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

Certain Fatalities Investigated By The Federal Railroad Administration Third Quarter 1987

Office of Safety
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ACCIDENTS REPORTS ACT - 45 USC 41

Section 41

"Neither the report required by Section 38 of this title nor any report of the investigation provided for in Section 40 of this title nor any part thereof shall be admitted as evidence or used for any purpose in any suit or action for damages growing out of any matter mentioned in said report or investigation."

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INTRODUCTION

This report represents the Federal Railroad Administration's findings in its investigation of 10 railroad employee fatalities suffered during the third quarter of calendar year 1987. Not included are the employee fatalities that occurred as a result of train derailments, collisions, or rail-highway crossing accidents; these are reported in the 1987 Summary of Accidents Investigated by the Federal Railroad Administration.

The purpose of this report is to direct public attention to hazards that exist in the day-to-day operation 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.

J. W. Walsh
Associated Administrator
for Safety

CAUSE DIGEST

SUMMARY OF ACCIDENTS INVESTIGATED INVOLVING ONE OR MORE FATALITIES

RAILROAD	ACCIDENTS
ATK	1
ATSF	1
CO	1
CSX	1
CR	1
CRN	1
NW	1
SP	2
UP	1

Accident Investigation Reports

REPORT: 17

RAILROAD: Southern Pacific Transportation Company

LOCATION: Rodeo, California

DATE, TIME: July 9, 1987, 11:55 a.m.

PROBABLE CAUSE: Operation of hi-rail vehicle on a main track without proper authority.

EMPLOYEE:

Occupation.	Laborer
Age	26 years
Length of Service	3 years
Last Rule Examination . . .	September 7, 1984
Last Safety Meeting	July 6, 1987
Last Physical Examination .	May 11, 1984

Circumstances Prior to the Accident

Rail Gang

On the day of the accident, the westward main track of the Martinez Subdivision, of the Western Division, was out of service between milepost 33 and milepost 26.3, at Rodeo, California (out-of-service track), because a rail gang was relaying rail in that area. Flagmen were stationed at each end of the out-of-service track to direct train movements, in both directions, on the eastward main track.

On the morning of the accident, a laborer, who was qualified as an on-track machine operator, was assigned to operate Pettibone speed swing SPO-222. The speed swing was equipped with both rubber tires and hi-rail flanged wheels. The laborer was instructed by the acting gang foreman to operate the speed swing to Hercules and pick up track material. Hercules, milepost 23.8, is 2.5 miles west of the westernmost limits of the out-of-service track. The acting gang foreman cautioned the laborer that the speed swing would be operating on live tracks outside the protected area, and therefore, the laborer would have to protect himself. The laborer apparently decided to move the speed swing using the hi-rail flanged wheels on the westbound main track to Hercules and back.

About 10:30 a.m. the speed swing departed the out-of-service track and, operating on the main track, proceeded to Hercules, where the speed swing bucket was loaded with tie plates, spikes

and rail anchors. About 11:30 a.m. the laborer began operating eastward on the westbound main track towards Rodeo with the machine facing eastward.

Extra 6807

About 11:35 a.m. SP train Extra 6807 West proceeded westward on the eastward main track from milepost 33 to milepost 26.3 where the train crossed over to the westward main track beyond the out-of-service track. According to the engineer, the train continued westward at approximately 40 mph, past signal 257 (milepost 25.7), which displayed a green aspect, indicating proceed. The maximum authorized speed in the accident area is 40 mph.

The Accident

Near milepost 25.2, the speed swing was traveling eastward and Extra 6897 West was traveling westward on the westward main track. Due to track curvature and an embankment, sight distance between them was approximately 700 feet. According to the engineer and front brakeman, the speed swing stopped, reversed movement and started westward.

Realizing a collision was inevitable, the engineer applied the train brakes in emergency. At 11:42 a.m., while moving at about 22 mph, Extra 6807 West collided with the speed swing at milepost 25.2.

The laborer was thrown through the windshield and suffered severe injuries. He was taken to John Muir Hospital in Martinez, California, where he died at 7 p.m., on July 11, 1987 (55 hours after the accident).

Post-accident Investigation

The flagman, at milepost 26.3, observed the speed swing depart on the westward main track and assumed the speed swing operator had authority for the movement. The flagman also overheard an unidentified radio transmission requesting authority to occupy the westward main track about 11:35 a.m., but the flagman did not hear any other radio transmission regarding the track involved.

The radio on the speed swing was tested at the Systems Communications shops, and found to be working properly.

The acting maintenance-of-way gang foreman instructed the laborer to proceed to Hercules on the westward main track and protect his movement outside the out-of-service track.

The laborer was a qualified on-track machine operator and was qualified on the carrier's flagging rules.

The crew of Extra 6807 West and the flagman at milepost 26.3 were not tested for drugs and alcohol because the carrier determined they had no role in the cause of the accident. The laborer was not tested because he died more than 12 hours after the accident. See 49 CFR Section 219.11(f).

Applicable Rules

Rules

Maintenance of Way and Structures
Adopted By:

Atchison, Topeka and Santa Fe Ry. Co.
St. Louis Southwestern Railway Co.
Southern Pacific Transportation Co.

