and 9:30 p.m. when no response was received by the block operator at Queens.

#### Post-accident Investigation

All westbound engineers that operated through Queens Interlocking between 8 p.m. and 11 p.m. were contacted by LI officials. None of the engineers indicated that they either saw or struck anything in that area.

An inspection was made of all westbound equipment that operated through Queens Interlocking between 8 p.m. and 11 p.m. The equipment disclosed no evidence of striking the employee.

Sight distance tests were conducted on November 27, 1989. The tests indicated that from the accident point the headlights on six westbound trains could be seen from a minimum of 7,821 feet to a maximum of 9,887 feet.

The autopsy indicated that the victim's injuries were similar to the type of injuries that would be inflicted by the impact of a train. The major injuries sustained were to the back and left side of the head. The cause of death was multiple fractures and internal injuries from a blunt force impact.

Results of post accident toxicological testing performed on the deceased signal maintainer were negative.

Applicable Rules

Long Island Rail Road Company Safety Rules for Engineering Department employees.

Protection against being struck or run over by train.

3208. When working alone on track:

(a) Assume a position and perform work in such a manner that will permit making frequent observations in both directions to see on which tracks trains approach. Trains must be expected to run in either direction on any track.

(b) Upon the approach of a train on any main track, clear the train-occupied track and the near adjacent track, preferably clear all main tracks.

When not clear of all main tracks, stand erect and maintain lookout in both directions to see on which tracks other trains approach, in order to clear if necessary, to prevent being trapped. Where view is restricted, clear all main tracks on approach of a train on any main track.

REPORT: 5 (FE-14-90)

RAILROAD: Southern Pacific, Chicago-St. Louis Corporation (SSWN)

LOCATION: Godfrey, Illinois

DATE, TIME: June 16, 1990, 6:53 a.m.

PROBABLE CAUSE: The roadmaster failed to keep clear of an approaching train.

Possible contributing factor: The noise from a hydraulic power unit engine mounted on a truck in which he had been riding.

EMPLOYEE: Occupation . . . . . Roadmaster

Age. . . . . 43 years

Length of Service. . . . . 7 months SSWN  
(23 years total)

Last Rules Training. . . . . April 1990

Last Safety Training . . . . . April 1990

Last Physical Examination. . No Record

Circumstances Prior to the Accident

On the day of the accident, the roadmaster and a track inspector started their tours of duty at approximately 5 a.m. and 6 a.m., respectively. They arranged via radio communication to meet at the east end of the siding at Godfrey, Illinois, to conduct a planned track inspection, paying particular attention to bolt defects. They met at about 6:35 a.m., arriving in separate vehicles. The roadmaster left his company vehicle parked about 100 feet east of the east siding switch at Godfrey and boarded the 1984 Ford 3/4-ton "club-cab" hi-rail pick-up truck driven by the track inspector. They drove eastward in the truck on a maintenance road adjacent to and on the north side of the track. The two men discussed the fact that eastbound Amtrak Train No. 302 was due to depart Alton, Illinois, milepost 257.2, at 6:44 a.m.

The truck was equipped with a hydraulic impact wrench used to tighten track bolts. The wrench was carried in the bed of the truck and connected by 25-foot hydraulic lines to a hydraulic power unit powered by a 23-horsepower gasoline engine.

The hydraulic power unit and gasoline engine were mounted on channel iron rails located horizontally across the top of the truck bed and directly behind the truck cab. The power unit's gasoline engine exhaust pipes directed the exhaust toward and above the truck cab.

The accident occurred at milepost 249.2 near Godfrey, a city in southwestern Illinois, about 30 miles north of St. Louis on single main track where traffic is governed by signal indications of a traffic control system. In the immediate accident area, the track extends north and south geographically; timetable directions are east and west. The grade approaching the accident site from Godfrey is 0.30 percent ascending eastward; the track is tangent for over a mile approaching the accident site and for a considerable distance beyond.

The track in the immediate accident area consists of 112-pound jointed rail with 6-hole joint-bars on timber crossties. The ballast is composed of 1/2 to 1-3/4 inch crushed limestone. The maximum allowed passenger train speed in this area is 70 mph.

The men drove about 400 feet east and stopped the truck to repair a missing track bolt. While driving and listening to the truck's communication radio, they overheard the Amtrak crew's radio transmissions as the passenger train made its station stop at Alton.

After the repair was made, the power unit's gasoline engine was left running in the 3/4-open throttle position, the normal operating position. More repairs were expected, and this was done to save the workers from having to repeatedly climb into the back of the truck bed to start and stop the power unit engine at each repair.

The two men again proceeded eastward in the truck, traveling at about 5 mph or less on the maintenance road. The track inspector was driving the vehicle and primarily watching the road ahead. The roadmaster was seated in the right passenger seat looking out the right door-window for track defects. The truck cab air conditioner was off, the driver had his left door-window rolled down and the roadmaster had his right door-window rolled up. The truck's AM commercial radio was turned off.

The two men were conversing as they drove along the track making the inspection. The track inspector first noticed the bright headlight of the approaching passenger train in the truck's side mirrors when the train was about a mile away. His view to the rear using the center rear-view mirror was obstructed by the hydraulic power unit and engine behind the cab. The track inspector heard the train's locomotive horn as the train approached, and he verbally warned the roadmaster of the train's approach.

### Amtrak Train No. 302

On the day of the accident, after completing the required off duty period, an Amtrak passenger train crew went on duty at St. Louis, Missouri at 5:30 a.m. to operate Amtrak Train No. 302 eastward from St. Louis to Chicago, Illinois. The crew consisted of an engineer, fireman, conductor and an assistant conductor.

Amtrak Train No. 302 operates between St. Louis and Chicago primarily via the SSWN's St. Louis Division, Springfield District. The required initial terminal air brake test was performed by Amtrak mechanical department personnel at St. Louis.

The train departed St. Louis on time at 6 a.m. with Amtrak diesel electric Locomotive No. 353 and four coaches. The train proceeded toward Godfrey, Illinois, without incident making a scheduled station stop at Alton, Illinois, milepost 257.2. The train departed Alton on time at 6:44 a.m.

After negotiating a 2-degree curve to the left at milepost 250.6, the train entered a 7,194-foot segment of tangent track and the engineer noticed two motor vehicles on the adjacent maintenance road about a mile ahead. The vehicles were about 1/4-mile apart on the north side of the track; the engineer did not notice anyone on or near the track and could not see anyone in the vehicles. The engineer rang the locomotive bell and repeatedly sounded a warning with the locomotive horn as the train approached the vehicles at the maximum allowed speed of 70 mph on a clear signal indication.

The locomotive throttle was in the No. 3 position and the locomotive and train brakes were in the released position. The headlight was displayed brightly and the strobe warning lights were flashing. The engineer was seated at the controls of the locomotive on the right side and the fireman was ascending the stairway from the toilet, located in the nose of the locomotive. The conductor and assistant conductor were located in the coaches.

At the time of the accident, the weather was clear and sunny. The temperature was about 80 °F with a light wind from the east.

### The Accident

At 6:53 a.m., the roadmaster opened his door on the right side of the truck and stepped out while the truck was still moving slowly eastward. The eastbound Amtrak Train No. 302 was about 100 feet to the west of the truck. The roadmaster did not look to his right or left and stepped southward onto the track structure and into the path of the train.

The top left area of the locomotive snowplow struck the roadmaster on the right side of his body and head. The force of the impact propelled the roadmaster's body northward away from the track and into the door of the truck which had remained open. The body continued eastward and came to rest on the ground 50 feet in front of the truck.

Rescue personnel from the local sheriff's department, fire department and ambulance service responded to the scene; the first rescue unit arrived at 7:09 a.m. The roadmaster was pronounced dead at the scene at 7:40 a.m.

#### Post-accident Investigation

No hearing protective equipment was found on or near the roadmaster's body nor was he believed to have been wearing any at the time of the accident. Inspection of the accident site revealed normal track ballast conditions, no slipping or tripping hazards and good visibility along the track. A track bolt was found to be missing from a joint bar on the south rail directly across from the point where the roadmaster had exited the vehicle.

An inspection of Amtrak Locomotive No. 353 revealed that the headlight, strobe lights, locomotive horn and bell functioned as intended. The locomotive speed tape was inspected and it was determined that the train was being operated within the maximum allowed speed restrictions. Approximate noise level measurements were taken of the hydraulic power unit in the interior of the truck cab. The noise level was measured to be 77 decibels (dBA) with the power unit engine in the 3/4-open throttle position.

An autopsy was performed which attributed the cause of death to massive blunt trauma to the head and torso as a consequence of being struck by a moving train. A coroner's inquest determined the cause of death to be accidental.

Toxicological tests were performed on the remains of the roadmaster as required by FRA regulation. The test results were negative.

No other testing was conducted.

Applicable Rules

SOUTHERN PACIFIC LINES: SAFE WORK PRACTICES FOR SP/SSW EMPLOYEES  
IN THE MAINTENANCE OF WAY TRACK DEPARTMENT

RULE 16(A). WORKING ON OR ABOUT TRACKS

Trains, cars or engine movements are to be expected at any time. You must keep a sharp lookout and when equipment is seen approaching, get clear in plenty of time. Employees must not stand on the track in front of an approaching engine, car or other moving equipment.

RULE 25(A). WALKING BETWEEN OR CROSSING TRACKS

To avoid being struck by moving equipment, determine that track is clear by looking both ways before fouling, walking between or crossing tracks. Walk single file.

SOUTHERN PACIFIC LINES: CHIEF ENGINEERS INSTRUCTIONS FOR THE  
MAINTENANCE OF WAY AND STRUCTURES AND ENGINEERING

SECTION 1, GENERAL INSTRUCTIONS

1.1 SAFETY

Instruction 1.1.15 Employees must look in both directions before crossing any track or roadway

SECTION 2, GENERAL INSTRUCTIONS

2.12 AUTOMOTIVE EQUIPMENT

Instruction 2.12.1-2244(D) No one shall alight from vehicle until operator has set hand brake.



REPORT: 6 (FE 17-90)  
RAILROAD: Burlington Northern Railroad Company (BN)  
LOCATION: Nichols, Montana  
DATE, TIME: July 26, 1990, 8:07 a.m.  
PROBABLE CAUSE: The machine operator failed to remain clear of an approaching train.

Possible contributing factor: The failure of the gang foreman to inform all of the workers about expected train movements, and to utilize other established procedures to provide positive protection for the workers.

EMPLOYEE: Occupation . . . . . Machine Operator  
Age . . . . . 41 years  
Length of Service . . . . . 13 years  
(seasonal)  
Last Rules Training . . . . . May 9, 1985  
Last Safety Training. . . . . No Record  
Last Physical Examination . July 5, 1990

Circumstances Prior to the Accident

On the day of the accident, the machine operator went on duty at 7:30 a.m. at Hysham, Montana as part of a 47-member maintenance-of-way crosstie replacement crew. After going on duty the crew was transported 21.5 miles via company bus to Nichols, Montana, where the crew's 25 track machines were located. The machine operator was assigned to operate a tie crane.

After arrival at Nichols, the machine operator and other members of the crew started the track machines' engines and prepared the machines for the day's work. The machines were located on a side track that is parallel to and south of the main track. Track centers are 14 feet 9 inches apart.

The machine operator started the engine on his equipment and then walked east to the next machine, a tie inserter, to assist the operator in locating a hydraulic leak. The machine operator and several other employees were positioned on the north side of the tie inserter, between it and the main track, attempting to determine the source of the hydraulic leak.

After locating the leak, the employees were discussing how to correct the problem when the volume of the fluid suddenly increased to a spray. Witnesses stated that the machine operator stepped backwards toward the south rail of the main track to avoid the hydraulic oil spray.

#### Train 01-019-24 West

On the day of the accident, a train crew consisting of an engineer, conductor and two brakemen reported for duty at Forsyth, Montana at 7 a.m. following their statutory off duty periods. The crew was assigned to operate BN train 01-019-24 west to Laurel, Montana. The train departed Forsyth at 7:50 a.m. with 24 loaded and 17 empty cars. The engineer was seated at the locomotive controls on the north side of the control compartment. The front brakeman was seated in the control compartment on the south side. The conductor and rear brakeman were in the caboose. The short hood of the locomotive was facing west.