Effective October 28, 1985

PROTECTION ON MAIN TRACKS

252. Track Permit: When authorized by special instructions between specific points within territory where current of traffic has been established, a train, track car, machine or employee may occupy main track or tracks on authority of track permit issued by a designated control operator under the direction of the train dispatcher, and may move in either direction on such track or tracks within the limits during the effective time of track permit without train order authority or flag protection.

REPORT: 18

RAILROAD: The Chesapeake and Ohio Railway Company

LOCATION: South Fayette, West Virginia

DATE, TIME: July 16, 1987, 9:45 a.m.

PROBABLE CAUSE: Operation of a hi-rail vehicle on the main track without looking in the direction of travel and without being prepared to stop within half the range of vision, not exceeding 10 mph.

A contributing factor was the operation of hi-rail vehicle on main track without proper authority.

EMPLOYEE:

Occupation	Machine Operator
Age	31 years
Length of Service	7 years
Last Rules Training	April 1987
Last Physical Examination	March 1987

Circumstances Prior to the Accident

Maintenance-of-Way Crew

A maintenance-of-way crew was replacing curve worn rail on No. 2 main track in the vicinity of South Fayette, West Virginia. The maintenance-of-way(MW) foreman obtained train dispatcher authority to occupy No. 2 track at 7:41 a.m., between the westward absolute signal at MA Cabin and the eastward absolute signal at Sewell. The crew brought their equipment out of the house track at South Fayette. Part of the crew departed westward to begin laying rail. Part of the crew, including the machine operator, went east to complete the anchor spiking on the curve that had been laid the previous day. The weather was clear that morning and the temperature was 80 degrees.

Assistant Division Engineer

At approximately 9:30 a.m. an assistant division engineer arrived at South Fayette after the crew had departed. He contacted the New River dispatcher and asked for permission to set on No. 2 track and hi-rail his 1985 Chevrolet Suburban east to inspect a defect found by the geometry car on the previous day. The dispatcher advised that he could not give an authority because the track had been turned over to the MW foreman by

means of a Rule 707(c) work authority. The assistant division engineer asked the dispatcher to contact the foreman and have him come to the block telephone so he could obtain the MW foreman's permission to set on No. 2 track and hi-rail east.

A signal maintainer, who at that time started using the dispatcher's block line, told the assistant division engineer that he had obtained permission from the MW foreman to occupy the main track under his Rule 707(c) authority between Sewell and the westward absolute signal at the east end of South Fayette siding.

The assistant division engineer told the signal maintainer that he needed to go by hi-rail from the tool house at South Fayette east to milepost 402 to check a defect and then return west to the tool house. He told the signal maintainer he would call him on the radio when he was finished and clear of his work area.

The Accident

Without obtaining permission from the MW foreman in charge, the assistant division engineer put the hi-rail vehicle on No. 2 track at the South Fayette tool house and backed east toward milepost 402. At milepost 403.3 the hi-rail vehicle struck the machine operator. The victim was taken to Oak Hill Hospital where he was pronounced dead at 11:45 a.m.

Post-Accident Investigation

An inspection of the accident area revealed that the machine operator was facing east with his back to the approaching vehicle. The tie drill, which he was operating, was powered by a gasoline engine. The noise from the engine kept him from hearing the vehicle.

The assistant division engineer thought that the entire maintenance-of-way crew was west of South Fayette laying rail. He backed east with the intention of hi-railing west to the rail-laying crew once he had checked the defect at milepost 402. As he backed through the 4-degree curve to the right, he was looking forward over the hood of the vehicle inspecting the spiking pattern on the newly replaced rail. The machine operator was standing in the gage of the track nearer the high, or north, rail. The assistant division engineer was in the driver's seat, which would place him on the inside, or low, rail of the curve. He did not see the machine operator until the vehicle struck and ran over him. The tie drill which the operator was running weighs 970 pounds. He was crushed between the drill and the hi-rail vehicle.

Results of toxicological testing of the deceased were negative.

Applicable Rules

CSX TRANSPORTATION OPERATING RULES

707. When necessary to perform scheduled work without flag protection * * * .

. . .

(c) When track is to be turned over to an employee to work without through-train traffic, temporary speed signs will not be displayed. The following example will be issued to the employee in charge.

EXAMPLE OF WORK AUTHORITY TO WORK
WITHOUT THROUGH-TRAIN TRAFFIC AND
WITHOUT FLAG PROTECTION

You may work on Main (Track) track 0730 hours (Time) until 1530 hours (Time)
Feb 29 (Date) between MP 29.0 (Specific Location) and MP 29.5 (Specific Location)
without flag protection.
Track will not be entered by trains or on-track equipment except as permitted by employee L U Murphy (Name) in charge.

(d) When working under Rule 707(c). The employee in charge will be responsible for all train movements within the limits.

. . . . .

719. * * * Employees in charge * * * must issue instructions stating that a lookout must be kept in both directions * * * .

720. On-track equipment must move prepared to stop within one-half the range of vision. It must not exceed the speed authorized for trains on the same track. Speed must be further reduced as follows:

. . .

(b) Rail-highway vehicle (passenger type):
Forward - 30 MPH,
Backward - 10 MPH.

. . . . .

REPORT: 19

RAILROAD: The Atchison, Topeka and Santa Fe Railway Company

LOCATION: Wellsville, Kansas

DATE, TIME: July 23, 1987, 3:45 p.m.

PROBABLE CAUSE: Failure of train dispatchers to properly record and block track-and-time permits granted.

EMPLOYEES:	Occupations	Trackmen
	Ages	32 years 37 years
	Length of Service	12 years 16 years
	Last Rules Training	May 24, 1982 February 12, 1976
	Last Safety Training	April 15, 1987 April 15, 1987
	Last Physical Examination . .	November 14, 1986 June 26, 1985

Circumstances Prior to the Accident

The method of operation in the accident area was by signal indication of a traffic control system in either direction on two main tracks, with protection for on-track equipment provided by track-and-time limits.

Section Crew

The section crew went on duty at 7:30 a.m., at Wellsville, Kansas. Their work assignment for the day consisted of moving ties close to the north main track for a work train. At 8:15 a.m. the foreman requested track-and-time limits from the dispatcher between Wellsville and Gardner, Kansas, on the north main track. The permit was granted from 8:18 a.m. until released. The crew set their 2-1/2 ton crew cab hi-rail truck on the north main track.

The crew worked until about 3:15 p.m., when they boarded the truck at milepost 41.3 and headed west towards Wellsville at a speed of 30 to 35 mph. The truck crew cab was designed with four seats on each side facing each other. Inside the crew cab, two

trackmen were seated on the left side facing each other and one on the right side facing forward. Inside the front cab, the driver was in his normal position, and the foreman was seated in the front cab on the right-hand side.

Train Dispatchers

At Kansas City, the dispatcher's control machine consists of a Union Switch and Signal Micro-processor, interfaced with a US&S 506-A Style Coding System, incorporating a color cathode-ray screen (CRT) with keyboard entry, having 25" overview CRT screens. Dispatchers work for eight hour periods that are referred to as "tricks."

After a proper off-duty period, the first-trick train dispatcher went on duty at 7:30 a.m. On the day of accident, the first-trick train dispatcher arrived about 15 minutes early for the transfer from the third-trick dispatcher. Three track-and-time permits were issued between Wellsville and Olathe between 7:15 a.m. and 8:18 a.m. The permits were requested by three foremen, who are designated in this report as foreman one, two, and three. (Foreman three would be involved in the accident.) Foreman one requested track-and-time limits between Wellsville (milepost 45.5) and Gardner (milepost 34.6) at 7:13 a.m. until released. This was properly entered on the log sheet and into the computer. Foreman two requested track-and-time limits between Wellsville (milepost 45.5) and Olathe (milepost 27.8) at 7:20 a.m. until released. The third-trick dispatcher wrote down Olathe to Wellsville in his log book, but only blocked the computer from Olathe to Gardner. The first-trick dispatcher understood what was requested and what was blocked, however took no exception to the action taken because the dispatchers knew the foreman was between Olathe and Gardner at this time. The third-trick dispatcher then went off duty. At 8:18 a.m. foreman three requested track-and-time limits between Wellsville and Gardner. The first-trick dispatcher properly blocked the computer at this time but failed to make a written record of this track-and-time request in his log book.

At 12:26 p.m. foreman two released his track-and-time limits between Olathe and Gardner and retained between Gardner and Wellsville. Due to the incorrect computer entry at 7:20 a.m. for foreman two, the computer now displayed only two permits between Wellsville and Gardner when in fact all three foremen were still working in this area. At 1:50 p.m. foreman two released his permit between Wellsville and Gardner. The first-trick dispatcher released one permit between these points, but, in fact, this was foreman three's permit because foreman two's permit was never entered into the computer for this area. This left only one track-and-time permit between Wellsville and Gardner to protect both foreman one and three.

At 2:34 p.m. foreman one released his permit between Wellsville and Gardner. No permit now remained on the computer between Wellsville and Gardner; however, foreman three was still on the track within these limits.

At 3:30 p.m. the first-trick dispatcher went off duty, and the second-trick dispatcher went on duty unaware that foreman three was on the north track between Wellsville and Gardner.

Extra 3848 East

Extra 3848 East was called at Emporia, Kansas, at 2:00 p.m., July 23, 1987, and departed at 2:20 p.m. with three locomotives, 40 cars and a caboose. The engineer and head brakeman were located in their respective positions in the lead locomotive, the rear brakeman was in the third locomotive, and the conductor was in the caboose.

Extra 3848 East traveled to milepost 43.8 on the north track without incident.

The Accident

Just prior to entering a 1-degree 30-minute curve to the left, the crew of Extra 3848 East observed the hi-rail vehicle on the same track coming around the curve, and the train air brakes were placed in emergency. The headlight was on bright, and the horn was sounding. The train struck the hi-rail vehicle at milepost 43.7 while traveling at a speed of 65 to 70 mph. The front brakeman saw one person jump from each side of the hi-rail vehicle prior to impact. The hi-rail burst into flame on impact and was demolished. Two trackmen located in the crew cab were killed on impact. A third trackman in the crew cab was severely burned. The foreman escaped with cuts and bruises, and the driver was uninjured. The Wellsville Fire Department was first to the scene, followed by an ambulance. A helicopter was sent in for the burn victim.

Post-accident Investigation

Toxicological testing was performed on all train crewmembers and the two deceased trackmen. Only urine samples were collected from the train crew, which is contrary to FRA mandatory post-accident testing requirements. The first-trick train dispatcher, who was off duty at the time of the accident, was also tested at his own request. Results of toxicological testing were negative.