According to the locomotive engineer, as the train proceeded by the east siding track switch of Nichols he saw a work train on the east end of the side track. After passing by the work train he could see track machinery occupying the west portion of the side track and workmen on both sides of the main track. The engineer sounded the locomotive horn. The speed of the train was about 43 mph, and full dynamic braking was in effect to reduce train speed for a slow order 0.6 miles beyond the accident site.

Approaching the accident scene from the east, the main track is tangent for 1.3 miles to the point of the accident and 0.7 miles beyond. The sight distance is unrestricted. Grade is ascending at 0.20 percent westward. The method of operation is by signal indications of a traffic control system.

Weather at the time of the accident was partly cloudy, 68 °F, with NE winds 15-17 mph.

#### The Accident

As the train approached the group of workmen standing between the main and side tracks, the engineer saw one of the workmen step backwards toward the south rail of the main track. The engineer's view of the workman then became blocked by the hood of the locomotive. The engineer heard the locomotive strike the employee and immediately placed the train brakes into emergency application. The front of the leading locomotive struck the machine operator in the back, and propelled him a distance of 68 feet. He came to rest with his head against the north rail of the side track.

The Rosebud County Sheriff's office was notified of the accident at 8:07 a.m. and arrived at the scene at 8:14 a.m. An ambulance arrived at 8:18 a.m., followed by the coroner at 8:50 a.m. The coroner pronounced the machine operator dead at 8:54 a.m. Cause of death was massive skull fractures.

*Adj. track*

Post-accident Analysis

Inspection of the accident area revealed that the distance between the south rail of the main track and the north rail of the sidetrack was 10 feet 1 inch. The tie inserter is an on-track self propelled machine approximately 28 feet long; 9 feet wide; and weighs about 38,000 lbs. Consequently, there is an insufficient distance to safely work on the machine when trains are passing. Some of the employees stated that they had not been advised of, nor were they aware of train movements in the area. The foreman had advised some of the crewmembers that two westbound trains would operate through the area before they could begin working.

*insuff. space for machine*

*No info. on expected trains*

There were no speed restrictions or Track Bulletin Form B restrictions in effect on the adjacent main track in the accident area. Additionally, the foreman in charge of the tie replacement crew had not communicated with the approaching train.

Toxicological testing of the deceased was performed under the authority of 49 CFR Part 219 Subpart C. Results were negative.

Applicable Rules

**Burlington Northern Railroad Company Safety Rules**

Rule 58 . . . "Employees must:

- a) Expect the movement of trains, locomotives, cars, or other movable equipment at any time, on any track, in either direction . . ."

**Burlington Northern Railroad Company  
Maintenance of Way Rules-Form 15125**

Rule 64 . . . "Operation When Train on Adjacent Track:

On-track equipment shall not be operated while a train is passing on an adjacent main track. Equipment shall be stopped, secured against moving and all persons shall be clear of tracks, unless:

Track bulletin Form B is in effect on main track(s) adjacent to track on which equipment is being operated and foreman in charge has instructed train on adjacent track to pass men and equipment at not exceeding 10 mph. Track warrant or track bulletin per Rule 45 must also be in effect . . .

Employees must not work between the two tracks while equipment is passing. . . ."

REPORT: 7 (FE-18-90)  
RAILROAD: Soo Line Railroad Company, (SOO)  
LOCATION: Burns City, Indiana  
DATE, TIME: August 3, 1990, 12:30 p.m.  
PROBABLE CAUSE: The equipment operator failed to properly secure the tie fork of a tie injector before making repairs.

Possible contributing factor: Inexperience and lack of training on the specialized equipment.

EMPLOYEE: Occupation . . . . . Equipment Operator  
Age . . . . . 22 years  
Length of Service . . . . . 3 months, 10 days  
Last Rules Training . . . . . None  
Last Physical Examination. April 4, 1990

Circumstances Prior to the Accident

On the day of the accident, the equipment operator reported for work with Tie Gang T-05 at 6 a.m. in Crane Depot, Indiana. The operator was assigned to operate a model 39-1 Kershaw Tie Injector. The gang had started work at milepost 237.1 on the Latta Subdivision removing and replacing ties. At 11 a.m. they stopped for lunch at milepost 236.7. Just past noon, the gang returned to work. They were working northbound toward milepost 235 when the accident occurred.

The weather was clear and dry. The temperature was 80 °F.

The Accident

The foreman stated that he looked back to the rear of the gang and noticed that the tie injector was not working. After a few minutes, the foreman again noticed that the tie injector was not working, and he decided to walk back to investigate. When the foreman was about 30 feet from the machine, he saw that the operator's head was pinned between the tie fork and the holddown foot frame of the tie injector. The operator was transported via ambulance to the Daviess County Hospital where he died at about 1:40 p.m.

## Post-accident Investigation

There were no eye witnesses to the accident. However, evidence indicates that the operator had stopped to make repairs to the tie injector. The LV-7 valve was not attached to its bracket, and the plunger and nut were gone. A new valve and a crescent wrench were found lying on the ground between the rails, indicating that the operator was in the process of changing the LV-7 valve. He had not shut-off the tie injector's engine.

To make the repairs, the operator had gone to the front of the tie injector, and climbed under the injector arm to replace the LV-7 valve. In so doing, he placed himself in a position where his head was between the tie fork and the hold down foot frame. When the LV-7 valve was removed from its bracket, the tie fork moved upward pinning the operator's head between the tie fork and foot frame.

The LV-7 valve was tested following the accident by restoring it to the proper operating position on the tie injector. The valve operated as intended, however, it leaked air. The LV-7 valve is controlled by a spring loaded arm on the tie fork. When the arm is moved the LV-7 valve releases air and activates the hydraulic valve to raise and lower the tie fork. Anything that depresses this arm or causes air to be lost, such as the removal of the LV-7 valve, will activate the tie fork.

The operator had been employed for 3 months and 10 days. He had been a machine operator for 2 months and 19 days. All of his machine operator training was "on the job". He had been given his rules book to study but had not taken the examination.

The results of toxicological testing of the deceased equipment operator were negative.

## Applicable Rules

SOO Safety Instructions:

Rule 245. The following practices are prohibited:

- a. Repairing, dismantling, or assembling motor driven machinery without first opening the power switch and securing it with a personal lock or appropriate tag on the switch.

REPORT: 8 (FE-33-90)

RAILROAD: Consolidated Rail Corporation (CR)

LOCATION: Ashtabula, Ohio

DATE, TIME: December 30, 1990, 11:34 a.m.

PROBABLE CAUSE: The vehicle operator failed to clear the track for an approaching train.

EMPLOYEE: Occupation . . . . . Vehicle Operator

Age. . . . . 41 years

Length of Service. . . . . 22 years

Last Rules Training. . . . . March 20, 1990

Last Safety Training . . . . . November 20, 1990

Last Physical Examination. September 19, 1990

Circumstances Prior to Accident

The vehicle operator reported for duty at 8:30 a.m. at Ashtabula, Ohio. He was called by a maintenance-of-way foreman to help him and a machine operator repair a rail joint that had pulled apart at controlled point 145. As the three men and a signal maintainer were repairing the pull-apart, the supervisor arrived and told them there were some bolts missing in the crossing frogs at controlled point 128, about 17 miles to the east.

At controlled point 128, the Consolidated Rail Corporation's (Conrail) Youngstown Line crosses the Chicago Line. In the accident area, there are two main tracks extending eastward and westward. From the north they are designated as Track Nos. 1 and 2. The method of operation is by signal indications of a traffic control system. There are no sight restrictions in either direction for a distance in excess of one-half mile. From the east, the grade approaching the accident area is practically level.

The gang arrived at controlled point 128 at about 11:30 a.m., and parked their trucks on the south side of Track No. 2. The machine operator went to the rear of the truck to get the tools. The foreman and vehicle operator went to Track No. 1 to inspect the crossing frog, and to determine what material and tools were needed to make the repairs. They found two bolts missing and a pair of broken joint bars. They also found that bolts were missing from the frog on Track No. 2.

The foreman looked east and saw westbound train SEEL-9A approaching on Track No. 1 at a speed of about 40 mph. Both men went to the south side of Track No. 2 to get in the clear for the train. Unseen by the men, a second westbound train, TV-7, was approaching the accident area on Track No. 2.

Train TV-7 with 3 locomotives and 54 empty cars left Buffalo, New York en route to Cleveland, Ohio at 9 a.m. The train was traveling west at approximately 50 mph on Track No. 2. The engineer was seated at the locomotive controls on the north side of the control compartment. The brakeman was seated on the south side of the control compartment. The conductor was seated in the control compartment of the second locomotive.

*Emergency Work*  
After clearing Track No. 2, the foreman went to the truck on the south side of Track No. 2 to radio a "slow order" to the train dispatcher. When he looked up, he saw the vehicle operator facing west, bent over the south rail of Track No. 2, installing a bolt in the rail joint. The foreman also observed TV-7 approaching westbound on Track No. 2 about 200 feet east of the vehicle operator. The foreman sounded the truck horn, and ran to grab the vehicle operator.

The temperature was 40 °F, and it was raining.

#### The Accident

The engineer and brakeman saw the vehicle operator bent over Track No. 2. The engineer stated that he sounded the locomotive horn, but the vehicle operator did not respond. The engineer made a full service application of the train air brakes. The foreman could not reach the vehicle operator in time to warn him of the approaching train, and the vehicle operator was struck by train TV-7. The train stopped approximately 400 feet west of the crossing frogs, and a crewmember contacted the Conrail dispatcher on the radio for emergency medical assistance. The vehicle operator's body was thrown about 48 feet westward. He was fatally injured.

#### Post-accident Investigation

Post accident investigation revealed the speed of train TV-7 was 50 mph which was the maximum speed permitted for freight trains on Track No. 2. The TV-7 engineer did not place the train brakes in emergency because of the possibility of derailing into the train moving on the adjacent track. Train SEEL-9A was moving on Track No. 1 at the crossing frog when the accident occurred. It was not involved in the accident, and did not stop. At the time of the accident the victim had been on duty for 3 hours and 4 minutes.



Results of toxicological testing of the deceased vehicle operator and the crewmembers of TV-7 were negative.

Applicable Rules

Conrail Safety Rules  
Maintenance of Way Employees  
Effective June 1, 1981

3215. On receiving warning or knowing of approach of a train, all men must clear tracks at least 15 seconds before train reaches point of work, discontinue all activity and remain clear until receiving signal from the watchman (or foreman when watchman is not required) to resume work, unless under the following circumstances and provided the action specified is take:

(b) Main Track

(1) Upon the approach of a train on any main track, clear the train-occupied track and the near adjacent track, preferably clear of all main tracks, stand erect and maintain sufficient lookout for trains in both directions to see on which tracks other trains approach, in order to clear tracks if necessary, to prevent being trapped. . .

REPORT: 9 (FE-25-91)

RAILROAD: Metro North Commuter Railroad Company (MNCW)

LOCATION: Milford, Connecticut

DATE, TIME: September 12, 1991, 6:18 a.m.

PROBABLE CAUSE: The signal maintainer failed to remain clear of moving equipment on a main track.

Possible contributing factor: The signal maintainer failed to wear the approved reflectorized safety vest.

EMPLOYEE: Occupation . . . . . Signal Maintainer

Age . . . . . 44 years

Length of Service . . . . . 26 years

Last Rules Training . . . . May 18, 1990

Last Safety Training . . . . May 18, 1990

Last Physical Examination . April 22, 1991

Circumstances Prior to Accident

At 6 a.m., September 12, 1991, the signal maintainer reported for duty at the Devon signal maintainer's trailer in Milford, Connecticut and contacted the C&S trouble desk. The employee on duty at the C&S trouble desk informed the maintainer that there was a track circuit failure on Track No. 2 on Devon Drawbridge. The trouble desk had previously dispatched two MNCW signal maintainers from Stamford, Connecticut, to Devon Interlocking. They arrived at Devon at 5:30 a.m., and proceeded directly to the trouble location.

The maintainer then contacted one of the two MNCW maintainers from Stamford on the radio and told him that he was proceeding west toward the moveable drawbridge. The maintainer proceeded to the trouble location by walking in a westbound direction between Track Nos. 6 and 4 on the south side of Track No. 4.