When notified of the accident, the first-trick dispatcher readily admitted his failure to properly record the track-and-time limits granted.

The foreman and driver, who both jumped, were not wearing their seat belts at the time of the accident, which is contrary to the carrier's safety rules.

Applicable Rules

General Code of Operating Rules

351(A). Protection of Limits: Before granting track and time limits, control operator must apply blocking or marking devices to the control machine to prevent movement into the limits * * * .

Blocking or marking devices must not be removed until limits have been cleared or released to the control operator * * * .

351(B). Protecting Machines, Track Cars or Employees: Track and time limits may be granted for machines, track cars or employees in the same manner as to trains. The employees granted track and time limits must notify control operator when machines, track cars or employees are clear of the limits, or if the limits were granted to protect maintenance work that such work is completed and track is safe for the passage of trains.

351(E). Record Track and Time: Employee requesting track and time limits will state his name, occupation, location and train or other identification and will repeat back the authority granted. If correct, the control operator will respond "OK". Control operator must maintain written record of authority granted including time track was released or cleared.

Train Dispatcher Instructions

21. Blocking or Marking Devices on Control Machine:

Control operator must set signals to display "stop", and apply blocking or marking devices to controls to prevent movements into the area being protected when:

. . .

(i) Before granting track and time limits.

SAFETY RULES
for
Santa Fe Employees

TRACK CARS

253. . . .

All employees must be properly seated and safety seat belts (where provided) must be fastened while vehicle is in motion.

REPORT: 20

RAILROAD: National Railroad Passenger Corp. (Amtrak)

LOCATION: New York, New York

DATE, TIME: August 17, 1987, 10:42 a.m.

PROBABLE CAUSE: The employee's failure to utilize his safety strap while crossing over a track by means of a catenary bridge.

EMPLOYEE:		
	Occupation	Electric Traction Lineman
	Age.	41
	Length of Service.	17 years
	Last Rules Training.	January 8, 1986
	Last Safety Training	August 17, 1987
	Last Physical Examination. .	Pre-Employment Physical

Circumstances Prior to the Accident

On the day of the accident, Sunnyside Line Gang P252 went on duty at 8:00 a.m. at "Q" Tower in New York. The gang consisted of a Supervisor, five Electric Traction Linemen, one Electric Traction Lineman Helper and one substation Electrician. The Supervisor informed the gang that one of the assignments for the day would be overhauling disconnect switch 4302L ("the switch"). The gang received clearance from the power director to begin work on the switch at approximately 9:00 a.m. The switch is located at the top of the south catenary pole of catenary bridge B904WA which spans Line (track) No. 4, 300 feet east of the portal of the tunnel running under the East River between the boroughs of Queens and Manhattan. The switch controls catenary circuit 4302 on Line No. 2. At 10:20 a.m. a ground wire was applied to the circuit. After applying the ground, the victim and two other linemen drove to the tunnel portal along Line No. 4 where they parked their vehicle and were met by the Supervisor and the rest of the gang.

The Accident

The victim and another lineman were directed to work on the switch, at which time they walked easterly from their parked truck 300 feet to catenary pole B904WA. The track in this area

is approximately 12 feet below ground level in a cut section between two retaining walls. One lineman continued walking easterly for an additional 300 feet where the track is at ground level, and he crossed safely to the south side of Line No. 4. The victim chose to cross the track by climbing the catenary pole and walking across via the horizontal beam of the catenary bridge. While walking on the bridge, the victim lost his balance and fell. While falling he grabbed the beam with his right arm at which time his legs came in contact with a steady span wire which was energized. His body acted as a ground causing a destructive arc between the energized steady span wire and the catenary beam. He then fell to track level. The critically injured lineman was rushed to the hospital, where he died at 9:30 a.m. on August 20, 1987 (three days after the accident) of electric shock, multiple burns and injuries caused by the 20-foot fall.

Post-accident Investigation

The victim chose to climb the catenary pole and attempted to cross the track via the catenary bridge to the work site. He apparently lost balance, slipped from the beam, and contacted energized equipment before falling approximately 20 feet to track level. Fellow employees going to the same work site used the crossing 300 feet east. Having chosen to cross Line No. 4 via the catenary bridge beam, he did not utilize a safety strap which he had on his person which could have been attached to the horizontal cable messenger suspended three feet above the beam.

Applicable Rules

National Railroad Passenger Corporation (Amtrak) Maintenance of Way Employees - NRPC 1908.

Rule 4447

When on an elevated place, look before stepping in any direction. Stay clear of opening, slipping, tripping or stumbling hazard, skylight or other situation that is likely to cause losing balance.

Rule 4453, Para. F

Use authorized body belt and safety strap in an untwisted position with tongue or snap away from body, rope or cable; adjusting the safety strap, rope or cable to allow only

slack necessary for performance of work, unless scaffold or other suitable protection is provided, in the following situations:

. . .

(F) any operation or situation which involves unprotected falling hazard.

REPORT: 21

RAILROAD: Union Pacific Railroad Company (UP)

LOCATION: Nebraska City, Nebraska

DATE, TIME: August 21, 1987, 10:30 a.m.

PROBABLE CAUSE: Derailment caused by an unsecured pneumatic spike hammer falling from a self-propelled, track-mounted air compressor.

EMPLOYEE:

Occupation	Track Welder
Age.	31 Years
Length of Service.	6 Years
Last Rules Training.	April 1, 1987
Last Safety Training	April 1, 1987
Last Physical Examination. .	October 28, 1987

Circumstances Prior to the Accident

On the day of the accident, a UP system rail laying gang went on duty at Nebraska City, at milepost 436.9, at 6 a.m. At approximately 10 a.m., the gang had completed the work assignment of relaying rail on the north end of a curve ending at milepost 434.2. A self-propelled, track-mounted air compressor ("air compressor") was one of several machines to be moved in a procession of equipment and manpower on the single main track into Nebraska City. The operator of the air compressor loaded the tools and two pneumatic spike hammers on the air compressor.

The air compressor was operated northward on tangent track and on a descending grade of 1.03 percent. Two loaded on-track push cars were being pushed ahead of the air compressor. The machine operator and the track welder were riding on the front platform of the air compressor. The machine operator was operating the air compressor from a standing position, and the welder was sitting on a water keg. A welder helper and a trackman were passengers riding on the rear of the air compressor.

The weather was clear, and the temperature was 84° F.

The Accident

At 10:30 a.m. the air compressor was being operated northward at a speed of about 15 mph as estimated by the machine operator, when one of the two pneumatic spike hammers located on the front

of the air compressor vibrated off the machine and fell into the center of the track at milepost 434.5. The pneumatic spike hammer wedged between a crosstie in the track and the lead axle of the air compressor. The front rail wheels lifted off the rail, and the machine derailed. The track welder fell forward into the center of the track when the machine derailed and was killed instantly when the machine ran over him.

Post-accident Investigation

Northward on the single main track from milepost 434.2, there are in succession a tangent of 400 feet in length, a 2-degree 6-minute curve to the left 1,015 feet in length, a tangent for a distance of 103 feet to the point of the accident, and 1,521 feet beyond. The 2-3/4 inches of elevation in the aforementioned curve immediately preceding the accident area was a contributing factor in the shifting action that allowed the pneumatic spike hammer to fall from the machine.

An inspection of the condition of the track and the air compressor revealed no exceptions that would have contributed to the accident.

Results of toxicological testing of the deceased were negative.

Applicable Rules

Union Pacific Railroad Company

Maintenance of Way Rules

Effective April 5, 1987

Rules for on-track operation of track cars, roadway, or work equipment.

1436. Secure Lading: All articles carried on track car must be so placed and secured as to prevent their falling off and must not block lifting handles or end rods.

REPORT: 22

RAILROAD: Southern Pacific Transportation Company

LOCATION: Sheldon, Texas

DATE, TIME: August 20, 1987, 4:30 p.m.

PROBABLE CAUSE: Employee working beneath a bridge while other employees were working on top of the bridge with materials likely to fall.

EMPLOYEE:

Occupation	Instrument Man
Age.	44 years
Length of Service.	12 years
Last Rules Training. . . .	September 9, 1986
Last Safety Training . . .	August 20, 1987
Last Physical Examination.	November 5, 1975

Circumstances Prior to the Accident

On the day of the accident, two separate carrier crews were working together replacing an open deck trestle with a closed concrete deck span on which ballast and track ties would be used to support the rails. A Senior Instrument Man was supervising the project.

A Maintenance-of-Way (MOW) Extra Gang No. 162, consisting of a foreman and five track laborers, was working on top of the span laying a track panel on the new concrete deck. They were putting on the rail joint bars, spacing the ties, and installing timbers and shims to support the track structure on the new deck. A Bridge and Building (B&B) gang was installing new girders under the track as the MOW removed the old track panels and assisted in the installation of the new concrete deck.

At about 4:30 p.m. one MOW laborer was working on the east end of the new concrete deck span driving spikes to hold the rail at the joint bars where the new track panel was connected to the track on the old part of the bridge. Earlier in the day, a track tie had been laid across the rails near those joints on the trestle. In order to complete his work, he had to move the tie. It was his intention to turn the tie and put it in the middle of the track, at least until he got through spiking the rail joint ties. He lifted up the south end of the tie to about knee height. As he started to swing the tie around to the center of the track, he slipped on the unevenly spaced ties on the open

deck trestle and started to fall. He let go of the tie in his effort to regain his balance. The tie fell over the north side of the open deck trestle.

At the same time, an Assistant B&B Foreman, a B&B welder, and the instrument man were raising a ladder to the north side of the bridge at the east end of the new concrete deck to assist the B&B welder as he installed a bridge cap to keep the concrete deck from shifting. There were three portable welding machines running at the time to perform this and other welding jobs. As the men were raising the ladder, the Assistant B&B Foreman looked up and saw the tie tumbling down. He yelled and jumped out of the way. The noise of the three welding machines was loud enough to almost completely drown out his shout of alarm. Another welder thought he heard the shout but was not sure.

The Accident

The tie fell 30 feet from the north side of the open deck portion of the bridge and struck the instrument man on the arm and upper body, inflicting serious internal injuries. The victim was taken by helicopter to Herman Hospital in Houston, where he died on August 21, 1987 at 6:10 p.m.

Post-accident Investigation

The group of employees under the bridge placed themselves in jeopardy when they went under the bridge to raise the ladder and proceed with the welding assignment while the crew on top of the bridge were still installing the rail panels on the new deck and old material was falling from the bridge. There was no attempt made even to tell the crew on the bridge that they were going under the bridge. The north side of the bridge where they were working was the area where the old ties and timbers were being thrown from the bridge.