At this location, the MNCW New Haven Line consists of four main tracks and a stub-end siding that extend geographically northeast to southwest. From the north they are designated as Track Nos. 3, 1, 2, 4 and 6. Track No. 6 is the stub-end siding. The timetable direction is east and west.

The signal system on this line consists of a traffic control system arranged for movement in either direction on all four main tracks supplemented by an automatic train control system, and is controlled from the train dispatcher's office in New York City. The maximum authorized speed for passenger trains on Track Nos. 3, 1, 2 and 4 at Devon Interlocking is 60 mph, with a speed restriction of 40 mph while operating over the Devon Drawbridge.

From the east, for approximately one mile, the track is tangent and the grade is descending. There are two slight curves at the accident site. From the east to the west, there is a 45-minute left-hand curve and a 52-minute right-hand curve. A drawbridge is located immediately west of the accident site. Track Nos. 3 and 1 have been out of service since April 8, 1991, because of ongoing repairs to the drawbridge.

#### Train No. 1513

At 5:38 a.m., the crew of westbound MNCW Train No. 1513 reported for duty at New Haven, Connecticut. The crew consisted of an engineer, a conductor and two assistant conductors. The train consisted of six M-2 MU electric locomotives. Train No. 1513 departed New Haven at 5:58 a.m., en route to New York City. The engineer stated he took no exception to the initial terminal train air brake test performed prior to departing New Haven, nor in the operation of the train between New Haven and the accident site.

As Train No. 1513 approached Devon Interlocking, the engineer placed the master controller in the "coast" position to prepare for the 40 mph speed restriction over Devon Drawbridge. When Train No. 1513 passed Devon Tower, about 500 feet east of the moveable bridge, it was moving at a speed of 40 mph.

It was dark, and the weather was clear and calm. The temperature was 54 °F.

#### The Accident

At about 6:18 a.m., Train No. 1513 passed Devon Tower, and was approximately 175 feet east of the Devon Drawbridge when the engineer saw the signal maintainer. The signal maintainer was wearing dark clothes and no safety vest. He was walking in a westbound direction between Track Nos. 6 and 4 about 85 feet ahead of the train. The engineer then observed the signal maintainer immediately turn northward, and without looking, walk from the south side of Track No. 4 directly into the path of the train and was struck. The engineer immediately released the master controller which caused an emergency application of the train air brakes. The train stopped approximately 385 feet west of the point of impact. The engineer notified the train dispatcher, who contacted emergency personnel.

The signal maintainer's body came to rest approximately 20 feet south of the point of impact. At 8:05 a.m., the body was taken to the Milford Hospital Morgue, where the victim was officially pronounced dead.

#### Post-accident Investigation

Inspection of rail equipment disclosed no defects which would have caused or contributed to the accident. The sudden appearance of the signal maintainer immediately prior to impact precluded the engineer from sounding the horn. It was determined that the signal maintainer was not wearing a safety vest, and was not carrying either a flashlight or a lantern.

An autopsy was conducted by the Medical Examiner for the State of Connecticut. The cause of death was attributed to blunt force injuries.

Results of toxicological testing of the deceased and surviving crewmembers were negative.

#### Applicable Rules

##### Metro-North Commuter Railroad Safety Rules:

##### General Safety Rules - Personal Protective Equipment;

Rule No. 9062: "Approved reflectorized vest or clothing must be worn by all employees while on or about tracks and right-of-way, and in yards."

Rule No. 9107: "Expect equipment to move on any track, in either direction, at any time. Employees must look in both directions before:

- (a) Fouling track.
- (b) Crossing track."

##### Engineering Department Safety Rules:

Rule No. 3090: "Employees working on track and not protected by foreman or watchmen looking out for trains, must assume a position and perform work in a manner that permits frequent observation of track in both directions."

REPORT: 10 (FE-27-91)

RAILROAD: Atchison, Topeka and Santa Fe Railway Company (ATSF)

LOCATION: Buena Park, California

DATE, TIME: October 14, 1991, 8:15 a.m.

PROBABLE CAUSE: The welder failed to remain clear of an approaching train.

Possible contributing factor: The welder failed to obtain either track and time or a track warrant from the ATSF dispatcher prior to fouling the main track.

EMPLOYEE: Occupation. . . . . Welder  
 Age. . . . . 41 years  
 Length of Service. . . . . 12 years  
 Last Rules Training. . . . . July 12, 1991  
 Last Safety Training . . . . . September 20, 1991  
 Last Physical Examination. N/A

Circumstances Prior to Accident

An ATSF welding crew went on duty at 6 a.m. on October 14, 1991 at Sheila Yard, in Los Angeles, California. The welding crew consisted of a welder and a welder's helper (helper). The welder was given a work assignment by the ATSF Track Supervisor to perform maintenance on a frog on the main track at Buena Park. The assignment was to perform routine welding repairs to the frog points on the Number 24 crossover at Buena Park, milepost 160.3.

Upon arrival at Buena Park, the welding crew got out of their truck and began unloading the equipment. While unloading the equipment, the welder began to hurriedly put on his protective welding clothes. The helper stated that the fog was very dense providing limited visibility. However, when they had off loaded their equipment, the fog had lifted from ground level and began to clear. Prior to beginning work on the main track, the fog returned to ground level and the visibility was limited to about 50 feet.

*Visibility limited*

The helper stated that the welder gave him instructions to begin grinding on the frog. He told the welder that it was too dangerous due to the poor visibility. At that time, the welder decided that he would do the grinding, and instructed the helper to be the lookout. The helper assumed a lookout position from which he was close enough to touch the welder.

While the welder was grinding, the helper observed that the grinding cables were twisted. The welder instructed the helper to straighten out the cables, and the helper moved from his lookout position to the grinding machine, which was located away from the welder. The welder continued to work on the frog with the grinder, and the helper moved to the grinding machine to straighten out the cables. After doing so, the helper looked up and saw the welder stand and take a step toward him to get off the track.

#### Amtrak Train No. 572

A National Railroad Passenger Corporation (ATK) train crew went on duty at 7 a.m., on October 14, 1991, after completing their statutory off duty period. The train crew was called to operate ATK Train No. 572 from Los Angeles to San Diego, California. A push-pull system is used by ATK on the commuter operations between Los Angeles and San Diego. The engineer was operating the train from the cab car.

The engineer stated as the train approached La Mirada, California, the fog was extremely heavy and visibility was approximately 40 to 60 feet. The train was operating at 79 mph. Weather conditions as recorded by the Federal Aviation Administration at the Fullerton Airport, which is located about one mile from the accident site, indicated that on October 14, 1991, at 8 a.m., the fog was heavy and patchy with variable visibility distances.

The sun was above the horizon, there had been no rain, and the ground was dry.

#### The Accident

The ATK engineer stated that as he approached Buena Park, he observed a person working on the north rail of the south main track and sounded the horn. The person stood up and ran south directly into the path of the train. After the impact, the engineer placed the automatic brake handle into an emergency application position to stop the train. The engineer stated he observed another person standing next to a white truck located south of the south main track. The train continued east and came to a stop at milepost 161. Upon stopping, the engineer contacted the San Diego Sub-Division Dispatcher and reported the accident.

### Post-accident Investigation

The ATSF welder and helper were authorized to work on the main track by utilizing the railroad's maintenance-of-way rules for working "under traffic."

The ATSF train dispatcher had no contact with the welding crew, and did not know that they were working on the main track at Buena Park. Therefore, the dispatcher did not issue track and time protection to the welding crew. The investigation also revealed that during the first week of July 1991, the ATSF Roadmaster in Los Angeles cautioned the welder about working under traffic as a result of a near miss that was reported by an ATSF engineer operating a freight train at Los Nietos. As in the October 14, 1991 incident, the welder was working on a main track without track and time protection from the ATSF dispatcher.

*No notification to Dispatcher*

A post-accident toxicological test was performed on the ATSF welder by the Orange County Coroner. A post-accident toxicological test was performed on the ATK engineer. Reasonable cause drug testing, under ATSF authority, was performed on the ATSF welder helper. The results of all tests were negative.

### Applicable Rules

Both the ATK train crew and the ATSF welding crew were subject to the railroad operating rules in effect from the General Code of Operating Rules, Second Edition, effective October 29, 1989:

- "I" Employees must exercise care to prevent injury to themselves or others. They must be alert and attentive at all times when performing their duties and plan their work to avoid injury.
- "K" Employees must expect the movement of trains, engines, cars or other movable equipment at any time, on any track, in either direction. Employees must not stand on the track in front of an approaching engine, car or other moving equipment.
- 351(B) Track and time limits may be granted for machines, track cars or employees in the same manner as to trains.
- 412 A track warrant may be issued in the same manner as to trains to permit men or machines to occupy or perform maintenance on main track without other protection.

ATSF rules from Rules and Instructions for Maintenance of Way and Structures Employees, effective October 29, 1989:

104(I) Clear of Main Track: When a train is approaching or passing on a main track, Maintenance of Way employees must not go nearer than 150 feet to any main track switch.

664 Whenever necessary to do work on or above the track, and full protection is not otherwise provided, a sharp lookout must be kept at all times.

When the view is restricted or hearing impaired by any condition, employee in charge will assign one or more lookouts to insure the safety of the men. Employee in charge and lookouts will wear police whistles outside their clothing.

Rules from ATSF Safety and General Rules for All Employees:

7029 Lookouts: Maintenance of Way welder helpers must keep a lookout and give ample warning to the welder calling attention to approaching trains, engines, cars or other equipment. Welder helper lookout cannot leave the immediate vicinity of the welder or become involved in other affairs during welding operations. Lookout must not wear anything which impairs vision or hearing.



REPORT: 11 (FE-02-92)

RAILROAD: CSX Transportation (CSX)

LOCATION: Folkston, Georgia

DATE, TIME: January 22, 1992, 4 p.m.

PROBABLE CAUSE: The signalman walked with his back toward an approaching train and failed to clear the track.

EMPLOYEE: Occupation . . . . . Signalman

Age . . . . . 39 years

Length of Service . . . . . 15 years

Last Rules Training . . . . July 11, 1991

Last Safety Training . . . . July 11, 1991

Last Physical Examination . January 14, 1985

Circumstances Prior to the Accident

On the day of the accident the signalman went on duty at Waycross, Georgia, at 7 a.m. Shortly thereafter, the signalman departed Waycross with a second signalman and an assistant signalman for Folkston, Georgia where they arrived at about 7:45 a.m. Upon arriving in Folkston, the signal gang foreman held a safety meeting and a job briefing with the signal department employees from both Waycross and Folkston. During the safety meeting, the heavy rail traffic in the Folkston area and the need to exercise caution was discussed. The foreman assigned the subject signalman and the Waycross assistant signalman the task of replacing lenses as necessary and painting the signals at the Folkston Controlled Point.

The signalman and assistant signalman went to lunch at about 12 noon. After lunch, they returned to the Folkston Controlled Point and resumed their assigned lens replacement and painting duties.

In the accident area, there are two main tracks that extend northward and southward. From the west, they are designated as Track Nos. 1 and 2. Train movement is governed by signal indications of a traffic control system arranged for movement in either direction on both main tracks, and is controlled from the train dispatcher's office in Jacksonville, Florida.

### Train No. R176-21

On the day of the accident the engineer, conductor, and brakeman of Train No. R176-21 reported for duty at 1:30 p.m. at Moncrief Yard in Jacksonville, Florida. All crewmembers had completed their statutory off duty period. After receiving the required brake test, the train departed Moncrief Yard northward at 1:45 p.m. The train consisted of four diesel electric locomotives and 49 loads. The train's weight was 3,496 tons.

As the train approached Folkston on Track No. 1, the engineer observed an aspect indicating Approach being displayed by the approach signal to the Folkston Controlled Point home signal. Another northbound freight train was crossing over at the Folkston Controlled Point from Track No. 2 to the Jesup Subdivision. The engineer on Train R176-21 stopped his train south of the Martin Street highway-rail crossing to wait for the other train to clear the Folkston Controlled Point.

After Train No. R176-21 stopped, the Folkston signal maintainer talked to the engineer via radio and told him he would key the crossing gates up at Main and Love Streets in order to alleviate the vehicular congestion while train R176-21 was stopped. The maintainer requested that the engineer call him via radio when train R176-21 received an aspect indicating proceed at the Folkston Controlled Point so that he could key the gates down. The engineer told the maintainer he would call him.