The crew on top were working on an open deck trestle and on new ties and rail on the concrete deck. The footing was difficult due to the new creosoted ties and the wide irregular spacing of the ties.

The crew on the ground should not have entered into the dangerous area beneath the bridge until the maintenance gang above had stopped work.

Applicable Rules

Southern Pacific Transportation Company Rules and Regulations for the Maintenance-of-Way and Structures.

General Rule

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.

REPORT: 23

RAILROAD: CSX Transportation, Inc.

LOCATION: Cincinnati, Ohio

DATE, TIME: September 1, 1987, 4:45 p.m.

PROBABLE CAUSE: Failure to remain clear of moving equipment.

EMPLOYEE:

Occupation	Carman
Age	42 years
Length of Service	19 years
Last Rules Training	July 19, 1987
Last Safety Training	July 16, 1987
Last Physical Examination	November 28, 1967

Circumstances Prior to the Accident

A carman reported for duty at 3:00 p.m., at Queensgate Yard, Cincinnati, Ohio, and was assigned as an outbound car inspector. He was instructed to complete an initial terminal air brake test of train Extra 4210 North. The cars to be hauled in the train had been previously charged, tested and inspected from the yard air plant and were standing on Track D4. The rear (south) car of the train was 2,214 feet north of the cart path on the south end of the D Yard. The carman, operating a motorized cart, traveled south on an asphalt path on the west side of Track D4. He parked the cart on the path near the rear end of the train and applied an end-of-train device to the rear car. Then he positioned himself on the cart path and waited for the hauling locomotives to be coupled to the train and for sufficient pressure to build in the train air brake system to complete the test.

After completing the required off-duty period, a train crew consisting of an engineer, conductor, head brakeman and brakeman was called for duty at 3:00 p.m. on the day of the accident. The crew was called to take Extra 7535 West, a mixed freight train consisting of 3 locomotives and 71 cars, from Cincinnati, Ohio to Washington, Indiana. The crew was taxied to the south end of D Yard where Extra 7535 West was standing on track D5. In the area of the accident, Track D5 is tangent and adjacent to Track D4. After boarding the train, the crew received instructions to pull south toward the No. 2 High-Line Track and switch a defective car from their train to the East Open Track. After switching out the defective car, the train was recoupled on Track D5 with the rear car of the train near the south end of the

D Yard. A carman, driving an automobile, arrived at the south end of the D Yard to test the air brake on the rear car of the train. He requested to make the air brake test where the train was standing because the location was convenient. After completion of the air brake test, Extra 7535 West shoved north on Track D5 and stopped with the front end of the lead locomotive immediately north of the car path on the south end of the D Yard. The rear (north) car was 4,631 feet north of the cart path and 2,417 feet north of the rear car of train Extra 4210 North. Extra 7535 West was shoved north past No. 40 switch so it could operate south through the crossovers toward the Indiana Subdivision.

The carman that made the air brake test of Extra 7535 West was instructed to get the waybill for the defective car from the train crew and deliver it to the inbound car foreman's office. When Extra 7535 West finished shoving north, he boarded the hauling locomotives and took possession of the waybill. Then he traveled north on the East Road toward the inbound car foreman's office. When he passed the rear end of train 4210 North, standing on track D4, he waved to the carman standing on the cart path waiting to finish the air brake test. While he was en route to the inbound car foreman's office, at approximately 4:40 p.m., Extra 7535 West was given permission to leave the yard.

At the time of the accident it was daylight, the weather was clear, and it was about 72° Fahrenheit.

The Accident

The carman who had been instructed to complete the air brake test of Extra 4210 North was discovered lying outside the west rail of Track D5 by an employee traveling north on the East Road. The carman's body, also the point of the accident, was near the north end of the rear car of Extra 4210 North. The leading wheel of the trailing truck (R-2) of the rear car of Extra 7535 West, BN 621680, had run over the carman's right shoulder and neck.

The carman was pronounced dead at 7:15 p.m. at the University of Cincinnati Hospital.

Post-accident Investigation

Apparently there were no witnesses to the accident. Post-accident investigation of the accident site and equipment involved failed to produce an explanation of why the carman came in contact with the train. The train had moved past his location for approximately 2,374 feet before the accident occurred. Presumably he could have finished the air brake test without leaving his last known position on the cart path. A post-accident inspection of the car involved in the accident did not reveal any condition that would have been a contributing factor

in the accident.

Since there were no witnesses to the accident, the final actions of the carman could not be determined.

Results of toxicological testing of the deceased and of the crewmembers of Extra 7535 West were negative with the exception of the conductor. Delta-9-tetrahydrocannabinol was detected in the blood at a concentration of 1 ng/ml. The carboxylic acid metabolite of Delta-9-tetrahydrocannabinol was detected in the blood at a concentration of 124 ng/ml and in the urine at 84 ng/ml. No other drugs or alcohol were identified. The conductor had no role in the cause of the accident.

Applicable Rules

Chessie System Railroads
Safety Rules No. 46

On or about tracks.

Employees on or about any tracks, whether in the open, in shops, on bridges, or in tunnels, must move to a place of safety upon the approach of rolling equipment on the track where they are working or on an adjacent track. Employees must always position themselves at a safe distance from moving equipment, and be alert for falling or protruding equipment.