About 5 to 6 minutes later, the engineer called the maintainer and advised him they had an aspect indicating proceed at the Folkston Controlled Point and were preparing to proceed. The maintainer and another signalman keyed the gates back down. Train R176-21 proceeded north toward the Folkston Controlled Point. The time was approximately 4 p.m. The engineer was operating the lead locomotive which had the short hood forward. The brakeman and conductor were also seated in the control compartment of the lead locomotive.

The weather was clear and the sun was shining. There are no visual obstructions in the area of the Folkston Controlled Point. Track No. 1 in this area is tangent for a considerable distance north and south. Wind was not a factor.

### The Accident

Train R176-21 approached the Folkston Controlled Point, and northbound Home Signal No. 8 was displaying Clear. As the train approached Home Signal No. 8, the engineer saw a man walking northbound on the end of the crossties west of the west rail on Track No. 1. The engineer estimated him to be about 1,000 feet north of his train. The engineer started sounding the locomotive horn to warn the man of the train's approach.

The other crewmembers also saw the man. All of the crewmembers discussed whether or not he was going to move away from the track out of the train's path. As the train approached the man, the brakeman opened the front door on the fireman's side of the locomotive and he and the conductor shouted warnings to the man. The engineer continued sounding the locomotive horn. The bell on the lead locomotive was also ringing. According to the engineer, the lead locomotive's headlight was illuminated on bright.

When the train was about 500 feet from the man, the engineer made an emergency application of the train's air brakes. The brakeman closed the door and he and the conductor continued shouting at the man from the fireman's side window. When the emergency brake application was made, the engineer estimated the train's speed was 35 to 40 mph and the throttle was in the number eight position.

According to the crew of Train R176-21, the subject signalman never changed his stride or moved his head to the left or right. The signalman was struck by the lead locomotive on the fireman's side and knocked to the west and clear of Track No. 1.

The Waycross assistant signalman working at the Folkston Controlled Point was on a ladder painting Home Signal No. 6 on southbound Track No. 1 as Train R176-21 approached. Upon hearing the train approach, he came down the ladder and as he reached the ground, the locomotives were passing. He backed away from the track and looked north and saw the subject signalman lying on the ground west of Track No. 1, approximately 200 feet from his location. He rushed to the signalman to see what was wrong.

The train stopped approximately 1,328 feet north of the point of accident. After the train stopped, the engineer of Train R176-21 tried to contact the dispatcher via radio. When he did not get an immediate response, he called the Folkston signal maintainer who immediately answered. The engineer advised the maintainer that the train had struck a man in the area of the Folkston Controlled Point and requested that he send an emergency rescue unit.

The maintainer immediately proceeded by truck to the Folkston Police Station, which was about one-half mile away, and advised the police of the accident and the need of an emergency unit. The Folkston Police Department and the Charlton County EMS were both notified at 4:09 p.m. The EMS unit arrived at the site at 4:12 p.m. and the police arrived at 4:13 p.m. The Charlton County coroner was also called. The victim was pronounced dead, and transported to Shepard's Funeral Home in Folkston.

### Post-accident Investigation

The only eye witnesses to the accident were the crewmembers of Train R176-21. After the accident, a carrier employee found a hearing protective device hanging on the horizontal handhold on the snowplow on the fireman's side of the lead locomotive. The device is distributed by the Cabot Safety Corporation and is identified as a Carboflex model 600 Hearing Protector.

This device is equipped with rubber pods that fit into each ear. The device found on the locomotive had one ear pod missing. The missing pod was found near the subject signalman in the ballast west of Track No. 2. It could not be determined if the subject signalman was wearing this device at the time the accident occurred.

A Federal Railroad Administration MP&E Safety Inspector inspected the lead locomotive of Train R176-21 on January 23, 1992. He found the horn, bell, headlight, and airbrake system to be functioning properly. A review of Train R176-21's lead locomotive on-board event recorder indicated the train's speed to be 38 mph and the throttle was in the number eight position when the engineer initiated the emergency brake application.

A copy of the computer log of events at the Folkston Controlled Point was obtained from the carrier's Dispatching Center in Jacksonville, Florida. A review of the log indicated Train No. R176-21 occupied the "OS" at the Folkston Controlled Point at 4:01:54 p.m., and that the train occupied the adjacent track circuit to the north at 4:03:20 p.m.

The required post accident toxicological samples were taken from the deceased signalman by the Charlton County coroner. The specimens were submitted and tested. The results were negative.

### Applicable Rules

#### CSX Transportation Safety Rules

810. Employees must expect the movement of trains, cars or equipment on any track, at any time, in either direction.
811. When required to be on or around tracks, employees must be alert and watchful and must keep out of danger. They must remain off and clear of the track structure at all times, unless required to be there in the performance of their work. Employees must look in both directions before stepping on or getting close to any track.

REPORT: 12 (FE-13-92)  
RAILROAD: Long Island Rail Road (LI)  
LOCATION: Valley Stream, New York  
DATE, TIME: May 19, 1992, 9:30 a.m.  
PROBABLE CAUSE: The welder failed to remain clear of a main track for an approaching train.

Possible contributing factor: The engineer on the approaching train failed to sound the required warning signal.

EMPLOYEE: Occupation . . . . . Welder  
Age . . . . . 43 years  
Length Of Service . . . . . 13 years  
Last Rules Training . . . . . May 19, 1992  
Last Safety Training . . . . . May 19, 1992  
Last Physical Examination . . . June, 1990

Circumstances Prior to Accident

On May 19, 1992, at 8 a.m., Bridge and Building (B&B) Gang No. 77 reported for duty at Valley Stream, New York. The gang consisted of a supervisor, a gang foreman, seven mechanics, a watchman, and an arc welder. The supervisor was in a trailer located to the west of Valley Stream Station, at street level. The gang foreman was traveling en route to deliver a permit. The eight mechanics were at the following locations: one mechanic was at Hicks Road directing traffic around the work site; another mechanic was sitting in the welding truck; two mechanics were working on the northwest end of the station platform; and four mechanics were working on the soffits and trim at the west end of the station platform.

The arc welder was positioned under the Valley Stream Station high level platform, between the bottom platform slab and the top concrete pier, working on the shims supporting the slab. The watchman was positioned at the west end of the station platform approximately 100 feet east of the gang and about 75 feet west of the arc welder. The watchman was equipped with a vest, a red flag, an air horn, and a whistle.

At Valley Stream Station, the Atlantic Branch consists of two main tracks, numbered from north to south, Nos. 1 and 2. Immediately north of and parallel to the Atlantic Branch is the Montauk Branch. The Montauk Branch consists of two main tracks, numbered from north to south, Nos. 1 and 2. Both the Atlantic Branch and Montauk Branch geographically extend in an east to west direction. Timetable direction is also east and west.

On the Atlantic Branch the current of traffic is westward on Track No. 1 and eastward on Track No. 2. The method of operation is by signal indications of an automatic block signal system for movements with the current of traffic. The maximum authorized speed for passenger trains on Atlantic Branch Track No. 2 at Valley Stream is 45 mph.

Approaching the point of accident from the west, there is in succession, a tangent for about 2,640 feet, a right-hand 1-degree 30-minute curve for 1,320 feet, a tangent for about 3,168 feet through two turnouts which are crossovers from Track No. 2 to Track No. 1, a 30-minute right-hand curve for 1,320 feet, and a tangent for 2,240 feet to the point of accident on the south side of the Valley Stream platform. The grade is practically level.

The Valley Stream Station's high level, island platform is located between Atlantic Branch Track Nos. 1 and 2. Valley Interlocking and block station is located 0.1 miles east of the passenger station.

#### Train No. 816

On May 19, 1992, at 1:20 a.m., the crew of LI Train No. 816 reported for duty at Long Beach Station, Long Beach, New York, after completing their statutory off duty period. The crew, consisting of an engineer, a conductor, an assistant conductor, and a collector, made several trips between Long Beach and Brooklyn, New York. At 9:04 a.m. the crew took charge of Train No. 816 at Brooklyn. Train No. 816 consisted of six multiple units (MU). Train No. 816 made a station stop at Jamaica, New York at 9:25 a.m. The next scheduled station stop was Lynbrook, New York. Valley Stream Station was not a scheduled station stop for Train No. 816.

Train No. 816 approached Valley Stream Station operating on Track No. 2 on a clear signal at a speed of between 30 and 35 mph. The engineer was located in the operating cab of the leading MU. The conductor was seated in the second MU. The assistant conductor and the collector were seated in the fourth MU.

## The Accident

### B&B Gang No. 77

At approximately 9:30 a.m., the B&B watchman, located at the west end of the station platform approximately 100 feet east of the gang and about 75 feet west of the arc welder, and having a view of all the workers, observed Train No. 816 approach from the west on Track No. 2. When Train No. 816 was about 1,000 feet west of the west end of the platform, the watchman sounded the air horn and raised the red flag to alert the arc welder of the approaching train. The arc welder acknowledged the warning by nodding his head to the watchman, and then the arc welder retreated under the platform. Underneath the platform, the arc welder was no longer in the watchman's view.

### Train No. 816

As Train No. 816 approached Valley Stream Station, the engineer observed passengers and several workers in orange vests on the station platform. The engineer also observed a flash of light which appeared to come from track level. At the west end of the station platform, about 200 feet west of the flash of light observed by the engineer, the engineer sounded the locomotive horn with two short blasts. The locomotive headlight was illuminated.

As Train No. 816 passed alongside the south side of the station platform, at an estimated speed of between 30 and 35 mph, a heating grate located on the side of the lead MU struck the arc welder inflicting fatal injuries. The engineer was unaware of the accident. Train No. 816 continued eastward beyond Valley Stream Station, and made all scheduled station stops en route to Long Beach.

After the train passed through Valley Stream Station, an unidentified female informed the watchman that, as Train No. 816 passed the platform, she observed a hat fly out from underneath the station platform. Utilizing a ladder, the watchman climbed down to Track No. 2 and observed the body of the fatally injured arc welder lying underneath the platform on the north side of Track No. 2. The time was approximately 9:35 a.m.

At 10:27 a.m. a Nassau County Advanced Medical Technician pronounced the arc welder dead at the scene. The body was transported to the Nassau County Morgue at 11:27 a.m.

## Post-accident Investigation

The engineer first became aware of the accident at the train's final destination in Long Beach. Inspection of the rail equipment disclosed no defects which would have caused or contributed to the accident.

Close examination revealed evidence of blood and body tissue on the heater grate of the lead MU, located about one-third of a carlength back from the leading end.

When Train No. 816 passed the west end of the Valley Stream platform, the engineer sounded the locomotive horn two short blasts instead of two long, a short, and a long blast that is required by carrier operating rules. According to Engineering Department officials, gang watchmen are required to sound two short blasts on the air horn to indicate that the track is clear and that it is safe to resume work.

There was no notice, either written or verbal, issued to the crew of Train No. 816 identifying the work being performed at Valley Stream Station.

Toxicological tests were performed on the deceased, the results of which were negative for alcohol and drugs.

#### Applicable Rules

The Long Island Railroad Co.  
Safety Rules  
Engineering Department Employees  
Effective November 1, 1959

3225. On receiving warning or knowing of approach of a train all men in gang must clear tracks at least 15 seconds before train reaches point of work, discontinue all activity and remain clear until receiving signal from the gang watchman (or foreman when gang watchman is not required) to resume work.....

#### Long Island Railroad Rules of the Operating Department

- 14(1)(3) Two longs, a short and a long are to be sounded when approaching passenger stations on tracks next to platforms where trains are not scheduled to stop (except Jamaica). To be sounded until passenger station is reached.



REPORT: 13 (FE-21-92)

RAILROAD: Norfolk and Western Railway Company (NW)

LOCATION: Circleville, Ohio

DATE, TIME: July 8, 1992, 10:15 a.m.

PROBABLE CAUSE: The signal maintainer failed to remain clear of approaching on-track maintenance-of-way equipment.

EMPLOYEE: Occupation . . . . . Signal Maintainer

Age . . . . . 57 years

Length of Service . . . . . 36 years

Last Rules Training . . . . . January 24, 1991

Last Safety Training. . . . . January 24, 1991

Last Physical Examination . August 5, 1982

Circumstances Prior to the Accident

A signal maintainer went on duty at Circleville, Ohio, at 7 a.m. on the day of the accident, after completing his statutory off duty period. His assignment was to observe a track resurfacing gang while the gang resurfaced the westbound track of a double track mainline in the vicinity of the Mill Street highway-rail grade crossing in Circleville. He was to ensure the uninterrupted operation of the highway-rail grade crossing warning device circuitry for the Mill Street crossing during these resurfacing operations.

At approximately 10:10 a.m., after the track resurfacing gang had completed its operations, the signal maintainer began to observe the installation of crossing timbers by members of a tie gang at the Mill Street crossing on the eastbound main track. This was also to ensure uninterrupted operation of the crossing warning devices. The signal maintainer was standing on the ends of the crossties of the eastbound main track, between the two tracks, with his back to the westbound main track. He was discussing the work with a member of the tie gang at the crossing.

Track Resurfacing Crew

A track resurfacing crew equipped with a Kershaw ballast regulator and a Cannon laser-guided tamper reported for duty at 7 a.m. on the day of the accident at Circleville.

The gang was assigned to resurface the westbound track of a double track main line from about milepost 676 to 676.2, in the vicinity of and through the Mill Street crossing.

The accident area is part of the NW's Lake Division, Columbus District, between Portsmouth, Ohio, milepost 605 and Columbus, Ohio, milepost 698.8. The double track main line extends geographically northward and southward. Geographical directions will be used throughout this report. The easternmost track is designated as the westbound main track, and the westernmost track is designated as the eastbound main track.

There are multiple street crossings in this area with an industrial facility immediately adjacent to the track on the west side, and a residential area on the east side. The track is almost level, and from the south to the north, moves through a 6-degree right-hand curve becoming tangent at milepost 676 and continues tangent to a 5-degree left-hand curve at about milepost 676.6.

The gang had completed the resurfacing operations in the Mill Street crossing. The ballast regulator and the tamper were occupying the westbound main track just south of the crossing. The operators of this equipment were making final preparations for moving it on the westbound main track northward to Columbus.

The ballast regulator operator began to move his machine northward sounding its air horn. The operator stopped the machine to allow a track supervisor to dismount, and then moved through the Mill Street crossing. The tamper began to move northward at the same time, operating in reverse. The tamper operator was maintaining a constant interval behind the ballast regulator of approximately 150 feet to properly activate grade crossing circuits. The tamper operator was sounding the air horn as the tamper approached the Mill Street grade crossing and passed other workmen.

The weather was clear and the temperature was about 78 °F.

#### The Accident

At approximately 10:15 a.m., as the tamper was moving northward through the Mill Street crossing on the westbound main track, the signal maintainer finished speaking with a tie gang member on the eastbound main track. The signal maintainer, who was facing westward at the time, then turned to the north (his right) and stepped into the gage of the westbound main track into the path of the approaching tamper.

The tamper operator fully applied the brakes as the maintainer turned toward the westbound main track. The signal maintainer was struck by the leading edge of the rear of the tamper, and was knocked down into the gage of the track. He was caught by the rear derailment bar of the tamper as it passed over him, and rolled under this bar for about 21 feet until the tamper came to a stop.

#### Post-accident Investigation

The Circleville Police arrived first on the scene after being contacted by railroad employees. The Circleville Fire Department Emergency Medical Technicians closely followed. The signal maintainer had suffered severe multiple trauma and was transported by helicopter to the Berger Hospital in Circleville where he was pronounced dead.

The derailment bar on the tamper serves to catch and support the machine in a derailment. It is attached to the underframe of the tamper, one at each end of the machine, and is suspended across and about 3 inches above the top of the rail. The bar extends laterally beyond each rail and would have been about 11-1/2 inches above the ties in the gage of the track.

Interviews were conducted with the tamper operator and each of the maintenance-of-way employees who were witnesses to the accident or had spoken with the signal maintainer immediately before the accident. Nothing unusual or abnormal was noticed about the signal maintainer or his actions before the accident.

The tamper was not equipped with a speed recording device but the operator estimated that the tamper was moving at between eight and ten miles per hour when it struck the signal maintainer.

The operator of the tamper noticed no irregularities or problems with the tamper during a routine daily inspection before commencing work with the machine. An inspection of the tamper by the railroad's work equipment supervisor disclosed no defective or abnormal conditions. No exception was taken to the tamper during post accident testing. Stop distance tests were performed on the subject tamper at different speeds and it appeared to operate within design limits. The tamper was a 1991 model, with little more than a year in service.

The railroad contracted with an independent environmental engineer to conduct various sound level measurements and tests of the tamper horn at the site of the accident. The ambient or prevailing noise levels and sources at the site at the time of the accident were duplicated.

A portable diesel air compressor had been operating at the crossing at the time of the accident and the industrial facility adjacent to the track on the south side was producing a significant noise level during its manufacturing operations.

The tests indicated the signal maintainer should have heard the air horn of the tamper as it approached his location. The tests did indicate that the tamper air horn conveyed a lower sound level to the rear of the machine than it did to the front. This is a result of the orientation of the horns toward the front of the machine.

Toxicological testing was performed on the deceased signal maintainer, and the results were negative.

#### Applicable Rules

Norfolk Southern  
Safety & General Rules  
Effective January 1, 1989

#### WORKING ON OR ABOUT TRACKS

1051. Employees working adjacent to a track upon which movements are being made must maintain vigilant lookout for approaching movements. Warning devices on all machines so equipped must be sounded continuously until the leading end of the movement has passed. If the adjacent track is less than 25 feet away and speed limit is over 25 MPH, machine operators must stop work but may remain seated: other employees must stop work and stand clear.

REPORT: 14 (FE-28-92)

RAILROAD: Chicago and North Western Transportation Company (CNW)

LOCATION: Wilder, Minnesota

DATE, TIME: September 8, 1992, 1:10 p.m.

PROBABLE CAUSE: Ballast regulator collided with an anchor squeezer, crushing the operator.

EMPLOYEE: Occupation. . . . . Machine Operator  
Age. . . . . 58 years  
Length of Service. . . . . 24 years  
Last Rules Training. . . . . Spring 1992  
Last Safety Training . . . . . August 1992  
Last Physical Examination. . May 5, 1992

Circumstances Prior to the Accident

On the day of the accident, a surfacing gang consisting of a foreman, assistant foreman, lead tamper, backup tamper, anchor squeezer and ballast regulator operators reported for duty at 7:30 a.m., at the Wilder, Minnesota, rail siding, milepost 152.7, to perform their daily maintenance on the machines.

At approximately 8 a.m., the lead tamper followed by the backup tamper, the anchor squeezer and ballast regulator entered the main track within the working limits designated in their Form B, Track Bulletin No. 28009. The surfacing gang traveled eastward to milepost 151.5 to conduct scheduled track surfacing. At approximately 11:50 a.m., a burro crane arrived with two cars of ballast. The surfacing gang moved their machines to milepost 150.5 and took a lunch break. The burro crane work crew unloaded the ballast between milepost 151 and milepost 151.5 and departed the area.

At about 12:50 p.m. the surfacing gang had finished their lunch break and returned to the location where they had left off. The ballast regulator operator started distributing the ballast from the track shoulder into the center of the track, working in a westward direction from milepost 151. When the ballast regulator operator reached the end of the ballast drop area, milepost 151.5, he began working back eastward in reverse.

Both tampers had returned to milepost 151 and had begun surfacing the track in an eastward direction. The anchor squeezer operator had stopped his machine 80 feet west of the area where the ballast regulator had started working to make repairs to the anchor squeezer. The tampers began surfacing the track in an easterly direction. The evidence indicates the anchor squeezer operator was in the process of replacing a sheared off block on the anchor squeezer arm. The operator was kneeling in front of the anchor squeezer machine (east end) where the tool box is located.

The weather was partly cloudy, and the temperature was 60 °F.

### The Accident

At approximately 1:10 p.m., the ballast regulator operator was operating eastward in reverse when the regulator struck a tie. The operator felt the machine lurch and placed the hydrostatic transmission lever handle into forward position. The ballast regulator continued to roll eastward about 20 feet and struck the anchor squeezer machine.

The ballast regulator operator climbed down to look for the anchor squeezer operator. He found the operator crushed beneath the anchor squeezer machine. The ballast regulator operator ran eastward to get help from the foreman who was standing in the area of the tamping equipment. The operator told the foreman about the accident. The foreman contacted a local section crew by radio, and instructed them to call 911.

The foreman, assistant foreman and ballast regulator operator took the ballast regulator approximately one-half mile westward to the crew maintenance truck to retrieve jacks to lift the anchor squeezer off the operator. The three men returned with the jacks about the same time the Windom Ambulance arrived. The anchor squeezer machine was jacked up and the paramedics pulled the operator from under the machine. The paramedics administered CPR and transported the operator to Windom Hospital where he was pronounced dead at 2:15 p.m.

### Post-accident Investigation

Evidence indicates the ballast regulator struck a tie 20 feet west of the accident point. The ballast regulator had no signs of damage. The anchor squeezer machine received a small 2-inch in diameter, one-half inch deep dent in the fuel tank. The anchor squeezer arm block was found in the tool box on the front of the machine. The anchor squeezer block had one of the bolts intact and two others sheared off. The anchor squeezer arm had three new block bolts installed. Hand tools were found lying on the ground near the anchor squeezer.

At the time of the accident, there were no rules or practices in effect that specifically required ballast regulator operators to establish work zones, and to have an understanding with adjacent work equipment operators regarding those work zones.

Additionally, there were no rules or practices in effect at the time of the accident that established procedures for the protection of maintenance-of-way employees required to inspect, service and repair work equipment that is subject to unexpected movement. Since this accident, the CNW Rules Of The Engineering Department were revised, and now provide for the protection of employees required to inspect, repair, or service work equipment.

#### Applicable Rules

Chicago and Northwestern Transportation Company  
Rules of the Engineering Department  
Effective-August 1, 1991

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

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

REPORT: 15 (FE-29-92)

RAILROAD: Chicago and North Western Transportation Company (CNW)

LOCATION: Belle Fourche, South Dakota

DATE, TIME: September 17, 1992, 1 p.m.

PROBABLE CAUSE: A tamper operator failed to remain alert, and maintain a lookout ahead.

Possible contributing factor: The failure of section laborer to protect himself from moving equipment.

EMPLOYEE: Occupation . . . . . Section Laborer

Age. . . . . 47 years

Length of Service. . . . . 22 years

Last Rules Training. . . . . March 18, 1992

Last Safety Training . . . . . September 14, 1992

Last Physical Examination. No Record

Circumstances Prior to the Accident

On September 17, 1992, a track foreman, a section laborer (Laborer-A), and three machine operators reported for duty at 7 a.m. at Belle Fourche, South Dakota. One section laborer (the deceased, Laborer-B) reported for work at 7 a.m. at Rapid City. All of these employees were assigned to the Rapid City Sub-division of the CNW.

The employees proceeded by company vehicles to two different work sites where they operated two tampers and a ballast regulator. One laborer assisted at each job site. By prearrangement, the three track machines cleared the main track at approximately 11:30 a.m. at the Mac Spur, milepost 156.7. After a noon meal, the equipment left the Mac Spur in the following order: First, the Mark I Tamper; second, the Junior Tamper, CNW-17-2463; and third, the ballast regulator. They proceeded on the main track to milepost 162.5, the location the Mark I Tamper had worked that morning, and began to perform quality control work. The work consisted of raising ties that had been knocked down during the tamping process and spiking them, changing joint bars, and installing rail anchors.



The laborers marked ties that they wanted the junior tamper operator to tamp. These ties were customarily marked with red paint between the rails in the center of the ties. Red paint was used to mark the ties on the day of the accident and on the preceding day. The two laborers then drove by company vehicle on US Highway 212 to a location adjacent to milepost 162.5. They parked the vehicle and walked a short distance to the railroad.

The foreman drove a second company vehicle, hi-rail truck, CNW-21-5277, to the highway-rail grade crossing at milepost 159.3. The truck carried tools and track hardware used in connection with the tamping operation. After the Mark I Tamper had passed the grade crossing, the Junior Tamper stopped to allow the foreman to place the hi-rail vehicle on the track, after which the equipment continued to proceed north behind the Mark I Tamper. Now the equipment was ordered as follows: First, the Mark I Tamper; second, the hi-rail truck; third, the Junior Tamper; and fourth, the ballast regulator.