REPORT: 24

RAILROAD: Norfolk and Western Railway Company

LOCATION: Kimball, West Virginia

DATE, TIME: September 8, 1987, 8 a.m.

PROBABLE CAUSE: Failure to lower and properly support truck crane boom prior to lubrication.

EMPLOYEE:

Occupation	Carman
Age.	33 years
Length of Service.	11 years
Last Rules Training. . . .	September 8, 1987
Last Safety Training . . .	September 8, 1987
Last Physical Examination.	May 24, 1985

Circumstances Prior to the Accident

The accident occurred beside the Kimball Yard car shop which is located between the westbound main line and the yard lead track. The terrain is level with a crushed limestone surface. The weather was rainy with a temperature of about 65° F.

On the day of the accident, a mechanical crew consisting of a foreman and two carmen reported for duty at 7 a.m. at Kimball Yard. After the daily safety meeting, the crew was in the process of lubricating the mast of a Hoesch truck crane. The engine was running, and the boom was raised and unsupported. The hand-operated grease gun they were using was found to be inoperative. The crew returned to the shop that was located alongside the truck, and the foreman and one of the carmen were making repairs to the grease gun.

The Accident

The other carman was last seen removing another grease gun from a cabinet under the workbench and apparently went outside to grease the mast. The foreman and the other carman were unaware that he had gone outside. The engine on the truck was running. Over the noise of the running engine, they heard a loud groan. They rushed outside and found the carman pinned between the boom and the mast.

The foreman and carman attempted to free the victim, but his left knee had the control lever in a depressed position, and they

could not operate the control lever to move the boom. They turned off the engine and used hydraulic jacks between the boom and mast to free the injured carman. The victim was taken to Stevens Clinic at Welch, WV, and was pronounced dead on arrival.

Post-accident Investigation

The carman had received instruction on the operation of this particular truck crane. Inspection of the crane by the railroad revealed no defects that would have contributed to the accident.

The grease gun had a flexible hose which required the end connection be held to the grease fitting with one hand while operating the gun handle with the other hand.

There were no witnesses to the accident; however, when the foreman and the other carman arrived on the scene, they found the victim's left knee in contact with the downward control lever, which would have allowed the 300 pounds per square inch of hydraulic pressure to lower the boom on the victim, crushing his body between the boom and the mast.

Results of toxicological testing of the deceased were negative.

Applicable Rules

Norfolk Southern Safety and General Conduct Rules

Safety Rule 1220. Repairing or cleaning machinery while it is in motion except for adjustments that require the machine to be running. If driven by individual motor, the motor must be stopped and control switch properly tagged before such work is performed. Mechanical locking devices, where provided, must be applied before adjusting or repairing machine. A machine in motion must not be oiled if an employee could contact or be caught by moving parts.

Safety Rule 1553. A crane or derrick boom must be lowered and properly supported for lubrication, repair, or when making any change in boom length or boom assembly, except in pile driver service. The boom must be secured to prevent movement when it is not in use.

REPORT: 25

RAILROAD: Consolidated Rail Corporation (Conrail)

LOCATION: Campbell Hall, New York

DATE, TIME: September 11, 1987, 10:15 p.m.

PROBABLE CAUSE: Going between equipment likely to move.

A contributing factor was the failure of the brakeman to specify distance of the movement while using radio communications and the engineer's failure to clarify the extent of the movement.

EMPLOYEE:

Occupation	Conductor
Age	52 years
Length of Service.	33 years
Last Rules Training. . . .	February 23, 1987
Last Safety Training . . .	February 23, 1987
Last Physical Examination.	January 26, 1986

Circumstances Prior to the Accident

In the accident area there are, from south to north, a main line track, a side track, four yard (storage) tracks, and a Wye track. The accident took place on the side track. The crew involved was working by radio communications due to a 1-degree 30-minute curve and noise from traffic operating on the main track.

A three-member crew, consisting of a conductor, brakeman, and locomotive engineer, went on duty in Port Jervis, New York at 8:30 p.m. on the day of the accident. All had the required off duty period prior to reporting for duty. They were assigned to train BUOI-1 which was to operate between Buffalo, New York and Newark, New Jersey. The involved crew operated the train between Port Jervis, New York and Campbell Hall, New York without incident or exception to the train equipment.

At Campbell Hall, the train was pulled clear of the main line track as the crew prepared to deliver a nine car cut and pick up cars in the yard. The conductor and brakeman conferred about which cars were to be set off because the computer print-out of the train's consist was incorrect. An uncoupling was made by the brakeman behind the twelfth head car. The conductor, who left

his portable radio on the locomotive, told the brakeman to attend the switch at location "B", and remain at the switch, and send the track back to the conductor. The brakeman then rode the rear car to the switch as directed. The conductor noticed that the brakeman had made an incorrect uncoupling and signaled the brakeman with his lamp to send the train back against its rear portion.

The Accident

The brakeman radioed the locomotive engineer directing him to "come west," but did specify the distance to be moved. The brakeman remained at the switch. The locomotive engineer stated that he assumed that he was headed for a yard track. While the train was moving west towards the rear portion of the train, the conductor went between the standing equipment to close the angle cock where the proper uncoupling was to be made. According to the brakeman, as soon as the conductor's lamp went out of sight, he attempted to stop the movement, but simultaneously the head portion of the train struck the standing rear portion at speed of between 6 and 7 mph.