Approaching the accident area from the south, the track is straight for 0.7 miles to the point of the accident and for a considerable distance beyond. The sight distance is unrestricted for a minimum of 1 mile in each direction. The grade ascends northward at 0.5 percent.

At the time of the accident, it was partly cloudy, with a north-west wind of about 25 mph, and a temperature of 75 °F.

#### The Accident

As the Mark I Tamper approached the location where the track laborers were working, the laborers ceased work and allowed the Mark I Tamper to proceed past without interruption. The hi-rail truck, operated by the foreman, arrived next. In response to a hand signal from Laborer-A, the foreman drove ahead slowly to the location of Laborer-A and stopped. Laborer-B followed the hi-rail vehicle as it moved north, walking between the rails. The employees had observed and were aware of the Junior Tamper following at an estimated distance of approximately 2,000 feet.

After stopping the truck, the foreman remained in the vehicle a brief time, estimated as approximately 90 seconds, to make notes. As the foreman stepped out of the stopped hi-rail vehicle, he observed the Junior Tamper closing to within a few feet of the hi-rail vehicle. The foreman shouted a warning to the laborers.

According to the Junior Tamper operator, he was proceeding at an estimated speed of 10 mph, or less, in second gear. He was engaging the foot clutch of the machine to increase speed, and then coasting for a time looking for ties marked with paint that indicated the location to begin tamping.

The operator stated that he was looking down toward the track trying to locate the exact location to begin tamping, and when he looked up the tamper struck the rear of the hi-rail truck. According to the tamper operator, there was insufficient time to apply the brakes.

Laborer-B had approached to within a few feet of the hi-rail truck with his back to the tamper. He was crushed between the tamper and the rear of the hi-rail truck. Laborer-A, who was standing on the bumper of the hi-rail truck, was thrown by the impact into the box of the truck. The foreman and the tamper operator separated the tamper from the hi-rail truck and removed Laborer-B from between the two pieces of equipment. The foreman immediately radioed the train crew, located at Belle Fourche, to call an ambulance.

The Butte County Sheriff's Department in Belle Fourche was notified of the accident at 1:14 p.m. on September 17, 1992, and arrived at the accident scene at 1:28 p.m. The Butte County Sheriff's Department and a representative of the Butte County Medical Examiner investigated the accident and concluded that the death was "an industrial accident with no crime involved." The representative of the Butte County Medical Examiner pronounced the employee dead at the scene of the accident at 2 p.m.

#### Post-accident Investigation

The Junior Tamper operator stated that he had overheard the lead tamper operator tell the roadmaster that they had tamped about the same footage as they had tamped the day before, and because of that information he expected to find the hi-rail truck and lead tamper further away. The Junior Tamper operator said that they had only tamped 10 or 12 rail lengths (approximately 390 to 468 feet) and not as much as the previous day. The Junior Tamper operator also stated that the hi-rail truck had been moved up to the lead tamper and then backed up. An on-site investigation determined that these statements were not correct.

Investigation revealed that the lead tamper and hi-rail truck were only 71 feet apart at the time of the accident, and about 1,754 feet of track had been tamped in the morning before clearing for a train.

Fellow employees stated that the Junior Tamper operator had made a round trip to Lusk, Wyoming, a distance of about 320 miles, by automobile sometime between the time he got off duty the previous day and when he returned to duty the day of the accident. Unsuccessful attempts were made to again contact the Junior Tamper operator to substantiate his off-duty activities, and their possible effect on the performance of his duties.

An inspection of Junior Tamper, CNW 17-2463, revealed that the bolts that hold the disc brake pads in the calipers on the front axle had fallen out, allowing the disc brake pads to dislodge from the calipers. In addition, the bottom front window was badly cracked, although there is no evidence that these conditions played a role in the accident.

Brake tests were conducted jointly by the National Transportation Safety Board, FRA, and CNW. Stopping distance for the Junior Tamper operating at an estimated speed of 10-12 mph in second gear varied from 23 feet 10 inches to 30 feet 11 inches. Because the brakes were never applied before the accident, this test is not considered to be significant. No radar speed tests were made to document the speed of the tamper.

The results of the toxicological tests of the foreman, Junior Tamper operator, and the deceased were negative.

#### Applicable Rules

Chicago and Northwestern Transportation Company  
Rules of the Engineering Department  
Effective-August 1, 1991

Rule 1006: Employees using work equipment: Employees using work equipment must observe the laws or regulations of a state or municipality within which the equipment is operated. In addition, the following procedures apply:

7. Lookout must be maintained in both directions when work equipment is travelling.

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

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

REPORT: 16 (FE-36-92)

RAILROAD: National Railroad Passenger Corporation, (Amtrak) (ATK)

LOCATION: Bristol, Pennsylvania

DATE, TIME: November 5, 1992, 10:33 p.m.

PROBABLE CAUSE: The track foreman failed to clear the track for an approaching train.

Possible contributing factor: The failure to provide a full-time watchman to warn employees of approaching trains.

EMPLOYEE: Occupation . . . . . Track Foreman

Age . . . . . 39 years

Length of Service . . . . . 16 years

Last Rules Training . . . . April 10, 1992

Last Safety Training . . . . October 13, 1992

Last Physical Examination. . July 18, 1989

Circumstances Prior to the Accident

The track foreman reported for duty at 8 p.m. on the night of the accident. He was one of the supervisors of a surfacing gang whose scheduled hours were from 8 p.m. to 6:30 a.m. On that evening, the surfacing gang consisted of 12 men. It included one supervisor, two foremen, six equipment operators, one van driver, one repairman, and one trackman. The surfacing gang was working in an eastward direction on Track No. 2 which was not in service for revenue train movements.

In the accident area, there are four main tracks and two yard tracks extending eastward and westward. From the south they are designated as Track No. 0 (yard track), Nos. 1, 2, 3, and 4 main tracks, and No. 5 (yard track). Train movements are governed by a traffic control system on Track Nos. 2 and 3, and an automatic block signal system on Track Nos. 1 and 4. In the accident area, the maximum authorized speeds are 100 mph on Track Nos. 1 and 4, 125 mph on Track No.2, and 120 mph on Track No. 3.

Approaching the accident point from the west, there are in succession a 32-minute curve to the left 3,600 feet in length, and a tangent 3,700 feet in length to the point of the accident. The grade for eastward trains is 0.13 percent ascending at the point of the accident.

Prior to the accident the surfacing gang was positioned from the east as follows: A tamper manned by two operators; a supervisor and an operator who were checking the track surface; a ballast regulator with two assigned operators 195 feet west of the tamper; the track foreman, the trackman and a signal maintainer were near the regulator; and a track stabilizer 725 feet west of the regulator. On board the stabilizer with the operator were a repairman and a foreman/pilot. The operator and repairman were working on the rear (west) cab door, and the foreman/pilot was talking on radio channel 2, the Amtrak assigned road channel, to electric traction personnel.

Just prior to 10:33 p.m., the track foreman at the ballast regulator sent the trackman to the van driver for a ballast fork in order to clear ballast from the track impedance bonds. The foreman was standing in the gage of Track No. 1 facing the regulator on Track No. 2. The foreman was talking via radio channel 4, the Amtrak assigned maintenance-of-way channel, to one of the ballast regulator operators about sweeping ballast from around the impedance bonds. The trackman had returned to the scene, and he was standing in the gage of Track No. 0 waiting for the ballast regulator to clear the impedance bonds.

#### Amtrak Train No. 80

On the day of the accident, the crew of Amtrak Train No. 80 went on duty at 4 p.m., after completing their statutory off duty period, at Sunnyside Yard in New York, New York. The crew consisted of an engineer, a conductor, and three assistant conductors. The crew operated a train from New York City to Philadelphia, Pennsylvania, and were returning from Philadelphia to New York City with Train No. 80 which consisted of one AEM-7 locomotive and seven passenger coaches.

Train No. 80 departed Philadelphia, and made no additional stops en route to the accident site. As Train No. 80 approached the accident site the engineer was seated alone at the controls on the south side of the locomotive control compartment. The train was moving eastward on Track No. 1 just under the maximum authorized speed of 100 mph. The headlight of the locomotive was illuminated on bright.

At the time of the accident it was dark, the weather was clear and the temperature was approximately 45 °F.

### The Accident

The track foreman continued standing in the gage of Track No. 1, facing the regulator on Track No. 2, as Train No. 80 approached. The signal maintainer and trackman noticed the train when it was about 250 feet west of the foreman. They began shouting to warn the foreman, and saw the foreman look west to see the train before he took a step to get out of the way. Train No. 80 struck and fatally injured the track foreman at about 10:33 p.m. The foreman's body came to rest at a point 150 feet east of the point of the accident, lying by the north rail of Track No. 0.

The engineer stated that as he heard and felt the impact, he made a full service application of train brakes. The train stopped approximately three quarters of a mile east of the point of impact. The engineer notified the surfacing gang and the train director at Fair Tower in Trenton, New Jersey to report the accident. The train director notified the train dispatcher in New York City. The dispatcher's office notified the Bristol Police and the Edgley Fire Department for assistance. The Bucks County Coroner was dispatched to the scene, and he pronounced the track foreman dead at 12:05 a.m. on November 6, 1992.

### Post-accident Investigation

The engineer stated he saw a person in the vicinity of a piece of track equipment prior to impact. The engineer stated he sounded the locomotive horn as he approached, and passed the surfacing gang. Inspection of lead Locomotive No. ATK 920 disclosed that portions of the foreman's remains were located on the cutting lever and the right step. The cutting lever and the steps on the right side were bent as a result of the impact.

Statements from track personnel indicated that none of them heard the locomotive horn. The engineer stated that he did sound the horn, and the conductor confirmed he heard the horn prior to impact. Statements by track personnel revealed that the noise level around the regulator is loud, but a locomotive horn can be heard above the noise of the regulator.

Representatives from the Federal Railroad Administration (FRA) witnessed removal of the locomotive speed recorder tape at 9:18 a.m. on November 6, 1992 at Sunnyside Yard. It indicated that the locomotive was moving at a speed of 98 mph at the time of impact, two mph less than the maximum authorized track speed of 100 mph. Amtrak policy does not limit the speed of a train operating on a track adjacent to a track on which a surfacing gang is working.

At time of this accident, there were no employees assigned as watchmen to warn other members of the surfacing gang about approaching trains. Rule number 4133, contained in Amtrak's Safety Rules and Instructions for Maintenance of Way Employees, NRPC-1098, as revised July 1, 1992, requires that a watchman be assigned to protect a gang when the work involves personnel fouling any live track and the job procedure involves the operation of machinery. However, according to statements from three eyewitnesses and other personnel, there were no full-time designated watchmen assigned to protect the gang on the date of the accident.

Typically, the track foreman assigns two trackmen to serve as watchmen with this surfacing gang. However, on November 5, 1992, one trackman did not report for duty due to illness, and his assignment was not filled. The other trackman had not been assigned as a watchman, and at the time of the accident, had just returned from obtaining a ballast fork at the request of the track foreman.

The foreman on the stabilizer at the west end of the gang was transmitting a Form D Clearance on the radio to an employee on a catenary maintenance vehicle so it could enter the surfacing gang's work limits. The foreman was on radio channel 2. However, the surfacing gang employees were on channel 4, which is the radio channel that MofW personnel normally use for their operations. Therefore, this foreman could not have notified the members in his gang of an approaching train until he finished issuing the Form D and switched back to channel 4.

The operator of the stabilizer at the west end of the gang was busy helping a mechanic fix a broken door on his machine. He was not near his radio, nor was he looking out for trains.

Visibility of a locomotive headlight at the time of accident, to the west from the point of the accident, was estimated to be at least 3,700 feet.

Post accident toxicological testing was performed on the engineer of the train and the remains of the deceased under Amtrak and FRA authority. All test results were negative.

Applicable Rules

Amtrak  
Maintenance of Way Employees  
Safety Rules and Instructions

4127 When necessary to walk on track:

- B. Maintain sufficient lookout in both directions to see on which tracks trains approach.
- E. Clear tracks at least 15 seconds before train reaches point at which walking, standing, or working.

4133 Before starting any job procedure that would involve personnel fouling any live track, regardless of the authorized speed of that track, and the job procedure also involves the operation of any power tool, machinery or equipment, or when outside noise interferes with the ability to ensure hearing an approaching train. You must either:

- A. Post a gang watchman close enough to the operation to be able to touch those involved upon the approach of a train;
- B. Take the track out of service;
- C. Obtain verbal permission to temporarily foul the track as outlined in Rule 101 of the Operating Rules.



REPORT: 17 (FE-12-93)  
RAILROAD: Burlington Northern Railroad Company (BN)  
LOCATION: Lodge Grass, Montana  
DATE TIME: April 8, 1993, 10:15 a.m.  
PROBABLE CAUSE: The signal maintainer failed to clear the main track for an approaching train.

Possible contributing factor: The signal maintainer failed to utilize available procedures to provide positive protection from approaching trains.

EMPLOYEE: Occupation . . . . . Signal Maintainer  
Age . . . . . 38 Years  
Length of Service . . . . . 18 Years  
Last Rules Training . . . . April 23, 1992  
Last Safety Training\* . . . . March 10, 1993  
Last Physical Exam . . . . April 24, 1987

Circumstances Prior to the Accident

On April 8, 1993, at 7:30 a.m., the signal maintainer reported for duty at his headquarters in Sheridan, Wyoming. A second signal maintainer and a signal inspector also reported for duty at the same time and location. On this day, as usual, these employees worked independently at different locations.

Train No. 01-021-05

At 8:50 a.m. westbound Burlington Northern freight train 01-021-05, departed Sheridan, milepost 698.6, with 41 loaded cars. The train's destination was Laurel, Montana. The crew had reported for duty at 7 a.m. following an off duty period which exceeded 24 hours.

At approximately 9:50 a.m. the signal maintainer communicated by radio from his company truck with a track inspector concerning two locations at which broken rails had been repaired in the vicinity of milepost 752. The signal maintainer told the track inspector that he would proceed to these locations and apply the bond wires to the rail.

The track is tangent in the accident area. From the west, there are no sight restrictions for a distance of more than 2,000 feet prior to point of accident and for a considerable distance beyond.

At approximately 10:07 a.m., the signal maintainer was observed at milepost 752.2 by crewmembers of westbound train 01-265-05. The signal maintainer stood clear of the track, near his truck, and gave the train a "roll-by" inspection.

At approximately 10:15 a.m. train 01-021-05 proceeded through Lodge Grass on a clear signal at a speed of 58 mph. As the train passed the controlled point at West Lodge Grass, the train crew saw a company truck parked clear of the track. They then observed the signal maintainer in the distance working on or near the track. The engineer began sounding the locomotive horn to alert the signal maintainer of the approaching danger.

The signal maintainer was positioned over the south rail, facing east, at milepost 752.2. His upper body was bent over and parallel with the rail. He was operating a gas-powered, hand-held portable grinder in preparation to applying bond wires to the rail. He was wearing the required safety equipment, including hearing protection of the soft plug type, which have an attenuation rating of 26 decibels.

The weather was partly cloudy with a wind of 10 mph and a temperature of 58 °F.

#### The Accident

The signal maintainer did not respond to the sounding of the locomotive horn. At a speed of 57 mph, and at a distance of approximately 600 feet from the signal maintainer, the engineer applied the train's brakes in emergency. The engineer continued to sound the horn. The speed of the train was not significantly reduced when the train struck the signal maintainer, who showed no sign of being aware of the approaching train.

After the emergency brake application, the train stopped in approximately 3,600 feet. The engineer immediately notified the train dispatcher that his train had struck an employee. The engineer then went back along the train until he found the deceased and remained there until the arrival of local emergency personnel.

At approximately 11:25 a.m., the Big Horn County Coroner arrived at the scene. The signal maintainer was pronounced dead at the scene by the coroner. The cause of death was determined to be massive head trauma, and time of death was established as being 10:15 a.m.

### Post-accident Investigation

Post accident investigation revealed two rail joint locations about 20 feet apart on the south rail at milepost 752.2 where fresh grinding had occurred. Pieces of red and black plastic and metal from a grinder along with pieces of a white hard hat were observed spread along the ballast and right-of-way ditch. The point of impact was determined to be the west grind mark, which was located 1,033 feet west of milepost 752 and 2,081 feet west of the west switch points of West Lodge Grass.

On April 9, a test was conducted by the BN Signal Department to determine the point at which an approaching train under similar circumstances could be heard. Under conditions which simulated the accident conditions, the horn of an approaching train did not become audible until the train was within a distance of 15 feet. It should be noted that at the time of the accident the signal maintainer was grinding the rail and thus additional noise would have been generated from the grinder's abrasive action against the rail.

The signal maintainer was not working under any formal method of protection at the time of the accident, such as track bulletin Form B, track and time limits, flag protection, or track permit. Nor did the employee have the benefit of an assigned lookout, as covered in Rule 725. Interviews with employees and supervisors indicated that the practice of performing minor maintenance without formal protection is common. According to the railroad's Director of Operating Rules, this practice does not violate the railroad's operating rules.

In response to this accident, the railroad initiated a review of the language and application of Maintenance-of-Way Rule 30. Pending the completion of this review, on April 26, 1993, the railroad's Chief Engineer issued a letter to engineering department employees. This letter requires employees who are working on or foul of the track without formal authority under Rule 10 or Rule 30 to contact the train dispatcher prior to commencing work. Additionally, the letter requires employees to receive formal authority under Rule 30, when their hearing or sight distance is impaired for any reason.

The toxicological test results were negative for the engineer, conductor, and the signal maintainer.

Applicable Rules

Burlington Northern Maintenance of Way Rules:

Rule 30. OCCUPYING MAIN TRACK: One of the following is required to authorize on-track equipment to occupy a main track, off-track equipment to foul a main track, or to perform work on a main track which affects the movement of trains:

- (1) Train location line-up.
- (2) Track warrant.
- (3) Track bulletin Form B.
- (4) Track and time limits.
- (5) Track flags placed as required by rule.
- (6) Track permit. ...

Rule 725. WORKING ON OR NEAR TRACKS: When working on or near tracks subject to use that are not protected under Rule 10, a lookout must be assigned where view is restricted for any reason, storm conditions exist or when noise of tools, machinery or equipment interferes with hearing . . .

REPORT: 18 (FE 18-93)  
RAILROAD: Northeast Illinois Railroad Corp. (NIRC)  
LOCATION: Joliet, Illinois  
DATE, TIME: May 11, 1993, 1:28 p.m.  
PROBABLE CAUSE: Two Maintenance-of-Way employees failed to remain clear of an approaching train.

Employee No. 1

Occupation . . . . . Track Laborer  
Age. . . . . 59 years  
Length of Service. . . . . 6 years  
Last Rules Training. . . . . September 1, 1992  
Last Safety Training . . . . . April 22, 1993  
Last Physical Examination. . . May 8, 1987

Employee No. 2

Occupation . . . . . Track Laborer  
Age. . . . . 40 years  
Length of Service. . . . . 5 years  
Last Rules Training. . . . . September 1, 1992  
Last Safety Training . . . . . April 22, 1993  
Last Physical Examination. . . August 10, 1987

Circumstances Prior to the Accident

On the day of the accident a maintenance-of-way crew consisting of a foreman, welder, and two track laborers reported for duty at 7:30 a.m., at MC Tower, in Joliet. The foreman reviewed the Rule of the Day and the work to be performed with the welder and two track laborers before driving a short distance to the work site.

The welder parked his truck just west of the south vertical support column for a signal bridge, milepost 39.6, located adjacent to and south of Track No. 1. The foreman parked his truck just east of the support column. The foreman obtained track and time from the Blue Island Train Controller between the EJ&E Crossing and Richards Street on Track No. 2 from 9:30 a.m., until released. The crew then began to cut and weld in two slugs (insulated joints) on Track No. 2.

In the accident area there are two main tracks extending between Richards Street, milepost 39.9 and the EJ&E crossing, milepost 38.9. Track No. 1 is located to the south and Track No. 2 to the north. There is a single main track between Richards Street and Joliet Union Station, milepost 40.2. The single main track is under the control of the operator at UD Tower, milepost 40.1.

The UD Tower Operator is under the direction of the Blue Island Train Controller. The operator at "UD" controls the Richards Street switch, and the train controller controls the trackage between Richards Street and the EJ&E crossing.

The maintenance-of-way crew had taken their lunch period at the site and returned to finish their work on Track No. 2. The foreman was located north of Track No. 2, facing south, and was in the process of picking up some small hand tools that had fallen on the ground. The welder was kneeling, facing south and looking downward while grinding on the north rail of Track No. 2. Neither the foreman or the welder saw the train approaching.

#### Train No. 516

After completing their statutory off duty period, the train crew reported for duty at 12:41 p.m., May 11, 1993, at NIRC's Yard office in Joliet, Illinois. The train crew, consisting of an engineer, conductor and assistant conductor, were called to operate Commuter Train No. 516 in push-pull service between Joliet and Chicago. The train consisted of a cab car, two coaches, with Locomotive No. 212.

Joliet Union Station was the first station stop where two passengers had boarded the train. The train departed Joliet Union Station at 1:24 p.m. The engineer was operating the train from the cab car. The conductor and brakeman were positioned in the middle coach.

The engineer performed a running brake test shortly after departure. The brakes functioned properly and the train continued eastward on the single main track to Richards Street and diverged onto Track No. 1. The maximum authorized speed through the turnout at Richards Street is 25 mph and increases to 40 mph for a considerable distance beyond. The method of operation is by signal indications of a traffic control system supplemented by an automatic cab signal system.

The weather conditions were dry and clear. The temperature was 72 °F.

#### The Accident

The maintenance-of-way crew had completed welding in two slugs and was in the process of grinding the weld on Track No. 2. The two laborers picked up some tools that were no longer needed and crossed Track No. 1 and placed the tools in the bed of the welder's truck.

They then walked northward from behind the truck and signal bridge support column and stepped foul of Track No. 1 where they were struck by Train No. 516. According to the engineer, he did not see the two laborers until they stepped out from behind the truck and fouled the main track. The foreman heard the impact and saw the train stopping. When the foreman realized that the two laborers had been struck he immediately radioed UD Tower and requested emergency assistance.

The UD Tower Operator requested emergency response personnel be sent the scene. An ambulance arrived and the paramedics transported the two laborers to Silver Cross Hospital in Joliet where they were pronounced dead.

The engineer of the train was relieved by the road foreman of engines who operated the train to Blue Island where an extra board engineer took charge of the train. The conductor and brakeman continued in service to Chicago.

#### Post-accident Investigation

Evidence indicates that the two laborers had placed some tools in the back of the company truck and then walked around from behind the truck and signal bridge support column and stepped foul of the main track. Both men were wearing hard hats and safety glasses equipped with side shields. The rail grinding operation could have produced noises that drowned out the sound of the approaching train.

The train was a regular scheduled train operating on time. The four maintenance-of-way employees had attended an eight hour Right-of-Way Safety Training Program on April 22, 1993, that stressed working on or about live tracks.

The toxicological tests results were negative for the engineer, conductor and the two fatally injured maintenance-of-way employees. The assistant conductor tested positive for cocaine.

#### Applicable Rules

##### General Code of Operating Rules

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

[Rule of The Day May 11, 1993]  
Employees must not stand on the track in front of an approaching engine, car or other moving equipment....

NIRC Safety Rules and General Procedures

Rule E 173. Employees must move to a place of safety upon approach of moving equipment traveling on the same track upon which they are working or on an adjacent track.

Rule E 174. Keep a safe distance from passing cars and trains to avoid falling or protruding objects.



REPORT: 19 (FE-51-93)  
RAILROAD: Consolidated Rail Corporation (CR)  
LOCATION: Seaford, Delaware  
DATE, TIME: December 13, 1993, 9:38 a.m.  
PROBABLE CAUSE: The handbrake failed on a free-rolling car.  
EMPLOYEE: Occupation . . . . . Welder  
Age . . . . . 41 years  
Length of Service. . . . . 17 years  
Last Rules Training. . . . February 17, 1993  
Last Safety Training . . . March 26, 1993  
Last Physical Examination. July 1, 1993

Circumstances Prior to the Accident

Maintenance-of-Way Welder

On the day of the accident, a Consolidated Rail Corporation (Conrail) maintenance-of-way welder reported on duty at 7 a.m. at Newark, Delaware. After a safety meeting with the foreman, he departed for Seaford at about 7:30 a.m. in a Conrail GMC hi-rail equipped truck. The welder was assigned to assist the gang foreman with the installation of continuous welded rail on the Delmarva Secondary Track north of the Seaford station.