The conductor was leaning over the car's couplers in order to close the angle cock. He was struck by the equipment's striker casting and sustained fatal internal injuries. The fatally injured conductor was taken to Arden Hill Hospital in Goshen, N.Y., where he died shortly after midnight.

Post-accident Investigation

Inspection of the rail equipment involved disclosed, no defects that would have contributed to the accident.

Inspection of the brakeman's portable radio and the radio assigned to the conductor both disclosed they were in working order.

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

Applicable Rules

CONRAIL SAFETY RULES

Train, Locomotive and other Transportation Employees

1304. Expect equipment to move on any track, in any direction, at any time. Therefore, employees must look in both direction before:

(a) Fouling or crossing track.

(b) Going between or around the end of equipment.

. . . . .

1711. Before fouling, going between or under standing equipment for inspection, adjustment, repairs or any other purpose:

. . .

(b) Have a thorough understanding with other employees involved so that no signal to move will be given.

(c) Make sure that protection has been provided against any approaching equipment on the same track.

. . . . .

Federal Railroad Administration Regulations

RADIO STANDARDS AND PROCEDURES
(49 CFR Part 220)
Subpart B---Radio Procedures

Section 220.49 Switching, backing or pushing.

When radio communication is used in lieu of hand signals in connection with the switching, backing or pushing of a train, engine, or car, the employee directing the movement shall give complete instructions or keep in continuous radio contact with the employees receiving the instructions. When backing or pushing a train, engine or cars, the distance of the movement must be specified, and the movement must stop in one-half the remaining distance unless additional instructions are received. If the instructions are not understood or continuous radio contact is not maintained, the movement shall be stopped immediately * * * .

REPORT: 26

RAILROAD: Carolina and Northwestern Railway Company

LOCATION: Plymouth, North Carolina

DATE, TIME: September 29, 1987, 9 a.m.

PROBABLE CAUSE: Jumping from moving equipment in an area of close clearance.

EMPLOYEE:

Occupation	Brakeman
Age	48 years
Length of Service. . . .	19 years
Last Rules Training. . .	February 1987
Last Safety Training . .	Not available
Last Physical Examination	February 18, 1986

Circumstances Prior to the Accident

The crew, consisting of an engineer, conductor, brakeman, and flagman, reported for duty at 7 a.m. at the Plymouth yard office after their required rest period. After switching in the yard, the crew began a switching assignment at the Weyerhaeuser paper plant.

The Weyerhaeuser Company has a system of tracks to various locations in the plant, including a four-track classification yard in the vicinity. A track known as the North Carolina Division Track of the Weyerhaeuser Company runs northward off the lead track to the building where the paper-loading docks are located. Ten cars were spotted inside the building along the platform. The tracks are level in this area.

The clearance between the side of the boxcars and platform is is as little as 7 inches. The clearance at the doorway entering the building on the west side is 3 feet. One car was spotted outside the building at a 16-foot loading dock doorway. The clearance between the boxcar and wall was 7 inches.

At approximately 9 a.m., after switching several tracks in the plant, the crew pulled 11 cars from the North Carolina Division paper shed loading docks and went to the classification yard and performed switching.

Three partially loaded boxcars, which were pulled from the plant, were again placed on the North Carolina Division Track to be

placed back into the plant for further loading. After more switching, another eight cars were coupled to the three cars. The brakeman was located on the west side of the cars while the engineer was on the east side and the flagman at the northeast end of the partially loaded cars. The brakeman made the coupling with the engineer via radio, coupled the air brake hoses, and then radioed the flagman saying, "Sammy, baby, they're all yours now." This was the last communication between the brakeman and other crewmembers. There were no witnesses to testify on where or what car the brakeman mounted.

The Accident

The flagman then directed the engineer to proceed into the plant with the cars while riding the end of the north car. The speed of the train movement was approximately 5 mph. After several cars entered the building, two eyewitnesses, located about 15 feet northeast from the loading platform door, stated the brakeman jumped from between the boxcars into the doorway used to spot the eleventh car for loading. These witnesses were unable to identify the car from which the brakeman jumped. The brakeman struck the wall and was caught between the wall and the moving equipment. He was then vertically rolled in the 7-inch clearance from the door into the building and fell to the ground at the next opening between the cars. The Weyerhaeuser employees attempted to warn the crew. One employee ran toward the flagman and the other to the engineer to stop the move.

Emergency medical services were called, and the brakeman was taken to Washington County Memorial Hospital, where he was pronounced dead on arrival.

Post-accident Investigation

The brakeman was a regularly assigned crewmember, had worked the job for eight months, and was familiar with the characteristics of the plant. He had been verbally reprimanded by the trainmaster for riding between cars approximately two weeks before this accident.

Post-accident inspections of the cars or locomotive by carrier personnel did not disclose any defective conditions that would have contributed to the accident.

Results of toxicological testing of the deceased were negative.

Applicable Rules

Norfolk Southern Corporation
Operating Rules*

GR-13. Employees must not:

(a). Ride on close-clearance side or on end of equipment moving adjacent to platform, building, or close-clearance structure, or stand between moving equipment and adjacent, building, or close-clearance structure.

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* Norfolk Southern Corporation Operating Rules apply to the Carolina and Northwestern Railway Company.