The welder arrived at the Seaford station about 9:30 a.m. Upon arrival, he met with the gang foreman to plan the day's work. After a short discussion, the gang foreman instructed the welder to place his hi-rail truck on the Cambridge Industrial Track in Seaford Yard at Porter Street. This location was selected because the hi-rail truck was larger than the crossing at Seaford Station, and it would have required more maneuvering to set the truck on the track. Once on the track, the welder was to proceed north to the Delmarva Secondary Track. The welder drove to Porter Street, positioned the truck on the track with the front facing north, and then began to set the truck's rear hi-rail wheels on the track.

#### Train WSPE-14

On the day of the accident, after completing their statutory off duty period, the crew of WPSE-14 consisting of a conductor, brakeman and engineer went on duty at 6 a.m. at Seaford. Upon reporting for work, the crew reviewed the safety rule of the day, and their work assignments. After experiencing trouble with their locomotive, CR 8102, they received another locomotive, CR 6519, from a passing road train.

The crew performed miscellaneous switching in the yard. Then they assembled their train, and traveled northward to Seaford Siding. They left their cars on the north end of the siding for pickup by a road train. The crew then proceeded to the south end of the siding, picked up 37 cars, and returned to Seaford Yard. Upon arrival at Seaford Yard, the crew proceeded south on the Cambridge Industrial Track to switch industries at the south end of the yard.

Seaford Yard is a flat switching yard. In the accident area there are three tracks extending northward and southward. From the east, they are designated as the Cambridge Industrial Track, the Storage Track, and the Gas Track. The Storage and Gas Tracks merge with the Cambridge Industrial Track on the south end in a 4-degree curve. The grade descends 0.63 percent to the north. The accident site is located 45 feet north of the point where the Cambridge Industrial Track and Storage Track merge on the north end.

After arriving at the south end of the yard, the crew stopped, cut off nine cars, and then pulled south with 28 cars. They continued their switching operation, and shoved 16 cars into the Gas Track for interchange to the Maryland and Delaware Railroad. The crew then pulled south with 12 cars to clear the Storage Track switch. The next move required the crew to place a loaded covered hopper car, CNW 173911, on the Storage Track adjacent to the Cambridge Industrial Track. They planned to uncouple the car from the train and allow it to roll freely onto the Storage Track.

The conductor and brakeman stated they tested the car's handbrake and determined that it worked prior to cutting off the car. The crew cut off CNW 173911, and it rolled freely toward the Storage Track. The brakeman was riding the north end of the car in order to apply the handbrake once the car was in the clear. The brakeman stated that as the car entered the Storage Track he applied the handbrake too quickly and the car stopped short, fouling the Storage Track Switch. The brakeman stated he then released the handbrake and the car proceeded to roll northward under its own momentum onto the Storage Track.

### The Accident

When the car cleared the south switch of the Storage Track the brakeman began to reapply the handbrake. The conductor lined the switch for the Gas Track and proceeded to place another car on that track. As the brakeman continued to apply the handbrake, he realized that the car was not stopping. As the car continued to roll, he continued his attempt to apply the handbrake. Shortly thereafter, he observed the welder's truck on the track ahead at Porter Street, and the welder at the rear of the truck. The brakeman used his portable radio in an attempt to warn the welder of the approaching car. Although there was no response, the brakeman observed the welder walk from the rear of the truck and get in the truck cab. The brakeman then observed the welder exit the truck cab and walk to the front of the truck.

The brakeman again attempted to warn the welder by radio. When the brakeman received no response, he dismounted the car and attempted to run ahead to warn the welder. The car ran through the switch at the north end of the Storage Track, and entered the Cambridge Industrial Track. The car struck the hi-rail truck and shoved it northward over the welder, and then to the west where it struck a standing covered hopper car on the adjacent track.

Emergency Medical Services Personnel responded to the scene at approximately 9:45 a.m. and administered emergency medical treatment. The welder was then transported to Nanticoke Hospital where he was later pronounced dead.

### Post-accident Investigation

There is no yardmaster assigned to Seaford Yard. The yardmaster at Harrington, Delaware sends switching instructions to the local yard crew at Seaford. The track supervisor and the conductor of the local yard crew usually meet in the station at Seaford to discuss the day's work. The employees then go their separate ways to complete the work.

The yard crew was unaware of the welder's presence on the Cambridge Industrial Track and was unable to see Porter Street from their position at the south end of the yard due to track curvature. Similarly, the welder was not able to see the yard crew at the south end.

The welder was complying with his instructions and putting his hi-rail vehicle on the track at Porter Street. The welder was not required by Conrail Operating Rules to obtain permission to occupy the Cambridge Industrial Track in Seaford Yard.

The welder had previously tested his radio prior to departing Newark, as required by NORAC radio rule 705. The radio on the hi-rail truck was found in the off position. The truck was equipped with an external speaker. However, the radio speaker switch was positioned for the internal speaker.

Post accident testing of the handbrake assembly by Conrail at the accident scene disclosed that the handbrake failed to apply in 8 of 10 attempts. The hand brake was a non-spin vertical wheel Klasing model 1500, manufactured by the Klasing Hand Brake Company, Joliet, Illinois.

The handbrake assembly was removed from CNW 173911, and sent to Conrail's Juniata Test Laboratory to be inspected for defects. During the tests conducted by Conrail's Engineering Services, the brake was applied and released repeatedly, and failed to apply approximately 70 percent of the time. A visual inspection revealed the brake failed to apply because the fingers on the pinion gear and connector plate would ride over and not engage.

Further inspection revealed the handbrake shaft was slightly bent and the release lever had been bent and then straightened using heat. The damage which appeared old, did not affect the operation of the handbrake. The investigation revealed that the fingers of the pinion gear and connector plate fail to engage because the yoke spring does not exert enough force on the yoke to move the connector plate to the engaged position.

The results of toxicological testing of the conductor, brakeman and deceased welder were negative. Conrail officials did not require the engineer to provide samples.

Applicable Rules

None

REPORT: 20 (FE-52-93)  
RAILROAD: Illinois Central Railroad (IC)  
LOCATION: Kankakee, Illinois  
DATE, TIME: December 17, 1993, 2:50 p.m.  
PROBABLE CAUSE: The signal maintainers failed to clear the main track for an approaching train.

Employee No. 1

Occupation . . . . . Signal Maintainer  
Age . . . . . 42 years  
Length of Service . . . . . 19 years  
Last Rules Training . . . . . April 30, 1992  
Last Safety Training . . . . . December 2, 1992  
Last Physical Examination. October 9, 1978

Employee No. 2

Occupation . . . . . Signal Maintainer  
Age . . . . . 42 years  
Length of Service . . . . . 24 years  
Last Rules Training . . . . . May 7, 1992  
Last Safety Training . . . . . December 2, 1992  
Last Physical Examination. February 6, 1979

Circumstances Prior To The Accident

Signal Maintainers

On the day of the accident, the two signal maintainers reported for duty at 7 a.m., at Gilman, Illinois. They were assigned to repair switch heaters at several locations in their territory in preparation for winter weather. Repairing switch heaters is a routine assignment, and the two men regularly worked together if one needed additional help. The signal maintainers had completed their statutory off duty period.

Earlier in the day the two maintainers worked on the switch heater at a remotely controlled power switch in Gilman. After work on the switch heater was complete, one of the maintainers contacted the Gilman operator by radio and requested that he operate the switch so they could determine whether or not it functioned as intended. This was the last established communication between the maintainers and any other railroad employee. The maintainers departed Gilman, and sometime later arrived at Otto, milepost 60.3, a railroad station 4.4 miles south of Kankakee, Illinois.

In the accident area there is a single main track that extends northward and southward. At Otto a passing siding parallels the main track to the west and extends northward for 13,224 feet. Approaching the point of accident from the south, the single main track is tangent for over one mile to the point of accident and for a considerable distance beyond.

The method of operation in the accident area is by signal indications of a traffic control system. The maximum authorized speed is 60 mph for freight and 79 mph for passenger trains. A wayside signal governing northbound train movement is located about 500 feet south of the point of accident.

Each maintainer drove his assigned company truck to the work site. The trucks were parked together on the west side of the track slightly north of the remotely controlled power switch. The signal maintainers were working within the gage of the main track at the remotely controlled power switch that connects the main track to the south end of the passing siding.

#### NS Train W18D5

On the day of the accident, a crew consisting of an engineer and a conductor reported for duty at 11 a.m., at the Norfolk Southern (NS) Decatur Terminal in Decatur, Illinois, to operate NS Train W18D5. Both men had completed their statutory off duty period.

Train W18D5 consisted of Locomotive No. 8716, with 45 loads and 8 empties. It was 4,451 feet in length, and weighed 3,109 tons. Train W18D5 received an initial terminal air brake test before departing the Decatur Terminal at 12:01 p.m. It proceeded eastward on the NS Lafayette District to Bement, Illinois, a distance of about 17 miles. At Bement the train entered the NS Bloomington District, and proceeded northward to Gibson City, Illinois, a distance of about 41 miles.

At Gibson City the train crew received a track permit from the IC Homewood, Illinois, train dispatcher to operate northward over the Gilman District between Gibson City and Gilman, a distance of about 29 miles. At Gilman, milepost 81.1, the train entered the IC Chicago District on a clear signal.

Train W18D5 was operating on a clear signal as it approached the point of accident. The locomotive's short hood was forward. The engineer was seated at the controls of the locomotive on the east side of the cab. The conductor was seated on the west side of the cab.

The weather conditions were foggy and misting rain. This restricted visibility in the accident area to about one-quarter of a mile. The temperature was about 40 °F. The wind was from the south at 8 mph.

### The Accident

According to the engineer, when his train was at milepost 60.7 he saw men on the track, and started to sound short blasts of the locomotive horn. The two men were bent over at the waist working between the rails on the main track. When it became apparent that the men did not see the approaching train, the engineer initiated an emergency application of the train's air brakes. The locomotive struck the two men, and came to a stop about 4,000 feet north of the point of impact.

The train crew notified the IC train dispatcher who in turn notified the emergency response teams. The Kankakee Police and Fire Department personnel arrived within five minutes of notification. One life support ambulance also responded. At 3:35 p.m., the two signal maintainers were pronounced dead at the scene by the Kankakee County Coroner.

### Post-accident Investigation

According to the IC train dispatcher on duty at the time of the accident, after an initial communication at about 7 a.m. with the signal maintainers concerning some trouble with a grade crossing signal at Kankakee, he had no additional contact with them.

The IC has a track occupancy policy that allows railroad employees to perform minor work on or about live tracks using their personal discretion. The IC utilizes General Rule No. 126 to govern maintenance-of-way and signal employees while working on or about tracks. However, if an employee believes that additional protection is required, track and time authority may be requested from the train dispatcher. In this instance, the signal maintainers did not request track and time authority, and the dispatcher was not aware that the two men were working on or near the main track.

The signal maintainers' vehicles were equipped with mobile railroad radios. Additionally, each maintainer had been issued a portable hand held radio. The portable radios were found in the maintainers' trucks after the accident. According to a carrier official, the four radios functioned as intended, and were returned to service. There is no evidence to indicate that either maintainer contacted the IC Homewood train dispatcher before beginning work on the switch heater at Otto.

Tools and material at the scene indicate that the two signal maintainers were cutting and installing sheet metal covers for the switch heaters. The two men were wearing work denim trousers, coverall jackets and hard hats. One man wore a helmet liner with ear flaps. Neither man was believed to have been wearing hearing protection.

Carrier officials indicated that both signal maintainers were issued reflectorized vests. However, no specific instructions were issued with respect to their required use, and neither maintainer was wearing one at the time of the accident. It was noted that Interstate Highway 57 parallels the railroad to the east.

The results of toxicological testing of the two deceased signal maintainers, the conductor and engineer of Train W18D5, and the IC train dispatcher were negative.

### Applicable Rules

#### IC Safety Rules

##### ON OR ABOUT TRACKS

Rule 126. Employees must:

- a) Expect the movement of trains, locomotives, or cars at any time, on any track 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.





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